Environmental Crime Threat Assessment 2021

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NETHERLANDS
PUBLIC PROSECUTION SERVICE

Omgevingsdienst NL

POLITIE

Human Environment and Transport
Inspectorate
Ministry of Infrastructure
and Water Management

Netherlands Food and Consumer
Product Safety Authority
Ministry of Agriculture,
Nature and Food Quality

Preface

This Environmental Crime Threat Assessment 2021 is the product of the input by a significant number of the parties involved in supervising and enforcing laws and regulations designed to protect the environment. Around the globe, the serious impact of environmental damage on the environment and human health is becoming ever more widely known. Discomfort in society is growing.

The Strategic Environmental Chamber (SMK) commissioned this threat assessment. The Chamber consists of the inspectors-general of the Human Environment and Transport Inspectorate, the Netherlands Food and Consumer Product Safety Authority, and the Social Affairs and Employment Inspectorate, the environmental crime portfolio holder of the National Police, the director of the Zuid-Holland Zuid Environmental Agency on behalf of the regional Environmental Agencies (Omgevingsdiensten), and the undersigned, Chief Public Prosecutor of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation, in the capacity of president. The SMK on outlines directs the criminal-law strategy to counter environmental crime.

Nine forms of environmental crime were selected and explored in more detail for this report, ranging from threats to soil and water quality and biodiversity to threats related to the circular economy. Environmental crime has far-reaching implications for the world we live in and are part of. Environmental crime is mostly 'hidden impact crime': its effects are not always (immediately) visible, but have very large and undermining consequences for the living environment, the economy, and society. Human and animal health and the environment are inter alia affected by polluted soil or water, illegal discharges of waste or hazardous substances, manure fraud, illegal plant protection products, and the processing of (chemical) waste into animal feed or marine fuels. Non-compliance with the rules also gives offenders unfair competitive advantages and harms the economic system.

A major threat that pops up in all chapters as a recurrent theme is that environmental crime is not only 'hidden impact crime', but that the actual environmental damage is even concealed by fraud. Given the major challenge of addressing the climate and nitrogen crises and the difficult measures that will need to be taken to do so, it will be tempting for various sectors to tamper with data. Well-known examples are Dieselgate and the large-scale fraud with European emission allowances. Such practises create the risk that polluting effects are only reduced in test situations, in models, or on paper, but not in real life. The section in the Threat Assessment on manure fraud attempted to quantify the environmental impacts of illegal action.

Both administrative law (punitive and restorative) and criminal law are needed to tackle environmental crime. This dual nature of the enforcement system, the large number of public parties involved, and the often complex nature of the various regulations - which are also very different - make environmental enforcement a specialised and complex affair.

Unfortunately, both this Threat Assessment and recent reports by the Centre for Crime Prevention and Safety, the Van Aartsen Committee, and the Netherlands Court of Audit show that, in practice, tackling environmental crime leaves much to be desired. Investigation and prosecution lack the ability to take decisive action, investigation is fragmented, prosecution and trial take too long, and the sanctions ultimately imposed more often than not have no dissuasive effect. Major avoidable environmental damage is the result. Changes are therefore required. Not only is more capacity needed, but so are differences in direction and increased clout to have the criminal-law approach become more effective. In short, there are important improvements to be made.

This Threat Assessment shows that serious commitment to long-term environmental goals also requires sustained attention to tackling environmental crime. It is up to the Strategic Environmental Chamber and implementing agencies to take action. And, also in view of the aforementioned reports, this certainly seems to apply to 'politics'.

Guus Schram,

Chief Public Prosecutor, Public Prosecution Office
President of the Strategic Environmental Chamber

Acknowledgements

A great number of people have been involved in drawing up this Environmental Crime Threat Assessment. The 'hard core' consisted of the project team, which was composed of the following members of staff from the organisations involved:

ILT: Rob Poelman (Senior Inspector/IOD Investigations Adviser); Eva Cornelissen (IOD Senior Inspector), Walter Klomp (Waste Programme Manager); Maarten Busstra (Senior Inspector, Soil Team)

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The sounding board group monitored the process on behalf of the client by conducting meetings in November 2020 and in January, May, and early June 2021. In addition to a project team member for each organisation involved, the sounding board group consisted of representatives with a mandate to reach agreement on the project plan to be submitted to the SMK, the progress of the project, and on the final Threat Assessment. These representatives were:

FP:Ingeborg Koopmans (Public Prosecutor), Floor van den Bogart (Committee Secretary)

ILT-IOD: Karin Schuit (IOD Team Leader)

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The chapters were written by members of the project team. For some chapters, external parties were brought in as authors or in another capacity. The authors of the chapters are responsible for the contents thereof. They are mentioned at the beginning of all chapters, as are all others who made crucial contributions. For some chapters, the choice was made to name the organisation concerned as the author.

The project team would like to thank everyone who contributed to the Environmental Crime Threat Assessment, be it by consenting to an interview, by making data or other material available, or in any other way.

Summary

This is the fourth consecutive Environmental Crime Threat Assessment. Time has not stood still and we can rightly ask 'what progress have we made in the past decades in tackling environmental crime?' The answer to that question is difficult. We can conclude that committing environmental crime is lucrative, there are plenty of opportunities and that the strategy is not in order. And, time is running out!

The Environmental Crime Threat Assessment 2021 appears under a special star. Over the past two years, several reports have been published on the fight against environmental crime in the Netherlands, in particular the CCV report '*De markt de baas*' (Being in charge of the market), the report '*Kwaliteitsborging bij de uitvoering van VTH-taken*' (Quality assurance in the performance of VTH tasks) and the Netherlands Court of Audit's interim report '*Een onzichtbaar probleem*' (An invisible problem). At the beginning of this year, the Van Aartsen committee advised on improvements in supervision and enforcement under the motto '*Om de leefomgeving*' (For the human environment).

These reports mention many bottlenecks in enforcing environmental legislation and combating environmental crime. This Environmental Crime Threat Assessment shows that the enforcement deficit leads to opportunities resulting in a large number of environmental crimes that cause serious damage to society and especially the human environment. Environmental crime probably accounts for a large share of the total damage to the environment from economic activities. In any case, this concerns damage that would not have occurred if environmental legislation had been complied with or environmental damage that has not been paid. It is therefore unnecessary damage that we have democratically found to be unacceptable. It is often difficult to quantify the damage, and criminal law is not aimed at this either. Quantifying ecological damage is sometimes possible, as shown in this Threat Assessment for specific forms of manure fraud.

The CCV report '*De markt de baas*' (Being in charge of the market) identifies a large number of bottlenecks in the enforcement of environmental legislation by Regional Environmental Agencies, Inspectorates/ Intelligence and Investigative Services and the police. Some of these impact the opportunities for environmental crime to be committed. For example, banning notorious offenders from the markets rarely or never happens in practice. A factor is that the costs of cleaning up can be borne by the community if a company is terminated anyway. Criminals can often continue their activities elsewhere due to poor information exchange. Enforcers in one region do not know what someone has done before in another region. The Netherlands Court of Audit advocates strengthening the national infrastructure for sharing information. The will of the parties involved to actually share information is of course also a necessary condition for improving the information position. Collaboration and information exchange at European and international level is also important or even necessary for a number of subjects (F-gases, waste and substances of very high concern (SVHCs)).

Identified violations are approached too much like an incident and underlying factors in the chain are insufficiently identified, so criminal motives sometimes disappear off the radar. Certification Bodies (CBs) are paid by the companies they are required to supervise. They are therefore less inclined to revoke a certificate if a company does not comply with the conditions. The influence of the business community in the development of laws and regulations makes it difficult to enforce environmental legislation: exceptions with fairly unclear criteria are the result (see also Environmental Crime Threat Assessment 2016).

On the basis of the aforementioned reports and its own research, the report '*Om de leefomgeving*' (For the human environment) published by the Van Aartsen Committee in March 2021, concluded that the system with which environmental legislation is enforced is underperforming. More capacity and higher priority are a prerequisite to improve the fight

against serious environmental crime. From now on, environmental agencies should be able to act independently of clients and no longer be dependent on output financing.

This is all the more pressing because in almost all environmental sectors, there are complex laws and regulations, which are supposed to regulate chains and processes that are also complicated, cross-border and often opaque.

The '*Liever een goede buur!*' (A good neighbour!) programme has been launched and aims to implement the recommendations that have been made. Various working groups are currently working on concrete proposals. This Threat Assessment shows this programme comes not a moment too soon: the environment is on the brink of disaster.

Key points from the threat assessment

Nine forms of environmental crime are described in terms of the opportunities for environmental crime, the practices of environmental criminals and the damage caused by them. In the thematic chapters, environmental crime is approached from the perspective of the opportunities that arise for the various parties in economic chains. Those who take advantage of these opportunities and do not follow the rules have a competitive advantage and can earn significantly more. Making these opportunities explicit also points the way to the prevention of environmental crime: by reducing the opportunities 'at the front', crime is prevented.

It's always about financial gain

Those who fail to observe the (environmental) rules that apply to an economic activity earn more than those who do. Because meeting the regulations, i.e. compliance, costs money. Since there are many and often complicated rules that apply to relevant industries, there are many opportunities to omit things that should have been done according to the rules (crimes of omission) and thus generate additional illegal income. This plays an important role in various forms of waste processing. In some cases, money is earned by accepting waste materials, while sales as a 'product' also yield money.

There are also forms of environmental crime that meet the demand for commodities that are not allowed, such as illegal crop protection products, phased-out refrigerants, wildlife products and heavy fireworks. In the eyes of the user, there is no legal alternative and so there is a lot of money to be made by meeting this demand. For example, the margins for illegal crop protection products can be as high as 500%.

The chance of being caught is small and the penalties are low

It is not easy to trace crime within very extensive and often complicated flows, especially since it is often combined with legal acts. Large groups of companies are active in some sectors, which means that various chain steps take place within their own company, making checks difficult. Supervision is fragmented and capacity is limited, not only in quantitative but also qualitative terms. Controlling various flows requires a high level of expertise, which is often very limited.

The prospect of a severe punishment hardly plays a role in the considerations of environmental criminals. The criminal proceedings are often long and complicated. At the end of the day, the offender gets away with a low sentence, because the judge takes the long lead time of the trial into account in the judgment.

Forgery is often part of the process

The illegal nature of flows or products is often difficult to establish. Checks are therefore dependent on the documents that must demonstrate the rules have been complied with, the product is authorised or there is no contamination in a batch. Papers can sometimes be forged quite easily. An example of this is that consultancy agencies and laboratories take their customer-friendliness so far that the report issued does not correspond to the composition of the material examined. A recently emerging form is where waste materials are converted into products and used in 'beneficial applications' that are only intended to get rid of the waste. Another aspect is that the documents state a less hazardous substance under hazardous (waste) substances, to avoid extra costs for safety measures and processing.

The Internet is playing an increasingly bigger role

In various forms of environmental crime, (trade) contacts are made via the Internet. For illegal flows, the Internet offers a way for those involved to remain anonymous. This applies to several forms of environmental crime, including the trade in illegal fireworks, where a trend towards even heavier explosive materials and an increase in demand is expected. Supervision and investigation will have to come up with an answer to this.

Environmental crime takes advantage of regulatory differences

It has been known for many years that waste materials are exported to countries where there is little regulation or control, resulting in their release into the environment. Sometimes, substances make detours via various countries, so the real origin can no longer be traced, which has been reported with F-gases. In the case of fireworks crime, clever use is made of differences with neighbouring countries in both legislation and prioritisation.

Environmental crime has serious consequences

This section summarises the findings with regard to the consequences of environmental crime. For some aspects, it is difficult to distinguish the adverse effects of environmental crime from those of legal and licensed activities. After this summary, a diagram gives an overview of the consequences per chapter. These are explained below.

Damage to physical or psychological health

This refers to the damage that occurs to individuals. For example, employees of companies that do not comply with the rules will run a greater risk of harming their health, as is the case, for example, with the illegal demolition of asbestos. The use of crop protection products has been associated with the development of diseases such as Parkinson's disease for years now.
The relative share of illegal practices on the total damage to our health is difficult to determine. It is known that seagoing vessels emit considerable quantities of harmful substances such as particulate matter, which significantly increases the mortality among the population, as explained in the previous Environmental Crime Threat Assessment. The contribution of ships that use illegal blending agents in their bunker oil is difficult to determine, but it can be assumed that it is relatively high, because these emissions are more toxic than those of ships that comply with the rules. Something similar applies to the use of illegal fireworks, which are generally considerably heavier and therefore more dangerous than regular fireworks that can be obtained from legal trade.

Environmental damage

The impact on the environment is not easy to quantify for many forms of environmental crime, as a large part of the environmental damage is caused by legal and licensed activities. Moreover, the damage often only becomes visible in the longer term. It is widely believed that environmental crime is a major contributor to environmental damage, but the exact proportion is difficult to determine. It can be assumed that less account will be taken of possible adverse effects on the environment in illegal activities, as explained above for bunker oil from sea-going vessels. However, the relative share is unknown.

An exception is the chapter on *manure fraud,* which reports on a study that shows that in specific cases, it is indeed possible to quantify the ecological effects of manure fraud, that these effects are significant and that it is valuable to pay more attention to this in future criminal cases. This approach puts the emphasis on the aim of manure regulations: to protect nature and the environment, which are the injured party in the event of fraud.

The results of the calculations into the ecological effects of manure fraud also make it clear that for the protection of nitrogen-sensitive nature, it is not only important to take a critical look at the granting of permits for new nitrogen-emitting activities, but also whether emissions have been paid for (for example, for purchase/lease production rights) and whether existing nitrogen-emitting activities meet the permit conditions.

This approach can also be applied to other forms of environmental crime. By mapping out the harmful effects of environmental offences where possible and also publicising them (via rulings), entrepreneurs are intrinsically motivated, or by external social pressure, to comply with the rules.

Nuisance, fear and unease in others

There is regular unrest among the population, whether or not in interaction with the (social) media, about activities that could potentially damage public health or the environment. Examples are easy to find, such as cases involving PFAS or GenX, which are discussed in the Substances of Very High Concern chapter, or the 'graphite rains' at Tata Steel.

Financial loss

In most forms of environmental crime, entrepreneurs who abide by the rules are disadvantaged because they find it difficult to compete with colleagues who do not comply with the rules and therefore also incur lower costs. The government is often faced with a considerable bill when clearing the assets of companies that go bankrupt and sometimes leave a 'legacy' in the form of a site full of hazardous material.

Undermining

In the previous Environmental Crime Threat Assessment, it was explained that environmental crime often concerns a twilight zone in which legal companies do not comply with the law for some of their activities.
Undermining in the form of affecting the integrity of public policy is a result of various forms of environmental crime. For example, in manure policy, it is considered necessary to keep an eye on the results by means of monitoring. Fraud causes incorrect administration and incorrect data at government institutions. And this data is used by Statistics Netherlands, for example, to monitor whether the legal usage standards are not being exceeded. In general, illegal practices will thwart the goals of government policy, thus undermining government policy.

Expectations for the future

This mainly concerns expected specific developments in government policy, which lead to changes in laws and regulations and supervision, and developments in the relevant markets, insofar as these are known. An important aspect of this is the Dutch Environment and Planning Act.
Once this has been introduced, many economic activities will fall under general rules and it will become easier for initiators to obtain a permit. The environmental agencies expect that enforcement processes will become more complicated in the event things do go wrong and that they may be made partly responsible because they are expected to 'come up with ideas' during the permit application and must primarily focus on making activities possible. There is good hope that the '*Liever een goede buur!*' (A good neighbour!) programme will lead to improvements in the approach to environmental crime, provided, of course, that the measures developed therein are indeed implemented.

Expectations for the near future are always expressed in the thematic chapters, based on expected developments in, for example, legislation or (international) markets. Some more pertinent issues mentioned in the chapters are discussed here.

The circular economy

As discussed in the previous Environmental Crime Threat Assessment, in the coming years, the pursuit of the *circular economy* will continue to lead to discussions about what constitutes waste and what constitutes a new product. This is an issue in particular in the chapter on soil. This also applies to other flows where 'end-of-waste criteria' play a role, such as bunker oil. The chapter that deals most explicitly with waste (Chapter 6) lists a number of waste materials that will be difficult to recycle. Some of these arise *because* of 'greening', such as solar panels. The interpretation of the legislation is also becoming increasingly complicated due to the waste versus raw material. Then there are Substances of Very High Concern, which most of us agree should be phased out, but which we still need for the time being and which run the risk of being left in the environment for a long time.

Measures to strengthen enforcement and information position

Strengthening enforcement, for which specific plans are mentioned in some chapters, should of course lead to a reduction in environmental crime. This applies, for example, to the introduction of systems that register real-time transport data, such as for manure transport. This should improve the quality of the data and reduce the opportunity for fraud because the transport details are known before the transport hits the road. With such innovations, it is good to remember that technological developments are expected to contribute to the effectiveness of checks, but it is important to also look at the

underlying causes of manure fraud and reduce the fraud incentive. Otherwise, new ways will be found to get rid of the manure surplus illegally. A strengthening of the information position is also expected in the soil flows, following recent evaluations. Improving international collaboration is mentioned on refrigerants and wildlife crime, in the latter also with NGOs.

Increase in fraud pressure due to tightening?

In some chapters, the concern is expressed that tightening regulations, in combination with poor supervision, could lead to more fraud, or more precisely, fraud pressure. After all, compliance with the rules entails costs. Tightening up regulations can also lead to a (temporary) shortage of legal products, which is to be expected with HFCs in refrigerants. Tightening up laws and regulations should also lead to investment in supervision and enforcement. Nevertheless, improving regulations and the effects of permits are generally expected to have a downward impact on crime.
Another risk that new policies may entail is that new subsidies are initiated to support the policies, which may be misused.

Prevention desperately needed

These findings indicate that environmental crime could be reduced 'at the front' through preventive measures. This could include, in particular, improving laws and regulations, so offenders are less likely to find loopholes in the law. In some areas, this should be done at European level.
Consideration could also be given to increasing social control, in which trade associations could play a role. Prevention requires reducing the opportunity to commit crime. It appears that the enforcement authorities sometimes have no insight into parts of the chain. If there is no supervision at all, it is difficult to avoid violations. In the chapter on F-gases, it is recommended that these blind spots be mapped out by the investigative authorities. Capacity would then be released for this.

Achieving long-term environmental objectives requires attention to fraud

Environmental crime is a form of crime with serious consequences for the human environment, public health and society and undermines the transition to a sustainable society. It frustrates policy efforts when fraudsters create a false reality with false documentation, fraudulent use of subsidy funds, illegal wildlife trade, illegal logging, use of illegal crop protection products, incorrect (re)use of residual and waste flows and hazardous chemicals.
Except for major incidents caused by non-compliance with laws and regulations, environmental crime can often only be observed by specialists. The great challenge of tackling the climate and nitrogen crises necessitates difficult measures. For some sectors, it will be tempting to cheat with the emission figures of pollutants. Well-known examples of this are Dieselgate, large-scale fraud with European emission rights, scandals with waste and manure fraud. Focusing on the prevention and combating of fraud can contribute to the achievement of long-term environmental objectives and prevents the waste of taxpayers' money through improper use of subsidies.

Timely identification requires investment in intelligence and investigative capacity

One of the recurring points in the chapters is the shortage of investigative capacity for environmental crime at the police, the Netherlands Human Environment and Transport Inspectorate and the Netherlands Food and Consumer Product Safety Authority. Priority is given to investigations in which the risk of direct victims is high, so certain forms of fraud remain unaffected.
If no investigation is carried out, it will also remain unknown which and how much fraud is taking place, what the consequences are (or could be) and what role the Netherlands plays in this. Taken together, this means we have limited/no insight into some forms of fraud, while there are potential risks to human and animal health. This can lead to certain risks not being identified in time, causing greater problems with (sometimes irreversible) consequences.

Conclusion

A large number of laws and regulations have been introduced in recent decades to protect the human environment, physical safety and public health. Those who obey the law will pay considerably more than those who do not. This gives the latter a competitive advantage. Checking that all these laws and regulations are complied with by all parties involved is only possible to a limited extent, which, combined with the low penalties, is an important factor in creating opportunities for environmental crime.
If the situation with regard to laws and regulations on the one hand and supervision and enforcement on the other hand does not change, we should expect environmental crime to continue to occur in the coming years, as well as the associated adverse consequences for society.

Overview of the consequences of environmental crime

	Impairment of physical or mental health	Impairment of or threat to the environment or the habitat
Manure fraud		• Eutrophication threatens nature and biodiversity. Manure fraud is putting pressure on the protection of these fragile nature and health values. • Contribution to nitrogen deposition within Natura 2000 areas and nitrogen-sensitive habitat types by illegally kept animals • Overuse of nitrogen and phosphate in areas/regions with a manure surplus
Illegal crop protection agents	• Link to Parkinson's disease and possibly to other diseases	• Remain present in soil and water for a very long time. • Impairment of biodiversity, including decline in bees.
Soil chain	• Health risk when working with building materials containing hazardous components, including particulate matter	• Consequences especially of a long-term nature • Soil functions affected, including drinking water extraction
Waste crime	• Serious consequences for individuals coming into contact with substances (asbestos, scrap ships, etc.) • Sometimes forms a food safety risk • Health complaints due to co-digestion fraud	• Damage to groundwater and drinking water supplies. • Often specific consequences per chain. Including pollution of farmland by paint residues.
Oil fraud	• Unknown proportion of 'particulate deaths' due to fraud. WHO: silent killer. • Danger to crews in case of failures due to wrong oil.	• Additional air pollution from contaminated fuel oil.
Fluorinated greenhouse gases		• Major role in climate change
SVHC	• Health damage to workers who come into contact with the substances. Causes cancer and inter alia affects hormone system and circulation.	• Substances contribute to climate change, ecosystem degradation, and biodiversity decline. • Combinations of substances have proportionally greater effect. • Concentrations per substance are decreasing but many new substances are introduced. Consequences uncertain.
Fireworks crime	• Substantial damage and injuries due to accidents and incidents with the setting off of heavy fireworks.	• High concentrations of particulate matter and heavy metals after New Year's Eve.
Wildlife crime	• Often involves offences against animal welfare.	• Serious damage to biodiversity. Species may disappear for good. • Illegal wildlife trade is likely a factor in the emergence of zoonotic disease epidemics.

Nuisance, anxiety, or unease in others	Economic damage	Undermining
• Unease • local residents	• Damage to bona fide businesses due to unfair competition. • Improper use of subsidies	• Manure streams monitoring system is undermined • Undermining the system to protect nature and water quality • Authority of the government undermined
	• Damage to bona fide businesses due to unfair competition. • Counterfeit agents infringe on intellectual property	• Stature of government undermined • Image of the Netherlands at stake due to agents entering EU countries via NL.
• Unease among local residents, including via social media, sometimes prompts investigations.	• Damage to bona fide businesses due to unfair competition. • Government pays for the damage in case of soil remediation.	• Lobbying for hard-to-enforce regulations. • Companies sometimes have a lot of influence at the local level, e.g. through sponsorship.
• Considerable unrest due to waste fires.	• Damage to bona fide businesses due to unfair competition. • Government pays for cleaning when companies go bankrupt. • Greatest damage in euros of all forms of environmental crime	• Grey area, legal businesses conducting (partly) illegal practices. • Government sometimes is party to the crime, e.g., for employment reasons or because of the importance of the activity (such as waste collection).
• In the case of major incidents.	• Damage to bona fide businesses due to unfair competition.	• Large companies seek out locations where fewest rules apply.
	• Each tonne of CO^2 equivalent emitted costs society EUR 57.00 • Damage to bona fide businesses due to unfair competition • Government misses out on tax revenue.	• European phasing-out targets are not met. • Strong greenhouse gases remain in circulation, resulting in emissions. • Availability of illegal agents delays introduction of more environmentally friendly alternatives (low heating potential, natural refrigerants).
• Recent significant uproar and media publications, including on PFAS and GenX.	• Damage to bona fide businesses due to unfair competition.	
• Illegal fireworks, or their flash powder, are used in ATM raids and in attacks.	• Damage to bona fide businesses due to unfair competition.	• Fireworks crime associated with other crime.
	• Damage to bona fide businesses due to unfair competition. • Legal and illegal trade are intertwined.	• Reputation damage for the Netherlands by under-prioritising counteractions.

List of abbreviations

WtE	Waste-to-energy plant
BAL	Living Environment (Activities) Decree
Bia	Waste Collection Decree
BIBOB	Public Administration (Probity Screening) Act
BKL	Living Environment (Quality) Decree
BOA	Special investigating officer
BOD	Administrative Environmental Consultations
BOR	Living Environment Law Decree
BRZO	Major Accidents (Risks) Decree
CBS	Statistics Netherlands
CCV	Centre for Crime Prevention and Public Safety
CI	Certifying Institution
CITES	Convention on International Trade in Endangered Species of wild Fauna and Flora
CKI	Certifying and Inspection Bodies
Ctgb	Board for the Authorisation of Plant Protection Products and Biocides
DSO	Environment and Planning Act Digital System
EEA	European Environment Agency
EIA	Environmental Investigation Agency
EMPACT	European Multidisciplinary Platform against Criminal Threats
EUTR	European Union Timber Regulation
EWSR	European Waste Shipment Regulation
FEK	Fraud Expertise Hub
FIOD	Fiscal Intelligence and Investigation Service
FLEGT	Forest Law Enforcement, Governance and Trade
FP	National Office for Serious Fraud, Environmental Crime and Asset Confiscation
GWP	Global Warming Potential (CO_2 equivalent)
HFC	Hydrofluorocarbon
IMC	Isolate, Manage and Control
ILT	Human Environment and Transport Inspectorate
IOD	Intelligence and Investigation Services
IG	Inspector General
ISZW	Social Affairs and Employment Inspectorate
JDS	Judicial Documentation System
LAP	National Waste Management Plan
LIEC	National Information and Expertise Centre
LMA	National Waste Control Centre
Ministry of I&W	Ministry of Infrastructure and Water Management
Ministry of LNV	Ministry of Agriculture, Nature Management, and Food Quality
NOVI	National Environmental Strategy
NWVA	Dutch Food and Consumer Product Safety Authority
OBM	Permit under the Environment and Planning Act with limited environmental assessment
ES	Environmental Agency
OECD	Organisation for Economic Co-operation and Development
PAS	Nitrogen Strategy Programme
PBL	Netherlands Environmental Assessment Agency

PFAS	Per- and polyfluoroalkyl substances
REACH	European system for registration, evaluation and authorisation of chemicals
RIVM	National Institute of Public Health and the Environment
Rud	Regional Implementing Agency
RVO	Netherlands Enterprise Agency
RvS	Council of State
SDG	Sustainable Development Goal
SER	Social Economic Council
SMK	Strategic Environmental Chamber
Sr	Criminal Code
UNEP	United Nations Environment Programme
UNODC	United Nations Office on Drugs and Crime
VDM	Animal Manure Consignment Note
Vihb	Transport, collect, trade, and broker
VTH	Permit conferral, supervision and enforcement
Wabo	Environmental Permitting (General Provisions) Act
WBB	Soil Protection Act
WED	Economic Offences Act
WGN	Plant Protection Products and Biocides Act
Wm	Environmental Management Act
SVHC	Substances of very high concern

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1

1 Introduction

Rudie Neve

At the request of the Strategic Environmental Chamber (SMK), a project team of staff from ILT-IOD, NVWA-IOD, Environmental Agencies and the National Police produced an Environmental Crime Threat Assessment.
In this final public report, environmental crime in a broad sense is highlighted by stakeholders as a form of crime with serious consequences for the living environment, public health, and society. Selected forms of environmental crime are explored in more detail in terms of opportunity structures, modi operandi, and starting points for prevention and approach. The final report can thus play a role in the further development of policy on tackling environmental crime by the SMK and its affiliates.[1] Before presenting the outline of this Threat Assessment in section 1.4, we will first address some general concepts (1.1) and explore the notion of environmental crime in more detail (1.2). Section 1.3 briefly describes the system for dealing with environmental crime.

1.1 Environment and environmental crime

Ever since the 1960s, a great many people have been concerned about the environment, causing the first environmental action groups to form during that time.[2] In 1968, the Club of Rome was founded. The "Limits to Growth" report produced by this group of scientists helped ensure that the subject has ever since received constant public attention (Meadows, 1972). Though many reports have come out since, this has not kept us from currently finding ourselves in a serious 'climate crisis'. Three major (inter) national reports on the topic were published in 2020. While at the time of the Club of Rome, the reports mainly served to raise alarm, the current focus is firmly on government policies - policies which the authors hold are seriously flawed, especially in terms of implementation, as the following brief overview shows.

1.1.1 Recent environmental and climate reports

According to the *European environment state and outlook 2020* report, the decline of biodiversity is taking on dramatic proportions. The authors even speak of indications that a sixth wave of species extinction is coming - a wave that is entirely due to human activity (EEA, 2020).[3] What is needed is nothing less than a transformation of the social systems that cause environmental, climate and public health pressures. The EEA[4] notes that it is not policies and policy objectives that are lacking, but rather their implementation. Some sub-areas - such as resource use, waste prevention, and biodiversity - still lack even binding quantitative targets (EEA, 2020).
The 2020 Global Biodiversity Outlook 5 also reports a decline in biodiversity at an unprecedented rate. Twenty biodiversity targets were set in Aichi, Japan, of which only six have been 'partially' achieved. This qualification concerns whether measures have been taken to implement the agreements rather than whether they are effective. Biodiversity looks set to decline further and indigenous peoples and local

1 Apart from the parties involved in the project team, the Social Affairs and Employment Inspectorate is also part of the Strategic Environmental Chamber. The chairman of the SMK is the Chief Public Prosecutor.
2 In 1963, for instance, the "Association against Air Pollution in and around the Nieuwe Waterweg" was founded in Vlaardingen. By its own reckoning, this is the oldest environmental action group still in existence. Consulted on 21 April 2021, via https://www.vtm-milieu.online/over-vtm/
3 After five previous extinction events, scientists argue that a sixth, the Holocene extinction event is underway, with species becoming extinct at an accelerated rate as a result of human intervention. The Holocene is also referred to as the Anthropocene. (The Guardian, 10 July 2017). Consulted on 26 March 2021, via https://www.theguardian.com/environment/2017/jul/10/earths-sixth-mass-extinction-event-already-underway-scientists-warn
4 European Environment Agency.

communities will be particularly affected, as they depend on diversity for their way of life (Secretariat of the Convention on Biological Diversity, 2020). Domestically, the "Balance of the Living Environment 2020" was published, highlighting that we face major issues in terms of climate, biodiversity, spatial quality, and resource use. The government will have to take a directorial role in shaping the distribution of benefits and burdens between different categories within current generations and those between current and future generations. The tenor of the report is that much has been set in motion but much more needs to be done to achieve the goals set. That these targets have been set and that the problems have been put on the map is in itself an achievement (PBL, 2020).
The realisation that measures to save the climate and the environment are urgently needed, partly on the basis of these reports, leads to a need to keep introducing new environmental legislation, and subsidy schemes to import environmentally friendly products or production methods. This may create new opportunity structures for environmental criminals. Chapter 2 focuses on new legislation.

1.1.2 Debates in the Netherlands

Several debates touching on the environment and environmental crime are taking place in the Netherlands. We briefly highlight a few: the 'nitrogen crisis', the use of biomass, reducing CO_2 emissions and the PFAS issue.

The nitrogen crisis
Briefly, the nitrogen issue boils down to the fact that excess nitrogen compounds in the atmosphere can disrupt ecosystems, especially in natural areas. Emissions are caused by the intensification of agriculture - something that has long been warned about[5] - and by the increase in traffic. The RIVM in 2019 reported that 'critical deposition values' are exceeded in 118 of 161 Dutch Natura 2000 areas (Remkes Committee, 2019).[6] The Nitrogen Strategy Programme (PAS), set up by the government after several lawsuits filed by environmental groups were lost, was declared invalid by the Council of State.[7] As a result, a significant number of pending licence applications had to be stopped and new applications could not be considered. The ensuing discussion on reducing agricultural emissions led to large protests by farmers and building contractors.

Reducing CO_2 emissions
In the 2015 Urgenda Climate Case, the court ruled that the State has an obligation to reduce greenhouse gas emissions by 25% by 2020 compared to 1990 (Urgenda.nl). In the same year, by way of the Paris Agreement, the signatories agreed internationally to curb CO_2 emissions to mitigate climate change. The agreement is for CO_2 emissions to be halved by 2030. In the Netherlands, a climate council was set up under the leadership of former minister Ed Nijpels. This resulted into the Climate Agreement, concluded in 2019 after much discussion, which covers investments into solar, wind and geothermal energy, closing coal-fired power plants and reducing methane emissions in dairy farming.

Biomass: from solution to divisive issue
The Climate Agreement considers biomass to be one of the solutions for reducing CO_2 emissions. "Biomass is plant and animal material that can be used as fuel or feedstock."[8] These 'renewable' fuels can be replenished within a relatively short time - in as short as several decades in the case of wood.
Of the particular is the resistance biomass is currently generating. An example is the Vattenfall biomass power plant that is to be built in Diemen with a government subsidy. Opponents are afraid this would result in deforestation due to the use of wood pellets.[9] The Public Prosecution Service described the sector as a "magic box" in the De Vuilnisman television programme, as it allowed for letting illegal waste disappear within the plant.[10] In the same programme, former minister Veerman stated that about 15 years ago, getting rid of the manure surplus played a more important role in promoting

5 Consulted on 27 March 2021, via https://www.volkskrant.nl/nieuws-achtergrond/ons-mestprobleem-is-al-meer-dan-vijftig-jaar-oud-de-stikstofcrisis-is-een-groot-deja-vu~b652bf32/?referrer=https%3A%2F%2Fwww.google.nl%2F
6 Consulted on 26 March 2021, via https://www.rivm.nl/grafietregen-en-gezondheid-2019
7 Consulted on 22 April 2021, via https://www.raadvanstate.nl/stikstof/
8 Consulted on 28 March 2021, via https://www.klimaatakkoord.nl/themas/biomassa
9 Consulted on 2 May 2021, via https://www.parool.nl/amsterdam/vattenfall-wacht-met-bouw-biomassacentrale-diemen-tot-uitsluitsel-politiek~bd59de76/
10 KRO-NCRV.nl, 21 March 2021. Consulted on 22 April 2021, via https://kro-ncrv.nl/persberichten/de-vuilnisman-de-toverdoos.

co-digestion than the yield of biogas per se did. However, it was not considered beneficial to social acceptance to present the matter in this way. The mixing of waste streams by way of co-digestion is discussed in Chapter 6 of this Threat Assessment.[11]

PFAS issues

The abbreviation PFAS stands for poly- and perfluoroalkyl substances. These are man-made substances that are used in many products but do not occur naturally in the environment. Just a few years ago, these substances were unknown, but by now they appear to have been released into the environment everywhere through emissions and incidents.[12] Among other things, setting new standards risks prejudicing construction projects.[13] These substances of very high concern are discussed in Chapter 9 of this Threat Assessment.

1.1.3 Environmental legislation and environmental crime

Climate change and the poor state of the environment are largely caused by legal economic activities, many of which are licensed. Environmental legislation is aimed at restricting these activities in such a way that the burden on the environment is kept within government-determined limits. Environmental legislation developed in the 1960s. In prior years, the Estates Act (1928) and the Birds Act (1936) had come into force. A law on pesticides came into force in 1962 and the Nature Conservation Act followed in 1967.[14] Environmental regulation has grown significantly, partly in response to a number of major 'environmental scandals' that came to light in the 1980s and 1990s, such as the Lekkerkerk, Uniser, and TCR cases, all of which had to do with the dumping or discharge of chemical or oil waste (van den Anker, 1997; Spapens, 2012).

By now, a complex body of environmental legislation has emerged. The Environment and Planning Act, discussed in Chapter 2, aims to make laws and regulations more manageable for citizens, businesses, and government. An earlier simplification of the swelling volume of legislation was the introduction of the Environmental Management Act in 1993.

Compliance with legislation when performing economic activities often comes at a significant cost. Conversely, therefore, a lot of money can be saved by failing to do so, which forms the root cause of the bulk of environmental crime.

Environmental crime has been recognised as a serious social problem in the Netherlands for decades (van der Meer, 1994a, 1994b; van den Berg, 1995a, 1995b; Bruinsma & Bovenkerk, 1996; Spapens, 2012, 2016) and, somewhat more recently, has also received considerable attention on the international stage. In the international arena, the focus is often on wildlife crime, such as the illegal trade in ivory and timber from protected tree species (UNODC, 2016). However, other forms of crime are also of importance, such as waste crime (Nellemann et al., 2016). Europol's most recent Serious Organised Crime Threat Assessment (SOCTA) briefly mentions wildlife crime and waste and pollution crime (Europol, 2021, p. 54). Another European agency, Eurojust, in a recently published report came to the main conclusion that environmental crime is expanding rapidly and threatening entire ecosystems. Huge sums of money can be made from some forms of environmental crime, and the likelihood of being brought to justice is estimated to be very low. When it does happen, the penalties tend to be low.[15]

On a global scale, many billions are involved in various forms of environmental crime and it is widely believed that the scale continues to grow.[16]

11 With respect to illegal practices in co-digestion, refer to Spapens, 2016 and Neve et al., 2012, Chapter 8).
12 Consulted on 22 April 2021 via https://www.rivm.nl/pfas
13 Consulted on 22 April 2021, via https://nos.nl/artikel/2305828-na-stikstof-nieuw-probleem-voor-bouwsector-pfas.html
14 Consulted on 21 April 2021, via https://www.natuurnet.nl/thema/natuurwetgeving.html
15 Also refer to the interview with coordinating environmental officer Rob de Rijck conducted by Algemeen Dagblad in July 2020. Consulted on 9 November 2020, via https://www.ad.nl/binnenland/milieucriminelen-komen-te-makkelijk-weg-zegt-om-duizenden-euro-s-boete-stelt-niks-voor~a567ceba/
16 Reference is made in this connection to Interpol-UNEP (2016). The turnover of $91 billion to $259 billion and growth rate of 5% to 7% mentioned in that report are taken from Nellemann, 2014.

A review of cases reported to Eurojust shows that they mainly involve waste crime, illegal trade in endangered species, pollution, and illegal trade in dangerous substances (Eurojust, 2021). These forms of environmental crime, as well as many others, are all also identified in the Netherlands.[17]

1.2 Environmental crime in more detail

Environmental crime covers a wide range of very different phenomena, ranging from waste dumping (including in developing countries) to illegal imports of plant protection products and non-compliance with safety regulations in high-risk companies.

1.2.1 The definition of environmental crime

Many reports on environmental crime do not provide a definition but refer to the practices criminalised by environmental legislation. For example, Europol's website lists a number of types of environmental crime, focusing on crime committed by organised crime groups. The profits obtained by them are comparable to those for drug trafficking, while the chances of being caught and the penalties are considerably lower.[18] Considering the matter from the perspective of green criminology, the attention is less on what is criminally classified as crime, but more on the damage inflicted to the living environment. For example, the enormous damage to biodiversity caused by depleting the oceans of fish has been labelled an environmental crime, even though it is not criminalised (White, 2011).

Since 2012, the Environmental Crime Threat Assessment has used the following definition:

"*Environmental crime includes criminal, administrative and/or morally culpable behaviour in the field of environmental legislation that (plausibly) results in environmental damage and by which (corporate) economic advantage and/or immaterial gain is sought at the same time.*"
(Neve, 2012, p. 8).

This definition is based on that of van den Berg (1995, p. 32), albeit after slightly expanding it by the addition of 'morally culpable behaviour' and 'immaterial gain', partly inspired by the reflections of van den Anker (1999, section 2.6.3). These additions serve to express that, in the context of the threat assessment and tackling environmental crime, cases may come into focus that are not (yet) covered by prohibitions, but that are seen as undesirable by the parties involved. Thus, while environmental criminals are almost always concerned with financial gain, this definition does not see such gain as a necessary condition for an act to be covered under the term. The definition used here can thus be seen as a middle ground between a purely 'legalistic' definition (crime is all that is prohibited) and that employed under the 'green criminology' moniker.

Criminalisation of such offences is mostly regulated through the Economic Offences Act (WED), but criminal law also often plays a role. This is true, for example, where forgery of documents (Section 225 of the Criminal Code) is involved - an offence that often plays a role in all forms of environmental crime.

1.2.2 Environmental crime, organised crime or corporate crime?

Environmental crime covers a wide range of phenomena, some of which can be considered to be 'corporate crime' (such as offences committed by employees or managers of legitimate companies or organisations) while types also exist that look more like 'traditional' organised crime, such as the illegal trade in endangered species and the smuggling of banned pesticides.

One of the first publications to address environmental crime dealt with waste crime in the context of an overview of organised crime. The author does not consider the question of whether this constitutes organised crime or the dealings of a 'mafia' particularly interesting:

Our concern is whether criminal enterprises have established themselves in this branch of trade, making money by breaking the law behind a semblance of legality. In doing

17 For comprehensive overviews, refer to Neve, Liezen, Nieuwdorp, Redder & van der Zon (2012), and Spapens (2016).
18 Europol therefore places less emphasis on corporate crime, which is discussed in the next section. Consulted on 26 March 2021, via https://www.europol.europa.eu/crime-areas-and-trends/crime-areas/environmental-crime

so, we are not concerned with companies dabbling at the margins of their operations, but with companies whose profit-driven business operations are built precisely on committing these kinds of offences. (Van Duyne, Kouwenberg & Romeijn, 1990, p. 101).

This is, of course, without prejudice to the fact that environmental crime can be committed within the framework of legitimate business, and offences committed in this category would therefore, according to the authors, fall outside 'organised crime', and thus under corporate crime.

In fact, Eurojust recently argued in favour of classifying environmental crime as organised crime, mainly because it would allow the use of heavier investigative resources (Eurojust, 2021). Eurojust does not elaborate on the discussion already mentioned by van Duyne, which has been going on for at least 30 years. From the examples of environmental crime cited, it can be seen that international police organisations are indeed mainly focusing on forms of environmental crime committed by 'organised crime groups', such as wildlife crime and illegal waste trafficking (Europol, 2021).

1.3 Tackling environmental crime

It is not possible to eradicate environmental crime altogether, but all parties involved strive to curb it through monitoring and enforcement, and, if necessary, through criminal investigations. Criminal investigations are primarily aimed at punishing offenders, but they also have a signalling function and provide information on the opportunity structures for environmental crime existing within different industries. Such insights can in turn be used in preventing environmental crime.

The permit conferral, supervision, and enforcement system (VTH) has recently been the subject of several evaluation reports, which are discussed in Chapter 2. For the moment, we limit ourselves to a brief description.

1.3.1 The system in brief

Supervision of compliance with environmental legislation is largely vested in the licensing authorities. These are mostly local and regional authorities (municipalities and provinces) that have often jointly outsourced this task to the Environmental Agencies. In principle, they also avail of special investigating officers, who are authorised to draw up official reports in case of violations of the rules.

The primary national supervisors of environmental compliance are the Netherlands Food and Consumer Product Safety Authority (NVWA) and the Environment and Transport Inspectorate (ILT). The Inspectorate SZW (ISZW), too, sometimes has a role to play, to wit, in cases where compliance with environmental regulations touches on working conditions at companies. Where there is an overlap between environmental compliance and taxation, the Tax and Customs Administration may also play a role as a supervisory body. Customs, as part of the Tax and Customs Administration, supervises the movement of goods at borders. All supervisory bodies have their own investigative service. Within the ILT, the NVWA, and the Tax and Customs Administration, the service is named the Intelligence and Investigation Service (IOD), hence ILT-IOD, NVWA-IOD and FIOD (Fiscal Intelligence and Investigation Service). Together with the ISZW-DO (Directorate of Investigation), they form the Special Investigation Services (BODs). The Special Investigation Services Act stipulates that the BODs are subject to the relevant line ministries. Apart from the BODs, the environmental teams of the 10 Regional Units and the Central Unit of the National Police are involved in tackling environmental crime. Furthermore, within the basic teams of the National Police, specialist police officers are charged with responsibility for the environment. Naturally, all criminal investigations are conducted under the direction of the Public Prosecution Service; in the case of environmental crime, the case is processed by Public Prosecutors from the National Office for Serious Fraud, Environmental Crime and Asset Confiscation.

1.3.2 The Strategic Environmental Chamber provides the outlines

The criminal-law approach to environmental crime is led by the National Office for Serious Fraud, Environmental Crime and Asset Confiscation, which, in addition to environmental crime, is also responsible for tackling fraud. Due to the complex institutional context involving various ministries, inspectorates, and investigative agencies, a coordinating body, the Strategic Environmental Chamber (SMK), chaired by the Office's Chief Public

Prosecutor, has been created. The SMK, which meets about three times a year, is charged with providing the main outlines of environmental enforcement under criminal law.

Apart from the Chief Public Prosecutor of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation (chairman), the SMK consists of a representative of OmgevingdienstNL (the national umbrella of Environmental Agencies) on behalf of the local authorities, the Inspector General (IG) of the Environmental and Transport Inspectorate (ILT), the IG of the Netherlands Food and Consumer Product Safety Authority (NVWA), and the Environmental Crime Portfolio Holder on behalf of the management team of the National Police. All agencies are thus represented at the highest level. The present Threat Assessment is commissioned by the SMK to play a role in the further development of policy on tackling environmental crime by its associated parties.

1.3.3 The Environmental Chamber assesses cases and distributes limited capacity

Day-to-day management, including the assessment of individual cases, is in the hands of the national Environmental Chamber (which is therefore also called the "Tactical Environmental Chamber"). The Environmental Chamber is headed by the coordinating Public Prosecutor for environmental crime of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation. The delineation of the "environment" domain is not entirely unproblematic, given its overlap with domains such as food safety, working conditions, and external safety. NVWA-IOD cases in areas such as food safety and product safety are discussed separately with the Public Prosecution Service. The ILT-IOD's transport crime cases are also discussed separately with the PPS.

Scarcity of available capacity should always be considered when assessing cases. Environmental cases are often lengthy and require a lot of human capacity, partly due to long lead times. This is now recognised by the government, as becomes evident, for example, from the cover letter to the "A good neighbour is worth more!" programme announcing improvements (Parliamentary Papers II, 22343, no 293, also refer to section 2.2.4). The Minister of LNV in a letter reported that the capacity available to the NVWA is reaching its limits (Parliamentary Papers II, 33835, no 171).

Of all the many hundreds of signals received, only a small number becomes the subject of criminal investigations by the Environmental Chamber, as is shown in Table 1.1, which lists the cases dealt with by the Environmental Chamber in the years 2017 to 2020. Strikingly, a number of themes covered in chapters in this Threat Assessment produced only a small number of cases. Cases related to fireworks make up a fifth of the total.

1.4 Structure of the Environmental Crime Threat Assessment 2021

The Environmental Crime Threat Assessment 2021 is just one factor in the development of policies and priorities in tackling environmental crime. It is impractical to cover all themes and sub-themes at any level of depth. The parties involved have mutually agreed on which topics to cover in the final report. Therefore, the inclusion or exclusion of a topic as a separate chapter does not reflect the extent to which a topic is important or should be prioritised. However, the importance attached to a topic by stakeholders may play a role in the considerations, as do any new developments in policy or in the sectors themselves. These will be set out in the relevant chapters.

1.4.1 Selection of themes

In order to select the themes for this Threat Assessment, we collected input in three ways:

- Coordinators of ongoing themes at the stakeholder organisations were asked to provide a document on the state of play in their domain, which also gauged the need for more in-depth studies. This resulted in several dozen documents. The Environmental Agencies conducted a survey among all 29 Environmental Agencies in the Netherlands, the results of which were provided in the form of a comprehensive Excel file.
- Nine interviews were conducted with a total of 11 external scholars, journalists and consultants. They were questioned about their perceptions with respect to environmental crime.

Table 1.1 *Cases taken up by the Environmental Chamber*

Theme	2017	2018	2019	2020	Total
Waste streams	10	11	6	7	34 (19.4%)
Asbestos	9	4	0	4	17 (9.7%)
Soil	4	8	4	3	19 (10.9%)
BRZO	2	1	3	3	9 (5.1%)
CITES	4	2	5	2	13 (7.4%)
Co-digestion	2	0	1	1	4 (2.3%)
Hazardous substances	1	1	4	1	7 (4%)
Plant protection products	0	1	0	0	1 (0.6%)
Manure	1	0	1	3	5 (2.9%)
Oil	2	3	0	0	5 (2.9%)
Fireworks	11	11	6	10	38 (21.7%)
Water	0	3	1	1	5 (2.9%)
Other	3	4	2	9	18 (10.3%)
Total	**48**	**49**	**33**	**45**	**175 (100%)**

- Experts from the inspectorates were asked to identify the themes with respect to which new developments can be expected and their implications, their responses being laid down in two documents.

The results of the preparatory phase were summarised by the project team, discussed at a sounding board meeting on 5 November 2020, and approved by the Strategic Environmental Chamber on 24 November 2020. Nine topics are covered in thematic chapters, clustered under broader themes of social and political interest. These chapters are preceded by an introductory chapter and a second chapter covering some topics relevant to the whole domain of environmental crime. This resulted in the following structure of this Environmental Crime Threat Assessment:

1. Introduction
2. Cross-thematic developments

Threats to soil and water quality

3. Manure fraud (coordinator: NVWA)
4. Illegal plant protection products (coordinator: NVWA)
5. Soil and soil flows (coordinator: ILT and Environmental Agencies).
6. Threats related to the circular economy Crime in relation to (international) waste streams (coordinator: ILT and Environmental Agencies)
7. Oil fraud (coordinator: NP)
8. Illegal trade in refrigerants (coordinator: ILT).
9. Threats to security Substances of very high concern (coordinator: ILT)
10. Fireworks crime (coordinator: NP).

Threats to biodiversity

11. Wildlife Crime (coordinator: NP in cooperation with the National Office for Serious Fraud, Environmental Crime and Asset Confiscation).

Not just the coordinators, but all parties with access to relevant information have provided it and where possible contributed to the aforementioned components in other ways.
Some topics cover a large number of different subtopics or subthemes. In fleshing out the structure of the chapters, the aim has been to set out the workings of crime at the level of the larger theme, with individual manifestations presented as examples. This method was inter alia used in

the context of waste crime, as a large number of different variants can be distinguished within this theme, and of wildlife crime, which was limited to a discussion of the illegal trade in protected animals or non-sustainable wood, topics that are relevant to the Netherlands. Each of the individual chapters contains an explanation on how the delimitation was arrived at.

1.4.2 Terms of reference

Chapters 3 to 11 address the following aspects of the selected topics - albeit only to the extent possible and relevant:[19]

1. Description of the chain, regulations, and enforcement.
   - What does the relevant chain look like in terms of the existing processes, what is the size of the flows and which parties are involved?
   - What developments of note have recently occurred in this context?
   - Is the chain a cross-border one?
   - Which regulations are relevant? Which licences? Which labels and certificates?
   - Are there any specific bottlenecks with regard to monitoring and enforcement?[20]

2. Criminal opportunities and practice.
   - What criminal opportunities occur within the chain, to which specific actors?
   - What criminal opportunities arise from the international nature of the chain?
   - Which opportunities led to concrete forms of crime? What can be said about the extent of such crime?
   - What is known about the organisation of the criminal activities (corporate crime, organised criminal groups, (fluid) networks, etc.)? Where do any gaps exist?
   - What role does security culture play in the opportunity structure?

3. Impact
   - What impact does this form of environmental crime have on the environment, human and animal health, the economy and the government, in the Netherlands and/or in other countries?

4. Expectations for the future
   - What developments in crime-relevant factors can be identified?
   - What are the expectations regarding the development of this form of environmental crime in the coming years?

5. Starting points for halting or reducing crime.
   - What observations can be made with respect to the barrier model?
   - What types are barriers are being raised?
   - Which opportunity structures have not (yet) entered the picture in the context of countering environmental crime?

1.4.3 Reading guide

Before presenting the thematic chapters, Chapter 2 discusses some themes relevant to environmental crime in general. These include the Environment and Planning Act, the circular economy, and recent reviews of the permit conferral, supervision, and enforcement (VTH) system. The aforementioned themes are then addressed in nine chapters.

19 To this end, all authors drew up a work plan for each chapter.
20 Insofar as these add to the CCV's findings mentioned previously in the 2019 "De markt de baas" report; refer to section 2.2.1.

Literature

Anker, M.J.J. van den (1999). *Wie betaalt, bepaalt. Over intermediare organisaties, milieucriminaliteit, organisatiecriminaliteit en integriteit in het complexe milieuveld.* The Hague: Elsevier bedrijfsinformatie.

Berg, E.A.I.M. van den (Ed.) (1995). *De markt van misdaad en milieu. Deel 1.* The Hague: WODC.

CCV (2019). *De markt de baas: Een verkenning naar ervaren knelpunten in de aanpak van milieucriminaliteit.* Utrecht: Centre for Crime Prevention and Public Safety.

EEA (2020). *European environment state and outlook 2020*. European Environment Agency.

Eurojust (2021). *Report on Eurojust's Casework on Environmental Crime*. https://www.eurojust.europa.eu/report-eurojusts-casework-environmental-crime. Download 26 March 2021.

Europol (2021). *European Union Serious and organised threat assessment 2021.* https://www.europol.europa.eu/socta-report. Download 26 March 2021.

Meadows, D. (1972). *Report by the Club of Rome.* Aula pocket.

Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. (Eds.) (2014). *The Environmental Crime Crisis – Threats to Sustainable Development from Illegal Exploitation and Trade in Wildlife and Forest Resources. A Rapid Response Assessment.* Nairobi and Arendal: United Nations Environment Programme and GRID-Arendal.

Neve, R. (2012). *Milieucriminaliteit in Nederland, een inventarisatie voor het Nationaal Dreigingsbeeld 2012.* Part 1: final report Zoetermeer: KLPD, IPOL department.

Neve, R., J. Liezen, A. Nieuwdorp, K. Redder & G. van der Zon (2012). *Milieucriminaliteit in Nederland, een inventarisatie voor het Nationaal Dreigingsbeeld 2012.* Part 2: Bundle submitted to the expert meeting on 2 February 2012.

Parliamentary Papers II, 2020-2021, 22343, no 293. *Voortgang Liever een goede buur! een sterkere VTH-uitvoering en effectievere aanpak van overtredingen,* 3 December 2020.

Parliamentary Papers II, 2020-2021, 33 835, no 171. Netherlands Food and Consumer Product Safety Authority (NVWA), 16 October 2020.

PBL (2020). *Balans voor de Leefomgeving 2020*. The Hague: Netherlands Environmental Assessment Agency

Secretariat of the Convention on Biological Diversity (2020). *Global Biodiversity Outlook 5*. Montreal

Spapens, A.C.M. (2012). *De complexiteit van milieucriminaliteit: De aard van het misdrijf, de opsporing en de samenwerkingsrelaties.* The Hague: Boom Lemma uitgevers.

Spapens, T. (Ed.) and Lectoraat Milieucriminaliteit (2016). *Handboek milieucriminaliteit*. Amsterdam: Reed Business.

Van Duyne, P., Kouwenberg, R.F. & Romeijn, G. (1990). *Misdaadondernemingen, ondernemende misdadigers in Nederland*. The Hague: WODC.

White, R. (2011). *Transnational environmental crime. Toward an eco-global criminology.* Abingdon (UK): Routledge.


2

2 Cross-thematic developments

Rudie Neve

This chapter discusses some developments that are relevant to most of the themes covered in the following chapters, justifying a general discussion. Already in the previous Environmental Crime Threat Assessment, attention was paid to the developing Environment and Planning Act, the introduction of which has by now been postponed to 1 January 2022. That date could still be changed in connection with the government formation process and the Senate debate. The previous Environmental Crime Threat Assessment also discussed the development of the newly started VTH system. The system has not yet come to full fruition, as is evidenced by several evaluation reports published in recent years. The "Being in charge of the market" (Dutch: De markt de baas) report in particular led to the deployment of working groups to develop new policies, including for tackling environmental crime (CCV, 2019). Other reports relevant in this context appeared from Berenschot (Tragter, van der Werff, and Oostdijk, 2019) and the Netherlands Court of Audit (AR, 2019 interim report). In March 2021, the report of the Van Aartsen Committee was published. Drawn up at the request of State Secretary van Veldhoven, this report compiles the various evaluation reports and formulates recommendations for improving the VTH system (VTH Advisory Committee, 2021). All this is discussed in section 2.2. Section 2.3 briefly discusses the European Green Deal, implemented in the Netherlands by way of the Climate Act. Partly as a result of this, the Dutch government is pursuing a circular economy, the progress of which is discussed in section 2.4. This issue already raised concerns in the previous Environmental Crime Threat Assessment, which questioned where the waste policy does not and does not still apply. The chapter is mainly based on the aforementioned reports and other documentation, such as Parliamentary Papers. In addition, a limited number of interviews was held with employees of the Environmental Agencies, Inspectorates, BODs and Ministries.

2.1 The Environment and Planning Act

This section first discusses the Environment and Planning Act in general. Section 2.1.2 discusses the Environment Vision and Plan.

2.1.1 The Environment and Planning Act in main outlines

Minister Ollongren wished for the Senate to adopt the Environment and Planning Act before the March 2021 elections, but the Senate did not want to rush matters. The introduction of the Act has by now been postponed to 1 July 2022.[21] Meanwhile, some municipalities are resisting the introduction of the Act, arguing that the resources at their disposal are insufficient to enforce it. Another problem is that the necessary software is not yet working properly. "Aldermen responsible for the introduction of this Act, due to come into force in January 2022, fear IT dramas and a financial debacle".[22]

"The Environment and Planning Act seeks to modernise, harmonise and simplify current rules on land use planning", or so run the opening words on the relevant government website.[23] The Environmental Crime Threat Assessment 2016 already revealed that the government focused on creating 'trust' in renewing environmental law and on enabling activities within general rules (Neve et al., 2016). The simplification of regulations and harmonisation of terminology, which previously

21 Consulted on 27 May 2021, via https://www.rijksoverheid.nl/ministeries/ministerie-van-binnenlandse-zaken-en-koninkrijksrelaties/documenten/kamerstukken/2021/05/27/kamerbrief-uitkomsten-bestuurlijk-overleg-omgevingswet-26-mei-2021

22 Consulted on 11 February 2021, via https://www.nrc.nl/nieuws/2021/02/10/verzet-tegen-omgevingswet-a4031176

23 Consulted on 14 April 2021, via https://www.rijksoverheid.nl/onderwerpen/omgevingswet

could differ from one piece of law to another, will make it easier to launch activities that may create environmental pressures. Compared to the existing situation, the initiator will come to have a better overview of the rules to comply with.

The delay of the Environment and Planning Act becomes understandable if one considers the development of the law: it is a huge operation, replacing 26 Acts totalling thousands of sections and over a hundred Orders in Council and ministerial regulations by one single Act featuring 350 sections, 4 Orders in Council and 10 ministerial regulations.[24] The Explanatory Memorandum comprises some 600 pages (Parliamentary Papers II, 2013/14, 33962, no 3).[25]

The four Orders in Council in the Environment and Planning Act are the Environment and Planning Decree, the Living Environment (Quality) Decree (Bkl), the Living Environment (Activities) Decree (Bal) and the Structures (Living Environment) Decree (Bbl).

- The Environment and Planning Decree inter alia regulates the environmental permit procedures and the authorities competent to grant the permit, as well as the organisation of the permit conferral, supervision, and enforcement (VTH). The Environment and Planning Decree also explains how the Environment and Planning Act Digital System (DSO) is to work.[26]
- The Living Environment (Quality) Decree (Bkl) includes environmental values - criteria to be met by the environment - which can be applied in the Environmental Strategy. Some of these have already been laid down by the central government, partly on the basis of European regulations. Examples include criteria for air and water quality. The municipal authorities include environmental values in their Environment Plans. In some cases, the municipal or provincial (water quality) authorities may determine environmental values that exceed those imposed by the central government. If the set values are not met, the government must develop a programme to remedy this situation.
- The Living Environment (Activities) Decree (Bal), which is still somewhat under development, lays down general rules for activities in the physical living environment, which citizens, businesses, and also governments must comply with. It also determines whether a notification or an environmental permit is needed to carry out the desired activity. A number of environmentally harmful activities listed in the Bal require a permit if certain criteria are met.
- The Structures (Living Environment) Decree (Bbl) includes rules on safety, health, sustainability, and usability of structures, including rules on construction and demolition.

The Soil chapter (Chapter 7) of the Environmental Crime Threat Assessment 2016 in particular warned of the consequences of the 'new paradigm' brought about by the Environment and Planning Act. "Trust and general regulations are replacing licensing and notification requirements." This would make it very difficult to identify soil stream violations, for example: it is utterly unknown to supervisors whether a party is active in the business. Thus, to establish a violation, either a report would have to be made by a witness, or the violation would have to be established while being committed. It should be kept in mind that even under the 'old' laws and regulations, it is extremely difficult to identify violations, while the size of the streams, combined with poor monitoring and ample opportunity to earn extra money by ignoring the rules, suggest that soil-related crime is extensive. "After all, the soil does not file a police report" (Neve et al. 2016, p. 96).

The question of whether the emphasis on trust will lead to greater opportunities for environmental crime proves difficult to answer. Staff working for the relevant ministries tend to say this is not the case: on balance, laws and regulations change very little. In recent personal interviews conducted with Environmental Agencies staff, the main emphasis was on how the legislative changes will affect the working processes. Permits are required much less often and applications must be processed within a

24 This section is largely taken from the website Iplo.nl. Consulted on 14 April 2021 via https://iplo.nl/regelgeving/stelsel-omgevingswet/omgevingswet-in-ontwikkeling/

25 The Environment and Planning Act is not the first attempt to bring order to the sprawling environmental legislation. A predecessor was the Environmental Management Act of 1993. Refer to Spapens, 2016, section 1.3.

26 The data sharing problems as identified in the Netherlands Court of Audit's interim report are discussed in section 2.2.3.

short time. The work of the Environmental Agencies will thus shift from conducting 'front-end' checks to performing supervision and enforcement activities later. If something goes wrong, a complicated situation featuring faits accompli and intensive procedures quickly arises. Costs are likely to increase and it is an open question whether the competent authorities, such as municipal councils, will be willing to make the required investments. When RUD Drenthe informed municipal councils about a possible cost increase, this led to immediate irritation among them (Dagblad van het Noorden, 20 March 2021).

The local authorities have a 'duty of care' vis-à-vis the environment. The way this will be fleshed out and substantiated in terms of what is and is not allowed, remains to be seen in practice, as, of course, does the enforcement process. In the words of an Environmental Agencies executive, it will become difficult for the central government to exert pressure, as this would lead to the municipalities wanting to see money if they manage to comply. It was also noted that the emphasis on enabling and thinking along with the initiator could lead to the licensing authority being made jointly responsible if the activity does cause more nuisance than expected.

2.1.2 Environmental strategy

The Environment and Planning Act requires governments - national, provincial, or municipal - to adopt an environmental strategy that describes what the area should look like in a few decades' time. Municipalities may choose to develop a single regional environmental strategy together. The choices to be made should be based on a review of the policies pursued so far: should the government build on what has been effected before, or should policies be firmly overhauled?

By deploying financial-economic, communication, and legal instruments, governments can try to realise the ambitions laid down in the environmental strategy. As stressed by the central government, the strategy is to be based on more than just legislation alone (Central Government, 2020).

Municipal authorities are often already in the process of formulating the environmental strategy and the environment plan (replacing the former zoning plan). When the Environment and Planning Act enters into force, by way of a veritable 'dowry', a slew of central government rules will come to fall under the remit of the municipal authorities. Once the municipal authorities become responsible for them, they will be able to change them to accord to their own environmental strategy. It has been noted from various quarters that the introduction of the Environment and Planning Act could, therefore, cause a return of the fragmentation in supervision and enforcement. The Van Aartsen Committee therefore advocates developing only regional environmental strategies (refer to section 2.2.5).

The National Environmental Strategy27

Several environmental strategies have already been adopted at the local and regional level, and the National Environmental Strategy (NOVI) was adopted in the autumn of 2020. In the NOVI, the Rutte III government has laid down a vision for the development of the environment in the Netherlands. In elaborating the environmental strategy, due attention was paid to the fact that the Netherlands of a few decades into the future will look quite different from the Netherlands of 2020, due to the challenges posed by issues such as climate change, the energy transition, the circular economy, accessibility, and housing.

The NOVI includes a comprehensive reflection on society as it will look like by 2050, with an emphasis being placed on the environment. However, not many concrete measures have been announced yet.

The instruments and (area-specific) programmes are elaborated in the Implementation Agenda made public together with the NOVI. The 2021-2024 National Environmental Strategy Implementation Agenda includes the announcement of a great number of programmes to be developed from 2021 onwards. An annual NOVI conference will be organised to allow governments to discuss the state of affairs. In addition, a National Environmental Policy Framework has been developed.[28]

27 Refer to www.denationaleomgevingsvisie.nl for the current state of affairs (consulted on 1 April 2021).

28 All documents referred to are available online. Consulted on 15 April 2021, via https://www.denationaleomgevingsvisie.nl/publicaties/novi-stukken+publications/default.aspx

This Environmental Policy Framework also contains interesting passages that shed light on how violations sometimes remain hidden under the surface. Insight into the licensing processes is still insufficient. Rijkswaterstaat conducted a pilot project involving checks of a number of discharge permits, focusing on Substances of Very High Concern (SVHC).

"Signs have in this context been identified that licensing regulations do not always assume that use is made of the Best Available Technology. Sometimes, the erroneous impression arises that certain investments are not proportional, for example because a notional interest rate that is much higher than the real interest rate, is applied. Following the public outcry over GenX29, it was found that a tightening of the permit requirements could result in a significant reduction of the actual emissions." (Ministry of Infrastructure and Water Management, 2021, p. 33).

The NOVI is accompanied by an Environmental Impact Report (EIR, Royal Haskoning, 2019). The environmental impact is summarised as follows in one of the first paragraphs of the report:

"Impacts can often still turn out to be both positive and negative, depending on their elaboration in (area-specific) programmes, on the knock-on effects to follow-up decisions by both central and decentralised governments, and on the instruments to be deployed' (Royal Haskoning, 2019, p. 6).

What is clear, is that the goals of the NOVI cannot be met using only the existing policies. In particular, a number of 'sensitive issues' (environmental quality, health, wellbeing, nature, and landscape) will require concrete follow-up decisions (Royal Haskoning, 2019, p. 146).

In a recent publication, the Netherlands Environmental Assessment Agency also notes that the NOVI leaves many substantive choices open and that "in the view of many, [it] does not yet offer sufficient direction concerning the implementation of the advocated policy" (PBL, 2021a, p. 9).

2.2 Licensing, monitoring, and enforcement: evaluations and an advisory committee

In the previous Environmental Crime Threat Assessment, section 2.4 included a brief description of the then-new Permit Conferral, Supervision and Enforcement (VTH) system, which relies mainly on the Environmental Agencies, which at the time were built 'from the bottom up' (Neve et al., 2016). In the meantime, several evaluation reports have been published (sections 2.2.1 to 2.2.3) and an improvement process has been launched under the 'A good neighbour is worth more' banner (section 2.2.4.), while the VTH Advisory Committee (Van Aartsen Committee) recently submitted its "Om de leefomgeving" report (section 2.2.5). This alone would show that the implementation of the VTH system and the tackling of environmental crime are not there yet, but that improvement is at least being made.

2.2.1 The "Being in charge of the market" report by CCV

Adequate supervision - or lack thereof - can affect the opportunities for committing environmental crime. In 2019, the Centre for Crime Prevention and Safety published a report on tackling environmental crime, which identifies a large number of bottlenecks in the enforcement of environmental legislation by Environmental Agencies, Inspectorates/IODs and the police (CCV, 2019).

In the context of administrative attention and prioritisation, it was noted that the clients of the Environmental Agencies, the local authorities, do not always appreciate the importance of countering individuals or (especially) companies that violate environmental legislation. It even happens that local administrators frustrate investigations of companies by Environmental Agencies, for example because of the economic importance of the company for local employment or because of business connections. The report provides examples of such instances. Cases are sometimes not reported to the National Office for Serious Fraud, Environmental Crime and

29 Inter alia refer to OZHZ.nl. Consulted on 20 April 2021, via https://www.ozhz.nl/dossiers/pfoa-in-de-bodem/

Asset Confiscation because people do not want to lose control by using the criminal justice system (CCV, 2019).[30]

It is proving very difficult to keep companies or individuals with poor track records out of the market. Notorious environmental criminals can easily continue their practices under another name or in another region. Although it is legally possible to revoke a licence, this is a very rare occurrence. Sometimes having a company closed down also results in significant costs to a government, for example when a site polluted with toxic substances needs to be decontaminated. While the rogue entrepreneur gets away with their deeds, the community has to foot the bill. "This makes governments risk-averse," the report states (CCV, 2019, p. 39). The CCV therefore advocates improved verifications of the integrity of parties before allowing them to enter the market.

Another issue, which, incidentally, was also identified in the 2016 Threat Assessment already, is that corporate influence makes the enforceability of environmental legislation difficult. The business sector, in contrast to the enforcement services, is widely consulted by the responsible ministries when drawing up regulations. This leads to rules that are difficult to enforce, for example due to the introduction of all kinds of exceptions with criteria that are open to multiple interpretations (CCV, 2019).

Industry influence is also reflected in the system of certification. Companies should have a certificate showing that they operate according to the rules. However, the Certifying Bodies (CBs) that issue these certificates are paid by those same companies. This creates the risk that certificates are issued to companies that are only moderately compliant with the criteria and that low priority is given to checking the validity of the certificates. This is aided by the fact that the CBs, in turn, are rarely subjected to inspections by the government.

The chapter on observation, evidence, and signal exchange notes that reported violations are often approached as if they were an incident, whereas more in-depth investigations conducted within the chain could reveal underlying factors that triggered the violations. Another observation concerns the stagnation of the supra-regional exchange of signals. "No single body feels responsible for the substance, accessibility, and completeness of available information" (CCV, 2019, p. 32).[31]

Regarding the application of sanctions, the CCV found that the processing time of environmental criminal cases is often very long, contributing to the already low sentences. In contrast, the approach under administrative law is strongly focused on stopping and repairing the offence, causing the offender's potentially criminal motives to become removed from view. As a result, little is 'passed on' to criminal enforcement. Another factor is that imposing (severe) sanctions requires a lot of effort with a high risk of loss of image, which encourages risk-averse behaviour (CCV, 2019).

2.2.2 Investigation into quality assurance in the performance of VTH tasks

Also in 2019, Bureau Berenschot performed an investigation into quality assurance in the performance of VTH tasks (Tragter et al., 2019). It looked at the instruments available for the quality assurance of the VTH tasks: quality regulation; policy and implementation cycle; horizontal supervision and inter-governmental supervision. A number of voluminous and complicated cases that triggered major public unrest, media attention, and political and administrative involvement, were considered. These big cases call for "...administrative sensitivity, processing discipline, and the ability to reason from the perspective of social tasks rather than that of rules" (Tragter et al., 2019, p. 26).

In one of the cases, employees of the Environmental Agency contributed to an initiative that helped create the circular economy, while the ILT did not initially want to grant its permission. To this end, they looked

30 The Environmental Agencies as recently as December 2020 advised the Van Aartsen Committee to improve the delineation of cases with the police and the Public Prosecution Service. "For this would mean that the Public Prosecution Service will have to take on fewer cases that actually fall under the remit of the Environmental Agencies, allowing the police and the PPS to have capacity available to deal with environmental crime." Consulted on 16 April 2021, via https://www.toezine.nl/artikel/394/aanbevelingen-aan-de-commissie-van-aartsen-investeer-in-het-vth-stelsel/

31 The Netherlands Court of Audit's study on the topic is discussed in section 2.2.3.

for room to manoeuvre within the rules and were given time to do so. However, precisely this type of competences is not so common among the services, the focus of which is aimed strongly on their financial duties. According to the authors, these competences should be invested in more often.

The central government is also involved in such big cases, so it has sometimes proved possible to amend regulations very quickly. The involvement of the central government increased the learning capacity of the system, the authors argue (Tragter et al., 2019).

The authors conclude that, while progress is made, the system cannot meet all expectations due to the 'dilemmas' embedded in it. Entrusting new tasks to the Environmental Agencies is difficult because all competent authorities have to agree to it and make the necessary funding available. This at times leads to grumblings like: "We have no say in it, but we still have to pay". At the same time, flexibility is of great importance due to the trends and developments society is faced with that demand a response, such as "....the energy transition, the circular economy, and perhaps digitalisation" (Tragter et al., p. 48). The emphasis on efficiency leads to a lack of capacity to learn from experience and to properly translate policy developments. According to the authors, the tension between independence and involvement experienced by people in the chain would not be a problem if policy and implementation were better aligned. The recommendation to establish a central knowledge infrastructure for the VTH system was later adopted by the Van Aartsen committee, which will be discussed below. Whether the competent authorities are willing to pay for such infrastructure is not yet certain.

2.2.3 Data problems in the VTH system

The Netherlands Court of Audit is investigating the operations of the VTH system, focussing on the tackling of environmental crime and violations, in particular among BRZO companies.[32] A report is expected in mid-2021. A first volume was released at the beginning of the year, and it focuses in particular on data quality in information systems (AR, 2021). The Court's conclusion is that Inspectieview and the Judicial Documentation System (JDS) are lacking. Connecting these systems will already be an improvement, but the quality of the data entered is also below par. The study also shows that this issue has been around for years and should therefore be known to the responsible authorities. For instance, being able to find companies in the systems is difficult because an identification number is missing and companies appear under various names. It is therefore advised to introduce such a number.

The systems should also be suitable for analysis purposes, so information becomes available at an aggregated level on, for example, companies with the highest risk of violations. Only "after many careful edits" (AR, 2021, p. 13) was the Netherlands Court of Audit able to analyse the data for the 500 BRZO companies only.

Some supervisors are not yet connected to Inspectieview, even though the Environmental Permitting (General Provisions) Act provides that all supervisors must share data with each other. It is not clear how the Environmental Agencies that do not participate (are able to) fulfil this obligation. It was found that some participants argue they have no resources to finance the administrative expenses, while the Permits (Conferral, Supervision and Enforcement) Act states that the administrative bodies concerned must ensure that sufficient resources and staff are available (AR, 2021).

Two Environmental Agencies were investigated more closely. With respect to one Service, a large proportion of the penalty orders reported in Inspectieview could not be retrieved from the Service's own records, prompting the ILT to conduct a further investigation. With respect to the other, hundreds of enforcement cases lacked information on the type of enforcement, such as 'order subject to a penalty' or 'administrative fine'. The problems were already flagged up in the Netherlands Court of Audit's previous investigations, conducted in 2012 and 2017. Commitments by the Secretary of State that improvements would be made had not materialised by the end of 2020.

32 The Major Accidents (Risks) Decree lays down rules for the external safety of, inter alia, chemical plants. The Environmental Crime Threat Assessment 2016 devoted a chapter on it.

The Environmental Policy Framework also makes a case for improving the nationwide exchange of inspection data. Tackling environmental crime should be improved, "..including by way of deploying IT expertise" (p. 33). The bottlenecks identified in the CCV report are leading. Further concretisation has been announced for autumn 2020.

The problems with Inspectieview also came up in some of our own interviews with Environmental Agencies directors. Municipal authorities possess only limited resources and are sometimes reluctant to invest in Inspectieview, because they can't really see for themselves what they stand to gain from it. In addition, Inspectieview is experiencing quite a few teething problems, raising the question of whether the system was launched too early. A negative first impression tends to stick. Another problem is that partners, such as Rijkswaterstaat and the Water Authorities, are not linked up to it. On the other hand, technology is said to be advancing well, so the Environment and Planning Act Digital System should eventually work fine. Whether the police should be connected to Inspectieview is a matter of debate. Proponents point out that the police can enter observations that could trigger inspections by the Environmental Agencies.

2.2.4 The 'A good neighbour is worth more!' programme

In response to the CCV report, the Ministry of Security and Justice initiated several improvement programmes, which were bundled under the 'A good neighbour is worth more!' name. The programme covers 13 project proposals submitted to Parliament in early December 2020 (Parliamentary Papers II, 22343, no 293). The overarching objective of the 'A good neighbour is worth more!' programme is to strengthen VTH implementation and tackling violations more effectively. To this effect, two earlier initiatives announced in June - the VTH Implementation Agenda and the Tackling Environmental Crime Action Plan (Parliamentary Papers II, 33118, no 147) - were merged. Some subprojects are already underway and are briefly discussed in the below.

Tying off existing agreements. As part of the Tying Off project, research is still being conducted into how existing agreements can be finished and how new tasks arising from the Environment and Planning Act can be incorporated into the VTH system.

Central knowledge infrastructure. A central knowledge infrastructure for the system is being developed. This has been lacking so far: the Environmental Agencies only avail of a very rudimentary central apparatus, which is currently being expanded. The idea that the system "...in addition to the strict enforcement of compliance with legislation should also provide room for signalling and placing matters on the agenda" is also emphasised in the Environmental Policy Framework (Ministry of Infrastructure and Water Management, 2021, p. 33).[33]

Administrative approach. A working group aims to promote administrative attention to Environmental Crime by identifying and highlighting best practices, in order to create a snowball effect. Cases where (local) administrators have adequately addressed environmental crime should receive attention and emulation. One official involved suggested staging a regular conference to generate attention to the administrative approach, so as to ensure that municipal administrators - usually replaced every 4 years - pay more attention to the environment.

National Enforcement Strategy. The NES is being updated and made to align with the Environment and Planning Act. The current NES was repealed in February 2021 and the NES 2.0 is expected to be introduced in mid-2021.[34] One new aspect is the introduction of an administrative fine for violations by BRZO companies, which will lead to a reassessment of the relationship between criminal and administrative law (Parliamentary Papers II, 22343, no 293).
The National Environmental Policy Framework already warns that the VTH process should prepare for new situations that might arise after the Environment and Planning Act enters into force:

33 This may be evidenced by the fact that the Environmental Agencies contribute to the present Threat Assessment.
34 Consulted on 18 April 2021, via https://iplo.nl/regelgeving/instrumenten/vergunningverlening-toezicht-handhaving-vth/landelijke-handhavingstrategie/

"When setting tighter standards, the possibility that doing so creates an incentive for non-compliance and, in the worst case, a new criminal revenue model must be taken account of in the VTH process. The VTH system must be designed to promote compliance from the outset and ensure that society is not left with damage to the environment. While enforcement is an important tool in this connection, its use will have to be a logical final element." (Ministry of Infrastructure and Water Management, 2021, p. 33).

