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ENVIRONMENTAL CRIMINAL LAW RESEARCH

di Michael FAURE

Abstract. This contribution discusses the history of environmental criminal law both in legislation as well as in research; it points at the way in which environmental criminal law originally mostly protected administrative interests rather than ecological interests. The article also shows that in legal doctrine a model has been presented claiming that a combination of various provisions would be indicated for an optimal protection of the environment through criminal law. The article then points at the importance of both comparative legal research, law and economics and empirical legal research to acquire a better understanding of environmental criminal law.

Key words: Ecological values, abstract endangerment, concrete endangerment, autonomous environmental crimes, environmental criminal law, Environmental Crime Directive

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1. Introduction

The goal of this article is to sketch the state of environmental law research. Environmental law research has now obtained an increasing interest in various disciplines. There is on the one hand elaborate research describing and analyzing the phenomenon of environmental crime as such, often from a criminological perspective and more particularly from what has now been called green criminology. The field is well represented by the reader in this domain put together by Rob White,[1] but also other volumes have been dedicated to analysing the phenomenon of environmental crime, whereby also an integrative perspective is achieved, combining law, criminology and policy.[2] Many studies have also focused on the question how compliance with environmental law can be guaranteed.[3] In addition there is also a scholarship dedicated to environmental criminal law, i.e. to the role of law in protecting the environment. Some of these volumes are general or international,[4]

1 WHITE, *Environmental crime: a reader*, Willan Publishing, 2009.
2 See for examples of that approach *inter alia* CLIFFORD, EDWARDS, *Environmental crime*, Jones & Bartlett Learning, 2012 and BRICKEY, *Environmental crime, law, policy, prosecution*, Wolters Kluwer, 2008.
3 See generally on explaining compliance inter alia the edited book by PARKER, LEHMANN NIELSEN (eds.), *Explaining compliance. Business responses to regulation*, Edward Elgar, 2011 and with a specific focus on environmental law PADDOCK, WENTZ (eds.), *Next generation environmental compliance and enforcement*, Environmental Law Institute, 2014 and see more recent PADDOCK, MARKELL, BRYNER (eds.), *Compliance and enforcement of environmental law, Elgar Encyclopedia of environmental law*, vol. IV, Edward Elgar, 2017.
4 See for example DE LA CUESTA, QUACKELBEEN, PERŠAK, VERMEULEN (eds.), *Protection of the environment through criminal law*, Maklu, 2016 and see especially the monograph by PEREIRA, *Environmental criminal liability and enforcement in European and international law*, Brill Nijhoff, 2015.

This brief overview (which could easily be extended with other scholarship) shows that there is meanwhile an impressive scholarship that has been developed concerning the role of criminal law in environmental protection.[6] There is indeed an increasing awareness, not only of the fact that there is a large amount of environmental crime and that it leads to substantial harm to society, but also that the criminal law plays an important role in implementing environmental legislation. Yet, at the same time, the scholarship also realises that the way in which the criminal provisions are drafted matters and that merely drafting legislation clearly does not solve the problem, as the concrete implementation will also depend upon practical elements such as substantial capacity for monitoring and inspection, but also specialisation at the level of the public prosecutor office and the judiciary.

Just this brief introduction into the environmental crime and criminal law scholarship shows that there is now a wide interest in this area. The goal of this article is on the one hand to sketch the different types of methods that have been used to address the effectiveness of environmental criminal law; on the other hand the article also wants to present some of the results, i.e. the main findings of this research. Positively the article will illustrate how different types of methods have been used to address environmental criminal law. Normatively the article will also indicate that there is not one single method necessary or ideal to analyse environmental criminal law, but that rather an optimal combination (a so-called smart mix) between different methods would be indicated to provide an integrated approach at this complex phenomenon of environmental crime.[7]

Given the breadth of the topic, this article will limit itself to research with respect to environmental criminal law. I will therefore not further discuss the interesting research with respect to green criminology. There is, as indicated, now a wide research in that domain as well,[8] with in some cases also a special focus on trade in wildlife[9] or on trade in waste.[10] The reader interested in these criminological approaches to environmental crime can consult one of the many publications in

5 See *inter alia*, FAURE, HEINE, *Criminal enforcement of environmental law in the European Union*, Kluwer Law International, 2005 and COMTE, KRÄMER (eds.), *Environmental crime in Europe. Rules of sanctions*, Europa Law Publishing, 2004.

6 In this respect, also a volume of the IUCN Academy of Environmental Law devoted to this topic should be mentioned: PADDOCK, QUN, KOTZE, MARKELL, MARKOWITZ, ZAELKE (eds.), *Compliance and enforcement in environmental law. Towards more effective implementation*, Edward Elgar, 2011.

7 See on these so-called smart mixes (not so much of research methods, but rather of instruments to remedy transboundary environmental harm) also VAN ERP, FAURE, NOLLKAEMPER, PHILIPSEN (eds.), *Smart mixes for transboundary environmental harm*, Cambridge University Press, 2019.

8 PINK, WHITE (eds.), *Environmental crime and collaborative state intervention*, Pallgrave MacMillan, 2016.

that respect, referred to in the footnotes.

2. History of environmental criminal law: legislation and research

2.1 The origins.

Originally there was, certainly in research, but in fact also in legislation, not much attention for the environment. In that respect I am referring to the first regulations that emerged in some cases already in the 19th century. When legislators discovered (also through pressures by the trade unions) some of the devastating effects of industrialisation regulation emerged to protect the workers. Several countries started developing legislation aiming at the protection of workers, instituting for example a permit system for installations or operations that could be considered as harmful (to the workers). This was typically the case in a country like Belgium where already in 1888 a regulation submitted particular industrial installations to a permitting system.[11] But also other countries saw a similar start of environmental law.[12] Indeed, even though many of those 19th century regulations were not concerned with the so-called external environment at all, the regulations (aiming at the protection of the internal environment, i.e. the workers) could *de facto* also protect the external environment (the nature outside of the factory), even though that may not have been the primary concern of the legislator. In that sense one could argue that originally the environment was protected more as a side product of the regulation of safety at work rather than aiming at the protection of the environment as such.

Interestingly, some of the early cases dealing with environmental harm were constructed as

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9 VAN UHM, *Uncovering the illegal wildlife trade. Inside the world of poachers, smugglers and traders*, Utrecht, diss. 1983.

10*GIARDI, Illegal waste activity in the process of bunker fuel production: A criminological case study of corporate environmental crime and its enforcement, diss. Maastricht 2023 and VAN WINGERDE, De afschrikking voorbij, Wolff Legal Publishers 2012 and BISSCHOP, Governance of transnational environmental crime: case study research on the illegal trade in e-waste and tropical timber, diss. University of Ghent, 2012; VAN SNELLENBERG, VAN DE PEPPEL, Perpectives on compliance: non-compliance with environmental licences in the Netherlands, in European Environment, vol. 12, 2002, pp. 131-148.*

11 For a historical description see FAURE, *Umweltrecht in Belgien. Strafrecht im Spannungsfeld von Zivil- und Verwaltungsrecht*, Max Planck Institute for Foreign and International Criminal Law, 1992, pp. 66-68.