Market access. The CCV report flagged the lack of success in keeping notorious environmental criminals out of the markets. To address this, some specific measures are being prepared and fleshed out by a working group acting under the 'A good neighbour is worth more!' umbrella. This in particular concerns actions under the Public Administration (Probity Screening) Act, which allows for the denying rogue companies a permit. Municipalities can ask the Ministry of Justice Agency for Scrutiny, Integrity and Screening, which maintains a central register, for advice on permit applications. For a long time, the Public Administration (Probity Screening) Act was mainly used to prevent notorious drug traffickers from opening catering establishments and similar actions, but is also applied in the context of the conferral of environmental permits. The Ministry of Justice Agency for Scrutiny, Integrity and Screening, which implements the Public Administration (Probity Screening) Act, has stated that there are still gains to be made in this connection, as not all authorities actively apply the Public Administration (Probity Screening) Act in the environmental domain yet. The National Bibob Agency therefore in 2020 started to pay more attention to environmental licensing in the information it provides to local authorities and Environmental Agencies.

In addition to applying the Public Administration (Probity Screening) Act, environmental criminals have their market access restricted by strengthening the supervisory role of governments within the certification system. The Environmental Crime Threat Assessment 2016 reported concerns among regulators about commercial Certifying Bodies lending their ear to clients: after all, they can easily approach another CB (Neve et al., 2016, section 2.2).[35]

In the words of one interviewed official, the naive belief that the market would take care of market supervision has been somewhat abandoned by the government. In consequence, increased supervision of the CB sector is being contemplated, so as to ensure that the CBs do hold their clients to the conditions laid down in the certificate. One possible approach is currently being tested in fishing industry. Fishing vessels must put their catch data into an industry-run database the NVWA has access to. This allows the latter authority to extract indications prompting targeted checks - an altogether necessary feature, given the limited capacity available. (Parliamentary Papers II, 2019-2020, 32670, no 197).[36]

One matter that is not addressed in the 'A good neighbour is worth more!' programme but that was mentioned in conversations with Environmental Agencies staff is the requirement of depositing a financial security when conferring permits. For it must not be the case that the community is left with the (clean-up) costs if a business does wrong. The Environment and Planning Act will allow this in the context of conferring permits to BRZO and other high-risk companies, while an amending decree will be drawn up to have this apply to waste companies as well. One consequence could be that only serious companies can get a licence, thus keeping out cowboys without sound knowledge and experience. After all, the latter will find it difficult to obtain a bank guarantee or other collateral. Interviewees emphasise the importance of proper advance considerations, as is exemplified by the Doetinchem firefighting foam case.[37]

Prosecution. The lack of decisiveness and long turnaround times in the prosecution of environmental crime is addressed in the

35 Also refer to Parliamentary Papers II, 2014-2015, 29304, no 5, in which the BODs warn about the consequences of privatisation of sectoral supervision.

36 In 2019, State Secretary van Veldhoven submitted an ILT signal report on biodiesel fraud addressing the subject of certification to the House of Representatives (Parliamentary Papers II, 35000 XII, no 80).

37 Follow the Money, 8 October 2021. Consulted on 5 May 2021, via https://www.ftm.nl/artikelen/blusschuim-chemische-tijdbom?utm_campaign=0c10a094a9-BlusschuimTijdbom&utm_medium=email&utm_source=Follow%20the%20Money&utm_term=0_4571d2c3f6-0c10a094a9-241709626&share=mySXgR6albGR84Kl2CkgVUNamH9ogoN9GpVSke5K9ljn3H02aTmwyn2qJjUBdjM%3D

Environmental Crime Action Plan[38] adopted by the Strategic Environmental Chamber in November 2020. It proposes improvements in cooperation between prosecutors, BODs, and police as well as improvements within individual organisations. These include improving case management, strengthening the information position, promoting expertise and prioritising themes.

The 'A good neighbour is worth more!' programme is based on the recommendations of the CCV report and the Berenschot report mentioned in the above. These reports prompted the State Secretary for Infrastructure and Water Management to commission an authoritative recommendation for a future-proof VTH system by the VTH Advisory Committee, better known as the Van Aartsen Committee.

2.2.5 The opinion of the Van Aartsen Committee

The Committee, headed by former politician Jozias van Aartsen, was commissioned by State Secretary van Veldhoven to "... strengthen the VTH system so as to have the system become more effective and decisive" (VTH Advisory Committee, 2021, p. 8). The terms of reference already state that the aim is to strengthen the independence and expertise of supervisors, in particular the Environmental Agencies, and identify what needs to be done to that end. The State Secretary also wanted to receive advice on the division of roles, tasks, and powers and on the possibilities for the State to fulfil its directive role.

The Van Aartsen Committee considered the aims of the system as formulated by the Mans Committee as a starting point for its current opinion, asking itself: how can they as yet be put into practice? The committee itself conducted only limited additional research and mainly used already published reports, included those by the Netherlands Court of Audit, Berenschot, and the CCV, discussed above. As was highlighted in the previous section, new policies are now being developed on that basis. The parties involved in the 'A good neighbour is worth more!' programme have stated they experience the Van Aartsen Committee's advice as supporting their cause.

In the Committee's view, the system is not functioning well and does not fulfil the Mans Committee's aims. The fragmentation and non-commitment Mans wanted to get rid of have not resolved. The main issues identified are:

- The independence of the Environmental Agencies has been wrongly subordinated to proximity to the competent authority.
- Professional distance is prevented by the services not being sufficiently robust
  - some services are too small to achieve this
  - output financing hinders enforcement, knowledge development, and expertise promotion
  - a regional enforcement strategy is not getting off the ground due to the wide diversity in the range of tasks.
- Information exchange and knowledge development are insufficient for compiling adequate expertise, also with a view to future issues.
- Intergovernmental oversight is not working in its current form.
- "...system responsibility by the minister is fictional in the system's current form" (VTH Advisory Committee, 2021, p. 6).

Further development within the current system is not going to result in sufficiently addressing fragmentation and non-commitment. The Committee suggests 'more coercive interventions'. Nevertheless, the Committee does not want to shake up the whole system, either, as this would be too drastic a response and would result in reorganisations that would consume too much attention. However, the Committee does want to implement sweeping changes to the implementation of the system. The measures proposed are mainly aimed at the Environmental Agencies. For they should, as the minister stated beforehand, be able to operate more effectively and decisively. Services must have sufficient size and adequate funding to be able to fulfil all the tasks they will face. Investments will also need to be made in knowledge building, information exchange, and quality assurance. The independence of the services vis-à-vis the principals needs to be strengthened, partly by strengthening the director's position vis-à-vis the Competent Authority.

38 This Action Plan was not yet made public in early May 2021.

The minister's systemic responsibility must be more strongly realised by creating new powers, but also by the minister making better use of existing powers.

The Van Aartsen Committee proposes 10 measures:

a. Increase the lower size limit of Environmental Agencies
   Some services are too small to have all the necessary expertise in-house.
b. Improve the quality and match the service to the nature of the organisations
   The Committee notes that there is little correlation between the size of Environmental Agencies and the scope of their task.
c. Increased priority, capacity, and commitment to criminal enforcement and prosecution
   The Committee in this context inter alia noted that the notional capacity (440 FTE) that has long been promised by the police really needs to be made available in full at this stage. As was noted in the above, this has already been taken up under the 'A good neighbour is worth more!' programme.
d. The same basic package for each Environmental Agency
   As was also observed by the CCV, Environmental Agencies at present have concluded all kinds of different agreements with competent authorities.
e. National standard funding instead of local output funding
   The standard should be related to the scope of the task in terms of the organisations and activities to be supervised.
f. Mandatory information exchange and investment in knowledge development and sharing
   This obviously includes the Inspectieview and the Environment and Planning Act Digital System, which have been mentioned several times already. In addition, a national knowledge infrastructure should be set up. This, too, has already been recommended by the CCV and the Netherlands Court of Audit.
g. One implementation and enforcement policy, and one implementation programme based on one risk analysis per region
   The Committee by this move wants to do away with the situation where the various municipalities make separate agreements with the Environmental Agencies.
h. Strengthening the position of the director by issuing a mandatory mandate and a more stringent appointment procedure
i. Effecting national supervision of the Environmental Agencies
   This should become a separate division within the ILT, unconnected to the supervisory duties of the ILT itself.
j. Advice and implementation review of the environment plans by the Environmental Agencies.
   The Environmental Agencies should be much more involved in the creation of policies by the Competent Authorities, so as to ensure that the policies are also enforceable.

The Van Aartsen Committee referred to a number of environmental crime cases. Some of these had also been mentioned in earlier reports.

Chain supervision for activities not linked to an organisation, such as trade in soil and (construction) waste, is not getting off the ground. This allows "... violations by *certified* companies for years on end..." to continue, for example. As discussed above, a sub-project is being launched to tackle this issue in the context of the 'A good neighbour is worth more!' programme (Market Access sub-programme).

Complex legislation makes it difficult to combat serious, organised environmental crime. Environmental legislation aims to regulate markets, meaning that evasion of the rules soon becomes a lucrative affair, creating a black parallel market. With respect to serious environmental crime, the Committee notes:

"Serious environmental crime is intertwined with organised crime in other areas (e.g., drug trafficking) and uses the same global black-market routes. In the case of organised environmental crime, too, the underworld and legal society may become intertwined"
(VTH Advisory Committee, 2021, p. 15).

The Public Prosecution Service, police, and municipal and provincial governments still fail to provide sufficient priority to environmental crime, as was already identified by the Mans Committee. The Committee on the basis of, inter alia, the CCV report finds that the situation has, in fact, deteriorated further since. Environmental violations are perceived

as less serious by both the public and official organisations. Given that the environment cannot file a report with the police, environmental crime is a form of crime requiring active investigations by the authorities, and one that is linked to legal activities. To come to grips with it, "*... it is for example necessary to collate and analyse all kinds of detailed information from different sources about activities that are not criminal but are unusual*" (VTH Advisory Committee, 2021, p. 16).

The Committee suggests that the Regional Information and Expertise Centres[39] (RIECs) and the National Information and Expertise Centre (LIEC) come to play a role as well, as environmental crime is a form of undermining crime[40] "and because of its scale, tackling this issue is an urgent matter" (VTH Advisory Committee, p. 45).

One of the inner contradictions existing in the VTH system is that self-interest and collective interests may clash when sharing information and knowledge. The committee in this connection refers to the aforementioned problems with Inspectieview and the creation of the Environment and Planning Act National System (LSO).

A related problem, identified by the Van Aartsen Committee and also mentioned in interviews, is that the municipal environment plans could result in the policy on permits fragmenting again. This could be (partly) overcome by instituting the regional environmental committees advocated by the Environmental Agencies. The Van Aartsen Committee reported that there are also concerns among businesses about differences in rules resulting from the various local environmental strategies, as this may impact the level playing field for competition between companies (VTH Advisory Committee, 2021). The Environmental Agencies, on the other hand, have expressed concerns that municipal authorities may not want to share some issues in regional coordinating consultations, for example because they wish to protect their competitiveness with respect to attracting businesses.

In the report's Epilogue, the Van Aartsen Committee refers to 'The time is ripe', the title of the 2008 report by the Mans Committee. For, apparently, the time was not yet ripe. The fact that things go well in 90 per cent of cases - a figure often claimed in comments - does not reassure the Committee. The Committee is unable to verify if these figures are correct: in contrast to when the Mans Committee was active, no national survey is currently available. Even if the figure would be true, the 10% of cases that go wrong result in significant harm to the environment, which is not acceptable.

2.3 The Green Deal and the Climate Act

According to the European Commission, climate change and environmental degradation pose an existential threat to Europe and the world. In consequence, a new growth strategy is needed - one that turns the EU into a modern, resource-efficient, and competitive economy. For this reason, the EC agreed to reduce net greenhouse gas emissions to zero by 2050. The EC aims to realise resource-free economic growth for all regions of Europe. The European Green Deal is the 'roadmap' by which these goals should be achieved. The necessary measures cover all policy areas. The Green Deal lays out proposals to use resources more efficiently by shifting to a clean, circular economy, and to restore biodiversity and reduce pollution. The action plan will clarify the investments and financial instruments needed to do so. The ambition is to achieve a "just and inclusive transition".[41]

The 2020 European Climate Law proposes measures to make the EU climate-neutral by 2050. The law mainly involves taking measures in all economic sectors, such as investing in environmentally friendly technology and innovations; cleaner, cheaper and healthier forms of transport, and making buildings

39 The Centres allow relevant parties to cooperate in tackling organised crime using an administrative-law approach. Consulted on 7 May 2021, via https://www.riec.nl/

40 Often an entangling of upper- and underworld results from the activities of organised crime, and Dutch police and authorities refer to this effect as "undermining". See: https://www.government.nl/topics/crime-that-undermines-society/crime-that-undermines-society. Consulted 1 February, 2023. Note added with the translation.

41 European Commission, 2019. Consulted on 4 May 2021, via https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_nl

energy efficient. To support the measures, €100 billion was made available for the 2021-2027 period.[42]

2.3.1 Climate policy and climate law in the Netherlands

Of course, the Dutch government, too, is taking measures to protect the country from the effects of climate change. In 2019, the Senate passed the Climate Bill, which provided that CO_2 emissions by 2030 would have to be down 49% compared to the 1990 benchmark, and 95% in 2050. To this end, the government, businesses and civil society organisations signed a Climate Agreement. The court in its 2015 ruling in Urgenda versus the State ordered greenhouse gas emissions in late 2020 must be down at least 25% compared to 1990. This ruling became final in 2019.[43] The Climate Act also stipulates that the Netherlands Environmental Assessment Agency (PBL) publish an annual Climate and Energy Outlook, analysing progress. The first outlook (PBL, 2019) showed that the Netherlands is unlikely to meet the 49 per cent reduction target by 2030.

2.4 Moving towards a circular economy

The government has been striving to realise a circular economy for several years now: raw material consumption and waste emissions must be reduced. In the previous Environmental Crime Threat Assessment, a section was devoted to this topic, referring, among other things, to government efforts already underway at the time, such as the 'Closing the loop' action plan (Neve et al., 2016, section 2.3).

Some main points were briefly summarised in section 2.3.1, with section 2.3.2 discussing the issues that were most salient among inspectors and enforcers: when does something become a product (again) and cease to be waste, and how can environmental criminals be prevented from profiting from toying with these definitions?

2.4.1 If nothing is done, resource consumption will spiral out of control

This year saw the publication of the first of the - henceforth - biennial reports in which the Netherlands Environmental Assessment Agency outlines the state of play and discusses what needs to be adjusted to meet the targets. If nothing is done, resource consumption will double by 2060. Greenhouse gas emissions will increase, and so will the total agricultural land used to produce food and biomass, such at the expense of biodiversity. This will in turn also accelerate climate change (PBL, 2021b).

The idea of achieving a circular economy by 2050 is included in the Raw Materials Agreement, which has been endorsed by 400 parties. There are now five 'transition agendas' and new laws and regulations are in the making. Of course, there is little to say yet about the effect these new rules will have on (opportunities for) environmental crime.

The focus so far has been quite heavily on recycling, while the entire economic system needs to be changed, as this system is till far too 'linear' in its workings. Public policy should use policy instruments to overcome the barriers it faces. For instance, primary raw materials are cheaper than circular ones, which are already more difficult to market due to a lack of quality requirements and guarantee schemes. Voluntary participation and non-commitment are no longer enough. The authors argue for more coercion, such as by implementing levies and regulation (PBL, 2021b).

Most raw materials will not run out immediately, but serious supply risks are looming for critical rare-earth metals like cobalt, tungsten, tantalum, tin, and indium. Some of these metals are crucial in the production of solar panels, green hydrogen, and batteries for electric cars. Dependence on China creates supply uncertainty. Raw material consumption also creates negative effects abroad, such as poor working conditions, child labour and human rights violations. Reducing such impacts is among the goals of fighting environmental crime.[44]

42 Eur Lex, 2020. Consulted on 5 May 2021, via https://eur-lex.europa.eu/legal-content/NL/TXT/?uri=CELEX:52020PC0080

43 Rijksoverheid.nl. By adopting the Climate Act, the Netherlands is complying with international obligations, including the recent UN Paris Climate Agreement. Consulted on 4 May 2021, via https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/klimaatbeleid

44 Consulted on 21 April 2021 via https://kro-ncrv.nl/wat-gaat-er-schuil-achter-de-handel-in-grondstoffen

In the aforementioned Berenschot report on the VTH system, the circular economy is discussed as one of the trends that policy will have to take account of in the coming period. The energy transition is moving to the implementation stage, meaning, or so the authors argue, that the VTH system will come to play a specific role in practice. Changes in legislation are being prepared in implementation of the Climate Agreement. *"This calls for municipal and provincial authorities and the Environmental Agencies to dedicate increased capacity in this field and for the implementing bodies to be consulted in the development of legislation"* (Tragter et al., 2019, p. 22). In other words, not just the business sector, but the regulators, too, should have a place at the table when developing new regulations, including in the field of the circular economy - as had already been suggested by the CCV.

A new opportunity structure for environmental crime could emerge if significant sums of money are released by the government to encourage initiatives in connection with the Green Deal and the promotion of the circular economy. It was pointed out during interviews that this might create opportunities for parties to slap the 'circular' label on all kinds of things, thereby (maliciously) obtaining grants.

2.4.2 Reusing raw materials without leakage to illegal waste streams

The previous Environmental Crime Threat Assessment stated that the government was endeavouring to produce a list of materials that would no longer fall under waste legislation and would henceforth be seen as a raw material or by-product or residual product. While the need to reduce resource depletion was widely affirmed, the supervising and enforcement bodies expressed concerns that the abolition of waste regulations would render it very attractive to declare all kinds of substances to be a 'product', meaning there would be very little supervision. For example, if someone would want to get rid of certain substances, they could have it cross the border as a 'product', without there being any subsequent monitoring on whether it would as yet be dumped as waste. Conversely, it appeared possible to circumvent the EWSR when importing waste materials for co-digestion under the pretext that these materials constituted products (Neve et al., 2016).

At present, there is a lot going on in the field of recycling waste streams in order to recover the remaining raw materials for processing in a new production round. 'R strategies' (including Reuse, Repair, Recycle) are already being applied in 100,000 circular businesses, while more than 100 conferences on the circular economy were held in 2019 (according to Royal Haskoning, 2020).

The PBL lists a number of transition processes, including starting pilot projects, making subsidies available for circular innovations, and "*...removing impeding waste legislation*" (PBL, 2021b, p. 22). While inspectors may want to know exactly which waste legislation is to be discarded, this is not mentioned.

Another issue raised by the PBL is the linking of waste incinerators to heat networks, creating an incentive to burn waste rather than recycle. Waste is even imported to keep the waste power plants running. A fifth of the waste burned in such plants is imported from abroad. While this volume has increased sharply, it again declined somewhat since 2017. This creates a problem for the circular economy: what to do with the remaining bottom ash, which may be seriously contaminated?[45]

In the context of the circular economy, the ILT-IOD has expressed concerns about exports of items wrongly classified as 'green list' waste or exports to countries that do not want to receive them according to OECD rules. A lot of waste still crosses borders, which is not always certain to be reused or otherwise processed in an environmentally friendly way. Waste may be dumped in an Eastern European country even when the discarder may show a certificate stating that it has been neatly processed (interview with an ILT-IOD employee). Exports of electronic waste and plastics are mentioned as being particularly problematic.[46]

45 This topic was the subject of an episode of the 'De vuilnisman' television programme. Consulted on 20 April 2021, via https://www.npostart.nl/de-vuilnisman/28-02-2021/KN_1725837

46 For plastics, refer to Interpol, 2020.

For environmental crime, the distinction between waste and product is of particular importance. This difference is laid down in the European Waste Framework Directive, which defines both waste and product. An Order in Council is currently being drafted that will incorporate a guideline that the 'holder' must adhere to. The European regulations are quite tricky to interpret and it often depends on specific circumstances whether something must be deemed to be waste or a product. It is up to the 'holder' to determine whether the substance concerned is waste or product. To this end, they must complete a declaration, which is next to be checked by the Environmental Agency (Ministry of Infrastructure and Water Management staff, interview M&S).

2.5 Conclusion

Over the course of the previous sections, it has become clear that legislation concerning the environment, the VTH system, and the pursuit of the circular economy is subject to great revisions. Various working groups are developing new policies in the framework of the 'A good neighbour is worth more!' programme. Naturally, promoting a good living environment and reducing both offences and environmental crime forms the underlying aim of all measures implemented by the government. However, policy and legislation are at this time so little fleshed out that the way to realise these objectives cannot, as yet, be properly determined. And of course, once this is possible, it will still remain to be seen whether things will work that way in practice.

Literature

AR (2019). Een onzichtbaar probleem, Gebrek aan kwaliteit van data over milieucriminaliteit en –overtredingen. The Hague: Netherlands Court of Audit.

Central government (2020). *Nationale omgevingsvisie, duurzaam perspectief op onze leefomgeving*. The Hague: Ministry of the Interior.

Dagblad van het Noorden, 20 March 2021. Milieuwerk verandert ingrijpend.

Ministry of Infrastructure and Water Management (2021). Een schone taak, Bouwstenen voor een veilig, gezond en schoon leefmilieu. Nationaal Milieubeleidskader. The Hague: Ministry of Infrastructure & Water Management.

Neve, R., van Doorn, M., Fortuin, B. In 'g Veld, M., Mac Gillavry, D., Stokman, A., van Zanden, N. 2016 *Environmental Crime Threat Assessment 2016.* Driebergen: Central Unit Consulted on 21 April 2021 via https://www.politie.nl/themas/2017-dreigingsbeeld-milieucriminaliteit-2016.html

Parliamentary Papers II, 2013/14, 33962, no 3 Environment and Planning Act, Explanatory Memorandum.

Parliamentary Papers II, 2014-2015, 29304, no 5. Letter from Secretary of State Kamp of 14 January 2015 with an annexe:

Alert concerning the Certification and Supervision by the Inspectorate SZW, the Netherlands Food and

Consumer Product Safety Authority (NVWA) and the Human Environment and Transport Inspectorate (ILT).

Parliamentary Papers II, 2019-2020, 33118, no 147. Letter from the State Secretary for Infrastructure and Water Management regarding: Progress on the VTH implementation agenda, the environmental crime action plan, and the implementation of motions and commitments.

Parliamentary Papers II, 2019-2020, 32 670, no 197. Letter from the Minister of LNV regarding the Progress made on Natura 2000. 30 July 2020.

Parliamentary Papers II, 2019-2020, 35000 XII, no 80. Letter from the State Secretary for Infrastructure and Water Management regarding an ILT signal report on biodiesel investigation, with an annexe: ILT Signal report. Sustainable biodiesel certification fraud.

Parliamentary Papers II, 2020-2021, 22343, no 293. Progress on 'A good neighbour is worth more! improved VTH implementation and more effective handling of violations' 3 December 2020.

PBL (2019). *Klimaat- en Energieverkenning 2019.* The Hague: Netherlands Environmental Assessment Agency.

PBL (2021a). *Grote opgaven in een beperkte ruimte: ruimtelijke keuzes voor een toekomstbestendige leefomgeving.* The Hague: PBL Netherlands Environmental Assessment Agency.

PBL (2021b). *Integrale rapportage circulaire economie 2021.* The Hague: PBL Netherlands Environmental Assessment Agency.

Royal Haskoning (2019). *Milieueffectrapportage Nationale Omgevingsvisie.* Zp: Haskoning DHV.

Royal Haskoning (2020). *Achtergrondrapportage Inventarisatie kennisactiviteiten.* Zp: Haskoning DHV.

Tragter, M., A. van der Werff & A. Oostdijk (2019). *Kwaliteitsborging bij de uitvoering van VTH-taken, Evaluatie van het instrumentarium.* Utrecht: Berenschot Group.

VTH Advisory Committee (2021) *Om de leefomgeving, Omgevingsdiensten als gangmaker voor het bestuur*. The Hague: Ministry of Infrastructure and Water Management. (Known as the Van Aartsen Committee Report)

Part 1
Threats to soil and water quality

3

3 Still an irresponsibly high surplus: manure fraud

Lysbeth van Brederode and Pauline Goemans with Angelique Mirande and Hanneke Kooloos (NVWA-IOD). The nitrogen deposition calculations were carried out and supervised by Albert Bleeker of the RIVM.

The Environmental Crime Threat Assessment 2016 in its Chapter 8 paid extensive attention to manure fraud and the different associated modi operandi. Ever since 2016 there has, partly in response to this previous Threat Assessment, been a lot of public, political, and media attention on manure fraud. Nevertheless, manure fraud still is a problem. In addition, there have been several developments - such as the nitrogen crisis and the review of manure policy - making it relevant to once again pay attention to manure fraud at this point, 5 years on.

Eutrophication is one of the biggest threats to Dutch nature and biodiversity. Although improvements have been made in recent decades, the intensive agricultural sector in the Netherlands in particular still causes excessive nitrogen and phosphate supply. This is detrimental to the quality of shallow groundwater and surface water and to nature on land and in water. Overfertilisation in agriculture affects the environment in the form of eutrophication and acidification of nature not only via leaching and run-off, but also as a result of nitrogen deposition from ammonia.

The consequences of the nitrogen problem have also been experienced by farmers, the construction industry, and governments ever since the Council of State invalidated the Integrated Approach to Nitrogen[47] (PAS) in May 2019. The PAS can no longer be used to authorise activities that emit nitrogen in or near vulnerable natural areas, which has brought permit procedures to a standstill.

To protect the fragile values of nature, the environment, and health, various laws and regulations have been developed to limit the harmful effects of an excess of manure. Manure policy in the Netherlands for example aims to protect the water quality of ground and surface water by regulating the use of manure on agricultural land. Agricultural activities are also subject to laws and regulations on ammonia emissions to protect vulnerable natural areas. Different regulators are responsible for enforcing various laws and regulations.

The complexity of the various legislation in place to protect nature and the environment regularly leads to a rather legal and technical approach to the problem. In criminal law, the focus is on the violation of rules and how to prove them, as well as on the violating party and the benefit they made from their illegal activities. Since environmental crime usually has no direct victims and is often not visible, the 'injured party' - nature and the environment - remains abstract and out of the picture.

This chapter looks at manure fraud from a broader perspective focusing on the purpose of the various laws and regulations: protecting nature and the environment. Manure fraud is putting pressure on the protection of these fragile values. An understanding of these social effects of rule violations may increase the willingness to comply by entrepreneurs. Entrepreneurs may be motivated by these insights either intrinsically, or through external social pressure, to reduce the harmful effects of their business. This prompted the Special Investigation Services (BODs) to jointly map the extent and

47 Consulted on 15 April 2021, via Nitrogen - Council of State

ecological effects of manure fraud of the 2020 (and 2021) annual plan. The results of this study are included in this chapter (sections 3.5 and 3.6).

Thus, by also determining ecological effects as part of the study and indicating where the damage occurs, the services also considered the point of view of the 'injured party'. This renders this party more tangible and less anonymous. The approach appears to be possible only for specific cases of manure fraud. This applies to the contribution of animals kept illegally under the Dutch Fertilisers Act to nitrogen deposits in nitrogen-sensitive nature areas (see section 3.6.1). The contribution of illegally kept animals, at a limited number of inspected farms, to nitrogen deposition on the forest Ulvenhoutse Bos is similar to the effect of the national driving speed limit in that area (around 6 mol N/ha/yr).

This approach does not appear to be fruitful for fraud with respect to the application of manure. Even after completion of criminal investigations, it is often unclear where the illegal manure was dumped. The ecological effects of fraud due to additional leaching of nitrogen into the ground and surface water cannot therefore be determined. The same goes for the effects on nitrogen deposition from illegally spread manure. Of course, the fact that such effects cannot be determined does not mean that these ecological effects do not occur or that these effects are less severe than the effects of illegally kept animals.

Based on this national inventory of detected manure fraud, no estimate can be made of the actual extent of manure fraud. This proves impossible not only because fraud often goes undetected, but also because criminal investigations are not geared to revealing the overall extent of manure fraud. The extent of detected manure fraud relative to the total volume of manure production in the Netherlands and the number of inspections, highlights the inherent limitations of surveillance and makes it clear that the chance of being caught is small. Further intensification of enforcement activities alone is therefore insufficient to prevent manure fraud.

It has also become clear from a review of criminal investigations that fraud undermines the system to protect nature and the environment (refer to section 3.5.2). The CBS annually calculates the extent to which the legal limits for spreading livestock manure have been adhered to in practice and whether areas remain within the application standards. Due to fraud, the CBS receives erroneous data for these calculations. This means that the effectiveness of manure policy cannot be properly monitored and that it is precisely in areas with a manure surplus that over-utilisation of phosphate and nitrogen is probably higher than is calculated by the CBS (refer to section 3.6.1).

In addition, the results of the calculations on the ecological effects of illegally kept animals make it clear that, in order to protect nitrogen-sensitive nature, it is not only important to take a critical look at the licensing of new nitrogen-emitting activities, but also at whether emissions have been paid for (e.g. by way of the purchase/lease of production rights) and whether existing nitrogen-emitting activities comply with the licensing conditions.

3.1 Description of the industry / chain / context

The manure sector roughly consists of the manure producer, manure buyer, and various service providers, such as intermediaries, consulting firms, administrative firms, and feed traders.

The Netherlands is home to an intensive livestock industry featuring high manure production: an average of 75 billion kg of manure is produced annually (Bruggen van & Gosseling, Dierlijke mest en mineralen 2019, 2020). Manure is rich in minerals (nitrogen, phosphates, potassium), making it a valuable raw material to supply crops with nutrients. The manure producer (livestock farmer) can therefore market some of the produced manure as a valuable raw material to the manure buyers, such as crop farms. However, there is too little land in the Netherlands where manure can be used without this having harmful environmental effects. To protect the environment, standards have been set for the use of livestock manure, nitrogen and phosphate, on farmland. Because of the implementation of such application standards, certain manure producers lack a sufficient market for selling the manure they produce: ultimately, manure supply outstrips demand. This makes it difficult and costly for manure producers to sell their excess manure. The high cost of getting manure processed in conformity with the

rules (in 2017, the manure disposal cost for an average pig farm amounted to about €60,000) combined with the low chance of being caught provide a strong (financial) incentive to commit fraud.

Intermediary companies are responsible for the trade and transport of manure, fulfilling an important role in the chain. To keep track of the amount of manure in the Netherlands, manure producers, manure buyers, and manure intermediaries are obliged to register with the Netherlands Enterprise Agency (RVO.nl). They must also keep records on the production, supply, disposal, and use of manure . With respect to the transport and record-keeping of manure, the amounts (kg) of minerals (nitrogen and phosphate) contained in the manure must be recorded.

Other service providers also operate in the manure sector. Administrative and consultancy firms help with the mandatory record-keeping, while feed traders often also provide services in manure sales.

The manure producer and the manure buyer have opposing interests: the producer benefits from high levels of minerals in the manure, as fewer tonnes of manure are needed to dispose of the required kilos of minerals. Fewer transports save marketing costs. This leaves the producer with some manure to dispose of or process illegally. On paper, the buyer, in contrast, wishes to receive manure with a low mineral content in order to adhere to the legal frameworks. In reality, they desire manure with high mineral contents, as these are beneficial for his crops to a certain extent. The manure intermediary is the linchpin in the manure chain. They are responsible for the trade and transport of manure within and outside the Netherlands and may therefore play an initiating or facilitating role in manure fraud.

3.1.1 Underlying causes of manure fraud: origins of the manure/mineral surplus in the Netherlands

The high manure production in the Netherlands stems from the large number of animals kept for meat, egg, and dairy production. A large share of these products are intended for export: the Netherlands is the third-largest exporter of agricultural products in the world. In order to have sufficient animal feed, the Netherlands partly depends on imports, especially soy, from North and South America (Brazil). Soy imports affect wildlife and biodiversity, available water and land, and deforestation in South America. The import of animal feed also means that large quantities of nitrogen, and phosphate are imported into the Netherlands.

This is the underlying cause of the national manure surplus: intensive livestock farming in the Netherlands is possible only because of imports of feed containing the minerals nitrogen and phosphate. And this results in the Netherlands producing more nitrogen and phosphate in animal manure than can be used in an agriculturally and environmentally responsible manner. There are no other countries or regions of similar size in Europe where so much manure cannot be used (Grinsven van & Bleeker, 2017).

3.2 Relevant legislation

Section 8.3 of the Environmental Crime Threat Assessment 2016 already provided a detailed discussion of the relevant legislation. This legislation is still in force. The relevant laws and regulations are:

- The Dutch Fertilisers Act
- The European Nitrates Directive
- The European Water Framework Directive

Dutch manure policy aims to protect and improve water quality, as specified in the Nitrates Directive and the Water Framework Directive. The Fertilisers Act was introduced in 1987 to reduce nitrogen and phosphorus leaching by fertilisation, thereby improving soil, water, and air quality. Since 1996, the Fertilisers Act also serves as the Dutch implementation of the European Nitrates Directive. The Fertilisers Act contains general rules on the production, marketing, and use of animal fertilisers. Production rights systems per livestock sector are in place to limit manure production. Besides manure production, its use, transport and processing are regulated by way of the Implementing Regulations to the Fertilisers Act and the Use of Fertilisers Decree (also refer to section 3.5.1).

However, this chapter looks at manure fraud from a broader perspective, focusing on the purpose of the various laws and regulations: protecting nature and the environment. After all, too much manure is not only detrimental to air and water quality, but also to nature on land and in water. Overfertilisation

in agriculture affects the environment in the form of eutrophication and acidification of nature not only via leaching and run-off, but also as a result of nitrogen deposition from ammonia. The Environmental Permitting (General Provisions) Act (Wabo), Nature Conservation Act, and other laws and regulations also play a role in this context. The Environmental Permitting (General Provisions) Act (Wabo) regulates the obligation to obtain an environmental permit. Livestock farms requiring an environmental permit are also subject to legislation on ammonia emissions. The Nature Conservation Act provides all rules concerning the protection of natural areas and species, including Natura 2000 areas.

In late 2017, the Minister of Agriculture, Nature, and Food Quality (LNV) announced a fundamental review of the manure policy and its legal rules[48]. Reducing fraud incentives and opportunities forms an important part of this system review (Ministry of LNV, 2018).

The outlines of the future manure policy were expressed in a letter to the House of Representatives in September 2020. In order to simplify the Dutch manure system, dairy and cattle farmers will have to become completely land-based in the future. Other livestock farmers, such as pig and goat farmers, are given the choice of being land-based or not. Land-based farming involves livestock farmers depositing all their manure on their own land or at a nearby farm. Farmers incapable of using the manure on their own land must carry it off to a manure processor.[49] The move towards land-based livestock farms and channelled manure flows from farms producing a surplus, can, in principle, reduce the incentive for fraud. As the outline policy memorandum does not yet contain any amendments to manure legislation or concrete proposals for control instruments, it is difficult to indicate whether the desired effects will actually occur.

Another development touching on fertilisers legislation is the structural approach to the nitrogen problem. In April 2020, the government announced a set of investments and measures to systemically address the nitrogen problem, after the Council of State declared the Integrated Approach to Nitrogen to be invalid in May 2019. The investments and measures are aimed at nature restoration and on tackling the source of the problem by reducing nitrogen deposits.[50]

3.3 Agencies involved

Several parties are responsible for the supervision and enforcement with respect to manure: the Intelligence and Investigation Service (IOD) and the supervision department of the Netherlands Food and Consumer Product Safety Authority (NVWA), the Netherlands Enterprise Agency (RVO.nl), the National Police and the Environmental Agencies. Criminal investigations are conducted under the direction of prosecutors from the National Office for Serious Fraud, Environmental Crime and Asset Confiscation.

Ever since the publication of the Environmental Crime Threat Assessment 2016, the bodies involved in supervision and enforcement have increased their cooperation. In 2018, the Ministry of Agriculture, Nature, and Food Quality drafted the Reinforced Enforcement Strategy (VHS) for Manure (Ministry of LNV, 2018). The objective of this strategy is to reduce fraud and increase compliance with laws and regulations. Executing an area-based and risk-based strategy forms an important part of the VHS for Manure.

The area-based strategy focuses on the high-risk areas of De Peel, Gelderse Vallei, and Twente. Cooperation between RVO.nl, the NVWA, the Public Prosecution Service (OM), the National Police, the Water Authorities, the environmental agencies, and the provincial authorities has intensified as part of this strategy. Such intensification is realised by sharing expertise and knowledge about the region and by working in multidisciplinary teams, allowing for improved utilisation of the various specific competences and powers.

48 On the occasion of the presentation of the Sixth Nitrates Directive Action Programme to the House of Representatives: Parliamentary paper 33037, no 250.

49 Consulted on 29 May 2021, via Minister Schouten: eenvoudiger en duurzaam meststelsel nodig | Nieuwsbericht | Rijksoverheid.nl:

50 Consulted on 29 May 2021, via Structurele aanpak stikstofreductie en natuurversterking | Nieuwsbericht | Aanpak Stikstof

In addition to area-based enforcement, the reinforced enforcement strategy also prioritises high-risk links in the manure chain, such as intermediaries and co-digesters. This prioritisation of high-risk links in the manure chain applies both within and without the system of area-based enforcement. Committing fraud is to be disincentivised by increasing the probability of being caught, increasing penalties, and limiting opportunities to commit fraud (Ministry of LNV, 2018).

3.4 New developments

3.4.1 Introduction of the phosphate rights system

The Environmental Crime Threat Assessment 2016 identified the introduction of the phosphate rights system as a future development. The phosphate rights system has effectively entered into force on 1 January 2018. The premise of the phosphate rights system is that livestock farmers can only keep dairy cattle and produce phosphate if they have sufficient phosphate rights. Prior to the introduction of the phosphate rights system, the temporary Phosphate Reduction Scheme 2017 had been implemented to bring dairy cattle phosphate reduction to below the agreed phosphate ceiling. The impact of the introduction of the phosphate rights system on fraud is described in sections 3.5.1 and 3.5.2.

3.4.2 Nitrogen crisis

In May 2019, the Council of State declared the Integrated Approach to Nitrogen (PAS) to be invalid (refer to section). The reason for this decision was that the PAS allowed for giving away development space for nitrogen-emitting activities without sufficiently ensuring this space was actually available. Among other things, the effectiveness of the measures was not sufficiently guaranteed, while measures for nature conservation and restoration and the room available for granting permits were lumped together. However, in order for a nitrogen emission allowance to be granted, it must first be shown that the nitrogen reduction achieved is not required for nature conservation purposes (Paul, 2021).

As a result of this ruling, the PAS can no longer be used to authorise activities causing nitrogen emissions in or near vulnerable Natura 2000 areas. This has brought permit procedures, especially in the construction sector, to a standstill, creating the so-called nitrogen crisis.

For all activities that potentially cause nitrogen deposition, the amount of nitrogen caused by this activity must be determined. If the contribution does not exceed 0.00 mole N/ha/year at any Natura 2000 area, no nitrogen permit requirement exists[51]. For the time being, licensing is based on the principle that any increase in nitrogen deposition due to an activity exceeding 0.00 mole of nitrogen per ha per year *may be* ecologically relevant (BIJ12, 2021). High requirements are, then, set for new nitrogen-emitting activities. Section 3.6.1 puts this into perspective, considering the extent a specific existing nitrogen-emitting activity complies with the legislation.

3.4.3 Independent sampler

Livestock manure should be weighed, sampled, and analysed before it is transported to third parties. To reduce solid manure fraud and strengthen enforcement in this field, solid manure samples (consisting of solid fraction[52]) may, from 1 October 2017 onwards, only be taken by independent samplers working for an accredited and recognised organisation (NVWA, 2019). The carriers themselves may no longer do so. This new arrangement does not apply to other manure.

Initial results show that the implementation of independent sampling resulted in fewer extreme sample results and a decrease in average nitrogen and phosphate levels compared to the period before the requirement's implementation[53] (NVWA, 2019).

51 Vergunning aanvragen of niet? - BIJ12: Consulted on 27-05-2021

52 Solid fraction is solid manure consisting of the cake resulting from separation of pig and cattle manure or a mixture containing this pig and/or cattle manure.

53 January 2017 through September 2017

3.4.4 Private parties

At the end of 2017, the industry itself entered into more collaborations to strengthen the manure chain. Industry initiatives to tackle fraud are not yet properly getting off the ground. For instance, there is still no functioning private quality system. Also, as is the case for the government, it is difficult for the industry to tackle or eliminate fraudsters. Investigative services for example found that potential and convicted fraudsters had also stated they complied with the private quality system. The industry has taken action in response to this signal.

3.5 Opportunities for crime and detected crime

In the introduction to this chapter, we mentioned that the 2020/2021 annual plan of the BODs includes the intention to jointly identify the extent and ecological effects of manure fraud. It is not just the Intelligence and Investigation Service and the supervisory division of the NVWA that are responsible for criminal enforcement in the context of manure: other parties involved include the National Police and the Environmental Agencies[54]. Criminal investigations are conducted under the direction of prosecutors from the National Office for Serious Fraud, Environmental Crime and Asset Confiscation. In cooperation with these bodies, as much information as possible on criminal investigations into manure fraud - such as their scope - has been analysed. In so doing, the modi operandi (methods) used by offenders and facilitators and the occasions for crime were also looked at.

This is the first time a nationwide survey of criminal investigations into manure fraud has been conducted. The criminal investigations considered were those that resulted in an official report being filed with the Public Prosecutor. This resulted in an analysis of a total of 320 official reports (see box)[55]. Finally, cooperation was sought with knowledge institutions to understand the ecological effects of manure fraud (refer to section 3.6.1).

The information in the following sections derives from criminal investigations by the Intelligence and Investigation Service of the NVWA (from 2005), the supervisory division of the NVWA (from 2015), and the National Police (from 2014). These criminal investigations resulted in an official report being filed with the Public Prosecutor. It should be noted in this connection that it was not possible to analyse the official report of all criminal investigations carried out. In addition, investigations resulting in complete acquittals or into the charges being dropped were not included in the analysis. Ultimately, the selection for analysis covers:

289 criminal reports relating to manure production fraud

- 137 criminal reports relating to production rights fraud
- 12 criminal reports relating to phosphate production in excess of phosphate rightsphosphate rights
- 140 criminal reports relating to the temporary phosphate reduction plan (these were not analysed, but processed on the basis of a PSS publication)
- Information on violations relating to licensed ammonia emissions being exceeded (data from the Brabant Environment Services)

31 criminal reports relating to fraud with respect to manure application

- 21 criminal reports relating to manure supply and disposal fraud
- 10 criminal reports relating to manure processing fraud

The analysis conducted provides insight into the various methods to commit manure fraud used by the parties involved. They are discussed in section 3.5.1. Section 3.5.2 provides a provisional estimate of the minimum extent of manure fraud based on court judgments or settlements by the Public Prosecution Service. Where possible, this is supplemented by

54 The Netherlands Enterprise Agency (RVO) is responsible for administrative enforcement with respect to manure. Only criminal investigations were included in this analysis.

55 Of these 320 official reports, 140 were processed based on a news release from the Public Prosecution Service. These 140 official reports have not been analysed.

available information from official reports submitted to the Public Prosecution Service, even if no judgment or settlement is yet known.

For several reasons, the analysis provides only a provisional estimate of the minimum extent of manure fraud. No precise statements can be made about the extent of fraud. It is nota complete analysis of all criminal investigations into manure fraud conducted in recent years; The analysis took place based on the information that was available or could be made available for the purpose of this study. In addition, the analysis of the official reports shows that criminal investigations are often limited and are not conducted in order to reveal the total extent of manure fraud (refer to section 3.5.2).

Finally, figures on the number of criminal investigations do not fully reflect the actual level of manure-related crime. As with crime in general, some of it remains unknown. Criminology in this connection refers to the *dark figure*, or hidden crime rate (Lissenberg, Het meten van criminaliteit, 2001). Capacity and prioritisation, too, may play a role in deciding whether or not to launch a criminal investigation in response to manure-related fraud signals received by the NVWA-IOD.
In the 2017-2020 period, about 10% of all fraud signals received by the NVWA-IOD related to manure. This puts this domain in the top 3. Several dozen signals were received, close to 45% of which were acted on by the NVWA-IOD and/or the FEK[56].

3.5.1 Types of fraud and modus operandi

The Environmental Crime Threat Assessment 2016 already noted that the entire chain is susceptible to committing manure fraud. A combination of a high cost of processing manure in conformity with the rules and the low chance of being caught provides a strong financial incentive to commit fraud. In doing so, the parties involved make use of various methods. The analysis of the official reports shows that manure fraud can be roughly divided into:

1. Fraud relating to manure production (illegal emissions from the farm)
2. Fraud relating to manure application (use, processing, and transport)

Fraud relating to manure production
Various laws and regulations are in place to protect air and water quality, as well as nature on land and in water, from the adverse effects of an excess of manure (refer to section 3.2). Laws and regulations regulate manure production and limit emissions from sheds.

For example, ever since 1998, the Fertilisers Act has required entrepreneurs to hold production rights to keep pigs, while a poultry rights system came into force in 2001 (Willems & Grinsven, 2011). These production rights aim to limit the production of animal manure. An entrepreneur may not, over a calendar year, on average keep more pigs or poultry than is permitted by the production rights they hold[57]. In addition, the phosphate rights system has been in force since 1 January 2018. The core of this phosphate rights system is that livestock farmers can only keep dairy cattle if they hold sufficient phosphate rights.

Internationally, agreements on emissions of pollutants such as sulphur dioxide and nitrogen dioxide have been laid down in the Gothenburg Protocol 1999. Ammonia, too, is covered by these agreements. In addition, phosphate excretion ceilings have been agreed at on the European level. Production rights can be used to control ammonia and phosphate emissions nationally and regionally in order to stay below internationally agreed ammonia and phosphate ceilings. Reductions in ammonia emissions from sheds can be achieved not only by regulating the number of animals to be kept, but also, for example, by applying low-emission techniques. For example, animal housing must be low-emission if low-emission housing systems are available. Only housing systems with an emission factor less than or equal to the maximum emission value are allowed. Maximum emission values apply for several animal categories: dairy and brood cows, veal calves, pigs, chickens, and turkeys[58].

56 The Fraud Expertise Hub (FEK) is where strategies to tackle fraud are coordinated and performed, with the supervisory divisions of the NVWA and the NVWA-IOD being deployed in varied compositions. The NVWA-IOD advises inspectors in recognising and demonstrating fraud and assists them with applying (economic) criminal law.
57 For indicative purposes: a broiler corresponds to 0.48 poultry units and a laying hen to 1 poultry unit.
58 Consulted on 29 May 2021, via Systematiek ammoniakvoorschriften van het Besluit emissiearme huisvesting - Kenniscentrum InfoMil

Criminal investigations show that fraud is committed in various ways. These different modi operandi are discussed in the following sections. Rules violations on manure production involve failure to observe the rules on manure production or low-emission housing, resulting in illegal nitrogen emissions from the farm.

Production rights fraud
Production rights are circumvented by keeping more animals than allowed. Livestock farmers thus keep more animals to produce eggs, meat (production rights), or milk (phosphate rights), and save on the cost of buying or leasing the production rights.

Good intentions

A company near Tilburg was short of a total of over 1,400,000 poultry rights in 2015, 2016, 2017 and 2018, according to the prosecution. The company sold the poultry rights it had, to invest in technology to process low-emission manure by way of a special drying method. The poultry farmer also received tens of millions of euros in subsidies for this investment.
The Tilburg entrepreneur made it clear that he was aiming to do well for his business. He had used the capitalised poultry rights to make investments in the farm, thus greening the farm and making production as circular as possible. However, because of how these investments were financed, the company gained a major competitive advantage over other companies. Other companies did stay within the law and were unable to make such investments.
PPS news release 03-12-2019 - Source: https://www.om.nl/actueel/nieuws/2019/12/03/ontnemingen-van-meer-dan-19-miljoen-geeist-tegen-pluimveehouders-in-onderzoek-naar-overtreden-meststoffenwet

The study into the ecological effects resulting from exceeding production rights (refer to section 3.6.1) only considers the additional ammonia emitted directly from the shed. This means that the effect on the calculated nitrogen deposition of the farm described in the above box is not less than that of a farm lacking a technique to process manure in a low-emission manner.

Phosphate production in excess of available phosphate rights
The phosphate rights system has been in force since 1 January 2018. From that date on, dairy farmers have had to render account for the phosphate production of their dairy cattle by way of phosphate rights. The NVWA has noted since, that certain livestock farmers produce more phosphate than they are allowed to under the phosphate rights for their farm within a given calendar year.

A number of FEK cases that have been handed over to the Public Prosecutor but that have not yet resulted in a verdict or settlement, show that fraud is suspected to have been committed by making sure the phosphate production figures presented on paper are less than the amount of phosphate actually produced. Methods to do so include falsifying records relating to animals kept, such as by declaring a cattle category for which no phosphate rights are required. Too, records can be falsely drawn up, rendering part of the milk production (from which phosphate production is calculated) invisible. Another practice is to increase phosphate rights on paper using illegally obtained entitlements. By submitting suspected falsified order confirmations and offers for a cattle shed, an attempt was made to unlawfully receive more phosphate rights. However, this was recognised in time.

When more animal manure is produced by dairy cattle in a calendar year than is allowed under the phosphate rights held by the farm, this does not automatically result in an attempt to conceal the excess. For example, in a number of cases, records based on completed livestock balance cards[59] appear to be correct. The livestock farmers indicate that they exceeded the phosphate production limits because the procedure to obtain phosphate rights was still ongoing, they could not afford to pay the phosphate rights costs, or because ambiguous rules concerning, for example, farm takeovers and 'starter schemes' led them to think they (would come to) hold more phosphate rights.

59 The livestock balance card can be used to keep compulsory animal records.

Temporary Phosphate Reduction Scheme 2017
Prior to the introduction of the phosphate rights system, the temporary Phosphate Reduction Scheme 2017 had been implemented to reduce dairy cattle phosphate reduction to the applicable phosphate production maximum. This meant that dairy farmers either had to reduce their stock of cattle to comply with the phosphate reduction scheme, or pay a levy. Presumably in response to this scheme, the NVWA, acting on a signal received from the RVO.nl, in its criminal investigations discovered attempts to keep fewer animals on paper than in reality. This was achieved by filing incorrect reports in the I&R system[60], thereby ostensibly meeting the phosphate standards and avoiding payment of a levy. Such falsifications mainly concerned falsely registered multiple births or falsely registered young cattle that had actually become dairy cows[61].[62]

Such false reports were found not always to have been made intentionally. A number of problem companies fraught with carelessness and impotence were discovered, for instance. In a number of deliberate misrecording cases, livestock farmers indicated that, due to changing regulations, previous investment decisions suddenly proved untenable.[61]

The impact on the sector was significant, as the Minister decided to block over 2,000 companies until they put their RVO.nl records in. This caused a lot of media and political attention at the time. The blockades led to increased manure disposal costs and lost revenue. Further investigations revealed that, in a large number of cases, no intent had existed to draw up incorrect records.[61]

Exceedance of licensed ammonia emissions
Exceeding the ammonia emissions volumes allowed under the license is inter alia possible by keeping more animals or by way of low-emission housing violations. Inspections by Environmental Agencies on compliance with environmental and nature legislation show that, in a few cases, the licensed low-emission shed system was not present or that the low-emission shed system was present but not working or not working properly.

Fraud relating to manure application (use, processing, and transport)

In addition to rules governing manure production, the Netherlands has rules for the application of manure - i.e., the use and spreading of manure - in place. By minimising manure leaching, the ground and surface water quality is protected. These rules are considered the core of manure policy[63].

Standards have in this connection been set for the use of livestock manure, nitrogen, and phosphate on farmland:
- Application standard for nitrogen from livestock manure
- Application standard for nitrogen from all manures
- Application standard for phosphate from all manures

As a consequence of the implementation of application standards, a number of manure producers produce more manure than they can apply. The 2014 Manure Processing Scheme therefore required manure producers to have a percentage of this surplus processed. Manure can be processed in different ways:
- export;
- burning or gassing;
- processing animal fertilisers into manure pellets in a facility approved by the NVWA;
- processing animal fertilisers into a mixture of dried digestate.

The transport of manure is highly regulated, meaning that registration and control of all manure flows should be possible. For example, the transport of manure is subject to rules covering the registration of the carrier and vehicles, the animal manure consignment note (VDM), and the weighing, sampling, and analysis of manure. The vehicle must have be equipped with GPS and Automatic Data

60 Identification and registration system. This is a central database for registering certain animal species (Identificatie en registratie dieren | RVO.nl | Rijksdienst).
61 Calves were attributed to a different 'mother cow', resulting in more multiple births. This allowed the cow that had actually calved to remain registered as a heifer.
62 Consulted on 28 May 2021, via Boetes en dagvaardingen voor meer dan 100 veehouders vanwege strafbare feiten met meerlingen | Nieuwsbericht | Openbaar Ministerie (om.nl)
63 Consulted on 29 May 2021, via Wegwijs in het mestbeleid | RVO.nl | Rijksdienst

Registration Equipment (AGS), so the time and location of loading and unloading are automatically and electronically submitted to RVO.nl.

This entire system of manure application rules is based on the application standards set to protect ground and surface water quality. It has become apparent from various criminal investigations that fraud takes place in a variety of ways to meet these application standards on paper, while the manure is in reality illegally spread on the producer's own land or - after it has been illegally traded - is spread elsewhere in the Netherlands. Different forms of fraud are often combined in the process. These are discussed in the following sections.

Fraud in the supply and disposal of manure

The various manifestations identified during criminal investigations into manure supply and disposal fraud include:

- preparing false animal manure consignment notes (VDM) and/or false loading and unloading reports
- manipulating manure samples to adjust nitrogen and/or phosphate levels
- incorrect land use declaration to account for a larger amount of manure

This results in fictitious manure flows on paper, while the ultimate disposal of the actual physical manure flows is no longer clear. Fraud takes place to save manure disposal and manure processing costs and to get the manure accounts right, so that all standards are complied with - on paper, at least. Since accounting for the amount of manure used only takes place after the year is closed, when the manure has long since been transported or used, investigations into these forms of fraud are complicated.

The false preparation of animal manure consignment notes comes up in almost all criminal investigations into manure supply and disposal fraud by the NVWA. Such fraud is not limited to falsely reporting the delivery locations (customer and loading/unloading point) on the transport certificates. It also takes the form of stating a different manure code on transport certificates to fictitiously dispose of more phosphate than is really transported and/or manipulating manure samples, for example. In addition, manure shipments weights are manipulated. To have the fictitious transports records match up, false unloading and loading notifications are also sometimes made, which in turn are used to draw up animal manure consignment notes. This is done by physically manipulating the AGR/GPS equipment.

Manure processing fraud

Manure producers who lack the entitlement to apply all the manure they produce must have a percentage of the surplus processed. One of the options for manure processing is co-digestion, which involves the extraction of biogas and the production of energy. Co-digestion is defined as "*any form of digestion of animal manure mixed with vegetable and/or animal co-digestion materials, while the share of animal manure, expressed by weight, is at least 50%*" (Fertilisers Act Experts Committee, 2015). The approved (designated) co-digestion materials are listed in Appendix Aa to the Fertilisers Act Implementing Regulations. These include vegetable or animal residues from the food and feed industries. The digestate remaining after digestion may be applied as fertiliser.

Criminal investigations by the police reveal that fraud is being conducted by dealing in waste materials that are not suitable and approved for use as co-digestion materials. To conceal the fact that unsuitable waste is delivered, accompanying transport documents may be forged and state an incorrect name and/or LoW code of the waste. This ultimately results in digestate that is used or traded as fertiliser while it does not meet the requirements.

The 2016 "Co-digestion: renewable energy or waste dump?" administrative alert[64] shows that it is very attractive, for financial reasons, to be "creative" when describing co-products. This is due to the high prices to be paid for legal co-products versus the low prices of illegal co-products or other wastes. At its core, this is the revenue model for diverting and/or mixing unauthorised products in the co-digesters chain.

64 This administrative alert was made public on 30-04-2019 following a request under the Government Information (Public Access) Act: Annexe to Parliamentary Paper 31409, no 235. Informatie over Bijlage 881530 | Overheid.nl > Officiële bekendmakingen (officielebekendmakingen.nl)

Co-digestion continues to be susceptible to fraud

"We notice no decrease in signals received. To the contrary: the surveys we do in fact confirm the picture that matters are often still not in order. At the same time, the vulnerabilities in the system we identified years ago are essentially still there.
Co-digestion sounds like a solid addition to sustainability policy. You can hardly be opposed to it. But the financial stakes are high. We are now seeing the first signs of organised crime making a move into this market. And they have a nose for criminal revenue models with good returns and low chances of being caught."
Deputy Chief Public Prosecutor of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation (Sander de Haas) - From: episode 3 of De Vuilnisman

Other forms of fraud include bringing in manure from outside the farm, while the permit only allows manure from the farm itself to be digested in the co-digester, and the export of more digestate than is allowed under the permit to save on the cost of disposing of the excess digestate to a waste processor.

Co-digestion subsidies
The "Co-digestion: renewable energy or waste dump?" administrative alert indicates that fraudulent trading in co-digesters is even more lucrative because of the subsidies granted to companies to make the high investment costs in constructing the plants economically viable[65].

'Mistaken'

"The manure surplus is a major problem in the Netherlands. (...) The co-digester is a way to convert organic residual streams into gas or electricity. Manure accounts for only a small part of it, meaning that other products had to be added to get and keep digestion going. (...) The more stuff other than manure you add, the better the process works. Yet the original intent was for the exact opposite. So, in practice, it turns out that this whole thing with digesting manure by way of co-digestion is not very successful at all."

Meanwhile, the country features over a hundred co-digesters, while new ones are still being built. Between 2008 and the present day, nearly EUR 2 billion in subsidies disappeared into these devices - even though they turned out to be so unprofitable that they could hardly be kept afloat even with all these subsidies.
"Saying: 'We can make a lovely green resource, namely electricity, out of that worthless manure we have way too much of,' does of course make for a way better sales pitch. Actual generation has been disappointing. However, if you don't try things out, you'll never know."
Former Minister of LNV (Cees Veerman) - From: episode 3 of De Vuilnisman

Manure processing and farm relocation subsidy fraud
Finally, the subsidy options available for purchasing manure processing equipment can also be misused. A criminal investigation revealed that one entrepreneur had submitted two applications for the determination of a subsidy in connection with their investment in a manure processing machine, even though these machines were never actually procured.

A very different example of subsidy fraud is that of several pig farms receiving subsidies to move further away from nature reserves. However, these were pig farms that had in reality already ceased business operations because they were not economically viable.

3.5.2 Minimum extent of fraud

In this section we will provide a provisional estimate of the minimum extent of manure fraud, basing ourselves on the criminal investigations that could be analysed for this Threat Assessment and which resulted in a court ruling or settlement by the Public Prosecution Service. Where possible, this was supplemented by available information derived from official reports submitted to the Public Prosecutor, even for cases where no verdict was given or settlement reached.

65 The subsidies aim to cover the front-end losses connected to the use of co-digesters.

Fraud relating to manure production

Production rights fraud

The NVWA-IOD has conducted three investigations into production rights fraud in recent years. The courts of first instance have by now issued their judgments in these cases and the following violations have been identified (Table 3.1 Poultry production rights violations identified on the basis of 3 criminal investigations by the NVWA-IOD.).

It was calculated that a total of over EUR 330,000 of unlawful gains had been made in these cases. In one case, a claim of over EUR 150,000 was rejected by the court, while a claim of EUR 106,000 was awarded in another. Some of the confiscation cases are still ongoing.

The vast majority of criminal investigations into exceeding production rights are carried out by the special investigating officers of the NVWA. A separate analysis was made of these criminal investigations[66], while the ecological impact of the exceedance of production rights were also calculated. The results of the ecological impact calculations are explained in section 3.6.1.

The criminal investigations provide insight into the violations observed. We for this purpose analysed 134 official reports submitted to the Public Prosecutor between December 2015 and May 2020 that resulted a court decision or settlement by the Public Prosecutor[67]. Based on analysis of these criminal investigations by the supervisory division of the NVWA, both production rights for poultry (Table 3.2 Poultry production rights violations on the basis of criminal investigations by the supervisory division of the NVWA.) and production rights for pigs (Table 3.3) were found to have been exceeded.

It should be noted that this is not a complete overview of the total violations observed per calendar year. First of all, the listing is based only on the official reports submitted from December 2015. With respect to some of the farms that exceeded production rights in the 2013 calendar year, official reports will already have been drawn up and submitted in 2014 and early 2015. In addition, the choice was made not to include any official reports that are not available digitally in the study. This means that some of the official reports submitted in 2015 come outside the scope of the study. Finally, not all official reports covering farms that exceeded production rights in more recent calendar years (2017-2018) have been submitted and resolved already.

It was calculated that a total of over EUR 7,1 million of unlawful gains had been made in these cases. It is not known how much of the illegally obtained gains were awarded or rejected.

Table 3.1 *Poultry production rights violations identified on the basis of 3 criminal investigations by the NVWA-IOD.*

Year of violation	Exceedance of poultry units	based on the number of companies
2009	9.785	2
2010	114.652	4
2011	8.992	2
2012	N/A	N/A
2013	60.982	1
2014	59.101	1
2015	61.001	1

66 This is a separate analysis from the analysis of all NVWA-IOD investigations into manure fraud. For this reason, the NVWA-IOD investigations into production rights fraud are explained separately in this section and are not included in the ecological impact calculations.

67 The selection consisted of 168 official reports. 34 of these official reports were ultimately not selected for analysis because they resulted in acquittal or a dismissal of the case (9 reports) or because the case is still ongoing (25 reports). The selection of 134 official reports also includes six so-called FEK cases, to which the NVWA-IOD made a contribution.

Table 3.2 *Poultry production rights violations on the basis of criminal investigations by the supervisory division of the NVWA.*

Year of violation	Exceedance of poultry units	based on the number of companies	Total number of production rights available for the farms found to have been in violation
2013	81.064	5	182.863
2014	446.465	25	850.202
2015	1.229.009	57	1.936.249
2016	813.020	46	1.495.511
2017	406.362	20	362.035
2018	253.411	11	224.663

Table 3.3 *Pig production rights violations on the basis of criminal investigations by the supervisory division of the NVWA.*

Year of violation	Exceedance of pig units	based on the number of companies	Total number of production rights available for the farms found to have been in violation
2013	488	2	18.702
2014	3.411	10	38.859
2015	6.590	24	60.205
2016	1.750	12	37.112
2017	2.116	8	12.911
2018	1.237	3	3.561

Nationwide, over 67 million poultry rights are available for an average of 1,500 poultry farms per year[68,69,70]. As for pig rights, over 8.6 million production rights were available nationwide[71]. The number of pig farms decreased in this period, from 5,530 in 2013 to 4,190 in 2018. Farms do grow ever larger; the average number of pigs per farm increases[72].

The proportion of observed poultry production rights (Table 3.2) and pig production rights (Table 3.3) exceedances is small compared to the total production rights available nationwide. However, as indicated in the above, no numerical conclusions about the overall extent of production rights fraud can be drawn from this. This is complicated by the relatively low level of control over production rights. For indicative purposes, in 2019, 94 farms were inspected (69 of them based on risk selection[73]) under the production rights system for pigs and poultry. Of the 69 risk-based selected farms, 65% did not comply with the production rights system (NVWA, 2020). The analysis used to select companies to be subjected to inspections thus seems to be an appropriate method. There are, however, over 5,000 poultry and pig farms in the Netherlands.

68 Consulted on 29 May 2021, via StatLine - Varkens- en pluimveerechten (cbs.nl)
69 https://www.agrimatie.nl/SectorResultaat.aspx?subpubID=2232&sectorID=2249: broiler farms and laying hen farms: Consulted on 23 April 2021
70 In 2013, there were 1,637 poultry farms. This number decreased to 1,399 in 2018.
71 Consulted on 29 May 2021, via StatLine - Varkens- en pluimveerechten (cbs.nl)
72 Consulted on 29 May 2021, via Krimp in aantal bedrijven met varkens (cbs.nl)
73 This means that farms are selected that were suspected of exceeding pig or poultry entitlements. The selection takes place on the basis of an analysis of the data registered with RVO.nl (in cooperation with RVO.nl), signals from the field and other investigations.

If more effort were to be put into inspections, more farms that do not comply with the production rights system might be detected. To obtain a solid picture of compliance in the sector, a-selective monitoring would be required. However, this method is often not opted for due to lack of capacity. For pig production rights, a compliance review will be carried out in 2020-2021.

As criminal investigations to an important extent result from risk-oriented inspections, it is also not possible to extrapolate the number of exceedances detected in a given calendar year to estimate the actual number of production rights exceeded.

Distribution of production rights violations over the farms
In order to get an impression of the distribution of the exceedance over the different farms that exceeded production rights in a given year, the number of (poultry) production rights registered and the number by which the production rights were exceeded in 2015 are plotted per farm in Figure 3.1 Poultry production rights exceedance per farm in the 2015 calendar year. The data relating to observed exceedances is most complete for this year.

The graph shows that some farms that exceeded production rights did not purchase production rights at all, that a large number of farms exceeded production rights to a relatively small extent, and that there are some major outliers among them.

Based on the observed exceedance levels, 57 poultry farmers collectively exceeded the production rights available to them by 1.2 million poultry units in 2015. In 2015, 24 pig farmers collectively exceeded the production rights available to them by 6,590 pig units. When the observed exceedances based on NVWA-IOD investigations are also included, the total comes to at least 1.29 million poultry units. In 2015, 67.16 million production rights were available nationwide for 1,579 poultry farms and 8.74 million production rights for 4,930 pig farms.

Phosphate production in excess of available phosphate rights
The supervisory division of the NVWA has drawn up 10 criminal official reports into fraud with phosphate rights in recent years and the NVWA-IOD has contributed to 2 FEK cases. At the time of writing, these cases have not yet resulted in a court judgment or settlement by the Public Prosecution Service. Only a provisional estimate of the minimum extent of manure fraud can therefore be made on the basis of the information that can be obtained from the official reports submitted to the Public Prosecution Service (Table 3.4 Suspected extent of phosphate rights exceedance based on 12 criminal investigations).

Based on the 12 official reports[74], six livestock farmers in 2018 collectively produced about 9,800 kg of phosphate in excess of the phosphate rights available to them. In 2019, 8 livestock farmers collectively produced about 9,465 kg of phosphate in excess of the phosphate rights available to them. It was calculated that a total of over EUR 725,000 of unlawful gains had been made in these cases.

Nationwide, 85.71 million phosphate rights were available to 17,210 dairy farmers in 2018, while 85.77 million phosphate rights were available to 16,630 dairy farmers in 2019.

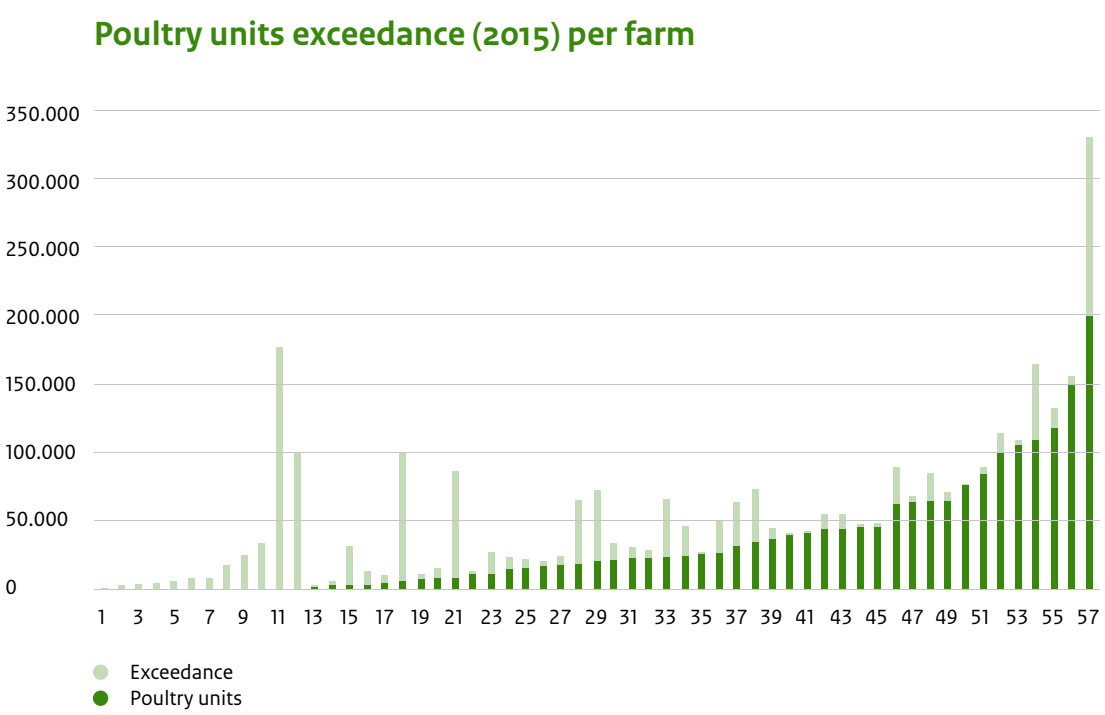
Temporary Phosphate Reduction Scheme 2017

Table 3.4 *Suspected extent of phosphate rights exceedance based on 12 criminal investigations*

Year of violation	Kilos of phosphate produced in excess	based on the number of companies	Total number of phosphate rights available for the farms found to have been in violation
2018	Approx. 9,800 kg	6	21.186 kg
2019	Approx. 9,465 kg	8	31.963 kg

74 In 1 of the 12 criminal cases, an attempt was made to illegally obtain more phosphate rights. However, this was recognised in time, meaning that no phosphate rights were exceeded in this case.

Figure 3.1 *Poultry production rights exceedance per farm in the 2015 calendar year*



In October 2020, the Public Prosecution Service (PPS) issued a news report that it had in the end fined some 100 cattle farmers for offences involving animal registration in order to reduce the number of dairy cows on paper[75]. In the news release, the PPS stated that it had decided to prosecute in 125 out of the more than 140 cases. Based on this news report, the following numbers of animals kept in excess were identified:

Year of violation	Number of animals kept in excess	based on the number of companies
2017	Approx. 3,000 heads of cattle	**Approx. 125**

Exceedance of licensed ammonia emissions
Violations of the ammonia emissions allowance can be related to keeping more animals or a lack of / incorrectly functioning low-emission shed systems. Depending on the impact of the offence on the living environment, combined with the offender's behaviour (this is reflected in the National Enforcement Strategy, the LHS), the severity of the offence is determined. In recent years, a few percent of the inspections carried out by the Brabant Environmental Agencies have found a serious violation related to a low-emission housing system. The available information is too limited to say anything about compliance or the extent of the fraud.

Fraud relating to manure application (use, processing, and transport)

The analysis of the official reports shows that criminal investigations into manure fraud are often limited and are not conducted in order to reveal the total extent of manure fraud. Most criminal investigations predominantly focus on identifying and proving forgery. In such cases, the investigation focuses on proving fraud with documents, such as

75 Consulted on 29 May 2021, via Boetes en dagvaardingen voor meer dan 100 veehouders vanwege strafbare feiten met meerlingen | Nieuwsbericht | Openbaar Ministerie (om.nl)

Table 3.5 *Quantity of manure not accounted for, or accounted for incorrectly, based on 5 criminal investigations (over the 2003-2018 period).*

Fraud form	Quantity of manure	Fraud period
The manure was disposed of on paper, but was not in fact transported.	Approx. 595 tonnes of manure + loads listed in 19 VDMs and loads listed in 49 false unloading and/or loading notifications	2009 through 2013 and 2015, 2016, and 2018
The manure was on paper delivered in Germany, but was in reality delivered in the Netherlands.	Approx. 305 tonnes of manure	2003 through 2005 and 2008 through 2009
The manure was on paper delivered in Belgium, but was in reality delivered in the Netherlands.	Approx. 35 tonnes of manure	2008 through 2009
The manure was on paper delivered to another location (in Germany) than it was in reality delivered to.	Approx. 300 tonnes of manure	2008 through 2009
Total	**Approx. 1,235 tonnes of manure + quantities of manure in loads listed in 19 VDMs and quantities of manure in loads listed in 49 false unloading and/or loading notifications**	

animal manure consignment notes (VDMs), land user declarations, or subsidy applications. It is not always important in this connection how many documents were tampered with. And in order to prove the offences, it is also not always relevant to determine the exact number of kilos of manure the fraud related to or to establish where the manure that was unaccounted for ended up. Moreover, this is often difficult to ascertain. This also means that it is not possible to quantify ecological impacts for these forms of manure fraud. For in order to do so, it must be known where the illegal manure ended up.

Fraud in the supply and disposal of manure

Both the NVWA-IOD, the supervisory division of the NVWA, and the National Police have issued criminal reports on manure supply and disposal fraud. For a total of 21 criminal investigations, the official report could be analysed to a greater or lesser extent. Ten criminal investigations have by now resulted in a (provisional) court judgment or have been settled by the Public Prosecution Service[76]. The following fraud was identified in this connection:

The findings from the 5 court decisions are summed up in Table 3.5 per type of fraud. The periods over which the fraud was committed are rounded to whole calendar years. Since criminal investigations often take a long time to complete, court decisions are available mainly for relatively older cases.

As far as was possible, we on the basis of the 21 criminal investigations made clear how many kilograms of manure were not accounted for or were accounted for incorrectly. In so doing, we based ourselves on the information available in the official reports submitted to the Public Prosecution Service, even if no judgment has yet been given or settlement yet reached. This produces the following picture (Scrap metal):

76 It was not possible to analyse the court judgment (or penalty order) issued in multiple criminal cases. As a result, it could not be ascertained which details listed in the official report were found proven. Information in the official reports on the quantities of manure not accounted for, or accounted for incorrectly, has therefore only been included in Table 3.6.

Table 3.6 *Suspected quantity of manure not accounted for, or accounted for incorrectly, based on 21 criminal investigations (over the 2003-2019 period).*

Organisation	Number of criminal investigations	Quantity of manure not or incorrectly accounted for	Kg of phosphate	Number of forged documents
NVWA-IOD	11 criminal reports drawn up	Over 185 million kg of manure	Over 2.9 million kg of phosphate	• Approx. 4600 VDMs (animal fertilisers transport certificates) • Approx. 120 D-VDMs • Approx. 95 CRMs • Approx. 90 GC • Approx. 2 false unloading and loading notifications • Land user declarations and Combined Declarations
Supervisory division of the NVWA	7 criminal reports drawn up	Approx. 20 tonnes of manure		• Approx. 15 VDMs
Police	3 criminal reports drawn up	Not known	Not known	• Approx. 47 false unloading and loading notifications

It was calculated that almost EUR 23 million of unlawful gains had been made in these cases. A total of EUR 22.5 million from this amount relate to two major criminal cases. A EUR 200,000 settlement was reached in one of these cases. Some of the confiscation cases are still ongoing.
The findings from the official reports are summed up by organisation (or division) in Table 3.6. Not every investigation and official report includes the same indicators for the extent of manure fraud, such as the number of kilograms of phosphate or the number of forged documents. That is to say, in some investigations information was for example available on the amount of manure that was not or incorrectly accounted for, while other investigations concerned only animal fertilisers transport certificate fraud. The data included in the different columns cannot, therefore, be linked.

As indicated in the above, it is not possible to use Tables 3.5 and 3.6 to calculate the exact number of kilogrammes of manure the fraud covered. The criminal investigations are often limited and are not conducted in order to reveal the total extent of manure fraud and the location where the manure unaccounted for ended up. In any case, based on the criminal investigations in which judgments were given, over 1,235 tonnes of manure appears not to have been transported at all or to have been transported to another delivery location (instead of being exported) (Table 3.5 Quantity of manure not accounted for, or accounted for incorrectly, based on 5 criminal investigations (over the 2003-2018 period).). This is based on the facts contained in the indictment and the proven facts in the judgments. That this constitutes a lower limit becomes apparent from one of the judgments rendered in a major criminal investigation (see box).

"Over a series of years, the accused committed these offences knowingly and purposefully in an organised context, the accused acting as the key player and the accused having taken the initiative. In view of the large number of transports falsely recorded in the records of the accused's companies and reported to the National Service for the Implementation of Regulations, the Court is of the opinion **that the accused systematically, on a large scale, and over an extended period of time violated the rules in force with respect to manure transport movements**. By setting up an opaque structure of multiple legal persons, the accused tried to

conceal the fact that he was the party primarily responsible for committing the offences found proven in the above. He repeatedly disregarded any advice given." - Oost-Brabant District Court, 2019 (ECLI:NL:RBOBR:2019:4400)

Every year, an average of 75 billion kg of manure is produced in the Netherlands. Manure that must be properly applied, processed, or exported to reduce the harmful effects of an excess of manure. To this end, just under one million manure shipments take place annually, not all of which can be physically checked: in 2019, for example, over 950,000 manure shipments took place, of which 821 were physically checked. This boils down to less than 1 in 1,000 transports, meaning that the chances of being caught in case of irregularities with the transport of manure are relatively small.

Fraud may prejudice the protection of nature and the environment. Although the actual extent of manure fraud and the exact impact it has on the effectiveness of manure policy cannot be determined on the basis of this analysis, criminal investigations do clearly show that fraud creates differences between (fictitious) manure flows on paper and physical manure flows. This in itself results in government agencies having incorrect records and data. These data are used, for example, to monitor whether the legal application standards for animal manure, nitrogen, and phosphate on agricultural land are not exceeded in a given area. Due to fraud with animal fertilisers transport tickets, the excess (overutilisation) calculated by the CBS in areas with a manure surplus is probably an underestimate (refer to section 3.6.1).