12 See for example as far as the UK is concerned, ABBOT, *Enforcing pollution control regulation, strengthening sanctions and improving deterrence*, Hart Publishing, 2009, pp. 78-118.

conflicting uses of property rights. It often concerned neighbours around a factory who would claim that their property right had been violated by a neighbouring factory causing harm to them. For example, in Belgium the early environmental case law used this property right protection as a legal basis to provide a remedy to victims of environmental pollution.[13] These solutions were obviously of a more private law character.

2.2 Sectoral environmental legislation.

Truly environmental criminal law only developed in the 1960-70s when sectoral legislation aiming at the protection of particular parts of the environment (air, water or soil) started to develop. In many European countries, administrative laws came into being that basically managed environmental pollution through administrative law. Statutes often contained a general prohibition to e.g. emit waste water into the surface waters. Subsequently, the emission of waste water was subjected to a permitting system. The administrative statute (for example aiming at the protection of the surface waters) would consequently indicate which authorities would be competent for granting the permit and which conditions could be imposed in the permit. The criminal law subsequently only intervened at the end of such an administrative statute to make e.g. the emission without a permit or in violation of permit conditions subject to the criminal law. This phenomenon was characterised as the administrative dependence of environmental criminal law. Environmental crime was thus not defined in an independent manner by, for example, taking account of the nature of the danger to the environment caused by a particular form of behaviour. It was the pollution without a permit or in violation of permit conditions (or other obligations) that was criminalised. The administrative law therefore largely provided the contents of the norms that had to be obeyed.[14] Environmental crime provisions could therefore usually be found only in those sectoral environmental laws. The contents of the prohibitive behaviour was determined by administrative authorities (via the conditions in the permit).

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13 This has been described in detail in the doctoral dissertation by BOCKEN, *Het aansprakelijkheidsrecht als sanctie tegen de verstoring van het leefmilieu. Een onderzoek naar de doelmatigheid, in funktie van de bescherming en het beheer van het leefmilieu, van de aansprakelijkheidsvordering en van een aantal aanverwante rechtstechnieken*, Bruylant, 1979, pp. 265-304.

14 That structure could traditionally be observed in many legal systems. For a good comparative overview, see *inter alia* PRABHU, *General report. English version*, in *International Review of Penal Law*, 1994, p. 699.

An example constitutes the Belgian Surface Water Protection Act of 1971. Articles 2 and 5 of the Act prohibit depositing polluting substances or liquids in surface waters without a licence or permit. Article 41 of the Act punishes actions in violation of a permit condition. Article 41 moreover also punishes any conduct violating any provision of the Act.[15]

The original formulation of environmental criminal law hence had the following features:

1. there was a strong reliance on the criminal law only (hence no prescription of administrative fines);
2. criminal provisions were dependent upon administrative law; there was no direct punishment of conduct that would endanger the environment and
3. most of the criminal law provisions could be found in statutes of an administrative nature where the criminal law seemed to have a subordinate role in backing up obligations of an administrative nature. For that reason, one can say that the interests that were protected by those administrative criminal law provisions were rather administrative interests than the environment as such.

2.3 Important changes.

After this initial phase where environmental criminal law was only to be found in statutes of an administrative nature, and only administrative interests were protected, important changes took place in many (European) jurisdictions. Although there were obviously differences concerning the moment when those changes occurred, but roughly one can argue that in the 80s and 90s of the past century the role of environmental criminal law started to change and that environmental criminal law slowly gained a more important role. This can be seen in three important changes.

A *first* important legislative change was that an integration took place of various sectoral legislations into environmental codes. This integration either resulted in special environmental protection acts (for example in Denmark, Finland, Latvia, Lithuania, Malta and Poland) or in the introduction of an outright environmental code (for example in France, Luxemburg and Sweden). In

15 See further on this type of criminalization with also other examples MANDIBERG, FAURE, *A graduated punishment approach to environmental crimes: beyond vindication of administrative authority in the United States and Europe*, in *Columbia Journal of Environmental Law*, vol. 34, no. 2, 2009, p. 453 and pp. 464-465.

many EU Member States one could see a movement to bring together all available environmental statutes in one document. In the 1990s there was a total of 22 European Member States that either had a special environmental protection act or an environmental code.[16] To an important extent, specific environmental crime provisions were incorporated in those environmental codes or special environmental laws. Examples could be found in the Scandinavian countries, for example in the Danish Environmental Protection Act of 1991, but also in Sweden. In that country the major provisions concerning environmental crime can be found in the Miljöbalk 1998, an environmental code that lays down most of the provisions concerning penalties.[17]

In some countries, environmental crime was directly incorporated into the penal code. This was for example the case in Germany. As a result of the entry into force of the 18th so-called *Strafrechtsänderungsgesetz* on 1 July 1980, provisions concerning environmental crime were incorporated into section 324 ff. of the German *Strafgesetzbuch*. Another example can be found in the Netherlands. In 1989 particular provisions (articles 173a and 173b) were amended in the penal code in order to punish unlawful emissions into the soil, air or surface water if the perpetrator had reason to suspect that this could lead to danger to public health or to the life of another human being. Also Poland and Spain have incorporated environmental crimes into their penal codes.[18]

A *second* important evolution was that a more independent protection (i.e. independent from administrative law) of the environment emerged. Increasingly criminal provisions circumscribed environmental harm in a more direct manner (and not only as a breach of permit conditions) and the relationship to administrative law changed by introducing the broader concept of "unlawfulness".[19] For example, in Spain the general crime in the Spanish Criminal Code is article 325 which was reformed in 2015 to transpose the EU Environmental Crime Directive. It now adds a basic crime that only requires conduct which causes or is likely to cause substantial damage to the quality of air,

16 For an overview, see FAURE, *To codify or not to codify EU environmental law. That is not the question*, in VANHEUSDEN, ILIOPOULOS, VANHELLEMONT (eds.), *Harmonisation of EU Environmental and Energy Law*, Intersentia, 2022, pp. 9-25.
17 For an overview, see FAURE, PHILIPSEN, *Environmental criminal law in Sweden*, in FARMER, FAURE, VAGLIASINDI (eds.), *Environmental crime in Europe*, Hart, 2017, pp. 221-242.
18 For other examples, see FAURE, *The evolution of environmental criminal law in Europe: a comparative analysis*, in FARMER, FAURE, VAGLIASINDI (eds.), *Environmental crime in Europe*, Hart, 2017, pp. 268-271.
19 Examples of this tendency can be found both in the US and in Europe (see MANDIBERG, FAURE, *A Graduated Punishment Approach to Environmental Crimes*, cit., pp. 447-511. For an elaborate overview, see DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, in *European Energy and Environmental Law Review*, 2022, pp. 272-297.

soil or water or to animals or plants.[20] In Poland a new article 182 of the Penal Code punishes in § 1 a person who pollutes water, air or soil with an ionising substance or radiation in such a quantity or form that it could endanger the life or health of, or cause considerable destruction to the plant and animal world.[21]

In other words, many examples can now be found in environmental criminal law where the criminal provisions do not merely punish administrative disobedience, but also criminalise endangerment of or harm to the environment as well. In some cases, truly autonomous environmental crimes are introduced. Those are criminal provisions that punish some cases of very serious pollution directly, i.e. irrespective of any compliance with administrative law. A classic example of that is § 330(a) of the German Criminal Code, which is related to the causing of a severe danger by releasing poison. Examples can also be found in Spain where for example article 328.1 relates to deposits or landfills that are toxic or hazardous and may seriously damage the balance of the natural system or the health of individuals.[22]

In general, one can notice a tendency in criminal law systems to provide for provisions that can apply in very serious cases, even when the conditions of an administrative permit would be met. It is referred to as the autonomous or purely criminal model where the link with administrative law has been eliminated.[23] This tendency to look for possibilities to punish environmental pollution irrespective of a breach of administrative law also fits into the dogmatic foundations of environmental criminal law which will be discussed in the next section.

There is a *third* tendency in this second wave of environmental criminal law, which relates to the fact that the "criminal law only" approach has been increasingly left, introducing also the possibility of administrative sanctioning via a so-called toolbox approach. Many examples of that can also be presented. Austria and Germany in fact already had models of administrative penal law whereby the legislator had ex ante decided that particular violations would no longer be handled by the criminal law, but exclusively through administrative penal law. Also in other Member States,

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20 See FUENTES OSORIO, *Environmental criminal law in Spain*, in FARMER, FAURE, VAGLIASINDI (eds.), *Environmental crime in Europe*, Hart, 2017, pp. 196-197.
21 See further JACKOWICZ, FITZMAURICE, MITSILEGAS, *Environmental criminal law in Poland*, in FARMER, FAURE, VAGLIASINDI (eds.), *Environmental crime in Europe*, Hart, 2017, pp. 184-186.
22 For more examples, see FUENTES OSORIO, *Environmental criminal law in Spain*, cit., pp. 194-198.
23 Further examples are provided by DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, in *European Energy and Environmental Law Review*, 2022, pp. 290-297.

such as Portugal, the enforcement of environmental administrative statutes took place through administrative punishment of those regulatory offences.[24]

It was especially in the United Kingdom where, following the recommendations of Macrory in 2008-2009 administrative fines were introduced. In England and Wales the introduction of the Regulatory Enforcement and Sanctions Act 2008 gave some regulatory bodies, including the Environment Agency, the power to impose a greater repertoire of civil (administrative) sanctions. They were introduced by various administrative orders and regulations such as the Environment Civil Sanctions Order 2010. Hence as a consequence in England and Wales the Environment Agency can impose either a fixed monetary penalty or a variable monetary penalty. The idea of applying those fines is to fill the gap in enforcement where prosecution does not seem to be in the public interest.[25]

Similar changes equally took place in the Flemish and Walloon Region as a result of the introduction of the Environmental Enforcement Decree 2008 in the Flemish Region and a similar Decree of 2008 in the Walloon Region. In the Flemish Region some environmental crimes have been declassified as administrative offences which are no longer subject to the criminal law. In that case the (exclusive) administrative sanction is the only sanction available. For crimes, which are still forwarded to the public prosecutor, there is a possibility for the Regional Agency to impose an (alternative) administrative fine, but only in cases where the prosecutor decides not to prosecute.[26]

Again there are still important differences between the Member States. For example in the Netherlands a variety of different administrative remedies do exist, but administrative fines have so far not been used in environmental law.[27] Also in Spain the introduction of administrative fines has still been opposed.[28] This shows that although there are some indications in some Member States

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24 FAURE, HEINE, *Environmental Criminal Law in the European Union. Documentation of the Main Provisions with Introductions*, Max Planck Institut für ausländisches und internationales Strafrecht, Freiburg im Breisgau, 2000, pp. 128-130, p. 283.
25 FAURE, SVATIKOVA, *Criminal or Administrative Law to Protect the Environment?*, in *Journal of Environmental Law*, vol. 24, no. 2, 2012, pp. 266-268.
26 Ibid, pp. 260-261.
27 See for a plaidoyer in favour of the introduction of administrative fines also in environmental enforcement JANSEN, *Op naar een algemene boetebevoegdheid in de Omgevingswet*, in *Tijdschrift voor Omgevingsrecht*, vol. 4, 2015.
28 See FAJARDO DEL CASTILLO, FUENTES OSORIO, RAMOS TAPIA, VERDÚ BAEZA, *Fighting Environmental Crime in Spain: A Country Report. Study in the Framework of the EFFACE Research Project*, 2015, text available at *EFFACE.eu,* 22/06/2023.

that a toolbox approach, focussing on a more reduced role of the criminal law is followed, this is certainly not the case for all EU Member States and, as will be shown below, neither for the EU Environmental Crime Directive.

3. Protecting legal interests and values

Many of the historical changes that took place concerning the employment of criminal law in the protection of the environment are related to the doctrinal foundations of environmental criminal law that were created through two important movements. The first relates to a project undertaken by the well-known Max Planck Institute for Foreign and International Criminal Law in Freiburg im Breisgau under the title "Umweltschutz durch Strafrecht?" ("environmental protection through criminal law?"). That project provided a critical analysis of the way in which the criminal law was to protect the environment in a wide variety of countries and paid specific attention to the relationship between environmental criminal law, administrative law and civil law.[29] A second important movement occurred in the same period and relates to work of the Association Internationale de Droit Pénal (AIDP) that devoted work to environmental criminal law at the beginning of the 1990s.

3.1 The AIDP.

After a preparatory colloquium was held in 1992 in Ottawa country reports were prepared and published in a special issue of the Revue Internationale de Droit Pénal (RIDP), which equally contained draft recommendations, preparing a meeting of the AIDP in Rio de Janeiro in 1994. The recommendations that were accepted at that conference and subsequently published in the RIDP[30] were more than state of the art, but pointed at a variety of important issues which are today still considered crucial in the formulation of environmental crime.

Interestingly in Recommendation 11 the AIDP already recommended that "*consistent with*

29 See further on this project, FAURE, *Günter Heine und das Umweltstrafrecht in Europa*, in GROPP et al. (eds.), *Strafrecht als Ultima Ratio: Gießener Gedächtnisschrift für Günter Heine*, Mohr Siebeck, 2016.
30 *Resolutions, Section 1, Crimes against the Environment. Application of the general part*, in RIDP, vol. 66, 1995, pp. 48-53.

the principle of restraint, criminal sanctions should be utilized only when civil and administrative sanctions and remedies are inappropriate or ineffective to deal with particular offences against the environment". This Recommendation clearly points to the need to have a 'Toolbox approach'. Whereas the legislator in many European countries 20 years ago only believed in the criminal law, today the limits of the criminal justice system have been better recognized and, in line with the recommendations of the AIDP, alternatives such as civil and administrative sanctions are increasingly used. Of course, this analysis applies to a large extent to European (EU) Member States and even in that respect it may constitute a rather crude generalization, as there are obviously still important differences between the various EU Member States.

The 1994 AIDP Conference also criticised the lack of an autonomous protection of the environment through the criminal law. Recommendation 22 inter alia held that "*where offences against the environment are subject to criminal sanctions, their key elements should be specified in legislation and not left to be determined by subordinate delegated authorities*." At the same time Recommendation 6 held "*consistent with the principle of legality, there should be certainty in the definition of crimes against the environment*."