Manure processing fraud

Both the National Police and the supervisory division of the NVWA have issued criminal reports into manure processing fraud. In total, the official reports of 10 criminal investigations could be analysed to a greater or lesser extent[77]. Unfortunately, this has provided few insights into the quantities of manure, co-products and/or digestate suspected to have been tampered with. It is known, however, that unlawful gains in these cases were calculated to amount to over EUR 5.7 million. In two cases, claims totalling over EUR 1.1 million were awarded by the court. Some of the confiscation cases are still ongoing.

Summary

Poultry and pig production rights exceedance

- The NVWA annually inspects a few percent of poultry and pig farms in a risk-oriented manner to ensure that they have sufficient production rights. As a large share of the checks are risk-oriented inspections, it is not possible to extrapolate the number of exceedances detected in a given calendar year to estimate the actual number of production rights exceeded.
- The fact that, in 2019, about 65% of the farms selected under this risk-based approach (69 select controls) did not comply with the production rights system proves that this risk-based selection method is an appropriate one. If more effort were to be put into inspections, more farms that do not comply with the production rights system might be detected. In order to get a sound picture of compliance in the sector, a-selective monitoring should also be carried out on a larger scale. However, this method is often not opted for due to lack of capacity. With respect to pig production rights, a compliance review will be carried out in 2020-2021.
- On the basis of criminal investigations into production rights violations resulting in a court decision or settlement by the public prosecutor, the numbers of poultry and pig units were each year exceeded by between 80,000 and 1.2 million poultry units (at 5 - 57 farms) and between 488 and 6,590 pig units (at 2 - 24 farms). The exceedances observed depend on the number of inspections and the data made available for this analysis each year. It was calculated that a total of over EUR 7.1 million of unlawful gains had been made in these cases.

Phosphate rights exceedance

- Based on the criminal investigations into phosphate rights exceedance that have not yet been reviewed by a court, six livestock farmers presumably in 2018 collectively produced about

77 Only very summary information was obtained for a large proportion of the criminal investigations.

9,800 kg of phosphate in excess of the phosphate rights available to them. In 2019, eight livestock farmers presumably collectively produced about 9,465 kg of phosphate in excess of the phosphate rights available to them. It was calculated that a total of over EUR 725,000 of unlawful gains had been made in these cases.
- Some 3,000 heads of cattle in excess of the limits imposed by the Temporary Phosphate Reduction Plan 2017 were found to be kept at 125 farms.

Fraud in the supply and disposal of manure
- On the basis of the criminal investigations into manure supply and disposal fraud that have resulted in court judgments, it appears that at least over 1,235 tonnes of manure had not been transported or had been transported to another delivery location (instead of being exported abroad).
- On the basis of the official reports submitted to the National Office for Serious Fraud, Environmental Crime and Asset Confiscation but not yet assessed in full by the courts, the amount of manure that is suspected to be not or incorrectly accounted for from 2003 through 2019 is at least 185 million kg.
- Fraud creates differences between (fictitious) manure flows on paper and physical manure flows, making control and registration of all manure flows impossible.

Manure processing fraud
- On the basis of the criminal investigations into manure processing fraud, no initial estimate of the minimum extent of the fraud can be given. It is known, however, that unlawful gains in these cases were calculated to amount to over EUR 5.7 million in total.

3.6 Consequences

The consequences of manure fraud are wide-ranging and affect the environment, nature, society, and the economy. This is also clearly recognised in a ruling by the Oost-Brabant District Court (refer to the box) (Oost-Brabant District Court, 2019). This section looks at the consequences of manure fraud. We look at manure fraud from a broader perspective, focusing on the purposes of the various laws and regulations: protecting nature and the environment.

Oost-Brabant District Court judgment in a criminal investigation into large-scale manure fraud

"The accused is guilty of directing forgery by failing to keep truthful records of manure transports carried out by his companies and by having manure transports that had not been carried out recorded in the records of the National Service for the Implementation of Regulations. By conducting himself in this way, the accused violated the trust that is placed by society in the accuracy of records in general and that of a government agency in particular.

Moreover, by his conduct, the accused has violated the system of the Fertilizer Act, which inter alia has as its purpose the reduction of the manure surplus and the protection of the environment. For many years now, the government has, in the interest of society as a whole, been heavily promoting this. Livestock farms have huge financial interests in this area. Farms have to pay a fine for all excess manure produced that cannot be traded. By way of these fictitious manure shipments, the accused enabled pig farmers to get rid of their manure surplus on a large scale in an unregulated manner. It is to be feared that this manure was spread illegally.

The proven facts greatly undermine compliance with the fertilisers legislation, which detracts from the protection of the environment, but also encourage unfair competition within the agricultural sector. Above all, the proven facts put the agricultural sector, and in particular pig farmers and manure transporters, in a bad light." – Oost-Brabant District Court (ECLI:NL:RBOBR:2019:4400)

3.6.1 Environmental impact

Eutrophication and acidification of nature due to excess nitrogen from the atmosphere, ultimately leads to disruption of the soil, vegetation, and wildlife in natural areas (Gies, 2019). In the Veluwe area, for example, high nitrogen deposition causes eutrophication, resulting in a small number of fast-growing plants pushing out other species. In addition, soil acidification in the Veluwe leads to

deficiencies of other minerals, causing oak trees to die and birds to disappear[78]. High nitrogen deposition affects the forest ecosystem, which is reflected in the vitality of oak trees, the survival of butterfly caterpillars, the vitamin B metabolism of songbirds, and the population of raptors such as sparrows and hawks. The sparrowhawk has almost disappeared from the Veluwe area.

In 2018, the national average nitrogen deposition was 1,730 moles of nitrogen per ha (mol/N/ha). The nitrogen deposited in the Netherlands mainly derives from Dutch agriculture, foreign sources (agricultural sources making up half of these as well), and road traffic. Regionally, large nitrogen deposition differences are visible. In the Gelderse Valley and Peel areas, for example, depositions are as high as about 4,000 moles of nitrogen per ha per year. This is due to high local ammonia emissions by, predominantly, intensive livestock farming[79]. At present, the critical deposition value is exceeded in about 70% of nitrogen-sensitive Natura 2000 areas. This means that more nitrogen is deposited at these sites than is good for biodiversity conservation. However, the degree to which the limits is exceeded has gone down, meaning that the "nitrogen blanket" is getting thinner.

In the context of the joint study on the extent and ecological effects of manure fraud, cooperation was sought with knowledge institutions to make the ecological effects of manure fraud visible. This approach does not appear to be fruitful for fraud with respect to the application of manure (refer to section 3.5.2). Even after completion of criminal investigations, it is often unclear where the illegal manure was dumped. The ecological effects of fraud due to additional leaching of nitrogen to ground and surface water, cannot therefore be determined. The same applies to the effects on nitrogen deposition caused by the additional ammonia emissions from illegally applied manure. For ammonia emissions from applied manure, contribute to nitrogen deposition to an almost similar extent as ammonia emissions from sheds. Of course, the fact that such effects cannot be determined does not mean that these ecological effects do not occur.

The ecological effects caused by animals illegally kept under the Fertilisers Act can be determined, however. The locations of the sheds and the number of animals kept in excess of the limits are known in these specific situations. This allows for calculating the contribution made by these illegally kept animals to nitrogen deposition in nitrogen-sensitive Natura 2000 areas. Quantifying the ecological effects of manure fraud by calculating the effects on nitrogen deposition is a new development.

In principle, it is also possible to determine the ecological effects caused by exceeding licensed ammonia emissions (refer to section 3.5.2). At the time this study was conducted, it was still too early for the Environmental Agencies to be able to calculate the effects of the exceedance of licensed ammonia emissions. This may, however, be possible in the future, also refer to the recommendation in section 3.8.

Ecological effects of exceeding production rights

The total nitrogen deposition attributable to animals kept illegally under the Fertilisers Act was determined by calculating the effect of the difference (actual number of animals on the farm vs acquired production rights) on nitrogen deposition. Only the additional ammonia emissions from the shed caused by these illegally kept animals are considered in this connection. The effects of additional ammonia emissions after the manure has left the shed are not included in the calculation. Since most poultry manure is directly brought to an incinerator (BMC Moerdijk), such manure may not cause any additional emissions, provided the manure is processed through the regular route. This may play a role for pig farms, however.

We in section 3.5.1 indicated that we analysed 134 official reports submitted to the Public Prosecutor between December 2015 and May 2020 that resulted in a court decision or settlement by the Public Prosecutor. Of these 134 official reports, 119 could eventually be included in the calculations. For 15

78 Consulted on 29 May 2021, via Van vogels tot eikenbos: stikstof nekt leven op de Veluwe | NU - Het laatste nieuws het eerst op NU.nl
79 Consulted on 28 May 2021, via Stikstofdepositie, 1990-2018 | Compendium voor de Leefomgeving (clo.nl)

cases, the GDI[80], data from which are needed for the calculation, was missing.

Various legislation to regulate livestock emissions
It should be noted that this specifically concerns exceedance of production rights under the Fertilisers Act. They are inter alia designed to control ammonia emissions on the regional and national levels in order to stay below the internationally agreed ammonia limit. After it was shown in the 1960s and 1970s that lakes in Scandinavia were acidifying due to sulphur dioxide emissions much further down in Europe, it became clear that international cooperation was necessary to solve this problem. This is the reason for international agreements having been concluded on emissions of pollutants such as sulphur dioxide and nitrogen dioxide. Ammonia is also covered by these agreements, as, even though most of it settles close to the source, some of it can travel up to several hundred kilometres.

The NVWA monitors nationwide compliance with production rights under the Fertilisers Act. Production rights are not directly intended to control nitrogen deposition on the local level. Environmental and Nature Protection Permits are area-based, are reviewed by the provincial authorities, and are inter alia intended to regulate odour nuisance and to protect Natura 2000 areas. The Nature Protection Act is reviewed locally by the provincial authorities. Production rights are not assessed when issuing Environmental and Nature Protection Permits. Only the numbers of animals and the corresponding housing systems listed in the application are reviewed.

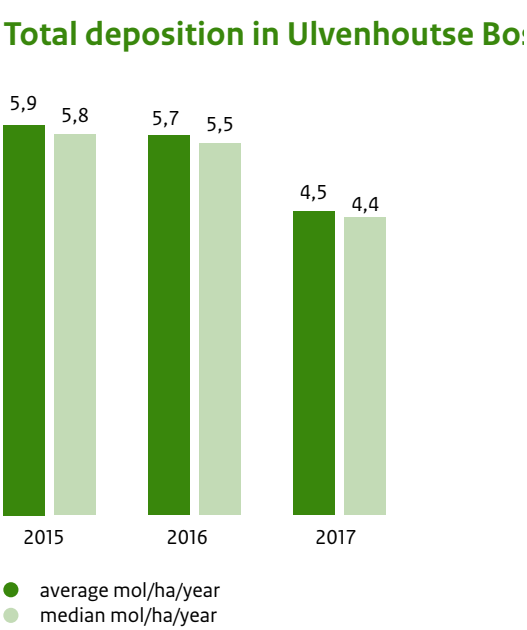
It therefore is possible for a livestock farmer who keeps animals illegally under the Fertilisers Act and who is summoned to appear in court and imposed a hefty fine, to in fact comply with the Nature Protection Act and keep their nitrogen emission levels within the limits of their permit. However, under the Fertilisers Act, the livestock farmer has not paid for the purchase of production rights, meaning the emissions from the farm are illegal. Incidentally, a lot of free space is still available under the environmental permits: the permits allow for 30 to 40% more animals than are currently kept, as livestock farmers have applied for extensive permits.

Nitrogen-sensitive Natura 2000 areas
The cumulative effects of the exceedance of the limits by the farms included in the analysis on the nitrogen-sensitive Natura 2000 areas - the 'injured party' of the violation of manure regulations - have been calculated on a per-year basis. The Netherlands features 161 Natura 2000 areas, including 130 areas home to nitrogen-sensitive nature (Paul, 2021). The calculated nitrogen deposition resulting from emissions by animals kept illegally under the Fertilisers Act differs for each Natura 2000 area.

The average effect of the cumulative exceedance of production rights exceeds 1 mole/ha/year for 21 nitrogen-sensitive Natura 2000 areas. The ecological effects of production rights being exceeded appear to be highest in the Ulvenhoutse Bos Natura 2000 area (5.8 mole/ha/year) (Figure 3.2 Nitrogen deposition due to animals kept illegally under the Fertilisers Act on the Ulvenhoutse Bos Natura 2000 area (per calendar year). The graph is based on the identified exceedances per year, based on available information; the data are most complete for the 2015 calendar year.). Spots 2 through 5 are taken up by Sarsven en De Banen (5.7 mole/ha/year), the Groote Peel (3.6 mole/ha/year), Kempenland West (3.0 mole/ha/year) and the Veluwe (2.3 mole/ha/year). These values depend not only on the degree to which production rights have been exceeded, but also on the number of inspections and the annual data available for this analysis.

80 This refers to the Combined Declaration agricultural entrepreneurs are required to annually complete. This declaration is used to transmit data to RVO.nl for the purposes of the Agricultural Census, manure legislation, and emission reports. Consulted on 28 May 2021, via Gecombineerde opgave | RVO.nl | Rijksdienst

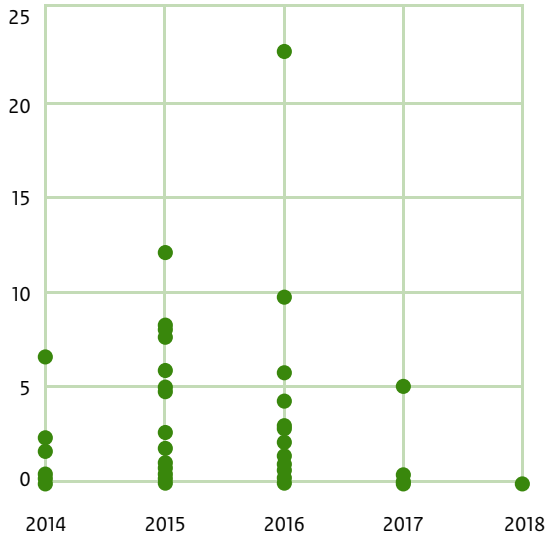
Figure 3.2 *Nitrogen deposition due to animals kept illegally under the Fertilisers Act on the Ulvenhoutse Bos Natura 2000 area (per calendar year). The graph is based on the identified exceedances per year, based on available information; the data are most complete for the 2015 calendar year.*



Based on the 57 poultry farms and 24 pig farms where production rights exceedances were observed in 2015, the average effect of the cumulative exceedance on the Ulvenhoutse Bos is 5.8 mole/ha/year. The 2016 figure is 5.6 mole/ha/year, based on 46 poultry farms and 12 pig farms where exceedances were identified. The 2017 figure is 4.5 mole/ha/year, based on 20 poultry farms and 8 pig farms where exceedances were identified.

So as to provide an idea of the maximum nitrogen levels deposited on a hectare of the Veluwe Natura 2000 by illegally kept animals, Figure 3.3 shows the level for each individual shed. Each individual point is the calculated maximum nitrogen deposition of an individual shed where animals for which no production rights were issued were kept. The graph shows a few outliers: farms that have heavily exceeded production rights and/or are located near the Veluwe.

Figure 3.3 *The calculated maximum nitrogen deposition on a hectare of the Veluwe by individual sheds where animals for which no production rights were issued were kept.*



To put the effect of the animals on these farms kept illegally under the Fertilisers Act on nitrogen deposition into perspective: The effect of the national measure to reduce speed from 130 km/h to 100 km/h on the Ulvenhoutse Bos is an average decrease of 6.2 mole/ha/year. The effects on the Ulvenhoutse Bos are highest for both the speed reduction (decrease in deposition) and the exceedance of production rights (deposition attributable to illegally kept animals).

Another way to put these outcomes in social perspective is to compare them with the limit for licensing nitrogen-emitting activities, which at present stands at ›0.00 mole/ha/year in the Netherlands. If the contribution does not exceed 0.00 mole/ha/year at any Natura 2000 area, no nitrogen permit requirement exists. For the time being, licensing is based on the principle that any increase in nitrogen deposition due to an activity exceeding 0.00 mole of nitrogen per ha per year *may be* ecologically relevant (BIJ12, 2021).

Table 3.7 *The highest calculated nitrogen deposition levels in nitrogen-sensitive habitat types by a specific farm.*

Natura 2000 area	Habitat type	Nitrogen deposition mole ha^{-1} $year^{-1}$
Ulvenhoutse Bos	Oak-hornbeam forests (higher sandy areas)	8.13
	Humid alluvial forests (streamside forest)	8.13
	Beech-oak forests with holly	7.82
Loonse en Drunense Duinen & Leemkuilen	Old oak forests,	4.26
	Shifting sand moors with heather	2.93
	Sand dunes	2.86
Langstraat	Green algae waters, on higher sandy areas	2.73
	Transition and quaking bogs (peat moss reed beds)	2.56
	Fen meadows	2.04

Nitrogen-sensitive habitat types
Natura 2000 areas are selected based on the presence of species and habitat types that need protection from a European perspective. In order to also provide insight into the effects on habitat types, these effects have been calculated for two farms that contributed the most to nitrogen deposition.

The calculated 2015 deposition due to emissions from the illegally kept animals by the first farm amounts to 8.13 mole/ha on the Ulvenhoutse Bos Natura 2000 area, 4.26 mole/ha for the Loonse en Drunense Duinen & Leemkuilen Natura 2000 area, and 2.73 mole/ha for the Langstraat Natura 2000 area. Refer to Table 3.7 for the highest contribution levels to deposition in three nitrogen-sensitive habitat types in these areas.

The calculated 2016 deposition due to emissions from the illegally kept animals by the second farm amounts to 22.22 mole/ha on the Veluwe Natura 2000 area, 0.09 mole/ha for the Binnenveld Natura 2000 area, and 0.09 mole/ha for the Rijntakken Natura 2000 area. The Veluwe is a large area: in addition to the habitat types listed in Table 3.7, it features 9 further habitat types where nitrogen deposition levels are above 1 mole. Refer to Table 3.8 for the highest contribution levels to deposition in three nitrogen-sensitive habitat types in these areas.

The results of the calculations on the ecological effects of manure fraud make it clear that, in order to protect nitrogen-sensitive nature, it is not only important to take a critical look at the licensing of new nitrogen-emitting activities, but also at whether emissions have been paid for (e.g. by way of the purchase/lease of production rights) and whether existing nitrogen-emitting activities comply with the licensing conditions.

Ecological effects of exceeding licensed ammonia emissions
Inspections of permits in application of the Nature Protection Act include a calculation of the deposition effect related to the ammonia emissions. Violations of the allowance under the permit can be related to keeping more animals or a lack of / incorrectly functioning low-emission shed systems. This was established for a few percent of the inspections carried out by the Brabant Environmental Agencies. The violations concerned may be substantial and have gone on for years.

Table 3.8 *The highest calculated nitrogen deposition levels in nitrogen-sensitive habitat types by a specific farm.*

Natura 2000 area	Habitat type	Nitrogen deposition mole ha^{-1} $year^{-1}$
Veluwe	Forest of poor sandy soils	22.22
	Forest of poor sandy soils	8.64
	Bent pastures	3.00
	+ 9 habitat types	> 1
Binnenveld	Transition and quaking bogs (quaking bogs)	0.09
	Transition and quaking bogs (peat moss reed beds)	2.39
	Fen meadows	0.07
Rijntakken	Dry hardwood riparian forests	0.09
	Kingcup pastures of peat and clay	0.09
	Wet, moderately nutrient-rich grassland	0.08

Ecological effects of fraud relating to manure application

To limit the harmful effects of nitrate and phosphate leaching into ground and surface water, among other things, the use of manure on agricultural land is regulated (refer to section 3.5.1). The CBS each year calculates the extent to which the legal limits for spreading livestock manure has been adhered to in practice. If more than 100% of the allowance has been used, overutilisation has taken place.

CBS figures show that, for several years, the calculated application has exceeded 100 per cent in a number of agricultural areas, especially in the southern Netherlands. If the legal limits have indeed been exceeded, the effectiveness of the manure policy in force will be lower than was estimated beforehand. This could also be one of the factors explaining why the nitrate target of 50 milligrams per litre for upper groundwater, as set out in the European Nitrates Directive, was found to be have been exceeded (van der Sluis, 2017). Specifically for the southern sandy soil area, van der Sluis' (2017) analysis indicates that the exceedance of the nitrate target in that area may to a significant extent be due to overuse of the application standards for nitrogen.

Scientists have in the past pointed to manure fraud as one of the possible explanations of disappointing results of the manure policy. For example, the 2016 Fertilisers Act Assessment indicated that indications existed that part of the calculated overutilisation in the southern sandy soil area may be due to manure fraud, i.e., the deliberate application of manure in excess of the statutory application standards (van der Sluis, 2017). Van der Sluis indicates that part of the calculated overutilisation could be explained by uncertainties about, for example, exact animal numbers in an area. But that leaves a range within that part of the calculated overutilisation for which no explanation exist that could be caused by fraud: for phosphate, the range of the unexplainable part of the calculated overutilisation is between 8% and 29%; for nitrogen, it is between 4% and 28%. At the time of publication of this analysis, van der Sluis could not link this data to data on fraud.

We did attempt to make this link in this study. It was found that, even after criminal investigations, it is often still unclear where illegal manure eventually ended up (illegally spread on own plot, illegally spread elsewhere, illegally processed, etc.). It does make it clear that fraud can lead to a paper utilisation rate that does not match reality; in fact, the NVWA and the police note that forgery of animal fertilisers transport certificates is a recurring issue in almost all criminal investigations into manure supply and disposal fraud. In principle, the CBS assumes that correct animal fertilisers transport certificates are used when calculating utilisation rates, but does apply some corrections to the composition of exported solid manure types and exported solid manure fractions (van Bruggen, et al., 2021). Thus,

due to fraud, the CBS receives incorrect data for calculating utilisation rates.

Fraud for instance takes place by disposing of manure on paper while it is, in fact, not transported (refer to section 3.5.2, Table 3.5), resulting in so-called 'fictitious transports'. When manure is spread illegally on the farmer's own plot, fraud involving 'fictitious transports' will result in manure application within the farmer's municipality being higher in reality than what was calculated. The CBS, basing itself on the animal fertilisers transport certificates, assumes that the manure leaves the area, while it in fact remains in the area. This means that illegal manure discovered during these criminal investigations is not included in the calculated overutilisation figures, this figure therefore actually being an underestimate.

Fraud also occurs by fictitiously transporting manure abroad, while it in reality stays within the Netherlands. If the manure is then illegally spread, this in principle also leads to an underestimate of the calculated utilisation in the area concerned. This becomes evident not only from the criminal investigations: a few years back it was found that around one in three Dutch manure transports to the German state of North Rhine-Westphalia were not in order[81].

In addition, fraud not only takes place with respect to the delivery locations (buyer and place of unloading and loading) stated on the transport certificates. The phosphate and nitrogen levels are also falsely listed on the certificates. Doing so is in the interest of both the manure producer (removing high levels of phosphate and nitrogen) and the manure buyer (procuring low levels of phosphate and nitrogen). This in principle leads to an underestimate of the calculated utilisation, either in the area where the fraudulent manure producer is active (less phosphate removed than suggested by the transport certificates) or in the area of the fraudulent manure buyer (more phosphate procured than suggested by the transport certificates).

The incentive to defraud will be highest in areas/regions with a manure surplus. Fraud allows intensive livestock farms with surplus manure to save on manure disposal and manure processing costs (and make the manure accounts accurate). Especially in areas where a manure surplus exists, the calculated overutilisation of nitrogen and phosphate is therefore likely to be an underestimate.

Ecological effects of manure processing fraud
Fraud is inter alia being conducted by dealing in waste materials that are not suitable and approved for use as co-digestion materials. This ultimately results in digestate that is used or traded as fertiliser while it does not meet the requirements. The use of this digestate on land can result in the release of environmentally harmful substances onto agricultural land (Fertilisers Act Experts Committee, 2015).

3.6.2 Government implications

Fraud undermines the system of protecting nature and water quality, as well as the authority of the government. Fraud creates fictitious manure flows on paper and physical manure flows, making control and registration of all manure flows impossible. Considering the official reports analysed in the context of this study, this has already resulted in at least 185 million kg of manure that is suspected to be not or incorrectly accounted for in the period between 2003 and 2019. As the monitoring system is being undermined, the government cannot properly monitor the effectiveness of its manure policy.

Fighting manure fraud also involves huge costs in terms of deployment of the NVWA(-IOD), the National Police, the RVO.nl, and the National Office for Serious Fraud, Environmental Crime and Asset Confiscation. As per a recently published article, it concerns tens of millions of euros each year.[82]

3.6.3 Impact on the economy

It was already noted in section 3.5 that the high cost of processing manure in conformity with the rules, combined with the low chance of being caught, provides a strong financial incentive to commit

81 Consulted on 29 May 2021, via https://www.pigbusiness.nl/artikel/142748-aan-1-3-nederlandse-mesttransporten-naar-duitsland-zit-een-luchtje

82 Consulted on 28 May 2021, via De stinkende achterkant van vleesfabriek Nederland - Follow the Money - Platform voor onderzoeksjournalistiek (ftm.nl)

fraud. The criminal investigations analysed for this study show that offenders made over EUR 36 million in (calculated) unlawful gains. Some EUR 22.5 million of this total relate to two major criminal cases. A EUR 200,000 settlement was reached in one of these cases.

As a result, manure fraud also results in unfair competition. Livestock farmers who invest in compulsory production rights and phosphate rights incur higher costs and may be able to keep fewer animals than those who exceed the rights and entitlements. This provides the offender not only with cost savings on rights and entitlements, but also higher yields, as it allows them to produce more meat, eggs, or milk. Illegality also has consequences in manure processing, as legal manure processors having to compete on price against illegal manure processors who may be able to offer their operations at favourable prices.

Finally, fraud occurs with respect to (applications for) subsidies or the systems for which subsidies have been obtained, such as co-digesters, resulting in improper use of public funds.

3.7 Expectations for the coming years

3.7.1 Attention to fraud is important for achieving environmental objectives

Due to concerns about climate change and biodiversity loss, a lot of social and political interest currently exists in achieving long-term environmental goals. This also calls for attention to fraud. Section 3.4 has already mentioned the structural approach to tackle nitrogen problems. Because of fraud, there is a risk that nitrogen deposition reductions may take place on paper or in digital systems, while pollution is not reduced in fact. Similar courses of action as already evident from criminal investigations may also contribute to a divide between a fictional paper reality and an actual physical reality in the future.

In the past, other sectors, too, have been creative in responding to environmental legislation, the undermining effects on environmental protection of which were recognised in hindsight. For example, the Dutch and European authorities had known for years that diesel engines performed better during a test drive than on the road (Weiss, 2011). This was not seen as fraud at that time. Moreover, the models predicting air quality were not adjusted to this fact, while stricter environmental requirements failed to materialise. This continued until a study by the International Council on Clean Transportation revealed that the cars were performing poorly in real life and that sham software had been installed[83]. The Volkswagen management was criminally prosecuted and 'dieselgate' was all in the newspapers. The criminal investigation has criminalised the practice of minimising emissions during test runs. Dieselgate contributed to political support for stricter environmental requirements for diesel cars.

To achieve its objectives, both in tackling the nitrogen crisis but also, for example, in the transition to sustainable agriculture, the government has announced investments and subsidies. The risk exists that companies will improperly use the environmental subsidy funds (also refer to section 3.5.1).

3.7.2 Innovations in enforcement

Finally, further efforts are expected to strengthen enforcement in the coming years. One example is real-time recording of VDM data. Real-time checks improve data quality and reduce fraud opportunities, as the transport details are known before the vehicle hits the road. Technologies like Near Infrared Spectroscopy and data science, too, are being relied on more heavily. A pilot with NIRS measurements on trucks will start from January 2022. A mobile test truck will be used to transfer, homogenise and physically sample manure from an already loaded (and NIRS-measured) load. Such samples are next analysed for comparison. This will be done both by way of random checks and as part of an MOT check. The NVWA intends to employ data science to select companies to be inspected on the basis of public data sources, (network) analyses, trends, and developments.

83 Consulted on 28 May 2021, via Real-world exhaust emissions from modern diesel cars | International Council on Clean Transportation (theicct.org)

While such technical innovations are expected to help improve regulatory compliance, they will not eliminate manure fraud. It is important to also consider the root causes of manure fraud and reduce the incentive for fraud. For if we do not, new ways will be found to illegally get rid of the manure surplus anyway.

3.8 Summary, conclusions, discussion and recommendations

Summary:

- This is the first time a nationwide survey has been carried out on criminal investigations by various investigative agencies into manure fraud. This analysis shows that the whole chain is susceptible to committing manure fraud. The high cost of processing manure in conformity with the rules, combined with the low chance of being caught, provides a strong financial incentive to commit fraud**.**
- Based on this national inventory of detected manure fraud, no estimate can be made of the actual extent of manure fraud in the Netherlands. First of all, criminal investigations are limited due to lack of capacity, the investigations being focused more on proving forgery than on mapping the amount of manure involved in the fraud. Secondly, we cannot know what we are not seeing (dark figure crime).
- By considering the detected extent of manure fraud in relation to the number of inspections and the size of manure production in the Netherlands, it becomes clear that further intensification of enforcement activities alone is insufficient to prevent manure fraud.
- The fraud that has been detected does, in some cases, concern very high amounts, showing that manure fraud undermines the system to protect nature and the environment (see summary in figures and section 3.5.2).
- In the case of 'fictitious manure transports', the CBS, basing itself on the animal fertilisers transport certificates, assumes that the manure leaves the area, while it in fact remains in the area. This means that illegal manure discovered during these criminal investigations is not included in the calculated overutilisation figures, these figures therefore actually being an underestimate.
- The incentive to commit fraud will be highest in areas with a manure surplus. Fraud allows intensive lifestock farms with surplus manure to save manure disposal costs. Especially in areas where a manure surplus exists, the calculated overutilisation of nitrogen and phosphate is therefore likely to be an underestimate.
- In cooperation with knowledge institutions, we tried to determine the ecological effects of manure fraud. Quantifying ecological impacts proved possible only for a specific type of fraud, to wit, the keeping of animals for which no production rights were obtained.
- At 5.8 mole/ha/year, the contribution made by a limited number of risk-controlled farms that exceeded production rights to nitrogen deposition appears to be highest in the Ulvenhoutse Bos. Comparable to the effect of the speed reduction, which results in this area in the largest deposition reduction nationwide (of 6 mole/ha/year). Only the additional ammonia emissions from the shed caused by illegally kept animals are considered in this connection.
- The results of the calculations on the ecological effects of manure fraud make it clear that, in order to protect nitrogen-sensitive nature, it is not only important to take a critical look at the licensing of new nitrogen-emitting activities, but also at whether emissions have been paid for (e.g. by way of the purchase/lease of production rights) and whether existing nitrogen-emitting activities comply with the licensing conditions.
- Of course, the fact that the ecological effects of manure supply and disposal fraud cannot be determined on the basis of the criminal investigations reviewed does not mean that these ecological effects do not occur or that these effects are less severe than the effects of illegally kept animals, which can be established and quantified.

Summary in figures:

- Figures on detected manure fraud:
- On the basis of criminal investigations into production rights violations resulting in a court decision or settlement by the public prosecutor, the numbers of poultry and pig units were each year exceeded by between 80,000 and 1.2 million poultry units (at 5 - 57 farms) and between 488 and 6,590 pig units (at 2 - 24 farms). The exceedances observed depend on the number of inspections and the data made available for this analysis each year. It was calculated that a total of over EUR 7.1 million of unlawful gains had been made in these cases.
- Some 3,000 heads of cattle in excess of the limits imposed by the Temporary Phosphate Reduction Plan 2017 were found to be kept at 125 farms.
- On the basis of the criminal investigations into manure supply and disposal fraud that have resulted in court judgments, it appears that at least over 1,235 tonnes of manure had not been transported or had been transported to another delivery location (instead of being exported abroad).
- On the basis of the official reports submitted to the National Office for Serious Fraud, Environmental Crime and Asset Confiscation but not yet assessed in full by the courts, the amount of manure that is suspected to be not or incorrectly accounted for from 2003 through 2019 is at least 185 million kg.
- The ecological effects could only be quantified for exceeding production rights:
- The average effect of the cumulative exceedance of production rights by 57 companies exceeds 1 mole/ha/year for 21 nitrogen-sensitive Natura 2000 areas. The ecological effects of production rights being exceeded appear to be highest in the Ulvenhoutse Bos Natura 2000 area (5.8 mole/ha/year). Spots 2 through 5 are taken up by Sarsven en De Banen (5.7 mole/ha/year), the Groote Peel (3.6 mole/ha/year), Kempenland West (3.0 mole/ha/year) and the Veluwe (2.3 mole/ha/year). These values depend not only on the degree to which production rights have been exceeded, but also on the number of inspections and the annual data available for this analysis.
- With respect to one specific farm, the highest calculated 2016 deposition due to emissions from the animals kept illegally under the Fertilisers Act amounted to 22.22 mole/ha on the Veluwe Natura 2000 area.

3.8.1 Looking from the perspective of the injured party - understanding ecological impacts

This study examined the effects of manure fraud on the injured party of environmental crime: nature and the environment. In order to do so, we attempted to capture the ecological effects of manure fraud. This appears to be possible only in specific situations. Yet this approach is valuable nevertheless: It emphasises the purpose of manure regulations, i.e., to protect nature and the environment.

Recommendation

Where possible, extend this approach of considering the matter from the perspective of the injured party to other forms of environmental crime and other sectors. And where possible, determine the ecological effects of environmental crimes and address this in publications about a criminal case. Entrepreneurs may be motivated by these insights or through external social pressure to reduce the harmful effects of their business.

It is recommended that a national record be kept of the inspection results of the Environmental Agencies and other agencies to make it possible to deduce the period an organisation exceeded the ammonia emission limits. It is also recommended that these ammonia exceedances be in the future dealt with under criminal law where possible. Additionally, cumulation could be used to determine the actual impact assessment and outcome.

3.8.2 Ecological effects of animals kept illegally under the Fertilisers Act

It appears to be possible to indicate the contribution of animals kept illegally under the Fertilisers Act to nitrogen deposition in Natura 2000 areas. Only the additional ammonia emissions from the shed caused by these illegally kept animals are considered in this connection. The effects of additional ammonia emissions after the manure has left the shed are not included in the calculation. The contribution of illegally kept animals at a limited number of

inspected farms to nitrogen deposition on the Ulvenhoutse Bos woods is similar to the effect of the national driving speed limit in that area.

Recommendation
The results of the calculations on the ecological effects of manure fraud make it clear that, in order to protect nitrogen-sensitive nature, it is not only important to take a critical look at the licensing of new nitrogen-emitting activities, but also at whether emissions have been paid for (e.g. by way of the purchase/lease of production rights) and whether existing nitrogen-emitting activities comply with the licensing conditions.
To gain insight into the compliance level of existing nitrogen-emitting activities (such as compliance with animal production rights systems) and to check the quality of risk analyses, it is important to also carry out sufficient a-selective inspection and so-called compliance monitors. With respect to pig production rights, a compliance review will be carried out in 2020-2021.

3.8.3 Manure supply and disposal fraud

The 2016 Fertilisers Act Assessment indicated that indications existed that part of the calculated overutilisation in the southern sandy soil area may be due to manure fraud, i.e., the deliberate application of manure in excess of the statutory application standards. At the time of publication of this analysis, the researchers could not link this data to data on fraud. We did attempt to make this link in this study. It was found that, even after criminal investigations, it is often still unclear where illegal manure eventually ended up. However, the NVWA and the Police find that the false preparation of animal fertilisers transport certificates comes up in almost all criminal investigations into manure supply and disposal fraud.

Due to fraud, the CBS receives incorrect data for calculating utilisation rates. For example, in the case of 'fictitious manure transports', CBS assumes, based on the animal fertilisers transport certificates, that the manure leaves the area, while in reality the manure remains in the area. This means that illegal manure discovered during these criminal investigations is not included in the calculated overutilisation figures, these figures therefore actually being an underestimate. The incentive to defraud will be highest in areas/regions with a manure surplus. Fraud allows intensive farms with surplus manure to save manure disposal costs. Especially in areas where a manure surplus exists, the calculated overutilisation of nitrogen and phosphate is therefore likely to be an underestimate.

Recommendation
It is recommended that future criminal investigations where possible focus not only on forgery, but also track the location where the manure that was unaccounted for ends up. This will also help identify the ecological damage caused by manure fraud.
It is also recommended that, where possible, the calculation of overutilisation should take account of the reality that there may be differences between 'actual' and 'paper' manure flows. Forgery of animal fertilisers transport certificates is a modus operandi frequently encountered in criminal investigations. Try to combat manure fraud not only by stepping up enforcement, but also pay attention to the underlying causes of manure fraud.

Literature

BIJ12. (2021). *Handreiking Voortoets Stikstof.*

Bruggen van, C., & Gosseling, M. (2020). *Dierlijke mest en mineralen 2019.* The Hague: Statistics Netherlands.

Bruggen van, C., Bannink, A., Groenestein, C., Huijsmans, J., Lagerwerf, L., Luesink, H., . . . Zee van der, T. (2021). *Emissies naar lucht uit de landbouw berekend met NEMA voor 1990-2019.* Wageningen: Wageningen University & Research.

Fertilisers Act Experts Committee. (2015). *Nut en risico's van covergisting. Syntheserapport.* WUR.

Gies, E. K. (2019). *Inzichten stikstofdepositie op de natuur.* Wageningen University & Research.

Grinsven van, H., & Bleeker, A. (2017). *Evaluatie Meststoffenwet 2016: Syntheserapport.* The Hague: PBL.

Lissenberg, E. (2001). Het meten van criminaliteit. In E. Lissenberg, S. Ruller van, & R. Swaaningen van, *Tegen de regels IV. Een inleiding in de criminologie.* (pp. 65-66).

Ministry of LNV. (2018). *Versterkte Handhavingsstrategie Mest.* Central Government.

Netherlands Food and Consumer Product Safety Authority. (2019). *Onafhankelijke monstername - Inspectieresultaten mest 2018.*

Netherlands Food and Consumer Product Safety Authority. (2020). *Dierrechten Inspectieresultaten 2019.* NVWA.

NVWA. (2019). *Onafhankelijke monstername. Inspectieresultaten mest 2018.* Netherlands Food and Consumer Product Safety Authority.

NVWA. (2020). *Dierrechten Inspectieresultaten 2019.* Netherlands Food and Consumer Product Safety Authority.

Paul, H. (2021). *Stikstofruimte voor de toekomst. Langetermijnverkenning stikstofproblematiek: doel, integratie en regie.* The Hague: ABDTOPConsult.

Oost-Brabant District Court. (2019, 07 25). *ECLI:NL:RBOBR:2019:4400.* Retrieved from Rechtspraak.nl: https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBOBR:2019:4400

Sluis van der, S. (2017). *Overbenutting van de plaatsingsruimte van dierlijke mest in het zuidelijk veehouderijgebied.* Netherlands Environmental Assessment Agency.

Weiss, M. B. (2011). *Analyzing on-road emissions of light-duty vehicles with Portable Emission Measurement Systems (PEMS).* Joint Research Centre – Institute for Environment and Sustainability. Luxembourg: European Commission.

Willems, J., & Grinsven, H. v. (2011). *Afschaffen van productierechten in de veehouderij in 2015: gevolgen voor veehouderij en leefomgeving.* The Hague: Netherlands Environmental Assessment Agency.

4

4 A gold mine for criminals: the trade in illegal plant protection products

NVWA-IOD

Plant protection products[84] protect plants or plant products from insects, fungi and other harmful organisms. They can also affect growth, conserve vegetable products, destroy unwanted plants or parts thereof and prevent or limit unwanted plant growth.[85] Plant protection products are associated with risks to humans (Health Council, 2020), animals, and the environment (Netherlands Environmental Assessment Agency, 2019). As a result, only agents that have been determined to be safe to use may be used.[86] Illegal plant protection products have not gone through this safety determination process and may therefore pose a risk to human and animal health and cause environmental damage. Trafficking in illicit substances is lucrative for criminals: both the odds of being caught and the punishments are low and profit margins can exceed 500% (de Rijck & van den Bogart, 2020).

4.1 Description of context and scope

4.1.1 Context

Only authorised plant protection products may be used in the Netherlands. Such plant protection products have been thoroughly assessed by the Board for the Authorisation of Plant Protection Products and Biocides (Ctgb). The Ctgb assesses the effect of the products and the risks they pose to humans, animals, and the environment. Once the product is authorised, it is given an authorisation number and provided with legal instructions for use, which also state the crops the pesticide is allowed to be used on.

Extent of legal use

Some 380 million kilograms (380,000 tonnes) of authorised plant protection products are sold in the EU every year.[87] This is a market worth over EUR 10 billion.[88] Almost 2.5% of sales take place in the Netherlands: in 2019, 9.3 million kilograms (9,300 tonnes) of plant protection product were sold here.[89] The most resource-intensive crop in the Netherlands is the lily: 125 kilograms of chemical pesticides were used per hectare of lilies in 2016, 93 kilograms of which were mineral oil. For the cultivation of apples, pears, greenhouse flowers, tulips, other flower bulbs,

84 The term 'pesticides' is also used in relation to plant protection products. 'Pesticides' is the collective name for plant protection products and biocides. Both these products are preparations designed to destroy or repel harmful organisms. Biocides are inter alia used to control pests and bacteria (disinfectants). Biocides are not discussed in this chapter.

85 Consulted on 2 April 2021, via https://www.ctgb.nl/onderwerpen/gewasbeschermingsmiddel

86 Consulted on 27 May 2021, via https://www.ctgb.nl/

87 Consulted on 5 March 2021: https://www.cbs.nl/nl-nl/nieuws/2020/13/verkoop-gewasbeschermingsmiddelen-afgenomen-in-2018

88 Consulted on 26 March 2021, via Article: Global crop protection market down 1% in 2019 | IHS Markit

89 Consulted on 8 April 2021, via https://www.cbs.nl/nl-nl/nieuws/2021/13/iets-minder-gewasbeschermingsmiddelen-verkocht-in-2019

and seed potatoes, between 20 kilograms and 35 kilograms of active ingredient per hectare were used. Usage volumes are lower for other crops.[90]

Use has been declining for year
Sales of authorised plant protection products in the Netherlands have halved since 1990 (Netherlands Environmental Assessment Agency, 2020). According to the PBL, this is in part due to the introduction of technical solutions, such as low-emission nozzles. Since 2010, the decline in sales of chemical plant protection products has stagnated (Netherlands Environmental Assessment Agency, 2020). Meanwhile, various agreements have been made at the global, European and national levels to further reduce use (see the *section on International and national agreements on reducing use*).

4.1.2 Illegal products

If a plant protection product that does not have a valid Dutch authorisation number is used in the Netherlands, it is an illegal product. There are broadly three categories of illegal plant protection products:

1. Banned plant protection products: these are products that used to be authorised, but are no longer. Large batches of banned products are sometimes still in circulation.
2. Non-authorised plant protection products: products that have never been submitted for assessment in the Netherlands, but that are, for example, authorised in other EU Member States or are not authorised in the EU but are authorised on another continent.
3. Counterfeit products.

A fourth form of illegality has nothing to do with illegal products, but involves the illegal use of legal (authorised) substances. For example, when a grower uses an authorised product on a crop it is not intended to be used for (i.e., for which the authorisation was not issued). One example is the so-called 'minor crops problem'. There are times when crop protection manufacturers do not want to invest in a costly authorisation application for a particular application in a particular minor crop because the return on investment is too low. In practice, this means that a product can be used legally on a major crop but not on a minor crop, because no authorisation for such use was applied for. The focus of this chapter is on illegal products and not the illegal use of legal products.

4.1.3 Demand for illegal products

Some growers use illegal products because they feel the available legal products do not always suffice or because legal products are not (or no longer) available to get rid of certain pests.[91]
One sector using many illegal products is that of greenhouse ornamental plant cultivation. In 2019, compliance with the rules in this sector was down to 63%. The growers inspected used substances that are not authorised in the Netherlands, and sometimes not even in the EU. In addition, products not authorised for greenhouse ornamental plant cultivation are used, while products are used contrary to the instructions for use (NVWA, 2020).

Another motive for using illegal products is money. Illegal products can in some cases be offered more cheaply, as the producer has not invested in years of research and development. Counterfeit products in particular can be provided more cheaply.

NVWA seizes large quantity of illegal plant protection products
On Friday, 16 April 2021, inspectors and investigators from the Dutch Food and Consumer Product Safety Authority (NVWA) seized over 2,000 kilos of illegal plant protection products. They found the products during a search of four chrysanthemum and fruit growing sites in Gelderland. The owner of these sites has been arrested on suspicion of possessing and using unauthorised - and therefore illegal - plant protection products. The criminal investigation is headed by the National Office for Serious Fraud, Environmental Crime and Asset Confiscation.

During a regular inspection, the NVWA discovered the banned substance chlorpyrifos on leaves of chrysanthemums produced by this grower. A small number of packages containing

90 Consulted on 20 April 2021, via https://www.cbs.nl/nl-nl/nieuws/2018/30/landbouw-gebruikt-5-7-miljoen-kg-chemische-middelen
91 Communication NVWA, Direction & Expertise department

illegal plant protection products were also found. This spurred the NVWA into launching a criminal investigation. During the searches on Friday, 16 April, inspectors and investigators found several hundred packages containing a total of 43 other illegal plant protection products in addition to agents containing chlorpyrifos. All these products have been seized.[92]

4.1.4 Size of the illegal market

Europol in 2012 estimated that 10% of the global plant protection products market is made up of illegal products.[93] In 2015, the European Commission released a report on the trade in illegal plant protection products in the EU. According to this report, the market share of illicit products in Europe is 10% (European Commission, 2015). The most recent estimate was published by the European Intellectual Property Organisation (EUIPO). According to a 2017 report, producers lose EUR 1.3 billion annually due to illegal sales of counterfeit plant protection products in the EU. The market share of illicit products in the EU is 13.8% (EUIPO, 2017). CropLife Europe, the advocacy group for the plant protection products industry, concludes that trade in counterfeit and illegal plant protection products in Europe is growing.[94] Croplife states that the sale of counterfeit plant protection products has silently become one of the most lucrative and poorly understood criminal activities.[95] Europe is a preferred market for illegal pesticide trade (UNEP, 2020).

Within Europe, the Netherlands is an important country for the import of goods, including (illegal) plant protection products. The prevailing hypothesis is that the Netherlands mainly serves as a transit country of the (illegal) products. The trade and use of plant protection products is so well regulated in the Netherlands - compared to other countries - that the use of illegal products is believed to be a lot less prevalent than in other countries.[96] There are no figures to support this hypothesis: the size of the illegal market in the Netherlands is unknown. According to the United Nations Environment Programme (UNEP), other markets are easier for illegal traders to capture, for example in countries with emerging and transition economies. This is largely due to the widespread lack of knowledge about the risks of using illegal products and the low standard of living in these countries (UNEP, 2020). Indirect indications, such as residues found in surface water, do not allow for any statements to be made about the extent of illegal product use in the Netherlands, either. This is because the focus of surface water measurements is on detecting excess use of permitted substances.[97]

4.2 The chain

This section paints a picture of the chain of the legal trade in authorised plant protection products.

4.2.1 Producers

The plant protection product chain is characterised by its international nature. A small number of research and development companies producing large quantities of plant protection products, such as Bayer, Syngenta and Dupont, are active on the global stage. A relatively small number of companies hold a large global market share. This is due to several factors, including the high research costs, the relatively low success rate of developing a new product, and the long lead time involved in the research, development, production, and authorisation of plant protection products. The vast majority of plant protection product production takes place outside the Netherlands. Factories are for example located in Israel, China, the United States, Switzerland, and Germany. Only a few companies producing plant protection products are

92 Consulted on 22 April 2021, via https://www.nvwa.nl/nieuws-en-media/nieuws/2021/04/21/nvwa-neemt-grote-hoeveelheid-illegale-gewasbeschermingsmiddelen-in-beslag
93 Consulted on 26 March 2021, via Tackling the Illegal Pesticide Threat | Europol (europa.eu)
94 Consulted on 26 March 2021, via Illegal Pesticides - CropLife Europe
95 Consulted on 26 March 2021, via Counterfeit crop protection products golden trade for criminals | Akkerwijzer.nl - News and knowledge for arable farmers
96 Communication NVWA, Direction & Expertise department
97 Communication Rijkswaterstaat and RIVM

located in the Netherlands. It is assumed that a good proportion of the illegal products (counterfeits) were made in countries such as China and India.[98]

4.2.2 Import

The Netherlands is known as an important import and transit country of (raw materials for) plant protection products, with most of the flows passing through the Port of Rotterdam. The NVWA is aware of 40 Dutch companies engaged in the import of plant protection products (NVWA, 2020-2). The amount of plant protection products imported into the Netherlands for use in the Dutch and European markets has been decreasing for several years.[99]

4.2.3 Trade and distribution

Once in the EU, the imported products are stored and, if necessary, repackaged. Transport within the EU is largely by trucks. Once on the European market, it is more difficult to inspect shipments . More than 1,000 authorisations have been granted by the Ctgb in the Netherlands.[100] This means that the party applying for authorisation, the approval holder, is allowed to market the product. There are 150 approval holders operating in the Netherlands (NVWA, 2020-2). 206 traders known to the NVWA are responsible for trade within in the Netherlands (NVWA, 2020-2). They sell the products on the high street and via the internet.

4.2.4 Users

Over 30,000 professional (corporate) registered companies in the agricultural sector in the Netherlands use the products. An overview is provided in the below table (NVWA, 2020-2).

Table 4.1 *Overview of registered users*

Sector	Number of companies
Crop farming	13,270
Outdoor vegetable cultivation	8,300
Uncovered tree and perennial crop cultivation	2,750
Outdoor uncovered fruit cultivation	2,680
Greenhouse ornamental plant cultivation	2,330
Bulbs	1,560
Greenhouse vegetable cultivation	1,220
Uncovered floriculture	1,080

Most professional users use crop consultants (agricultural advisers). They inter alia provide advice on how to improve crop yields. This includes the use of plant protection products. There are two types of crop protection consultants rendering advice on crop protection aspects: independent consultants and representatives of the plant protection trade.[101]

4.3 Relevant legislation

The authorisation and use of plant protection products is subject to EU rules. These rules have been translated into national legislation. The most relevant legislation is discussed below. We will also address the plant protection products authorisation rules and processes.[102]

4.3.1 European Regulation 1107/2009

In 2011, European Regulation (EC) 1107/2009 *concerning the placing of plant protection products on the market* came into force. **'***The purpose of this Regulation is to ensure a high level of protection of both human and animal health and the environment and at the same time to safeguard the competitiveness of Community*[103] *agriculture.*

98 NVWA-IOD communication
99 NVWA-IOD communication
100 Consulted on 5 March 2021, via https://toelatingen.ctgb.nl/nl/authorisations
101 Communication NVWA, Direction & Expertise department
102 Raw materials for plant protection products in their pure form are covered by the so-called REACH legislation. REACH is a European regulation on the production of and trade in chemicals. We will not discuss it here.
103 This includes all matters with respect to which the EU Member States have transferred powers to the European Union. If an issue falls under Community law, the European Union has the power to decide on the matter, without the individual Member States having the power to prevent such decisions.

Particular attention should be paid to the protection of vulnerable groups of the population, including pregnant women, infants and children. The precautionary principle should be applied and this Regulation should ensure that industry demonstrates that substances or products produced or placed on the market do not have any harmful effect on human or animal health or any unacceptable effects on the environment.'[104]

4.3.2 European Regulation 2009/128

This European regulation contains guidelines to achieve sustainable use of pesticides by application of a precautionary and prevention-based approach.[105]

4.3.3 Plant Protection Products and Biocides Act

The Plant Protection Products and Biocides Act (Wgb) implements European Regulations 1107/2009 and 2009/128. The Wgb regulates the authorisation, marketing, and use of plant protection products and biocides.[106]

4.3.4 Plant Protection Products and Biocides Decree

The Plant Protection Products and Biocides Decree (Bgb) contains rules on the duties of the Ctgb, the authorisation of plant protection products and biocides, trade, use, and enforcement.

4.3.5 Plant Protection Products and Biocides Regulations

The Plant Protection Products and Biocides Regulation (Rgb) lay down more detailed rules on, among other things, special forms of authorisation, the plant protection products register, proofs of competence, and the use of plant protection products.

4.3.6 Authorisation

In the Netherlands, growers are only allowed to use plant protection products authorised by the Ctgb. Several forms of authorisation exist: parent authorisation, derived authorisation, parallel trade authorisation, and mutual recognition. These are briefly explained in the below.

Parent authorisation

Parent authorisation is necessary when a company wants to market a new plant protection product. The active substance must first be approved at the European level by the European Commission. Only then can an application for the authorisation of a plant protection product based on that active substance be submitted to a Member State. This constitutes so-called 'graduated authorisation'. In the Netherlands, the Ctgb assesses new plant protection products for their effects and risks.[107] The assessment may take several months or longer and costs tens of thousands of euros.[108] The Ctgb will then also decide on the authorisation.

Derived authorisation

In the case of derived authorisation, an already authorised plant protection product is marketed under a different name.[109] The condition for authorisation being granted is that the product is identical to the one that was granted parent authorisation.[110] Obtaining a derived authorisation costs EUR 930.[111]

Parallel trade license

A parallel trade license is a license to import a product from an EU Member State and market it in the Netherlands. This is only possible if a product with an identical composition to the one to be imported is already on the market in the Netherlands. For this product will have been assessed by the Ctgb already.[112] This application, too, costs EUR 930.[113]

104 Consulted on 8 March 2021, via https://eur-lex.europa.eu/legal-content/NL/TXT/PDF/?uri=CELEX:32009R1107&from=BG
105 Consulted on 25 May 2021, via https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:309:0071:0086:NL:PDF
106 Consulted on 8 March 2021, via https://www.nvwa.nl/onderwerpen/gewasbescherming/wat-regelt-de-wet-gewasbeschermingsmiddelen-en-biociden
107 Consulted 13th February, 2023 via https://www.ctgb.nl/gewasbeschermingsmiddelen/aanvraagproces/beoordeling-fase
108 Consulted on 8 March 2021, via https://zoek.officielebekendmakingen.nl/stcrt-2020-63801.html#d17e1319
109 Consulted on 12 March 2021, via https://www.ctgb.nl/gewasbeschermingsmiddelen/aanvraagtypen-middelen/afgeleide-vergunning
110 Ctgb (2018). Administrative regulations on the authorisation procedure for plant protection products and biocides. Ctgb 2018.
111 Consulted on 8 March 2021, via https://zoek.officielebekendmakingen.nl/stcrt-2020-63801.html#d17e1319
112 Consulted on 23 March 2021 https://www.ctgb.nl/gewasbeschermingsmiddelen/aanvraagtypen-middelen/parallelle-toelating
113 Consulted on 23 March 2021, via https://zoek.officielebekendmakingen.nl/stcrt-2020-63801.html#d17e1319

Mutual recognitio

Finally, within the EU, it is also possible to admit products authorised by other Member States into the Netherlands and vice versa by way of mutual recognition. This option allows applicants to obtain an authorisation for their product in an EU Member State in a relatively short period of time.[114] The application fee for mutual recognition is EUR 5,000 and the assessment fee is EUR 12,000.[115]

4.4 Agencies involved

Several agencies are involved in the supervision, criminal prosecution, and certification of the trade in and use of plant protection products. This section also discusses some bottlenecks related to enforcement (detection and supervision).

4.4.1 Supervision

The NVWA ensures that plant protection products are used in accordance with the laws and regulations. The NVWA also monitors the composition of plant protection products, whether only plant protection products authorised in the Netherlands are marketed, whether all plant protection products sold bear the correct labels, etc.[116] The NVWA is responsible for supervising importers, approval holders, traders, and users in the agricultural sector. The NVWA also monitors import flows at the Port of Rotterdam and at Schiphol Airport. The NVWA and Customs signed an agreement containing working arrangements. For example, shipments (containers and postal parcels) are selected on a risk-oriented basis in the Customs systems and then inspected by the NVWA.[117] In other countries, chain supervision is much more fragmented. In the Netherlands, one organisation - which features its own investigation service - is responsible for monitoring the chain.

NVWA's supervision is knowledge-driven and risk-oriented. This means that not all companies are inspected with the same frequency. Companies are classified into risk categories on the basis of various indicators. The NVWA carries out more intensive supervision on high-risk companies. The classification is based on indicators such as past compliance with the rules, specific reports, and specific issues in a sector. Risk classification is a dynamic process. In 2019, the NVWA classified the greenhouse ornamental plant cultivation, trade, import and bulb cultivation sectors as carrying the highest risk levels (NVWA, 2020-2).

In addition, Rijkswaterstaat, the Water Authorities and the Environmental Agencies or Regional Implementing Agencies (RUD) are also involved. The Environmental Agencies or the Regional Implementing Agencies check whether plant protection products are stored properly in the designated storage area. In so doing, they focus on the facility itself, and not on the plant protection products present. Rijkswaterstaat and the Water Authorities inter alia monitor the amount of pesticide residues in surface water. Rijkswaterstaat is responsible for the main waterways, such as the major rivers and IJsselmeer, while the Water Authorities are responsible for regional waters and the provincial authorities for groundwater quality. The Inspectorate SZW (labour inspectorate) monitors whether plant protection products are handled safely, checking, for example, whether the correct personal protective equipment is used.

4.4.2 National Intelligence Agenda

The current National Intelligence Agenda (NIA), prepared by the Strategic Environmental Chamber (SMK), lists plant protection product fraud as one of its high-priority topics. The operational management of the NIA topics takes place in the National Environmental Chamber, which inter alia is responsible for deciding on the cases to be subjected to criminal investigations. Information is exchanged during the so-called TULP consultations, conducted every two months between the National Police, the National Office for Serious Fraud, Environmental Crime and Asset Confiscation, the NVWA's plant protection products team, and the NVWA-IOD.

114 Consulted on 2 April 2021, via https://www.ctgb.nl/gewasbeschermingsmiddelen/aanvraagtypen-middelen/wederzijdse-erkenning
115 Consulted on 2 April 2021, via https://zoek.officielebekendmakingen.nl/stcrt-2020-63801.html#d17e1885
116 Consulted on 2 April 2021, via https://www.nvwa.nl/onderwerpen/gewasbescherming/rol-nvwa-en-andere-partijen
117 Consulted on 23 March 2021, via https://download.belastingdienst.nl/douane/docs/convenant_douane_lnv_bijlage_13_gewasbeschermingsmiddelen_d08031b13fd.pdf

4.4.3 International cooperation

Cooperation in tackling plant protection product fraud also takes place on the international stage. Europol has coordinated the annual *Silver Axe* operation since 2015, for instance. This coordinated action focuses on tackling trade in illegal plant protection products. Police and inspection agencies, the private sector[118], and government authorities at various levels all participate in *Silver Axe*. Seven countries, including the Netherlands, participated in the first edition. This number had grown to 32, including the Netherlands, in the latest edition in early 2020. Over the course of this latest edition, 1,346 tonnes of illegal plant protection products were removed from the market. Since the launch of *Silver Axe*, a total of 2,568 tonnes of illegal plant protection products have been seized.[119]

To further promote cooperation between investigation services of the European Member States, Europol also launched the EMPACT programme. EMPACT stands for *European Multidisciplinary Platform against Criminal Threats*. The aim of EMPACT is for investigative agencies of European Member States to jointly combat cross-border forms of crime. In the context of the EMPACT environmental crime programme, in early 2019, 15 so-called operational actions were selected to be turned into international projects. Together with the National Office for Serious Fraud, Environmental Crime and Asset Confiscation, the NVWA-IOD served as coordinator of the EMPACT project on the topic of pesticides until early 2020. During this period, the NVWA-IOD and the National Office for Serious Fraud, Environmental Crime and Asset Confiscation inter alia issued questionnaires to the 21 Member States concerned to arrive at a common picture of the problem (refer to the *Bottlenecks* section).

4.4.4 Licences and certification

In the Netherlands, several bodies are responsible for the granting of licences and for certification. Some of them are discussed in this section. The role of the Ctgb is not considered, as it has been discussed earlier.

All companies wishing to deal in professional plant protection products must hold a valid certificate from the Certification of Plant Protection Products Distribution (CDG) Foundation and they must be included in the register kept by the CDG Foundation. Since 2010, all these companies must comply with the universally binding declaration (UBD) of the CDG certification scheme.[120] It is illegal to trade in plant protection products without complying with the UBD.[121] The CDG Foundation was set up on behalf of the Dutch government. The NVWA occasionally receives reports from the CDG about non-certified companies that do trade in professional plant protection products.

As from 1 July 1996, anyone working with professional plant protection products requires a Certificate of Professional Competence to sell, store, or use professional plant protection products. This certificate serves as proof that the holder possesses the proper knowledge and skills.[122] This obligation is legally enshrined in the Plant Protection Products and Biocides Decree. Ever since 1 January 2019, professional crop consultants who do not sell plant protection products themselves have also been required to hold the Certificate of Professional Competence.[123] The certificate is issued by Bureau Erkenningen upon completion of a training course and is valid for five years.[124] The Inspectorate of Education supervises Bureau Erkenningen. The Inspectorate SZW and the NVWA check whether users hold a Certificate of Professional Competence.[125]

118 European Crop Protection Association (ECPA), the European Crop Care Association (ECCA), and Croplife International
119 Consulted on 12 March 2021, via https://www.europol.europa.eu/newsroom/news/record-number-of-1-346-tonnes-of-illegal-pesticides-taken-market-in-2020-global-operation-silver-axe
120 Consulted on 12 March 2021, via https://www.stichtingcdg.nl/Meest-gestelde-vragen#Wanneer_moet_ik_een_CDG_certificaat_hebb
121 Refer to Section 111 of the Plant Protection Products and Biocides Act
122 Consulted on 12 March: https://www.nvwa.nl/onderwerpen/gewasbescherming/gebruiksvoorschriften-gewasbeschermingsmiddelen
123 Consulted 13th February, 2023 via https://www.nvwa.nl/onderwerpen/gewasbescherming/gebruiksvoorschriften-gewasbeschermingsmiddelen#:~:text=Sinds%201%20juli%201996%20heeft,over%20kennis%20en%20vaardigheden%20beschikt
124 Consulted 13th February, 2023 via https://www.nvwa.nl/onderwerpen/gewasbescherming/gebruiksvoorschriften-gewasbeschermingsmiddelen#:~:text=Sinds%201%20juli%201996%20heeft,over%20kennis%20en%20vaardigheden%20beschikt
125 Consulted on 2 April 2021, via https://www.inspectieszw.nl/publicaties/rapporten/2015/06/15/veilig-en-gezond-werken-in-de-glastuinbouw

4.4.5 Bottlenecks

The second topic of this section is that of the bottlenecks in tackling illegal plant protection products.

Capacity and priority

Deloitte was commissioned by the Ministry of LNV to examine whether the NVWA's capacity is sufficient for its current and future duties. The report inter alia concludes that insufficient capacity is available for the adequate monitoring of the trade and imports of plant protection products, for the monitoring of the sales of plant protection products to individuals and businesses outside the agricultural sector, and for enforcing EU water quality standards. Moreover, participation in international working groups is insufficient (Deloitte, 2020). The number of inspections relating to plant protection products decreased between 2016 and 2019 ((NVWA, 2020-2) and (NVWA, 2017). In 2019, the 33,586 registered companies trading in or using plant protection products were subjected to 894 inspections. Of this total, 505 inspections related to the 33,196 primary companies (1.5%). Approval holders, importers, and distributors were, in 2019, subjected to proportionally more inspections: 194 inspections of nearly four hundred companies. A company can have been inspected more than once. The fact that fewer inspections were carried out compared to 2016 need not be a problem, as the NVWA takes a risk-based approach. However, because only a small proportion of companies are visited, it is possible that too little information is obtained to properly update the selections required under this risk-based approach.

In order to launch criminal investigations, signs of fraud must have been received. In recent years, however, fewer fraud signs have been recorded by the NVWA-IOD than was the case before. There is no single direct cause for this. One explanation could be that compliance has improved ('good agricultural practices') and that fewer illegal products are being used. However, too little insight into the illegal market currently exists to make any statements to this effect. Another possible explanation has to do with the capacity available at the NVWA. Deloitte reported that the NVWA-IOD lacks sufficient capacity to collect information in all 23 domains (of which plant protection products is one) the NVWA monitors, that there is insufficient capacity to collect information in a sufficiently proactive manner, and that fraud is not detected to a sufficient degree, creating blind spots and a lack of attention to certain topics. Available capacity is insufficient to carry out more than one very large and multi-year study, causing major players to either escape unpunished or remain out of view (Deloitte, 2020). Because of capacity issues, the Criminal Intelligence Team and the Intelligence Team of the NVWA are forced to make choices about which topics to actively gather information about. Incidentally, in May 2021, a motion was passed in the House of Representatives in which the government is, among other things, requested to collaborate with the NVWA and other relevant parties and to draw up an action plan to curb the criminal trade in illegal plant protection products, as well as to inform the House of Representatives of the progress made in the autumn of 2021 (House of Representatives, 2021).

Emphasis on the short run

The available picture of the illegal market in the Netherlands is partly based on pre-2016 criminal investigations. At that point in time, the National Police and the NVWA-IOD still conducted some major criminal investigations into the illegal trade in plant protection products. Investigations of this kind provide insight into illegal flows and the illegal market. The National Police has not conducted criminal investigations into plant protection products since 2016. The NVWA did conduct a number of criminal investigations in the 2016-2020 period. These were mainly aimed at removing batches of illegal products from the market or at punishing the user. They are so-called 'short-run' cases. In principle, these cases do not provide insights into the illegal market and criminal networks. The NVWA seized a total of 250 tonnes of illegal plant protection products and biocides in the 2015-2019 period. 150 tonnes of this total were seized during import inspections conducted at the Port of Rotterdam. Most of the illicit products found in the port were destined for transit to other parts of Europe. 100 tonnes were seized from traders and users; 64 tonnes of this total were seized in one investigation.

By far the majority of the NVWA's criminal investigations into plant protection products are conducted by the Fraud Expertise Hub (FEK). These involve relatively simple fraud cases, conducted by special investigating officers from the inspection division, with support from NVWA-IOD investigators.

These investigations are often started up in response to a report. Their emphasis is mainly on the short-run effects.

The Environmental Chamber discussed one proposal for a larger investigation into illegal trade since 2016. This investigation was eventually conducted by the NVWA-IOD. No illegal trade was proven in the context of this investigation. As hardly any investigations are conducted into the networks responsible for illegal trade and actions are being taken mainly in response to reports, the insights into the illicit market is outdated. If no reports about the use of an illegal product are received, the chances of the NVWA taking action are low. The limited insight into the illegal market is not a purely Dutch phenomenon. The EMPACT programme shows that the Member States participating in the programme have hardly conducted any relevant criminal investigations into this problem over the past five years. Many countries lack the capacity, expertise, and resources to effectively tackle the trade in and use of illegal products.[126]

Dual penalty system 'insufficiently elaborated'
Rob de Rijck, the national coordinating public prosecutor for environmental cases, in 2020 published an article entitled *Het strafrecht en illegale gewasbeschermingsmiddelen in 2020 (Criminal law and illegal plant protection products in 2020)*. Among other things, the article describes criminal enforcement in the area of plant protection products. The Netherlands has had a dual sanction system - under both administrative and criminal law - in place for sanctioning violations of the Plant Protection Products and Biocides Act since 2007. According to de Rijck, this dual system has not yet been elaborated in case law: it is not clear from case law when a case is to be sanctioned under criminal, rather than administrative, law. That is, it is unclear when the Public Prosecution Service can prosecute (de Rijck & van den Bogart, 2020). There have been instances in recent years when the prosecution has been declared inadmissible by the court because the matter should have been dealt with by an administrative settlement (de Rijck & van den Bogart, 2020). According to the authors, it is as yet unclear how to apply criminal law under this dual system, while two fundamental questions remain unanswered: what does the European sanction obligation[127] mean for criminal law and what is the effect of criminal law being part of a dual sanction system (de Rijck & van den Bogart, 2020). The article does not answer these questions. In August 2020, the specific intervention policy on plant protection products was amended by the NVWA in coordination with the PPS. Time will have to tell whether this is an adequate response. In May 2021, a programme commissioned by the SMK will be started up to clarify the use of criminal and administrative law in environmental cases.

4.5 New developments

There are some developments in the field of plant protection products that could potentially impact the development of (opportunities for) environmental crime.

4.5.1 International and national agreements on reducing use

National and international agreements have been made to further reduce the use of plant protection products. The United Nations Sustainable Development Goals (SDGs), for instance, set targets with regard to plant protection products. The Sustainable Consumption and Production SDG aims to reduce chemicals and other waste in the air, water, and soil (Ministry of LNV, 2019). In the context of the European Green Deal, the European Commission has formulated concrete 2030 targets ('farm to fork strategy') for making agriculture more sustainable, such as with respect to the use of plant protection products: use and risk should be reduced by 50% in 2030, compared to 2020 (Netherlands Environmental Assessment Agency, 2020).

On the national level, the government and the industry have agreed on reducing the use of plant protection products in the Crop Protection Future Vision Implementation Programme. It was for example agreed to reduce plant protection product emissions into the living environment by outdoor cultivation to almost zero by 1 January 2030.

126 NVWA-IOD communication
127 Refer to section 4.6.1

In addition, new genetic techniques are being deployed to more quickly have plant varieties obtain disease and pest-resistant traits (Ministry of LNV, 2019). A shift in the types of plant protection products that are being authorised is currently taking place. A number of products that have been widely used in the past and that had cultivation systems tailored to them, have had their approval revoked on reassessment due to tightened authorisation criteria. The downside of this development is that it can lead to illegal use, as the users will believe there are no good alternatives available for the product that had its approval revoked and cultivation systems are not easy to change. This was part of the reason for drafting the Crop Protection Future Vision 2030: to initiate a shift towards resilient plants and cultivation systems.

4.5.2 Emergence of new import methods

Internet ordering has become increasingly common in recent years. The corona pandemic further increased the number of parcels delivered each day.[128] Plant protection products, too, are offered for sale on the internet. Anyone can order authorised and unauthorised products anywhere in the world with just a few clicks. Global internet sales of plant protection products are increasing. Visibility on this development is limited.[129] Together with Customs, the NVWA checks postal parcels arriving at Schiphol Airport. These range from small parcels containing 250 grams to packages of 500 litres.[130] Because of the corona pandemic, the tracks between China and Europe see more traffic than ever before. A total of 6,354 liner trains travelled on this 'Silk Road' in the first seven months of 2020 - a 41% increase from previous year's figure. Transporters diverted to using trains as transport movements by air and sea were disrupted by the pandemic. However, rail transport will never become an alternative to shipping. A liner train fits 42 containers, a container ship 20,000. However, this could become an important niche for goods that need to be moved faster than by sea and cheaper than by air. Right now, three per cent of transport movements from China to Europe takes place by rail, but this figure could rise to 10 per cent.[131]

4.5.3 Possible shift in illegal product imports

Waterbed effects are possible within the EU market whenever one Member State ramps up its enforcement when inspecting imports. Criminals will avoid this Member State and import their illegal goods via another Member State, where controls are less stringent. Once in the EU, goods can easily be transported by trucks from one country to another. Controlling flows in the internal market is difficult. It is suspected that the import of illegal plant protection products has shifted from the Port of Rotterdam to other ports in Europe. For, until 2016, major shipments of illegal products were regularly discovered in Rotterdam. This has become a less common occurrence.[132] Other explanations are of course also possible, including limited capacity, a decrease in the quantities of illegal products being smuggled, or outdated detection methods at the Port of Rotterdam. A shift is presumably currently also taking place from importing finished plant protection products to importing technical products / semi-finished products. The intended use of such technical products / semi-finished products is often not known. This makes monitoring difficult. It does occur that products are imported in one Member State, that a plant protection product is put together ('formulated') using the semi-finished products in another Member State, and that the finished product is marketed in yet another Member Sate. Cooperation between Member States is essential to keeping track of developments in the illegal market and to barring illegal products from crossing the external borders.

4.6 Criminal opportunities and practice

Several forms of criminality have been observed in the plant protection product chain in recent years. Criminal opportunities also exist. Illegal trade is attractive to criminals because the chances of being caught and the penalties are low, while the profits are high.

128 Consulted on 25 March 2021, via Flinke stijging bezorging pakketjes bij PostNL door corona | NOS
129 Consulted on 29 March 2021, via Illegal Trade in Chemicals | UNEP - UN Environment Programme
130 Communication NVWA, Direction & Expertise department
131 Consulted on 25 March 2021, via Treinverkeer langs de Nieuwe Zijderoute booming dankzij coronapandemie | De Volkskrant
132 Communication NVWA, plant protection products team

4.6.1 Illicit trade is lucrative and the chances of being caught and the penalties are low

A lot of money can be made from the trade in illegal plant protection products. Criminals procure the illegal crop protection products in China, India, or another third country for a relatively low price and end up selling it for many times this original price. According to Europol, criminals earn up to 70 euros per smuggled kilo of illegal pesticide.[133] Profits can top 500% (de Rijck & van den Bogart, 2020). Europol describes it as a very lucrative business. For a cargo of 160 tonnes, profits amount to around eight million euros (Elibol, 2020).

It is not just the profits that make illicit trade attractive to criminals. The low penalties and low chance of being caught, too, have a role to play. Published court decisions show that unconditional prison sentences are imposed only in exceptional cases. Such sentences are rare, even when tens of thousands of kilos of unauthorised products are being marketed. Cases are mostly disposed of with suspended sentences and fines (de Rijck & van den Bogart, 2020). These fines often contrast sharply to the profits that can be made. This does not hold true only in the Netherlands. In other European countries, too, suspects usually get off with a fine (Elibol, 2020). The question is whether these penalties are in line with European legislation. For this requires a sanction to be effective, proportionate, and dissuasive (de Rijck & van den Bogart, 2020). Rob de Rijck in this context told *Groene Amsterdammer*: *"On two occasions, I tried to get the judge to impose a hefty sentence. I in these cases made the comparison with a drug mule. This wretch from Colombia, carrying a kilo of cocaine in his stomach, is sentenced to a year of unconditional imprisonment or over. But if you import six containers of illegal pesticides, you get off with a fine. It genuinely surprises me."* (Elibol, 2020). Another factor at play here is that it can take years for a case to be heard by a court. This diminishes the deterrent effect and may lead to lower sentences, because the reasonable time limit has been exceeded.

4.6.2 Authorisations and production

The focus in tackling crime is mainly on the trade in and use of illegal plant protection products. Possible fraud in the authorisation process and in the production of plant protection products is a blind spot for the investigating authorities. Given the high financial stakes at play, a clear motive for committing fraud exists in this connection. This section describes an opportunity to commit fraud. The NVWA-IOD has no concrete evidence that fraud is taking place in the authorisation process or in the production of plant protection products. However, the NVWA-IOD does, in the context of other NVWA domains such as animal feed, find that accredited laboratories adapt analytical results to costumer requirements, arguing that those who pay the piper call the tune (Anker, 1999). Given the high (financial) stakes involved in developing plant protection products, it is not inconceivable that (scientific) fraud could take place. But, as was already noted in the above, the NVWA-IOD has no concrete evidence of this taking place.

4.6.3 Import

The plant protection product chain is highly internationalised. Many (raw materials for) plant protection products are imported from countries outside Europe. Trade flows are often completely opaque. For instance, some criminal investigations revealed that plant protection products were transported from China to Rotterdam and were intended to be forwarded to Poland and Lithuania. It is possible that these countries were not the final destination for the products. In one case study, they were next sent on to Ukraine (Elibol, 2020). The most obvious form of fraud is importing products not authorised in the Netherlands or counterfeit products. A common modus operandi (MO) is to change the nature of a shipment on paper. For example: while the accompanying documents state that the shipment imported consists of cat gravel, in reality the container holds illegal plant protection products. This is a common and simple MO used when importing and exporting illegal goods. Its purpose is to bypass checks. The misuse of a parallel trade licence is a form of fraud that was identified by the NVWA in the past. This type of fraud entails importing and marketing a different product than the one for which the authorisation was granted.

133 Consulted on 29 March 2021, via A record number of 1 346 tonnes of illegal pesticides taken off the market in 2020 global operation Silver Axe | Europol (europa.eu)

NVWA seizes 64 tonnes of illegal plant protection products

The plant protection products team and the NVWA-IOD seized a total of 64 tonnes of plant protection product at various locations across the country in December 2017. The investigation focused on a company suspected of importing and marketing an unauthorised plant protection product.

Twenty-five tonnes of the plant protection product were seized from the suspected importer. The importer stated it sold nearly 200,000 litres of this plant protection product per year, on both the domestic and foreign markets. The records, a copy of which was taken, showed that a major shipment had been recently sent to a company in Apeldoorn. Upon a visit to this company, an additional 39 tonnes of the plant protection product in question were found and seized there.

4.6.4 Trade

The NVWA finds that plant protection products that are not authorised in the Netherlands, but that are authorised in a neighbouring or other EU country (so-called 'cross-border plant protection products') are offered for sale or used in the Netherlands. Such products are inter alia offered for sale via the internet. It also happens that a Dutch trader drives out to a neighbouring country to buy a product that is authorised there, but not in the Netherlands (see box).

NVWA stops sale of illegal plant protection products via Marktplaats

In May 2017, the NVWA seized illegal plant protection products and halted their sale via the internet. The trigger for the investigation were findings by the NVWA plant protection inspectors. They discovered that banned plant protection products were offered for sale on the Marktplaats classified advertising website in the Netherlands. Providers were urged to stop doing this. The suspect failed to comply.

The suspect was found to have bought large vials of plant protection products banned in the Netherlands in Germany. He put these in smaller packages, which he sold to individuals via the internet. Not only banned plant protection products were found in his shed: it also contained a large number of packed boxes ready to be shipped to Marktplaats customers. Upon unpacking, a box was found to contain some old plastic cola bottles containing the plant protection product. In doing so, the suspect violated the 'duty of care'. The suspect was fined 750 euros.

4.6.5 Users

The most commonly observed form of crime among users is the use of illegal products or the illegal use of an authorised product.[134] One underexposed problem is the use (mixing) of multiple plant protection products at the same time. By mixing them, a new substance is formed, which is not authorised and the associated risks of which are unknown.

4.6.6 Illegal use in cannabis cultivation

Another underexposed problem is the use of plant protection products in cannabis cultivation.[135] Such use is illegal by default. The RIVM has investigated which plant protection products are present on Dutch cannabis offered for sale in the Netherlands. This shows that growers use several illegal products that are not authorised in the Netherlands and/or in the EU (RIVM, 2020). Wastewater from cultivation and, possibly, pesticide residues are flushed down the sewer. Sewage treatment plants are not set up to treat such substances. As a result, they might possibly remain present in the surface water. This can be very harmful to the environment.[136] Incidentally, according to the RIVM, smoking or eating herbal cannabis or cannabis resin that contains residues of these illegal plant protection products does not pose any major additional health risks (RIVM, 2020).

134 Although the focus of this chapter is not on the illegal use of legal products, we do mention it here for the sake of completeness.
135 The 'Closed coffee shop chain' experiment involving legal cannabis cultivation is not considered in this section
136 Rijkswaterstaat communication

4.6.7 Traders

Criminal traders come in different shapes and sizes. According to Europol, organised crime groups are involved in smuggling illegal pesticides. Some of these groups are also involved in other criminal activities, such as the smuggling of counterfeit cigarettes and the illegal trade in pharmaceuticals.[137] At the other end of the spectrum, there are companies that import and sell illegal products in addition to legal ones and small-scale unregistered dealers who offer unauthorised products for sale to individuals via the internet (in old cola bottles, for example).

4.7 Consequences

The use of illegal products can have serious consequences for humans, animals and the environment, the economy, and the government in the Netherlands and other countries. The implications are discussed below.

4.7.1 Humans

There are three types of illegal plant protection products: banned products, products that have never been submitted for assessment in the Netherlands, and counterfeit products (refer to the *Illegal products* section). Only with respect to banned products is it commonly known what the active substances are and what risks they pose, as these products were allowed in the past and were assessed by the Ctgb at that time. The authorisation lapsed when the eligibility criteria were tightened up. The authorisation procedure is constantly being improved because, no matter how careful the procedure is, it can never provide an absolute guarantee that only safe products are allowed on the market (Health Council, 2020). The other two types of illegal plant protection products have never been submitted to the Ctgb for assessment. It is therefore often unknown what active ingredients they contain and what risks they pose. The use of illegal products therefore not only poses potentially high risks of health damage, it also undermines the government's efforts to reduce the use and effects of plant protection products. And since doubts already exist about at least some of the authorised products (see box), the first order of business for enforcement is, of course, to keep unauthorised products off the market (de Rijck & van den Bogart, 2020).

Follow-up report on plant protection and residents (Health Council, 2020)
At the request of the Minister for Medical Care and Sport, the Minister for Agriculture, Nature, and Food Quality, and the State Secretary for Infrastructure and Water Management, the Health Council in 2020 issued another advisory report on the current state of knowledge on the health risks associated with exposure to plant protection products, on the extent to which the authorisation procedure for plant protection products needs adjustment, and on whether a relationship exists between the use of plant protection products and Parkinson's disease.

In this report, the Health Council noted that international epidemiological literature provides indications that plant protection using chemical agents may result in damage to human health. Links to Parkinson's disease have been found, for example. A connection has also been found between prenatal exposure to plant protection products and developmental disorders in children. However, the determination of the level of exposure in studies is often inaccurate. As a result, it is not clear exactly how high the risk is and which plant protection products are responsible.

According to the Health Council, Dutch studies conducted in recent years do not provide clear indications of health effects, but neither do they allay concerns. Domestic epidemiological research is limited in scope and the weak evidence of effects that some of these studies do show is in line with foreign findings. The Health Council believes the conclusion that exposure to chemical plant protection products poses a risk to health to be justified, even though the risks resulting from current Dutch agricultural practice are not known. What is clear is that local residents and, especially, growers and their families are, on average, more subjected to exposure than people who

137 Consulted on 29 March 2021, via A record number of 1 346 tonnes of illegal pesticides taken off the market in 2020 global operation Silver Axe | Europol (europa.eu)

do not work in agriculture and who live further away from agricultural plots. To what extent this results in a higher health risk for these populations in our country remains uncertain.

4.7.2 Animals and the environment

The use of illegal products may also have consequences for animals and the environment. Some plant protection products, now banned, can still be found in the soil or the water decades later. Some substances break down very slowly. For example, several organochlorine pesticides can still be found in the soil, even though their use has been banned since the 1970s (NVWA, 2020-3). The most frequently found substances in deep groundwater are substances that have, in some cases, been banned for 20 years now (Netherlands Environmental Assessment Agency, 2019). Because some substances degrade very slowly, when found, it cannot be determined whether it concerns a residue from the past or a sign of current illegal use.

According to the PBL, biodiversity in agricultural land is under pressure. The numbers of wild bees and other flying insects, and the diversity of species, have declined, for example. The possible causes are the loss and fragmentation of natural areas, economies of scale in agriculture, and the influx of plant protection products. This has implications for ecosystem services such as pollination, natural pest control, and soil fertility (Netherlands Environmental Assessment Agency, 2019). The use of illegal products must also be countered for this reason, as such use is fraught with greater risk than that of authorised products.

Ornamental plant grower suspected of fipronil use: hundreds of thousands of bees dead

In the summer of 2019, hundreds of thousands of bees died near Biezenmortel in Noord-Brabant, probably due to a plant protection product containing the banned substance fipronil. Three suspects were arrested at an ornamental plant cultivation company and a supplier of crop protection products following searches by the NVWA.

In a similar case, another plant grower was sentenced to 120 hours of community service in 2020. The grower must also compensate the damage suffered by the beekeepers. Some 1.8 million bees are believed to have died in this incident in 2016.

4.7.3 Economic damage

Trade in illegal products creates unfair competition. Some illegal products can be offered more cheaply, as they are produced illegally, do not comply with laws and regulations, no investment has been made in costly research, and no costs have been incurred in the authorisation process. This deprives producers of legal products of revenue. Such revenue loss is estimated to amount to EUR 1.3 billion a year in the EU.[138] Counterfeits are made in such a way that they look just like the real thing. This gives the impression that they were made by a plant protection product authorisation holder, which constitutes a violation of the company's intellectual property rights and could lead to reputational damage. It could also lead to companies no longer wanting to invest in developing plant protection products and applying for authorisations.

4.7.4 Government

The use of illegal products is undermining the prestige of government. This in particular holds true if enforcement is lacking. The Netherlands is a major importing country in Europe. It is important that the external border is well guarded and that illegal batches are kept out. Where government efforts to keep illegal plant protection products out are insufficient, governments of other EU member states and interest groups may raise objections. This is harmful to the confidence in the government and the image of the Netherlands.

138 Consulted on 16 March 2021, via pesticides_sector_en.pdf (europa.eu).

4.8 Expectations for the coming years

4.8.1 Increase in illegal use due to efforts to reduce legal use?

Global, European, and national agreements have been made to reduce the use of chemical plant protection products. For some crops, this causes problems because, in the growers' perception, full-fledged substitutes are not yet available. This is likely to lead to an increase in the number of requests to be allowed to make temporary use of an unauthorised product. In addition, the Future Vision 2030 focuses on developing resilient crops. However, it is expected that there will always be a need for the use of chemicals. Depending on the problems a sector experiences, the rejection of requests for the temporary use of banned products, and insufficient progress made by the sector in switching to growing resilient plants and cultivation systems, the use of illegal products may increase in the future.

4.8.2 The role played by the internet is increasing

Around the world, more and more plant protection products are being offered for sale online (UNEP, 2020). This share is expected to increase further, especially since unauthorised products are also offered via the internet in the Netherlands. When the demand for illegal products grows, the internet is an easy way to get them.

4.9 Conclusions and recommendations

This section presents the main conclusions from this chapter and makes some recommendations.

4.9.1 Conclusions

Authorised plant protection product use in the Netherlands is decreasing. Sales have halved since 1990. Since 2010, the decline in sales of chemical plant protection products has stagnated (Netherlands Environmental Assessment Agency, 2020). Global, European, and national agreements have been made to further reduce use.

Only authorised products may be used in the Netherlands. These agents have been assessed by the Ctgb for risks to humans, animals, and the environment. However careful the procedure, it can never provide an absolute guarantee that only safe products reach the market (Health Council, 2020). Plant protection products are associated with the development of diseases such as Parkinson's disease (Health Council, 2020) and the loss of biodiversity (Netherlands Environmental Assessment Agency, 2019). So while there are already doubts about at least some of the authorised products, the primary enforcement task is obviously to keep unauthorised (illegal) products off the market (de Rijck & van den Bogart, 2020). This is because illegal products have not gone through the Ctgb procedure. This means that it often is unknown what substances they contain and what the risks of using the illegal products are.

Illegal plant protection products are traded and used in the Netherlands. The extent of the trade in and use of illegal products is unknown. The NVWA is responsible for monitoring the use of and trade in plant protection products. However, the NVWA (inspection, expertise, and IOD) has insufficient capacity to properly perform its tasks (Deloitte, 2020). The main focus of criminal-law actions to tackle illegal plant protection products is to remove them from the market and punish illegal use. These investigations pay little attention to illicit flows and the criminal networks responsible for illicit trade (short run). Cases are often started up in response to a report. Cases not reported are unlikely to come to light. Because of the focus on the short run and the fact that only one more in-depth criminal investigation into the trade in illegal products has been conducted since 2016, the insight into the illegal market and criminal networks is outdated.

This is not only the case in the Netherlands. Europol's EMPACT programme shows that the Member States participating in the programme have hardly conducted any relevant criminal investigations into this problem over the past five years. Many countries lack the capacity, expertise, and resources to effectively

tackle the trade in and use of illegal products.[139] In other countries, chain supervision is often more fragmented. This is a fundamental difference with the Netherlands, where one organisation - which features its own investigation service - is responsible for monitoring the chain.

The trade in illegal plant protection products is attractive to criminals. It is lucrative, the chances of being caught are slim, and the penalties are low. Cases are often settled with a suspended sentence and a fine. These fines often contrast sharply to the profits, which may top 500% (de Rijck & van den Bogart, 2020).

Due to tightened authorisation criteria in the EU, a number of commonly used products have been banned. This trend will continue in the coming years. This may lead to an increase in the use of illegal products in the coming years, especially when these products may still be used and produced outside the EU and there are no good alternatives available (yet).

4.9.2 Recommendations

Early intervention in the chain is essential
In tackling the illegal plant protection product problem, it is essential to act as early in the chain as possible. If action is taken only after the product has been used, it is too late. It is therefore important to get a good overview of the illicit market: how do the flows run, who are the illicit traders, where do the resources come from, etc. International cooperation is necessary to obtain this overview. The EMPACT project shows that this cooperation could be improved. In order to be able to share information on the international stage, insight on the national level must first be acquired. Taking illegal products off the market is a good intervention from an environmental perspective, but understanding the illegal market requires in-depth criminal investigations into the origins of illegal products and criminal networks. The capacity of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation and NVWA should be balanced and in line with the need for criminal justice deployment. This is especially important at this point in time, because the demand for illegal products may increase in the coming years.

Work on the basis of intelligence
The NVWA has conducted several criminal investigations in recent years. Most cases were started up following a report. Cases not reported are unlikely to come to light. To get a better grip on the illegal market, it is important to take a more intelligence-based approach, such as by focusing on sectors where certain products have been removed from the market, causing growers to feel too few authorised products are available (examples include the ban on the use of neonicotonoids in beet cultivation or of chlorpropham as a sprout inhibitor when storing potatoes). Another option is to make targeted enquiries and run a survey on pre-selected parts of the illegal market so as to update the information position.
Use of illegal substances in cannabis cultivation
The use of illegal plant protection products in cannabis cultivation is a problem, including from an environmental perspective. As goes without saying, this use is not monitored. Because of the potential risks to the environment, it is important to gain a better understanding of the extent of illegal use in cannabis cultivation.

Enforcement agencies insufficiently attuned to internet commerce
Enforcement agencies have not yet formulated a good answer on how to combat illegal trade via the internet. It is possible to order an illegal product anywhere in the world with just a few clicks. Monitoring smaller shipments from third countries and intra-EU shipments is difficult. Internet sales are expected to continue to increase in the coming years. Both the NVWA and the National Office for Serious Fraud, Environmental Crime and Asset Confiscation need to be properly prepared for this.

139 NVWA-IOD communication

Literature

Anker, M. v. (1999). *Wie betaalt, bepaalt. Over intermediaire organisaties, milieucriminaliteit, organisatiecriminaliteit en integriteit in het complexe milieuveld.* The Hague: Elsevier.

CBS. (2018). *Illegale activiteiten in nationale rekeningen.* The Hague.

De Rijck, R., & van den Bogart, F. (2020). Het strafrecht en illegale gewasbeschermingsmiddelen in 2020. *Boom Strafblad*, 163-172.

Deloitte. (2020). *Onderzoek of de capaciteit van de NVWA toereikend is voor het actuele en toekomstige takenpakket.* The Hague.

Elibol, R. (2020, 3 June). Onderzoek illegale pesticiden in Europa. *Groene Amsterdammer*.

EUIPO. (2017). *The economic cost of IPR infringement in the pesticides sector.* Alicante.

European Commission. (2015). *Ad-hoc study on the trade of illegal and counterfeit.* Brussels.

Health Council. (2020). *Vervolgadvies gewasbescherming en omwonenden.* The Hague.

House of Representatives. (2021). Motion by MP Bromet et al, (pp. Session year 2020-2021, 33 835 no 184). The Hague.

Ministry of LNV. (2019). *Toekomstvisie gewasbescherming 2030*. The Hague.

Ministry of LNV. (2019-2). *Ctgb advies inzake het rapport van Buijs en Samwel-Mantingh over afname weidevogels in relatie tot bestrijdingsmiddelen in mest.* The Hague.

NVWA. (2017). *Meerjarig nationaal controleplan Nederland. Jaarverslag 2017.* Utrecht.

NVWA. (2020). *Inspectieresultaten sierteelt onder glas 2019.* Utrecht: NVWA.

NVWA. (2020-2). *Meerjarig nationaal controleplan Nederland. Jaarverslag 2019.* Utrecht.

NVWA. (2020-3). *Advies over de risico's van de aardappelketen.* Utrecht.

Netherlands Environmental Assessment Agency. (2019). Geïntegreerde gewasbescherming nader beschouwd. Tussenevaluatie van de nota gezonde groei, duurzame oogst.

Netherlands Environmental Assessment Agency. (2020). *Balans voor de Leefomgeving 2020.* The Hague.

RIVM. (2019). *Bestrijdingsmiddelen en omwonenden : Samenvattend rapport over blootstelling en mogelijke gezondheidseffecten.* Bilthoven.

RIVM. (2020). *Inventarisatie van gewasbescherming toepasbaar in de teelt van Cannabis binnen het "Experiment met een gesloten coffeeshopketen".* Bilthoven.

UNEP. (2020). *The illegal trade in chemicals.*

Van Bruggen, A. e. (2018). Environmental and health effects of the herbicide glyphosate. *Science of the Total Environment*, 255-268.

5

5 Soil and construction materials: Can our soil handle the substances put into it?

Renske van Ginkel, Priscilla van Hal, Edwin Lipholt, Maarten Busstra*

Many activities are carried out in the Netherlands that can affect the quality of the soil[140] we humans, as well as animals and plants, live on. The negative effects these activities can have on humans and their physical environment render soil protection essential. Contamination of the soil (and the groundwater it contains) may in the long term even pose a systemic threat to drinking water quality, food safety, and biodiversity.

The media have also covered several disturbing signals about soil activities in recent years.[141],[142] The most recent and telling example of this concerns the golf course in Spijk, where heavy metal contamination of soil and water occurred due to a large quantity of steel slag - residue from steel production - coming into contact with rainwater (van der Aa, 2021).[143] The quicklime contained in the steel slag, too, came into contact with it. This caused the water to function like a drain unclogger.[144] Cows kept on the adjacent property had to be kept inside for a long time due to this contamination. The Water Authority, the Environmental Agency, and the Municipality of West Betuwe raised the alarm about serious pollution and subsequently took enforcement action. The contaminated soil must now be remediated.[145]

5.1 Context

The move towards a circular and sustainable economy, explained above in Chapter 2, results in new risks and challenges with respect to activities carried out with, in, and on the soil. This chapter looks at two chains featuring an inherently great risk of substances that can contaminate the soil - so-called soil-damaging substances - being mixed into other streams:[146] the soil stream and construction materials chains. Soil streams refer to the excavation, utilisation, storage, transport, and dumping of soil, also known as the loose excavated soil.[147] Construction materials are classified into primary and secondary construction materials. Primary construction materials are substances that have not previously been used as construction materials (sand, soil or gravel), as well as building materials composed of them, such as concrete. Secondary, especially stony, construction materials,

140 *The authors thank Shanna Mehlbaum and all ILT, Environmental Agencies, Police, and NVWA colleagues for their valuable feedback. In addition, the authors would like to thank all individuals and organisations that contributed in any way to the preparation of this chapter.
140 The Earth's surface with all its functions. Consulted on 4 May 2021, via https://www.bodemrichtlijn.nl/Bibliotheek/grondstromen
141 Such as: Zembla (BNN-VARA), De Vuilnisman (KRO-NCRV) and EenVandaag (AVRO-TROS).
142 Consulted on 4 May 2021, via https://www.gelderlander.nl/west-betuwe/vervuilende-staalslakken-tientallen-jaren-in-de-grond-laten-zitten-daarmee-overtreedt-west-betuwe-de-wet~a561162c/
143 Consulted 13th February, 2023 via https://www.gelderlander.nl/west-betuwe/vervuilend-staal-blijft-onder-golfbaan-spijk-liggen~a7ee367f/?referrer=https%3A%2F%2Fwww.google.nl%2F
144 Consulted on 4 May 2021, via https://noord-holland.sp.nl/nieuws/2021/03/gevaarlijke-staalslak-tata-uitgestort-over-land
145 Consulted on 4 May 2021, via http://deeplink.rechtspraak.nl/uitspraak?id=ECLI:NL:RVS:2019:3232
146 Section 1.1 of the Activities Decree: substance that can contaminate soil as referred to in Annexe 2 of Part 3 of the Dutch Soil Protection Guidelines for Business Activities, and substances or mixtures as defined in Article 3 of the EC Regulation on classification, labelling and packaging of substances and mixtures that can contaminate the soil. Consulted on 15 April 2021, via infomil.nl/onderwerpen/integrale/activiteitenbesluit/activiteiten/begrippen/bodembedreigende
147 Consulted on 4 May 2021, via https://www.bodemrichtlijn.nl/Bibliotheek/grondstromen

are materials that are reused as construction materials. These include concrete and mixing granulate made from crushed construction and demolition waste or construction materials from industrial processes such as blast furnace slag[148] and WtE bottom ash.[149] The Soil Quality Decree (Bbk) was created to prevent the soil (soil and groundwater) and surface water from being contaminated by the use of construction materials, soils, or dredging spoil. It lists the quality requirements that construction materials and soils must meet.[150] The (re)use of soil streams and construction materials involves the use of soils and construction materials on or in the soil. This is also known as the application. It also involves the chain of actions preceding it, from the time of production or the moment of release.
The previous Environmental Crime Threat Assessment (Neve et al., 2016) discussed soil chain crime as a very major concern. The soil is subjected to a wide variety of activities, while the potential for crime is high because of the large financial interests at play and the low chance of being caught. This previous threat assessment focused on the act of mixing dirty soil into clean soil and ringing soils in the soil chain as belonging to a higher quality class[151]. Many of these risks are also addressed in this chapter. This time, our main focus is on the construction materials and the potential negative impacts of the circular economy on the construction materials and soil stream chains. The previous threat assessment also covered a number of developments, such as the changing legislation due to the introduction of the Environment and Planning Act. As these changes have been delayed in recent years, this development is still a hot topic in this chapter. Besides addressing soil streams and, in particular, secondary construction materials, this chapter also focuses on soil protection facilities. These are facilities that aim to prevent the penetration of soil-damaging substances into the soil. Examples include liquid-tight floors, storage tanks, but also sealing layers in the soil when constructing ground energy systems,[152] in which cases these soil-protecting facilities are required. Information from the Human Environment and Transport Inspectorate (ILT)[153] shows that abuses were also often discovered with respect to the construction of these systems, in particular with regard to the mapping and subsequent sealing of separating soil layers.
We conducted literature and desk research in preparing this chapter. In addition, a few expert sessions were held.[154] The results from these sessions are incorporated in sections 5.5 and 5.7.

5.2 Description of the chain

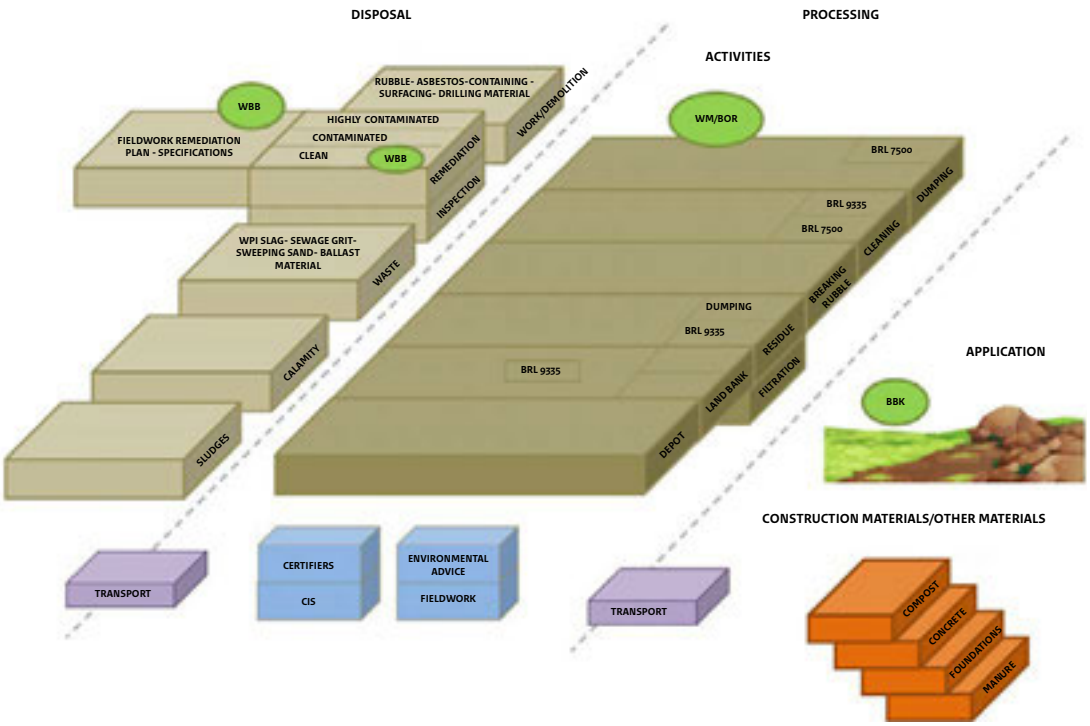
Both the soil stream chain and the (secondary) construction materials chain can be divided into three major segments: disposal, processing, and application (refer to Figure 5.1). All three segments are governed by their own legal regime and subject to specific (specialist) supervision. In addition, the production, reuse, transport, and disposal links are of importance.

5.2.1 Disposal

The disposal segment is generally about waste being released by a company or from a site (during or after a production process) and wanting to get rid of it. In formal terms, (contaminated) soil released from at a site qualifies as a waste (te Dorsthorst et al., 2015). All disposals of waste to an authorised recipient or processor must be reported monthly to the National Waste Control Centre (LMA). The basic principle is that companies are obliged to keep all their waste separate and dispose of it separately.[155] Disposal of waste is realised by delivering it to someone authorised to receive the waste. This can be a licensed waste processor that processes the waste, but also, for example, a party using it under the Bbk and having submitted a notification that the waste/

148 Also called steel slag, a by-product of steel production.
149 The material left over after incinerating waste, including household waste in a waste-to-energy plant.
150 Consulted on 4 May 2021, via https://www.bodemplus.nl/onderwerpen/wet-regelgeving/bbk/vragen/bouwstoffen-algemeen/
151 Ringing is the act of giving a product the identity of another product.
152 Ground energy is a system that can be used to replace gas. Two types of ground energy systems exist: Open and closed systems. For more information, refer to https://www.infomil.nl/onderwerpen/lucht-water/handboek-water/activiteiten/grondwater-ander/bodemenergiesystemen/ (consulted on 4 May 2021).
153 Consulted on 4 May 2021, via https://www.ilent.nl/onderwerpen/bodemtoezicht/bodemenergie
154 Supervisors from the Environmental Agencies, Water Authorities, and the ILT.
155 For a detailed explanation, refer to http://www.infomil.nl/onderwerpen/integrale/activiteitenbesluit/themas/afvalbeheer/algemene/#Verbodopmengenvanafvalstoffen (Consulted on 4 May 2021).

Figure 5.1 *The soil chain (te Dorsthorst, van Hal, Lievaart, Poelarends & van Soest, 2015)*



soil will be applied. Waste may also be supplied to, for example, a manufacturing company holding an environmental permit allowing it to use waste materials in its production processes to replace primary raw materials (te Dorsthorst et al., 2015). Soil streams and construction materials can be transported to establishments[156] that are allowed to accept soil and construction materials or to a soil depot, temporary storage, or storage site. Disposers, collectors, transporters, recipients, dealers, and brokers of waste are required to keep waste records[157]. Companies are obliged to keep all their waste separate and to dispose of it separately, unless this cannot reasonably be required of them.[158],[159] In principle, it is not allowed to mix wastes if they are not comparable, i.e., if they do not fall into the same category. Wastes fall into the same category if they are similar in nature, composition and/or concentration (Rijkswaterstaat, undated a).

5.2.2 Processing

(Contaminated) soil and secondary construction materials often cannot be used directly for their intended purpose, such as being included in a noise barrier or road foundation. Soil streams and secondary construction materials, being waste under the Environmental Management Act (Wm), can in part be usefully applied as renewed construction materials under the conditions provided by the Bbk. The nature and composition of these materials is unequal and they are often contaminated to varying degrees (te Dorsthorst et al., 2015). This may affect the potential for reuse and can also make reuse more

156 Section 1.1(1) of the Environmental Management Act defines an establishment as: "any activity performed by people in a commercial capacity, or on a scale as if they acted in a commercial capacity, which is usually performed within certain limits".

157 Private individuals are NOT obliged to keep waste records.

158 Consulted on 4 May 2021, via https://www.infomil.nl/onderwerpen/landbouw/activiteitenbesluit/thema%27/afvalbeheer/algemene/

159 Section B.3.5 of the National Waste Management Plan 3 (LAP 3) specifically addresses waste separation by companies and waste that cannot reasonably be kept separate. In determining whether something is reasonable, the LAP takes account of the quantities released, the method of release, and the cost of keeping the waste separate. https://www.infomil.nl/onderwerpen/landbouw/activiteitenbesluit/thema%27/afvalbeheer/algemene/, consulted on 4 May 2021.

expensive. Various forms of waste reuse processing and/or storage systems exist within both chains (Swartjes et al., 2019; te Dorsthorst et al., 2015):

- Storage in a depot;
- Transport it to a land bank[160] and merge or split it there;
- Transport to a waste collector;
- Filtering the waste;
- Crushing the waste using a rubble crusher;
- Cleansing the waste;
- Dumping the waste;
- Reprocessing;[161]
- Immobilisation (in concrete), which involves isolating a construction material containing contaminants in cement, producing the so-called immobilised waste;
- Washing.

5.2.3 Application

After processing, such as cleaning, recycling, or recovery, a waste can be reused as soil or construction material. The application, i.e., the reuse of soils on or in the soil, is regulated by way of the Bbk. The Bbk also regulates the (re)use of waste materials as construction materials. The Decree aims to realise sustainable soil management and to make certain that wastes can be used as secondary construction materials (te Dorsthorst et al., 2015). The Decree lays down how to determine the quality of soils and construction materials and the conditions for their reuse on the soil. Construction materials may in this context only be used in a functionally and useful manner, for example in buildings, (rail)roads, bridges, noise barriers, and dykes (te Dorsthorst et al., 2015). Moreover, no more construction materials may be applied than are functionally necessary (te Dorsthorst et al., 2015). If a construction material is not applied in a functional and useful manner, their use constitutes waste disposal (illegal dumping).[162]
Finally, secondary (lightly) contaminated construction materials can be reused as immobilised waste (in concrete) or, by means of IMC schemes[163], end up in road banks, viaducts, and noise barriers, as surfacing materials, and as foundation layers.

5.2.4 Reuse

Secondary construction materials have in the past been used at numerous sites in the Netherlands (ILT, 2019; Poelarends et al., 2017; te Dorsthorst et al., 2015). These sites can be torn down again years later, causing the materials to surface again. It is possible for the application of the construction material to change, for example in connection with new construction work or site redevelopment. This may involve breaking down and reusing a previously used IMC construction material (Poelarends et al., 2017; te Dorsthorst et al., 2015). This new (secondary) application contains a risk that no new insulation provisions, such as laying foil and application above groundwater level, are made. The risk also exists that immobilised waste is released, broken up in a rubble crusher and then reused as rubble pavement. It is precisely in the context of such excavated secondary construction materials, which are reused without regard to historical data and their poorer quality, that there is a risk of leaching[164].

5.2.5 Transport

To move the materials between the different processes in the chain, they must be transported. Such transport may take place by boat, by truck, or via rail. The receipt of waste transported from A to B is recorded with the LMA.[165] When transporting these wastes in the Netherlands, mandatory transport documents and accompanying letters must have been issued. When imported from abroad, a notification, a compulsory transport document, and the consent of the relevant authorities must have been issued. In addition, transportation industry requires that a number of forms are completed (te Dorsthorst et al., 2015).

160 A physical place where batches of soil are collected, inspected, and reused.
161 Purifying materials by extracting substances that do not belong in it or that are still very valuable.
162 Consulted on 4 May 2021, via https://www.bodemplus.nl/onderwerpen/wet-regelgeving/bbk/vragen/bouwstoffen-algemeen/
163 IMC stands for Isolate, Manage and Control. Under an IMC scheme, the construction material is isolated. Additional measures must be taken when using IMC construction materials to prevent emissions of pollutants present in the construction materials from causing contamination of the soil (including groundwater) or surface water.
164 Leaching is a process in which minerals are extracted from a solid substance by solution in a liquid. An example would be the heavy metals and quicklime in steel slag that 'leaked' into the soil through contact with rainwater
165 Wastes that may be used after processing and leave the waste chain must also be reported (delivery reports). All establishments subject to notification that dispose of waste or products generated from it must make such delivery reports. If the delivery of waste takes place to the establishment subject to notification, which reports the receipt concerned, no delivery report is required.

5.2.6 Disposal

Section 1 of the Waste Substances (Landfill Sites and Dumping Prohibitions) Decree (2020) lists several categories of waste subject to a landfill prohibition, including various soil streams[166] (such as sludge from sewers, gullies or pumping stations, sweepings, soil, screening sand) and construction materials (including WtE bottom ash[167]). In addition, Chapter 10 (Section 10.2(1)) of the Environmental Management Act prohibits the disposal of waste by dumping it, packaged or otherwise, outside an establishment, or otherwise placing it on or in the soil or incinerating it.[168] According to the preferred waste disposal order, only those wastes that do not qualify for reuse, recovery, or incineration leading to energy generation may be dumped. This means that dumping is the least desirable method of disposal (also according to the waste hierarchy as presented in Lansink's Ladder). This holds true for soil streams and construction materials, as well.

5.3 Risks in the chain

On the instruction of the ILT, the RIVM in 2019 performed a study on the biggest risks existing in the soil chain (Swartjes, Kok, Vercruijsse & Dekker, 2019). The top 10 include risks associated with improper construction of ground energy systems, possible errors in combining different batches of soils, and incorrect sampling of soils. Half of these adverse events take place in the 'application' step. In addition, 75% of the top 20 adverse events are related to the storage, mixing, labelling, and dumping of soils within the various steps in the chain (Swartjes et al., 2019). The study by the RIVM thus specifically focused on the soil chain.

The RIVM did not investigate the greatest risks within the construction materials chain. Nevertheless, partly on the basis of the previously mentioned reports, the media reports mentioned in the introduction, and the fact that the regime for construction materials is similar, it can be concluded that largely similar risks will exist within the construction materials chain.

As described in the introduction to this chapter, there are several worrying reports about activities involving soils and construction materials that cause concerns about the impact on human health and the environment. These worrying reports are supported by a 2020 study quantifying ILT findings on compliance with the Kwalibo system. The report shows a lack of compliance with Kwalibo rules throughout the chain (Dietz, Visser & Schipperheijn, 2020). This analysis of the ILT's various thematic investigations shows that many of the companies inspected had deviated from the requirements set by the sectors themselves in Assessment Guidelines and the associated protocols.[169]

The report by Winkelhuijzen et al. (2020), too, lists violations in the context of compliance with the necessary quality assurance and high risks to the environment. Such violations include pollution of the soil and groundwater and, by extension, long-term threats to the drinking water supply. For when groundwater becomes polluted, the water companies will have to expend more efforts to purify it. The level playing field is also at risk, leading to pressure to perform work in a manner contrary to the rules.

Finally, based on the aforementioned reports, Kuijken (2020) also concludes that compliance still leaves much to be desired at present.

5.4 Relevant legislation

The key legislation in the Netherlands regulating environmental protection and the responsible (re)use of soil is made up of the Environmental Management Act (Wm) and the Soil Protection Act (Wbb). The purpose of these laws is to protect the living environment and, thereby, our health. The Soil Quality Decree (Bbk) and the associated Soil Quality Regulations (Rbk) form part of these laws. These

166 With the exception of material that is deemed soil under Section 1 of the Soil Quality Decree and that is presented at the landfill site on submission of a declaration as referred to in the ministerial regulation pursuant to Section 28a of the Soil Protection Act, evidencing that the soil is not cleanable and not cold immobilisable.

167 The Decree still uses the old term, WPI bottom ash, in this connection.

168 Consulted on 22 April 2021, via https://www.bodemrichtlijn.nl/Bibliotheek/beleid/beleid-van-centrale-overheid/landelijk-beleid/beleidsblad-wet-milieubeheer/beleidsblad-storten

169 An assessment guideline is a document containing all the information required for assessing a (certification) system for a particular product/realisation process/person/service (https://www.komo.nl/begrippenlijst/beoordelingsrichtlijn/, consulted on 4 May 2021).

laws will eventually merge into the Environment and Planning Act (Ow) and its associated Living Environment (Activities) Decree (Bal). On 18 December 2018, the House of Representatives adopted the Environment and Planning Act Soil Supplementary Act. The proposal incorporates rules on protecting and using the soil into the Environment and Planning Act.
Chapters 3 and 4 of the Bbk and the Rbk[170], which are currently still in force, lay down rules on the conditions that must be met when applying construction materials and soils. The quality of construction materials and soils are determined using normative documents and certification schemes.[171] Various types of evidence (environmental health declarations) exist to prove that the quality of a construction material or soil meets the quality requirements of the Bbk and can therefore be applied. Depending on the quality of the soil and construction material, conditions on their possibilities for reuse have been set. Clean materials may be freely applied. Usage restrictions apply to (slightly) contaminated materials: they may not, for example, be used in (vegetable) gardens or playgrounds.
Requirements are also imposed on the quality and integrity of persons and companies carrying out operations in relation to the soil - the so-called soil intermediaries. According to the Bbk, these soil intermediaries must be accredited and certified[172] before the activities, which have an effect on the soil, can be carried out. This makes up the so-called Kwalibo[173] regulations (Quality Assurance for Soil Intermediaries, Chapter 2 of the Bbk) and constitutes a public-private form of quality assurance of products and activities in the (water) soil sector by way of a system of certification and accreditation and the issuance of quality marks. The system covers a wide range of activities, including soil remediation, the cleaning and application of soils and dredged materials, the production and application of construction materials, the preparation of environmental health declarations for soils and construction materials, mechanical drilling, including installation of energy systems and installation of soil protection facilities.

5.5 Agencies involved

Many agencies have a role to play in the supervision and enforcement of the soil streams and construction materials chains. Figure 5.2 shows the interactions between the various supervisory and enforcement bodies. They can be distinguished into private and public supervisory bodies.

5.5.1 Public supervision

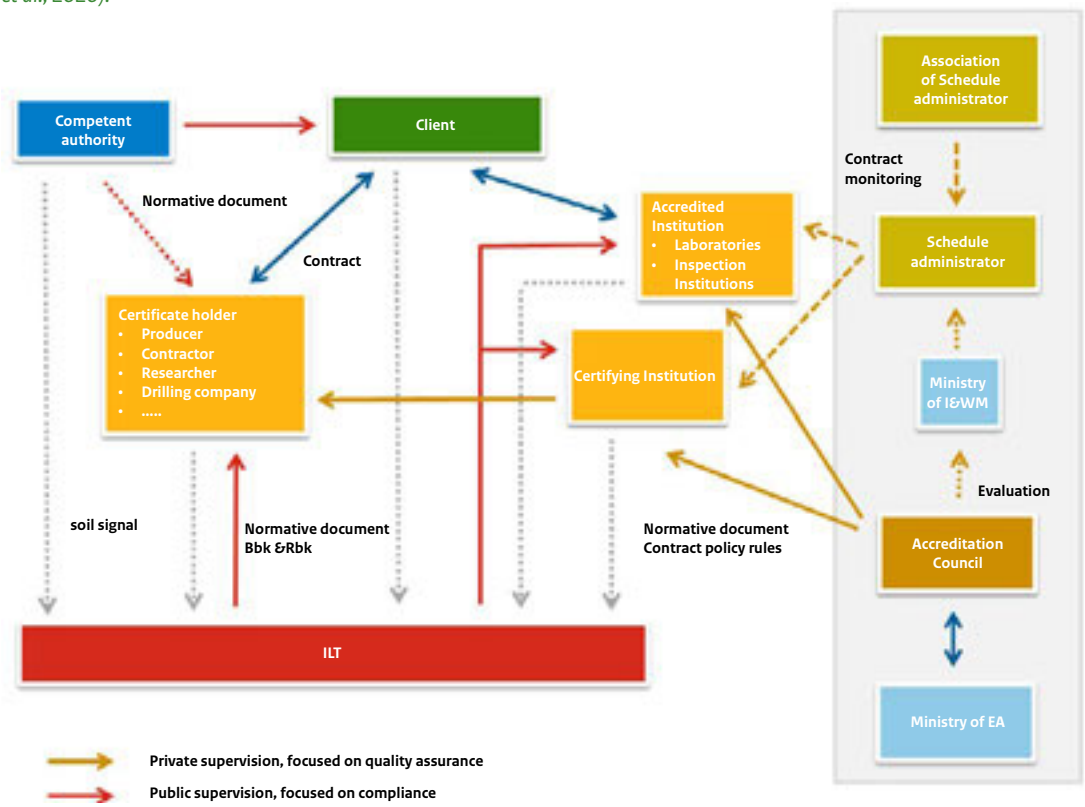
Public supervisors check whether a company complies with the rules in practice. Public supervision is divided between the (local) competent authorities and the ILT. The (local) competent authorities include municipal and provincial authorities, Rijkswaterstaat, and the Water Authorities. The municipal and provincial authorities supervise the actual operations in the chain (such as a remediation or the application of soils, dredged material, or construction materials) as described in Chapters 3 and 4 of the Bbk. They also issue permits for activities and companies working with soils or soil streams. They are responsible for enforcing permit conditions under the law. Many of the competent authorities have assigned these tasks to the Environmental Agencies. In addition, Rijkswaterstaat performs various tasks within the VTH system[174] for the soil on behalf of the Minister of Infrastructure and Water Management (I&WM). Water Authorities fulfil a similar role to that of Rijkswaterstaat, albeit that their focus is on regional waters.
Finally, ILT's supervision focuses on certificate-holding companies and CIs as described in Chapter 2 of the Bbk (Kwalibo) (Winkelhuijzen et al., 2020).

5.5.2 Private supervision

Private supervision focuses on quality assurance, such as conducting audits of certificate-holding companies. Such audits are carried out by the Accreditation Council (RvA) and the Certifying

170 once the Ow enters into force, the provisions of these chapters will become part of the Bal
171 Consulted on 4 May 2021, via https://www.bodemplus.nl/onderwerpen/wet-regelgeving/bbk/vragen/kwalibo/
172 Consulted on 4 May 2021, via https://www.bodemplus.nl/aanvragen/erkenningen/
173 Consulted on 4 May 2021, via https://www.sikb.nl/bodembeheer/kennisdelen-en-innovatie/dossiers/kwalibo
174 "VTH" refers to Permit conferral, supervision and enforcement.

Figure 5.2 *Relationship between parties involved in Kwalibo for the purpose of supervision and enforcement (Winkelhuijzen et al., 2020).*



Institution (CI). The RvA supervises the CI and the CI supervises the certificate-holding companies.

5.5.3 Bottlenecks

Kuijken (2020) in a recent report recommends that an enforcement framework be established that clarifies responsibilities and powers, and thus the assessment and enforcement limits. Supervision and enforcement within the Bbk system (incl. Kwalibo) also require quality improvements, both within the private system itself and in the public control of the system.

The fragmentation of supervision clearly impacts Kwalibo supervision and enforcement. The Kwalibo system is complex, requiring supervision and enforcement at many different points. However, the policy evaluation of soil quality control by Winkelhuijzen et al. (2020) shows that supervision and enforcement are often only take conducted at one link in the chain. Cooperation and exchange of information between regulatory bodies are also non-existent or very limited. This makes it possible for a rejected batch of soils to be simply offered again at another location. Due to the fragmentation of supervision, each authority deals with companies in its own way. As a result, violations are repeatedly assessed as incidents only. Solid supervision is also hampered by limited capacity and insufficient expertise. Back in 2015 already, ter Dorsthorst et al. noted that environmental agencies often lack a sufficient number of specialised supervisors. Finally, tensions exist between private and public supervision. Private audits of CIs cannot form a substitute for public supervision. The quality of supervision and enforcement also varies by region (Winkelhuijzen et al., 2020).

All in all, the conclusion must be that supervision of the soil streams and construction materials chain is fragmented at this point in time. These supervision limitations may provide opportunities for conduct in the chain that is in violation of the rules.

5.5.4 Solutions

A significant number of actors (both public and private) were found to have seriously lost confidence in the implementation of the Kwalibo system over the years. The identified bottlenecks must therefore be addressed vigorously and in short order to ensure that the sufficient support of and confidence in the system is regained and that the system becomes future-proof. However, restoring confidence is only possible if all parties recognise the seriousness and urgency of the bottlenecks and the need to embark on a joint improvement process (Winkelhuijzen et al., 2020). Professionalisation efforts are under way within the VTH system as well. For example, the updated quality criteria 2.2 came into force on 1 July 2019. They render the performance of VTH tasks more transparent and try to make them more predictable. Efforts are also being expended to equalise the implementation of the system across the country (Rijkswaterstaat, undated b). This is especially important since the supervisory tasks are fragmented and actors often operate independently of each other. Instead, cooperation should be sought. The quality criteria 2.2 include a focus on chain supervision. This emphasises the importance of cooperation with chain partners. Several Environmental Agencies have committed to effecting such cooperation and are expanding and intensifying supervision accordingly. Organisational structures, too, are sometimes adjusted, resulting in regular supervision being more in-depth. Too, supervisors are starting to look beyond individual establishments, with the chain approach taking on an increasingly important role. Data and information-driven work is increasingly given central stage in this connection. Data and information analysis is used to identify those links of the chain where high-risk companies operate before any actions are taken. This development is in line with the recommendations of Kuijken (2020), the report by Swartjes et al. (2020) and the VTH Advisory Committee (Van Aartsen, 2021): improved cooperation between (chain) partners is badly needed.

5.6 New developments

Compared to the previous Environmental Crime Threat Assessment (2017), there are no major new developments. A complex public-private system continues to be in place, inter alia resulting in fragmentation of supervision. As a result, the chance of catching companies that break the rules is low. Compliance with the rules for supervised activities also leaves much to be desired in this sector. Following the Kwalibo policy evaluation and reports by the Kuijken and Van Aartsen committees, a task force on soil system redesign was set up by the State Secretary of Infrastructure and Water Management.[175] This task force is, by late 2021, to come up with a plan of action to implement the necessary improvements in the Kwalibo system. Given the government's commitments to the House of Representatives, the results of this task force will most likely lead to adjustments in the system affecting soil and construction material streams.

The main development concerns the ever-increasing circular economy (also refer to Chapter 2) and the related reuse of previously used (possibly contaminated) materials. The use of new substances (such as PFAS) in products, too, is an ongoing development. In addition, the energy transition is causing a new development with respect to the soil, as well, as frequent use is made of the deep soil layers for the storage and extraction of heat and cold. This includes drilling in these layers.

5.7 Opportunities and manifestations

Multiple opportunities for crime exist within the soil streams and construction materials chains. Opportunities for crime can also be identified in connection with the soil protection facilities to be realised within these chains. These are set out below as they have become apparent from literature and the results of the expert sessions.
The biggest challenges within these chains concern enforcing legislation and detecting environmental crime. These are labour-intensive activities, while

175 Consulted on 4 May 2021, via https://www.bodemplus.nl/actueel/nieuwsberichten/2020/beleidsevaluatie-kwalibo-procesevaluatie-granuliet/

crime is difficult to identify. Once committed, there usually is no immediate victim to complain about or report the crime. This is primarily due to the fact that the quality of a batch of soils or construction materials is often impossible to visually determine. In many cases, a batch of clean soils or construction materials looks the same as a contaminated batch. The financial gains companies obtain from deliberate violations of the rules can be large. Examples include relabelling a substance with negative value as a valuable raw material or product, not investing in mandatory soil protection facilities, or failing to wash or clean contaminated streams (Poelarends et al., 2017). The returns of such actions make it very attractive not to comply with the rules.
Previous soil analyses and studies of the soil (te Dorsthorst et al., 2015; van Hal, Lievaart & Poelarends, 2017) have identified several risk-increasing factors:
Slight chance of being caught;

- Major financial gains;
- Many operations in the soil by a multitude of large and small companies;
- Multitude of regulations relating to the soil (Kwalibo, Wbb, Bus, Rus, etc.);
- Industry influence on regulation;
- Dual role played by the certifying institutions;
- Limited self-cleansing ability of the sector;
- Fragmented supervision;
- Fragmented information position.

5.7.1 Opportunities in practice

In addition to those referred to in the existing literature, a number of concrete opportunities for rules violations behaviour were identified during the expert sessions. These will be described and explained in order.

Application dependent on the supply of, rather than the demand for, construction materials
As a result of the drive towards a circular economy, previously used raw materials and waste materials released as residues from a production process are increasingly often used in the production of construction materials. Examples include WtE bottom ash and steel slag. The same applies to certain soil streams that are released and require a new application. Examples include thermally cleansed soils (a soil cleansing residue) or industrial-class soils from a factory site or remediation site where houses are being built.
These residues and soil streams are then used to produce new construction materials or are marketed as usable soils. The available quantities of these soils and construction materials is dependent on the supply from the production processes and not on the demand for this particular construction material. As a result, more such soils or construction materials may be available than there are applications where these soils or construction materials can be used.
It has also become apparent that the number of large-scale infrastructure projects, where a sizeable share of these streams end up at, is decreasing. There is a risk of these soils or construction materials accumulating due to waste stagnation in a poor market (Poelarends et al., 2017).

Non-functional application of soils and construction materials
When the supply of soils or construction materials outstrips available sites for their use, the risk of companies having to deal with an accumulation of soils or construction materials arises. This results in shortages of storage space and high costs for storing this material. As described in the section above, the batches of soils or construction materials often result from a production process and sometimes already constitute residual products with negative value. Such negative value may be the result of the materials being polluted, but also of a lack of suitable application options. When they need to be stored, such soils or construction materials acquire an (even greater) negative value.
Buyers of the soils or construction materials are actually given money for the treatment and processing of the stream, instead of having to pay for acquiring the soils or construction materials. This renders acquisition of such soils or construction materials for use at a site, while such use is not required in reality, a lucrative option. Examples include lookout or recreational hills or noise barriers on or near to objects/site that are not noise-sensitive, or the use of construction materials the original owner actually paid for to get rid of (but which may be contaminated), while another construction material would be more appropriate at that site. Instead of the waste being recovered, it is in fact disposed of (covertly dumped), all in accordance with an associated revenue model. According to the

rules of the Bbk, construction materials may only be used in a functional and useful manner, for example in buildings, (rail) roads, bridges, noise barriers, and dykes. Moreover, no more (or fewer) construction materials may be applied than are functionally necessary. Otherwise, their use constitutes waste disposal. In the context of the use of WtE bottom ash, for example, maliciously incorrect layer thickness labels have already been identified (Poelarends et al., 2017).

Incorporating (cleanable) waste into concrete product, causing the product to contain hazardous substances

Many contaminated soils or construction materials can be cleaned, removing the environmentally harmful substances, such as contamination above intervention values[176] or Substances of Very High Concern (SVHC, also refer to Chapter 9)[177], from the batch concerned by incineration, filtering or washing. In many cases, it is cheaper to have the contaminated soils or waste legally, but also illegally, processed into a concrete product by way of immobilisation (Poelarends et al., 2017). In this process, the environmentally hazardous substance is not removed from the material, but the risks of exposure to that substance are temporarily removed or isolated. Processed bottom ashes, for example, can be used by concrete and asphalt plants as a 'mineral residue' in their products.

The Bbk allows such immobilisation under certain conditions, but restrictions do apply. Not all environmentally hazardous substances may be immobilised. The risks of immobilising environmentally hazardous substances are often long-term ones. When the construction material in question is released during demolition, for example as rubble granulate during crushing or when the immobilised waste weathers, the risk exists that the environmentally hazardous substances could as yet be released into the environment. There is also a risk that greater levels of contaminated substances are used in the immobilisation process than is allowed.

Failure to report emerging (non-standardised) substances and SVHC when releasing, producing, processing and applying soils and construction materials

The Bbk standardises common pollutants in soils and construction materials. However, many other chemicals exist, for which no standards have been set. In many cases, these are non-standardised substances that are already permitted on the European market or SVHC that have not yet been the subject of sufficient research and the long-term effects on humans and the living environment of which are insufficiently known. Section 1.1(2) of the Environmental Management Act therefore imposes a general duty of care. The Section provides:

"*Any person who knows or has reasonable grounds to suspect that his acts or omissions may cause adverse effects on the environment shall be required to refrain from such acts to the extent that they can reasonably be required to do so, or to take all measures that can reasonably be required of him in order to prevent such effects or, to the extent that such effects cannot be prevented, to minimise or remedy them.*"

This duty of care is further elaborated in Section 7 of the Bbk with respect to non-standardised substances in soils and construction materials. The Section provides that applying the soil or construction material may not make the quality of the soil worse than it was at the time of application. As a result, soils and construction materials with elevated levels of non-standardised substances often cannot be used, causing a risk that companies may choose not to disclose, or deliberately conceal, the presence of such substances in the material. This constitutes the disposal of waste and its dispersion into the environment. The company in so doing saves on the high costs for cleaning, immobilising, or dumping this particular waste.

Mixing heavily contaminated soils into industry-class or cleaner soils

Illegal operations with contaminated soil are lucrative. Money can be made by changing (improving) the quality level of the soils, so it can be used for a more lucrative purpose. It is difficult to identify such conversions, as it can take place both

176 When intervention values are exceeded, the functional properties that the soil has for humans, plants or animals are seriously impaired or at risk of being impaired.

177 These are substances that are dangerous to humans and the environment, for example because they are carcinogenic, impede reproduction, or accumulate in the food chain.

on the physical level and in the records. Physical conversion is irreversible. By mixing two batches, the contamination level of the soils are averaged out, for example. The primary goal of relabelling the soils in the records is to disguise their original identity (Poelarends et al., 2017). Because of the ever-increasing circular economy (release of contaminated waste that is turned into a new secondary construction material), it is not inconceivable that the mixing of contaminants in construction materials is, or will become, an issue.

Failure to carry out a processing step

Besides making money, money can also be saved by ultimately failing to process the soils or construction materials as intended. One example is the free 'application' of soils, which should actually be dumped, to raise the land at farmers' premises. Another is formed by illegally mixing such high-risk streams into a much larger batch of cleaner soils. While this saves on dumping and cleaning costs, the contaminants enter the environment.

A particular risk is formed in this context by companies that accept substances before availing of the proper permits, methods, and techniques to process these substances. Such conduct has been observed by companies that are financially in the red and yet do accept large quantities of raw or partially processed construction materials still requiring a processing step to make them freely applicable. They first need to invest in these techniques, but are unable to do so because of their financial position. As a result, there is a distinct likelihood that the substances are not cleaned or the company goes bankrupt, resulting in society having to pay for the (disposal) costs (Poelarends et al., 2017).

Because processors carry out many links in the process themselves and on their own premises, supervision, enforcement, and detection are impeded.

Application of construction materials in a non-recoverable way or not in accordance with the application conditions

According to the rules of the Bbk (Section 33), the person applying a construction material must ensure that the construction material:

4. Is not mixed with the soil;
5. Can be removed, and;
6. Shall be removed in the event that the work or the part of the work the construction material forms a part of can no longer be considered a functional application (unless the removal results in a greater degradation of the soil or a surface water body than non-removal would).

This means that measures must already be taken at the time of application to ensure that the construction material cannot be mixed with the soil. This results in additional costs in the application of construction materials. It regularly happens that construction materials have not been applied in this way. With respect to the use of construction materials, the environmental health quality check under the Bbk primarily focuses on the leaching behaviour of many chemical parameters (in contrast to the application of soils, where the composition takes centre stage). This means that these substances are allowed to be present in the construction material, as long as they do not leach out. However, when the construction material is mixed with the soil, these substances become part of the soil and thus remain in the environment. Furthermore, according to this legal provision, the construction material must be removed if the work loses its function. Especially in the case of construction materials with elevated levels of pollutants,[178] their removal will come at great cost. As a result, there is a risk that these construction materials will not be removed and will eventually become part of the soil. Pollutants present in the construction materials will also spread into the soil over time.

Mishaps can also occur when applying IMC construction materials or other construction materials subject to application conditions (such as steel slag). Examples include (Poelarends et al., 2017):

- Supply of bottom ash in rainy weather (waterlogging);
- Spillage and drift (temporary isolation);
- Poor cover soil (moisture problems);
- Quality assurance in the design;
- Insulation measures (single seal);
- Lack of adequate monitoring;
- Speed of affixing the final seal.

178 Such as immobilised waste or substances subject to application conditions, such as IMC construction materials or steel slag.

Failure to report and register applied construction materials

In the case of WtE bottom ash, it was found that no complete overview existed of which ashes were applied where, exactly (Poelarends et al., 2017). The same goes for many other construction materials. No reporting requirement prior to application exists for most construction materials. However, some construction materials are subject to such reporting requirements. When no notification is made, the municipal authorities usually have no insight into the type of construction material applied. Should these construction materials be released, there is a risk that no account is taken of any contaminants present in the construction materials in question - be it wittingly or not.

Falsification or multiple use of an environmental health certificate

Visually, batches of soils or construction materials are generally indistinguishable from each other. As a result, there is a risk that an environmental health certificate issued for a (clean) batch of soils or construction materials is reused for a contaminated batch. The risk of falsified environmental health certificates being used also exists (Poelarends et al., 2017). Due to the lack of full raw materials or construction materials records, such violations can sometimes only be identified by conducting in-depth investigations of the records or additional investigations focused on specific parameters in the relevant batch of soils or construction materials.

Foreign streams

A study by Poelarends et al. (2017) that focused on the WtE bottom ash chain also identified risks associated with foreign streams, to wit: importing materials with an incorrect description (the codes used referred to metals instead of WtE bottom ash), difficulties in finding out how much material was actually transported, and complex regulations regarding imports making the quality of the imported bottom ash difficult to determine.
In addition, a Green Deal was signed with the government in 2012, under which WtE bottom ash could no longer be used as an IMC construction material. As a result, there is a risk that, in the future, more and more bottom ash will be immobilised in concrete, instead of being cleansed at a heavy cost. The potential risk therefore continues to be present in the immobilised waste stream, instead of the bottom ash being processed to produce a cleaner material.
Furthermore, it has been observed that streams to be dumped abroad are transported to the Netherlands, because it is cheaper to export them to and process them in the Netherlands. The quality of these streams depends heavily on the producer. As the production takes place abroad, the risk of the ashes potentially being more heavily contaminated is increased. After all, no direct supervision of the quality of the (household) waste used exists. Projects where foreign ashes are used therefore increase the risk of possible negative impacts.
Information provided by the ILT[179], too, shows that the Dutch government has difficulties determining whether soils imported from abroad comply with Dutch laws and regulations. As a result, the soils may be of insufficient quality. Soils from Belgium seem to predominantly originate from industrial areas or civil and hydraulic engineering projects. The filling of sand reclamation lakes with foreign soils has, for this reason, already caused social unrest, such as when people living near a deep lake see plastic, wood, and other types of waste floating up.

Aftercare and monitoring

In some cases, residual contamination will continue to exist after completion of a soil remediation operation. An aftercare obligation exists under the Wbb with respect to such situations. This means that insulation measures (such as a pavement or concrete floor) must be maintained, or that the residual soil contamination must be monitored, for example by sampling the groundwater. An aftercare and monitoring obligation also exists when using IMC construction materials. The aftercare for such contaminants and construction materials was often found to be lacking in 2017 (Poelarends et al., 2017). In addition, no monitoring was performed in many cases, such as after proper application of WtE bottom ashes. It took a lot of effort to obtain correct and useful information.

179 Consulted on 4 May 2021, via https://www.ilent.nl/onderwerpen/bodemtoezicht/geimporteerde-grond

Soil protection facilities

To protect the soil, soil protection facilities must be provided in many cases, such as when (potentially contaminated) materials are stored in a depot. Disposers, temporary storage and transfer sites, and application sites all must have such facilities in place. This also applies to companies that use substances as secondary raw materials, such as the concrete and cement industry and, possibly, asphalt plants. Soil protection facilities are also in place at petrol stations and garages, for example, so as to catch petrol and oil leaks. These soil protection facilities should be checked regularly for defects (cracking, spills, and rainwater runoff) and groundwater should be monitored.

The installation and maintenance of these soil protection facilities are very costly. Where such facilities are not in place or are defective, there is a risk of contaminants leaching from the stored construction materials and entering the soil while they should have been collected in wastewater, to be discharged into the surface water only after cleaning. Based on the literature consulted, it is unclear how often such problems occur.

Another activity requiring measures to protect the soil is when installing ground energy systems. When installing closed ground energy systems, the poorly permeable layers in the soil are penetrated. The separating effect of these layers must be restored after drilling to avoid risks to groundwater quality. As construction of closed ground energy systems involves drilling deep (>100m) boreholes with a relatively small diameter (<20 cm), backfilling is error-prone. Moreover, it is not possible to measure whether the borehole has been properly backfilled after the process is completed. The ILT when performing supervisory activities in 2018 and 2019 found that regulations are regularly deviated from during the backfilling process (Kooiman et al., 2021). This creates longer-term risks to the quality of deep groundwater, which is inter alia used for drinking water production (ILT, 2021).

Drug crime-related discharge

The production of hard drugs is fraught with risks of environmental damage caused by illegal dumping of the chemical wastes released in the process. Recent examples of the overwhelming damage caused by drug waste dumping and the contamination associated with drug production labs include the dumping in a pit on Brabantse Wal[180] and the production lab in Achter-Drempt in the Achterhoek region.[181] Chemicals dumped to a depth of six metres into the ground on Brabantse Wal include mercury, phenol, benzene, and toluene. These are all characteristic substances associated with the production of synthetic drugs. The clean-up and remediation costs to be incurred are being assessed at the time of writing.[182]

A large crystal meth lab, set up in an old pig barn, was closed down in Achter-Drempt in May 2020. Elevated acid levels were measured on the site. The lab caused soil contamination and a risk of explosion.[183] In addition, the (natural) environment is in danger, inter alia because of the high concentration of mercury released during crystal meth production.

Both cases are a clear example of how damaging and undermining drug crime is to our society.

5.8 Consequences

The likely consequences of the potential criminal acts described in this chapter do not differ from those described in the Environmental Crime Threat Assessment 2017.

5.8.1 Impairment of physical or mental health

Persons working with soils or construction materials contaminated with pollutants without wearing unprotected equipment may suffer from health damage. The Environmental Crime Threat Assessment 2017 described possible effects of some of the substances that can be found in contaminated

180 Consulted on 4 May 2021, via https://www.omroepbrabant.nl/nieuws/3376758/drugsput-brabantse-wal-duurste-afvaldumping-ooit-en-kan-in-miljoenen-lopen

181 https://www.gelderlander.nl/bronckhorst/boerderij-drempt-vol-gif-na-vondst-chrystal-meth-lab-mogelijk-miljoenen-opruimkosten-dit-kan-gierend-uit-de-klauwen-lopen~adc664do/, consulted on 4 May 2021.

182 Consulted on 4 May 2021, via https://www.omroepbrabant.nl/nieuws/3376758/drugsput-brabantse-wal-duurste-afvaldumping-ooit-en-kan-in-miljoenen-lopen

183 Consulted on 4 May 2021, via https://www.gelderlander.nl/bronckhorst/zwijgende-drugskoks-crystal-methlab-drempt-gaan-jaren-de-cel-in~abeae1ba/

soil. In addition to these previously mentioned substances, the effects of emerging substances, often SVHC, must be taken into account (also refer to Chapter 9). These can have serious consequences if they enter the body. A recent example from the construction industry that forms a risk to personal health is the high concentration of carcinogenic quartz dust that can be released when working with track ballast (the stones lying between the rails), which is so small that it can penetrate deep into the lungs.[184] Of course, the extent to which contamination results from criminal acts remains an open question: this will vary from case to case.

5.8.2 Deterioration of or threat to the environment or living environment

As was also noted in the 2017 Threat Assessment, the current focus is on developing a coherent policy on the use of the subsoil. In the meantime, more and more activities are being conducted in the soil, including the extraction of drinking water and natural gas from the soil, the digging of tunnels and the laying cables and pipelines, and the storing of heat and cold in the subsoil. The provincial and municipal authorities therefore sometimes have to choose how and where the soil can be used, how to protect the groundwater in the process, and how to deal with soil contamination when digging in a new place.[185] Non-compliance with the rules reduces the quality of the soil and all the functions that depend on it. In the case of wilful and systematic violation with a view to obtaining economic gains, the consequences are likely to be greater. As is described in this chapter, in many cases (but not all: consider steel slag), the risks are not acute in nature. Rather, there is the long-term risk of contaminants entering and spreading into the environment (soil, groundwater, surface water).

5.8.3 Behaviour leading to nuisance, anxiety, or unease in others

Cases involving (suspected) environmental crime often come to attention because local residents (increasingly often united in residents' initiatives)[186] call attention to earth-moving activities or the application of construction materials in their local environment. In many cases, this causes them to experience nuisance, anxiety, or a sense of unease in connection with the application of the material in question in their environment. Partly due to social media attention to the matter, attention to activities involving soil or construction materials is generated more quickly. One example is formed by the broadcasts of the Zembla programme in 2018 and 2020 concerning contaminated soils in a residential area in Barneveld[187] and granulite which the programme makers said was "dumped" in a nature reserve in Gelderland.[188] This caused much controversy.

5.8.4 Financial losses

Many cases involve large quantities of soils or construction materials that represent a major negative value (for example due to the costs of dumping the materials in question). This may cause the offender to be unable to bear the costs of reversing the consequences of the offence and to go bankrupt. Often, the moneys earned have by then already been siphoned. As a result, the cost of undoing the negative impact on public health or the environment must be borne by society and thus paid for through taxes. Such costs may amount to millions of euros.

The ILT's Inspection-wide Risk Analysis (IBRA) provides an estimate of the damage caused by non-compliance with soil regulations (ILT, 2020). It in so doing determines where social risks are greatest. This ILT-wide risk analysis displays the damage of societal risks the ILT has to respond to in euros. To compile the IBRA, damages were calculated using the so-called "avoidance costs". These are the costs avoided by not processing soil streams according to the rules. The IBRA 2020 shows that approximately 8 million tonnes of soils and sludge are improperly processed every year. Assuming avoidance costs of about €196 per tonne, the environmental damage

184 Consulted on 4 May 2021, via https://www.bnnvara.nl/zembla/artikelen/spoorwerkers-jarenlang-blootgesteld-aan-kankerverwekkend-kwartsstof

185 Consulted on 7-04-2021, via https://www.rijksoverheid.nl/onderwerpen/bodem-en-ondergrond/ruimtelijke-ordening-ondergrond accessed 7-04-2021

186 Consulted on 4 May 2021, via https://petities.nl/petitions/stop-de-milieuvervuiling-door-het-golfterrein-in-spijk?locale=nl.

187 Consulted on 4 May 2021, via https://www.bnnvara.nl/zembla/artikelen/vervuilde-grond-illegaal-onder-barneveldse-nieuwbouwwijken

188 Consulted on 4 May 2021, via https://www.bnnvara.nl/zembla/artikelen/de-afvaldump-door-rijkswaterstaat

caused by improper waste treatment is estimated to amount to €1.6 billion per year (8 million tonnes x €196).

5.8.5 Undermining of economy and society

Circumventing regulations has implications for pricing: those who comply with the rules cannot compete with the free riders - who save on the certification costs - and will lose out in the market. This will result in a degradation of the sense of values of the managers of companies active in the soil sector, as they will feel pressured to imitate others in not following the rules.

In addition, many companies play an important role in the region where they are located. They provide jobs and sometimes sponsor local associations. In itself, this is not a problem. However, a problem does arise when a company (owner) 'buys' influence in, for example, an association board by way of such sponsoring and employment opportunities, thereby capturing a seat at the table of local government. This will give rise to opportunities for the underworld to start making use of legitimate society (Spapens, 2019).

5.9 Expectations for the coming years

As discussed in Chapter 2, a number of large-scale changes are currently taking place in the Netherlands and around the world, including the drive towards a circular economy and the introduction of the Environment and Planning Act. Their impact on the soil domain will be the topic of this section.

5.9.1 Circular economy

As this chapter makes clear, the transition to a circular economy has a major impact on soil streams and construction materials. The reuse of soils, but especially of construction materials, or the processing of waste materials into construction materials, are expected to become increasingly common. As a result, fewer clean construction materials will have to be extracted from the environment. However, this comes at the risk of pollutants and hazardous substances being released into the environment.
As the costs of cleaning or dumping wastes are often very high, there is a risk that the wastes will be processed much more cheaply and not be recovered and functionally applied in the environment or processed into construction materials. The balance will, in that case, quickly tip towards economic interests being given greater importance than taking care of the environment.
Partly as a result of the circular economy, technological and other developments within the sector often move faster than can be anticipated by parties like the government. Responding to these developments is therefore required.

5.9.2 The Environment and Planning Act

The Environment and Planning Act is likely to enter into actual effect in the near future (should the Senate adopt the Act, this is currently projected to be by 1 January 2022). As was also described by Neve et al. (2016), the Environment and Planning Act will probably mean that all kinds of activities in the soil chain will no longer require a permit or notification, except where required by, for example, European regulations. This will put pressure on the supervision of soil streams.
In addition, competent authorities and all other stakeholders will have to get to grips with the new rules imposed under the Environment and Planning Act, which may initially lead to a lack of clarity about the various tasks and responsibilities.

Furthermore, a task force on restructuring the soil system was set up by the Ministry of Infrastructure and Water Management in response to the Kwalibo policy evaluation and the reports of the Kuijken and Van Aartsen committees.[189] Given the government's commitments to the House of Representatives, the results of this task force will most likely lead to adjustments in the system affecting soil and construction material streams. These adjustments are expected to lead to an improved information position (insight into the time when and place where companies perform their work) for both private and public regulators. This will make supervision more efficient and is therefore expected to increase

189 Consulted on 4 May 2021, via https://www.bodemplus.nl/actueel/nieuwsberichten/2020/beleidsevaluatie-kwalibo-procesevaluatie-granuliet/

the likelihood of companies carrying out illegal operations with soils or construction materials or in the soil being identified.

5.10 Summary, conclusion, and recommendations

Compared to the chapter on soil in the previous Environmental Crime Threat Assessment (2017), this chapter focuses more strongly on the construction materials chain and the related criminal opportunities. This is partly in response to the growth of the circular economy and the changes this brings to the soil domain.
The specific risks and opportunities within the soils and construction materials chain highlighted in this Threat Assessment are the following (as discussed in section 5.6):

- Many manufacturing processes produce a residual stream that can be reused. There is a risk in this connection that the amount of residual products (supply) outstrips the number of available useful applications they can be incorporated in (demand);
- Whenever the supply of residual products that can be used as reusable construction materials outstrips demand, there is a risk that they will accumulate in temporary storage depots and are ultimately not put to useful and functional use (illegally dumped). An example would be the construction of noise barriers without there being a noise-sensitive object requiring protection;
- The incorporation of waste materials into a concrete product, causing the contamination to be immobilised (fixed) in the cement in the short term, but to possibly be released due to weathering or the demolishment of the concrete product in the long term;
- The (deliberate) omission of non-standardised substances when applying a secondary construction material, i.e., a material reused after processing;
- The mixing of (heavily) contaminated soils into cleaner soil, creating an applicable lightly contaminated soil, instead of completely removing the contamination from the soil through cleaning;
- The (deliberate) failure to carry out a processing step, causing hazardous substances to remain present in a batch of soils or construction materials and then being released into the environment without this being known;
- The non-removable application of construction materials, causing the construction material to become mixed into the soil. This results in the contaminants potentially present in the construction material to be released into the soil;
- The failure to report the application of soil or high-risk construction materials subject to a reporting requirement. As a result, it is not known where these construction materials have been used, meaning that the municipal authorities are unable to keep proper records;
- The forgery or multiple use of an environmental health certificate issued for a batch of soils or construction materials. This allows contaminated (non-applicable) soils or construction materials to be applied as clean soils or construction materials on paper;
- The failure to carry out aftercare and monitoring of an isolation facility constructed to cover contaminated soils or construction materials and to stop contaminants from leaching into the soil;
- The failure to install or adequately check soil protection facilities at industrial sites. This may cause the soil protection facility to malfunction, resulting in wastes being released into the soil;
- Contamination of the soil due to drug crime-related wastes being dumped.

Given the manifold criminal opportunities in the soil and construction materials chain, crime in this sector is not expected to decline in the short term. No hard data are available on the overall scale of crime in the soil and construction materials sector. This form of crime is characterised by a high degree of interwovenness of legal and illegal activities, making it more difficult to detect abuses. Nevertheless, there is a lot of information on the size of the streams, which seem to present ample opportunity for crime. It can also be concluded that the public-private system as provided for by the legislation on soils and construction materials is complex and that supervision of the soil streams and construction materials chain is fragmented. It has become clear that no thorough checks of the various links in the chain are performed in all cases. However, when checks are performed, irregularities are often

identified with respect to various activities in the different links of the chain.
It may be concluded that crimes are committed in multiple links in the chain and that by no means all offences are discovered. The consequences can be severe: soil functions, public health, ecology (flora and fauna), and drinking water supply are at risk. In addition, illegal practices hamper the functioning of the market and undermine the integrity of the government.
It is therefore of continuing importance for the government to ensure that the various regulators possess a solid information position. This concerns both a good understanding of soil and construction material streams and sound cooperation and exchange of information between the various licensing and supervisory parties. For example, companies operating on the national scale should be prevented from obtaining different permits for different sites, as this enables them to mix multiple flows.
It is recommended that the connection between the various supervisory parties involved be intensified and made a structural one. It is also recommended to give the chain approach an increasingly important role. Data and information-driven work should increasingly be given central stage in this connection. Data and information analysis is used to identify those links of the chain where high-risk companies operate and which criminal opportunities exist within the chain concerned before any actions are taken.
Licensing and monitoring parties will also have to remain attentive to new developments in the soil and construction materials industry and to developments with implications for the soil. For example, what are the implications of the wind turbines that are being installed all over the country? The blades are made of glass fibre and composite and may weather and flake off under the influence of (fine) dust, sunlight, etc. What threats are posed by all these pieces of plastic breaking down into microplastics? And what happens to face masks and other debris that ends up in the environment? Where do all these materials end up and where do they accumulate? What are the associated risks for man and the environment?

Literature

Aa, H. van der (Director). (2021). De Vuilnisman [TV series]. KRO-NCRV

Dietz, L., Visser, M., & Schipperheijn, K. (2020, September). *Onderzoek kwantificering ILT-bevindingen naleefgedrag Kwalibo-stelsel.* P2. https://www.rijksoverheid.nl/documenten/rapporten/2020/09/18/rapport-p2-onderzoek-ilt-bevindingen-naleefgedrag-kwalibo-eindrapport-03-09-20

Dorsthorst, A. te, Hal, P. van, Lievaart, L., Poelarends, C. & Soest, van K. (2015). *Tactische analyse Ketenaanpak Verontreinigde Grondstromen* (geanonimiseerde versie). Tiel: Gelderland Environmental Agencies Chain Supervision Team and the Police.

Hal, P., van, Lievaart, J. & Poelarends, C. (2017). *Tussenevaluatie Ketenaanpak Verontreinigde Grondstromen.* Tiel: Gelderland Environmental Agencies Chain Supervision Team and the Police.

ILT (2019). Signaalrapportage. Analyse risico's in de keten van bodemas. September 2019, https://www.ilent.nl/documenten/signaalrapportages/2019/09/04/signaalrapportage-analyse-risicos-in-de-keten-van-bodemas

ILT (2021). Signaalrapportage. Risico's bij de aanleg van gesloten bodemenergiesystemen. March 2021, https://www.ilent.nl/documenten/signaalrapportages/2021/05/10/risico%E2%80%99s-bij-de-aanleg-van-gesloten-bodemenergiesystemen

Kooiman, J.W., de Graaf, A, Bloemendal, J.M., van der Schans, M.L. (2021), *Rapport aanvullen van boorgaten voor gesloten bodemenergiesystemen: Verkenning van en voorstellen tot verbetering van de kwaliteitsborging* (No. 402045-108), KWR, Buro38.

Human Environment and Transport Inspectorate (2020). *Inspectiebrede Risico-analyse (IBRA).* The Hague: Ministry of Infrastructure & Water Management.

Kuijken, W. (2020, September). *Kleine korrels, grote discussie: Rapportage over granuliet en het Besluit bodemkwaliteit*. Secretary of State for Infrastructure and Water Management https://www.rijksoverheid.nl/documenten/rapporten/2020/09/18/20200901-procesevaluatie-granuliet

Poelarends, C., Hal, P., van & Lievaart, J. (2017). *Tactische analyse Ketenaanpak AEC-bodemassen* (anonymised version). Tiel: Gelderland Environmental Agencies Chain Supervision Team and the Police.

Rijkswaterstaat (undated a). *Algemene voorschriften voor afvalstoffen in het Activiteitenbesluit*. Infomil. Consulted via https://www.infomil.nl/onderwerpen/landbouw/activiteitenbesluit/thema'/waste-management/general/#Ban on mixing waste materials

Rijkswaterstaat. (undated b). *VTH en kwaliteitscriteria*. Infomil. Consulted via https://www.infomil.nl/onderwerpen/integrale/wet-algemene/vth-o/#:~:text=A%20professional%20quality%20of%20the,the%20Wabo%2Domain%20is%20involved

Spapens, A.C.M. (2019). Bestuurlijke aanpak van ondermijning: ervaringen in Nederland en het buitenland, *Tijdschrift voor Bijzonder Strafrecht & Handhaving* 2019, pp. 85-92.

Swartjes, F. A., Kok, L., Vercruijsse, W., & Dekker, E. (2019). *Risicogestuurd toezicht en handhaving: Ranking ongewenste gebeurtenissen in de bodemketen* (No. 2019–0105). RIVM https://www.rivm.nl/publicaties/risicogestuurd-toezicht-en-handhaving-ranking-ongewenste-gebeurtenissen-in-bodemketen

Winkelhuijzen, H.J.M., Kuil, J.W., Cieraad, F.D., Hendriks, W., Van Houten, M. & Weerman, E. (2020, September). *Beleidsevaluatie Kwaliteitsborging bodem* (No. 114822). Witteveen+Bos Raadgevende ingenieurs B.V. Deventer. https://www.rijksoverheid.nl/documenten/rapporten/2020/09/18/eindrapport-deel-1-beleidsevaluatie-kwaliteitsborging-bodem-04-09-20

Part 2
Threats related to the circular economy

6 Waste exists after all: old and new threats

Leo Buckers, Renske van Ginkel, Priscilla van Hal, Sipke Havinga, Walter Klomp, Edwin Lipholt, Mariëtte de Louw *

In recent years, the media have addressed various waste-related incidents where harm to the environment, public health, administrative integrity, and financial gains played a major role. Examples include the "Beerput Nederland" documentary, which has environmental investigators telling their story about fraudulent waste companies (Bosma, 2017), the pile-up of artificial turf in Dongen, which could not be processed and which went up in flames when a major fire raged (Bosma, 2018), the problems with the application of contaminated soil in a Barneveld residential area (Koomen, 2019), and the pile-up of barrels of toxic fire-fighting foam in Doetinchem (Haggeman, 2021). In addition, recent broadcasts of the "De Vuilnisman" programme (Van der Aa, 2021) highlighted the risks associated with co-digestion[190], plastic waste, and the possibilities - or lack thereof - of using WtE bottom ash.[191] Issues such as combustible waste, the complexity of certification, and fragmented supervision and waste fires have also been covered in this series. The recently published Van Aartsen report (2021) also stresses that these kinds of situations rightly receive a lot of attention, as they may have serious consequences for the health of local residents or cause damage to the environment. According to Van Aartsen, these incidents also raise questions about the effectiveness of government action.