The AIDP 1994 Conference also considered the place of environmental criminal law of importance. That is why it held in Recommendation 21 that "*core crimes against the environment, that is crimes that are sui generis and do not depend on other laws for their content, should be specified in national penal codes*."

So far it was sketched how in the past 20 years to an important extent changes took place, at least in some legal systems (although surely not in all) which seem to be in line with the 1994 AIDP Recommendations: environmental crime is increasingly formulated in a manner which is more autonomous and less dependent upon the violation of prior administrative obligations and environmental crimes can no longer only be found at the end of environmental statutes of an administrative nature but were increasingly incorporated either in penal codes and/or in environmental codes or special environmental statutes, thus giving more attention to those environmental crimes.

3.2. Max Planck Institute.

These recommendations of the AIDP are to a large extent also in line with German legal

doctrine and more particularly the project "Umweltschutz durch Strafrecht" of the Freiburg Max Planck Institute. The project stood under the coordination of Günter Heine, who himself published widely on environmental criminal law in Germany[31] and internationally.[32] The general tenet in the project was to examine the limits of the criminal law in awarding its protection to the environment as well as to question the effectiveness of criminal law and determine how protection could be improved, especially in relation to administrative law.[33] Heine and his team developed a model of environmental criminal law with a reduced dependence upon administrative law, at least with a more nuanced approach to the relationship.

One could summarize the ideas of Günter Heine and his disciples as proceeding from the point that the close relationship between administrative and criminal law should be abandoned. Otherwise, the criminal law cannot award its full protection to the environment. However, this does not necessarily mean that one should immediately abandon any link between environmental criminal law and administrative law. Indeed, this link may even have certain advantages. First of all, administrative dependence has the advantage that it respects the *lex certa* principle that follows from the principle of legality in criminal law. *Lex certa* holds that the legislator should prescribe the criminalized behaviour as precisely as possible.[34] In case the legislator punishes violation of administrative norms (for example, conditions in a permit) the criminalized behaviour will usually be relatively clear *ex ante*.[35] However, one should also realize that referring to a permit may not always be the ideal way of criminalizing pollution since permit conditions can be vague and ambiguous. Secondly, one can hold that a link with administrative law is indispensable to some extent, since the alternative of simply criminalizing "pollution" would be too broad and vague. In that case (if such a broad definition was to be used) it would no longer be clear ex ante which

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31 See, e.g., HEINE, *Aspekte des Umweltstrafrechts im internationalen Vergleich*, in *Goltdammer's Archiv für Strafrecht*, 1986, pp. 67-88; HEINE, *Zur Rolle des Strafrechtlichen Umweltschutzes*, in *Zeitschrift für die Gesamte Strafrechtswissenschaften*, vol. 101, 1989, pp. 722-755.

32 HEINE, *Die Verwaltungsakzessorietät im deutschen Umweltstrafrecht unter Berücksichtigung des österreichischen Rechts. Aktuelle Probleme und Reformüberregungen*, in Österreichische Juristenzeitung, vol. 11, 1991, pp. 370-378.

33 FAURE, *Günter Heine und das Umweltstrafrecht in Europa*, cit.

34 FAURE, GOODWIN, WEBER, *The Regulator's Dilemma: Caught between the Need for Flexibility & the Demands of Foreseeability. Reassessing the Lex Certa Principle*, in *Albany Law Journal of Science & Technology*, vol. 24, no. 2, 2014, pp. 283-364 (discussing the importance of this *lex certa* principle in criminal law).

35 See, e.g., A. De Nauw, *Les métamorphoses administratives du droit pénal de l'entreprise*, Mys & Breesch, 1994, p. 84.

behaviour is criminalized and which is not. The example is given that it would not be useful to criminalize for instance "the one who would have contributed to climate change." The impossibility of proving a causal link between certain behaviour and the criminalized result would render such a provision inapplicable in practice.[36] Moreover, the formulation of obligations in administrative law may also contribute to making the concept of unlawfulness more precise in environmental criminal law. One can hope that it is the administrative authority which is best situated to determine whether a specific form of pollution is lawful or not. Indeed, administrative authorities may be far better qualified (given their expertise and thus their information advantage) than the judge in a criminal court to determine which type of pollution should be considered unlawful and which not. And this information advantage of administrative authorities is thus a strong argument in favour of some link between administrative and environmental criminal law. Consequently, some link between environmental criminal law and administrative law should likely be retained. The primary decision on the admissibility of certain polluting acts should remain with administrative authorities within the limits set by law and respecting general principles of administrative law. As a result, different types of criminal provisions are necessary to protect the environment, all with a different goal and all with a different relationship to administrative law.[37]

3.2 A combination of various provisions.

An effective environmental criminal regime, according to Heine and the MPI scholarship, needs a combination that penalizes abstract endangerment of the environment and concrete endangerment of the environment, as well as an independent crime for when pollution has serious consequences.[38]

3.3.1. Abstract endangerment.

The notion of abstract endangerment refers to the fact that within this model the criminal

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36 See ROBERT, *Le problème de la responsabilité et des sanctions pénales en matière d'environnement*, in *International Review of Penal Law*, vol. 65, 1994, pp. 954-955.
37 For an overview, see HEINE, *Allemagne: Crimes against the Environment*, in *International Review of Penal Law*, vol. 65, 1994, pp. 731-759.
38 FAURE, HEINE, *Environmental Criminal Law in the European Union,* cit.; see for an overview of the various types of provisions in environmental criminal law also DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy,* cit., pp. 272-297.

provision usually does not punish environmental pollution directly. In this model the criminal law is an addition to a prior system of administrative decisions concerning the amount and quality of emissions into the environment. Within this system, the role of criminal law usually limits itself to the enforcement of prior administrative decisions that are taken. A distinction may be made between a dependency upon general administrative rules and principles (*Verwaltungsrechtsakzessorietät*) and the dependency upon individual decisions of administrative agencies (V*erwaltungaktsakzessorietät*).[39] In sum: breach of administrative obligations needs to be penalized. Some legal remedy needs to be used to guarantee compliance with important administrative obligations to avoid environmental pollution. However, since the link between the provision and the environmental harm is rather remote in this model, the penalty should not necessarily be very high and in some cases administrative penal law may suffice. It is, however, clear that in addition to penalising abstract endangerment, an effective environmental criminal law should do something more than punishing the mere failure to meet administrative obligations.