The above picture is confirmed by the survey conducted and the interviews held with various experts prior to drafting the present Threat Assessment.[192,193] These showed that the vast majority of the listed threats were identified in the context of activities involving waste. Several government services have, as a result thereof, recognised the importance of jointly devoting a chapter to waste-related crime.

This chapter will address waste crime in its broadest sense. Before doing so, we will first provide a general overview of the waste industry. Our focus is on the physical and administrative activities and operations involving waste, which are carried out by various actors. We will then discuss the relevant laws, regulations, and agencies involved. In so doing, we will discuss any bottlenecks preventing effective action to be taken against waste crime. In addition, we provide insight into where and how waste-related crime takes place and which opportunities facilitate illegal behaviour.

In contrast to previous threat assessments (Neve et al., 2012; 2016), we chose not to specifically focus on one waste-related theme. This is because all illegal practices share a common thread: they are almost always aimed at obtaining financial benefits and reducing the administrative burden. We in this chapter therefore attempt to provide a comprehensive description of waste crime. To this end we, in addition to consulting the literature,

190 * Leo Buckers, Sipke Havinga, and Mariëtte de Louw work for the ILT. The authors would like to thank Shanna Mehlbaum and all their ILT, Environmental Agencies, and Police colleagues for their valuable feedback and their assistance with the preparation of this chapter. This term is explained in more detail in the box in section 6.5.4.

191 The material remaining after incineration of waste, such as household waste in a waste-to-energy (WtE) plant, which used to be known as a waste incinerator.

192 Scientists, journalists, and inspectors working for the NVWA, ILT, FP, Police, and the 29 Environmental Agencies.

193 Already described in Chapter 1.

made use of the results from interviews with various investigation leaders working for the ILT-IOD[194] and conducted a survey among various experts[195]. In conclusion, we will discuss the future threats identified within the waste domain. Finally, we provide insights into the impediments to properly tackle waste crime and make recommendations for a possible more effective approach to counter this form of crime.

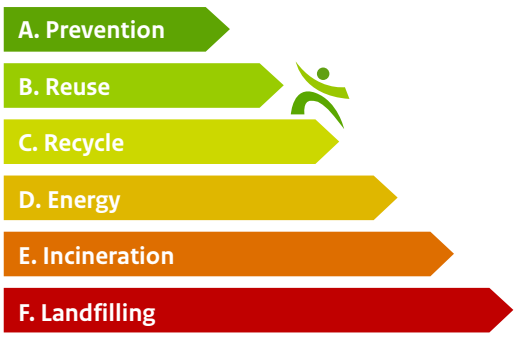
6.1 Industry description

The word waste is a broad term covering a multitude of substances, mixtures, and objects. Once the owner or holder wants to get rid (dispose) of them, these materials are referred to as a waste (Section 1.1 of the Environmental Management Act (Wm)). Wastes come in solid, liquid, and gaseous forms and can be divided into three main groups: household waste, industrial waste, and hazardous waste. Household waste refers to waste generated by and/or transported by private individuals. Once household waste is collected by the companies that store or transfer it[196], treat and/or process it, it becomes industrial waste. Waste from businesses is also considered (mixed) industrial waste. Hazardous waste contains substances that may be hazardous to safety, health and/or the environment due to their composition. The LoW code system must be adhered to when classifying waste. This is discussed in more detail in section 6.2. In addition to the above classification, certain special waste streams exist, including soils, dredged materials, sewage sludge, and radioactive (waste) materials. Many of these wastes are governed by their own legal framework. In a few cases, a substance is legally classified as waste, such as metallic mercury produced by the gas cleaning industry (EU 2017/825).

The waste management system as we know it today is the result of a transition process that has occurred over the past 50-60 years. In the 1960s, waste management was mainly a local issue. The dominant method of waste disposal was landfilling, and each municipality had its own landfill. Economic progress led to an increase in the amount of waste and changes in the composition of the waste (plastic packaging materials, disposable products, and toxic and chemical materials became more prominent, for example) (Raak, Spork & de Graaf, 2019). The space occupied by landfills, increasing public opposition, and soil contamination made (small-scale) dumping virtually unsustainable.

The pressure on the waste system led to a number of institutional and policy reforms and changes in the waste system gained momentum. In the 1990s, for example, waste (treatment) was increasingly considered to be a market. This led to the development of a waste market with its own economic regulations and privatised waste companies (Raak et al., 2019). This transition process has led to a strong policy framework, based on the so-called Lansink's Ladder of 1979 (Figure 6.1).[197] Prevention, reuse, and recycle (A, B and C) form the starting points for reducing waste (Raak et al., 2019). These three steps fit in well with the principles of the circular economy. Steps D, E and F reflect the linear economy: discarded products are simply thrown away.[198]

Figure 6.1 *Lansink's Ladder - The Waste Hierarchy (recycling.nl[199])*



194 Human Environment and Transport Inspectorate - Intelligence and Investigation Service.
195 The survey was widely distributed among the staff of the 29 Environmental Agencies, the ILT, the Police, and the FP.
196 E.g., recycling centres.
197 Also refer to the National Waste Management Plan, which details the policy framework setting out the objective of waste policy in the Netherlands and the policy for waste prevention and management (www.lap3.nl) Consulted on 7 June 2021.
198 https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/werking-circulaire-economie Consulted on 30 April 2021.
199 http://www.recycling.nl/ladder-van-lansink.html Consulted on 30 April 2021.

The concept of the circular economy has been added to this waste hierarchy, which has become an established policy framework. A circular economy is based on redesigning production and consumption to prevent or reduce waste generation (Raak et al., 2019) (also refer to Chapter 2). Given the rise of the circular economy, current policies are once again starting to feel obsolete. As a consequence, the waste sector seems to be on the eve of a new transition process. The current waste system is increasingly focused on optimising the waste treatment system and having as few streams as possible be processed using the least desirable forms of treatment (incineration and/or landfilling). Figure 6.2 illustrates the ideal path to transition from a linear economy to a circular economy. The rightmost image suggests that there will be no more waste. However, we are far from reaching that point, as we are still producing massive amounts of waste.

6.1.1 The waste chain and the parties involved

We will provide an overall description of the process steps of a waste chain. Several parties operate within the waste chain, including disposers, collectors, dealers, transporters, and processors. Many of the players can play multiple roles at the same time.

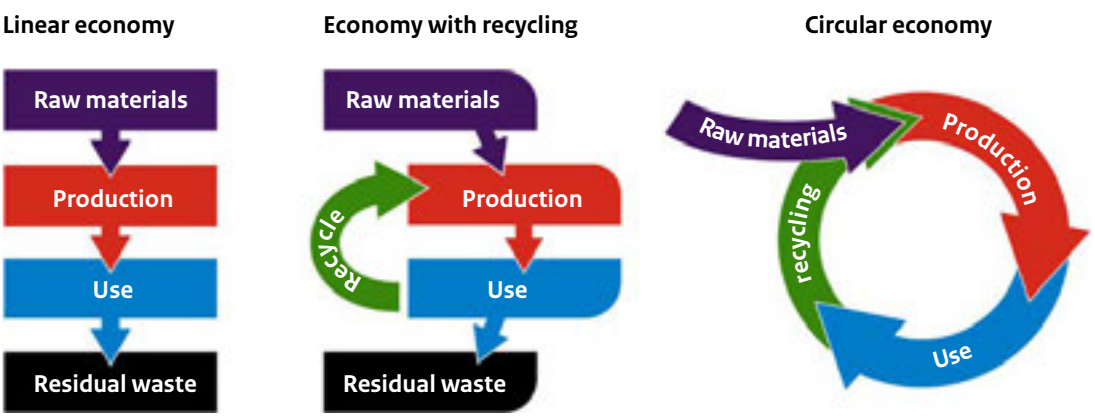
The first link in the chain is formed by the producers or the (primary) disposers of the waste. They are the parties the waste originates from and they must ensure that disposal takes place in a responsible manner. The (waste) materials may be delivered directly to an authorised final processor. In many cases, the waste can be processed indirectly, including by transferring it to a collector, (intermediary) dealer (without a facility), or broker, or by way of temporary storage. Transport plays an important role between the various steps. The transporter also forms a link in the direct and indirect waste disposal chain.

Keeping up with current developments in the waste sector, the vast majority of the parties involved (such as the waste collectors and processors) make sure the waste produced every day is treated as well as possible. Nevertheless, the waste sector's shift to a commercial market and the ever-increasing call for waste recycling contribute to incentives for conduct in violation of the rules within the sector.

6.1.2 Waste crime

Various studies have shown that high risks of (environmental) crime exist in connection with the physical and administrative operations to be performed in the delivery, transport, and processing of waste materials. Such criminal activities are also known as waste crime (van den Anker, 1997, 1999;

Figure 6.2 *From a linear economy to a circular economy (rijksoverheid.nl[200])*



200 https://www.rijksoverheid.nl/onderwerpen/circulaire-economie/werking-circulaire-economie Consulted on 30 April 2021.

Lievaart, Lipholt & van Hal, 2014; Mehlbaum, 2018; de Vries, Koonstra, Lievaart, Lipholt & van Hal, 2015; Spapens, Mehlbaum & Neve, 2019). Waste crime can be interpreted as the deliberate violation of waste legislation - in particular, violations of Chapter 10 of the Environmental Management Act (Wm) (Mehlbaum, 2018). The Economic Offences Act (Wed) enables criminal investigation and prosecution of violations of, inter alia, the Wm.[201] In addition - as was also mentioned in Chapter 1 - all kinds of environmental crime are seen to be closely linked to offences under ordinary criminal law, such as committing fraud (Section 326 of the Dutch Criminal Code) and forgery (Section 225 of the Dutch Criminal Code) (Neve et al., 2016).

Not all violations are deliberate violations: they may also be the result of companies being unsure about prescribed and desired behaviour due to regulatory complexity or a lack of knowledge of administrative obligations or environmental legislation (de Vries et al., 2015; Spapens, 2016; Mehlbaum, 2018). (Waste) legislation changes regularly and is quite extensive and complex. Although it can be a complex matter for companies to stay informed, this still remains the responsibility of the company itself (De Vries et al., 2015). Companies need to invest in knowledge and this does not always happen. In addition, the company has a legal obligation, when holding a permit (but also with respect to general rules), to be aware of the rules in force and to operate according to the general rules and/or terms of the permit (de Vries et al., 2015). Companies can sometimes use the (changes in) complex laws and regulations as an excuse, to justify their mala fide practices (de Vries et al., 2015; Mehlbaum, 2018). The boundaries of and loopholes in the law are both sought and exploited, because definitions are not always unambiguous and logical (de Vries et al., 2015). As a result, proving intent (deliberate action) proves difficult when dealing with waste crime.

6.1.3 Nature

Waste crime is a many-headed monster and has many manifestations. Examples include illegal export of waste from the Netherlands to China (Spapens, Mehlbaum & Neve, 2019), illegal mixing of waste by way of co-digestion[202], systemically using incorrect waste designations (Mehlbaum, 2018)[203], or cross-border smuggling of electronic waste to West Africa (Bisschop, 2015).

Many different players, locations, chains, industries, and knowledge themes can be identified in the waste stream chains (Mehlbaum, 2018; CDM, 2015). This means that the authorities involved in licensing, supervision, and administrative and criminal enforcement of the waste stream chains have a lot on their plate (Mehlbaum, 2018; CDM, 2015). The cooperation and exchange of information between these authorities, described in Chapter 1, forms a complicating factor. Moreover, the individual supervisory bodies are only responsible for part of the supervision within the chain. As a result, there is a lack of focus on the chain in its entirety, causing the various authorities to fail to organise their joint clout. In addition, the nature of the offences almost always relate to complex legislation, regulated by (constantly) changing competent authorities, and resulting in complex flows and a multitude of (administrative) obligations. Physical and administrative investigations are difficult and offenders are only rarely caught in the act. Crime often stays hidden: it requires active detection by the authorities (CCV, 2019). Criminal investigations are largely about matching an offender to an identified crime. This process is turned around in the case of environmental crime: the investigative bodies must actively find out whether criminal activities have taken place and whether crimes have been committed (CCV, 2019).
Furthermore, waste and waste chains move across borders; they are not tied to a particular location and are moved locally, regionally and (inter)nationally. In addition to being committed in the domestic waste chain, waste crime also often occurs on the international stage. Waste crime can be facilitated from the Netherlands due to its favourable geographical location in relation to surrounding countries, its highly developed (IT) infrastructure, and its solid transport options using various modes of transport. Much waste is transported

201 Section 1a(1°) and (2°) of the Economic Offences Act (Wed) stipulates which offences are economic offences. If the economic offences are committed intentionally they are serious offences; if not, they are minor offences (Section 2(1) of the Wed).
202 This term and the problem is discussed in more detail in section 6.5.4.
203 Also refer to Gelderland District Court, 4 December 2017, ECLI:NL:RBGEL:2017:6196

internationally by containers and other countries make use of the facilities that the Dutch ports offer - often uniquely so. This creates a pull factor: waste is transported from neighbouring countries to the Netherlands for subsequent bulk shipment to various global destinations. The Netherlands also imports a lot of waste for processing in its domestic waste-to-energy (WtE) plants. In addition, waste materials are imported for use as construction materials (WtE bottom ashes), among other things. The residues must be domestically dumped or used as disguised construction material.

6.1.4 Size

The total size of waste crime is currently unknown. When recorded in police systems, environmental cases are sometimes also registered under another heading (e.g., forgery). It is therefore quite possible that certain incidents are not recorded as environmental crimes, but, for example, as fraud cases. The number of recorded cases is around 7,000 cases per year, with 'waste fires' and 'putting waste on/in the soil' jointly accounting for more than half of them (BVH Environmental incidents, 2016-2020). However, there may be a dark number at play in the context of waste crime.[204] Offences committed are not always visible and are therefore not recorded.

There is also a lack of visibility on the number of waste-related offences processed and settled by other regulatory bodies. What is known is that these amount to several thousand cases that are mostly dealt with administratively, the advance notice that enforcement action will be taken often already leading to desired behaviour. The Environmental Agencies and other regulatory bodies, such as the ILT, Water Authorities and NVWA, often do not label violations and acts as being waste-related. On top of that, many offences are combined ones, the improper handling of waste being just one aspect of the total offence. Examples include improper delivery combined with improper storage, EWSR violations that are also recorded as administrative offences, the discharge of waste into the sewer, surface water and/or soil.

Inspectieview has been in use for several years. This information system, set up by the ILT, allows the Environmental Agencies, national inspectorates, and other supervisors to upload their own information and view data about the inspections carried out by the other parties. However, a study by the Court of Audit (2019) has shown that the quality of the data entered into Inspectieview is, to date, of insufficient quality. In addition, the extent of waste regulation violations cannot be properly deduced from these data, as the sources (the member services) do not consistently record them as such.

The lack of reliable information on the number and nature of waste-related offences limits the effectiveness of the services concerned. The probability of a violation being flagged is related to the probability of being subjected to an inspection. It is therefore important to focus inspections on those parts of the chain where violations are most likely to occur. Because of the absence of validated information, this is currently impossible, even though each service makes choices based on its knowledge and experience.

While the so-called dark number cannot be calculated, it is clear that waste crime is significantly more common than is shown by the number of criminal cases resolved by the Environmental Chamber: some 15 in 2019 and 20 in 2020.[205] The number of cases recorded by the police (approx. 7,000 per year)[206] provides a better indication of the scale, as the number of cases settled under administrative law is also estimated to amount to several thousand. Unfortunately, these are not uniformly labelled, making it impossible to present validated figures.

6.2 Relevant legislation

Attempts are made to control the risks posed to humans and the environment by waste-related activities by way of international and national legislation and supervision.

204 The dark number refers to unrecorded crime, especially in the criminology context.
205 Report of cases resolved by the Environmental Chamber, prepared for the Threat Assessment.
206 BVH Environmental incidents, 2016-2020.

6.2.1 Definitie

The concept of waste is defined in national legislation. Chapter 10 (the chapter on waste) of the Environmental Management Act (Wm) delineates the concept. According to Section 1.1 of the Wm, waste is "any substance, mixture, or object that the holder disposes of, intends to dispose of, or is required to dispose of". Of particular importance in the definition of waste is the delineation of by-products and of the end-of-waste status (when the material is no longer considered to be waste). A by-product is created as a production residue during the manufacture of the primary intended product and need not always be a waste. Section 1.1(6) of the Wm sets out the conditions for determining whether a material is a by-product (non-waste). Materials released from a waste treatment operation aimed at 'recovery' of waste can obtain end-of-waste status. If no international or national regulation providing end-of-waste criteria applies to the waste stream in question, the provision can be met based on the conditions set out in Section 1.1(8) of the Wm. One of the (unclear) conditions that applies to both a by-product and end-of-waste status is that its use will not result in overall adverse environmental or human health impacts.

However, many waste topics are not regulated in the Environmental Management Act, but in other legislation, such as European regulations, Orders in Council, provincial environmental bylaws or municipal waste substances bylaws. A distinction can in this connection be made between regulations aimed at the treatment of waste within a company and those applicable to the collection and transport of the waste.

6.2.2 Regulations within the establishment

One important regulatory instrument for the handling of waste by a company (the Environmental Management Act refers to an "establishment") is the permit, as referred to in the environmental legislation. Incidentally, not all activities involving waste are regulated by a permit: such activities are subject to general rules (see cat. 28.10 of the Living Environment Law Decree). Establishments are required to obtain a permit when they are designated as an establishment requiring an environmental permit under an Order in Council - in this case, Annexe I to the Living Environment Law Decree (Bor).

Pursuant to Section 2.1(1)(e) of the Environmental Permitting (General Provisions) Act (Wabo), it is prohibited to set up, operate, modify, or alter the operation of an establishment without possessing an environmental permit. The Wm defines an establishment as: "any activity performed by people in a commercial capacity, or on a scale as if they acted in a commercial capacity, which is usually performed within certain limits". The Activities (Environmental Management) Decree distinguishes between three types of establishments: types A, B, and C.[207] Type A establishments carry out activities that are only lightly detrimental to the environment. Offices form an example. They are not required to notify the competent authorities when setting up or modifying the establishment. Nor are they required to obtain a permit. However, an establishment as referred to in the Wm must be set up and the requirements of the Activities Decree must be met. Unlike type A establishments, type B establishments do have to report to the competent authority when setting up or modifying the establishment. Type B establishments do not need an environmental permit, but do sometimes require an environmental permit under the Environment and Planning Act with limited environmental assessment (OBM).[208] Garage businesses are an example of a type B establishment. Type C establishments require an environmental permit. They must report activities to which Chapter 3 of the Activities Decree applies. The permit does not need to state any conditions applicable to such activities. Sometimes, type C establishments also need to obtain an OBM. In addition to having elements of the Activities Decree apply to them, the company's environmental permit will list supplementary environmental rules the company

207 https://www.infomil.nl/onderwerpen/integrale/activiteitenbesluit/activiteitenbesluit/typen-inrichting/ Consulted on 6 May 2021.

208 The permit under the Environment and Planning Act with limited environmental assessment (OBM) is a simple permit. OBMs are mandatory when performing certain activities that cannot meet the requirements of the Activities Decree without a prior test having been conducted. Such test could cover, for example, local nuisance (noise, odour, air quality) and efficient waste management. https://www.infomil.nl/onderwerpen/integrale/activiteitenbesluit/activiteitenbesluit/eerste-kennismaking/uitleg-0/#hd07c5332-bda2-48de-ad71-a0c8b46c3809 Consulted on 6 May 2021.

needs to comply with. Other environmental rules may apply in addition to those imposed by the Activities Decree and the environmental permit.

The licensing authorities carry out an efficiency assessment of the waste-related permit requirements based on the National Waste Management Plan (LAP).[209] In addition to prescribing that general policies need to be complied with, the permit for each waste stream provides how it must be processed in terms of segregation and recycling, landfilling or incineration.

6.2.3 Requirements outside the establishment

The Industrial and Hazardous Waste (Notification) Decree contains rules on issuing, receiving, and transporting industrial waste and hazardous waste. According to Section 10.40(1) of the Wm, "a person who is authorised to collect the waste or who is authorised to recover or dispose of the waste and to whom industrial waste or hazardous waste is provided" must report this to the National Waste Control Centre (LMA). During transport, the transporter must carry an accompanying letter containing important data about the disposer, the transporter, and the recipient (Section 10.44 of the Wm).[210]

The distinction between hazardous and non-hazardous wastes and the definition of many types of waste are laid down in the European List of Wastes (LoW). The European List of Wastes (LoW) classifies waste into 840 different waste streams. It also contains a system for classifying waste streams into hazardous or non-hazardous ones, depending on the amount of hazardous substances present. The usually pluralistic composition of waste complicates correct categorisation for both the market and enforcement bodies. Costs must for example be incurred in taking a representative sample and having an analysis of the composition of the samples taken performed.

Companies that collect waste from the disposer and do not bring it to their own establishment are classified as collectors. To be allowed to transport, collect, trade and/or broker commercial and hazardous waste in the Netherlands, the collector must be listed on a list of Transporters, Collectors, Traders, and Brokers, known as the VIHB list. The National and International Road Transport Organisation (NIWO) controls admission to this register. The submission of a Certificate of Good Conduct (VOG) is sufficient to be placed on the VIHB list.
Collectors of small hazardous/chemical waste, waste oil, and ship waste substances must possess a collection licence issued by the Minister of Infrastructure and Water Management. This licence, issued by the ILT on behalf of the minister, includes regulations on the means of collection to be used, on keeping waste separated, and on record-keeping and internal controls.

At the global level, the Basel Convention governs international trade in waste. Its core principle is that exports of hazardous waste from OECD[211] countries to non-OECD countries are prohibited. The EU has adopted this principle in the European Waste Shipment Regulation (EWSR)[212] to regulate the trade of waste both between Member States and to countries outside the EU. This roughly boils down to the following:

- Imports and exports of hazardous waste require a permit;
- The export of hazardous substances to non-OECD countries is prohibited;
- A permit is required to export non-hazardous waste to non-OECD countries when that country stipulates that a permit is required for that particular waste;
- Documents enabling regulatory bodies to monitor shipments are prescribed for shipments of non-hazardous waste between OECD countries (including Europe). The sender of the waste in these documents also undertakes to take back the waste if it cannot be processed by the recipient.

209 But it also contains environmental waste-related instructions.
210 Containing information on the disposer, receiving establishment, amount of waste, and type of waste.
211 Organisation for Economic Co-operation and Development.
212 Regulation (EC) No. 1013/2006 of the European Parliament and of the Council.

The EU has furthermore set rules for the treatment and disposal of waste within Europe in its Waste Framework Directive (Directive 2018/851/EC), which contains definitions of wastes and of the concepts of recovery and final disposal. The Waste Framework Directive establishes a permit requirement for waste treatment and requires transporters, collectors, and dealers of, as well as brokers in, waste to be registered.

6.2.4 Relationship with non-waste regulations

Waste regulations often need to be seen in conjunction with other policy domains concerning streams that pose environmental risks. Examples include fertiliser regulations, the Animal By-Products Regulation (supervisor: the NVWA), the use of waste streams as biofuel (supervisor: Dutch Emissions Authority (NEA)), the Soil (supervisor: the ILT and Environmental Agencies), Reach/Substances of Very High Concern (the ILT and Environmental Agencies), and water management (Water Authorities, Rijkswaterstaat).

This consistency and the sometimes difficult demarcation between legislative regimes renders waste regulation, including supervision, a complex affair.

6.3 Competent authorities and supervisors involved

The permit conferral, supervision, and enforcement system (VTH) has recently been the subject of several evaluation reports, such as the "De markt de baas" report by the Centre for Crime Prevention and Public Safety (CCV). This report explored bottlenecks in tackling environmental crime on behalf of the Ministry of Justice and Security (J&V) and the Ministry of Infrastructure and Water Management (I&W). In addition, the Van Aartsen Committee recently issued an opinion on how to strengthen environmental monitoring and enforcement. These reports have been addressed in detail in Chapter 2.

Several organisations are involved in the supervision of waste streams and related activities. The supervision of compliance with waste legislation has in part been assigned to the provincial and municipal authorities, which have jointly outsourced this task to the Environmental Agencies. A nationwide system of 29 Environment Services exists in the Netherlands. These services are responsible for the permit conferral process (including notifications as required by the Activities Decree), supervision, and administrative enforcement of establishment-related waste operations. In principle, the Environmental Agencies also avail of special investigating officers, who are authorised to draw up official reports (under criminal law) in case of violations of the rules. The municipal authorities are responsible for enforcement in public spaces and, therefore, for enforcement actions when waste is dumped.

At the national level, multiple bodies, including the ILT, NVWA, ISZW, and Customs, are involved in supervising waste streams. The ILT, Customs, and the police monitor compliance with the EWSR. In addition, the ILT serves as supervisor of compliance with the Waste Collection Decree and Regulations (BIA/RIA) and with five product decrees that make producers responsible for the collection and recycling of packaging, discarded electrical and electronic equipment, batteries, scrap vehicles, and car tyres. It also (co-)supervises compliance with various other laws and EU regulations that touch on waste, such as REACH, POPs, mercury, asbestos, and soil.

The NVWA inter alia supervises animal residues and by-products and fertiliser legislation, which may be linked to waste legislation. The same applies to biofuels, which incorporate waste streams; these are supervised by the Dutch Emissions Authority (NEA). The NVWA also supervises the safety of food and (consumer) products.

The Inspectorate SZW (ISZW), too, sometimes has a role to play, to wit, in cases where compliance with environmental regulations touches on working conditions at companies. This connection also makes waste regulation, including supervision, complex.

The Water Authorities and Rijkswaterstaat are the supervisory authorities for the direct discharge of waste into surface waters. Supervision of indirect discharges, via a sewer, is generally conducted by the Environmental Agency, on the instructions of either the municipal or the provincial authorities. In special cases, the State has competence: the Minister

of Infrastructure and Water Management (I&W) supervises military establishments and the Minister of the Interior and the Minister of Economic Affairs (EZ) supervises mining establishments. In addition, the Special Investigative Services (BOD) and the police have a duty to investigate. Chapter 1 details the organisation of this investigative duty.

In addition to harmful effects to the environment arising from establishment-related waste activities, the trade in wastes, construction materials, and soils also produces a so-called mobile environmental impact. For example, after asbestos is removed and a building is demolished, construction rubble is crushed into granules by a mobile rubble crusher and then used in regional road construction. Regulation of this environmental impact, which is not tied to an establishment, requires supervision of an entire chain of actions by different companies (chain supervision). This is all the more relevant now that trade is increasingly taking place fully digitally and the party selling or buying the materials can be located anywhere in the world. Although chain supervision and/or internet supervision has been implemented and is being performed in some cases and by some services, the current system still does not contain any systemic provisions for doing so. "Chain supervision is not ingrained in the system," Berenschot notes in its report (Berenschot, 2019, p. 34). However, contrary to Berenschot's assertions, a number of Environmental Agencies have systemically implemented chain supervision since 2013. The Environmental Agencies that do perform chain supervision have, first of all, gained more insight into these types of waste-stream chains within the administrative environment by conducting chain-wide risk analyses. This for example requires collating and analysing all kinds of detailed information from different sources about activities that are not criminal but are unusual or fraught with risks. In addition, (in-depth) administrative audits validated the problems described in the analyses. It has been found that occasional 'regular' physical supervision alone is not the right approach for supervising waste chains. A transition to a comprehensive and targeted administrative strategy is required.

Some 10% of total container movements in Dutch ports involve containers labelled 'waste'. These containers originate from, are destined for, or are transited through locations around the world. To realise effective international enforcement and supervision, international networks, such as IMPEL[213], are being used. Because international waste streams also are also destined for, or originate from, the Netherlands, the sound exchange of information between national services and the competent provincial and municipal authorities is crucial in the framework of the VTH system. Cooperation between the various supervisors, and between supervisors and the investigative authorities, is essential to tackle non-compliance and waste crime and for enforcement to be effective. It is precisely the 'fragmentation' of supervision and lack of cooperation between different supervisory bodies that increases the likelihood of non-compliance and provides opportunities for criminal activities involving waste. These developments call for more comprehensive (and better aligned) supervision. However, supervision is still fragmented and non-committal, while working methods and sanctioning procedures are not uniform (van Aartsen, 2021).

A stringent approach to environmental crime is further hampered by the lack of urgency given to environmental crime by the Public Prosecution Service (PPS), Police and the competent authorities, such as municipalities and provinces (Mans Committee, 2008). Recent studies show that the situation has worsened rather than improved since (van Aartsen, 2021). The CCV (2019), in its exploration of bottlenecks in tackling environmental crime, mentions a number of causes for the lack of attention given to criminal enforcement. Substantive environmental law is complex. As a result, it is susceptible to fraud and difficult to enforce. Criminal enforcement requires a lot of specialised knowledge, both at police and by prosecutors and judges. That capacity is scarce. The sentences imposed are often disproportionate to the proceeds of illegal environmental transactions. This may seriously compromise the credibility of public policy and societal interests.

213 IMPEL is a European organisation for the implementation and enforcement of environmental legislation in which all European countries participate.

6.4 New developments

6.4.1 Letting go of the precautionary principle

Until recently, the so-called precautionary principle seemed to be leading in the world of waste. Under this principle, waste regulations are interpreted strictly to avoid risks of environmental damage and the setting of a precedent, even where this would not necessarily be required. Due to the pursuit of circularity, this principle, too, is increasingly being put into question. If, in a production process, a so-called production residue is generated that falls under the definition of waste, the disposer is faced with certain regulations when handling the stream concerned and limits sales options.

Residual production of plastic flower pots
Leftover trimmings from the production of luxury plastic flower pots. If they could be supplied as by-products[214] to the neighbouring company, which will be able use them directly in the production of less luxurious flower pots, it would seem 'excessive' to label those trimmings as waste. Once stripped of the waste label, the trimmings can, by designating the stream as a by-product, be sold as a product to the nearby flowerpot company without much fuss. That would seem to be a win for the circular economy, as it results in less waste. But that same 'product' can also be sold without impediment (because it is not waste) to a trader who ships them to, say, Pakistan, where no supervision on the use of this 'product' whatsoever exists.

This, in a nutshell, is the core dilemma and an example of the risk involved in broadening the interpretation of the concept of by-products. The same applies to the so-called 'End of waste statement'. After a bit of processing, something that was waste is once again designated a product. Few trade restrictions are in force for the producer and recipient of this product. The waste company would preferably market the plastic pellets produced by a plastic processor's recycling facility as a product (end-of-waste) and sell them to a company that makes plastic products out of them. When sold to a trader, the same pellets may be shipped abroad, to be sold as fuel pellets without any restrictions being in place.

6.4.2 Delineation of the definition

Given the great diversity of production residues and waste to be recycled, it is very complicated to delineate the definition of waste. The Ministry of Infrastructure and Water Management has drawn up a 'Waste or product guideline' that may help stakeholders in their assessment. In addition, a 'Waste or resource' web test able to provide an automated assessment based on the data entered, has also been developed. The possibility of seeking a legal opinion from Rijkswaterstaat has currently been put on halt due to the high number of applications.

This scaling back of the precautionary principle and the pursuit of circularity causes the already complicated waste law to become even more complicated for companies to adhere to and more difficult for enforcement agencies to enforce. The risk of environmental crime in the waste world increases when polluting streams - dubbed by-products or end-of-waste materials - enter the free market without the trade restrictions and monitoring tools relevant to controlling waste being in force. The steps taken towards greater circularity in the waste world should go hand in hand with clear statements on the demarcation between waste on the one hand and by-product and end-of-waste status on the other.

6.4.3 Reducing administrative burdens

Simplification in legislation for reasons of reducing administrative burdens has led, among other things, to waste permits being granted for an indefinite period of time, meaning it is up to the competent authority to take the initiative[215] to update the permit. However, the licensed waste establishment often lacks an incentive to cooperate with a new permit conferral procedure if environmental requirements have tightened since the last permit was issued.

214 Refer to the legislation section for an explanation of the concepts of by-product and end-of-waste status.
215 This was enshrined in law following amendments to the National Waste Management Plan.

6.5 Opportunities within the waste chain

Everyone has their own picture of what waste crime looks like - a picture that is often based on personal experience, news reports, and other sources. These pictures are often similar and are based on news reports featuring the same types of parties involved (waste processors), behaviours (just fumbling around), and motives (money).

The results of a survey conducted among supervisors and investigating officers of the Environmental Agencies and national organisations show that, while these images may not be untrue, some nuance is required. We have also conducted some in-depth interviews with ILT-IOD investigation leaders to identify the prevailing views with regard to developments in waste-related environmental crime. The results of the survey and interviews are presented in the following sections, which also outline the existing opportunities for waste crime.

6.5.1 Complex legislation

Opportunities for crime arise because watertight monitoring of environmental compliance is difficult to achieve (Neve et al., 2016). When it comes to environmental crime, these opportunities appear to be widely available, as does the financial incentive to take advantage of them. These characteristics virtually generate crime (Neve et al., 2016). This is also an issue in the context of waste crime. The regulations concerning waste are complex. There are a number of reasons for this state of affairs.

Firstly, the term 'waste' is a collective noun for all stuff/substances an individual or company - the disposer - wants to dispose of at any point in time. All products made can return to a waste stage after use; waste streams are therefore as diverse as products are. In addition, activities are subject to requirements and rules for the protection of the environment, physical safety, food safety, and public health. Compliance with these rules is costly (Neve et al., 2016). Waste is trade. Waste treatment is often a cost item, and waste producers and waste processors try to keep the cost as low as possible. For this reason, waste companies and traders are looking for methods to keep the costs of processing, landfilling, or incinerating the waste as low as possible and for locations and countries where such treatment is as cheap as possible.

The specialised and complex nature of many wastes and rules constitutes a final cause. This frequently manifests itself by deliberately or unintentionally misstating the composition of waste and/or providing a wrong designation of (waste) activities. While the legislation is complex, many small actors in the waste chain lack sufficient knowledge. The same applies to licensing, supervision, and enforcement. As a consequence, potentially harmful substances are diluted and/or unknowingly dispersed across the earth's surface while an unfair market position may be obtained.[216]

The below box provides an example of the market and subject matter complexity and of the financial gains characteristics in the context of biomass:

Biomass

The call for more environmentally friendly fuels and a commitment to drive their use in the EU has led to various oil-based resources being exploited to produce biodiesels. It turns out that, besides crops (rapeseed and palm oil), some waste products can also be used. The Used Cooking Oils (UCOs) in particular are popular. This development has some downsides. For instance, virgin forests are converted to palm oil plantations, with the resulting virgin palm oil being directly shipped to the EU as an UCO, as the EU is willing to pay more for UCOs than palm oil is worth in the country of production. In addition, vulnerable areas are threatened by the intensive cultivation of monocultures, while dangerous UCOs are being falsely labelled as sustainable UCOs.

So far, increased regulation (limiting the use of so-called UCOs) has only led to a shift of criminal activities to the production of (palm oil-containing) wastewater from the palm oil industry, demand for which (in the EU) has also quickly outstripped supply (in Asia/South America).

216 Results of interviews and experts.

In addition to manipulating (the origin of) raw materials, fraudsters also take advantage of the absence of supervision and control. For many governments, the matter is something they have not dealt with before. As a consequence, specific legislation is still lacking or not yet fully fleshed out. The EU's sincere intention to increase biofuel usage has directly and primarily led to adjustments in the (global) market, to new illegal activities, and to a significant impact on multiple environments.

6.5.2 Improper use of legal funds

An important principle that applies to environmental crime, and certainly to waste crime, is that a large proportion of criminal (environmental) offences are committed by legitimate businesses and their associated executives. This constitutes the so-called organisational crime (Neve at al., 2016). Offences therefore also tend to take place within a legal context (Neve at al., 2016), as the companies that commit them tend to have a legitimate raison d'être. The dividing line between illegal and legal activities is often a thin one and the activities are often closely related. Examples include improper use of environmental permits, market access, subsidies, and other sources of funding to facilitate illegal activities. The legal context in which waste companies operate is highly regulated by the government, especially with respect to economic activities involving risks to the environment and to local residents (Neve at al., 2016). Waste crime therefore often consists of the wrongful (un) intentional *failure to do* things that should have been done, such as not following the regulations on business processes (Neve at al., 2016). Huisman and van Erp (2013) refer to such acts as *crimes of omission.*

6.5.3 Cost avoidance

It is interesting to discuss the possible motives for a company to knowingly commit an offence and knowingly risk getting caught. To ensure continuity of a business, it is important for it to generate sales and to eventually make a profit. In most cases, the disposer pays the collector in order to hand over the waste, while the collector only needs to incur costs to responsibly dispose of it, or have it disposed of, at a later stage. Because, barring exceptional cases, waste costs money, a company often wants to have the waste processed or disposed of in the cheapest way possible, putting economic interests ahead of the environmental soundness of the solution (de Vries et al. 2015; Spapens, 2016). For companies can save money by avoiding these costs. One method used to achieve this is to manipulate an administrative label or physical composition by way of mixing, thus effectively disguising the identity of a (waste) substance. This manipulation allows (waste) substances to become a source of profit, as it can now be recovered or usefully applied. Once such administrative or physical manipulation has taken place, it is often difficult to expose the illegal activities (de Vries et al. 2015). The increasing interconnectedness of environmental rules with tax rules is likely to increase cost avoidance as an incentive to commit crime.

The box below shows an example calculation of this type of avoidance costs:

Avoidance costs

The ILT's Inspection-wide Risk Analysis (IBRA) provides an estimate of the damage caused by non-compliance with waste regulations (ILT, 2020). It in so doing determines where social risks are greatest. This ILT-wide risk analysis displays the damage of societal risks the ILT has to respond to in euros. 'Waste' risk has topped the list for four years in a row.

Due to the large number of different waste streams and the many different hazardous substances present in those wastes to varying degrees, the environmental damage cannot be calculated. To compile the IBRA, damages were therefore calculated using the so-called "avoidance costs". These are the costs avoided by not processing waste streams according to the rules. The IBRA 2020 shows that approximately 9.5 million tonnes of waste are processed improperly or not in accordance with the Dutch recycling targets every year. Assuming avoidance costs of about €196 per tonne, the environmental damage caused by improper waste treatment is estimated to amount to €1.8 billion per year (9.5 million x €196).

6.5.4 Paper reality

Because waste streams, which should be reported to the LMA, are deliberately or unintentionally mislabelled or disguised on paper by not reporting them, reporting them in full, or using an incorrect LoW code or waste description (de Vries et al. 2015; Mehlbaum, 2018), disposers, brokers, transporters, and recipients can be rendered invisible to the supervisory authorities. This may also serve to conceal unlawful gains. By using an incorrect LoW code, the waste stream has become invisible in the records, as it can no longer be properly tracked in the systems (de Vries et al. 2015). Furthermore, it may appear on paper that the waste is going to an authorised processor or to an intermediate storage facility, while they are in reality sent to an unlicensed site (de Vries et al. 2015). Identifying such activities require in-depth administrative and/or financial investigations, comparing a company's waste flow records, financial records, and process records to identify discrepancies.

The below box provides an example of the paper reality, financial gains, and complex regulations characteristics in the context of co-digestion:

Co-digestion

Co-digestion, which involves animal manure being mixed with plant and/or animal co-digestion materials, provides renewable energy (biogas, electricity) and was supposed to contribute to resolving the manure surplus issue. The wet residual product, the digestate, is used as a fertiliser in agriculture. Co-digestion is in keeping with the pursuit of a sustainable and circular economy and the Climate Accord and is socially welcomed. However, it has been found that co-digestion cannot be made profitable without the subsidy provided by the Dutch government (the so-called SDE+) (Lievaart et al., 2014; CDM, 2015; Toezine.nl, 2015; LIEC, 2016; Mehlbaum, 2018).

Too, it has become apparent over the last two decades that co-digesters are also used to illegally dispose of (unauthorised) waste. (Lievaart et al, 2014; CDM, 2015; Toezine.nl, 2015; Mehlbaum, 2018). Such wastes include offal, sludge from the paint and cardboard-producing industries, PCBs, dioxin and filter materials containing carbon (activated carbon), bleaching earth with high levels of heavy metals, distillation residues from organic chemical industries, wastewater and sludge from industrial cleaning processes, chemical product residues, process water containing cleaning agents (including those containing fluorine), various fats and oils, pit greases and sludges (Lievaart et al, 2014; CDM, 2015; Toezine.nl, 2015; LIEC, 2016). The greatest risks of violations relating to the environment and/or public health, as well as to the mislabelling of streams and (subsidy) fraud, relate to compliance behaviour with regard to the (waste) streams to be co-digested (Lievaart et al, 2014; Toezine.nl, 2015; Mehlbaum, 2018).

A clear financial motive to commit fraud is apparent in the sector, while ample opportunity exists to do so (Lievaart et al., 2014; Mehlbaum, 2018). In a nutshell, the paper reality in a context of (overly) complex legislation, the fact that fraud is lucrative and easy to commit, and the lack of compliance with regulations, causing all kinds of risks to public health and the environment, are the main bottlenecks in the co-digestion sector. Considered in combination with fragmented supervision and a lack of physical inspections, the government is creating opportunities for the mislabelling, blending, or other fraudulent processing of waste materials (Lievaart et al., 2014; Toezine.nl, 2015; LIEC, 2016). The limited possibilities to conduct physical sampling of the substances used - they are expensive and labour-intensive - also play a role.

As there is no immediate victim, it is easier to trivialise the wrongdoing. After all, the environmental problem only arises over time and is rarely directly attributable to a particular wrongdoing and/or to incorrect labelling or classification. Also, the problem mostly manifests itself elsewhere.[217]

217 Interview and expert consultation results.

6.5.5 Actors in the chain

The survey shows that the cases relate to a wide range of companies, from large processors to one-man businesses, from traders to chemical complexes. It does seem that the share of companies that have made deliberately testing/crossing the limits of the law their business case has decreased over the years.[218] Large waste companies seem to be acquiring an increasing share of the waste market.[219] This increase in scale also spells the end of some of the small businesses that, on average, possess less expertise and pay less attention to internal controls and the segregation of duties. On the other hand, there are plenty of examples where a local company is acquired by an (inter)national player and the existing day-to-day business continues under a different monnicker.

Several surveys show that traders form a particular problem in the waste industry. The literature (van den Anker, 1997; Spapens, 2016) notes about these traders that they conceal the market from view, cannot be properly inspected, and presumably act in a culpable manner. Traders being difficult to properly inspect is mainly due to the fact they are not subject to licensing, like an establishment is, and often do not have a physical business location, making it difficult to carry out controls. Waste trading is also increasingly taking place on the internet.[220] Controls, however, focus mainly on physical activities. Supervision and enforcement actions by the government are, after all, based on a permit or a notification under the Activities Decree. Traders must be registered in the VIHB, however. Problems occur when they do not have the required dispositions, certificates, recognitions, or registrations. It is difficult to obtain a proper view of the traders, as these companies also, mostly for competitive reasons, often do not want to reveal the parties they do business with. This is to prevent a processor from directly doing business with the disposer.

The above issues may also arise in the case of a processor of substances. The core difference with the situation of the traders detailed in the above is that processors have their own establishment. Companies can use an environmental permit issued for an establishment to commit offences. The permit indirectly and unintentionally facilitates this conduct. Sometimes, several links in the chain are in the hands of the same individuals. And sometimes a licensed establishment is used by multiple companies. In practice, multiple companies are often located at the same address, complicating the view of the establishment and limiting visibility on the companies' actions. The various companies may all play a part in the specific waste chain and can thus exchange waste streams/wastes among themselves to remove them from sight and mislabel waste streams. On paper, the substance is delivered to another company, when in fact it is stored and/or mixed within the same establishment. Practical experience has shown that such companies may act similarly to the traders described in the above. They are however able to mix waste materials on their own site (de Vries et al. 2015). The (intermediary) trader sometimes makes money twice, by turning a waste with no value into a valuable substance.

The below box provides an example of the unequal international playing field and the financial gains characteristics in the context of plastic waste:

Plastics

The plastics discarded in the western world in recent decades were sent to south-east Asia, and in particular to China, by the shipload. Research has also shown that the Netherlands and the EU hardly possess any processing capacity. This is partly driven by limited demand for recyclate, while this is very much present in south-east Asia. Moreover, labour in south-east Asia is cheap and residual waste rules are 'limited'. Too, hardly any (administrative) export restrictions existed with respect to plastic waste. This fact, coupled to the lack of enforcement capacity, has led to a proliferation of illegal recycling activities and an increasing plastic waste stream. A growing number of countries has introduced or is considering to introduce import restrictions. The extended Basel Convention (2019) forms an important foundation for this development.

From 2021 onwards, exports of contaminated plastics are allowed only with the consent of the both sending and receiving country (EWSR notification). This

218 Interview and expert consultation results.
219 https://www.nrc.nl/nieuws/2007/01/22/schaalvergroting-drijft-overnamegolf-in-afval-11263521-a938811 Consulted on 7 June 2021.
220 https://www.circulair.biz/ Consulted on 7 June 2021.

creates problems in (continuity of) waste disposal in the sending countries, which are taken advantage of by various traders and companies by mislabelling contaminated waste and exporting it as yet. In so doing, they undermine the need and necessity of developing and maintaining recycling facilities in the Netherlands and/or the EU.

6.5.6 Financial gains

Financial gains still form a major driver of waste crime (Mehlbaum, 2018). This is acknowledged by several experts. The waste producer, the disposer, usually pays for the disposal of the waste and in doing so assumes - often based on the contract concluded - that its waste will be carefully processed, relying on the knowledge and experience of the processor. Processing the waste in a different and less careful way forms an easy source of money for the processor, regardless of the problems this causes further down the chain. However, the survey shows that multiple incentives are often at play, unfamiliarity with the complex regulations or a different interpretation of them scoring high. The supervisory bodies, too, confirm that the issue of waste, both in its manifestations and as encapsulated in regulation, is a complex one (including with regard to biomass and the Substances of Very High Concern (SVHC)). Of course, this can and is regularly used as an excuse, but it is clear that complacency (read: the low chance of being caught and minor sentences) reinforces the above incentives. It is noted in this connection that the processing time for enforcement and punitive action is (overly) long - a processing time of several years is not exceptional - and that this undermines the effectiveness of government action and makes it less of a deterrent.

The below box provides an example of the unequal international playing field and the financial gains characteristics in the context of scrap ships:

Ship breaking

Many ships - and oil rigs, as well - are scrapped on the beaches of India, Pakistan, and Bangladesh under conditions that affect the health of workers and residents and the (maritime) environment. Cheap labour and the ability to virtually ignore provisions for the protection of humans and the environment allow the wrecking yards based there to offer the highest price for a ship. As long as (part of) the shipping industry continues to opt for the highest (metal) price, beaching activities[221] in Asia will continue unabated in the coming years.

Ships larger than 500 GT[222] and sailing under a flag of an EU Member State may, according to the Ship Recycling Regulation (SRR), only be scrapped at companies certified to do so (mostly scrap yards in the EU and Turkey). Scrap ships the SRR does not apply to must, in principle, be exported to their final destination under an EWSR permit. As ships are often re-flagged to a flag state outside the EU when they near end-of-life status, owners can bypass European rules. Too, ships are often sold to so-called cash buyers before they reach end-of-life status, thus absolving the original owner of its responsibilities with respect to responsible scrapping. However, the original owner's intentions in selling the vessel are often difficult to ascertain. Under the EWSR, it must be proven that the owner intends to scrap the ship at the time the ship leaves the European port. The owner's intentions can often only be ascertained through the use of investigative means.

The criminal practices related to ship breaking are difficult to tackle. Information exchange at the international level and improved cooperation between relevant authorities are prerequisites for improved supervision. As long as owners and shipping companies have the option of running their ships under flags of convenience, and large European shipping companies take full advantage of this opportunity, gaps in supervision will continue to exist.

6.5.7 Market forces

Partly because of its complexity, the market seems to be tilting more and more. More and more companies, from large to small, are offering a total package of services to get rid of waste risk-free. In doing so, these companies control more and more links in the chain, potentially removing waste streams from the picture. Such schemes also seem to transfer responsibility from the disposer to a

221 Ships are sailed onto a beach ('beaching') and scrapped there.
222 Gross tonnage.

party who is aware of the rules and acts accordingly - which in some cases is not true. Inclusion on the so-called VHIB list does not provide sufficient guarantee. Delisting is rarely used as an enforcement tool. A more far-reaching form of certification for waste management companies might need to be introduced to address this issue. That said, certification or other barriers to market access do present their own risks and often do not provide a solution.[223]

6.6 Consequences

The previous sections have covered the phenomenon of waste crime in its broadest sense. The impact of waste crime does not appear to have significantly changed compared to that described in the 2017 Threat Assessment. Given that environmental crime will continue to occur in the future, the expectation that this would be the case was in fact already stated therein. The consequences cited in 2017 are the following (Neve et al., 2016):

- Impairment of physical or mental health
- Environmental degradation
- Anxiety, nuisance, and unease
- Financial losses
- Undermining

6.6.1 Impairment of physical or mental health

Waste crime still has serious consequences for humans, animals, and the environment. First of all, the deliberately or unintentionally careless handling of waste poses risks to human health. These consequences are often severe and irreversible. The damage and consequences are also only exposed long after the deed has been done. Proving a causal link between cause and damage is often difficult. The improper removal of asbestos forms a sound example. Inhaling asbestos particles can lead to lung emphysema, lung cancer, and peritoneal cancer. Improper treatment and disposal of discarded electronics, too, can result in harmful substances that pose health risks being released (Gelderland Environmental Agencies Chain Supervision Team, Human Environment and Transport Inspectorate, DCMR, Police & Rijkswaterstaat, 2020). Ship scrapping may result in the release of major quantities of hazardous substances such as fuel oil, heavy metals (mercury), and asbestos.

There is also a risk of contaminants entering the food chain due to mixing in the co-digestion process. Any contaminated fertiliser used in agriculture produced as a result would compromise food safety. Unfortunately, many more examples could be mentioned.

6.6.2 Environmental degradation

Waste crime can lead to damage to the environment. For example, the groundwater can be polluted due to substances leaking or leaching into the soil. Harmful substances can also be released into the air when they are improperly stored or processed. The environmental damage of an individual breach may be limited. Nevertheless, it should be stressed that, taken together, the total effects of all these single offences may well add up to serious and often irreversible environmental damage.

Suspicions of (latent) environmental pollution being linked to animal disease outbreaks (Toezine.co.uk, 2015) and allergies and diseases in humans (RIVM) are increasing. Biodiversity decline is also commonly linked to increasing environmental pressures.

6.6.3 Anxiety, nuisance, and unease

With respect to anxiety, nuisance, or unease among citizens, a link can be made to, for example, the increasing number of waste fires in the Netherlands. Such incidents occurring at waste treatment companies are increasingly seen as worrisome. The De Vuilnisman programme also dedicated an episode to waste fires.[224] Ironically, the day after this episode aired, yet another waste company was on fire.[225] Waste fires can release toxic substances into the air. “Whether waste fires are caused by deliberate arson cannot be proven to date,” Prosecutor Koopmans explained in De Vuilnisman broadcast. Nevertheless, it stands out, raises concerns, and puts waste companies under scrutiny. Waste fires can

223 Interview and expert consultation results.
224 https://www.npostart.nl/de-vuilnisman/07-03-2021/KN_1725838 Consulted on 22 April 2021.
225 https://www.bd.nl/den-bosch-vught/brand-bij-a-v-i-in-den-bosch-is-na-meer-dan-een-dag-onder-controle-maar-werkzaamheden-kunnen-nog-heel-lang-duren~a115b23f/ Consulted on 22 April 2021.

occur relatively easily due to improper storage of waste materials or because far more waste materials are stored than the relevant permit allows for. In these cases, the fire may be the result of careless storage and/or poor rule compliance instead of being lit intentionally. This was the case at a waste-to-energy plant in Den Bosch, where a major fire raged in March 2021, as well. [226] However, the fires do attract attention, as environmental crime often involves a failure to do certain things that should have been done (Huisman & van Erp, 2013). One of the possible causes for the increase in waste fires is the contamination of waste with unwanted, flammable materials such as lithium batteries, which are increasingly common.

Unrest may also arise when the media announce that contaminated soil has been applied under new housing estates (Zembla, 2019). On the one hand, the unrest arose because it was unclear how contaminated soil affects human health. On the other hand, residents feared depreciation of the value of their homes.

6.6.4 Financial losses

Waste crime also still leads to large financial losses. Non-compliant companies make more money by improperly handling waste. Companies that do comply with the rules will eventually be unable to compete with these free riders. An uneven playing field is thus being created. In addition, incidents (such as waste fires or soil contamination) lead to enormous damage, both in terms of health risks and money. The old principle that the polluter pays turns out to be far from true. Businesses no longer bear the costs by default To the contrary: the polluter often does not pay. Investigations by De Groene Amsterdammer (Staal, Van Raaij & Muntz, 2021) show that governments often have no view of the costs they incur in cleaning up pollution (such as by way of soil remediation) and/or illegal waste dumping. In addition to these cleaning costs, governments also face costs arising from bankruptcies. Until 2009, the Financial Security (Environmental Management) Decree was in force. This Decree required waste companies to provide financial security for any future environmental damage. As a result of the abolition of this Decree, society as a whole is increasingly stuck with the cost of these serious incidents.

6.6.5 Undermining of economy and society

The interwovenness of the underworld and legitimate society typical of organised undermining crime is not so easy to demonstrate in the case of waste crime. Rather, as was already mentioned in the 2016 Threat Assessment, there is "*a grey area in which businesses that are legal commit offences that have adverse effects on the environment and public health*" (Neve et al., 2016). An unlevel playing field may also trigger compliant companies to flout the rules in order to survive. After all, the waste industry has become highly commercialised in recent years. Making profits, for whatever reason, is a key driver for companies. While these private companies fulfil a social function, they are for-profit organisations. The proper treatment and disposal of waste and proper care for the environment is no longer a matter of course. The same sometimes applies to governments, as well, such as when a major employer is at risk of bankruptcy or when a major actor in the waste market, which collects household waste for a large number of municipalities, should be subjected to enforcement.

6.7 Expectations for the coming years

Of course, having attention to the mixing of waste, carelessness, and insufficiently clear labelling of the composition of streams and their potential danger will remain relevant in the coming years.

6.7.1 Future high-risk wastes

Future high-risk wastes, which cannot be properly processed as yet and are governed by control structures that do not rule out incidents, may be factors that could affect crime. This does not mean that this form of waste is immediately going to be controlled by criminal circles. However, it does present opportunities for crime the government should anticipate on at an early stage. It is important in this connection for the legislator to be attentive to

226 https://www.bd.nl/den-bosch-vught/bossche-bedrijf-avi-werd-eerder-op-de-vingers-getikt-voor-branden~a47cd192/?referrer=https%3A%2F%2Fwww.google.com%2F Consulted on 13 April 2021.

new streams, products, or developments that have as yet unknown consequences once they become wastes. Add to this the globally mounting social pressure to seriously protect the environment, now that the realisation dawns that economic growth and associated waste production is unsustainable.

The survey found that regulators see a number of wastes (not exhaustive) emerging that are believed to harbour incentives to break rules:

- Solar panels and wind turbines;
- Energy carriers;
- Electric modes of transport;
- Bioenergy resources;
- Refrigerants;
- Secondary construction materials entering the waste stage;
- Composites.

It is important to already consider the environmental impact and disposal of these types of products once they become waste during the design stage. Consider, in this connection, asbestos, which was widely used in the past and allowed for such use, but was classified as being hazardous only later on. Everyone may want to appear sustainable now, but what threats does this process bring forth in the long run?

6.7.2 Investing in supervisory bodies

The interviewees consider it important for the government to commit not only to driving the circular economy, but also to providing the supervisory bodies with the appropriate tools to supervise this process. Given the increasing complexity of the matter, a reconsideration of the waste disposal and supervision structure is desirable. The ongoing digitalisation of society is also likely to provide opportunities for supervision and supervisory bodies.

6.7.3 Legislation

The legal framework relating to waste is going to change in the years to come. First of all, the concept of 'establishment' will disappear with the introduction of the Environment and Planning Act. It will be replaced by the concept of 'environmentally harmful activity (eha)'.[227] An eha is an activity that may cause adverse effects on the environment.

The biggest change this brings about is that an eha can also cover activities that take place outside the establishment, such as wastewater discharges into sewer systems and into the soil. As a result, the licensing system will undergo a transition and provide frameworks for activities. This creates space and a need for supervision to focus more on the chain (of activities).

In addition, the EWSR is currently under review and other frameworks will be developed to export less waste to vulnerable countries. This is partly prompted by a strong desire to make the western economy more circular, and thus prevent raw materials from leaking out. In addition, there are developments related to specific wastes - such as plastics and end-of-life equipment - that will lead to changes in the waste disposal structure in the years to come.

Another development that impacts this structure is the growing realisation that the contamination levels of waste in the reuse and later stages pose health and environmental risks. In particular, the risks due to the presence of Substances of (potentially) Very High Concern (SVHC) are becoming manifest. The presence of such substances is regulated by substance regulations (in particular, REACH) and/or construction materials regulations. Expectations are, therefore, that waste, to the extent it is still considered, will increasingly be co-regulated by other types of regulation. These regulations are at least as complex as the waste regulations are and thus require new regulator competences and, possibly, new consultation structures. The discussions on the end-of-waste status, for example, are illustrative of these developments. In each case, the way we, as a society, want to keep track of the presence and locations of SVCH-contaminated secondary substances remains an important question.

In addition to these substantive developments, parallel developments are taking place regarding the permit conferral and environmental supervision structure. The Van Aartsen Committee report, discussed in Chapter 2, is expected to be translated

227 https://iplo.nl/regelgeving/regels-voor-activiteiten/toelichting-milieubelastende-activiteiten/verandert/#:~:text=From%20establishment%20to%20environmental%20activity,may%20also%20apply%20other%20rules%20 Consulted on 6 May 2021.

into a number of concrete actions over the next few years, which is also likely to affect environmental monitoring.

6.7.4 Financial security

There is currently a discussion raging on reintroducing a decision regarding financial guarantee. Such financial guarantee seems to have to be related to the licensed storage capacity. A financial guarantee is mandatory for establishments governed by the Major Accidents (Risks) Decree (BRZO)[228].

6.8 Summary, conclusions, and recommendations

Waste is still there. And it is inevitable, no matter what it is called or in what kind of economy (linear or circular) it arises. And, although processing is becoming more sophisticated and many things are going well, the incentives for criminal behaviour that harms people and the environment are also still present. This means that right now, in 2021, waste crime is still a threat that (government) organisations - and thus the physical environment - have to deal with. Waste crime is a many-headed monster and has many manifestations. The waste chains are composed of multiple links, each of which has its own role - and sometimes several - to play in the chain. There are many different players, locations, chains, industries, knowledge themes, and regulations involved with waste and its treatment. And they operate on a playing field featuring a great deal of development and innovation, involving a lot of money.

A quick profit can no less easily be made by deliberate violations of waste rules and/or the deliberate failure to act as desired than used to be the case and, in many cases, the consequences are still hardly visible, if at all. Deliberate violations are prompted by the relatively quick financial gains, the small chance of being caught, and the complex laws and regulations that are often difficult for both the market and enforcers to understand. The main motive visible in all manifestations of waste crime is financial gain. This often manifests itself within the waste sector by the failure to perform certain required actions to save costs (crimes of omission) or by administratively diverting or concealing waste by not or incompletely reporting it or using an incorrect LoW code. A special and elusive role is in this connection taken by traders lacking their own establishment, as they currently operate outside of the supervisory system. It also appears that waste companies that have committed offences regularly cite lack of clarity or unfamiliarity with the complex legislation as a reason for their actions. Another reason is lack of knowledge among companies. Like waste companies, regulators, too, struggle with the complex legislation. The various supervisory, enforcement, and investigative partners are tasked with ensuring compliance. Calls for less ambiguous, more sharply defined regulations are growing louder and are voiced by many different actors. Misuse of complex legislation can be reduced by the improved exchange of information within the government.

As waste stream chains have many different manifestations, the knowledge and expertise possessed by the supervision, enforcement, and investigation partners must be combined to realise an effective approach. Also, improved cooperation between supervisory and investigative organisations may lead to the faster and more efficient handling of criminal cases. Both a sound information position and sound information exchange are extremely important in this connection. The information position regarding waste-related environmental offences does not appear to be sufficiently transparent. Information possessed by the criminal justice partners is more readily retrievable on the national level than is information possessed by the administrative justice system. Figures available on waste crime do not currently give a representative picture and do not do justice to all the efforts that are currently being expended by various (administrative) bodies.

The opportunities for waste crime do not seem to have changed substantially in recent decades. Over the past few decades, several studies have been conducted and enforcement action has been taken against multiple companies active in this sector.

228 Major Accidents (Risks) Decree. Companies keeping large quantities of hazardous substances, in excess of a certain threshold.

However, this does not seem to have resulted in major systemic changes. However, some shifts were noted. The international, global chain more emphatically seems to form a barrier to ensuring the careful processing of waste, for example. The need for the supervision of businesses dealing with waste is increasingly shifting from physical supervision to administrative supervision, such as supervision of registration and reporting obligations. It has been found that occasional 'regular' physical supervision alone is not the right approach for supervising waste chains. A transition to a comprehensive and targeted administrative strategy is required. The visibility of violations and, thus, the chance of an offender being caught can be improved by the increased exchange of information between authorities and by analysing where the greatest risks of violations exist in advance.

Waste crime seems to be an unwanted side effect of the circular economy, which focuses on ensuring no waste is created. It is therefore important for the legislator to be attentive to new streams, products, or developments that have as yet unknown consequences once they become wastes. Though they are not criminal by default, they do present opportunities for future crime the government should anticipate on at an early stage. Side effects that could potentially be related to waste crime, such as waste fires, have also emerged. This phenomenon is considered worthy of further investigation.

It has become established that the information position of environmental supervision in general, and waste supervision in particular, needs to be improved to cope with this, now and in the future. Intensification of cooperation and further use of digital opportunities deserve explicit attention. Further development of chain supervision is also considered crucial. Various tools (including the barrier model, risk models) can be helpful in this regard. It is important to recognise that the waste issue is a global one. Cooperation at the international level should not be underestimated.

We also found that supervision is shifting from inspections of physical waste operations to checking waste composition and the administrative obligations. This has implications for the knowledge level supervisors need to possess and the tools required. Waste legislation is becoming ever more complex and increasingly interfaces with other disciplines (soil, construction materials). This also increasingly requires waste companies and supervisory authorities to possess specific knowledge.

Based on these conclusions, we have arrived at a series of recommendations. The below recommendations are aimed at the bodies active in the sector and/or supervising and enforcing it.

- Strengthen cooperation between the different partners. Increased cooperation between the supervisors and the investigative authorities is essential to tackle non-compliance and waste crime and for enforcement to be effective. International cooperation must also be boosted.
- Establish a barrier model for each waste chain in cooperation with partners, inter alia in order to ensure that the various intervention options of all partners are clearly bundled for each waste chain.
- Intensify risk-based supervision. Assess in advance, based on information available from all partners, where the risks of lacking compliance behaviour exist within a sector or chain and focus on them.
- Focus supervision on those waste sectors shown by reports (such as this one) to contain many opportunities for crime. Supervisors should prioritise their supervision in response to the opportunities currently visible. This process can be boosted by drafting a national Waste Monitoring Plan all departments have to conform to.
- Efficiently organise the supervision of establishments trading in waste. Put more effort into supervising registration and reporting obligations. Monitoring this should become a regular supervision aspect. Invest in the knowledge and skills concerning in-depth administrative and/or financial investigations possessed by supervisory bodies.
- Invest in chain supervision, also in view of the future Environment and Planning Act, and explicitly include supervision of the composition of secondary raw materials. In doing so, prioritise a chain of operations by different companies; from disposal to processing/application and re-entry into the waste stage.
- Prioritise and facilitate better information exchange between supervisory parties.

- Invest in transport inspections. This allows for improved tackling of traders without an establishment but availing of a means of transport (as they are now not subject to supervision).
- Investigate the phenomenon of waste fires. Establish the causes and the extent to which they result from deliberate action. The ILT counted 585 fires at waste processors since 2015. In almost all cases, more waste was stored than was allowed.
- Ensure that the compliance figures generated through administrative enforcement are uniformly recorded and available, so as to monitor compliance behaviour.

Literature

Aa, H. van der (Director). (2021). *De Vuilnisman* [TV series]. KRO-NCRV.

Anker, M.J.J. van den (1999). *Wie betaalt, bepaalt. Over intermediaire organisaties, milieucriminaliteit, organisatiecriminaliteit en integriteit in het complexe milieuveld.* The Hague: Elsevier bedrijfsinformatie.

Anker, M.J.J. van den & Hoogenboom, A.B. (1999). *Schijn bedriegt. Overheid, bedrijfsleven en gelegenheidsstructuren voor milieucriminaliteit op de hergebruikmarkt.* The Hague: VUGA Uitgeverij.

AR (2019). Een onzichtbaar probleem, Gebrek aan kwaliteit van data over milieucriminaliteit en –overtredingen. The Hague: Netherlands Court of Audit.

Berenschot (2019). Kwaliteitsborging bij de uitvoering van VTH-taken.

Bisschop, L.C.J. (2015). Governance of the illegal trade in e-waste and tropical timber: case studies on transnational environmental crime (Green Criminology Series). London: Routledge.

Boerman, F., M. Grapendaal, F. Nieuwenhuis & E. Stoffers (2017). *Nationaal dreigingsbeeld 2017. Georganiseerde criminaliteit.* Driebergen: National Police Information Unit.

Bosma, R. (Director). (2018). *Zembla: De kunstgrasberg* [TV series]. BNNVARA.

Bosma, R. (Director). (2019). *Zembla: Nieuwbouwwijk als stortplaats* [TV series]. BNNVARA.

Fertilisers Act Experts Committee (2015). *Nut en risico's van co-vergisting*. WOttechnical report 32.

Gelderland Environmental Agencies Chain Supervision Team, Human Environment and Transport Inspectorate, DCMR, Police, Rijkswaterstaat (2020). *Tactische analyse e-waste 2020*. Arnhem Region Environmental Agency and Police.

Haggeman, H. (2021). *Gronings bureau doet onderzoek naar gifvaten*. De Gelderlander. Consulted on 16 April 2021 via https://www.gelderlander.nl/doetinchem/gronings-bureau-doet-onderzoek-naar-gifvaten~a7d83505/?referrer=https%3A%2F%2Fwww.google.nl%2Furl%3Fsa%3Dt%26rct%3Dj%26q%3D%26esrc%3Ds%26source%3Dweb%26cd%3D%26ved%3D2ahUKEwjmsILTjoPwAhX6gfoHHfHpA4MQFjAAegQIBRAD%26url%3Dhttps%253A%252F%252Fwww.gelderlander.nl%252Fdoetinchem%252Fgronings-bureau-doet-onderzoek-naar-gifvaten%7Ea7d83505%252F%26usg%3DAOvVaw2GvwKuqlGLsLcJklO-Ff5R

Huisman, W. & Van Erp, J. (2013). Opportunities for environmental crime: A test of situational crime prevention theory. *British Journal of Criminology*, *53*(6), 1178-1200.

Human Environment and Transport Inspectorate (2020). *Inspectiebrede Risico-analyse (IBRA).* The Hague: Ministry of Infrastructure & Water Management.

Koomen, W. (Director). (2017). *2Doc: Beerput Nederland* [TV series]. VPRO.

LIEC (2016) Administrative Alert. Co-vergisting duurzame energie of afvallozing? Knelpunten en maatschappelijk risico's rondom wet- en regelgeving bij co-vergisting. Consulted on 2 April 2021 via https://megamestvergistergroenlonee.nl/wp-content/uploads/2019/05/Rapport-Co-vergisting-of-Afvallozing-1.pdf

Lievaart, J., Lipholt, E.A.J, & Van Hal, P. (2014). Bestuursrechtelijke tactische analyse co-vergisting 2013. Uitgevoerd ten behoeven van de Gelderse Omgevingsdiensten en de Overijsselse RUD's.

Mehlbaum, S. (2018). Hier zit een luchtje aan. Over het wegwerken van afvalstoffen door co-vergisting. Tijdschrift voor Criminologie 2018 (60) 2.

Neve, R., van Doorn, M., Fortuin, B. In 't Veld, M., Mac Gillavry, D., Stokman, A. & Van Zanden, N. 2016 Environmental Crime Threat Assessment 2016.

Raak, R., van, Spork, C. & Graaf, S., de (2019). Onderzoek 'Afvalprikkels. Een onderzoek naar huidige prikkels voor het storten, verbranden en nuttig toepassen van afval in Nederland. Erasmus University Rotterdam. Commissioned by the Ministry of I&W.

Spapens, T. 2016 Handboek milieucriminaliteit. Reed Business Information, Amsterdam.

Spapens, T., Mehlbaum, S. & Neve, R. (2019). Preventing illicit waste-exports from the Netherlands to China. In: Mitsilegas, V, S. Hufnagel, A. Moiseienko, S. Yanan & L. Mingxiang (2019). Transnational crime, European and Chines perspectives. London/New York: Routledge. Pp. 215-234.

Staal, T., van Raaij, L. & Muntz, T. (2021, 18 February). Een riviertje van een miljoen; Onderzoek De vervuiler wordt betaald. *De Groene Amsterdammer*. Consulted on 2 April via https://www.lexisnexis.com/

Toezine.nl. (2015, 29 September). Barrièremodel met een luchtje. www.toezine. nl/ artikel/ 116/ barrieremodel -met -een -luchtje/ Consulted on 17 April 2021.

Vries, de, C., Koonstra, L., Lievaart, J., Lipholt, E.A.J., & Hal, P. van (2015). Risicoanalyse activiteiten met afvalstoffen. Een onderzoek naar de risico's en de beïnvloeding en aanpak van illegale handelingen met afvalstoffen in Oost Nederland. Commissioned by the Overijssel Gelderland Tactical Consultations (TOOG).

7

7 Marine fuel blending "Waste goes up in smoke"

Yora Tolman

Fuel oil, or bunker oil, is the fuel used in international shipping. Fuel oil is widely traded at the Port of Rotterdam. For many years now, various parties have observed violations of laws and regulations in the oil industry. Especially in connection with fuel oil, multiple signals have been received and investigations conducted. Complex legislation makes it difficult to actually achieve effective prosecution in many cases. The 2016 Threat Assessment already had a chapter devoted to this topic (Neve, et al., 2016). This time, the main focus will therefore be on the developments in recent years and the phenomena currently visible in the industry. As a major Dutch oil waste processor went bankrupt in 2015, the nature of Dutch violations is changing and oily waste streams are now mainly processed abroad. Such streams are later blended with fuel oil again.

7.1 Description of the industry / chain / context

The Port of Rotterdam is the largest bunkering port in Europe and among the top three bunkering ports in the world. In 2019, a total of 9 million m^3 was delivered to the shipping industry in Rotterdam in some 20,000 individual deliveries. (Port of Rotterdam - Shipping, 2021). Transports of these so-called Black Streams take place not only in the Port of Rotterdam, but also in the entire ARA (Amsterdam, Rotterdam, Antwerp) area.

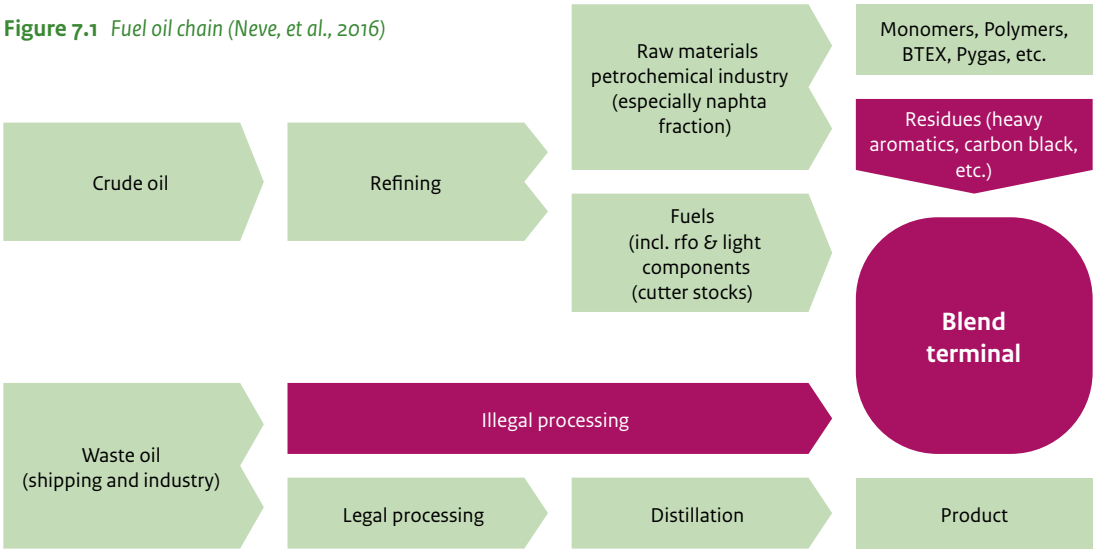
Crude oil is heated and cooled in a refinery to make different types of petroleum products (e.g., petrol or diesel). The residual oil left after this process is a thick sludge located at the bottom of the distillation tower. The properties of this residual oil are not good enough ('off spec') to be used as fuel oil in (seagoing) vessels. Organic liquids (blend agents) are therefore added to bring it 'on spec'. The properties relevant under the specifications are sulphur content, viscosity, flash point, and density[229]. Although such admixture with blend agents is necessary, it is often not clear which substances are used for this purpose and whether they are allowed to be used in this way. Ideally, lighter fuel types (such as diesel) should be used as blend products. But because diesel is too 'expensive', alternative blending agents are used, such as petrochemical industry residues and oily wastes. A graphic representation of the chain is shown in Figure 7.1 Fuel oil chain (Neve, et al., 2016).

The residual oil from refineries, as well as the blend agents, are usually procured on the international market by a trader (agent), who arranges for it to be stored at a tank storage company the trader has rented storage space from. The trader indicates the tanks the batches procured are to be pumped into, thereby also determining the first blend. Finally, the oil is often transported to a bunker supplier, responsible for bringing the fuel oil on spec before it is sold to a ship owner.

The key players in the market are briefly discussed in the below:

229 Sulphur content is the amount of sulphur in the oil, viscosity is the ropiness of the oil, the flash point indicates the temperature sufficient vapour is present to ignite when it comes into contact with an ignition source, and density indicates the mass (kg) per volume (m3) of the oil.

Figure 7.1 *Fuel oil chain (Neve, et al., 2016)*



The oil refineries

There are six oil refineries in the Netherlands: Shell Nederland, BP, ExxonMobil, Koch HC Partnership, Gunvor Petroleum Rotterdam (Port of Rotterdam, 2021). They create various products from crude oil. They sell the residual product to traders, collectors, and processors.

Disposers of waste oil

Disposers of chemical and oily waste streams include companies active in the petrochemical industry and marine and inland navigation. Companies are under great pressure to empty their waste storage tanks as soon as possible so as to allow the production process to continue. Such disposers include metal companies, petrochemical companies, and companies active in the plastics and paint industry. Marine and inland vessels are also disposers of oily waste or chemical waste. In their case, the waste disposed of consists of cargo residues and residues from marine fuels used (also known as slops, bilge, and sludge). Ships are required to deliver their waste to a port reception facility when they lack their own storage capacity (Havenaar, 2011)

Collectors and processors

Collectors and processors form a relatively large group (or category...) of actors within the chain and are divided into collectors and processors of land or marine waste streams. Land streams processors are companies focusing exclusively on the collection and processing of oily waste or chemical waste (Havenaar, 2011). Ideally, these processors aim to reconvert the wastes into product, for example by separating waste oil from water and sediment to create another blend product for fuel oil. The marine streams are processed primarily by port reception facilities (PRFs), which collect waste from the said maritime and inland shipping industry. A small number of these PRFs are also authorised to process waste.

Oil traders & tank storage and transhipment companies

This part of the chain is comprised of the traders (also known as paper traders or brokers), who buy large batches of residual fuel oil (rfo) and other oily residues from the collectors and processors, from the oil refineries, or directly from petrochemical companies. They then rent storage and transhipment tanks from tank storage companies (blend terminals). These companies blend residual oils and blends to specification ('on specs') on the instructions of the traders. As a rule, storage and transhipment companies do not own the product they have in storage.

Bunker suppliers

Bunker suppliers are the last stop before the fuel oil disappears into the fuel tanks of vessels. They buy the fuel oil and, where necessary, blend it further to specification in storage tanks. They then sell the fuel oil as fuel to shipping companies and ship owners. Shipping companies and ship owners

The last link in the fuel oil chain is made up of the shipping companies and ship owners, which purchase fuel oil from the bunker suppliers. De-bunkering involves removing unused fuel oil fuel from the ship. In some cases, the fuel oil is then classified as waste. Shipping companies are provided with a sample of the fuel oil so that they can check the quality, usually afterwards (Havenaar, 2011).