3.3.2 Concrete endangerment.

Concrete endangerment provisions treat an endangerment of environmental values posed by a concrete threat to the environment as a prerequisite to criminal liability.[40] Under this provision, an abstract danger that some illegal operation might pose to the environment is insufficient for criminal liability. Usually, an emission criteria is set to value a given level of threat. Usually the provisions falling under this model do not require that actual harm needs to be proven, the threat of harm is sufficient. In addition, concrete endangerment provisions usually only lead to criminal liability if a second condition is met—an illegal emission. In a model of absolute administrative dependence, all that needs to be shown is that the act violated administrative rules. In the concrete endangerment model, the emission or pollution that can cause a threat of harm needs to also be proven. However, as long as the administrative rules are observed, no criminal liability is likely to follow since the act

39 HEINE, *Verwaltungsakzessorietät des Umweltstrafrechts*, in *Neue Juristische Wochenschrift*, vol. 39, 1990, pp. 2425-2434; SCHALL, *Umweltschutz durch Strafrecht: Anspruch und Wirklichkeit,* in *Neue Juristische Wochenschrift*, vol. 20, 1990, p. 1263, pp. 1265-1266. Prabhu refers in this respect to the 'administrative accessoriness of penal law. PRABHU, *General Report: English Version*, cit., p. 708.
40 BUITING, *Strafrecht en milieu*, Gouda Quint, 1993, pp. 32-34; HENDRIKS, WÖRETSHOFER, *Milieustrafrecht,* Tjeenk Willink W.E.J., 1995, pp. 31-32; WALING, *Het materiële milieustrafrecht*, Gouda Quint, 1990.

itself will not be unlawful. This departs from the serious environmental harm model, discussed below, in which criminal liability can occur even if administrative requirements were formally met. This type of provision, in which the unlawful concrete endangerment of the environment (through emissions) is penalized, has the advantage that one does not merely focus on the failure to abide by administrative obligations. This equally means that if enforcement of administrative obligations is lacking, criminal law can nevertheless intervene since an unlawful endangerment of the environment (through emissions) might have taken place.

3.3.3 Serious environmental harm.

A third type of criminal provision directly punishes some cases of serious pollution. In fact, this model also punishes emissions, but the consequences are more serious—namely, long-lasting pollution, serious consequences for the health of persons, and/or a significant risk of injuries to the population. The main difference between this model and the others discussed above is that the linkage between criminal law and prior administrative decisions is completely removed. Under this type of provision, serious environmental pollution can be punished even if the defendant has complied with the conditions of his license. The underlying notion is that the administrative regulation never allowed this specific risk or harm. These are therefore cases where the veil of the famous dependency of the administrative law is pierced. There are some examples of such an autonomous crime.[41] It is also more important to notice that there is an international tendency to limit a defendant's ability to rely on a license where they have caused serious harm to the environment.[42] There are instances of prohibitions unrelated to environmental law that punish the one who causes bodily harm to another. Most Penal Codes have provisions punishing the one who negligently or intentionally causes injuries to another, regardless of whether or not these injuries were caused through emissions into the environment. Again, in most legal systems these provisions still apply even if the defendant followed the conditions of a license.[43] This independent crime for

41 FAURE, *Towards a New Model of Criminalization of Environmental Pollution: The Case of Indonesia*, in FAURE, NIESSEN (eds.), *Environmental law in development: lessons from the Indonesian experience*, Edward Elgar, 2006, pp. 198-200.
42 See Resolution 10 of the XVth International Congress of Penal Law, *International Review of Penal Law*, 1995, p. 50.
43 HEINE, *Aspekte des Umweltstrafrechts im internationalen Vergleich*, cit., p. 83.

serious pollution, of which several examples also exist,[44] focuses again on emissions, but in this case on those that may also endanger human health. The major difference with the model previously discussed is that unlawfulness is no longer required.

3.3.4 An optimal combination of different provisions.

At the policy level, the strength and weaknesses of various models show that an effective environmental criminal law really needs a combination of these various types of provisions. The penalization of abstract endangerment is necessary to give administrative obligations force. But these provisions are unsatisfying policy mechanisms because they apply even if no ecological harm or danger exists. Moreover, they cannot provide adequate protection if there is no violation of existing administrative rules.[45] In that respect, the provisions merely penalizing the failure to meet administrative obligations (which remain necessary) need to be complemented with provisions aiming at the concrete endangerment of the environment. Penalizing unlawful emissions can do this. However, in some cases, the conditions of an administrative license may still provide a sort of affirmative defense. And the protection granted to the environment by a judge is already autonomous in that it is not limited to penalizing administrative failures. Finally, the system needs to be complemented with an independent crime applicable to serious pollution if a concrete danger to human life or health exists. Only at this level is the inter-dependence of environmental criminal law and administrative law entirely abandoned.

4. Comparative legal research

4.1. Evolutions in the domestic legal systems.

This theoretical scholarship from the Freiburg Max Planck Institute clearly also influenced the AIDP Recommendations, but also the evolution of environmental criminal law in many EU Member States. Comparative research allows to apply the above-mentioned models in order to

44 FAURE, *Towards a New Model of Criminalization of Environmental Pollution*, cit., pp. 198-200.
45 FAURE, VISSER, *How to Punish Environmental Pollution? Some Reflections on Various Models of Criminalization of Environmental Harm*, in *European Journal of Crime, Criminal Law and Criminal Justice*, 1995, p. 358.

discover the different types of provisions awarding different degrees of protection to the environment, especially in relation to administrative law. Not only can examples of the different models of environmental criminal law be found in various jurisdictions,[46] one can (in combination with the historical overview) also argue that there seems to be a certain trend whereby originally environmental criminal law was limited to sanctioning administrative disobedience (abstract endangerment crimes); later a more direct protection of the environment emerged by punishing unlawful emissions (via concrete endangerment crimes) and finally we have arrived at the phase where discussions are taking place concerning the need to have a truly autonomous protection of the environment (even in cases of compliance with a permit) in cases of serious environmental pollution.

The evolution in many jurisdictions have been analysed and compared using the various models of environmental criminal law.[47] Comparative and legal historical research indeed allows to analyse the protection awarded to the environment via criminal law through the different provisions.

As already mentioned (in section 2), originally most countries undoubtedly had abstract endangerment crimes. It are the type of crimes where the criminal law is "purely accessory" to administrative law.[48] Examples constitute the unauthorised operation of facilities or the violation of permit conditions. Those are traditionally punished in almost all jurisdictions. Examples can be provided from Germany and France,[49] but also from the US, Belgium and France.[50]

In a second wave of criminalisation, various countries started introducing concrete endangerment crimes, focusing on unlawful emissions. In addition to the examples mentioned above, we can also refer for example to France where the Environmental Code contains several concrete endangerment crimes. For example article L226-9 of the Environmental Code punishes the emission of pollutant substances constituting atmospheric pollution into the air.[51] Article L216-6 of the Environmental Code moreover directly punishes the damage to the environment in case where

46 For a detailed overview see DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy,* cit., pp. 272-297.
47 See in this respect especially MANDIBERG, FAURE, *A Graduated Punishment Approach to Environmental Crimes*, cit., pp. 447-511; DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, cit., pp. 272-297; but also PEREIRA, *Environmental criminal liability and enforcement in European and international law*, cit.
48 DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, cit., p. 274.
49 Ibid, p. 275.
50 MANDIBERG, FAURE, *A Graduated Punishment Approach to Environmental Crimes*, cit., pp. 457-459.

specific emissions have killed or damaged fish. Examples of this special unlawfulness clause in ecocrimes can also be found in Germany, Austria, Portugal, Spain, France, England and the US.[52] As a result, there is surely a tendency towards this more direct protection of the environment (by criminalising unlawful concrete endangerment through emissions). Some EU Member States previously did not have concrete endangerment crimes (like for example Spain), but introduced those as a result of the implementation of the EU Environmental Crime Directive.[53]

Finally, most recently there is an increasing tendency also to consider the introduction of autonomous environmental crimes, but the examples are relatively scarce. Di Landro could, in his comparative overview, find examples in Germany, Spain, Poland, France, England and Italy.[54]

4.2 Evolutions at the European level.

In 2008, the EU adopted a Directive on the protection of the environment through criminal law, the Environmental Crime Directive (ECD).[55] Recital 3 of this ECD holds explicitly that criminal penalties "*demonstrate a social disapproval of a qualitatively different nature compared to administrative penalties or a compensation mechanism under civil law*". That shows that the ECD was still relying on a "criminal law only" approach and provided no room for a toolbox approach in which there would also be room for civil and administrative penalties. Article 3 of the ECD holds that 9 specific offences would have to be criminalised "*when unlawful and committed intentionally or at least with serious negligence*". Article 2 of the ECD defines the unlawfulness as either a violation of the European Environmental Directives or a violation of domestic (usually administrative) environmental laws, which leaves no room for the application of criminal law in the absence of a violation or administrative obligations. Article 3 of the ECD further lists 9 specific offences which are either abstract or concrete endangerment crimes. The independent crime for pollution with serious consequences is lacking in the ECD.

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51 See BIANCO, LUCIFORA, *Environmental criminal law in France*, in FARMER, FAURE, VAGLIASINDI (eds.), *Environmental crime in Europe*, Hart, 2017, pp. 75-79.
52 For an overview see DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, cit., pp. 277-283.
53 FAURE, *The Evolution of Environmental Criminal Law in Europe,* cit., p. 278.
54 DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, cit., pp. 290-297.
55 Directive 2008/99/EC of the European Parliament and of the Council of 19/11/2008 on the protection of the environment through criminal law, 2008 OJ L328, 28.

On 15 December 2021 the European Commission launched a Proposal for a new directive on environmental crime.[56] The Explanatory Memorandum accompanying the Proposal refers to the option of defining environmental crime in the Directive without the requirement of a breach of relevant EU sectoral legislation. It is an option 1c mentioned in the Memorandum[57] which has, however, not been pursued. If this option was included in the Proposal, a truly autonomous environmental crime would have been introduced in the Directive. The Directive, however, in article 2(1) still requires unlawfulness as a conduct infringing either Union legislation, irrespective of its legal basis or infringing a law, or administrative regulation of a Member State or a decision taken by a competent authority in a Member State. That already shows that the way in which the unlawfulness would be described under the 2021 Proposal is much broader than the way it was described in the 2008 Directive. In the ECD unlawfulness was directly linked to the violation of Member State legislation implementing the environmental acquis, with reference to a specific list contained in annex. In addition, article 2(1) in fine provided that "*the conduct shall be deemed unlawful even if carried out under an authorization by a competent authority in a Member State when the authorization was obtained fraudulently or by corruption, extortion or coercion*". That is, however, a very limited exception which may not be very meaningful in practice. The Preamble of the Proposal refers to the ecocide debate in Recital 16 which deals with aggravating circumstances "*when an environmental criminal offence causes substantial and irreversible or long-lasting damage to an entire ecosystem*". The Recital holds that "*this should be an aggravating circumstance because of its severity, including in cases comparable to ecocide*". This idea is included in article 8(b) of the 2021 Proposal. However, the problem is that in this case (of aggravating circumstances) criminal liability applies when there is unlawfulness in the sense of article 2 of the Proposal. As a consequence, even if the conduct "*caused destruction or irreversible or long-lasting substantial damage to an ecosystem*" criminal liability can be averted as long as the conduct is covered by an authorization (as long as it is not obtained fraudulently or by corruption,

56 Proposal for a Directive on the protection of the environment through criminal law and replacing Directive 2008/99/EC of 15/12/2021, COM(2021) 851 final. For a further analysis of this Proposal see also LAVRYSEN, BOUQUELLE, *The EU and the protection of the environment through criminal law*, in LUCHTMAN et al. (eds.), *Of Swords and Shields: Due Process and Crime Control in Times of Globalization. Liber Amicorum Prof.dr. J.A.E. Vervaele*, Eleven, 2023, pp. 397-406.
57 COM(2021) 851 final, p. 12.

extortion or coercion).[58]

Meanwhile the Proposal has continued its way through the legislative process. On 9 December 2022 the Council of the European Union adopted a general approach on the Proposal for a new environmental crime directive. The text that was adopted sticked to the requirement of offences being unlawful, but had removed the sentence that the conduct would be considered unlawful even if carried out under an authorization when that authorization was obtained fraudulently or by corruption, extortion or coercion. Also the aggravating circumstances in article 8 were in a sense weakened as the offence causing the death of or serious injury to a person was removed as aggravating circumstance. The European Parliament came to a position in April 2023. In the text accepted by the Parliament there was a new consideration 8 included holding "*Indeed, being in possession of such an authorization does not preclude the criminal liability of the holder of the authorization as long as the authorization is unlawful and the holder had knowledge of this unlawfulness or could not be unaware of it*". The drafters here clearly foresee a possibility of providing a broad interpretation to unlawfulness. A consequence could be that even when there is compliance with a permit, there could still be criminal liability if the conduct could otherwise be considered unlawful. That therefore seems an important step towards accepting an autonomous environmental crime. Obviously that Proposal led to questions in the Council and at the time of writing (June 2023), attempts are made to come to a text that would be acceptable both for the European Parliament and the Council.[59] It is at this moment uncertain what the outcome of these debates will be and therefore what the precise formulation will be in the new Environmental Crime Directive.

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58 The chosen formulation also led to critical comments by DI LANDRO, *Models of environmental criminal law, between dependence on administrative law and autonomy*, cit., pp. 286-288: "*The Commission Proposal excludes any possible form of environmental criminal protection, autonomous from administrative law. With reference to the most serious forms of crimes, this also appears to be inappropriate, as it does not guarantee adequate protection of primary interests, such as human health and the environment*".

59 In that respect an interesting proposal was made by the European Commission that there would be unlawfulness, even when behavior is carried out under an authorization by a competent authority in a Member State, when the authorization: a) was obtained fraudulently or by corruption, extortion or coercion or b) is in breach of relevant substantial legal requirements and the person who relies on the authorization knew of should have known this. That formulation would obviously also provide further going possibilities for applying the criminal law even in the case of compliance with a permit.

5. Law and economics

The economic approach certainly also has added value in environmental criminal law research. The simple reason is that in the seminal article by Nobel Prize Winner in economics Gary Becker, the criminal has been portrait as a rational offender that would weigh the benefits of violation against the costs.[60] According to Becker's model, the potential violator of environmental regulation is faced with the following choice:

$B \leq p \times S$

whereby B = benefits of the offence, p = probability of detection and S = severity of the actual sanction. Based on this deterrence hypothesis the rich and abundant literature on the economics of crime and law enforcement suggests that the likelihood that potential offenders will respond to the incentives created by the criminal justice system and crime rates, depends, inter alia on the risks and benefits of crime.[61]

This model can also easily be applied to environmental crime. Given a low probability of detection, deterrence can only be achieved if the sanction can be increased to reasonably high levels.[62]

This economic approach of course assumes that a rational criminal will weigh costs and benefits. Society can influence deterrence by either increasing the probability of detection (p) or the sanction (S). However, the economic approach also stresses that other sanctions (like reputational losses, naming and shaming) can play an important role as well in the decision of perpetrators to commit the environmental crime or not.