7.2 Relevant legislation

The following laws and regulations are relevant throughout the chain:

Name	Substance
MARPOL Convention (MARINE POLlution)	Convention on marine waste treatment and quality requirements for marine fuels. Valid in 117 countries. Requirements under Annexe VI: the fuel oil must be a homogeneous blend of hydrocarbons derived from petroleum refining (exception are additives intended to improve the characteristics of the fuel), the oil may not contain inorganic acids or biomaterials (exception clause), and the oil may not contain additives or chemical wastes that could harm the safety of the ship or crew.
Prevention of Pollution from Ships Act (Wvvs)	Dutch implementation of the MARPOL Convention. This Act contains the prohibition on discharging harmful substances into the sea. The Wvvs provides that ship waste must be delivered to a select number of designated processors (PRFs).
Environmental Management Act (Wm)	This Act specifies when a substance constitutes a waste or a (by)product, and which operations with waste are allowed, also with respect to its receipt or processing.
Environmental Permitting (General Provisions) Act (WABO).	It is prohibited to establish, operate, or change the operation of an 'establishment' as referred to in the Wm without a permit
Living Environment Law Decree (BOR)	Establishments in the fuel oil industry can be designated as environmentally harmful. Permit requirements are stipulated in the Waste Substances (Collection) Decree (BIA). This Decree for example provides that waste from seagoing vessels, also known as sludges, may only be collected in the Netherlands by companies (‘establishments’, to use the term applied in the Wm) that possess a collection permit for ship waste issued on behalf of the Minister of Infrastructure and the Environment.
Waste Framework Directive (WFD)	Describes when something constitutes a waste. The WFD stipulates that waste materials cannot be used as raw materials. Obtaining 'end-of-waste' status is important within the oil waste processing industry. For example, refining oily or chemical wastes in a particular way creates a 'product' that could potentially be marketed as a blend product for fuel oil.
European Waste Shipment Regulation (EWSR)	Imports and exports of waste must comply with the European Waste Shipment Regulation (EWSR). Once waste crosses the border, it must be accompanied by a notification. This is used by the governments of the two countries to test whether the waste shipment is allowed.
Port Regulation	This contains the internal rules of the ports. Its Section 9.1 states that, among other things, fuel oil may only be bunkered or de-bunkered when in possession of a permit from the Board. (Also refer to 7.4 New developments0)
REACH	REACH sets the standard for the production of and trade in chemicals. Producers and importers have an obligation to register. In so doing, they must indicate the composition and harmfulness to humans and the environment. Sellers of chemicals (including mixtures) are required to issue the Safety Data Sheet (SDS) to the user.

7.3 Agencies involved

Several agencies are involved in dealing with the Black Streams chain. Before any actions under administrative or criminal law can be taken, the supervisory bodies must get to work. The supervision task is divided between the Environmental Agencies, the ILT and the police. The Environmental Agencies supervise establishment-related elements, such as petroleum and (petro) chemical companies. A facility's permit states which (waste) substances may be present on a site and how they must be dealt with. ILT and police inspectors check transports on land and water under the Road Traffic Act. The ILT is also the competent authority in the context of the international shipments of waste (EWSR). Customs also has a role to play in this connection, supervising the imports and exports of goods.

During interviews, ILT and police experts have indicated that the available level of knowledge is a major bottleneck for the effective supervision in this chain. Only a few individuals working for the various services possess sufficient chemical and legal knowledge to be able to assess whether the controlled flow is indeed what the documentation says it is and whether the recipient is indeed allowed to receive and process this flow as indicated. The number of these individuals is so low that effective supervision of this extensive chain leaves much to be desired.

Since February 2021, it will be mandatory for the bunker sector to possess a transporter bunker licence, which will be covered in the next section. It is up to the harbour master to check compliance. The effects of these new licences and supervision information are not yet available.

7.4 New developments

Developments that may affect the modus operandi or opportunity for crime in the oil streams trading sector are under way. The energy transition and the Climate Agreement, which set targets on reducing emissions into the air are examples of such developments on a major scale. On a smaller scale, we will discuss three developments that may have a direct impact on crime in this sector.

Due to criminal investigations, company inspections, and falling oil prices, (final) processing of oily waste streams into product (fuel) in the Netherlands has largely disappeared in recent years. These oily waste streams are often only pre-processed in the Netherlands in a simple way (water and sediment removal), before they are transferred abroad as wastes for further processing. Some of these oily wastes are now "recovered" abroad as fuel for power generation. Another (large) share of these oily wastes ends up with foreign processors indicating to be able to reprocess these wastes into fuel products. Most of these foreign processors collect waste oil from Europe, including the Netherlands, and recycle it into the intended product, i.e., base (lubricating) oil (vacuum distillation process). During this process, several side fractions are released in addition to the intended product, which, unlike the intended product, are not purified of contaminants (hazardous substances such as organic halogens and solvents). These (unpurified) side fractions still have waste status, but are offered and sold as products by these foreign companies to international oil traders, who apply them as blending agents in marine fuels (fuel oil and gas oil).
The police (Infra Unit) and the ILT over the course of criminal investigations have shown that these side fractions are blended at terminals in the Netherlands and supplied as marine fuels (bunkers) to seagoing vessels. In cooperation with the ILT, it was found during these investigations that these wastes (side fractions) are incorrectly described as products on the Safety Data Sheets. This is a violation of the REACH regulations (refer to Chapter 9) and also constitutes forgery. Refineries and chemical companies do not consider the by-products from their processes to be waste. If products are not waste, the substances regulation (REACH) applies. Inspections conducted in 2015-2017 revealed that compliance of these fuel products with the REACH regulations is lacking, with the majority of companies investigated failing to comply. This can result in mixtures that pose an unknown risk to humans and the environment when stored, transferred, and burned in engines. Although these regulations have been in place since 2007, the parties active in the fuel market do not yet sufficiently realise that all raw materials for fuel must comply with them (Human Environment and Transport Inspectorate, 2018).

Dagblad van het Noorden (3-3-2021)

W., along with co-director H., was arrested in November 2011 on suspicion that the company received hazardous chemicals in violation of its licence and illegally mixed them with oil and fuels.

Illegal transport.
According to the PPS, these men, residents of Essen and Putten, Belgium, had between January 2005 and July 2011 tampered with and forged documents to enable illegal transport of waste oil. Fully loaded trucks and ships arrived at the company. According to the documentation, the cargo was to be unloaded at the company for processing. In reality, the documents were exchanged and the transport continued unprocessed to Germany.

District court: community service
W. and H. were in 2017 sentenced by the Groningen court to community service of 180 and 240 hours respectively, as well as to fines of 75,000 and 100,000 euros.
Court of appeal: lower fine
But little was left of the case on appeal. The court did sentence W. for forgery and violating environmental regulations, but reduced the fine for W. to five thousand euros, partly because the case had lasted so long and no repeat offences had been discovered.

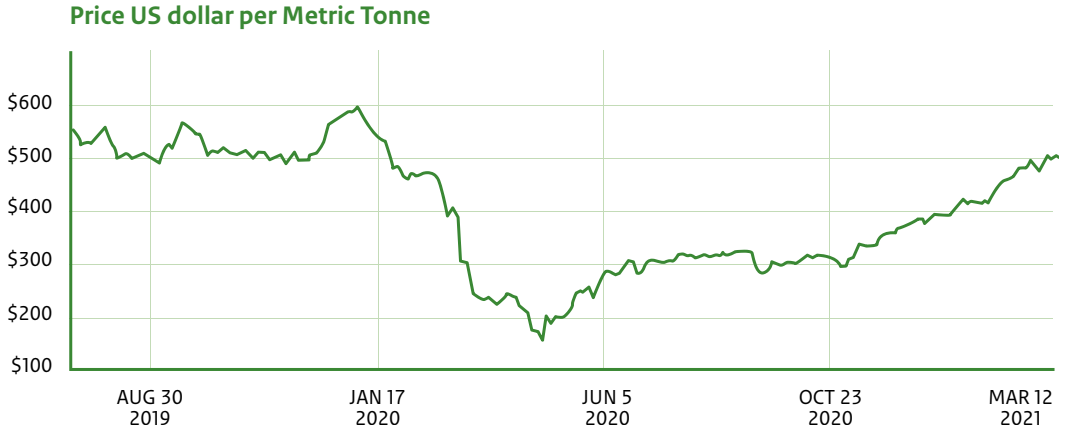
Leaking oil tanks
The company went bankrupt in February 2015. Cleaning up the site contaminated by a leaking oil tank will cost the provincial authorities millions of euros. They have tried, so far unsuccessfully, to recover some of these expenses from the trustee.

As from 1 January 2020, shipping worldwide must comply with stricter sulphur emission rules. Ships are only allowed to run on fuel containing a maximum of 0.5% sulphur, as opposed to the limit of 3.5% in force in most areas. The cost of this Very Low Sulphur Oil (VLSFO) is significantly higher than that of the fuels used heretofore, partly because more blending agents have to be used to reduce sulphur levels of the fuel oil to these low specifications. An overview of bunker oil prices (Figure 7.1 Price development of Very Low Sulphur Fuel Oil (VLSFO). The effects of the new IMO regulations (peak in December 2020) and the March/April 2020 COVID-19 crisis are visible. (Ship and Bunker, 2021)) clearly shows a peak in December 2019. Due to the new regulations coming into force, extensive demand existed for this type of oil. What the effects on crime related to this phenomenon are is not yet clear. However, there is speculation about the origin of large amounts of the blends to be used to get the oil on spec. Another consequence observed is that de-bunkering occurs more frequently. A ship can have different reasons for de-bunkering its oil. This is usually done at the time when a ship experiences problems with its fuel, with the engines not running smoothly, for example. Subsequent detection of excessive sulphur content in the fuel can also be a reason for de-bunkering. Shippers want to avoid the risk of a fine and are therefore more likely to de-bunker when the sulphur content is found to be too high.

Figure 7.1 also clearly shows the effect of the COVID-19 pandemic. By early 2020, prices of VLSFO (as well as other fuels) dropped dramatically.

As from 1 February 2021, supplying bunkers to seagoing vessels will be subject to licensing in the "RA" range, i.e., in all seaports from Dordrecht to Zaanstad. This means that bunkers, defined as fuel oil, diesel, and biodiesel, may no longer be transported and delivered from shore to shipboard or between shipboards without the transporting company holding a permit. The aim is to create a transparent bunker market. As was also mentioned in the previous threat assessment, the media and the world of politics have expressed unease about the bunker market for years now, both as concerns the quantity and the quality of bunkers supplied. The number of disputes is also on the rise and shipping companies increasingly more often complain about the bunkers delivered. (Port of Rotterdam, 2021).
A permit is granted by the Port Authority of Rotterdam (for "Rhine" ports) and/or that of Amsterdam (for North Sea Canal ports), provided a number of conditions are met. This is about the requirement and assessment of procedures and documents, not a substantive test of quality or quantity of bunkers supplied

Figure 7.1 *Price development of Very Low Sulphur Fuel Oil (VLSFO). The effects of the new IMO regulations (peak in December 2020) and the March/April 2020 COVID-19 crisis are visible. (Ship and Bunker, 2021)*



7.5 Criminal opportunities and practice

As with most forms of crime, money is the main driving force.

RIVM study
The National Institute for Public Health and the Environment (RIVM) in 2018 published a report commissioned by the Human Environment and Transport Inspectorate. Fifty samples of fuel oil were taken and their composition determined. Lead (compounds), trichloroethylene, and cyclododecatrienes were detected during the analyses. These Substances of Very High Concern (SVHC, refer to Chapter 9) do not belong in fuel oil and the presence of these substances indicates that waste was probably been mixed into it. In addition, some of the Poly Aromatic Hydrocarbons (PAHs), that were expected to be found, were present in unusually high concentrations, supporting the same conclusion. (Broekman, 2018).

The market is focused on optimising fuel blends in economic terms: the blending processes are geared to just meeting the standards of the intended destination country. The room for manoeuvre offered by standards differing between countries is used to the utmost. This is common practice within the industry on the international level. It should be remembered that a large seagoing vessel consumes hundreds of tonnes of fuel oil per day. A full tank easily costs a container ship several millions.[230]

The major sums associated with fuel oil use mean that trade in it is brisk and that a lot of profit can be made by using cheaper batches as a blend in the fuel oil. Taken together with the limited enforcement and surveillance practice, this breeds criminal activity. Opportunities and criminal activities include:

- The waste treatment sector, including the treatment of waste oil, is based on the principle that recipients are paid to accept the waste before they start treatment. This makes it attractive to process the waste differently, or to not process it at all, as is the case with waste treatment in general (refer to Chapter 4).
- Of crucial importance within the chain is that companies do not consider residual products to be waste: they are products. This means they must be registered under the REACH regulations when used to produce fuel, information must

230 Consulted on 12 May 2021, via https://www.portofrotterdam.com/nl/havenkrant/havenkrant-22/een-volle-tank-van-zes-miljoen

be available on their composition and on the hazard levels of the substances. Because of the complexity of the regulations, little clarity exists in this context.
- As foreign processors (refer to section 7.4) of oil waste are more frequently engaged these days, the chain now contains additional links that make it possible to commit fraud. Foreign countries have different guidelines regarding waste (e.g., concerning the chlorine levels allowed) than the Netherlands. By cleverly exploiting these differences, a lot of money can be made by savvy traders. This is consistent with the previous threat assessment (Neve, et al., 2016), which already noted that "savvy hustlers" are deemed a criminogenic risk across the oil industry.

When is oil a waste? Supreme Court judgment
In its judgment of 07-04-2020 (ECLI:NL:HR:2020:433), the Supreme Court of the Netherlands defined further criteria for determining whether fuel oil is a waste. This will have a direct bearing on both the developments of the accused's modus operandi and the possibilities of enforcement, surveillance, and, especially, detection. The case was summarised as follows:

In 2011, 140 tonnes of fuel oil sporting a certificate of approval (which stated that it had a sediment level of 0.010) was delivered to a seagoing vessel in Poland. Once this fuel oil was first burned in the engine of the seagoing vessel, the engine stalled, preventing the vessel from sailing. Even after 10% mixing it with other fuel oil, the engine stalled. The ship's captain reported that the fuel oil was inadequate and caused problems with the engine. After analysing the fuel oil, it was found that the sediment level was not 0.010, but 0.91. The maximum approved level is 0.1. The fuel oil was legally taken back (meaning the fuel oil remained stored in the seagoing vessel and compensation was paid). The fuel oil was then sold by the owner of the seagoing vessel to the accused, who is a supplier of fuel to seagoing vessels. At the time of this purchase, the accused was aware of the circumstance that the fuel oil had too high a sediment level and therefore did not meet specifications. Given this knowledge, the accused had to know the oil did not constitute fuel oil, but hazardous waste. Collecting hazardous waste requires a permit, which the accused did not possess at the time. After de-bunkering, the accused had this fuel transferred to their own vessel. During the de-bunkering process, both the seagoing vessel and the accused's vessel were inspected by the police and the batch of fuel oil was seized.

The key question in this case was whether the oil constituted a waste. For if this was not the case, the accused was acting lawfully, as he would not need a licence and could also resell the fuel oil. If it did constitute waste, the accused was obviously liable to punishment. The Supreme Court ruled that it was a waste, primarily substantiating its position by arguing that:

- the fuel oil did not meet specifications,
- the fuel oil contained 9 times more sediment than was standard,
- the seagoing vessel's engine repeatedly stalled due to the fuel oil,
- the fuel oil could not, in its present state, serve as marine fuel, even though it had been marketed as such,
- there had been no investigation into the causes of this overly high sediment level after the analysis of the sample,
- the fuel oil had not been processed upon this defect becoming known in order for it to be as yet used as fuel oil,
- the fuel oil has been legally taken back.

Effective monitoring and/or enforcement is proving to be very difficult in this sector. This has several causes, which were also described in the previous Environmental Crime Threat Assessment.

Benefits come before costs

Oil waste collectors are usually paid to take in waste before they process the waste. This encourages them to forego responsible disposal methods and mix the waste immediately, saving on responsible disposal costs;

- The many links within the chain
- The various actors, such as discarders, collectors and transport companies, do not keep to the Dutch national borders, partly encouraged by

free trade within the European Union. Due to the international nature of the trade, controlling specific waste streams is complex and time-consuming.
- Growth in scale
- The dominance of companies within the oil and waste treatment industry continues to be strengthened by internationalisation, partly due to the increasing importance of waste disposal around the globe. In addition, government parties also facilitate and turn to the waste treatment industry when disposing of waste, which can render taking enforcement action in case of violations of laws and regulations difficult.
- Savvy hustlers
- Industry parties do not believe that they are committing serious crimes. Instead, they believe to cleverly capitalise on the wishes of disposers - the quick release of waste materials - and the demand of bunker suppliers - fuel oil that (almost) meets the specs. In addition, the industry is highly interconnected.

7.6 Consequences

According to a report by the World Health Organisation (WHO), particular matter causes 7 million deaths each year. The WHO considers air pollution as one of the biggest threats to public health around the world and refers to it as "the silent killer": invisible but highly lethal. Shipping and fuel oil combustion are major contributors to these death rates.

A recent global study found that chronic exposure can affect every organ in the body and complicates and worsens existing health conditions. In addition, it is suggested that chronic exposure to air pollution may play a role in increasing susceptibility to COVID-19; this requires additional research. Air pollution also has significant economic impacts, as it shortens lives and increases medical costs. It is estimated that, in 2018, about 379,000 premature deaths in the 28 Member States States of the EU (EU-28) could be attributed to particulate matter. In addition, there were deaths due to ozone exposure and 54,000 deaths due to NO_2 exposure. (European Environment Agency, 2020)

Some nuance is required here, because, as serious as the above figures look, they are not the direct result of crime in this sector. In this context, criminal behaviour ensures that even more particulate matter is emitted than is necessary, but also that toxic (often carcinogenic) substances are burned at sea. These substances thereby re-enter our environment. The extent of the effects of these toxic emissions has not yet been assessed.

The fact that this issue was also mentioned in the 2016 Threat Assessment is in itself an indication that the issue is difficult to tackle. The large profit margins realised by the companies involved also mean that they are not easily impressed by a fine or criminal prosecution. In fact, these costs are often factored in and quickly recovered.

7.7 Expectations for the coming years

As was mentioned in Chapter 2 of this Threat Assessment, there are several developments in the field of supervision and enforcement in the Netherlands. This will also affect the oil market in the Netherlands and surrounding countries. The transporter bunker licence introduced in 2021 aims to contribute to a more transparent and fair market for fuel oil. The large profit margins are likely to keep it attractive for traders to break rules.

The first steps towards a more sustainable bunkering sector have been taken by reducing the maximum amount of sulphur in fuel oil, and there are increasing signs that shipping is looking for more sustainable alternatives. For example, Eindhoven University of Technology is receiving a five-million-euro grant from the European Union to develop an alternative to heavy fuel oil. The university will try to extract a substance from materials such as sawdust

and wood chips to make a different kind of fuel oil.[231] And the Port of Rotterdam is testing sustainable biofuel for marine vessels.[232]

However, as long as these developments towards sustainability cannot yet compete financially with current fuel oil prices and there is no legislation forcing the industry to choose sustainable options, this sector, financially driven as it is, will not easily opt for such solutions.

7.8 Conclusions and recommendations

A lot of money can be made in the fuel oil chain by very cleverly manoeuvring between regulations and breaking laws and rules. Combined with the fact that supervision is fragmented and often requires very specialised knowledge to carry it out properly, this ensures that tampering remains an attractive for parties in the chain. Taking legal action against this chain remains difficult due to the complexity of the regulations. Also, when legal action is taken, the industry is often unimpressed by the fine amounts demanded.

Of note within the industry is that much of the waste (oil) that used to be processed in the Netherlands is now first sent abroad for processing and is then reimported into the Netherlands to be used as a fuel oil blend. As a result, Dutch supervisors have less insight into and control over this part of the chain. Due to new requirements on the composition of fuel oil imposed for environmental reasons (lowering the maximum sulphur content), more blend agent will be needed to have the fuel oil reach the desired quality. Finally, the transported bunker licence has been introduced in the Dutch ports. No bunkering is allowed without this licence. The bunker licence is a kind of certificate of good conduct with respect to the documentation required in the chain. It is expected to make the chain fairer and more transparent.

The industry will undergo some developments in the coming years. Shipping is crucial to the global economy, but also a major source of pollution. Hence, there are all kinds of initiatives aimed at making shipping more sustainable. Ultimately, even if these initiatives are successful, a lot will have to happen to move this financially driven industry towards more sustainable alternatives. From the oil producers' perspective, using their residual product as fuel oil is obviously a good outlet, but it remains to be seen if this continues to be the case.

Literature

BNNVARA/ZEMBLA. (2017, 03 15). *Forse boetes geëist in zaak North Refinery*. Retrieved from BNNVARA/ZEMBLA: https://www.bnnvara.nl/zembla/artikelen/forse-boetes-geeist-in-zaak-rond-north-refinery

Broekman, M. (2018). *Chemische samenstelling van vijftig stookoliemonsters 2017-2018.* Bilthoven: National Institute of Public Health and the Environment.

European Environment Agency. (2020). *Healthy environment, healthy lives: how the environment influences health and well-being in Europe.*

Havenaar, A. (2011). *Een Viscose Onderneming: een onderzoek naar de gelegenheden tot regelovertreding binnen de stookolieketen.* Amsterdam: Vrije Universiteit.

Human Environment and Transport Inspectorate. (2018). *Stookolie voor zeeschepen- Autobrandstoffen voor West Afrika.* Human Environment and Transport Inspectorate.

Neve, R., Doorn, M. v., Fortuin, B., in 't Veld, M., Mac Gillavry, D., Stokman, A., & Zanden, N. v. 2016 *Environmental Crime Threat Assessment 2016.*

Port of Rotterdam - Scheepvaart. (2021, April 01). Retrieved from Port of Rotterdam: https://www.portofrotterdam.com/nl/scheepvaart/zeevaart/overig/rotterdam-bunker-port

231 https://studio040.nl/nieuws/artikel/tue-krijgt-5-miljoen-voor-zware-stookolie-op-houtbasis (visited on 24-04-2021)

232 https://www.ad.nl/rotterdam/test-met-duurzame-bio-stookolie-voor-zeeschepen-in-rotterdamse-haven~a3c190b1/ (visited on 24-04-2021)

Port of Rotterdam. (2021, 03 14). *Olieraffinage | Haven van Rotterdam*. Retrieved from Port of Rotterdam: https://www.portofrotterdam.com/nl/zakendoen/vestigen/gevestigde-industrie/raffinage-en-chemie/olieraffinage

Port of Rotterdam. (2021, February 1). *Toelichting bij de bunkervergunning transporteur.* Retrieved from Port of Rotterdam: https://www.portofrotterdam.com/sites/default/files/toelichting-bunkervergunning-transporteur.pdf

Ship and Bunker. (2021, 04 01). *Rotterdam Bunker Prices Ship and Bunker*. Retrieved from Ship and bunker: https://shipandbunker.com/prices/emea/nwe/nl-rtm-rotterdam#VLSFO

Part 3
Threats to safety

8

8 Climate change does not impress: the illegal trade in F-gases

Eva Cornelissen, Frank Kaandorp, Max Kroes, Sijmen Roosma (ILT-IOD), René Henderson, Mariska van Lier, Jacob Zeefat (ILT), Gert-Jan Strik (Customs)

Climate change is one of the most important issues of our time. It sits at the top of global political agendas.
The European Climate Law of April 2021 stipulates that the European Union should be climate neutral by 2050. To achieve that goal, the aim is to reduce emissions of greenhouse gases such as CO_2 by 55 per cent by 2030, compared to the 1990 level.In addition, on 1 January 2020 the Climate Act entered into force in the Netherlands, while a national Climate Agreement was concluded in 2019[233]. This contains more than 600 agreements to curb greenhouse gas emissions.

Synthetic refrigerants, including F-gases (fluorinated gases), are also greenhouse gases. Each greenhouse gas has a GWP value. GWP stands for Global Warming Potential and indicates the CO_2 equivalent. Several F-gases are heavy greenhouse gases with a high GWP of around 4,000 kg of CO_2 equivalents. One kilogram of an F-gas has the same climate change impact as 4,000 kg of CO_2 has. In 2013, F-gas emissions in the EU were about 2.5% of total greenhouse gas emissions. (European Environment Agency, 2015).

Europe has ambitious targets to reduce F-gas emissions by two-thirds from the 2014 level by 2030. This puts Europe ahead of other parts of the world. This phasing-out is controlled by the F-Gas Regulation, using a production and imports quota system and mandatory registration of quota holders (refer to section 8.2). However, this has also triggered an illegal flow of heavy (often cheaper) F-gases into Europe (refer to section 8.4). This is because the reduction targets force the legal trade to market F-gases with lower GWPs to not exceed the allowed quota.
For users, switching to low-GWP F-gases or natural refrigerants often means a substantial investment. This can be delayed by buying these cheap, illegally marketed F-gases from illegal circles.
The illegal trade in F-gases is thus characterised by circumvention of the quota scheme.

Enforcement agencies within the EU do not as yet properly succeed in jointly halting this illegal flow. The laws and regulations and the highly international nature of the F-gases trade complicate the matter. There are estimates that at least 16% - but probably a higher percentage - of the market now consists of illegal trade (refer to section 8.4). As a result, reduction targets are not being met.

Illegal trade in ozone depleting substances (ODS) takes place, as well. Currently, the F-gases problem probably outstrips the illegal trade in OAS, as the phasing-out of ODS was largely made possible by the emergence of F-gases. In addition, the ODS regulation system has been operating for some time now and seems to work better than the current F-gases regulation system does.

This chapter details various aspects of the illegal trade in F-gases, enforcement issues, and consequences.

233 Consulted on 3 May 2021 via https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/klimaatbeleid

8.1 F-gases: context, industry and chain

8.1.1 Synthetic refrigerants

Synthetic refrigerants are man-made and widely used in everyday life, including in refrigeration systems and heat pumps.
CFC and HCFC gases, which are able to cool well, were first used for this purpose. At some point, it became clear that these were ozone depleting substances (ODS), the frequent use of which was leading to ozone depletion. This discovery led to the signing of the Montreal Protocol (1987), which introduced a number of bans on the production of and trade in ODS.

These ODS bans led to an increase in the production of fluorinated gases, known as F-gases. F-gases are a family of man-made fluorinated gases used in a range of industrial applications. While F-gases do not deplete the ozone layer, they are powerful greenhouse gases, having a heating effect that is up to 23,000 times greater than carbon dioxide (CO_2). The primary F-gases are hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF6). HFCs are used as refrigerants, degreasing agents, and foam blowing agents (such as fire extinguishers). PFCs are used in semiconductor production, as degreasing agents, and as foam blowing agents. Sulphur hexafluoride is used in high-voltage switches and in magnesium production[234].

The production of HFCs in particular has increased in recent decades. This is by far the most relevant F-gas group from a climate perspective, although it is only present in the atmosphere for a relatively short time. The other two F-gas groups, PFCs and SF6, can remain in the atmosphere for thousands of years.[235]

According to RIVM (2016), the contribution of HFCs to the global greenhouse effect will by 2050 have increased to 10 per cent of that of the main greenhouse gas, CO_2, if global HFC use would continue to increase at the current rate.

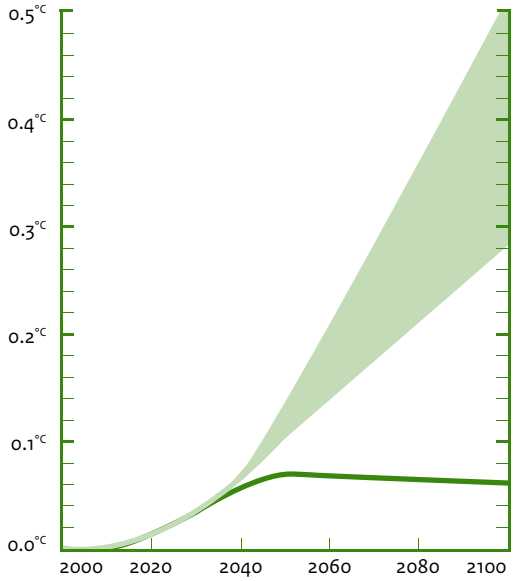
HFC emissions are expected to mainly increase in emerging economies, such as China, India, and other countries in Asia.[236]

Europe wants to reduce F-gas emissions by two-thirds from the 2014 level by 2030. The phasing-out of HFCs plays an important part in reaching this objective. By 2030, the amount of HFCs marketed in Europe must be brought down to 21% of the 1 January 2015 level (refer to section 8.2), forcing a large-scale switch to climate-friendly technologies in new equipment and products. This on the one hand requires that F-gases with much lower GWP values are used and, on the other, that natural refrigerants such as ammonia, CO_2, and propane, which also have lower GWPs are applied. However, the Environmental Investigation Agency (2016, 2019) is critical of the manner and speed of implementation of this switch.
The projected cumulative emission savings are 1.5 gigatonnes of CO_2 equivalent in 2030 and 5 gigatonnes in 2050. The latter number is more than the CO_2 produced by a billion round-trip flights from Paris to New York and more than the sum of all greenhouse gases emitted in the EU during a year.[237]

Agreements to reduce the use of HFCs have also been concluded at the global level. The Kigali Amendment was adopted by all United Nations countries in 2016. In so doing, they agreed to include HFCs in the Montreal Protocol's list of controlled substances, thereby greatly reducing their use. The Kigali Amendment came into force on 1 January 2019. Most developing countries will start phasing out in 2024.
Expectations are that about 80 gigatonnes of CO_2 equivalents can be saved by 2050 in this fashion (Figure 8.1).

234 Consulted on 3 May 2021 via https://eur-lex.europa.eu/legal-content/NL/ALL/?uri=LEGISSUM%3A2001_10
235 Consulted on 3 May 2021 via https://ec.europa.eu/clima/policies/f-gas_en
236 Consulted on 3 May 2021 via https://www.rivm.nl/fluorkoolwaterstoffen/bijdrage-hfk-s-aan-broeikaswerking
237 Consulted on 3 May 2021 via https://ec.europa.eu/clima/policies/f-gas_en

Figure 8.1 *The contribution of HFCs to average global warming with and without the effects of the Kigali Amendment (RIVM, 2016).*



The Kigali Amendment is expected to limit the contribution of HFCs to global warming to less than 0.1 degrees Celsius by the end of the 21st century. Without the Amendment, the contribution of HFCs to warming could have reached 0.3 to 0.5 degrees Celsius by 2100 (RIVM, 2016).[238]

8.1.2 Industry and chain description

The Netherlands

F-gases are produced mainly in China but also in the US and Turkey.

In the Netherlands, about 10 major importers control 80% of the legal market. The gases are supplied over sea (China/USA) but also overland, in particular from Turkey. Specifically for F-gases, there are 3 major importers in the Netherlands. Multiple (smaller) importers import pre-filled equipment, such as refrigerators and air conditioners.

In the below, we will provide a picture of the imports of cleared F-gases in the Netherlands in 2019 and 2020, based on preliminary ILT and Customs data. In both years, around 1,000 transports of F-gases from the US were reported, and around 800 from China. Relatively little was imported from other countries. Customs data show that, in 2019, F-gases with net weights of around 15,000 tonnes were imported from China (32%), 12,800 tonnes from the US (27%), and 13,000 tonnes from Brazil (28%). The remaining 12% was made up of smaller quantities arriving from different countries. Data through November 2020 show a similar trend for 2020: around 14,000 tonnes arrived from China (44%) and 12,700 tonnes from the US (39%); imports from Brazil had decreased to 2,500 tonnes (8%). The remaining 9% were imported from other countries.

A large part of these imports consists of F-gases with a GWP of 0. Looking at the total amount of GWP imported, the 2019 contribution from China is almost 93%, equivalent to 23,000 kilotonnes of CO_2. The US is responsible for 6% (1,500 kt CO_2) and the other countries together for 1% (180 kt CO_2).

In 2020, GWP from the US looks set to increase to over 4,500 kilotonnes of CO_2. While the December 2020 data were not yet available at the time of writing this chapter, the percentage seems to be shifting to 80% GWP from China, 19% from the US, and 1% from other countries.

Prefilled devices are imported mainly from China (>10,000 import reports). In addition, there are some 5,000 reports of imports from the US and about 2,000 reports of imports from Turkey. However, this only lists the number of reports, not the weight or GWP.

Europe

The trade restrictions apply to first-time buyers on the European market. Once a product has been imported into Europe, the free market mechanism applies.

A late 2020 report by the European Commission shows that the patterns of the HFC market in the EU have changed over the past five years. The HFC bulk market has grown from just over 100 companies,

238 Consulted on 3 May 2021 via https://www.rivm.nl/fluorkoolwaterstoffen/montreal-protocol

including a few dominant gas suppliers, to around 2,500 companies. Many of them have small quota amounts. This has had a major impact on traditional supply chains, which may have lost market share to new competitors.

8.2 Relevant legislation

The legislation with respect to F-gases is very complex because it is based on multiple European Regulations. In addition, many peculiarities and exceptions apply. This means that, in order to estimate possible criminal acts by subjects, explicit attention must be paid to the specific situation of each case.

This section in particular addresses the F-Gas Regulation (EU 517/2014). This Regulation has been in force from 1 January 2015 and replaced the previous Regulation EC 842/2006. The Regulation is an elaboration and tightening of the Kyoto Protocol's obligations with respect to substances that enhance the greenhouse effect.

8.2.1 Phasing out HFCs

The Regulation inter alia provides that the amount of HFCs marketed in Europe each year must be phased out. The maximum quotas, the baselines, are based on the annual average demand for HFCs in the 2009-2012 period. This amounted to about 182.5 million tonnes of CO_2 equivalent.

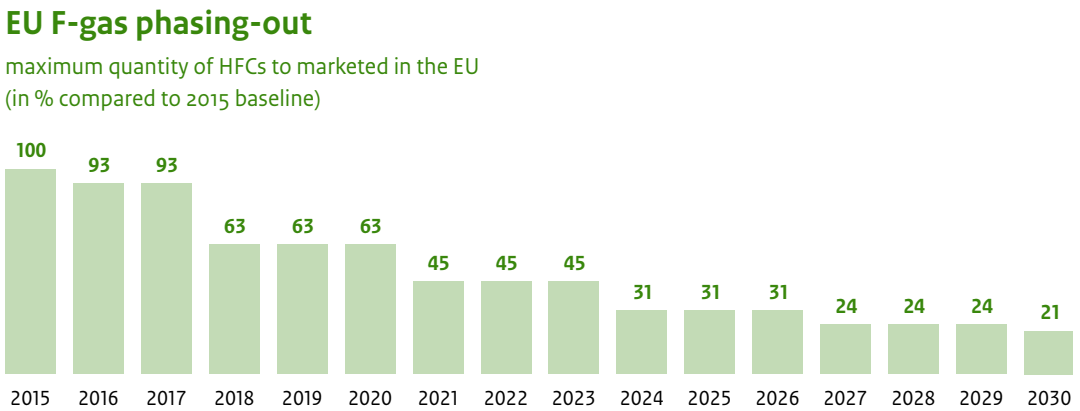
After decreases to 93% in 2016 and 63% in 2018, the amount of marketed HFCs was to decrease to 45% in 2021 and then to 31% in 2024. Eventually, this was to lead to the 2030 amounts being equal to 21% of the 2015 ones (Figure 8.2).

The available annual quota is divided over the importers of bulk gases that have filed an application. Pre-filled equipment, such as air conditioners, are also covered by the quota scheme. An importer of pre-filled equipment must obtain quota from a bulk holder to be able to import products.
Quotas that have been obtained and traded are tracked in the European F-gases portal.
A quota holder must annually render account to the European Commission. In many cases, the account has to be approved by an auditor.
In current enforcement practice, this means that only initial HFC imports by a producer or importer that holds no quota rights or that exceeds their quota is liable to punishment.

8.2.2 Marketing restrictions and usage regulations

In addition, the F-Gas Regulation contains restrictions on the marketing of certain products and equipment (Article 11) and usage regulations (Article 13).
Imports of several product groups containing a refrigerant with a GWP value above a certain limit are prohibited in full (Annexe 3 of the F-Gas Regulation).

Figure 8.2 *schematic representation of the phasing out of F-gases in the EU*



The use of higher GWP gases is also restricted under the F-Gas Regulation. For example, an F-gas with a GWP value over 2,500 may only be used in refrigeration equipment with a refrigerant charge of no more than 40 tonnes of CO_2 equivalent. Moreover, it has since 2007 been prohibited to market refrigerants in non-refillable cylinders. The gases should be stored in refillable cylinders that are technically suitable for refilling. In addition, a return system must be set up to allow for cylinder refills. This means that even cylinders that are technically refillable are labelled as being non-refillable if no provision exists for a return system to have the cylinders refilled.

The F-Gas Regulation is fleshed out in more detail in many European sub-regulations. These set out further requirements, such as reporting obligations, mandatory labelling requirements, basic leakage control requirements, and mandatory certification of companies and personnel carrying out operations.

8.2.3 Dutch legislation

The European requirements provided by the F-Gas Regulation have, under Sections 9.2.2.1(1) and 11a.2(1) to (3) of the Environmental Management Act, been incorporated in the following pieces of Dutch legislation:

- The Fluorinated Greenhouse Gases and Ozone-Depleting Substances Decree
- The Fluorinated Greenhouse Gases and Ozone-Depleting Substances Regulation
- The Assessment guideline 100 (companies), or BRL 100
- The Assessment guideline 200 (persons), or BRL 200

The main infringements of the F-Gas Regulation that take place in the context of trade and are almost directly related to illegal imports of F-gases are:

- Trading outside the quota system
- Importers exceeding the allocated or transferred quota
- Import of non-refillable cylinders/containers
- No provision for a return system for refilling refillable cylinders/containers
- Incorrect and/or incomplete labelling of cylinders/containers
- Sales to and use by non-certified companies or persons
- Use of prohibited F-gases (phased out) for repair and/or refilling purposes

All these acts are prohibited under Section 4 of the Decree and are economic offences (6-year offences) under Section 9.2.2.1 of the Environmental Management Act and Section 1a(1) of the Economic Offences Act.

Due to the illegal nature of prohibited imports and/or use in the chain, the following related legislative obligations are also often not complied with: the transport legislation for hazardous substances and pressure containers (EU Directives 2008/68/EU and 2010/35/EU) and the REACH Regulation (EC No 1907/2006), the European system for registration, evaluation, and authorisation of chemicals produced or imported into the European Union. Every refrigerant is a classified hazardous substance of hazard class 2 (gases), meaning that the legislation on hazardous substances always applies.

8.3 Agencies and private parties involved

8.3.1 National

The main agencies active at the national level are the Human Environment and Transport Inspectorate. (ILT), Customs, the Environmental Agencies (a total of 29 of which exist) and the ILT-IOD (the ILT's special investigation service). Cooperation between these agencies is based on is the Regulation on fluorinated greenhouse gases (EU 517/2014).

Cooperation between the ILT and Customs focuses on the illegal trade in these substances and compliance with the trade restrictions imposed. A cooperation agreement has been concluded between ILT and Customs to this purpose. This agreement regulates the cooperation between ministries[239], the ILT and Customs in the performance of the implementation tasks of the ILT and Customs with respect to fluorinated greenhouse gases.

239 the Ministry of Economic Affairs and Climate and the Ministry of Finance

The ILT is the competent authority and provides a risk profile that is monitored by Customs. The results obtained are studied by the ILT, which takes enforcement action where necessary.

Cooperation between the ILT and the Environmental Agencies focuses mainly on leakage. The Environmental Agencies have competence with respect to stationary refrigeration systems located within establishments. The ILT, too, has competence with respect these installations and also with respect to mobile refrigeration systems and installation and maintenance companies (BRL 100 and 200). Private supervision of installation and maintenance companies is regulated by a system of Inspection Bodies and Examination Bodies that fall under the public supervision of the ILT.

In case of organised crime, or if additional investigative resources need to be deployed, the ILT-IOD may conduct criminal investigations. This is done in consultation with the ILT.

8.3.2 International

International cooperation focuses on Europe. There are several key partners:
The European Customs Houses. Dutch Customs receives so-called RIF (EU risk information form) notifications that may indicate illegal trade from other European Customs Offices. Customs shares this information with the ILT.
OLAF, the European Anti-Fraud Office. OLAF shares information on illegal trade with the country the shipment is sent to, allowing it to take enforcement action
NGOs such as the Environmental Investigation Agency (EIA). The EIA itself investigates illegal flows and supports enforcement agencies with the information obtained. In its report "Doors Wide Open" (2019), the EIA notes that illicit trade is relatively obstacle-free
Industry organisations, such as the European FluoroCarbons Technical Committee (EFCTC). Illegal trade is of course also detrimental to the legally established trade in these substances. Kroll corporate investigation firm has been engaged by the EFCTC to detect illegal trade.
Europol. Europol has been actively tackling this issue since 2020, cooperating with Member States, OLAF, and other parties.

8.3.3 'Reducing greenhouse gases' ILT programme

Throughout the 2017-2020 period, the 'emissions of substances harming the ozone layer/air/climate' supervision topic consistently made the top 10 in the Inspection-wide Risk Analysis (IBRA) of the ILT. This provided cause to launch the 'reducing greenhouse gases' programme in 2019. The programme will run until the end of 2022. The aim of this programme is to reduce emissions of ozone-depleting substances (ODS) and fluorinated gases (F-gases). The programme's focus is on:
reducing illegal trade in ODS and F-gases
improving the information position (in order to work in a more risk-oriented way)
reducing leakage of ODS and F-gases from old refrigeration systems
The Infographic shown in Figure 8.3 displays the field of work.

8.4 Criminal opportunities and practice

The outlined operation of the illegal network is based on the current intelligence picture and information provided by multiple EU Member States. Due to the absence of completed (criminal) investigations, a representative picture is lacking.

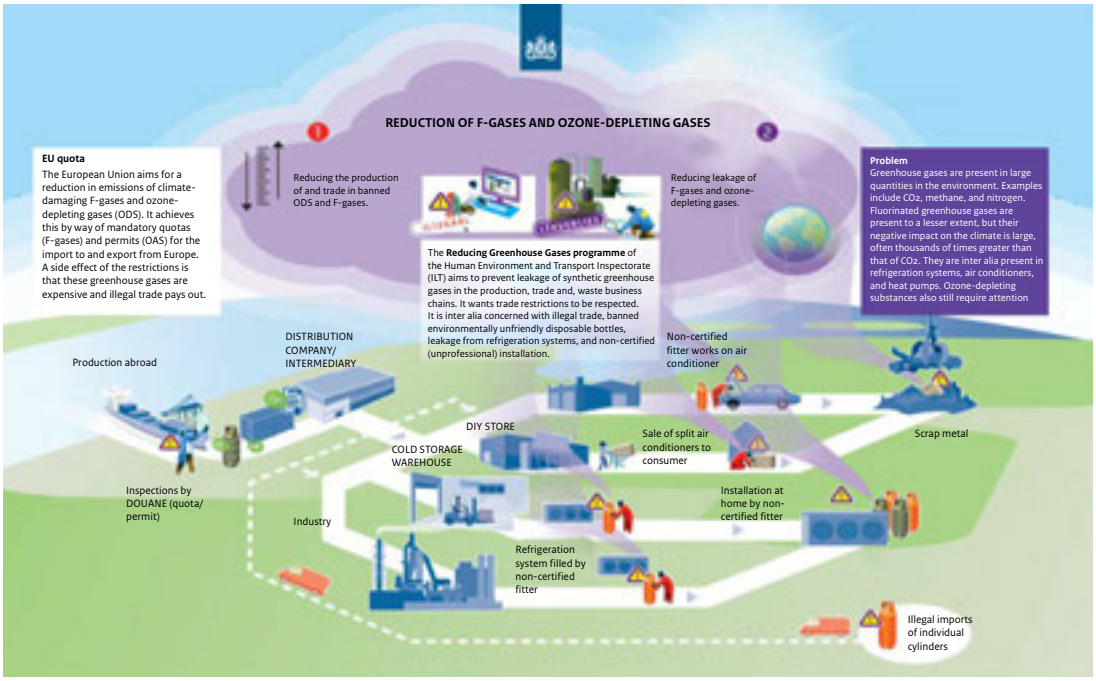
8.4.1 Emergence of illegal trade

In 2016, soon after the F-Gases Regulation came into force, the first signs of circumvention of the quota regulations in the trade in marketed refrigerants appeared.

In anticipation of the stricter quota requirements entering into force in 2018, the price of various refrigerants already rose in mid-2017. The prices of various refrigerants rose by 600 to 1,300 per cent in a short time; refer to Figure 8.4 (Öko-Recherche, 2020). A price hike was expected due to scarcity created by quota reduction. As prices rise, the illegal market flourishes (European Commission, 2020). In illegal circles, refrigerant can at times be bought for less than half the peak price.

Trading illegal refrigerants pays off. As the legal market faced rising prices, several cases emerged of refrigerants at times being imported for less than

Figure 8.3 *ILT's field of work with respect to F-gases and ODS, ILT*

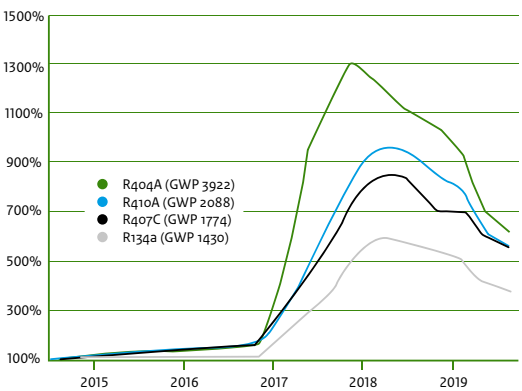


€50 per cylinder and being sold to the end user for €300 per cylinder. Prices for refrigerants from regular batches were sometimes twice as high.

8.4.2 Illegal marketing

Imported F-gases must be declared to Customs (customs clearance). To legally market gases, the importers must be registered in the European F-gases portal and cannot exceed their annually allocated quota.

Figure 8.4 *Average sales prices of the most commonly used F-gases by service companies, Öko-Recherche.*



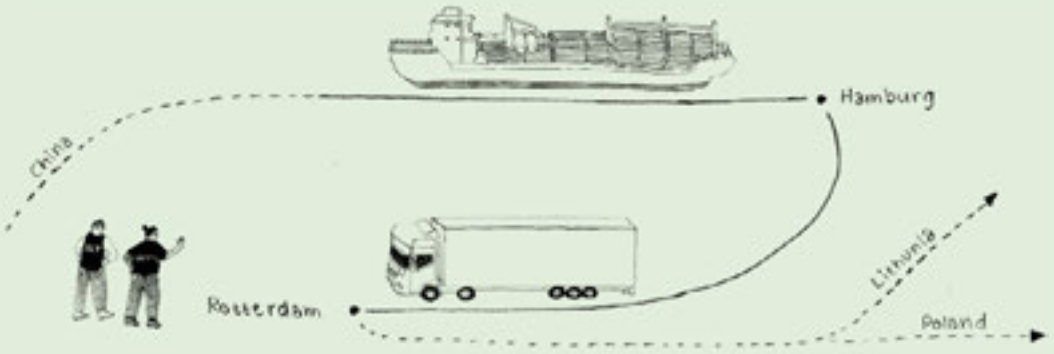
F-gases intended for the illegal trade are put on the European market in different ways. The following picture of ways by which refrigerants are illegally introduced into the European market appear from national (ILT and Customs) and international sources of information (OLAF, EIA, and market operators):

- F-gases introduced into the European market by way of customs clearance in quantities exceeding the allocated quota. The amount of substances marketed during a year must be reported to the European Commission by 31 March of the following year. In addition, operators may acquire quota from each other during the year. As a result, it is not always possible to determine whether the quota has been exceeded on clearance.
- Import via customs clearance, with the F-gases being imported under a different designation/ code or carried as deck cargo.
- Via transit status (T1), meaning the F-gases have not yet entered the European market. Such a batch is then quickly removed from sight and marketed illegally. To date, this illegal mode of import receives little priority from supervisors.
- Smuggling, bypassing Customs.

Case study on illegal imports

In 2020, the Human Environment and Transport Inspectorate (ILT) - working closely with Customs, Rijkswaterstaat, and the European Commission (OLAF) - intercepted a transport containing 1,150 illegal, non-refillable cylinders filled with refrigerants (F-gases) during an inspection at the port of Rotterdam. The batch had been shipped from China and then transhipped to trucks in Hamburg. The official destination was Lithuania. Customs declaration took place in the Netherlands and the shipment was to be transported by a Polish transport company. Meanwhile, the final destination had been changed to Poland. During customs clearance in the Netherlands, the ILT detained the batch and then delivered it to an authorised collector at the Lithuanian importer's expense.

Figure 8.5 *Unconventional routes are followed to avoid supervision (schematic of illegal import and distribution, ILT-IOD)*



8.4.3 The chain

Once inside the EU, illegal F-gases are distributed to the end user through various links. Case histories show that the following roles can be distinguished in the illegal trade chain[240]:

- Producers: Refrigerants are mainly produced in China
- Transporters: transport the cylinders by sea or land on behalf of the importer
- Forwarding agents: arrange for import through Customs on behalf of the importer
- Importers: are responsible for buying the gases in China and illegally marketing them in the European Union. Imports used to travel mainly via the eastern borders of Eastern European countries and Turkey. But now it appears the gases are also being imported into / marketed in Europe via the Netherlands and Germany, among other countries. This can be done through customs clearance in the Netherlands (initial import) or by using T1 status (transit).
- Distributors: are responsible for the further distribution of illegally imported refrigerants. It happens that the primary and secondary distributors are part of the same criminal organisation.
- Sellers: buy the product from the distributors and sell it to the end user or act as intermediaries. Sales are made door-to-door or offered online on platforms like Marktplaats, Facebook, or by e-mail.

On the basis of multiple case histories, both national and European/international, it has become clear that the chain operates throughout Europe, making it possible for the offence (the initial import) to be committed in any European country, while the goods are destined for the Dutch market. The criminal organisation behind the import of F-gases uses unconventional routes to avoid supervision.

240 Not published publicly

8.4.4 A new phenomenon

F-gases traded on the black market were, until recently, generally offered in non-refillable cylinders. This type was easy to distinguish. This made it clear at a glance that the import was illegal, as marketing refrigerants in non-refillable cylinders has been banned since 2007. In 2020, the illegal market shifted to offering F-gases in apparently refillable cylinders (refer to figure 8.6). The cylinders recently discovered had faulty labelling lacking certain information, such as producer, GWP and UN numbers, affixed to them.

In recent years, various agencies have conducted interventions to stop illegal trade. Industry associations, such as the EFCTC, support governments in these efforts, including by informing end-users about illegal refrigerants. They alert potential users to the financial, health, and safety risks.

End users may have become more aware of the risks. Several reports have been made to the ILT by companies that were offered refrigerants in non-refillable cylinders. Shipments in non-refillable cylinders were also returned on the black market. However, cases are also known where rejected refrigerant stored in non-refillable cylinders was as yet marketed by transferring it into refillable cylinders. In late 2020, for example, a "ringing plant" was closed down in Spain.[241]

Figure 8.6 *Shift in the illegal market. On the left, the easily recognisable, non-refillable cylinder. On the right, the type of cylinder offered today, ILT-IOD*

8.4.5 Size of illegal trade

The exact size of the illegal trade is not known. Several (market) parties have made varying estimates of total illegal imports. In 2018 and 2019, the total available quota in the EU was 101.2 Mt Co_2 equivalent.

- Coolektiv from Germany states that, in 2018, around 22.5 megatonnes of CO_2 equivalent was illegally imported into the EU (mainly products with a high global warming potential, such as R-134a, R-404A, and R-410A) (Coolektiv, 2019).[242]
- The EFCTC states that, in 2019, a maximum of 31 megatonnes of CO_2 equivalent had illegally entered the EU. In 2018, the figure was said to be as high as 42 million tonnes of CO_2 equivalent (EFCTC, February 2021).[243]
- The EIA estimates that the total amount of HFCs put on the market in 2018 was 117.5 megatonnes of CO_2 equivalent, or about 16.3 megatonnes of CO_2 equivalent in excess of the available quota. This was said to have been achieved by open smuggling of HFCs, i.e., by imports openly cleared through customs by parties not holding quota rights. Cross-border smuggling, conducted out of sight of Customs, is not included in this figure (Environmental Investigation Agency, 2019).

The above estimates of the illegal trade amount to between a minimum of 16% and a maximum of 42% of gases marketed on top of the total permitted amount of HFCs.

The European Commission's report on the availability of HFCs on the European market, published in December 2020, also states that there is clear evidence that HFCs are illegally imported. National customs authorities have intercepted several illegal imports and OLAF is investigating several possible illegal activities. The research firm Öko-Recherche's March 2020 'briefing paper', which partly underpins the EU report, acknowledges the existence of illegal trade. No quantitative statements on the total size are made. Due to low prices in 2019, increasing efforts expended by enforcement, and harsher penalties, illegal activities were expected to decrease.

241 Consulted on 3 May 2021 via https://www.koudeenluchtbehandeling.nl/nieuws/spaanse-overheid-rolt-omkat-fabriek-illegaal-koudemiddel-op-102407?vakmedianet-approve-cookies=1
242 Consulted on 3 May 2021, via https://www.coolektiv.de/2019/01/18/aktion-politikausschuss-2/
243 Consulted on 3 May 2021, via https://stopillegalcooling.eu/wp-content/uploads/Press-release_Oxera_EN_FINAL-1.pdf

8.5 Supervision and enforcement bottlenecks

Several aspects complicate the supervision and enforcement of the phasing-out of F-gases. A few of these bottlenecks are identified in the below.

8.5.1 Illegal imports

As noted earlier, only the illegal import itself (marketing within the EU) is criminalised. This means that, whenever supervisory bodies come across illegal refrigerants during an inspection or receive a report of their presence, they must always trace the matter back to the importer who first entered them into the EU market. This takes a lot of capacity and results are not assured. Often, several Member States will have to invest time and energy in tracing all the steps in the distribution chain, all the way back to the initial import.
And often, the illegal imports take place in, say, the Netherlands, while the final destination of the refrigerants is another European country. Because the offence is committed in the Netherlands, when the illegal refrigerants are imported, the Netherlands is responsible for taking enforcement action. However, the offender is located abroad. Enforcement under Dutch law abroad creates a complex situation where there is a risk that the Dutch state will have to pay for the costs of processing the refrigerants while these cannot be recovered from the offender.

8.5.2 Non-refillable cylinders

Since 2007, it has been prohibited to market refrigerants in non-refillable cylinders. The gases should be stored in refillable cylinders that are technically suitable for refilling. In addition, a return system must be set up to allow for cylinder refills (also refer to section 8.3). Parties looking to make a quick buck employ a 'creative' definition of refillable cylinder. The actual meaning in practice of the definition is sometimes difficult to determine by supervision and enforcement authorities. This renders harmonisation within the EU on this topics difficult, but necessary.

8.5.3 International and cross-border issues

The F-gases problem is characterised by both its international and cross-border nature. The Kigali Amendment and the Montreal Protocol are international agreements. However, there are differences in the phasing-out schedules across the world.
In addition, the chain is international and difficult to control. Once inside the EU, illegal F-gases often as yet cross several country borders. Illegal streams often follow the path of least resistance. These aspects render supervision and enforcement (including detection) a complex affair. In addition, legislation is not yet adequate in a number of respects, also because the responsibilities of many of these links are not clearly defined.

8.5.4 Priority and sanctioning within the EU

Member States attach different degrees of priority to the F-gases issue. This is often reflected in the capacity made available. There are also differences in sanctioning between EU Member States.
The EIA (2018) asked all Member States about their implementation and enforcement efforts. Thirteen Member States responded and the responses show a variety of approaches and some clear enforcement successes. However, the EIA was concerned about the lack of strict punishments and the extent to which punishments were imposed.
As a result, illegal traders will simply factor in fines as 'business expenses'. And for as long as Member States do not impose equal, proportionate, and dissuasive sanctions, countries imposing lower penalties will undermine the efforts of neighbouring countries.

8.6 Consequences

Many reports have described the impact of human activity, by way of greenhouse gas emissions, on the natural climate. In its recent 'Balans van de samenleving 2020' report, the Netherlands Environmental Assessment Agency lists the consequences: a rise in average temperatures, melting ice caps, a rise in sea level, and more frequent occurrence of extreme weather events (heat waves, drought, excessive rainfall). In addition, diminishing quality of life in certain areas can cause people to move away and increase migration flows, for example to Europe.

To combat climate change (and its consequences), international agreements have been made to reduce emissions of greenhouse gases, including F-gases. The illegal trade in F-gases undermines these objectives.

In addition, illegal trade can lead to safety and health risks, as standards cannot be guaranteed. This may increase the risk of fires or poisoning, for example. Several industry associations are jointly warning users and buyers about such risks. They point out that refrigerants are hazardous substances and should be handled with care, especially in view of the increased use of flammable and high-pressure gases. Refrigerants that do not meet the gas manufacturers' specifications or do not match the contents indicated on the cylinders can pose a serious risk to the health and safety of fitters and users[244]. Equipment performance can also decrease if refrigerants that do not meet specifications are used.

Moreover, the illegal trade deprives Member States of tax revenue, while destroying the level playing field for legal market players. This in turn has potential implications for the R&D budgets for the necessary alternative refrigerants. The switch to renewable systems may also be delayed if enough illegal F-gases remain available in the market.

8.7 New developments

There are several parties (NGOs, market players, but also governments) who expect that the scheduled and relatively rapid phased reduction of F-gases in the period to 2030 could lead to rising prices and scarcity within the EU. This in turn may mean that, despite legal businesses endeavouring to market F-gases with lower GWP values, the illegal trade will grow.

A positive development is that several national and European initiatives aiming to improve cooperation and enforcement to counter illicit trade have been started up. The ILT has prioritised the issue in its Reduced Greenhouse Gases programme. One of the objectives is to move towards even more information-driven and risk-oriented selection in the future. In addition, the ILT intends to set up an Advisory Committee, which would allow EU supervision and enforcement agencies to coordinate with each other at the implementation level and to share information and best practices.

OLAF and Europol are also actively working on the issue. Too, several collaborative initiatives have sprung up. Customs authorities are cooperating in a project group and a Europol EMPACT project ('operational action') on F-gases will start in 2021. This latter project is led by the ILT-IOD. Several of these initiatives are focused on seeking cooperation with market players and NGOs, which are themselves very actively dealing with this topic.

In addition, the F-Gas Regulation is currently being revised[245] with the aim of improving it. Interested parties - both public and private - are in this process given the opportunity to provide their views or respond to European Commission proposals. A Commission proposal is expected by the end of 2021. In addition, on the national level, an amendment to the Fluorinated Greenhouse Gases and Ozone Depleting Substances Decree is pending. The aim is to improve the enforceability of complying with obligations under the F-Gas Regulation.

Too, as per 16 July 2021, the new Regulation 2019/1020 will be in force.
The EU by way of this Regulation aims to improve the functioning of the principle of free movement of goods, such by strengthening market supervision of products covered by EU harmonisation legislation. The F-Gas Regulation is also covered by harmonisation legislation.
The Regulation provides market supervision authorities with several options to achieve this effect. One is the power to obtain product samples, including when using a false identity, in order to inspect and dissect the samples for the purpose of detecting non-conformity and obtaining evidence.

244 Consulted on 3 May 2021 via https://www.epeeglobal.org/wp-content/uploads/Protect-your-business-Buy-refrigerants-from-safe-sources.pdf
245 Consulted on 3 May 2021 via EU legislation to control F-gases | Climate Action (europa.eu)

8.8 Conclusions and recommendations

Europe has ambitious targets to reduce F-gas emissions by two-thirds from the 2014 level by 2030. The phasing-out of HFCs plays an important part in reaching this objective. By 2030, the amount of HFCs marketed in the EU must be brought down to 21% of the 1 January 2015 level. This puts Europe ahead of other parts of the world in terms of legislation and targets.

This phasing-out is controlled by the so-called F-Gas Regulation, using a quota system for producers and importers and mandatory registration of quota holders. The illegal trade in F-gases is characterised by circumvention of the quota system. The F-Gas Regulation focuses largely on production and imports and provides for few prohibitions (restrictions) against the further distribution and use of, for example, F-gases illegally put on the EU market (without quota/registration). This complicates effective enforcement and requires sound national and international cooperation between the various authorities involved (customs, F-gas authorities, investigating authorities, national and local inspection services).
There are at present strong indications that the illegal trade in F-gases in the EU accounts for at least 16% of the total F-gases trade. This in particular concerns trade in HFCs
with a high GWP. Other estimates, rising to 42%, paint an even more negative picture.

In 2021, the percentage of HFCs that may be marketed in the EU decreased from 63% to 45%. This will drop further to 31% in 2024. It remains to be seen whether the supply of (affordable) alternatives can compensate for this. Because this may lead to an increase in the prices of legal F-gases, illegal trade may grow even more.
This further undermines the contribution of F-gas reduction to reducing global warming. In addition, there are security concerns associated with illegal trade, while legal trade is deprived of a level playing field.

The issue has several international and cross-border aspects that complicate the tackling of illegal imports and trade. There are global treaties in effect, that contain differences in the timing of the phasing-out process. Production takes place mainly in China. Turkey is a widely used transit country for illegal imports into the EU. Illegal imports also take place via the EU's eastern border and major ports (such as Rotterdam and Hamburg). Within Europe, F-gases often cross several country borders before they are formally imported into the European market and reach their destination. As long as no formal import (Customs clearance) has taken place, no action can be taken on a suspicion of illegal imports. The networks behind illegal imports are taking advantage of this fact.

Currently, the enforcement and detection agencies in the Netherlands and Europe as a whole do not yet have a clear and complete picture of the illegal market. A preliminary picture of the illegal chain, certain MOs and routes exists. However, this is fragmented and incomplete, and visibility of the (key) players is lacking.
Moreover, cooperation within Europe is still insufficient, while there is also room for improvement within Member States as concerns the cooperation between the different services involved. Recently, though, much more attention has been devoted to the subject. Both within the Netherlands and the EU, several initiatives have been started up to improve joint supervision and enforcement. The industry and NGOs regularly act as drivers of such initiatives.

8.8.1 Recommendations

On the basis of our discussion in the previous sections, we provide the following recommendations:

- Prioritise the subject within the various enforcement agencies
- Continue and improve mutual cooperation at the national and European levels, possibly coordinated by OLAF, based on providing follow-up to signals
- More dissuasive and equal sanctioning within the EU
- Improve the capture, collection, analysis, and sharing of data on the illegal market and players by enforcement agencies, at the European level (routes, MOs, High Value Targets etc.)
- Have investigative services draw up a picture of those parts of the chain invisible to enforcement agencies

- Enhance the knowledge available within enforcement agencies in Europe and exchange best practices and new developments

Literature

Environmental Investigation Agency. (2016). *EU F-gassenverordening handboek: voorop lopen op Europa's HFK-phase-down.*

Environmental Investigation Agency. (2019). *Doors wide open, Europe's flourishing illegal trade in hydrofluorocarbons (HFC's).* London: EIA UK.

European Commission. (2020). *REPORT FROM THE COMMISSION on the availability of hydrofluorocarbons on the Union Market.* Brussels: European Commission.

European Environment Agency. (2015). *Fluorinated greenhouse gases 2014.* Luxembourg: Publications Office of the European Union.

Netherlands Environmental Assessment Agency. (2020). *Balans van de Leefomgeving 2020. Burger in zicht, overheid aan zet.* Netherlands Environmental Assessment Agency. The Hague: Uitgeverij PBL.

Öko-Recherche. (2020). *Briefing paper: HFC availability on the EU market.*


9

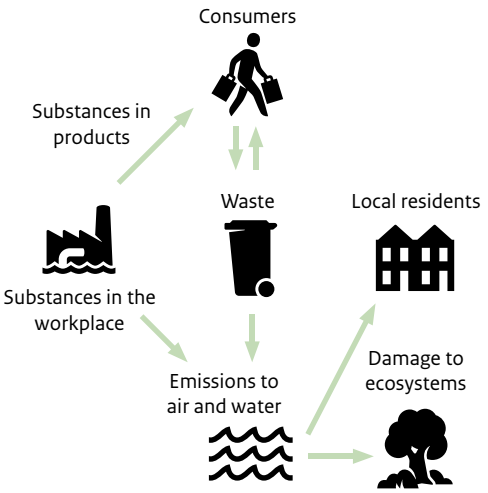
9 Substances of very high concern; are criminals also concerned?

R.A.W. Poelman[246]

Society is regularly rocked by reports of chemicals widely released in the living environment. Incidents involving these substances lead to public unrest and also cause substantial social damage. Humans and ecosystems are exposed to chemicals by various routes - refer to Figure 9.1 - which may involve illegal practices. The Dutch government is particularly concerned about a specific group of chemicals, because they may cause cancer, affect reproduction, or do hardly or not at all degrade in the environment. They are referred to as substances of very high concern (SVHC). A decade ago, the term was relatively unknown, but this has changed by now. Substances such as asbestos, lead, benzene, some PFAS, and GenX substances are examples of substances of very high concern. The potentially large impact they may have on humans and the environment is often only noticeable in the longer term.

Figure 9.1 *(Standing Committee on Infrastructure and Water Management, 2020)*

Exposure to substances by three main routes: the environment, through products, and in the workplace



This chapter focuses on the SVHC. These substances form a specific priority group within the almost infinite number of chemicals that can be hazardous. An important caveat here is that the problems outlined in this chapter are not limited to SVHC. It applies to hazardous chemicals in general and is still relatively uncharted territory from an environmental crime perspective.

246 My thanks go to ILT's Hazardous Substances and Organisms Chain Department

9.1 Description of context and scope

More than 100,000 companies in the Netherlands work with hazardous substances. This usually proceeds without a hitch and the safety of the chemical industry in the Netherlands is of a high standard. However, this sector is also fraught with dangers, ranging from acute accidents or emissions to health and ecosystem degradation. PFAS is a group of about 4,000 chemicals used to make products water, dirt, dust or grease repellent. Examples include pans with a non-stick coating, water-repellent raincoats, or the foam used in fire extinguishers. Examples of PFAS include PFOA: perfluorooctanoic acid, PFOS: perfluorooctanesulfonates (perfluorooctanesulfonic acid), and so-called GenX substances. The latter are used in a technology to produce fluorine-containing plastics, which are used to manufacture non-stick coatings in pans and heat-resistant coatings in packaging. Like PFOA, the substances used in GenX are not or only to a very limited extent degradable in the environment (persistent) and harmful (toxic). The Dutch government has stated its ambition for our chemical industry to be the safest in the world by 2030[247]. To realise this ambition, there is still a long way to go. On 26 April 2021, the Dutch Safety Board launched an investigation into how citizens in the Netherlands are protected from the risks of - at times long-term - harmful industrial emissions and discharges[248].

"The Human Environment and Transport Inspectorate (ILT) wipes the floor with a report on Tata Steel's poison. In the report, the steel company details the toxins present at the site and released into the air. This is a legal requirement, but the ILT considers the report to be wholly inadequate. State Inspectorate ILT sent a letter to the Noordzeekanaalgebied Environmental Agency listing a large number of shortcomings in the so-called SVHC survey. SVHC stands for 'substances of very high concern', such as toxins that can cause cancer or impede reproduction. The Environmental Agency issues the permits for the company and monitors compliance."
(Noordhollands Dagblad, 2021)

There are signs that the distribution of chemicals into the living environment will continue to increase in the future (Council for the Environment and Infrastructure, 2020). Many of these are ubiquitous in the world around us because of their continuous (sometimes illegal) use. Plant protection products and biocides, plastics, industrial chemicals, and pharmaceuticals can be found in nature and our food chain. And that has adverse consequences. These chemicals can have unwanted side effects and cause diseases.

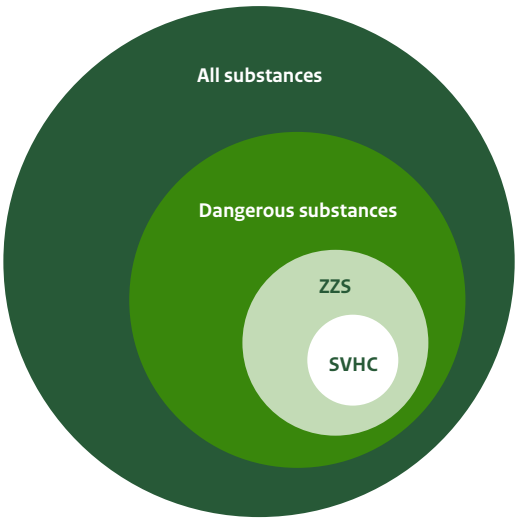
"Over 5 million reports of SVHC present in products
In less than a week, the ECHA has already received over 5 million reports of chemicals of concern being present in products. Since 5 January 2021, European companies are required to submit data on substances of very high concern (SVHC) in their products to the European Chemicals Agency (ECHA). The data are used to create the so-called SCIP database containing information on the use of SVHC in products. This obligation applies to products marketed in the EU. Increased transparency should make it easier for waste processors to know how to recycle a product. It also allows consumers to make a more informed product choice."
(Afval Online, 2021)

The term 'substance of very high concern' was coined in the REACH (Registration, Evaluation, Authorisation and restriction of Chemicals) Regulation; also refer to 9.6.2. It concerns substances the EU or its Member States believe to be of such high risk that they should not be put on the European market. The definition of 'substances of very high concern' (SVHC) in Dutch legislation is not fully equal to that used in the REACH Regulation. Under Dutch legislation, SVHC are part of the group of hazardous substances

247 Consulted 13th February, 2023 via https://www.rijksoverheid.nl/actueel/nieuws/2020/10/05/overheid-petrochemisch-bedrijfsleven-en-wetenschap-lanceren-safety-delta-nederland
248 Consulted on 30 April 2021, via https://www.onderzoeksraad.nl/nl/page/18693/risico%E2%80%99s-omwonenden-door-uitstoot-industrie

that can also be flammable, explosive or toxic, for example (Dutch: Zeer Zorgwekkende Stoffen, ZSS). All 'European' SVHC are covered by the Dutch SVHC policy. All substances meeting the criteria of Article 57 of the REACH Regulation are designated as SVHC under Dutch legislation (but do not have to be SVHC under EU legislation). The term SVHC as used in Dutch legislation is therefore broader than that used in the REACH Regulation.

Figure 9.2 *(RIVM, Identification of Substances of Very High Concern, 2021)*



As of 29 March 2021, the RIVM list includes a total of 1656 SVHC[249]. The RIVM aims to update the SVHC list at least twice a year. Specific criteria are used to determine whether a hazardous substance is considered an SVHC. The substances must possess one or more of the following properties, as defined in Article 57 of the REACH Regulation:

- carcinogenic (C carcinogen)
- mutagenic (M mutagenic)
- toxic to reproduction (R reproductive toxic)
- persistent, bioaccumulative, and toxic (PBT Persistent, Bioaccumulative, and Toxic
- very persistent and very bioaccumulative (vPvB very Persistent and very Bioaccumulative)
- similar concerns (such as endocrine disruptors)

Biocides

Biocides contain active substances that damage harmful organisms. For this reason, their use may have detrimental as well as beneficial effects to public health and the environment. Biocidal products may contain active substances that are eligible for substitution (Article 10 of Biocidal Products Regulation (EU) 528/2012). These substances are called "Candidates for Substitution" (CfS) and can also be SVHC. It is possible to look up whether a substance is designated as CfS on the website of the European Chemicals Agency (ECHA) (ECHA, 2021). All substances that meet the so-called exclusion criteria (Article 5 of the Biocidal Products Regulation) are CfS. Briefly put, these exclusion criteria are the following:

- substances classified in the CLP Regulation (EC) 1272/2008 as belonging to C, M, or R category 1A or 1B;
- substances with endocrine-disrupting properties;
- substances meeting the POP criteria;
- substances with potential for long-range transport
- are PBT or vPvB;
- substances posing unacceptable risks to the environment after assessment.

Potential SVHC

Potential SVHC are substances that are not (yet) classified as SVHC, meaning that the obligations associated with SVHC do not apply. Using the list of potential SVHC (RIVM, 2021) the competent authorities are able to specifically consider whether a company should meet such an obligation with respect to the substance, while the company can use it to its advantage in fulfilling its duty of care. This broadly speaking entails a company having to prevent or otherwise limit all negative impacts on the environment to the extent possible. The duty of care applies to all 'usual' environmental aspects.

Other hazardous chemicals

Besides (potential) SVHC, many other hazardous chemicals, mixtures, and products, such as plant protection products, biocides, plastics, and industrial chemicals can be found in nature and our food chain. These substances are also of concern and also have major adverse effects, their associated hazards ranging from acute accidents or emissions

249 Consulted on 30 April 2021, via https://rvszoeksysteem.rivm.nl/SVHClijst/TotaleLijst

to health and ecosystem degradation. One pertinent example here is the Fipronil affair of July 2017, when a large number of poultry farms were fighting blood lice infestations in chickens using an illegal biocide, resulting in this substance - which is harmful to humans - being found in eggs. Millions of eggs had to be destroyed and over 100 farms were closed. The two main suspects were sentenced to a non-suspended one-year term in prison and a suspended fine of €25,000 each (De Rechtspraak, 2021).

9.2 Description of the chain

The production, distribution, end-user, and transport chain of (environmentally) hazardous substances has long been an important segment in our economy, infrastructure, and living environment. The Dutch chemical sector is the fourth-largest in Europe and tenth-largest in the world in terms of turnover. Providing work to 46,000 employees and generating €62 billion in annual turnover, this sector is essential to the Dutch economy, accounting for 13.3% of its production and 18.5% of its exports[250]. Almost all companies deal with chemicals directly or indirectly. Practice shows that new substances or combinations of substances that can be at least as dangerous are constantly being discovered, put into production, traded, and applied. Several bodies at the national (state) and decentralised (provincial and municipal) levels supervise chemical substances, mixtures, and goods. The permanent sharing of per-establishment supervision information between all authorities involved is a prerequisite for building up an adequate information position and, thus, for effective and efficient supervision, enforcement, and cooperation between the administrative-law and criminal-law bodies. This means that the failure by the multiple supervisors to collate information prevents the creation of an overall picture, which is a risk; also refer to section 9.4.

9.3 Relevant legislation and policies

To protect humans and the environment from the risks of chemicals, including the group of SVHC, extensive and complex legislation is in force. Discussing these laws and regulations in greater detail would not be useful at this juncture. Some of them will be discussed with context in the sections below. In order to provide an overview, a list of all relevant legislation follows.

Legislation:

By the United Nations

- marine shipping: IMCO (International Maritime Consultation Organisation)
- aviation: ICAO (International Civil Aviation Organisation) and IATA (International Air Transport Organisation)

By the European Union

- registration, authorisation and restriction and evaluation of chemicals: REACH Regulation
- authorisation and evaluation of biocidal products: Biocidal Products Regulation
- legal framework for persistent organic pollutants: POPs Regulation
- legal framework for the import and export of certain hazardous chemicals: PIC Regulation
- Mercury Regulation
- prevention and reduction of emissions of chemicals from industrial activities into the air, water, and soil: Industrial Emissions Directive (IED)
- protecting water from chemicals: Water Framework Directive

For road transport:

- CMR (Contrat de Transport International de marchandise par la Route);
- ADR (Accord Européen relatif au transport international des marchandises dangereuses par
- route: International; Agreement concerning the International Carriage of
- Dangerous Goods by Road)
- For rail transport:
- RID (Regulation concerning the International Carriage of Dangerous Goods by Rail)

250 Consulted on 30 April 2021, via https://www.vnci.nl/over-de-chemie

For inland navigation:

- ADN (European Agreement concerning the International Carriage of Dangerous Goods
- by Inland Waterways)
- ADNR (Regulations for the Carriage of Dangerous Goods in the Rhine)

NATIONAL LEGISLATION

- Wabo (Environmental Permitting (General Provisions) Act)
- WVGS (Carriage of Dangerous Substances Act)
- Wgb (Plant Protection Products and Biocides Act)
- WVMC (Abuse of Chemical Substances (Prevention) Act)
- Environmental Management Act (Violations of the REACH/CLP/POP/PIC/Mercury Regulations have been made punishable under this Act)

The WVGS is elaborated in more detail in:

- BVGS (Carriage of Dangerous Substances Decree);
- VLG (Carriage of Dangerous Goods by Land Regulations);
- VSG (Carriage of Dangerous Goods by Rail Regulations);
- VBG (Carriage of Dangerous Goods by Inland Waterways Regulations)
- The Wgb is elaborated in the Plant Protection Products and Biocides Decree and the Plant Protection Products and Biocides Regulation

EU POLICY

EU chemicals strategy for sustainability towards a toxic-free environment

The EU and its Member States by way of this strategy[251] aim to:

- support innovation to create safer products;
- ban toxic substances unless they are indispensable and no alternatives exist, with due attention to human protection;
- reduce exposure to substances harmful to the hormonal system, and to toxic combination effects;
- improve legislation and simplify risk assessment;
- set the example for a toxic-free planet.

"The European Commission will extend the scope of action of the European Anti-Fraud Office for coordination and investigation, to tackle the circulation of illicit chemical products in the EU. It will also support Member States to prioritise integrated enforcement through multi-legislation checks."

DOMESTIC POLICY

In 2011, the then Ministry of Infrastructure and the Environment revised the policy on priority substances. The tackling of these substances, referred to as SVHC from that point on, is prioritised by the government because they can be dangerous to humans and the environment. Dutch SVHC policy aims to keep SVHC out of the living environment as much as possible. The policy is based on three tracks: substitution (using alternatives) of the SVHC in the production process, forming the so-called source approach; if substitution is not possible, reduction of emissions to the extent possible; banning substances through EU regulations. Within the Netherlands, the competent authority for SVHC can impose additional measures to minimise emissions, the so-called BAT (Best Available Technique)+ measures. The substances detailed in (among others) the aforementioned REACH Regulation, the POPs Regulation, the IED, the Water Framework Directive, and the Priority Substances Directive have in the Netherlands been combined into a single Substances of Very High Concern list. This is laid down in the Environmental Management Act. In addition, the Netherlands has supplemented the substances listed in the Water Framework Directive with substances that pose a potential risk in Dutch waters.

Impact of European policy

European policies and regulations on substances of (very) high concern impact the policies of the Dutch provincial authorities, Water Authorities, municipal authorities, and water companies. To the Water Authorities and the ILT, for example, the rules are important, as they ensure the quality of water in the Netherlands and the associated chemical status of the water. Water Authorities must prevent these substances from entering surface water and are implementing cross-border cooperation in the Rhine and Meuse Commission in order to improve the quality of river water reaching our country.