This economic approach can provide useful insights, for example explaining why there may be a relatively large amount of environmental crime. The relatively high benefits to offenders and the low probability of detection (in combination with low sanctions) may imply that environmental crime can be attractive for the individual offender. The economic approach is also useful as it

60 BECKER, *Irrational behaviour and economic theory*, in *Journal of Political Economy*, vol. 70, no. 1, 1962, p. 1 and BECKER, *Crime and punishment. An economic approach*, in *Journal of Political Economy*, vol. 76, no. 2, 1968, p. 179.
61 See GAROUPA, *The theory of optimal law enforcement*, in *Journal of Economic Surveys*, vol. 11, no. 3, 1997, p. 267.
62 See further LU, FAURE, *Does the tiger have teeth? A critical examination of the toolbox approach of environmental law enforcement in China*, in *RECIEL*, 2022, vol. 31, no. 1, pp. 89-102.

indicates the different reactions society could have to environmental crime. However, an important limitation of this economic approach is that it strongly relates on data for an effective, evidence-based policy.

6. Empirical

Relatively little is known about the enforcement of environmental law in practice. That was the case in the 1980s and is still largely the case today. In countries like the Netherlands, Belgium, the United Kingdom, and Germany data on enforcement activities as well as the output and outcome of investments in enforcement are rare. Moreover, the way in which data in the Member States are collected (if at all) is not harmonized. What available data does show is that where enforcement authorities formally established that a violation took place, cases were often not prosecuted and simply ended with a dismissal.[63] A few facts and figures can illustrate this. For the Flemish Region in Belgium the Environmental Inspectorate collected data on the number of cases that were dismissed out of the total number of notices of violations.[64] For the period 1998–2004 the Environmental Inspectorate noticed that of all of its notices of violation on average 64 percent of the cases were dismissed whereas approximately 7 percent were prosecuted.[65] This low number of prosecutions casts doubts on the efficacy of the criminal enforcement system.[66] Similar data points come from the United Kingdom. Bell and McGillivray report that for the period 2000–2007, around 25,000 pollution incidents were reported but less than 5 percent were prosecuted.[67] Similar data were also reported by the group of German criminologists that participated in the Max Planck

63 For a summary of the empirics in that respect, see FAURE, SVATIKOVA, *Criminal or Administrative Law to Protect the Environment?*, cit., pp. 253-286.
64 Afdeling Milieuinspectie [Department of the Environmental Inspectorate, the Flemish Region], Milieuhandhavingsrapporten [Environmental Enforcement Reports] (1993–2008). For a detailed analysis of these reports, see SVATIKOVA, *Economic Criteria for Criminalization. Optimal enforcement in case of environmental violations*, diss. Rotterdam, 2011, pp. 110-119 (on file with author).
65 A few others resulted in transactions imposed by the prosecutor. See FAURE, SVATIKOVA, *Criminal or Administrative Law to Protect the Environment?*, cit., pp. 260-266.
66 For a further discussion of these data on the Flemish Region see, FAURE, SVATIKOVA, *Enforcement of Environmental Law in the Flemish Region*, in *European Energy & Environmental Law Review*, vol. 19, no. 2, 2010, pp. 60-79.
67 BELL, MCGILLIVRAY, *Environmental Law*, 6th ed., Oxford University Press, 2005, p. 291.

project on the protection of the environment through the use of criminal law. In their report to the German Law Association, Heine and Meinberg refer to data on the enforcement of environmental law for the period 1975–1986.[68] According to them in 1985 more than 40 percent of all criminal environmental cases were not prosecuted.[69] In a later study, Lutterer and Hoch examined decisions of the public prosecutor concerning the prosecution of environmental crime and noticed that 60 percent of the cases were dismissed in 1997, whereas prosecution only followed in 7.9 percent.[70] This small sample of studies indicate that environmental cases were not often prosecuted by the public prosecutor before the criminal court, which led to high dismissal rates. That confirms the assumption made in law and economics literature that prosecutors will, given the high costs of criminal law, focus efforts on a few egregious cases and allow others to be dismissed.[71] Two interesting conclusions may be drawn from the empirical studies. First, the probability of being detected and prosecuted was very low due to high rates of dismissal. The data provided by the Environmental Inspectorate on the Flemish Region suggests there was a 20 percent chance that on average a company will be inspected on a yearly basis.[72] The conditional probability of being prosecuted based on the number of prosecutions out of the number of notices of violations dealt with by the public prosecutor was even lower—7 percent.[73] On average, data indicates that the probability an inspection would take place, the violation would be detected, and the firm prosecuted, was less than 1 percent, meaning that less than one in every hundred firms in violation would be detected and prosecuted.[74] This raises serious questions on the deterrent effect of the criminal law.[75]

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68 See HEINE, MEINBERG, *Empfehlen sich Änderungen im strafrechtlichen Umweltschutz, insbesondere, in Verbindung mit dem Verwaltungsrecht? Gutachten für den 57. Deutschen Juristentag, Verhandlungen des 57. Deutschen Juristentages*, Beck, 1988.

69 Id. The numbers follow from a more detailed study executed by the criminologist MEINBERG, *Empirische Erkenntnisse zum Vollzug des Umweltstrafrechts*, in *Zeitschrift für die Gesamte Strafrechtswissenschaften*, 1988, pp. 112-157.

70 LUTTERER, HOCH, *Rechtliche Steuerung im Umweltbereich. Funktionsstrukturen des Umweltstrafrechts und des Umweltordnungswidrikeitenrechts. Empirische Untersuchungen zur Implementation strafbewehrter Vorschriften im Bereich des Umweltschutzes*, 1997, pp. 147-149.

71 See FAURE, OGUS, PHILIPSEN, *Curbing Consumer Financial Losses: The Economics of Regulatory Enforcement*, in *Law & Policy*, vol. 31, no. 2, 2009, pp. 170-171.

72 FAURE, SVATIKOVA, *Enforcement of Environmental Law in the Flemish Region*, cit., pp. 60-79.

73 FAURE, SVATIKOVA, *Criminal or Administrative Law to Protect the Environment?*, cit., pp. 260-266.

74 Ibid, p. 265.

75 Combined with the fact that when a case was prosecuted and a conviction achieved the fines imposed were quite low as well. See id. The authors hold: "*Thus on average, around 7% of [Notices of Violation] are prosecuted, which might not provide sufficient incentive ex ante to comply with the environmental regulations in the first place*." Id.

Second, the German data provided by Lutterer and Hoch not only provided information on the prosecution of criminal cases, but also on the way in which administrative authorities dealt with cases in administrative penal law. Recall that for the criminal law, 60 percent of the cases were dismissed, whereas in only 7.9 percent of the cases did a prosecution take place.[76] Contrast this figure with rates in the administrative penal law system, where a fine was imposed in 53 percent of the cases by the administrative authorities.[77] In the administrative penal law system, some noticeable reaction took place in 57 percent of the cases, whereas in the criminal system this occurred only in 48.9 percent.[78] Lutterer and Hoch therefore concluded that the probability of a sanction being imposed was higher under the administrative penal law than under the criminal procedure.[79] These empirical conclusions validated the assumptions of commentators questioning environmental regimes and provided strong support for a radical change in environmental criminal law, towards a limited role for criminal prosecution and the development of alternative remedies.

A result of these data is that one could conclude that apparently the expected costs of environmental crime are apparently low. There is a high degree of dismissals; the probability of detection is low as well as the expected sanctions. Notwithstanding these data there is equally overwhelming empirical evidence showing that the environmental enforcement system does generally have a deterrent effect. Targeted enforcement actions do lead to deterrence.[80] Also overview studies with respect to empirical research show that enforcement actions do deter.[81] This is partially due to the so-called Harrington Paradox. Winston Harrington established that given low expected sanctions one would expect more environmental criminality than can be observed in practice.[82] The answer is that there are many reasons why there is compliance with environmental legislation, an important one being that perpetrators may be risk averse and could have (wrong)

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76 FAURE, SVATIKOVA, *Enforcement of Environmental Law in the Flemish Region*, cit.
77 FAURE, SVATIKOVA, *Criminal or Administrative Law to Protect the Environment?*, cit.,p. 278.
78 *Ibid*.
79 LUTTERER, HOCH, *Rechtliche Steuerung im Umweltbereich*, cit.
80 So ROUSSEAU, *Timing of environmental inspections: survival of the compliant*, in *Journal of Regulatory Economics*, vol. 32, 2007, pp. 17-31.
81 See for example COHEN, *Empirical research on the deterrent effect of environmental monitoring and enforcement*, in *Environmental Law Reporter*, vol. 30, no. 4, 2000, p. 10245 and GRAY, SHIMSHACK, *The effectiveness of environmental monitoring and enforcement: a review of the empirical evidence*, in *Review of Environmental Economics and Policy*, vol. 5, no. 1, 2011, pp. 21-22.
82 HARRINGTON, *Enforcement leverage when penalties are restricted,* in *Journal of Public Economics*, vol. 37, no. 1, 1988, pp. 29-53.

subjective perceptions of (high) expected sanctions.

Criminological research also indicates that many environmental perpetrators are not necessarily the rational calculating types who intentionally violate in order to generate benefits. Apparently many environmental violations are rather committed out of ignorance then as an intentional act to violate.

It is, in order to have a reasoned, evidence-based enforcement policy, crucial to have information on for example the cohort of operators that has to be monitored as well as on the enforcement capacity, the number of violations and the remedies imposed. Those are all data which are crucial within the framework of a so-called smart, evidence-based, enforcement policy.[83] The new 2021 Proposal for a ECD therefore rightly imposes a duty on Member States (in article 21) to collect statistical data to monitor the effectiveness of their systems by collecting data inter alia on:

a) the number of environmental crime cases reported;
b) the number of environmental crime cases investigated;
c) the number of convictions for environmental crime;
d) the number of dismissed court cases;
e) the types and levels of sanction imposed.

The collection of data is precisely an issue which had been advocated as crucial in the literature in order to make an evidence-based enforcement policy possible.[84]

7. Concluding remarks

This article had as goal to provide some insights on the way in which environmental criminal law, both in legal doctrine and in legislation, has evolved over time. It is striking to see how a decent theoretical basis, provided with the German doctrinal perspective (sketching criminal law as a model to protect legal values and interests) has been of influence *inter alia* at the AIDP, but

83 BLANC, FAURE, *Smart Enforcement. Theory and Practice*, in *European Journal of Law Reform*, vol. 20, no. 4, 2018, pp. 78-103; BLANC, FAURE, *Smart Enforcement in the EU*, in *Journal of Risk Research*, 2020, pp. 1-19.
84 FAURE, *Environmental criminal liability: the long and winding road towards an effective environmental criminal law system in the EU*, in PEETERS, ELIANTONIO (eds.), *Research Handbook on EU Environmental Law*, Edward Elgar 2020, pp. 259-263.

later also in the development towards a more direct protection of the environment (inter alia through the introduction of concrete endangerment crimes and more recently also autonomous environmental crimes).

The various approaches towards environmental criminal law presented in this article show that environmental crime needs a holistic, eclectic approach. Obviously, in addition to the approaches presented in this article (which were limited to environmental criminal law), also other disciplines and more particularly the green criminology perspective may be indispensable in order to formulate an appropriate societal reaction against environmental crime.

Looking just at the (admittedly restricted) question of how environmental crime legislation should be formulated, it is useful to start with decent theoretical foundations to be found in German legal doctrine. The advantage is that that approach invites to identify the specific interests protected by the legislation, allowing subsequently for a critical discussion of the role of administrative law in criminal liability. Next, also a historical approach provides interesting insights on how the protection of the environment as such was certainly not the primary focus of the criminal law; it was rather a more anthropocentric approach focusing on the protection of mankind. That also explained why administrative law was the primary instrument allowing a "management" of the environment by regulating pollution. Criminal law originally only played a role to back up this administrative environmental law system. It is only more recent that ecological interests became a genuine autonomous concern for the criminal law.

Those different approaches to the protection of the environment (distinguishing anthropocentric and egocentric, administratively dependent versus autonomous) can certainly also be seen in different forms in various jurisdictions. To some extent these evolutions in several (EU) Member States originally (that is to say before the ECD) took place in an independent manner, although the German environmental crime research as well as the AIDP Recommendations certainly influenced the developments within the EU Member States. The fact that countries often choose different options and models to protect the environment also has the advantage that it provided insights on (other) possibilities to protect the environment by using the criminal law and thus for mutual learning. For example, the fact that in Germany already for decades an autonomous environmental crime provision existed in § 330a of the Criminal Code provided an interesting example and a source for other countries wishing to introduce autonomous environmental crimes.

Of course, comparative research and examples from different Member States certainly also played a role, first in the development of the ECD in 2008 and also today during the process of creating a new ECD which is still ongoing at the moment of writing (June 2023). That shows the great value of such a functional comparative method, also for policy-making.

To an important extent the goal of environmental criminal law is in the end to influence the behaviour of perpetrators and to provide them incentives towards compliance with environmental law. Of course the question what affects compliance and which are the causes of violation is a complex one, also studied extensively within criminology. But one of the aspects affecting compliance relates undoubtedly to the classic economic question whether perpetrators may gain more from violation than from compliance. The basic insights from Becker that crime will occur when the benefits to the offender are higher than the costs (calculated as the probability multiplied with the sanction) are certainly valid in the environmental area as well. At first blush environmental crime is committed by rational perpetrators that would therefore, in theory, be deterrable as indicated in economic theory. Although that may play an important role, other factors (such as reputation and risk aversion) may equally affect the decision to comply or violate. In that respect it is crucial for an enforcement policy to have reliable data on which a smart, evidence-based law enforcement policy could be based. That can not only shed light on the reasons for non-compliance, but also on the appropriateness of particular reactions and remedies and will in principle allow for a more cost-effective enforcement policy. By the end of the day the environmental legislation is only as strong as its enforcement policy. An important element in that enforcement policy is an adequate formulation of the criminal law provisions. This article has attempted to indicate the various approaches that can be used to formulate environmental criminal law provisions in an appropriate, effective manner.