251 Consulted on 30 April 2021, via https://europadecentraal.nl/strategie-voor-duurzame-chemische-stoffen-voor-een-gifvrij-milieu/

But the provincial and municipal authorities, too, must take this policy into account, as they enforce environmental laws in, for example, the air, soil, and water. The inclusion of chemical substances in the SVHC list therefore has implications for licensing. This applies, for example, to companies that emit or discharge chemicals, such as industrial plants and livestock farms. When applying for a licence, the competent authority must check whether the substances that a company comes into contact with meet the SVHC criteria and requirements. In addition, the competent authorities must also supervise companies that emit SVHC. It also impacts the future strategy of companies. Drawing attention to a substance and starting preparations to nominate it for placement on the SVHC list, such as is the case with PFAS, is an opportunity for manufacturers and users (based both inside and outside the EU) to actively seek substitutes and phase out the substance in their own process or product.

SVHC in the Circular Economy

The Netherlands has pronounced the ambition to have its economy be circular by 2050. This is a social task that also requires governments to possess new and/or different knowledge; also refer to section 2.3. The competent authorities and licensing authorities assess initiatives done in the context of the Circular Economy (CE). To do so, they often require specialist knowledge, such as on SVHC, or in order to determine the contribution made to sustainability. One part of the circular economy is the so-called manufacturing industry. The manufacturing industry processes raw materials and materials into semi-finished goods and products. In a circular economy, products and materials are put back into circulation - including the SVHC present in them. It is therefore crucial to have access to information about the (safety of) substances present, including SVHC, throughout the chain.

Green Deal

The European Commission aims to better protect citizens against hazardous chemicals; also refer to section 2.3. One of the goals of the Green Deal is to end pollution of the air, water, and soil by way of the 'Zero Pollution' action plan. The Commission for example wants to propose measures to tackle pollution from microplastics and drug residues. In the aforementioned chemicals strategy for sustainability, the Commission announced its intention to include endocrine disruptors; persistent, mobile and toxic; and highly persistent and highly mobile substances in the category of substances of very high concern.

Relationship with working conditions

A strong relationship exists between REACH, CLP, biocides, and health and safety legislation within companies. After all, knowledge about the hazardous properties of substances and risk control, and communication about them in the chain, form an important part of the REACH Regulation. The obligation of passing information down the chain by means of an up-to-date Safety Data Sheet (SDS) and correct classification and labelling according to the CLP Regulation applies to both hazardous substances and mixtures, and to biocides. Without this information, it is almost impossible to implement a good health and safety policy with respect to hazardous substances. Where no chemical safety assessment is required under the REACH Regulation, the health and safety legislation still requires the implementation measures on the basis of the company's own hazard identification and risk assessment (HIRA). In this way, the REACH Regulation and health and safety legislation interact. However, there are also important differences between the REACH Regulation and health and safety legislation. One of the most obvious differences is that, under the REACH Regulation, some substances are exempted from certain obligations. In contrast, the Working Conditions Decree stipulates that exposure to all hazardous substances must be adequately controlled. Wood dust, for example, may seem harmless, as it is a natural product. However, certain wood processing operations can release such a quantity of wood dust that workers are at risk of health damage. Moreover, wood dust can be carcinogenic. Wood dust exposure should therefore be assessed as part of the HIRA. Occupational exposure to hazardous substances contributes by about 5% to the total burden of disease in the Netherlands. Every year, about 4,000

(former) employees alone die from the effects of this exposure during work, while a multiple of this number fall ill[252].

9.4 Permit conferral, supervision, and enforcement

In controlling SVHC emissions, the competent authority that grants environmental permits to companies and supervises them (provincial authorities, environmental agencies, municipal authorities, Water Authorities, Rijkswaterstaat) plays a key role. The Van Aartsen Committee concluded, among other things, that environmental crime is insufficiently tackled by administrative-law and criminal-law agencies acting in tandem; also refer to section 2.2.5. As a result, avoidable environmental problems continue to occur, culminating in health damage, economic damage, and administrative damage. Attention must be paid to the limited capacity available to deal with these issues if we are to close the net around companies that do not want to comply with the law. To be able to issue sound permits, exercise adequate supervision, and maintain a balanced relationship with the administrative competent authority, it is necessary to work on an organisational culture where experts reinforce and challenge each other, including across regional borders. Shared information is necessary to facilitate that cooperation. Increased cooperation and sharing of experiences will lead to more expertise and thus improve the quality of and consistency in the performance of VTH tasks. Risk-oriented, information-driven, and more societal impact-oriented investigations and the deployment of the right mix of the various instruments (administrative law, criminal law, communications, etc.) will lead to maximum effect and impact of the work. Finally, sound coherence between the administrative and criminal justice chain requires criminal justice to follow up on signals received by administrative-law bodies. Systematic processing and analysis of information is crucial to effect this, as well. In the Netherlands, the permit conferral, supervision, and enforcement tasks in respect of chemicals are divided among various departments. In order to provide an overview, a list of the relevant departments follows:

- Companies that emit or discharge (potential) SVHC require a permit. This is granted by Rijkswaterstaat, the provincial authorities, or the Water Authority.
- Permit conferral, supervision, and enforcement (VTH) in the field of the environment is the core work of the 29 Environment Services, which perform these tasks on behalf of the municipal and provincial authorities.
- The Human Environment and Transport Inspectorate (ILT) supervises the risks associated with the production of, trade in, and handling of chemicals, working in good cooperation with other state inspectorates and other implementing organisations. The supervision field is characterised by a chain approach in which the ILT in particular plays a role at the beginning of the chain, being responsible for the registration of, admission of, and proper provision of information (including labelling and advertising) to professional users. In addition, it is responsible for authorisation and restriction. With respect to biocides, the ILT also supervises professional skilled users (e.g., in the fields of fumigation and animal pest control in general). The ILT's supervision extends beyond supervision of authorised substances. The import of, trade in, and use of unauthorised substances are also subject to ILT supervision. Within the current performance of supervision on substances, the ILT focuses mainly on opportunities to handle chemicals responsibly and safely, and seeks to promote the replacement of dangerous substances (including SVHC) with safe ones (within national frameworks and having a link with REACH).
- The Dutch Food and Consumer Product Safety Authority (NVWA): supervises manufacturers of, importers of, and traders in chemicals, mixtures, and consumer articles.
- The Social Affairs and Employment Inspectorate (Inspectorate SZW): supervises professional users of chemical substances and mixtures, such as painting companies and metal companies.

252 Consulted on 30 April 2021, via https://www.tno.nl/nl/over-tno/nieuws/2020/6/preventie-van-beroeps-ziekten-door-meer-zicht-op-blootstelling/

- The State Supervision of Mines (SSM): supervises mining companies.
- Customs: provides information on imports and exports of certain substances, and carries out inspections on the import into the EU of chemicals, mixtures, and goods.
- The Inspectorate for Health and Youth Care (IGJ) oversees the entire medicines chain.
- The National Office for Serious Fraud, Environmental Crime and Asset Confiscation of the Public Prosecution Service is in charge of directing the criminal enforcement of environmental legislation.
- Such enforcement also requires the involvement of the police, which has environmental investigators, environmental officers in the base teams, and intelligence officers perform the actual enforcement.

Many regulators in the Netherlands operate in a risk-based manner. Risk-based supervision involves supervisors explicitly determining which risks deserve the most attention and using their limited resources to focus on these risks. In practice, tackling environmental crime suffers from a significant lack of capacity; also refer to section 4.4.5. Operational cooperation between (the special investigation services of) the Human Environment and Transport Inspectorate, the Netherlands Food and Consumer Product Safety Authority, the Inspectorate SZW, and the Police is necessary to enable a more comprehensive approach to tackling environmental crime. The BOD policy briefs up until 2023[253] refer to "smarter and better tracking" and the deployment of technical capabilities. Within the Smarter and Better Tracking theme, 2020 saw further investment in creating a solid network encompassing all partners. This has improved the cooperation and connection between services on this theme as a whole, as well as at the level of specific initiatives.

9.5 New Developments

9.5.1 Policy development

The Dutch government has policies in place to minimise the risks of SVHC to humans and the environment. This can be done by having them replaced with less harmful substances and/or by having processes modified where feasible and affordable. Furthermore, emissions are subject to a minimisation obligation. The aim is to realise a continuous process of improvement by having producers submit five-yearly reports to the competent authority covering the measures taken by them to reduce SVHC use and emissions. The first five-year report of SVHC emissions to the competent authority was to have been submitted by 1 January 2021. It is hoped that a better picture of the extent and distribution of SVHC in the living environment and on the measures taken to reduce SVHC in the living environment can be obtained from these reports. No complete image can yet be distilled from this first report. In 2018, the Human Environment and Transport Inspectorate (ILT) issued a signal report (Central Government, 2018) on the use of the (temporary) exception to the applicable emission requirements for 76 SVHC. In this report, the ILT notes that, while it does not have a complete picture, it in practice finds that companies - sometimes explicitly invoking the exception period - do not as yet make serious efforts to phase out or minimise emissions of these 76 substances. As a result, they fail to comply with the minimisation requirement, potentially leading to an unintended and unnecessarily high volume of SVHC emissions up to 2025. This means that much higher emission amounts will until 2025 be allowed for this group of substances than for the other SVHC. The transition period until 2025 for these SVHC was not intended to be used in this way. It is not a standstill period, but one in which emissions are to be reduced in steps under the minimisation obligation. This will also make it easier for companies to meet the emission requirements applicable in 2025. In 2021, the ILT will once again report on progress in minimising emissions of these substances.

253 Consulted on 30 April 2021, via https://www.rijksoverheid.nl/documenten/kamerstukken/2019/08/29/tk-beleidsbrief-bijzondere-opsporingsdienst

9.5.2 Unlocking information

The new Environment and Planning Act is supposed to come into force on 1 January 2022. One of the principles underlying the Environment and Planning Act is for governments to consider safety as early as possible in their plans, allowing them to prevent a disaster or crisis or limit its consequences. The Environment and Planning Act has given rise to the Living Environment (Quality) Decree (Bkl), which inter alia stipulates that a Register of External Safety Risks (REV), to be managed by the Minister of Infrastructure and Water Management and to be electronically accessible to everyone, must be set up (Section 10.8 of the Bkl). Summarily put, the Environment and Planning Act states that, from 2022 onwards, the REV must make the information concerning some 40 activities held by some 400 source holders electronically accessible. These source holders are generally the Environmental Agencies, but may also be the municipal, provincial, and national authorities. Sound information on the living environment is crucial for implementing the duty of care under the Environment and Planning Act.
From 5 January 2021 onwards, goods containing substances included on the REACH Regulation's Candidate List at levels over 0.1% must be reported to ECHA, the European Chemicals Agency. These are the SVHC as classified by the EU. The ECHA has set up the SCIP - Substances of Concern In articles as such or in complex objects (Products) - database for this purpose. These new European rules should lead to improved disclosure of information on SVHC in products, which is also important when dealing with these products at the waste stage.
The Industrial and Hazardous Waste (Notification) Decree is being amended. The draft decree amends Section 7a to include an exception on the submission of information on the presence of SVHC in goods to the Ministry of Defence and record it in the ECHA database. Registering the substances in a public database would make this information available to anyone, which is not desirable. This Decree will enter into force at a time to be determined by Royal Decree.

9.5.3 POPs

Persistent organic pollutants (POPs) are organic substances that remain in the environment for a long time, accumulate in living organisms and pose a risk to our health and the environment. POPs are regulated globally by the Stockholm Convention[254] and the Aarhus Protocol[255]. These laws are implemented in the European Union by way of the POPs Regulation. The POPs Regulation aims to protect human health and the environment by implementing specific control measures that:

- prohibit or severely restrict the production, marketing, and use of POPs;
- minimise the release into the environment of POPs formed as industrial by-products;
- ensure that stockpiles of restricted POPs are safely managed; and
- ensure environmentally sound disposal of waste consisting of or contaminated with POPs.

Chemicals identified as POPs are:

- pesticides (e.g. DDT);
- industrial chemicals (such as polychlorinated biphenyls, which are or were widely used in electrical equipment); or
- unintended by-products created during industrial processes, decomposition, or incineration (such as dioxins and furans).
- A number of SVHC listed in the REACH Regulation that are regulated globally through the aforementioned Stockholm Convention and its associated transposition in the EU POPs Regulation are causing REACH to be amended. A number of REACH restrictions and authorisations, such as those relating to hexabromocyclododecane (HBCDD), short-chained chlorinated paraffins (SCCPs), decabromodiphenyl ether (DecaBDE), and - soon - perfluoro octanoic acid (PFOA), have already been transferred to the POPs Regulation for this reason. Compliance with the EU POPs regulation results in a usage ban, although, in some cases, a list of exceptions apply, as yet allowing the use of these substances under certain conditions.

254 Consulted on 30 April 2021, via https://wetten.overheid.nl/BWBV0001517/2020-12-03
255 Consulted on 30 April 2021, via https://www.eea.europa.eu/policy-documents/convention-on-long-r...c-pollutants-pops

9.6 Criminal opportunities and practice

Many modus operandi and manifestations exist. Environmental crime takes place in many industries. What these industries have in common is that they engage in activities that are covered by environmental legislation due to potential environmental damage, resulting in market access being regulated. One thing that environmental criminal enterprises within all these industries have in common is a number of typical modus operandi. Characteristic criminal MOs in the environmental sector include (Centre for Crime Prevention and Safety, 2019):

- Manipulation of samples/measurement data/etc.
- Relabelling of batches
- Wrong classification (higher/lower/end of waste/ other substance)
- Mixing with/of other substances
- Failure to process/pass on damages/bankruptcy ('benefits come before costs')
- Forgery (facilitating crime)
- Money laundering (consequential crime)
- Undermining (interwovenness of underworld and legitimate society)
- Discharge and dumping
- Leakage from goods/substances streams
- Uncertified work/free riders/lending certificate
- Failure to report
- Abuse of power to frustrate investigations
- Bribery to keep incidents quiet

All these practices also apply to criminal acts involving SVHC. In most cases, the businesses that engage in these practices are legal ones. By not complying with environmental laws and regulations, companies seek to cut costs in order to make extra money illegally. The various manifestations are difficult to map out in terms of size. There are a number of reasons for this. When legal and illegal activities are intertwined within a company's regular operations, detecting crimes is often difficult. Even when it becomes established that rules have been broken, it is still difficult to prove that this was done intentionally. As a result, it remains mostly unknown if and, if so, how often crimes take place. An overall picture is lacking. This is related to the fact that responsibility for the safety of hazardous substances is divided over multiple governments, while responsibility for the enforcement of chemicals legislation is divided over multiple government agencies. There are several databases and reports that provide information on different types of substances for different actors and at different points in the product chain. In the current situation, no conclusive picture of SVHC in product chains in the economy and the risks they may cause exists.

9.6.1 Pesticide risks

The term 'pesticides' is the collective term for plant protection products and biocides; also refer to Chapter 4. The production of, trade in, and application of biocides are regulated by the European Biocidal Products Regulation (EU 528/2012, BPR), which entered into force in 2013 and has direct effect[256]. Both plant protection products and biocides are substances, mixtures, and preparations intended to render harmless, destroy, or repel harmful organisms. Plant protection products are herbicides, fungicides effective against fungal diseases, or insecticides active against insect pests. The rapid growth of the agricultural sector has led to intensive production and pesticide use. Biocides are pesticides used in and around the home, such as insecticides against woodworm and disinfectants (e.g., for swimming pools). A large proportion of biocides are also used in all kinds of industrial processes (paper/metal/tanning industry, etc.). In addition, professional biocide use occurs in a variety of professional sectors, such as the paint industry, hospitals, and healthcare facilities (e.g., hand disinfectants, operating theatre disinfectants, and medical instruments). Professional gassings with highly toxic gases (sulphuryl fluoride, prussic acid gas, etc.) take place in the context of pest control (of residential houses, flour mills, cocoa sheds, and containers of logs used as export timber to China), as well.

For some so-called PT groups (there are 22 product types), the application of wood preservatives, insecticides, and rodenticides (rat and mouse poison) requires a certificate of competence. The ILT is responsible for supervising compliance. Outdoor use of rat rodenticides requires a legal company certificate. Biocides may only be marketed and used in the Netherlands once they have been assessed

256 Consulted on 30 April 2021, via https://echa.europa.eu/nl/regulations/biocidal-products-regulation/understanding-bpr

for efficacy and safety/risk for use by the Board for the Authorisation of Plant Protection Products and Biocides (Ctgb). The active substances contained in biocide products must also be pre-approved at the European level by the ECHA and the European Commission. The European harmonisation process in which all biocide substances are assessed will run at least until 2027. Some 1,877 biocide products have now been authorised by the Ctgb, as have 1,057 plant protection products.[257] Marketing an unauthorised biocide avoids authorisation costs. The cost of applying for authorisation of a biocide depends on the type of application and the status of active substances in the EU. All applications are subject to the Ctgb's rates bylaw (Staatscourant, (Tarievenbesluit Ctgb 2021, 2020).
When applying biocides - e.g., in heavy industry - one should always follow the legal instructions for use (dosage, frequency of use, etc.) of the relevant biocide authorisation. Climate change (warming) and globalisation mean that more and more biocides are needed to control pests/invasive exotic species. The introduction of the aforementioned BPR has also led to the trade in and sale of treated articles gaining momentum. The trade in unidentified, fake, obsolete, and banned chemicals takes place in legal and illegal markets (UNEP, 2020). Pesticides containing SVHC are traded under various brand names, displaying limited or no specific information on their chemical composition. Limited product information on chemical content and insufficient trade transparency hinder effective controls. The trade in illegal pesticides is caused by a combination of factors, but in all cases, sustained demand and the lucrative interest in illegal production and trade are the main drivers of illegal pesticide markets. Easy access to potential markets, combined with a developed transport infrastructure and weak transit and border regulations attract the attention of criminals, who use countries with such conditions as hubs for further illicit activities[258]. The Netherlands features a modern infrastructure and the associated facilities at airports and seaports, which not only play an important role in the regular economy. These facilities also turn the Netherlands into a popular country for various forms of transit crime - and this does not apply to pesticides only. The Port of Rotterdam and Schiphol Airport offer numerous opportunities for illegal activities, the Netherlands sometimes acting as a transit country and at other times as a destination or production country.

> "If you want to make a quick buck smuggling goods: forget drugs, forget guns, forget alcohol and cigarettes, and get into the business of illegal pesticides. This is because, as Rob de Rijck, national coordinating prosecutor for environmental cases and prosecutor in a case involving six containers of illegal pesticides, stated: 'If you commit offences in this field, you don't have to be very nervous about punishments. That is, if you get caught at all. Illegal pesticides seem to be a totally underestimated and under-researched problem. The crime is simple and the risks small: buy illegal pesticides in China for 15 to 20 euros a litre and sell them in Europe for 80 to 100 euros. Subtract the cost of packaging and transport and the net profit is almost 50 euros per litre. 'So if you ship 160 tonnes in one batch, you rake in eight million euros. 'To criminals, this is a very lucrative business,' Rien van Diesen of Europol, the expert on trafficking in illegal plant protection products, said. Moreover: 'The risk of being arrested and convicted is small, while the margins realised on the product are huge."
> (De Groene Amsterdammer, 2020)

Between 13 January and 25 April 2020, Europol coordinated the fifth edition of Operation Silver Axe, with twice as many illegal products being seized as in the previous year. This took place as part of the annual law enforcement operation targeting pesticide counterfeiting and illegal pesticide trade. Law enforcement agencies carried out inspections at land and sea borders, in domestic market places, and of parcels, checking more than 3,000 tonnes of pesticides. A total of 260 investigations were started up, two individuals were arrested, and 1,346 tonnes of illegal pesticides were seized. Pesticides worth €94 million in criminal profits were seized; also refer to section 4.4.3.

257 Consulted on 6 May 2021, via https://www.ctgb.nl/toelatingen/vraag-en-antwoord/waar-vind-ik-de-lijst-van-europese-middel-toelatingen-van-biociden

258 Consulted on 30 April 2021, via https://www.unep.org/resources/assessment/illegal-trade-chemicals

Hand disinfectants are biocidal products and can only be marketed under authorisation. The high demand for disinfectants to control COVID-19 and the conferral of permits in emergency situations by the Member States have caused new manufacturers and suppliers to flock to the market. These companies may have no or insufficient knowledge of the applicable legal framework. While many act in good faith and make use of all available assistance from the ECHA and national authorities, some seem to take advantage of the situation. Many of the Member States report sales or use of disinfectants that do not possess the required authorisation or exemption, or that lack safety labels[259]. Due to the Ministry of Infrastructure and Water Management granting temporary exceptions for the production and marketing of these alcohol-based products, companies are able to relatively easily jump into that gap in the market. For example, an ice cream factory and some beverage producers started making hand sanitiser in spring 2020. Many of the hand disinfectants available are ethanol (or alcohol) based. Ethanol exposure can lead to cancer. In addition, it can also cause reduced fertility and affect offspring development. The professional use of ethanol requires certain precautions to be taken by law. There are limits to the amount of ethanol a person can be exposed to. A recent publication[260] discloses that the US Food and Drug Administration discovered that methanol and 1-propanol - hazardous substances both - were present in several disinfectants. Before that, the European Chemicals Agency, too, issued a warning[261] about the large number of illegal products flooding the market. Many of these products are ineffective and, if used incorrectly, even harmful to health, as they create a false sense of security. In the Netherlands, ethanol is considered a CMR (carcinogenic, mutagenic, and reprotoxic) substance from an occupational health and safety perspective. These substances are harmful to personal health in the long term. As from 5 March 2021, only authorised agents and agents explicitly listed in the exemptions may be traded and used for hand and surface disinfection against coronavirus.

9.6.2 REACH

REACH stands for Registration, Evaluation, Authorisation, and Restriction of Chemicals. This European Union regulation was adopted to, among other things, better protect human and environmental health from hazards posed by chemicals. To comply with the Regulation, companies must identify and control the risks associated with the substances they manufacture or place on the EU market. They should show how the substance can be used safely and should educate users on risk-reducing measures to be taken. There is great concern in the EU about the hazards and risks posed by SVHC. After being placed on the candidate list, they and their associated authorisation requirement will eventually be included in Annexe XIV of the REACH Regulation. Sometimes, companies cannot use an alternative substance or process to replace the SVHC. In that case, they can apply for authorisation to as yet use the substance. An authorisation applies to restrictively listed uses during a defined time period and is issued only in conjunction with the imposition of additional obligations. The authorisation procedure is designed to ensure that SVHC are gradually replaced by less hazardous substances or technologies once technically and economically feasible alternatives become available. One risk associated with substances subject to authorisation is the fact that, although the authorisation holder must communicate the authorised uses and additional hazards to their customers, they are no longer responsible for them after selling them. If the buyer proceeds to resell the substances without communicating the authorised uses and additional hazards to their customers, this will lead to ignorance about the restricted uses and obligations in the supply chain and among end-users, causing them to no longer be met. The supply of substances, including substances subject to authorisation, should in applicable cases be accompanied by the provision of a safety data sheet, which should also include the exposure scenarios of the identified uses, based on a chemical safety assessment. In cases where substances subject to authorisation are sold without the buyer being informed of that authorisation, the

259 Consulted on 30 April 2021, via https://www.biociden.nl/coronavirus/illegale-en-niet-werkzame-desinfectiemiddelen
260 Consulted on 30 April 2021, via https://arstechnica.com/science/2020/08/fda-finds-new-toxic-hand-sanitizer-ingredient-expands-warning-to-157-products/
261 Consulted on 30 April 2021, via https://echa.europa.eu/nl/-/eu-member-states-report-illegal-and-ineffective-disinfectants

risk exists that the accompanying safety data sheet may have described risk management measures that are exclusively based on the authorised use, while the end user uses the substance for something else. The said course of action will almost always be driven by financial motives. There is a demand for authorised substances for uses other than the authorised ones, so it can be lucrative to offer a supply to meet that demand. However, ignorance or lack of understanding about the complex regulations also plays a role. Of course, even where a violation of the REACH Regulation is caused by ignorance, it is still a violation.

Under the REACH Regulation, import means "the physical introduction into the customs territory of the Community" and is considered as placing it on the market. An ECHA notice of 24 September 2020[262] shows that national enforcement agencies and customs inspectors checked nearly 1,400 products in 16 Member States, more than 300 (23%) of which failed to comply with certain obligations under the REACH Regulation and the classification, labelling, and packaging (CLP) regulations. Most of the checks concerned compliance with the Regulation's restriction obligations, and in particular the presence of the restricted substances cadmium, lead, and nickel in goods, such as jewellery. 17% of the 1,225 products checked on the presence of restricted substances were found to contain quantities exceeding the limits. This means that using them could endanger the health of citizens if they were to enter the market. 92% of non-REACH-compliant chemicals in consumer products come from outside the EU/European Economic Area (EEA). This is the main finding of the Cefic analysis of data reported through the EU's 'Safety Gate' rapid alert system (RAPEX). The finding confirms the urgent need for EU Member States to strengthen enforcement of the REACH Regulation for imported consumer products[263].

9.6.3 Risks under POPs

The POPs Regulation imposes restrictions and does not allow for authorisation. Shifting SVHC from REACH to POPs may cause stress for certain uses, where no alternatives are available, if previously, their use was still (temporarily) allowed in the EU under REACH, albeit with an authorisation. The introduction of a duty to report is being discussed.

9.6.4 Mixing and bulking of hazardous substances in (waste) streams

In the Netherlands, steel slag is used as foundation materials for infrastructure works, or is stored in the open air. This is possible because it is not classified as a 'hazardous substance' but as a usable 'by-product' and can therefore be legally dumped on land. However, a by-product can also be a hazardous substance. As a result, toxins leak into the surface water and soil[264]. By-products should also be handled responsibly and included in the REACH registration of substances (including by-products). Having a view of the hazardous substances in waste streams and by-products is important to make sure that no risks that require additional controls, in addition to the measures already taken by transporters and processors, are overlooked throughout the chain - be it in transport, storage, processing, and recycling. Right from the point where the waste is generated, adequate information must be provided to adequately manage risks further down the chain. Reports by the RIVM and the ILT on the spread of GenX substances into the environment through waste streams (Central Government, 2019) provide an example of a case where information was lacking and where, moreover, actions to tackle the problem were hampered by the fact that the route the harmful substances took via the various actors in the waste chain could not be easily identified. Better information (transfer) prevents unnecessary risks to people and nature and possible high remediation costs.

9.6.5 Networks

The sector is vast and opaque. Almost the entire environmental sector involves chains engaging in similar activities: removal, collection, transport, storage, processing, and reuse/incineration. Chains also intertwine in this respect (e.g. food, feed, non-food, waste). Criminal activities not infrequently involve multiple parties. Different steps in a chain involve networks of logistics agents or brokers, insurers, and financiers,

262 Consulted on 30 April 2021, via https://echa.europa.eu/nl/-/1-in-4-imported-products-found-to-be-non-compliant-with-reach-and-clp
263 Consulted on 30 April 2021, via https://vnci.nl/nieuws/nieuwsbericht?newsitemid=4913037313
264 Consulted on 30 April 2021, via https://www.npostart.nl/de-vuilnisman/KN_1718256

as well as government departments. Some links involve thousands of players and multiple times as many activities and transactions.
Chains are becoming increasingly integrated, with a single party becoming responsible for different links in the chain. Companies often operate in different regions/units. In a number of sectors, including, for example, waste treatment and fuel oil, players also operate internationally, allowing them to operate under different legislative regimes. Groups and internationally operating companies are better able to keep violations out of sight of regulators. Environmental crime takes place in chains and networks. An establishment's location, its offence, and its consequences are often not tied to a single region. This places special demands on information sharing between regions and agreements on the ownership of a case (Centre for Crime Prevention and Public Safety, 2019).

9.6.6 Risks under the Carriage of Dangerous Substances Act

About 13 million tonnes of hazardous materials are annually transported by road alone. Nearly 10,000 of the 12,000 road haulage companies in the Netherlands are involved, to a greater or lesser extent, in the transport of (containers of) dangerous goods; 300 transport companies specialise in the transport of dangerous goods. Transport and logistics in the Netherlands are invariably vulnerable to crime. This is the conclusion of the 'Doorbraak Verzocht' report (CIROC, 2021). This was a study commissioned by trade association Transport en Logistiek Nederland (TLN) and made possible by the Ministry of Justice and Security. The study identifies the working conditions, labour market flexibility, and competitive pressures as the sector's most prominent vulnerabilities to criminal abuse. This is against the backdrop of a low chance of being caught (making it easier for criminals to make use of the legal flows of goods, for example) and well-organised, wealthy criminal syndicates taking advantage of the Netherlands' logistics infrastructure as a gateway to Europe. Not a new finding is that criminals actively recruit individuals and companies in a vulnerable economic position. This recruitment is reflected in internal involvement: private corruption is a real problem, one the sector is also actively guarding against. The enormous competition and negative effects of flexibilisation (including underpayment) also lead to the adoption of survival strategies. Those strategies in some cases open the door to organisational crime. All these factors increase economic vulnerability. A professional culture difficult for the outside world to access, a low barrier to entry, and digitalisation are vulnerabilities that cannot be ignored. However, according to the aforementioned study, these are less decisive as (in-the-field) explanations for criminal abuse, or are in turn linked to financial and economic vulnerabilities. The study by no means states that the sector is riddled with rogue logistics service providers and drivers. On the contrary: despite major economic vulnerability, most companies, drivers, and couriers do not intend to get involved with criminals. This is not to say that, at the case level, incentives other than a financial one may not have been decisive for the drivers, couriers, and companies involved. Workers earning a bit more may be less vulnerable to crime financially, but may still be open and even susceptible to blackmail in other areas. For coercion is also sometimes used to have someone cooperate in criminal abuse, or other than purely financial motives exist for someone to participate in organised crime (Kleemans and van Koppen, 2020). The problem is that crime in the transport industry mainly consists of the deliberate failure to perform the required safety measures, or the failure to declare dangerous goods for transport, which can significantly reduce costs. Cost cutting is attractive because of the low profit margins in the transport industry and high competitive pressure from Eastern Europe, among other reasons. In practice, transporters may not feel very responsible for the cargo they carry. This is often because they do not own the (waste) materials. This gives rogue principals room to have more hazardous substances - including SVHC - transported than is stated in the accompanying transport documents. By using a generic or adapted substance designation, restrictions on transport can be circumvented and costly analyses avoided. Labelling substances incorrectly - or not at all - is easy, as many hazardous substances are transported invisibly in sealed tanks, containers, and packages. It is difficult for enforcers to determine what the tank truly contains and whether laws and regulations are being complied with. If hazardous substances are not declared for transport, there are no physical characteristics at all that indicate that the shipment transported consists of such hazardous substances. In addition, a category of transporters exists that use their knowledge

of hazard classification and waste coding rules to advise clients on what to include in the transport documents to avoid inspections. Buyers, such as waste processors, also sometimes have an interest in concealing the true nature of shipments. As is the case in other environmental domains, the capacity of supervision and, consequently, the number of checks is low compared to the size of flows of hazardous substances and the number of companies engaged in their transport and processing. If a company does get caught, the penalty is often a light one. In all, committing fraud with the transport of hazardous (waste) materials is lucrative and relatively easy.

9.6.7 Risks among BRZO companies

Some 400 companies in the Netherlands working with large quantities of hazardous substances are subject to the Major Accidents (Risks) Decree (Brzo). Many of them are chemical companies, but the group also includes energy companies and waste processors. There is also an unknown number of companies the Brzo does not - if only barely so - apply to, yet are faced with risks due to operations involving certain hazardous substances. These inter alia include large chemical companies (RIE-4 companies), waste companies, and transport companies. The enforcement regime applicable to those companies is less strict than the one governing Brzo companies. Because of the high risk they face, Brzo companies are bound by a wagonload of regulations. As a result, the offences they commit also vary considerably. (Kluin, 2020): "They range from the presence of a cup of coffee in a room where this is not allowed, to taking major safety risks that require inspectors to shut down plants. We discovered that Brzo companies are generalists. They commit several offences, not one specific one. And many of the companies are offenders. As many as nine out of ten Brzo companies violate the rules. And 6.9 per cent involve notorious offenders. They account for almost a quarter of the 7,700 offences we counted in total." Both inside and outside Brzo companies, various opportunities exist for committing offences. Companies update their historical substance data, which means that inspections do not reveal how much of a particular substance has been present in the company. Companies do not report to the safety region when they are going to carry out maintenance, even though they should. Small to medium-sized companies turn to consultancy firms to develop legally required safety management systems (SMS) - which are then not fully implemented. Some consultancy firms simply copy previously developed SMS, while customisation is required in all cases. Brzo companies carry out loading and unloading operations with hazardous substances on their own premises. These actions are neither covered by the legislation on the transport of hazardous substances nor by permits requiring specific safety regulations. Hazardous substances are (temporarily) stored without licence outside the establishment of the Brzo company, including in means of transport. Several indicators determine the likelihood of violations or criminal offences occurring at Brzo companies. Poor maintenance and limited investment is one such indicator. Certain companies display calculating conduct and make adjustments only when required by the inspectorate or operate using the 'breakdown principle': something is replaced only when it breaks down. These types of companies do not report unusual occurrences, or they downplay them. The risk of criminal offences being committed also exists in companies that disregard their own working procedures, have unclear licences or maintain poor relations with the authorities.

The duty to report all unusual occurrences (part of Brzo) is sometimes evaded to avoid reputational damage. A number of investigations by the Dutch Safety Board have shown that a less than ideal 'safety culture' existing at companies often plays a role in the creation of unsafe situations and the commission of criminal offences. (Dutch Safety Board, 2017) Some of the incidents occur because companies do not take sufficient measures to prevent them. This is a violation of the core principle of the Brzo. If this is done intentionally, it is mostly spurred by a cost-cutting incentive. The Environmental Agencies have the impression that there are companies that are specifically setting up their business operations in such a way as to not become subject to the Brzo or are even splitting up business activities to avoid such classification. They in this way evade the strict Brzo controls while carrying out activities that should, in fact, fall under the Brzo regime. Another criminogenic factor that leads to violations at Brzo companies being able to go unnoticed is the importance given to industry input in the creation of laws and regulations. Their

lobby negotiates the inclusion of exceptions and qualifications, creating regulations that are difficult to enforce (National Threat Assessment, 2017).

9.6.8 Risks with precursors

A precursor is a chemical substance that by its nature or properties can be used in the manufacture of a finished chemical product. Precursors are raw materials for the manufacture of chemical products and the chemical industry makes extensive use of them before or during the production of numerous products. Such use is perfectly legal. However, certain individuals and groups manage to procure raw materials for homemade explosives - so-called explosives precursors - through the mainstream market. In addition, there is a certain group of precursors, called 'drug precursors', which are not only used for legal purposes but are also misused for the illicit production of narcotics. The designation drug precursors is a collective term. It includes substances that are an important component of the final product but also excipients that are indispensable for drug production, such as reagents (e.g., potassium permanganate), solvents (e.g., acetone) and catalysts. Many of these precursors are relatively freely available. While the famous film 'Breaking bad' (Gilligan, 2019), which has a chemistry teacher taking to crime and making crystal meth, is just that: a film, in real life we are also regularly confronted with chemicals abuse: dumped drums packed with drug waste, closed-down drug labs, or individuals who have assembled explosives at their kitchen table.

The substance safrole is an SVHC and is regularly found in drug laboratories as a precursor for PMK, the raw material for MDMA (XTC). This promotes the crime associated with the distribution of those drugs. The substances Formamide and benzyl chloride (SVHC) are so-called non-registered substances of the EU voluntary monitoring list, and are also used in the production of amphetamine and other drugs. Mercury(II) chloride, a highly toxic mercury compound, is also a SVHC and is frequently found in methamphetamine labs, which are increasingly often discovered in the Netherlands[265]. The RIVM often has to be called in to find whether the lab can be dismantled safely. The above substances are SVHC that are used for criminal purposes.

They are procured under the radar and used without any responsibility existing for the lab technicians and the environment where the lab is located. Labs are frequently detected by unwanted emissions, which cause odour nuisance. Dutch Customs has created lists of chemicals used to produce drugs and/or explosives. These so-called scheduled substances are divided into four categories, based on the likelihood the substance is misused:

- category 1: key substances for the production process of drugs and explosives
- category 2: other important substances for the production process of drugs and drug precursors
- category 3: chemicals with different applications in the drug production process
- category 4: medicinal and veterinary products containing certain scheduled substances.
- Category 1 and 2 chemicals may only be traded with a licence. This means that the supplier will ask the buyer for a licence on purchase, but also that all customers down the chain will need a licence if the product is to be sold to them.

9.7 Consequences

As noted in the above, we are all widely exposed to SVHC. While the concentrations of many substances in the living environment are falling, the number of substances is increasing and new potential hazards are created by new applications. Concerns are fuelled by incidents, by changing demands we place on, for example, water quality, or by uncertainty about the adverse effects of the accumulation of substances in the living environment. The transition to a circular economy is more likely to exacerbate rather than alleviate these concerns. The overall risk due to exposure to a combination of SVHC is usually greater than the risk due to exposure to each of the individual SVHC in isolation. Exposure to a combination of SVHC may therefore have the above-mentioned adverse health and environmental effects, even at exposure levels considered "safe" for the individual SVHC on its own.

9.8 Expectations for the coming years

265 Consulted on 30 April 2021, via https://magazines.rivm.nl/2020/07/altijd-alert/kwikdampmetingen-bij-drugslabs

Various lines of action have been worked out in the RIVM report "Omgaan met Zeer Zorgwekkende Stoffen in een Circulaire Economie" (RIVM, 2020) to realise the vision for 2050. These lines of action can be divided into three time blocks:

- Short term (2020-2021);
- Medium term (2021-2030); and
- Long term (2030-2050).

This RIVM report addresses an important issue at the interface of substances and waste policy: how to ensure that, in the future, we only use substances that are produced and applied sustainably and can ultimately be fully reused in material cycles without generating unwanted risks for humans and the environment? This is by no means an easy task: it requires a fundamental change in the choices the industry makes in its production processes. The cross-border nature of many product and waste streams necessitates an approach at the EU and probably also the global levels, as was also explicitly recognised in the recently published European Green Deal of the new European Commission; also refer to section 2.3. "While the aim is to replace all SVHC and important steps can be taken to do so, the complete phasing-out of these substances is not realistic. SVHC are needed in certain applications - certainly in the short and medium term - because of their specific functionality and cannot, therefore, be phased out completely (RIVM, 2020)".

9.9 Conclusions and recommendations

As long as SVHC are used in products and materials, these substances can re-enter circulation in a circular economy. As a result, workers, consumers and the environment may be unintentionally exposed to these substances, especially if the new application is different from the original one. In the current situation, no conclusive picture of SVHC in product chains in the economy and the risks they may cause exists. This is related to the fact that responsibility for the safety of hazardous substances is divided over multiple governments, while responsibility for the enforcement of chemicals legislation is divided over multiple government agencies. There are several databases and reports that provide information on different types of substances for different actors and at different points in the product chain. Exposure to a combination of SVHC may have adverse health and environmental effects, even at exposure levels considered "safe" for the individual SVHC on its own. The overall risk due to exposure to a combination of SVHC is usually greater than the risk due to exposure to each of the individual SVHC in isolation. When legal and illegal activities are intertwined within a company's regular operations, detecting crimes is often difficult. Some companies update their historical substance data, which means that inspections do not reveal how much of a particular substance has been present in the company. Easy access to potential markets, combined with a developed transport infrastructure and weak transit and border regulations attract the attention of criminals, who use countries with such conditions as hubs for further illicit activities. As is the case in other environmental domains, the capacity of supervision and, consequently, the number of checks is low compared to the size of flows of hazardous substances and the number of companies engaged in their transport and processing. In all, committing fraud is lucrative and relatively easy. If a company does get caught, the penalty is often a light one.

9.9.1 Recommendations

Much information has been collected on substances/SVHC, regulations, and fragmented crime data, but how to achieve better detection of SVHC-related offences/crime? To this end, topics from this chapter can be used for concrete actions, for example targeting the aforementioned trade in substances for drug laboratories. This approach should not only focus on SVHC. After all, misuse of acetone is harmful/dangerous, too, as is the dumping of acetone-containing hazardous waste. Of key importance is that only substances are used that are produced and applied sustainably and can ultimately be fully reused in material cycles without generating unwanted risks for humans and the environment. This requires a fundamental change in the choices the industry makes in its production processes. The business sector has an important responsibility, both for providing information on substances produced and used, and for implementing measures aimed at reducing risks. Important questions in this connection are how to define 'essential' uses and how to balance the use of SVHC against other aspects, such as climate change, energy use, and safety. Establishing a vision or common goal is necessary to deal with SVHC in a responsible manner.

It is crucial to have access to information about the (safety of) substances present, including SVHC, throughout the chain. Having a view of the SVHC is important to make sure that no risks that require additional controls, in addition to the measures already taken by transporters and processors, are overlooked throughout the chain - be it in transport, storage, processing, and recycling. A safe circular economy requires that a finger is kept on the pulse of what happens to SVHC once products and materials are used differently than in their original use phase. Customisation is required in the fields of supervision and investigation. Operational cooperation between (the special investigation services of) the Human Environmental and Transport Inspectorate, the Netherlands Food and Consumer Product Safety Authority, the Inspectorate SZW, and the Police aimed at achieving this allows for a more comprehensive approach. Risk-oriented, information-driven, and more societal impact-oriented investigations and the deployment of the right mix of the various instruments (administrative law, criminal law, communications, etc.) will lead to maximum effect and impact of the work. This makes it possible to close the net around companies that do not want to comply with the law. Finally, due to the very large number of possible SVHC combinations, the risk assessment and management of combined effects of chemicals pose a particular challenge from a scientific and regulatory point of view.

Literature

Afval Online. (2021, 11 January). Al 5 miljoen meldingen van ZZS in producten. Afval Online.

Central Government. (2018, 19 October). www.rijksoverheid.nl. Retrieved from https://www.ilent.nl/documenten/signaalrapportages/2018/10/10/uitzondering-emissie-eisen-76-zeer-zorgwekkende-stoffen#:~:text=In%20deze%20signaalrapportage%20wijst%20de,de%20betrokken%20zeer%20zorgwekkende%20stoffen

Central Government. (2019, 25 September). Central Government. Retrieved from Officiele publicaties: officielebekendmakingen.nl/kst-28089-148.html

Centre for Crime Prevention and Public Safety. (2019). DE MARKT DE BAAS Een verkenning naar ervaren knelpunten in de aanpak milieucriminaliteit. 2019/198401: CCV.

CIROC. (2021). Doorbraak Verzocht: onderzoek naar kwetsbaarheden voor crimineel. Newsletter 39, 2-3.

De Groene Amsterdammer. (2020, 3 June). Simpele misdaad, weinig risico, Rasis Elibol. pp. https://www.groene.nl/artikel/simpele-misdaad-weinig-risico.

De Rechtspraak (2021, 12 April). Bloedluisbestrijders veroordeeld voor gebruik fipronil. Retrieved from https://www.rechtspraak.nl/Organisatie-en-contact/Organisatie/Rechtbanken/Rechtbank-Overijssel/Nieuws/Paginas/Bloedluisbestrijders-veroordeeld-voor-gebruik-fipronil.aspx

ECHA. (2021, 25 April). Identification of substances of very high concern. Retrieved from https://echa.europa.eu/nl/substances-of-very-high-concern-identification-explained

ECHA. (2021, 26 April). Information on biocides. Retrieved from https://echa.europa.eu/nl/information-on-chemicals/biocidal-active-substances

Europa Nu. (2020, 14 October). Strategie voor chemische stoffen, op weg naar een gifvrij milieu - vragen en antwoorden. Retrieved from https://www.europa-nu.nl/id/vlcwhgm4n5va/nieuws/green_deal_strategie_voor_chemische?ctx=vg9pjk198axu

Gilligan, V. (Director). (2019). Breaking Bad [Film].

House of Representatives. (2020, 10 November). www.tweedekamer.nl. Retrieved from Antwoord schriftelijke vragen: https://www.tweedekamer.nl/kamerstukken/kamervragen/detail?id=2020Z15054&did=2020D45266

Kleemans and van Koppen. (2020). Organised crime and criminal careers. The University of Chicago: February.

Kluin. (2020, 25 February). Toezine. Retrieved from www.toezine.nl/artikel/353/regelovertreding-in-de-chemische-industrie-onder-de-loep/

National Threat Assessment. (2017). National Threat Assessment 2017 Zoetermeer: Police, National Information Service.

Noordhollands Dagblad. (2021, 19 March). Rijksinspectie ILT veegt vloer aan met gifrapportage van Tata Steel. Noordhollands Dagblad, Bart Vuijk.

OVV. (2017). Retrieved from www.onderzoeksraad.nl: https://www.onderzoeksraad.nl/nl/page/4202/veiligheid-brzo-bedrijven-lessen-na-odfjell

RIVM. (2020, 14 May). Omgaan met Zeer Zorgwekkende Stoffen in een Circulaire Economie. Bilthoven: RIVM. Retrieved from https://www.rivm.nl/documenten/rapport-in-nederlands-omgaan-met-zeer-zorgwekkende-stoffen-in-circulaire-economie

RIVM. (2020). Omgaan met Zeer Zorgwekkende Stoffen in een Circulaire Economie. Bilthoven: RIVM.

RIVM. (2021, 3 February). Identificatie Zeer Zorgwekkende Stoffen. Bilthoven. Retrieved from Identificatie Zeer Zorgwekkende Stoffen: https://rvs.rivm.nl/Zeer-Zorgwekkende-Stoffen/Identificatie-Zeer-Zorgwekkende-Stoffen

RIVM. (2021, 21 April). Zeer zorgwekkende stoffen. Retrieved from Potentiele ZZS: https://rvs.rivm.nl/Zeer-Zorgwekkende-Stoffen/Potentiele-ZZS

Rli. (2020). Greep op Gevaarlijke Stoffen. The Hague: Council for the Environment and Infrastructure

Staatscourant (2020, 24 December). Tarievenbesluit Ctgb 2021. Retrieved from Government Gazette 2020, 63801: https://zoek.officielebekendmakingen.nl/stcrt-2020-63801.html#d17e1319

UNEP. (2020). Illegal Trade in Chemicals. ISBN: 978-92-807-3783-7.

Standing Committee on Infrastructure and Water Management. (2020). Zicht op Chemische Stoffen, Reference 2020Z21260/2020D45433. The Hague: Analysis and Research Department.


10

10 Fireworks: more serious fireworks, more serious crime

Erik Kooijker and Sharon van der Vliet-Sandig

Fireworks originated in China, where they were set off at religious events to drive away evil spirits, and found their way to Europe in the 13th century.[266] In the 17th century, our New Year's Eve tradition of having lots of 'fire and noise' arose and has since developed to encompass fireworks, bonfires, and carbide shooting. From the beginning, the tradition was accompanied by nuisance and vandalism.[267] The setting off of fireworks by private individuals did not really take off in the Netherlands until the late 1970s. Experimenting with fireworks - preferably as heavy as possible - is popular among children and adolescents because it is exciting, with peer pressure making them up the ante.[268]

The Dutch fireworks tradition has by now entered a new phase. Illegal fireworks are also used in attacks, riots, and ATM gas attacks due to their high explosive power. Increasingly heavy illegal fireworks cause more injuries and many forms of (environmental) damage. Traders consider the chances of being caught to be small and the earnings to be large.

This chapter describes the illegal chain of prohibited consumer fireworks, developments in recent years, and the use of illegal fireworks in the Netherlands in situations besides New Year's Eve. These issues are considered in the light of various criminal opportunities and their consequences, such as environmental and social damage. Finally, conclusions are drawn based on current and upcoming threats and trends are discussed as they can be identified from, inter alia, criminal investigations and expert interviews.

Before delving deeper into fireworks crime, it seems opportune to provide the main fireworks-related definitions.

Legal and illegal fireworks

Fireworks, provided they bear a category marking and CE mark, are in principle a legally manufactured product. CE stands for Conformité Européenne, or conformity with European regulations. Approved fireworks that comply with European requirements will be given a CE mark that includes a reference to the fireworks category, which is a designated F category identifiable on the label. This in principle makes fireworks a product that can be freely traded in all European Member States, provided the trader meets a number of conditions. Under the Pyrotechnic Articles Directive (discussed in more detail in section 2), fireworks are classified into F, T and P categories (Article 6(1) of Directive 2013/29/EU):

The following categories of fireworks are listed in the Pyrotechnic Articles Directive:
Category F1: very low-hazard fireworks, can also be used indoors;
Category F2: low-hazard fireworks;
Category F3: medium-hazard fireworks;
Category F4: high-hazard fireworks intended for professional use only.
There are also pyrotechnic articles[269] for stage use (category T1 and T2) and other pyrotechnic articles (P1 and P2).

266 Consulted on 10 April 2021, via http://www.historischkader.nl/wordpress/vuurwerk/
267 Consulted on 13 April 2021, via https://www.nemokennislink.nl/publicaties/waarom-steken-we-vuurwerk-af-met-oud-en-nieuw/
268 Consulted on 12 April 2021, via https://decorrespondent.nl/58/de-cobra-6-een-handgranaat-van-vijf-euro/10577921332-818a6542
269 Articles containing explosive substances designed to produce heat, light, sound, gas, or smoke or a combination of such phenomena.

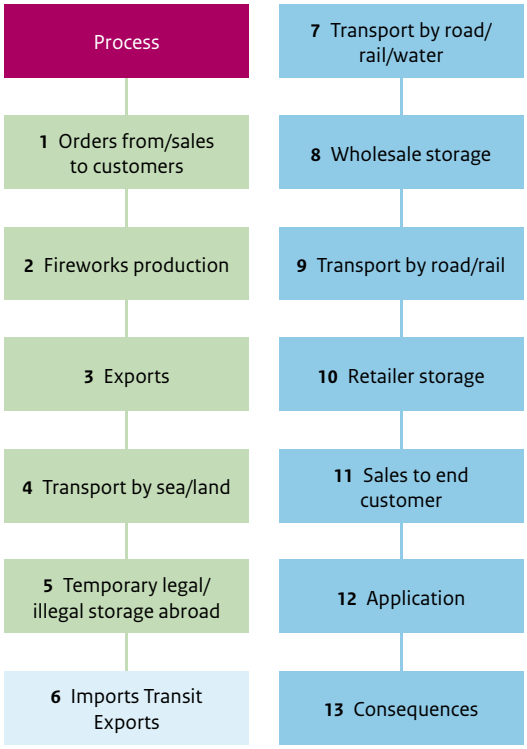
Fireworks of categories F1 and F2 are for the most part marketable and available for sale to consumers in the Netherlands. Fireworks of categories F3 and F4 (professional decorative fireworks and professional firecrackers such as Cobras and shells) pose a medium or high level of danger. The use and possession of F4 fireworks is therefore prohibited to private individuals in the Netherlands and neighbouring countries. These fireworks may only be distributed and set off by certified companies (Article 7(1) of Directive 2013/29/EU). Certain F2 and F3 category fireworks are also classified as professional fireworks in the Netherlands and may not be owned by a private individual.
Illegal fireworks are defined as 'all fireworks that are not manufactured, sold, and used within the legal trade and under the associated requirements'. A requirement for legality includes that all information and safety warnings on products must be legible in the Dutch language and be easily understood by everyone. If this is not the case, it is illegal to possess and set off these fireworks in the Netherlands. They are labelled as *illegal fireworks*.[270]

This definition allows for further distinction into various sub-forms of illegal fireworks, such as prohibited professional consumer fireworks or illegally manufactured firecrackers. In any case, whenever this chapter refers to banned fireworks or the illegal trade in fireworks, we always refer to illegal fireworks.

10.1 Description of the chain

The fireworks trade can be divided into legal trade and illegal trade. The two forms of trade are closely intertwined. Legal trade refers to trade by or to registered fireworks shops, official fireworks keepers, and so on. The illegal trade largely consists of legal heavy fireworks (category F4) sold by and/or to unauthorised persons. This means that, somewhere in the sales chain, fireworks change from being legal to being illegal. Another part of the illegal trade consists of illegally manufactured (and/or misclassified) fireworks (Figure 10.1).

Figure 10.1 *source: not externally published police analysis*



10.1.1 Production and importers

Fireworks production mainly takes place in China. A police fireworks specialist has informed us that fireworks from China are mainly produced to order. Importers and wholesalers often are in personal contact with producers for this reason. The fireworks from China are, from a limited number of central warehouses, transported by ship to European ports, mainly to Antwerp, Hamburg, Gdansk and Rotterdam.

The Netherlands is a transit country for legal fireworks. This means that some of the fireworks arriving here will be transited to official/licensed stores of legal fireworks importers and wholesalers outside the Netherlands. There are also fireworks manufacturers in Europe, for example in Poland,

270 Consulted on 13 April 2021, via https://www.ilent.nl/onderwerpen/vuurwerk

Germany, Spain, the Czech Republic, and Italy. They initially store the fireworks produced on their own premises.

10.1.2 Storage

It has become apparent, inter alia from criminal investigations, that fireworks bought from importers and/or European manufacturers are usually transported to large storage sites in Belgium or Germany. Just across the Dutch border are several former NATO ammunition bunkers, which currently also serve as storage sites for fireworks. The legislation with regard to, inter alia, possession and storage of fireworks differs between the Netherlands and its neighbouring countries; this is discussed in more detail in section 2. Some of these bunkers are known to the authorities and these sites are licensed to store fireworks. Others are (as yet) unknown. The bunkers are also sometimes sublet to persons not authorised to possess and sell these types of fireworks to Dutch consumers. In addition, fireworks are these days also stored in other large spaces, such as rented barns. At this stage, the difference between legal and illegal trade begins to emerge.

After obtaining the fireworks by way of illegal trade, they are stored in rented garage boxes, sea containers, barns, and storage boxes, but sometimes also in rooms belonging to multi-tenant business buildings. From these storage sites, the fireworks are sold to brokers, who then sell them on to consumers, or directly to consumers. Brokers usually store the fireworks in a rented garage box or shed, but also in their own garage box, shed, basement, or home. Consumers/users often store them in or near the home.

10.1.3 Trade and transport

Illegal sales involve selling fireworks from large foreign storage sites to illegal fireworks dealers. The fireworks are then often transported by hired van or trailer to storage locations in the Netherlands. Passenger cars are sometimes used, as well. Around 2016, it became clear that professional fireworks from countries like the Czech Republic and Poland were regularly sent to the Netherlands by mail, using an international postal parcel company. According to an employee of the Dutch Transport Operators Association, this international flow of illegal fireworks seems to be under control, partly because several internet shops where these banned fireworks could be ordered have been taken offline by the police and the Public Prosecution Service.[271]

The picture painted by postal companies on domestic transports of postal packages containing professional fireworks (from illegal local dealer to consumer) is that these do occur with some regularity, although they are rarely, if at all, identified. The Human Environment and Transport Inspectorate (ILT) notes it has recorded a small number of incidents where banned fireworks were found in postal packages. Several postal parcel companies say they are aware of the practice. This image is confirmed by an employee of a postal company, who states that - especially around New Year's Eve - illegal traders on various internet forums 'advertise' the use of certain courier services. No clear picture on the volume of (domestic) postal packages containing professional fireworks is as yet available.

Many banned consumer fireworks are brought into the Netherlands by traders themselves, using vans or trucks. These fireworks are usually improperly packaged and wrongly classified under the European regulations on the carriage of dangerous goods.[272] This form of transport can be life-threatening, especially where the heaviest types of fireworks (mass explosives) are transported (Biezeveld & de Poorter, 2005).

10.1.4 Sales

In the legal fireworks trade, sales and storage take place at official outlets around the country, from bicycle shops and garden centres that add fireworks to their product range during the winter season, to shops that focus specifically on the sale of fireworks and are closed to the public the rest of the year. The consumer fireworks retail market has fluctuated between €60 million and €75 million in recent years. In addition, consumers have been setting off illegal

271 Consulted on 5 April 2021, via https://www.nu.nl/jaarwisseling/5614679/vier-webshops-met-illegaal-vuurwerk-offline-gehaald-2000-kopers-in-beeld.html

272 Hazardous materials must be transported according to rules/requirements of the ADR (Accord relatif au transport international de marchandises Dangereuses par Route). The ADR is the pan-European treaty for the international carriage of dangerous goods by road.

firecrackers on a large scale since 2017 (Dutch Safety Board, 2017). The legal sales will not be considered in the following.

The illegal trade in fireworks is a cyclical model: importers place orders with fireworks factories at the start of the year. The fireworks are then transported and stored. Finally, the illegal fireworks are traded, partly online.

10.2 Relevant legislation

Legal instruments have been developed to protect people from the adverse effects of fireworks by establishing rules for their storage, manufacture, trade, and use. This section discusses the main regulations.

10.2.1 Pyrotechnic Articles Directive

The Pyrotechnic Articles Directive (Directive 2013/29/EU) is European legislation covering the manufacture, transport, sale, consumption, and overall safety of fireworks throughout the European Union (EU). The Pyrotechnic Articles Directive aims to ensure the free movement of pyrotechnic articles in the EU market and the optimal protection for the health and safety of consumers and professional end-users of these articles.

One body working in the field of legislation, is the European Commission (EC). The EC is the EU's executive body and develops legislation on a wide range of subjects in consultation with the Member States involved. Such legislation is binding on the Member States, but it regularly only provides the main outlines, leaving it up to the Member States to elaborate the legislation in greater detail. This allows for (major) differences between different Member States.

The European Member States may not prohibit, restrict, or impede the marketing of pyrotechnic articles that meet the requirements of the Directive. A key objective of this Directive is to promote the free movement of pyrotechnic articles. Due to this free trade principle within the EU, the Netherlands cannot unilaterally restrict or ban the import, trade, transport, and storage of category F4 fireworks into or in the Netherlands. As a side effect, the Directive facilitates the illegal trade of these fireworks within the EU, thereby increasing their availability to consumers (Biezeveld, 2010).

Dutch legislation based on the Pyrotechnic Articles Directive designates certain fireworks as professional fireworks, thus prohibiting their use by Dutch private individuals. The Netherlands has chosen to ban F3 fireworks for consumer use. Some other European Member States have not banned consumer use of F3 fireworks (Dutch Safety Board, 2017). In these countries, it is fairly easy to obtain fireworks that do not meet the Dutch consumer fireworks requirements, including by Dutch customers (van der Torre, van Valkenhoef, Esman & Greven, 2017).

The main agreement between all European Member States is the illegal nature of all F4 fireworks intended for private individuals, based on the Pyrotechnic Articles Directive. In addition, the placing on the EU market, the possession and/or the making available to others of heavy fireworks without a CE mark and/or name of the importer/producer is prohibited throughout Europe (Drenth, 2017).

10.2.2 Environmental Management Act and Fireworks Decree

National fireworks legislation exists in addition to the European laws and regulations. The rules for the trade in, storage of, and possession of fireworks are in the Netherlands laid down in the Fireworks Decree, via the Environmental Management Act. Violations of this decree (illegal trade, possession, and storage) are punishable under the Economic Offences Act. These offences (if committed intentionally) carry a penalty of six years' imprisonment and are investigated by the police.

The Fireworks Decree distinguishes between consumer fireworks and professional fireworks on the basis of the F categories (see section 1). The Fireworks Decree also lays down requirements for the storage, composition, packaging, import, export, and transit of fireworks, among other things. Pursuant to the Fireworks Decree, the ILT is designated as the supervisor of compliance with the fireworks legislation. It mainly supervises product safety, classification, notification requirements, and transport. Compliance with the rules at fireworks sales points is checked by the supervisors of the Environmental Agencies.

10.2.3 Consumer and Stage Fireworks (Designation) Regulation (RACT)

The RACT describes which fireworks are allowed for consumer use and which fireworks can only be used by professionals. This distinction is made on the basis of the nature, composition, construction, and properties of fireworks, the RACT using the same fireworks categories as listed in the Fireworks Decree.

10.2.4 Impacts of the differences in legislation

International legislation provides tools for curbing the illegal trade in fireworks, but is certainly not comprehensive. It for example provides no legal upper limit on the quantity of (legally) produced fireworks, meaning that fireworks can be produced indefinitely as long as there are customers to sell the fireworks to.

Nor is there a legal limit on the explosive strength of fireworks (Dutch Safety Board, 2017). This is by now clearly reflected in the strength of the new fireworks confiscated by the police. Whereas the cobra used to be a type fireworks that only produced a big bang, the major explosive force emanating from today's illegal "fireworks" (and the associated material damage and danger of injury) no longer matches that of consumer fireworks.

The differences in the legislation on fireworks crime between different European Member States have not gone unnoticed by fireworks criminals, either, and they are happy to exploit them. Efficient police tactics are regularly hampered because criminals know that certain investigative actions cannot cross the border, due to the sovereignty principle of the country concerned. This means that a country has supreme power within its own territory and another country cannot conduct criminal-law procedures within its territory without its permission (van der Wilt, 2007).

10.3 Agencies involved

Various partners actively and intensively cooperate in the context of enforcing fireworks regulations and tackling fireworks crime in the Netherlands.

10.3.1 National cooperation

The issue of fireworks crime is one of the environmental topics prioritised by the Strategic Environmental Chamber. Both the police and the ILT carry out enforcement and investigation activities in the field of illegal fireworks and/or fireworks crime. In a few cases, related to the import of fireworks, cooperation is sought with Customs and the Royal Netherlands Marechaussee. Cooperation with Customs could be improved, for example in the field of exchanging information on illegal fireworks transported via ports.

The ILT supervises compliance with the laws and regulations covering fireworks for professional use under the European Pyrotechnic Articles Directive and the Fireworks Decree. The ILT carries out inspections throughout the year, inter alia focusing on the product safety of fireworks, the classification of fireworks, the compliance with notification requirements for the import, export, and making available of fireworks, the transport of fireworks, and the possession of fireworks. Checks take place at import companies, at the border, at ports, along the road, and at storage and sales points.[273] Especially in the last part of the year, the police carry out (transport) checks for possession of illegal fireworks (district and infrastructure) and the setting off of illegal fireworks.

In parallel with the fireworks ban imposed in 2020, an intensified approach to tackling fireworks crime was introduced, with a task force being set up to drive a nationwide approach. The task force is the result of a close partnership of the police and the National Office for Serious Fraud, Environmental Crime and Asset Confiscation. This revamped approach led to improved distribution of intelligence and investigation work, allowing for greater efforts being expended into tackling criminal partnerships. The enforcement agencies have started cooperating better with the investigative services, making it

273 Consulted on 13 April 2021, via https://www.ilent.nl/onderwerpen/vuurwerk

possible to obtain an improved picture of, and tackle, the local illegal fireworks trade. This has led to a sharp increase in fireworks cases and the amount of fireworks seized doubling compared to previous years.[274] This intensified cooperation will remain necessary in the coming years to combat fireworks crime - and especially to tackle the big players. Cooperation with the competent authorities to strengthen the use of the administrative-law approach is also taking shape and is becoming more visible. In late 2020, the news regularly showed homes and business premises being closed down after illegal fireworks had been found.[275]

10.3.2 International cooperation

International cooperation aimed at tackling fireworks crime has existed for some years. This cooperation has increasingly taken shape over the past few years and has resulted in several small and bigger successes. These include legislative amendments and joint guidelines to facilitate cross-border enforcement and investigation of fireworks. There have also been several investigation successes in recent years. We provide an example in the below.

In November and December 2018, cooperation between the Dutch, German, and Polish authorities, Eurojust, and Europol led to the arrest of 35 members of organised criminal groups, the search of 150 businesses and homes, the seizure of tonnes of (illegal) fireworks, the closing of four major internet stores, and the seizure of data from these stores over the course of multiple action days (Figure 10.2).[276]

Yet, as a rule, success remains an irregular occurrence, as lasting cooperation is still in the future. For this reason, it is important to continue investing in such international cooperation. The police, acting in cooperation with external partners, are currently developing a strategy to realise an effective and resistant approach to fireworks crime on the international level. The strategy is built on three pillars, to wit: speeding up operational cross-border actions, improving cooperation with fireworks source countries, and prioritising fireworks crime in Europe.

Two key international investigative agencies are Eurojust and Europol.
Eurojust is an EU agency based in The Hague. It helps national authorities to cooperate in the fight against terrorism and serious organised crime involving more than one EU country.[277] Europol is a multinational police organisation and partnership of European police forces and is also based in The Hague. It organises information exchange between the police forces of the 27 EU Member States, with the aim of fighting international crime.

10.3.3 Impeding factors

While there are all kinds of opportunities to conduct investigations abroad on the basis of mutual legal assistance requests, there are also some impeding factors, such as the bureaucracy involved. As a result, it sometimes takes a very long time before any action is actually taken in response to a mutual legal assistance request. Because the trade in illegal fireworks is often swift in nature and short-lived, the scope for action has often disappeared by the time a mutual legal assistance request is acted on. In addition, determining which requests can be made under foreign legislation - and which will actually be acted upon - requires a great deal of knowledge of the legislation of the country concerned.

Too, other European Member States place less of a priority on fireworks crime, which makes them less willing to cooperate with Dutch investigations at the drop of a hat.
In most European member states, fireworks cases are dealt with by the departments responsible for arms & explosives. These departments are often not focussed on dealing with prohibited fireworks. This attitude seems to be shifting slightly, however, as the main ingredient of fireworks - the flash powder - is regularly used in Improvised Explosive Devices (IEDs) in ATM ramming and gas attacks, including in other European Member States.

274 Consulted on 12 April 2021, via https://www.om.nl/onderwerpen/jaarwisseling--vuurwerk/vuurwerkbarometer/2020
275 Consulted on 18 April 2021, via https://www.gelderlander.nl/arnhem/marcouch-sluit-woning-in-geitenkamp-vanwege-illegale-vuurwerkhandel-heeft-meer-weg-van-oorlogsmaterieel~af6857e7/
276 Consulted on 13 April 2021, via https://www.eurojust.europa.eu/international-cooperation-disrupts-illegal-fireworks-network
277 Consulted on 19 April 2021, via https://europa.eu/european-union/about-eu/agencies/eurojust_nl

Figure 10.2 *Source: Eurojust, see footnote*

The Netherlands has called attention to the professional fireworks issue several times within European consultative structures. While European partners do recognise the Dutch problems, they often lack the legal ability and political will to act against importers. Moreover, the legal options to take action against importers are usually limited in the countries concerned.

The Ministry of Infrastructure and Water Management is doing a lot to put and keep this issue on the international agenda. Intensive lobbying is currently taking place at the European level and the Ministry is investing in influencing other Member States and providing solutions. Systemic international cooperation is also being given increasingly more attention within the police.278

10.4 Developments

Illegal fireworks are not only set off around New Year's Eve. In this section, we describe the main developments and manifestations of illegal fireworks.

10.4.1 Increase in illegal fireworks seizures

The Fireworks Barometer tracks illegal fireworks seized, as described in the Fireworks Offences Criminal Procedure Guidelines. The Barometer does not list fireworks that were temporarily banned to reduce the number of fireworks casualties in order to relieve hospitals during the corona crisis. Nor does it include rejected consumer fireworks and illegal/self-produced fireworks (Table 10.1).

278 Consulted on 23 April 2021, via https://www.websitevoordepolitie.nl/een-nieuwe-koers/

Table 10.1 *Source: Fireworks Barometer*[279]

2017	40,383 KG
2018	56,522 KG
2019	61,429 KG
2020	122,815 KG

A scientifically substantiated explanation for the increase in the quantity of illegal fireworks found cannot be given. On the one hand, it may be that the amount of illegal fireworks in the Netherlands has in fact increased. On the other, a lot has been invested in tackling illegal fireworks in recent years, including by setting up a task force that aims to point greater attention within the organisation on investigating the illegal trade in fireworks than was the case in previous years. Furthermore, in recent years the police has increasingly focused on tackling the illegal fireworks trade via the internet and social media channels.

A study by the Dutch Safety Board (2017) suggests that an - unsubstantiated - estimate would be that five to ten per cent of the total amount of illegal fireworks in circulation are confiscated by the police, out of the total one to two million kilos of illegal fireworks traded. In this study, fireworks specialists estimated that one to two million kilos of illegal fireworks are traded on the Dutch market every year. The Public Prosecution Service's 2020 Fireworks Barometer shows that the total kilos of illegal fireworks seized has risen sharply in recent years.[280]

10.4.2 ATM ramming and gas attacks

Illegal fireworks have not only found their way to consumers, who set them off around New Year's Eve, but also to criminals. More and more often, ATM gas attacks are carried out using these professional fireworks or IEDs. The flash powder contained in a Cobra, for example, has the explosive force of a light hand grenade and is therefore regularly used to blow up ATMs.[281] 72 out of the 95 ATMs raided in 2019 were blown up using the flash powder removed from heavy fireworks.[282]

10.4.3 Football matches

The use of fireworks at football matches has become increasingly common in recent years (Football and Safety Audit Team, 2020). In addition to decorative fireworks and firecrackers being set off, emergency signalling devices are increasingly often used.
The use of emergency signalling devices (such as emergency rockets, emergency flares, and smoke signals, which officially serve to signal that someone is in distress) as fireworks is prohibited to private individuals in the Netherlands (Football and Safety Audit Team, 2017). This use is not just limited to setting off these devices for entertainment during football matches: in some cases they are thrown at people, possibly causing damage and a sense of unsafety.[283]

10.4.4 Attacks

Recent examples of attacks with fireworks shells (mortars) in 2020 and 2021 reported by the media include the one at the home of the mayor of Woensdrecht, several attacks on the homes of police officers, **the explosion at the home of a Castricum councillor,** the man arrested for preparing an attack with a fireworks bomb at the GGD vaccination site in Den Helder[284] **and** the attack on the home of a family in Urk.

There are also signs that flash powder is used in the preparation of terrorist attacks, as became evident in a case brought before the Court of Appeal in The Hague (2019), involving the find of 266 pieces of super Cobra 6 in the bedroom of the convict's son. In another case, a man who called himself a supporter of radical Islamic ideology and endorsed armed jihad was convicted by the Rotterdam District Court (2019).

279 Consulted on 13 April 2021, via https://www.om.nl/onderwerpen/jaarwisseling--vuurwerk/vuurwerkbarometer/2020
280 Consulted on 13 April 2021, via https://www.om.nl/onderwerpen/jaarwisseling--vuurwerk/vuurwerkbarometer/2020
281 Consulted on 12 April 2021, via https://fd.nl/futures/1326893/hoe-italiaans-vuurwerk-wordt-gebruikt-bij-plofkraken
282 Consulted on 2 March 2021, via https://www.dvhn.nl/drenthe/Aantal-plofkraken-explosief-gestegen-maar-waarom-Daders-hebben-zelden-buit-25383301.html
283 Consulted on 12 April 2021, via https://www.ad.nl/utrecht/vier-maanden-cel-geeist-tegen-utrecht-supporter-wegens-rellen-bekerfinale-2016~a6c6fba8/
284 Consulted on 11 April 2021, via https://www.nu.nl/coronavirus/6126537/man-opgepakt-voor-voorbereiden-aanslag-met-vuurwerkbom-op-priklocatie.html

When his residence was searched, a Kalashnikov with two full cartridge cases and a large quantity of Cobra-6 fireworks were found.
In 2020, a raid by police led to the discovery of, among other things, about 160 empty Cobra cartridges and the flash powder removed from them. Presumably, this flash powder would be used in metal or plastic cartridges in the context of an attack within the underworld, a Police employee of the ATM ramming and gas attacks team said.

10.4.5 Fireworks ban and COVID-19

The government in 2020 imposed a partial fireworks ban. All F3 category fireworks and F2 category firecrackers and flares were banned to consumers. F1 category fireworks ("joke" fireworks, year-round) and F2 category fireworks (decorative fireworks, such as certain fountains and cakes, in the days before New Year's Eve) were allowed. Because of the COVID-19 pandemic, this partial ban for 2020 was converted by the government into a temporary total fireworks ban.[285]

The perception is that the imposed (blanket) fireworks ban played into the hands of illegal fireworks dealers.[286] According to a fireworks enthusiast, a fireworks ban is not going to prevent fireworks being set off by the wagonloads around New Year's Eve. They stated that if you know the right people, it was easy to get a batch of cobras or nitrates in no time.[287] It is still unclear what the consumer fireworks ban will be like in 2021.

10.4.6 Criminal investigations

Between 2017 and 2020, about 40 large-scale criminal investigations were conducted by the police on behalf of the Public Prosecution Service. A large-scale criminal investigation is an investigation involving multiple people, large quantities of (illegal) fireworks discovered, and multiple trade movements on the local, national and/or international levels.

Large-scale criminal investigations take a long time. This means that investigations make take years from the time illegal fireworks are discovered until the time offenders are convicted. The number of such criminal investigations has remained relatively stable. In addition to the large-scale investigations, smaller or more short-term ones have also been conducted. In 2019, around 1,000 such investigations were conducted. These for example consisted of an investigation into the trade in or sale of illegal fireworks by a party unauthorised to do so. These cases are usually resolved by the imposition of community service sentences or fines. Following a recent amendment of its guidelines, the PPS now also demands prison sentences.

In recent years, organised criminal groups have come to the police's attention following such criminal investigations. By now, it has become clear that the illegal trade in fireworks is both local and national in nature. This means that, on the one hand, local traders conduct small-scale trade, offering fireworks to private individuals close to where they live. These traders work with one or more local partners/friends and mostly supply the goods to anyone who wishes to purchase fireworks. On the other hand, there is a relatively small, select group of national fireworks dealers who are internationally organised. They cleverly take advantage of the free movement of persons and goods within Europe and trade banned fireworks on a large scale to predominantly local traders. Due to the differences in legislation, a trader can move undetected by Dutch police by crossing the border and storing fireworks that are legal abroad, despite these fireworks ultimately being destined for Dutch consumers, which is illegal.
In Germany, this trader may sell professional fireworks (stored, for example, in an old NATO bunker complex or on (agricultural) business premises) to the local dealer, who quickly crosses the border, loads in the goods in a vehicle, and drives them back to the Netherlands.

10.4.7 Trends

In recent years, interwovenness with other forms of crime has increasingly come to light. "Suspects in the fireworks trade often also engage in drug trafficking or the trade in illegal cigarettes," the

285 Consulted on 10 April 2021, via https://www.rijksoverheid.nl/onderwerpen/vuurwerk
286 Consulted on 17 February 2021, via https://www.volkskrant.nl/nieuws-achtergrond/onlinehandel-in-cobra-s-en-andere-harde-knallers-floreert-door-vuurwerkverbod~b7f850b6/
287 Consulted on 12 April 2021, via https://www.ad.nl/dordrecht/vuurwerkverbod-dan-maar-illegaal-als-je-de-juiste-mensen-kent-heb-je-zo-een-lading-cobra-s-in-je-bezit~a25976b5/

national fireworks officers stated in the Het Parool newspaper.[288] Traffickers use smuggling routes and contacts from the drug trade in the process. This is also evident from a recent judgment by which a defendant was convicted of trafficking in hard drugs and fireworks (Amsterdam District Court, 2020). The shipments traded are also found to become ever larger and more valuable. As a result, violence and threats are more common, the PPS and police informed Het Parool. Sometimes, the police literally see how drug and fireworks trafficking go together. "We would see a van loaded with cannabis tops on the way out and return with a load of illegal fireworks," the national police's New Year's Eve coordinator stated.[289]

"In the world of fireworks, too, people are also pressurised to do or fail to do something, such as talking to the police," national fireworks officers told Het Parool. "And we have found examples of ripoffs. There's a reason people often go buy fireworks in pairs. It's to avoid being mugged."[290]

"Illegal traders seem to take the slow investigation and prosecution processes into account. When, after years of litigation (including appeals), a prison sentence of at no more than a few years is ultimately imposed and the convict is not bled dry financially, trafficking remains lucrative. Criminals factor in possible convictions. Smarter (preventive) alternative interventions targeting the criminal's financial assets should be considered. Starting with convicted illegal fireworks dealers," a fireworks specialist from the Intelligence and Investigation Service of the ILT stated.

Finally, recent criminal investigations have given rise to the picture that many articles that were still classified as F2 or F3 category fireworks before 2021 are now entering the European market as P1 articles (pyrotechnic articles other than fireworks and pyrotechnic articles for stage use, which are low hazard). These items are misclassified and (illegally) marketed as being relatively harmless. In addition to fireworks being marketed under an incorrect classification, heavy firecrackers increasingly often do not state the name of the manufacturer or importer. Consequently, the items often do not have a valid CE mark. Apparently, a shift towards illegal production is taking place.
Fireworks criminals use legal payment systems, online platforms, and the infrastructure of the Netherlands. As fireworks criminals influence society with their illegal trade, their actions can be deemed to constitute undermining crime.

10.5 Opportunities for fireworks crime

The criminal opportunity structure for illegal fireworks dealers has been coming to the fore in recent years - much more so than used to be case. Dutch consumer demand for heavy firecrackers is high due to the strong Dutch tradition of lightning fires and setting off fireworks at the turn of the year. Following the Enschede fireworks disaster, safety distances were introduced for the storage of professional fireworks, which inadvertently caused the (illegal) trade in professional fireworks to phase out of view. These fireworks are now stored in, for example, Germany, keeping them largely out of sight of the Dutch supervision and enforcement agencies (van der Torre et.al, 2017). As is the case in the Netherlands, such storage in Germany is partly legal and partly illegal. Both licensed fireworks storage sites and unlicensed (and therefore illegal) fireworks storage sites exist.

As detailed in section 10.1.2, it is easy to transport and store fireworks in NATO bunkers on German territory, close to the Dutch border. There are at least a thousand such bunkers in the border region. A complex in Kevelaer, off northern Limburg, alone includes 325 such old bunkers. German police found 35,000 kilos of the heaviest kind of fireworks in two bunkers in Kevelaer a few years back. Rents are relatively low, the German police do not much

288 Consulted on 12 April 2021, via https://www.parool.nl/nederland/criminelen-zien-in-illegaal-vuurwerk-een-lucratief-verdienmodel~b7d3c520/
289 Consulted on 12 April 2021, via https://www.parool.nl/nederland/criminelen-zien-in-illegaal-vuurwerk-een-lucratief-verdienmodel~b7d3c520/
290 Consulted on 12 April 2021, via https://www.parool.nl/nederland/criminelen-zien-in-illegaal-vuurwerk-een-lucratief-verdienmodel~b7d3c520/

prioritise checks, and penalties are much lower in Germany. This makes the bunkers ideal for storing illegal fireworks.[291]

The illegal fireworks market in the Netherlands features organised criminal fireworks dealers (large batches, transport, and storage) and profiteers (driving up and down, and retail via social media and in small social circles). When considering the profiteers, those persons who operate independently when purchasing illegal fireworks abroad, it can be said that illegal fireworks find their way to Dutch consumers relatively easily. There is little control over the cross-border transport of people and goods. This presents opportunities for those carrying prohibited goods across national borders. Among other things, this makes it fairly easy to bring illegal fireworks into the Netherlands by car or in postal packages, although the latter practice has increasingly come to the attention of police in recent years, with the parcels increasingly often being intercepted (van der Torre et.al., 2017).

10.5.1 Nature and extent of fireworks crime

When looking at the types of illegal fireworks in circulation in the Netherlands, it is important to point out that the police has in recent years mainly given priority to heavy ornamental fireworks and firecrackers. Examples include signal rockets, bangers (heavy flash bangers like Cobras and nitrates), shells, cakes, and Roman candles. These types are given priority as they are the most dangerous and most common types of illegal fireworks.[292] According to an explosives investigation carried out for the police by the Netherlands Forensic Institute in 2020, the heavier firecrackers currently in circulation in some cases, such as the Giant Maroon, contain almost 200 grams of flash powder.

By comparison, until December 2020, firecrackers with a maximum of 2.5 grams of black powder were allowed for consumer use. Whereas the Widowmaker of the 1990s sometimes contained as much as 5 grams of gunpowder,[293] the current Cobra 8 contains around 100 grams of gunpowder.[294]

In 2017 and 2018, the types of illegal fireworks involved in incidents (in the context of the trade, storage, and use of illegal fireworks) were mapped for the Noord-Holland Unit. Unfortunately, no such survey has been conducted on the national level. The following picture emerged from the information from Noord-Holland:

The figure shows that, in both 2017 and 2018, the vast majority of illegal fireworks found consisted of nitrates and cobras. Together with shells and cakes, they covered about 80% of the total amount of illegal fireworks products found.

Figure 10.3 *NATO bunkers (Source: Amsterdam Office for Serious Fraud, Environmental Crime and Asset Confiscation)*

291 Consulted on 13 April 2021, via https://www.parool.nl/nederland/criminelen-zien-in-illegaal-vuurwerk-een-lucratief-verdienmodel~b7d3c520/

292 Consulted on 14 April 2021, via https://www.politie.nl/binaries/content/assets/politie/onderwerpen/vuurwerk/big-five-versie-2020.pdf

293 Consulted on 20 March 2021, via https://www.digibron.nl/viewer/collectie/Digibron/id/tag:RD.nl,19951128:newsml_679a5dd4b07a5f33e05d0e007da04df12a2cf027f97295899d889744

294 Consulted on 20 March 2021, via https://nos.nl/artikel/2150872-cobra-fabrikant-maffia-en-chinezen-maken-mijn-vuurwerk-na.html

The EC has had the legal production of flash bangers charted to gain more insight into its extent and (legal) use by professionals (European Commission, 2019). It was found that Italy and Spain are by far the largest producers (Table 10.2).

The EC report reflects that no market for professional flash bangers exists in many countries. This is different only in Spain and Italy. According to the report, about 100,000 units, or about 10 percent of legal production, are traded between the Member States. In 2015, legal imports in the Netherlands amounted to 25 kilograms of flash bangers. Besides legally produced fireworks being illegally used, the use of cheaper imitations and illegal production of flash bangers, especially cobras, forms a problem. They look almost the same as real cobras, but are much less reliable and therefore even more dangerous (Bezemer, 2020).

10.5.2 Digital trade

Besides being easy to obtain, fireworks are also easier to market than before. The internet and social media have made it easier in recent years to get in touch with unfamiliar traders, both locally and from places further removed from one's hometown. In addition, it is often possible to operate fairly anonymously on social media, which is very useful for both the seller and the buyer. Due to the speed and brevity of contact (and due to encryption of messages), it is difficult for the police to get a good overview of the digital trade.

In recent years, the police and the Public Prosecution Service have invested heavily in tackling illegal trade in fireworks. The chance of being caught has been increased by deploying more staff and specialised teams dedicated solely to detecting illegal fireworks.

But those "good old days" are no more, Willems says. "The moment I got caught, things had gone south already. Margins were a lot lower because of those Polish websites. People can see the costs on those sites and place an order themselves, if they dare." The illegal fireworks trade has become "too tricky" for Willems, he says. "Margins have gone down and penalties have gone up. There also used to be a lot more illegal dealers around here. Now, only a few big players are left." [295]

Figure 10.4 *Source: not externally published police analysis*

- 26% Cobras
- 4% Signal rockets
- 15% Shells
- 5% Flowerbeds
- 5% Spanish crackers
- 35% Nitrates
- 10% Other

- 19% Cobras
- 1% Signal rockets
- 15% Shells
- 10% Flowerbeds
- 1% Spanish crackers
- 34% Nitrates
- 20% Other

295 Consulted on 12 April 2021, via https://www.ad.nl/binnenland/deze-handelaar-dealde-20-jaar-in-illegaal-vuurwerk-ik-verdiende-tot-wel-40-000-euro-per-jaar-netto~a9b6d65b/

Table 10.2 *Source: Dutch Safety Board (2017)*

	Number of producers	Number of units	Turnover in euros
Italy	10	<700,000	<4,000,000
Spain	50	300,000-400,000	6-7,000,000
Slovakia	1	20,000	100,000
Germany	2	<10,000	<50,000
Sweden	1	500-2,000	2,500-10,000
Total	**Approximately 65**	**<1,150,000**	**9-10,000,000**

In addition, cooperation with other enforcement agencies, both nationally and internationally, has increased. This cooperation has improved visibility of the movements of illegal fireworks and of the locations where they are ultimately discovered. As is common knowledge, only a small proportion is seized by the police. Nevertheless, the quantity does seem to be increasing year on year.

A police fireworks specialist says that, after a number of fireworks platforms, such as Bombashop, were closed in 2018, open groups (set up by illegal traders) gradually emerged on various social-media channels such as Instagram, Telegram, and Snapchat. This trade is brisk and seems to be only increasing in size.

Furthermore, the PPS guideline has been amended in recent years, resulting in higher sentences being demanded. As shown by verdicts given, on several occasions in 2020, prosecutors demanded years-long prison sentences, whereas just a few years before, no more than fines and community service were demanded. The hefty demands have everything to do with the increased power of fireworks and the dangers posed by storage and transport as well. According to an ILT fireworks specialist, a van unfit for transporting dangerous (explosive) substances, such as professional fireworks, is effectively a moving bomb. When such a vehicle loaded with fireworks gets into a traffic accident, the risks are incalculable.

As argued by fireworks officer Broere in Het Parool:[296] "The verdicts show that the court often agrees with our high sentencing demands." Whether this will actually deter people from dealing in illegal fireworks remains to be seen.

10.6 Consequences

This section addresses the consequences of fireworks and illegal fireworks. Not in all cases can the consequences be broken down into those relating to illegal and those relating to legal fireworks. In some cases, both types of fireworks contribute to the consequences.

10.6.1 Environmental damage, emissions into the air, soil, sewer system

Millions of kilos of fireworks are set off in the Netherlands each year (Dutch Safety Board, 2017). Ornamental fireworks and firecrackers contribute to the emission of certain components, such as heavy metals for colouring in ornamental fireworks and gaseous substances in firecrackers (van Apeldoorn & Smit, 2006). Fireworks lead to very high concentrations of particulate matter in the air, especially on 1 January. Despite the fact that the peak load lasts only a few hours, the setting off of fireworks does make a definite contribution to annual average particulate emissions. Besides particulate matter, the setting off of ornamental fireworks also releases metals (dusty substances), such as barium, strontium, antimony, copper, and zinc (van den Elshout, Woudenberg, and van Zanten, 2019). However, these metals emitted to the air via

296 Consulted on 12 April 2021, via https://www.parool.nl/nederland/criminelen-zien-in-illegaal-vuurwerk-een-lucratief-verdienmodel~b7d3c520/

fireworks have less of an effect on air quality than particulate matter has. 100% of the particulate and gaseous substances from fireworks end up in the air, while 30% of the dusty substances end up in the air, 16% in the sewer system, and 54% in or on the soil (Dröge & Roex, 2018).

The Municipal Health Service (GGD), acting in collaboration with the Groningen University Medical Centre and the National Institute for Public Health and the Environment (RIVM), conducted a study on the harmfulness of short-term exposure to particulate matter in humans. This study concluded that - in the Netherlands - no relationship between short-term exposure to particulate matter from fireworks and daily mortality could be found. It was not ruled out that health effects may occur as a result of exposure to particulate matter from fireworks (Academic Environment and Health Workshop & GGD Groningen, 2015). It is unclear how much environmental damage is caused by illegal fireworks compared to legal fireworks. Based on estimates by specialists that 1 to 2 million kilos of illegal fireworks are set off (Dutch Safety Board, 2017), further research could be carried out on the environmental damage caused by illegal fireworks in addition to or together with that caused by legal fireworks, of which some 18 million kilos are known to have been purchased by 2020.[297]

10.6.2 Financial damage

Professional fireworks are regularly marketed to consumers in the Netherlands. The non-professional use of professional fireworks (and homemade fireworks) poses major safety risks. This category of fireworks is not without cause banned for consumer use. The New Year's Eve event costs society between 10 and 15 million euros every year, due to vandalism and fires.[298] This estimate does not include other costs, such as those related to the clean-up of waste, environmental damage, healthcare, loss of labour productivity due to injury and psychological damage, destruction of bus shelters, and the deployment of fire brigades, the police, and ambulances. It also does not include the financial losses caused by the other criminal activities discussed in section 10.4.

10.6.3 Social damage

Since the Enschede fireworks disaster, both professional and consumer fireworks are stored mainly in Germany and Belgium, meaning that the likelihood of another disaster seems to have decreased. However, illegal fireworks dealers do store highly dangerous mass-explosive fireworks in garage boxes, basements, and attics of homes, seemingly oblivious to the risks. As a consequence, a real potential danger of another (smaller) fireworks disaster in residential areas exists. Such a situation will potentially damage citizens' trust in the government, including the police.

A second type of social damage is formed by the illegal trade in fireworks bombs. Should they fall into the hands of extremists or terrorists, these bombs can cause extensive damage to both people and buildings. Traders on the internet do not seem to care about the consequences of the possible misuse of their illegal goods.

10.6.4 Health damage

Setting off and throwing fireworks can lead to (serious) physical injuries. This is also evidenced by news items published around the turn of the year. Injuries include burns, lacerations, amputations, and broken bones.[299] Citizens often have to pay with their fingers, hands, or even lives for setting off professional fireworks.

Every year, the police record more than 11,000 incidents including assaults, fires, vandalism and also some 4,000 fireworks incidents in the period around New Year's Eve. These incidents cause injury and damage. Since the year 2000, there have been 16 deaths in the Netherlands caused by fireworks, an average of almost one per year. The registered

297 Consulted on 15 April 2021, via https://www.rtlnieuws.nl/nieuws/nederland/artikel/5205921/vuurwerk-vuurwerkverbod-opslag-kosten-hoog-vuurwerkbranche
298 Consulted on 16 April 2021, via https://www.verzekeraars.nl/publicaties/actueel/schade-jaarwisseling-tussen-de-10-12-miljoen-euro
299 Consulted on 20 April 2021, via https://www.trauma.nl/traumachirurgen-constateren-veel-blijvende-schade-ten-gevolge-van-vuurwerk

Table 10.3 *Source: 2020-2021 New Year's Eve national overview (Police Management Information Desk, 2021).*

Theme	2020-2021 New Year's Eve	Average in the last four years	% relative to last four years
(Serious) assault/threats	1,151	1,528	-24.7%
Violation of public order	45	52	-13.5%
Fire/explosion	2,161	1,522	+42%
Assistance to agencies	268	432	-38%
Destruction/property damage	1,617	1,843	-13.3%
Fireworks	3,431	3,130	+9.6%

number of fireworks injuries in emergency rooms vary between 473 and 1,000 each year. Eye and hand injuries and burns are the most common injuries.[300]

2020 was a year with relatively few victims of incidents with fireworks. There were 1,300 fireworks victims in 2019, as opposed to nearly 400 during the 2020/2021 turn of the year. This brought the total number of victims down by 70 per cent from the previous year. This decrease is caused by the full fireworks ban in force last year and by the COVID-19 measures (Valkenberg & Nijman, 2021). It is estimated that there were over 50 emergency room visits following accidents involving heavy illegal fireworks this year, compared with an estimated 60 at the previous turn of the year. This estimate was based on those fireworks accidents for which specific accident information was available (Valkenberg & Nijman, 2021).

Most fireworks injuries (burns, lacerations, amputations, eye injuries, and broken bones) in the Netherlands are related to setting off the lighter types of fireworks. During the 2020/2021 turn of the year, 39% in absolute terms were caused by illegal fireworks (Valkenberg & Nijman 2021). While the direct costs of medical care that society ends up paying for are over 2 million euros, the indirect costs are many times that amount for each year. This is due to the costs of follow-up treatment, which in the case of eye injuries is commonly required for life (Dutch Safety Board, 2017).

10.6.5 Violence against emergency workers and nuisance

One specific group of people suffering physical injury is made up of emergency workers whose job is to provide assistance or maintain or restore public order. Emergency workers are regularly besieged with professional fireworks while performing their duties. The police in particular experiences problems with violence against emergency workers around the turn of the year. This is linked to the fact that many fireworks that can be used against the police are available during this period, while police officers are often on site when trouble arises. Tests conducted by TNO, commissioned by the police, show the destructive effect illegal fireworks can have (TNO, 2017). While emergency workers are predominantly assaulted with fireworks around New Year's Eve, this is also becoming increasingly common at other times of the year, for example during football matches and demonstrations (Dutch Safety Board, 2017).

The House of Representatives is annually informed of the number of New Year's Eve-related incidents involving violence. This number fell by almost 25 per cent last year, compared to the previous four years. Again, last year was a special year for emergency workers, as the fireworks ban was in force while the Central Government had implemented COVID-19 measures during the partial lockdown in the Netherlands.

Major excesses were virtually non-existent. According to the report, last New Year's Eve witnessed more incidents of violence against police

300 Consulted on 20 April 2021, via https://www.nazb.nl/nieuws/terugblik-themabijeenkomst-vuurwerkletsel#:~:text=%E2%80%9CBurns%20are%20the%20most%20common,followed%20by%20eye%2D%20and%20hand%20injuries.&text=For%20the%20mere%20part%20still%20being%20surgery%20and%20rest%20of%20the%20injuries%20to%20consequently.

officers (up by 29.3%), but fewer police officers (126) and other emergency workers (12) faced physical violence than was the average in previous years (down by 4%). Verbal violence against police officers and other emergency workers increased by about 20%. Table 10.7 shows the 2020/2021 New Year's Eve-related incidents broken down by theme (Police Management Information Desk, 2021).

10.7 Expectations for the coming years

This section describes the main expectations, based on the findings described in sections 4, 5 and 6.

10.7.1 Increasing demand for heavy fireworks

Despite a fireworks ban being in place the police confiscated over 122,000 kg of banned fireworks in 2020. Demand clearly remains as high as ever. It is expected that this demand will not decline in the coming years. In fact, it may even increase because, on the one hand, the (provisional) fireworks ban does not eliminate the demand for fireworks and, on the other, certain heavy types of fireworks are also increasingly often used for other criminal purposes. This picture is supported by the increasing number of open groups and messages on various social media and communication platforms.

On the one hand, this calls for closer cooperation between enforcement and investigative agencies to combat crime and a more source-oriented approach that provides for improved regulations and European cooperation. On the other hand, it is up to the local governments to devise and facilitate alternatives for or in addition to classic New Year's Eve fireworks, so as to reduce the demand for illegal fireworks.

10.7.2 Increase in the quantity of heavy fireworks

The Pyrotechnic Articles Directive does not provide a maximum explosive value for professional firecrackers, leaving this to the Member States. This allows fireworks manufacturers to make firecrackers and ornamental fireworks with as much explosive force as requested. The illegal market has presumably contributed significantly to the visible trend of increasingly higher explosive values of certain (popular) types of firecrackers in recent years.

Moreover, due to legislative restrictions on certain types of fireworks that are in the pipeline, demand for other firecrackers is expected to shift. Examples include nitrates, widowmakers, and celebration crackers of the P1 category and all kinds of other pyrotechnic articles. This will also eventually encourage misclassification of heavy fireworks.

10.7.3 Increase in firecracker misuse

Banned heavy firecrackers have found their way to criminals engaged in other forms of crime, such as assaults, ATM ramming and gas attacks, and attacking emergency workers during New Year's Eve and demonstrations. Professional firecrackers in particular are life-threatening in nature. Despite no deaths or serious injuries resulting from the illegal use of these fireworks last year, it remains to be seen how long it will take for the first victim to be reported. The demand for these dangerous types of fireworks has increased in recent years and is expected to increase further. As the number of unregulated storage sites and transport movements of these fireworks will increase, the likelihood of (mass) explosions will also go up - with all this entails.

10.7.4 Increase in digital trade

Various internet forums and social media channels offer numerous banned fireworks, also listing the quantities and prices. For trade to flourish, these fireworks must be somewhat easy to find for consumers. At the same time, these illegal sellers/traders may not be too conspicuous, lest the investigative agencies find them. The online trade in illegal fireworks is expected to continue to increase and to shift to other existing or new open and closed communication methods.

10.8 Conclusions and recommendations

This section describes the main conclusions, followed by a number of recommendations.

10.8.1 Criminals have discovered fireworks

Heavy firecrackers banned for consumers, such as the Cobra or Gigant Maroon, have found their way in the Netherlands and abroad, not only to consumers, but also to criminals and vice versa.
These life-threatening illegal firecrackers get heavier and more dangerous every year, resulting in destruction, fires, casualties, and beleaguered emergency workers. Fireworks are not only a problem around New Year's Eve. Criminals also use these (composite) illegal fireworks for purposes such as ATM ramming and gas attacks and preparing (terrorist) attacks. It is recommended that the intensification on tackling fireworks crime be continued, with cooperation being sought in areas such as the exchange of information with investigation teams carrying out other investigations mentioned in the above.

10.8.2 Illegal fireworks get heavier each year

Whereas, 10 years ago, people traded in banned fireworks that were considered heavy back then, such as widowmakers and nitrates, the explosive mass of today's firecrackers can now be as much as 20 times higher. This kind of 'fireworks' can, given the high explosive force and effect it produces, no longer be considered consumer fireworks. Italy and Poland are major producing countries. Germany is an important transit and storage country. It is recommended that cooperation with these countries in tackling fireworks crime is stepped up.

10.8.3 Demand for illegal fireworks will increase

Without further European regulation and improved international strategies, the expected supply and demand for illegal fireworks is not expected to decrease on its own. As a result, the effects of, in particular, the banned heavy (illegally produced) firecrackers will need to be taken into account throughout the year in the Netherlands.
It is recommended that, in addition to continuing the intensification of the response to fireworks crime by supervision and investigation agencies, additional investments are made into monitoring and analysing communication platforms offering illegal fireworks. Another recommendation is of a more preventive nature. Local governments can eliminate some of the demand for illegal fireworks by devising (and possibly facilitating in) alternatives to setting off fireworks during New Year's Eve.

Finally, we recommend that the police and local governments more closely cooperate in improving the administrative-law approach.

10.8.4 International cooperation

The core problem of banned consumer fireworks being traded to the Netherlands is that fireworks are manufactured abroad, complicating strategies aimed at tackling the source. Cooperation with other countries and international organisations active in the enforcement and detection of illegal trade in fireworks is therefore very important. It is important that Europe further harmonises its legislation and that the seriousness of the Dutch problem becomes more widely known among other Member States. The first steps have already been taken in this connection.

10.8.5 Confiscating money

The illegal trade in fireworks is extensive, international in nature, and digitally organised, and the main goal for illegal traders is to make money. To tackle these criminals more effectively, they must be hit in their wallets. We therefore recommend working with financial specialists to find ways of confiscating unexplained assets and illegally obtained gains.

Literature

Academic Environment and Health Workshop and GGD Groningen (2015). *Onderzoek naar de relatie tussen kortstondige blootstelling aan fijn stof van vuurwerk en dagelijkse mortaliteit in Nederland.* Groningen: Academic Environment and Health Workshop.

Football and Safety Audit Team. (2017). *Vuurwerk tijdens en rond voetbalwedstrijden: no pyro, no party?* Utrecht: Football and Safety Audit Team.

Football and Safety Audit Team (2020). *Benchmark Voetbalveiligheid. Een overzicht van de bevindingen over seizoen 2019-2020.* Utrecht: Football and Safety Audit Team.

Bezemer, K. D. B. (2020). *Forensic explosives intelligence*. Amsterdam: UvA-DARE.

Biezeveld, G.A.(2010). Illegaal vuurwerk: biedt Pyrorichtlijn uitzicht op oplossing? *Tijdschrift voor Omgevingsrecht, June 2010, no. 2.* The Hague: Boom Juridische Uitgevers.

Biezeveld, G.A., de Poorter, J.P. (2005) *Landelijk Handhavingsprogramma 2005. Prioriteit Verboden consumentenvuurwerk.* The Hague: LOM Secretariaat.

Police Management Information Desk (2021). *Jaarwisselingsrapportage 2020-2021*. The Hague: Politie Nederland.

Drenth, A. (2017). *Notitie Vuurwerkbeleid*. Consulted on 21 April 2021 via https://maatschappijenveiligheid.nl/het-woord-is-aan-anthonie-drenth/

Dröge, R. & Roex, E. (2018). *Emissieschattingen Diffuse bronnen Emissieregistratie - Afsteken vuurwerk*. Utrecht: Rijkswaterstaat WVL.

European Commission. (2019). *Study on illegal sales of pyrotechnic articles destined for professional users (category F4) to the general public.* Oxford: Oxford Research A/S.

The Hague Court of Appeal (2019, 15 April). ECLI:NL:GHDHA:2019:801. Consulted on 19 April 2021 via https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:GHDHA:2019:801

Dutch Safety Board (2017). *Veiligheidsrisico's jaarwisseling*. The Hague: Dutch Safety Board

Amsterdam District Court (2020). ECLI:NL:RBAMS:2020:460. Consulted on 30 April 2021, via https://jure.nl/ECLI:NL:RBAMS:2020:460

Rotterdam District Court (2019). ECLI:NL:RBROT:2019:7973. Consulted on 23 April 2021, via https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBROT:2019:7973

Directive 2013/29/EU. (2013, 12 June). Consulted via https://eur-lex.europa.eu/legal-content/NL/TXT/HTML/?uri=CELEX:32013L0029&from=NL

TNO (2017). *Onderzoek naar de impact van illegaal vuurwerk.* Rijswijk: TNO.

Valkenberg, H. & Nijman, S. (2021). *Ongevallen met vuurwerk Jaarwisseling 2020-2021. Report 889.* Amsterdam: VeiligheidNL.

Van Apeldoorn, R.C. & Smit, C.J. (2006). *Effecten van evenementen-vuurwerk op beschermde natuurwaarden in Zeeland*. Wageningen: Alterra.

Van den Elshout, S., Woudenberg F., van Zanten, M. (2019). "Vuurwerk, relevante luchtvervuiling?". *Tijdschrift Lucht 2019, volume 15 (4)*. Utrecht: VVM netwerk van milieuprofessionals.

Van der Torre, T., van Valkenhoef, J., Esman, C, Greven, H (2017). *Veiligheid bij jaarwisselingen.* Apeldoorn: Police Academy.

Van der Wilt, H.G. (2007). Internationaal Strafrecht. In N. Horbach, R. Lefeber, O. Ribbelink (eds.), *Handboek Internationaal Recht.* The Hague: T.M.C. Asser Institute.

Part 4
Threats to biodiversity

11

11 Wildlife crime

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This chapter deals with the main threats and forms of crime relating to wildlife. The International Consortium on Combating Wildlife Crime (ICCWC) has the following to say about wildlife crime (WLC):

> ICCWC considers 'wildlife' to include all wild fauna and flora[301]. Besides animals and plants, this also includes (non-sustainable) wood. Wildlife crime refers to the taking, trading (supplying, selling or trafficking), importing, exporting, processing, possessing, obtaining and consumption of wild fauna and flora, including timber and other forest products, in contravention of national or international law.[302]

This chapter uses the above definition for wildlife crime. Due to the wide scope and great diversity of animal and plant species covered, it is impossible to discuss all threats in this one chapter. For this reason, we chose to discuss some existing cases and use them to interpret the threat. Environmental violations where animals are victims or other forms of indirect animal abuse are beyond the scope of this chapter. The focus of this chapter is on the role of the Netherlands in this cross-border form of crime. The Netherlands serves as a transit country or final destination.

Given the great many local, regional, and national issues at play, the threat of WLC, its role, and its implications for the Netherlands go somewhat unnoticed. Various (international) developments are gradually changing this.

11.1 Description of the chain

This section outlines the context of wildlife crime and the chain. This will be illustrated by way of examples. We will next discuss the extent of this type of crime and the turnover it generates.

11.1.1 Wildlife crime

Around the globe, there is high demand for animals and plants, both dead and alive, and products made from them (henceforth referred to as wildlife products) (Thomas-Walters, et al., 2020). A quarter of all land animal species are traded in some way (Scheffers, Oliveira, Lamb, & Edwards, 2019). For many species, trade in these wildlife products to a greater or lesser extent plays a role in their decline(Diaz, et al., 2019), forming the second largest cause, after habitat destruction. Both national and international legislation seek to prevent unsustainable trade in vulnerable species and thus to save them from extinction. Such legislation is violated on a significant scale around the world. The reason for this is the continuing demand for such products, with legal sources often being inadequate. This trade is largely internationally oriented, as the countries where the animals and plants originate are often completely different from the countries where there is a market for wildlife products. Wildlife products are extremely diverse. For imaging purposes, the following are some examples of the applications internationally protected species that have, to a greater or less extent, been involved in illegal trade incidents in the Netherlands are used and traded for:

- Food: eating smoked eel, drinking salep (a hot drink made from orchids which is popular in the Middle East), and eating caviar.

301 Animals that used to live in the wild but now live in captivity or as pets are also included in the definition.
302 Consulted on 6 April 2021, via www.cites.org/eng/prog/iccwc/crime.php

- Luxury products: the use of teak wood from Myanmar to cover the deck of luxury yachts, wearing snakeskin shoes or a coat of ocelot fur (a South American feline).
- Lifestyle products: adding African cherry to food supplements, using orchids in face masks, and incorporating seahorses in traditional Chinese medicines.
- Decoration: exhibiting an ivory statue as an antique, displaying a stuffed sea turtle, playing a piano made of the protected Rio Rosewood wood species, and displaying a cactus.
- Companionship: keeping a macaw (a parrot-like animal) in an aviary, keeping a marmoset in a cage, an Arowana (a fish) in an aquarium, and a monitor lizard in a terrarium.

11.1.2 Background

It is well known that biodiversity (Brondizio, Settele, Diaz, & Ngo, 2019) worldwide and certainly also in the Netherlands[303] is in sharp decline. The total forest area worldwide is about 4.06 billion hectares. The extent of deforestation over the 2015-2020 period was about 10 million hectares[304]. Deforestation contributes to desertification and climate change. But logging in a forest also unlocks the area for poachers in search of wildlife and plants[305]. The illegal wildlife trade was estimated to be worth USD 23 billion in 2016[306]. Both logging and the trade in protected species often feature interwoven legal and illegal flows, making effective enforcement difficult compared to dealing with prohibited products such as weapons or drugs. Between 2000 and 20212, a third of total forest conversion in the tropics was carried out illegally (Lawson, 2014). Trade in illegally harvested timber and illegal wildlife products has a direct impact on several sustainable development goals, such as ecosystem restoration, sustainable economic inclusive growth, sustainable consumption[307].

The use of wildlife products and the sourcing and trading preceding it has a huge impact on animal and plant populations. The evolution and extinction of species is a natural process, over the course of which more species generally appear than disappear, except in the case of mass extinctions. This has led to the enormous diversity of life on Earth. Although accurate calculations are difficult because we do not know of all extinct species that used to exist, examination of fossils suggests that, at present, species are going extinct 10 to 100 times faster than was the case before humans appeared on the scene (Barnosky, et al., 2011). Anthropogenic impact[308] forms the main culprit for this development (Almond, Grooten, & Petersen, 2020).

Destination countries bear partial responsibility

The effects of wildlife crime are particularly noticeable in the countries of origin of the animals, plants, and forests affected (Obasi & Vivian, 2016). Belief in the medicinal properties of rhinoceros horn in Vietnam and demand for ivory decorative carvings in China are decimating rhinos and elephants not only in Asia but also in Africa. This has a huge effect on the jungles and savannahs there. However, fighting poaching in Africa without reducing demand in Vietnam and China will not solve the problem. The same applies to the Netherlands. Fighting wildlife crime in the Netherlands is essential to protect animals and plants in other parts of the world and frustrate this form of crime within the EU as well. Most wildlife source countries are relatively poor compared to the Netherlands and face more acute problems than wildlife crime. Partly because of this, the effects of wildlife crime are only visible in the longer term.

11.1.3 Chain

For centuries, humans have been 'consuming' the environment and all that nature has to offer. Trade in animals and plants and products made from them is allowed to some extent. This makes that wildlife crime is often intertwined with the regular commercial chain. You could represent this chain as being composed of the following steps:

- Acquire: hunting/breeding/capturing/cultivating/picking/cutting etc.

303 Consulted on 20 May 2021, via www.pbl.nl/publicaties/lerende-evaluatie-van-het-natuurpact-2020
304 Consulted on 25 May 2021, via www.fao.org/state-of-forests/en
305 Consulted on 29 May 2021, via www.eia-international.org/wp-content/uploads/Double-Impact-2020-SINGLE-PAGES.pdf
306 Consulted on 25 May 2021, via www.traffic.org/about-us/illegal-Wildlife-trade/
307 Consulted on 25 May 2021, via www.forestgovernance.chathamhouse.org/publications/why-tackling-illegal-logging-is-important#footnote-2
308 The impact of human activities.

(Intermediate) Trade: exchange and sale
- Transport: use of transport routes and options (containers/cases/etc.)
- Obtain: buying, receiving as gifts, exchanging, etc.

Each product has a different chain. These are often hugely diverse and complex, as they often involve multiple countries and (intermediate) products, depending on the species. Examples include:
- the chain of trade in a Tillandsia (a bromeliad) smuggled from South America to the Netherlands to be kept here as a houseplant;
- a swan, who has been stolen in the Netherlands while still an egg and ends up in a zoo in China as an adult bird;
- a pangolin from Nigeria that ends up as medicine in Vietnam via the Netherlands.

In addition, all chains feature their own complexity in and between the various links. These include mixing illegal products with legal ones, using smugglers, brokers or other intermediaries and collecting, making, and arriving at the final product. Offences can be committed within multiple links in the chain and by different actors. These steps, at best, all take place within one country. Often, they take place in different countries. The trade in different types or products may be regulated by different types of legislation. As a result, different chains have different control mechanisms. The trade in timber, for example, is conducted differently and must meet different conditions that in marine fish, which differs again from the trade in ornamental plants or native songbirds. The parties involved in the chain can be both individuals and companies, depending on their role in the trade. This huge diversity of chains, stakeholders, and target groups is a characteristic of wildlife crime.

The EU is the biggest market

Perhaps erroneously, the idea has arisen that China is the biggest market for illegal wildlife products, due to its role in the ivory, rhinoceros horn, and pangolin trade. However, when the 27 Member States are considered as one single market, the EU is the largest illegal wildlife trade outlet (EUCPN, 2019). The EU serves as a destination for a hugely diverse range of illegal wildlife products. This is a direct result of its relatively high prosperity compared to the rest of the world, its open internal borders, and its developed infrastructure. The EU is a particularly important destination for live animals (Altherr & Lameter, 2020) and luxury products (EUCPN, 2019).

In terms of timber, China is the largest importer of timber (Wellesley, 2014), with Vietnam coming in second place[309]. In China, timber is converted into furniture, paper, and wood products, some of which are transported back to the EU[310]. Chinese companies also have many concessions, mainly in Africa. These are often not operated in accordance with the sustainability requirements of national legislation. The role and influence of the EU and other regulated markets has diminished in recent years as the demand for timber in Southeast Asia for the internal market has increased due to rising living standards (Hoare A. , 2015). Most wood species are somewhat interchangeable: you can make window frames from protected African teak, but also from meranti. However, teak, which is used as a coating in expensive yachts, has a very exclusive character, meaning that the market only desires this product. However, wild teak is nowadays really only available in Myanmar, where it is difficult for companies to comply with the rules from the Timber Regulation and with the sanctions.

The role of Dutch traders

Depending on the species of animal, plant, or type of product, the Netherlands acts as a country of origin, transit, or destination. Because of its good infrastructure, the Netherlands is an important trading country within the EU: the port in Rotterdam is the largest port (Port of Rotterdam, 2021)and Schiphol airport the second largest airport, in terms of passenger numbers, in the EU (Schiphol Group, 2021). As for wildlife products, the Netherlands features global distribution centres for flower bulbs, fish, brands that incorporate reptile leather in their products, etc. In addition, major international traders in all kinds of different live animals and ornamental plants are operating in the Netherlands. The market for these species in the Netherlands consists mainly of collectors and hobbyists who like to keep unusual

309 Consulted on 25 May 2021, via www.chathamhouse.org/2015/07/tackling-illegal-logging-and-related-trade-what-progress-and-where-next
310 Consulted on 25 May 2021, via www.ec.europa.eu/environment/forests/pdf/Country_overview_China__03_10_2018.pdf

animals and plants. This also shows how illegal poaching of animals and plants abroad is linked to trade in the Netherlands.
An example of the Netherlands serving as a country of origin is that of the trade in European eels, which are considered a delicacy worldwide. Companies smuggle the young glass eels from the EU to fattening beds in China, where they grow into into adult eels and are processed further and distributed around the world. Birds are also poached from the wild in the Netherlands, both for the local and international trade. The authorities often discover such illegal trade by chance at Schiphol Airport or the port of Rotterdam.

The Netherlands also serves as a transit country of all kinds of products. Examples include traditional Chinese medicines featuring ingredients from protected species, elephant ivory, or shark fins. A few years back, pangolin scales were seized at multiple occasions. These were sent in postal packages from Nigeria to Hong Kong and intercepted in the Netherlands. This also indicates that many wildlife products can be sent by post, making it difficult to control the trade. Trading wildlife products over the internet is also easy these days.

In addition, Dutch traders also play a role in laundering species that are protected in their countries of origin but not internationally. This is particularly notable (TRAFFIC, 2020) in the trade in live reptiles, but not limited to that trade alone. Under the laws of some countries, any wildlife product is illegal if it is not obtained according to the laws of the country of origin. The EU has no such legislation in place. For this reason, EU countries, including the Netherlands, are labelled as the countries of origin of wildlife allegedly bred in captivity, to allow exports to such countries. But in reality, the Netherlands is just a stopover between the country where it was illegally obtained and the actual destination country.

A number of Dutch traders engage in both legal and illegal trade. They collect, both in fact and on paper, species from the rest of the EU for export to other countries, making it difficult to trace their origins. Due to the intertwining of legal and illegal trade, understanding the chain and taking enforcement action are complicated. Dutch enforcement rarely identifies individuals or companies that solely focus on illegal trade. Inspection data show that most violations occur among businesses that mainly ply the legal trade and receive additional income from an illegal component. This presumably applies to both trade in plants, including wood, and animals. The Netherlands reported 834 seizures in 2019 (TRAFFIC, 2020).

The Netherlands is one of the largest importers of timber and wood products in the EU. The percentage of illegally imported timber cannot be estimated. In most cases, timber supplies are accompanied by documents, but the validity of these documents has not been sufficiently verified and no link can be established between the imported timber and the documents. Dutch companies themselves operate concessions in Africa and South America. In addition, companies trade with exporters in many source or production countries. This applies both to large companies and entrepreneurs who only import a few containers a year. In fact, the percentage of certified concessions has not been increasing for years, so the volume of certified wood made available to the market has not risen. However, the number of chain-of-custody certified Chinese companies is rising rapidly.

11.1.4 Turnover

The legal trade in wildlife products, including timber trade and fishing, generates €100 billion in annual turnover in the European Union (European Union, 2016). The World Bank indicates that source countries miss out on USD six to nine billion a year in taxes due to illegal logging and around USD 1 billion on wildlife trade.[311] It is estimated that the international value of trade in illegally harvested timber is between USD 52 and 157 billion and that of IWT is between USD 5 and 25 billion.[312]

311 World bank (2019) Illegal logging, fishing and wildlife trade: The costs and how to combat it. Consulted 13th February, 2023 via https://thedocs.worldbank.org/en/doc/482771571323560234-0120022019/original/WBGReport1017Digital.pdf

312 World bank (2019) Illegal logging, fishing and wildlife trade: The costs and how to combat it. Consulted 13th February, 2023 via https://thedocs.worldbank.org/en/doc/482771571323560234-0120022019/original/WBGReport1017Digital.pdf

11.2 Relevant legislation

Legal instruments are needed to protect endangered animal and plant species. This section addresses how species are protected by application of criminal and administrative law.

11.2.1 CITES

The Convention on International Trade in Endangered Species of wild Fauna and Flora (CITES) is the global treaty to regulate and - where necessary - prohibit international trade in endangered animal (5,800 species) and plant species (30,000 species). These species have their very survival threatened. The purpose of this Convention is to ensure that they do not become extinct.

The CITES, which has been signed by the EU and 183 countries, sets rules for the international trade in animals and plants. Species potentially threatened with extinction are listed in one of three Appendices. The most stringent rules apply to Appendix I and the least stringent to Appendix III.

In Europe, the EU has incorporated the CITES into European Regulation (EC) No 338/97. This basic regulation is stricter in parts than the CITES is. The species are divided into four appendices, with Appendix A largely listing the CITES Appendix I species, Appendix B listing those of Appendix II and so on. Species that, according to the EU Member States, require additional protection are also included or listed in a higher-ranking appendix. The Regulation also explains what is required within the EU to be allowed to trade in these species (CITES, 2020).

To combat the trade in invasive alien species, the Invasive Alien Species Regulation has been adopted at the EU level. This regulation prohibits trade in a number of species that, should they become established in the EU, could cause enormous damage to native wildlife (EU, 2021).

11.2.2 EUTR

The European Union Timber Regulation (EUTR) and the Forest Law Enforcement, Governance and Trade (FLEGT) Regulation (EU, 2021) regulate trade in timber in the EU. The EUTR prohibits the placement on the market of illegally harvested timber and requires companies placing timber on the European market to comply with a system of due diligence. This regulation does not so much protect specific timber species, but it does ensure that Member States do not place illegally harvested timber on the market. The EU thus aims to protect sensitive biotopes in source countries (NVWA, 2021). In addition, the European Union has concluded a Voluntary Partnership Agreement (VPA) with certain countries. Under the FLEGT licensing scheme, specified timber products exported from a partner country and entering the European Community at a customs post designated for release for free circulation must be covered by a FLEGT licence issued by the partner country (NVWA, 2021).

11.2.3 Dutch legislation

The Nature Conservation Act and the Nature Conservation Decree (Central Government, 2021) contain the penalty provisions included in the EU regulations and apply in the Netherlands. Criminalisation is regulated by Section 1a of the Economic Offences Act (WED).

11.3 Agencies involved

Several chain partners cooperate in enforcing CITES, tackling wildlife crime, and combating the illegal timber trade in the Netherlands.

11.3.1 CITES

Every country that is a party to the CITES is obliged to establish a Management Authority (MA) and a Scientific Authority (SA). The Management Authority in the Netherlands is hosted by the Ministry of Agriculture, Nature and Food Quality (LNV) and is responsible for legislation and policy. The secretariat of the Scientific Authority is also hosted by the Ministry of LNV. The SA itself consists of a group of independent scientists in an advisory role. The Netherlands Enterprise Agency (RVO) implements the administrative aspects of these regulations. The RVO is part of the Ministry of Economic Affairs and Climate and issues CITES permits for the export of animal and plant species.

The RVO's Administrative Enforcement Team (BHH) handles administrative enforcement. It has a monitoring role with respect to violations of CITES regulations, supervising the possession of and trade in protected animals and checking export permit applications (RVO, 2021). It also is authorised to

conduct administrative seizure, impose a penalty payment, or impose an administrative fine; however, it is default policy not to do the latter. The fine is between 410 and 4,100 euros.

Dutch Customs is responsible for enforcement at the border during import, export, and transit. The NVWA conducts domestic inspections, carries out criminal investigations independently and in cooperation with the police, and supports Customs. Criminal investigations by the police and the NVWA take place under the authority of the National Office for Serious Fraud, Environmental Crime and Asset Confiscation (FP) of the Public Prosecution Service (PPS). The FP prosecutes these cases in the economic criminal chambers of the courts and, increasingly, in the second line. The NVWA-IOD mainly plays a role in collecting and enriching intelligence to be used for investigations, but it also conducts criminal investigations. These signals are discussed in the signals consultation held between the FP and the investigative services.

The enforcement partners hold bi-monthly National CITES Consultations (LOC), which are chaired by the Ministry of LNV. The LOC regularly draws up an enforcement strategy and sets annual enforcement focal points. Guidance on criminal enforcement is provided through the Selection Consultations held between the NVWA and the FP, the Strategic Environmental Chamber (SMK) and the Environmental Chamber (MK).

11.3.2 CITES analysis and intervention strategy

Every three years, a multi-year strategy to combat CITES violations is drawn up by the various enforcement partners: RVO, Customs, the NVWA, the PPS, and the Police.

11.3.3 Timber Regulation and FLEGT Regulation

The NVWA monitors compliance with the Timber Regulation. During major criminal investigations, the police and the NVWA-IOD cooperate under supervision of the FP. The NVWA checks FLEGT licences for accuracy, while Customs checks whether licences match the shipment at the border in a risk-based manner. If they do not match, the NVWA takes over and the importer will have to destroy the goods at its own expense. Any impoundments or seizures are coordinated and stored by the RVO-IBG.

11.3.4 International

In varying composition, with the NVWA acting as permanent delegation leader, the police, the RVO, Customs, and the FP participate in the semi-annual meetings of the Wildlife crime Enforcement Group (WEG), chaired by the European Commission (European Commission, 2021). The WEG's role is to oversee enforcement policy and practice in the EU Member States. In addition, the WEG can make recommendations to improve enforcement of wildlife trade laws. The WEG also aims to exchange information, experience, and expertise on trends in illicit trade, major seizures, and investigations, including intelligence sharing and the creation and maintenance of databases.

The FP, the NVWA-IOD and the Police take turns participating in Interpol's Wildlife crime Working Group (WCWG) meetings (Interpol, 2021). The WCWG, like the Forestry Crime Working Group (FCWG), falls under Interpol's Environmental Crime Programme. It meets annually to share information and knowledge and maintain and improve the international network of enforcers and other parties, such as the World Bank, online marketplaces, the Egmont Group, and academics. The WCWG, acting in collaboration with the World Customs Organisation (WCO) and participating countries, organises annual global actions against wildlife crime. The FP, NVWA-IOD or police do not by default participate in the FCWG each year. It is possible that the expertise currently being gained in criminal investigations will cause them to link up with these actions.

The police and the NVWA, acting under the authority of the FP, jointly investigate criminal offences. The NVWA and the Ministry of LNV are members of the European EUTR Expert Group and the Forest Law Enforcement, Governance and Trade (FLEGT) Committee.

In addition to Interpol, Europol (Europol, 2021) is another key partner in tackling international environmental crime. Europol's actions are taken under the European Multidisciplinary Platform Against Criminal Threats (EMPACT), a multi-year policy programme covering a wide range of

cross-border, organised forms of crime, including environmental crime, focusing on wildlife crime and waste crime. EMPACT sees Member States in concert implementing a sizeable number of Operational Action Plans (OAPs). The NVWA, the Police, the ILT, and the FP liaise with each other on the implementation of the OAPs.

Other relevant international and national partners in combating WLC and non-sustainable wood include the UNODC, ICCWC, FATF, WCO, World Bank, United for Wildlife, environmental special investigating officers and Environmental Agencies, NGOs, Crimestoppers NL, and Regional Implementing Agencies.

11.4 New developments

A number of new developments in international and national policy and investigations are of relevance in the context of this Threat Assessment.

11.4.1 International

In June 2020, the Financial Action Task Force (FATF) released a report on the money laundering risks related to the illegal trade in wildlife (Force, 2020). In its report, the FATF acknowledged that illegal wildlife trade can be considered a serious transnational organised form of crime - a type of crime that breeds corruption, threatens biodiversity, and can have significant public health implications. In June 2021, the FATF is to publish a similar report on money laundering risks in environmental crime in general and more specifically in the context of non-sustainable wood, waste, and illegal mining. Because of the significant money laundering risks, the FATF calls on countries to give greater priority to these serious crime forms and the fight against money laundering, to combine financial and expertise in the various areas, and to improve international cooperation. The FATF also recommends starting up public-private partnerships to combat money laundering connected to these types of offences.
The United Nations Convention Against Transnational Organised Crime (UNTOC) on 16 October 2020 adopted a resolution recognising WLC as a serious crime and calling on parties to combat WLC directly (United Nations, 2020). The resolution recognises the risks of corruption and money laundering and follows a call for Member States to implement legislation in this area. As a result, the resolution has global implications for the prioritisation of tackling this form of crime.
The EU action plan against WL trafficking was adopted and approved within the EU in 2016 (European Commission, 2021). The Action Plan runs until 2020 and it is expected that a new and updated action plan will be drawn up after the present one has been reviewed. Work within the EU on tightening the rules on ivory trade continues. An open consultation is currently taking place on these stricter rules. The proposal inter alia states that trade in raw ivory will be banned, except when a Member State authorises its use for the repair of musical instruments. Internal EU trade in processed specimens is curtailed, as are exports and imports of ivory within and outside the EU. The tightened rules are expected to take effect in mid-2021. In addition, the European Commission is developing a deforestation-free agro strategy, which should ensure that no further deforestation for agricultural purposes takes place.

11.4.2 National

The enforcement partners are currently exploring options to not only take criminal action against professional traders who systematically fail to comply with the CITES regulations, but to also impede them from continuing their practises in violation of the standards in any other way. This includes exploring the possibility of having the Public Administration (Probity Screening) Act apply to permits and recognition. A comprehensive approach should ensure effective enforcement and general compliance.
In late 2020, the police, NVWA and FP teamed up with a financial institution to set up a public-private partnership. They will investigate ways in which the risks of money laundering relating to wildlife crime and non-sustainable wood can be recognised earlier in the unusual transaction reporting process. Investigations into the extent the follow-up to unusual transactions in these areas can be improved upon are also apace.

11.5 Nature and scale

Wildlife trade is a global phenomenon. The CITES, which protects endangered species, is primarily a trade treaty that imposes restrictions as soon as

species become endangered. According to the World Wide Fund for Nature (WWF), ten billion dollars is spent in the illegal animal trade each year[313].

The planet's biodiversity is vast, comprising millions of species. About 35,000 of them are protected under the CITES, but many more species are threatened to some extent. Almost every country and environment is home to rare animal and/or plant species. This makes them easily accessible to anyone. In addition, the demand for many plants, animals, and wildlife products exceeds the legal supply.

11.5.1 Global scale

Wildlife crime is the fourth largest criminal industry in terms of revenue.[314] It was estimated to be worth USD 5 billion to USD 23 billion (EUR 4.2 billion to EUR 19.5 billion) per year (May, 2017). At present, this seems like an underestimate, as trade in the EU alone accounted for EUR 4.7 billion in 2019. If illegal fishing and illegal logging are included, the market amounts to USD 48-216 billion (EUR 40.7-183.5 billion) per year (World Bank, 2019). In addition, according to Interpol, wildlife crime is increasing by 5-7% per year, or about 2 to 3 times as fast as the global economy (INTERPOL, 2021). Trade chains are characterised by enormous diversity and complexity. The size of the organisation can range from the very small-scale, such as a picker of a protected plant, to serious organised crime, such as ivory trafficking. The UNODC maintains an overview to keep track of how many wildlife products are confiscated worldwide every year. The last full year for which seizure data are available is 2017. That year, there were 20,762 seizures of wildlife products around the globe (UNODC, 2020).

11.5.2 Scale in the Netherlands

There is an extensive trade in (illegal) CITES species and non-sustainable wood. In the period from 2015 to 2019, between 15,000 and 30,000 birds and between 2,500 and 10,000 terrarium animals (both listed on the a CITES Appendix) were annually exported from the Netherlands. The import of CITES birds to the EU is banned to prevent the risk of bird flu. Every year, as many as between 5,000 and 7,500 terrarium animals listed on the CITES Appendix are imported into the Netherlands, while 500 are re-exported. 40.2 million m^3 of timber was imported into the Netherlands in 2018, 0.4 million m^3 (1%) of which was illegal (Hoare A. , 2021).
In 2019, EU member states reported some 6,441 seizures - an increase from the 2017 (5,644) and 2018 (6,012) figures. In 1104 (17%) cases, an indication of the value was given. This totalled EUR 4.7 million. A simple extrapolation yields an estimated EUR 27.6 million as an indication of the total value of the seized wildlife products. The Netherlands is one of four countries, along with France, Germany and Spain, that collectively report around 80% of all seizures within the EU each year (TRAFFIC, 2019).

Seizures were conducted mainly at airports (42%) and postal companies (22%). Far fewer seizures took place at ports (3%), at shops and fairs (5%), and at private homes (10%).
More than 75% of the seizures took place because the consignments were found to either have been shipped without a CITES permit, or to have been shipped with a permit that was just recently granted.

Between 2015 and 2019, the NVWA received 211 reports[315] concerning abuses at bird dealers and 58 reports on terrarium animals. The NVWA and police carry out inspections on the basis of these reports or any other reason, with violations actually being established in over a third of the cases. At least 16 criminal investigations into bird trafficking and three into terrarium animals were conducted in the 2016-2019 period. In both trades, there are a few (major) entrepreneurs who engage in illegal as well as legal trade.

Some criminal investigations into illegal and non-sustainable wood have been conducted in recent years. Initial experience with criminal enforcement of the European Timber Regulation in the Netherlands and in Europe is currently being gained.

11.5.3 General characteristics

Due to its international nature and the existence of legal trade, it is not always clear to those involved in the chain whether the trade is legal. Sometimes, end users and traders are unaware of the illegal

313 Consulted on 20 April 2021, via www.wwf.nl/wat-we-doen/focus/Wildlife/illegale-handel
314 The three largest criminal industries are drug trafficking, arms trafficking, and human trafficking.
315 Police figures are missing from this report.

origin of their products, and sometimes local hunters and loggers are unaware that they are feeding an international, illegal chain.

According to research, the major players of criminal syndicates are rarely arrested. The chance they will be caught remains low, while the proceeds are often significant.
Wildlife crime is a form of crime that can persist because governments do not take it seriously.

This crime is highly internationalised, the largest source countries being located in Africa, Asia and South America, while Europe and the United States are the predominant buyers.

The illegal trade in the Netherlands should be considered in an EU-wide perspective. Because of the open EU borders, both collection and marketing are possible throughout the Union. Traders in the Netherlands seem to play an important role in both bird trade and terrarium animal trade

In the trade in protected species, the species listed on the official documents regularly differ from those actually traded. The distinction is often hard to see. In addition, new species are constantly being described and new insights into classification cause species to change names, creating ambiguity.

11.5.4 Offenders

The perpetrators of wildlife crime can be natural and/or legal persons, who may be linked via legal or illegal organisations. This diversity is present at each stage (acquire/transfer/transport) of the chain (as defined in section 11.1.3).

When the poachers, catchers and/or possessors are natural persons, they usually trade in small quantities of animals, plants, or products. Whenever larger quantities are found in criminal cases and seizures, this usually concerns offenders who use their organisation for this (il)legal trade. By now, criminal organisations are also known to have been set up with the sole purpose of committing illegal wildlife crime (ESAAMLG, 2016). The illegal trade in ivory or pangolin scales are telling examples.

Some of the organised crime organisations engage in other forms of crime besides wildlife crime (EUCPN, 2019). Suspicion existed that terrorist organisations generate part of their income from wildlife crime. For a long time, this was deemed unfounded with regard to Al-Shabaab (Maguire & Haenlein, 2015), but the organisation was later confirmed to indeed commit this form as crime. The same applies to the Lord's Resistance Army, the Janjaweed, Ahlu Sunnah Wal Jamaah, and RENAMO (resistance fighters in Mozambique), who finance their armed struggle in part by inter alia selling elephant ivory and rhinoceros horns (Roberts, 2021). This probably has no direct impact on wildlife crime in the Netherlands, but it does affect the stability of the regions concerned, while indirect interests may be at stake.

11.5.5 Motives

In the source countries, given general poverty, the financial gains form the primary motive for illegally acquiring animals and plants or making products out of them, either for personal use or for trade purposes.

Cultural aspects, resistance to (historical) domination and/or authority, the urge to stand out and/or collect, the display of power, money and/or possession, and feeling entitled also play a major role.

Supervision in source countries is often virtually non-existent and, unfortunately, some regulators are also willing to look the other way for financial gain or a similar compensation (Delpech, Borrion, & Johnson, 2021).

11.5.6 Revenue model

The revenue model of the criminal syndicates is based on obtaining the merchandise cheaply and selling large numbers/quantities at high(er) prices. The scarcer the animals, plants, or products, the higher the price.
Specific types or quantities are therefore supplied at the request of brokers and ultimate customers.

Trading in protected species and derivatives can be very lucrative, while it is also easy to launder the proceeds. In African source countries, payment is mainly conducted in large sums of cash. In those countries, government supervision of the legal sourcing of these earnings is often limited. In the destination countries, the animals/plants/products are sometimes paid for with crypto-currency or exchanged for drugs or weapons.

11.5.7 Modus operandi

The legal and illegal trade are interwoven. In addition to completely illegal trade taking place, legal traders, collectors, or zoos are known to have been tempted to buy or sell protected species. Protected species are also known to have been transported among other (similar) species, the trade in which is allowed. Smuggling protected species in personal luggage has also been observed (e.g., birds hidden in cardboard tubes or nylon stockings).

'Corrupt' transport routes are sometimes used for the logistics chain. These are the same routes also used for illegal transports of drugs, human smuggling, etc. Efficient use is therefore made of these routes.

Due to the major profits that can be obtained, this form of crime also has other effects, including corruption, extortion, threats, and the occasional murder and manslaughter of individuals or organisations seeking to address these abuses.

11.6 Consequences

The consequences of wildlife crime on nature, often extending far beyond the Dutch borders, are significant and are described later in this chapter. This form of crime also has implications within the Netherlands. Global northern countries often levy harsh criticism on the level of conservation in southern countries. This is unjustified and it is in fact the northern countries where nature conservation at times lags behind (Sollund & Runhovde, 2020).

11.6.1 Deterioration of the rule of law

Wildlife crime is associated with the same negative side effects other organised forms of crime generate (EUCPN, 2019; Roberts, 2021), ranging from corruption, extortion, fraud, and money laundering to threats, assault, and murder. This type of crime was often overlooked in the past and was not considered a very serious form of crime. As a result, enforcement around the globe has been lacking for a long time. Globally, the chances of being caught are low. And when an offender does get convicted, the penalties are often not proportionate to the seriousness of the crime and the illegal income obtained (May, 2017). In the Netherlands, an offender can be sentenced to a maximum prison term of six years and a fine of EUR 870,000.
The interwovenness with other forms of crime and the fact that some terrorist organisations are partly funded by wildlife crime means that more attention should be paid to this form of crime.

11.6.2 Economic damage

Acquiring wildlife products illegally creates unfair competition with those companies that do follow all the rules. Applying for licences and performing due diligence takes time and money and traders have to make these investments. The breeding of animals or cultivation of plants in captivity also requires a company to invest. Again, when an offender smuggles the same species into the country, they are creating unfair competition. No import duties and VAT are paid over illegal trade, either, causing additional economic damage. Damage is also caused when legal sectors dealing in animal or plant products are affected by diseases that spill over from the illegal wildlife trade (Akella & Allan, 2012). This is explained in more detail later in this section. Finally, the economic and social damage caused by COVID-19 hardly needs further explanation. For example, the illegal trade in timber globally causes timber prices to be lower than they should be, which means developing countries are missing out billions of dollars in revenue. Illegal fishing deprives countries of various revenues related to boat registration, fishing fees, and taxes (Hooks, 2011).

11.6.3 Expectations of the government

Globally, 80-90% of people believe that nature has the right to exist (Strien, 2020). This means nature conservation matters to many people, including in the Netherlands. The subject is getting a lot of public attention. People therefore expect the government to take decisive action against violations.

11.6.4 Irreparable damage to nature

Species extinction is something that must be prevented at all times. Local extinction is undesirable, as well. In a healthy ecosystem, each species fulfils its own role, linked to those of many other species. The decline in biomass alone creates a waterfall effect on species that depend on other species (Gaston, 2011; Ceballos, Ehrlich, & Dirzo, 2017). The decline in numbers of a single species affects that species' natural predators, as well as its

prey animals, its symbionts and parasites. As a result, an ecosystem changes. With the disappearance of natural predators, animals or plants may become pest to others, while predators, may start hunting domestic animals or livestock when their natural prey disappears. For example: some insects are completely dependent on one type of plant. If this plant disappears, this insect will also go extinct (Dunn, Harris, Colwell, & Koh, 2009). The disappearance of species therefore also results in the disappearance of unique interactions with other species (Tylianakis, Laliberté, Nielsen, & Bascompte, 2010). The network of these relationships is sometimes compared to a house of cards - a house that may collapse (MacDougall, McCann, Gellner, & Turkington, 2013). The local extinction of a species is, then, already problematic, even if that species is not necessarily threatened with global extinction. The disappearance of species also makes the ecosystem more vulnerable to negative impacts from the introduction of invasive exotic species.
Nature has a high degree of resilience and can recover well over time, provided it is given the opportunity to do so (Almond, Grooten, & Petersen, 2020). A characteristic of wildlife crime is that it leads to irreparable damage to nature. This creates an irreversible situation. A species once extinct never comes back. Examples include the aurochs, the tarpan (horse), and the dromedary, which today only exist as domesticated animals because they have been eradicated from the wild. Animals like the Sumatran rhinoceros (<80 individuals)[316], vaquita (18 adults)[317], Yangtze giant softshell turtle (3 individuals)[318], and saola (not observed since 2013; possibly, no viable population exists anymore)[319] survive in such low numbers that they may soon become extinct.

Finally, trade is characterised by a number of features, which, in the case of wildlife crime, are destructive. The rarer a sought-after item, the higher its value. As a result, poaching and illegal trade become more lucrative the rarer the species and the greater the demand. Market scarcity drives up prices (Courchamp, et al., 2006). As a result, more effort is put into poaching, picking, or logging the last surviving specimens of a species. When one species becomes rare, the demand for replacement, similar specimens arises, which then become targets of poaching themselves. Tigers have in the wild been decimated to fewer than 4,000 individuals across Asia, for example. For this reason, leopards, lions, and jaguars are now being poached to serve as replacements in Chinese medicines (Lemieux & Bruschi, 2019; Environmental Investigation Agency, 2020).

When human activity reduces populations of animals and plants, the risk of extinction increases. After all, small populations can easily be wiped out by a single disease or natural disaster. This form of crime is characterised by its ability to make species extinct, permanently altering the course of evolutionary history and wiping out millions of years of evolution.

11.6.5 Ecosystem services

Fighting wildlife crime is not only important to preserve biodiversity. Wildlife crime also directly affects people. A natural landscape provides ecosystem services whose value is not always easy to express in monetary terms (Schoonover, Cavallo, & Caltabiano, 2021). Mangrove forests, for example, protect coasts from wave action, making the area behind them habitable. Forests on mountain slopes retain moisture and thus prevent mudslides and guarantee a constant flow of water through rivers. This benefits people, possibly without them realising it themselves. Carbon sequestration is also seen as an ecosystem service provided by living plant materials (WHO, 2005).

Besides the loss of biodiversity and ecosystem services, there are a number of negative consequences linked to the loss of animals and plants. In many parts of the world, people still rely on meat and plant products from the wilds. Wildlife crime is creating unfair competition between commercial poachers, who raid an entire area in a short period of time, and hunters and gatherers trying to support themselves (Nasi, Taber, & van Vliet, 2011).

316 Consulted on 30 April 2021, via www.dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T6553A18493355.en
317 Consulted on 30 April 2021, via www.dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T17028A50370296.en
318 Consulted on 30 April 2021, via www.dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T39621A2931537.en
319 Consulted on 30 April 2021, via www.dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T18597A166485696.en

Poor people suffer most from wildlife crime. These people are denied the opportunity to earn money in a sustainable way. In the case of ecotourism, for example, the presence of wildlife constantly generates money for multiple stakeholders in the tourism industry (Fitzgerald & Stronza, 2016). However, a dead animal only generates a lot of money for the few poachers, while the really impressive sums are only received at the end of the chain, far from where the animal once lived. Illegal logging sometimes destroys habitats of indigenous peoples (Reboredo, 2013).

11.6.6 Zoonoses and animal diseases

The conditions under which animals are smuggled or sold provide ideal conditions for diseases to spread: animals are packed closely together, easily come into contact with each other's blood and faeces, and have their immunity reduced due to stress and malnutrition. This risk has been recognised in the past, including after the first outbreak of SARS coronavirus (Schoonover, Cavallo, & Caltabiano, 2021), and has now become topical again with the outbreak of COVID-19 and its possible animal origin. The entire COVID-19 pandemic currently raging, which has caused over three million deaths worldwide and billions in damage to economies, may be the result of wildlife crime. For the source appears to be a species of horseshoe-nosed bat or pangolin. One plausible scenario is that an animal poached from the wild, possibly via other intermediate hosts, caused the spread of the virus at Wuhan's now famous Huanan market.[320] Other examples of zoonoses that still take human lives are HIV, Q fever, and Ebola (Bezerra-Santos, Mendoza-Roldan, Andrew Thompson, Dantas-Torres, & Otrando, 2021). Not only can these kinds of diseases infect us humans. But also, and more commonly, they can be transmitted from one animal to another and eventually cause outbreaks of animal diseases among production animals. Examples are avian flu and African swine fever, which is advancing increasingly westward. These types of outbreaks have a severe impact on the livelihoods of livestock farmers and the economy, in addition to resulting in an enormous loss of animal life (Bezerra-Santos, Mendoza-Roldan, Andrew Thompson, Dantas-Torres, & Otrando, 2021; Nasi, Taber, & van Vliet, 2011). Incidentally, there are few signs that the COVID-19 outbreak is having a restrictive impact on wildlife trade and it appears that, in the absence of trade opportunities, stocks are simply being piled up (Wildlife Justice Commission, 2020).

11.6.7 Hidden suffering

More animals die than eventually reach the end user during the capture of and trade in live animals, due to stress, disease, suffocation, hypothermia and overheating, and carelessness. For example, during a recent criminal investigation into the trapping of native songbirds, it was found that almost half of the poached birds had died in the trapping net. After capture, a large proportion of them die during transport and captivity due to inadequate care, poor nutrition, and stress. This example also shows that wildlife crime involving live animals also involves serious animal welfare violations.

11.7 Expectations for the coming years

The world population is expected to grow from 7.8 billion in 2021 to 9 billion in 2040[321]. The area reserved for nature is shrinking and the agricultural area needed for food production is increasing. The world faces the challenge of stopping climate change caused mainly by enormous CO_2 emission levels. In the short term, decline will be particularly noticeable, as animal and plant species cannot keep up with the pace of climate change and will decrease in number.

11.7.1 Crime-relevant factors

The above developments mean that natural populations of animals and plants and products made from them are becoming increasingly scarce. According to existing economic principles, this scarcity will drive up prices, meaning these products remain a source of income. This applies not only to locals but also to the existing revenue model of criminals. No major changes are expected in this pattern over the next five to 10 years. The factors noted as breeding opportunity for this type of crime remain present. However, the modus operandi of criminals is expected to increasingly shift to online trading. This includes online marketplaces on the

320 Consulted on 12 April 2021, via www.who.int/health-topics/coronavirus/origins-of-the-virus
321 Consulted on 12 April 2021, via www.worldometers.info/nl

(dark) web or social media, instant messages serving as the mode of contact. In addition, wildlife crime is receiving increasing international attention. Because of the increase in this focus, this form of crime is expected to become more complex and most likely more violent.

11.7.2 Developments in combating wildlife crime

Cooperation with NGOs

In recent decades, many non-governmental organisations (NGOs) were set up to protect wildlife[322]. They mainly do so by influencing the general public. They are also increasingly more often actively promoting themselves as cooperation partners to inspection and investigation services. This is visible in the (intelligence) investigations conducted by them into (illegal) wildlife activities and also by the provision of training (digital tracking) and collaboration in prevention campaigns (Europol, 2021).

Public-private partnerships

A new trend is the collaboration between public and private companies. One example of this trend is the cooperation between the globally organised Financial Intelligence Units, which are mainly concerned with gaining insight into unusual and suspicious financial transactions. This should increase visibility of the rogue financial institutions and/or individuals used in numerous money-laundering schemes.

Technology and science

As indicated, source countries tend to be less capital-rich than destination countries. Especially in rich countries, investments are being made in new technology, such as the development of sensing devices that allow the detection of sounds of chainsaws (distinguishing them from, e.g., an off-road engine). This signal can be quickly relayed to local government agencies using satellite technology.

International cooperation

Good international cooperation is imperative for the detection of wildlife crime. This already became evident in the "Legislation" and "Agencies involved" sections. The European approach to wildlife crime is part of the EMPACT programme. Acting under the direction of Europol, the Netherlands has formally committed to this programme and participates in various operational actions in the fight against wildlife crime. This network of European services is now building up contacts with similar services in Asia and South America, the expectation being that this will increase and disrupt wildlife crime in source countries. This is consistent with the observation that Western destination countries do in fact have a responsibility to assist source countries in combating wildlife crime (Akella & Allan, 2012).

Recognising ecocide as an international crime

Knowingly destroying the ecosystem is considered ecocide by some people. Initiatives are currently underway to have ecocide recognised as an international crime at the International Criminal Court in The Hague. The Partij voor de Dieren political party submitted an initiative policy document to this effect. Should this recognition take place, it will be easier to hold offenders accountable internationally.

11.8 Conclusions and recommendations

This chapter on wildlife crime covered many topics. This section contains the main findings.

11.8.1 Impact and role

Globally, all different types of wildlife products are in high demand. The trade in and use of these products heavily impacts the population of animals and plants, extinction being the worst consequence. The interconnectedness between legal and illegal trade renders enforcement a complex affair. The Netherlands is considered a major transit country within the EU because of the port of Rotterdam and Schiphol Airport.

11.8.1 Complexity

Wildlife crime is characterised by a complex and highly diverse chain. Insight into the entire illegal chain is insufficient and complex due to the size and diversity within the chain. Research shows that disrupting the chain does not have the desired effect.

322 Examples include Stichting Aap, Four Paws, WWF, etc.

Links within the chain are quickly re-formed and repaired. Besides the chain, the subject matter itself is complex, as well, and requires knowledge and expertise within the investigation and enforcement organisations. In-depth research into both the chain and the various phenomena described in the above are crucial to stop the entire illegal chain. Momentum is also very important, as trading in some species and products is very trend-sensitive.

The largest illegal chains, into which the greatest level of insight exists at this point in time, are those of timber, birds, and reptiles. These should be the focal points of enforcement and investigation. It is also important to proactively identify trends and new forms of wildlife crime.

11.8.2 Insufficient knowledge

The information position of investigative and enforcement organisations can be expanded through in-depth investigations, long-term focus on a few themes, and the deployment of experts. Improving visibility also leads to better insight. It is crucial in this connection to constantly seek cooperation with chain partners worldwide. In addition, it is also important that residual information from (investigative) investigations leads to new investigations by enforcement and investigative bodies.

11.8.3 Online trading

More attention is being paid to the (irreversible) consequences of wildlife crime on the international stage. The main counteraction is made up of the initiatives to have ecocide, the deliberate destruction of the ecosystem, recognised as an international crime by the International Criminal Court. In addition, more cooperation is being sought between different countries in countering wildlife crime.

11.8.4 Countering wildlife crime

More attention is being paid to the (irreversible) consequences of wildlife crime on the international stage. The main counteraction is made up of the initiatives to have ecocide, the deliberate destruction of the ecosystem, recognised as an international crime by the International Criminal Court. In addition, more cooperation is being sought between different countries in countering wildlife crime.

11.8.5 Increasing priority

Failing to vigorously tackle wildlife crime in our own country undermines our international reputation as being progressive in conserving nature. Globally, wildlife crime does not get the recognition as a serious form of crime it deserves and is often seen as merely a conservation problem. Because it has received little enforcement priority up to the present day, criminals actually consider wildlife crime to be a form of crime with low chances of being caught and low penalties, while high profits can be made (May, 2017). This is one of the reasons for the increase in this form of crime worldwide. Being aware of this fact is a first step to improved intervention. If we fail to do so, this form of crime will not be checked.

Literature

Akella, A. S., & Allan, C. (2012). Dismantling Wildlife Crime: Executive Summary. Washington: WWF. Retrieved from Websita : https://www.traffic.org/site/assets/files/7385/dismantling-wildlife-crime_2.pdf

Almond, R. E., Grooten, M., & Petersen, T. (2020). Living Planet Report 2020: Bending the curve of biodiversity loss. Gland: WWF.

Altherr, S., & Lameter, K. (2020). Stolen Wildlife III – The EU is a main hub and destination for illegally caught exotic pets. Munich: Pro Wildlife.

Barnosky, A. D., Matzke, N., Tomiya, S., Guinevere, O., Wogan, U., Swartz, B., Ferrer, E. A. (2011). Has Earth's sixth mass extinction already arrived? Natur, 51-57.

Bezerra-Santos, M. A., Mendoza-Roldan, J. A., Andrew Thompson, R. C., Dantas-Torres, F., & Otrando, D. (2021). Illegal Wildlife Trade: A Gateway to Zoonotic Infectious Diseases. Trends in Parasitology, 181-184.

Brondizio, E., Settele, J., Diaz, S., & Ngo, H. (2019). Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn: IPBES.

Ceballos, G., Ehrlich, P. R., & Dirzo, R. (2017). Biological annihilation via the ongoing sixth mass extinction signaled by vertebrate population losses and declines. National Academy of Sciences of the United States of America.

Central Government. (2021, 04 06). Info on the Nature Protection Act. Retrieved from the Central Government: https://www.rijksoverheid.nl/onderwerpen/natuur-en-biodiversiteit/wetgeving-voor-natuurbescherming-in-nederland

CITES. (2020, 12 12). Info on CITES. Retrieved from https://cites.org/eng/disc/what.php

Courchamp, F., Angulo, E., Rivalan, P., Hall, R. J., Signoret, L., Bull, L., & Meinard, Y. (2006). Rarity Value and Species Extinction: The Anthropogenic Allee Effect.

Delpech, D., Borrion, H., & Johnson, S. (2021). Systematic review of situational prevention methods for crime against species. Crime Science.

Diaz, S., Settele, J., Brondizio, E., Ngo, H. T., Gueze, M., & Agard, J. e. (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. Bonn: IPBES.

Dunn, R. R., Harris, N. C., Colwell, R. K., & Koh, L. P. (2009). The sixth mass coextinction: are most endangered species parasites and mutualists?

Environmental Investigation Agency. (2020). A Bitter Pill to Swallow: China's flagrant trade in leopard bone products. London: Environmental Investigation Agency.

ESAAMLG. (2016). A special typologies project report on poaching and illegal trade in wildlife and wildlife products and associated money laundering in the esaamlg region. ESAAM.

EU. (2021, 04 08). Information on the EU Regulation. Retrieved from https://eur-lex.europa.eu/legal-content/NL/TXT/?uri=CELEX%3A32014R1143

EUCPN. (2019). European Crime Prevention Monitor 2019. European Crime Prevention Network.

European Commission. (2021, 04 06). Info on EU Action Plan against Wildlife Trafficking. Retrieved from the European Commission's website: https://ec.europa.eu/environment/cites/trafficking_en.htm

European Commission. (2021, 04 06). Info on WEG. Retrieved from the European Commission's website: https://ec.europa.eu/environment/cites/eg_en.htm

European Union. (2016). EU Trade Policy and the Wildlife Trade. Brussels: Directorate-General For External Policies Policy Department.

Europol. (2021, 04 06). Information on EMPACT. Retrieved from Europol: https://www.europol.europa.eu/empact

Fitzgerald, L. A., & Stronza, A. (2016). In Defence of the Ecotourism Shield: A Response to Geffroy et al. Trends in Ecology & Evolution, 94-95.

Force, F. A. (2020). Money Laundering and the Illegal Wildlife Trade. Paris: FATF.

Gaston, K. J. (2011). Common ecology. BioScience, 354-362.

Haken, J. (2011). Transnational Crime in The Developing World. Washington : Global Financial Integrity.

Hoare, A. (2015). Tackling Illegal Logging and the Related Trade: What Progress and Where Next? London: Chatham House.

Hoare, A. (2021, 04 08). Chatham House Forest Policy Assessment - The Netherlands. Retrieved from www.forestgovernance.chathamhouse.org

Interpol. (2021, 04 06). Information on Wildlife crime Retrieved from Interpol's website: https://www.interpol.int/Crimes/Environmental-crime/Wildlife-crime

INTERPOL. (2021, 04 06). Wildlife crime: closing ranks on serious crime in the illegal animal trade. Retrieved from Interpol: https://www.interpol.int/en/News-and-Events/News/2020/Wildlife-crime-closing-ranks-on-serious-crime-in-the-illegal-animal-trade

Lawson, S. (2014). Consumer Goods and Deforestation: An Analysis of the Extent and Nature of Illegality in Forest Conversion for Agriculture and Timber Plantations. Washington: Forest Trends.

Lemieux, A. M., & Bruschi, N. (2019). The production of jaguar paste in Suriname: a product-based crime script. Crime Science.

MacDougall, A. S., McCann, K. S., Gellner, G., & Turkington, R. (2013). Diversity loss with persistent human disturbance increases vulnerability to ecosystem collapse. Nature Vol., 86-89.

Maguire, T., & Haenlein, C. (2015). An Illusion of Complicity - Terrorism and the Illegal Ivory Trade in East Africa. London: Royal United Services Institute for Defence and Security Studies.

May, C. (2017). Transnational Crime and the Developing World. Washington: Global Financial Integrity.

Nasi, R., Taber, A., & Van Vliet, N. (2011). Empty forests, empty stomachs? Bushmeat and livelihoods in the Congo and Amazon Basins. International Forestry Review, 355-368.

NVWA. (2021, 04 08). Information on timber imports. Retrieved from https://www.nvwa.nl/onderwerpen/import-van-hout-en-houtproducten-flegt/europese-houtverordening

Obasi, M. T., & Vivian, E. L. (2016). Wildlife Crime And Rural Livelihoods In Developing Countries. International Journal of Innovation and Applied Studies.

Port of Rotterdam. (2021, 04 06). Info on the Port of Rotterdam. Retrieved from https://www.portofrotterdam.com/nl

Reboredo, F. H. (2013). Socio-economic, environmental, and governance impacts of illegal logging. Environment Systems and Decisions.

Roberts, I. (2021). An Unholy Alliance - Links between extremism and Illicit Trade in East Africa. Counter Extremism Project. Counter Extremism Project.

RVO. (2021, 04 06). Info on trade in protected animals and plants. Retrieved from the Netherlands Enterprise Agency: https://www.rvo.nl/onderwerpen/agrarisch-ondernemen/beschermde-planten-dieren-en-natuur/handel-beschermde-planten-en-dieren

Scheffers, B. R., Oliveira, B. F., Lamb, I., & Edwards, D. P. (2019). Global wildlife trade across the tree of life. Science, 71-76.

Schiphol Group. (2021, 04 06). Information on facts and figures. Retrieved from https://assets.ctfassets.net/biomoeqyyi6b/5kuIHXrcglQhaLyEZ-P18cX/39386ca947a6f68e4f327d6a5001e14e/Feiten_en_Cijfers_2018.pdf

Schoonover, R., Cavallo, C., & Caltabiano, I. (2021). The Security Threat That Binds Us: The Unraveling of Ecological and Natural Security and What the United States Can Do About It. Washington: The Converging Risks Lab.

Sollund, R., & Runhovde, S. R. (2020). Responses to Wildlife Crime in Post-Colonial Times. Who Fares Best? British Journal of Criminology.

Strien, v. W. (2020, 28 March). Natuurbescherming: Waar doen we het voor? Bionieuws, pp. 8-9.

Thomas-Walters, L., Hinsley, A., Bergin, D., Burgess, G., Doughty, H., Eppel, S., Veríssimo, D. (2020). Motivations for the use and consumption of wildlifeproducts. Conservation Biology, 483 - 491.

TRAFFIC. (2019). Briefing on illegal trade and prosecutions in the European Union.

TRAFFIC. (2020). An Overview of Seizures of CITES-listed Wildlife in the European Union - January to December 2019. Cambridge: TRAFFIC.

Tylianakis, M., Laliberté, E., Nielsen, A., & Bascompte, J. (2010). Coservation of species interaction networks. Biological Conservation, 2270-2279.

United Nations. (2020). Conference of the Parties to the United Nations Convention against Transnational Organised Crime. Vienna: United Nations.

UNODC. (2020). World Wildlife Crime Report. UNODC.

Wellesley, L. (2014). Trade in illegal timber: the response in China. London: Royal Institute of International Affairs.

WHO. (2005). Ecosystems And Human Well-Being - Health Synthesis. Geneva: WHO Press.

Wildlife Justice Commission. (2020). Rapid assessment of the impact of COVID-19 on Wildlife trafficking. The Hague: Wildlife Justice Commission.

World Bank. (2019). Illegal Logging, Fishing, and Wildlife Trade : The Costs and How to Combat it. Washington: World Bank.

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