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Regulating Artificial Intelligence while respecting the environment:

An evaluation of the AI Act with recommendations for sustainable solutions

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List of Abbreviations

AI……..……Artificial Intelligence

AIA…….……. Artificial Intelligence Act

CFR/ Charter……. Charter of Fundamental Rights of the European Union

CJEU……Court of Justice of the European Union

EIA…...……Environmental Impact Assessment

EEC……European Economic Community

ECHR…….……. European Court of Human Rights

ESPR ……..……..……Ecodesign for Sustainable Products Regulation

EGD……. European Green Deal

EU……...……. European Union

OECD……Organisation for Economic Cooperation and Development

SEA……...…… Single European Act

TEC……...…...…… Treaty Establishing the European Community

TEU……...…….…… Treaty of the European Union

TFEU……..... Treaty on the Functioning of the European Union

Chapter I: Setting the scene

1. Background

Environmental protection is closely tied to the concept of a legal duty to protect and improve ecosystems, environmental components and human health, constituting the ultimate aim of environmental law.[1] As a concept, it was not included in the original text of the EEC Treaty, signed in 1957. However, the growing global recognition of the importance of safeguarding the nature has significantly impacted the goals of the EU and thus, environmental protection has become a constitutional aspect of EU Law[2] permeating the EU legal order. In particular, a high level of environmental protection constitutes one of the EU objectives according to Article 3(3) TEU and an underlying principle of the EU environmental law.[3] Furthermore, environmental protection is rooted in the principle of environmental integration (Article 11 TFEU) as well as in Article 37 CFR.[4]

The fact that environmental protection has evolved to be an indispensable requirement for the further evolution of the Union is reflected also in the European Green Deal.[5] Although not legally binding as a piece of soft law, this strategy aims to tackle environmental degradation and climate change which pose a threat to Europe and the world. The goal is to create a modern, resource-efficient and competitive economy within the EU that achieves net zero greenhouse gas emissions by 2050, while ensuring that economic growth is not dependent on resource use.[6] To realize this, the EGD outlines Sustainable Development Goals, wherein the effective implementation of AI technologies have the potential to play a crucial role.[7]

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[1] Alicja Sikora, '*Constitutionalisation of environmental protection in EU law*' (Europa Law Publishing 2020) 12

[2] Alicja Sikora, 'EUROPEAN GREEN DEAL - legal and financial challenges of the climate change' (2020) ERA Forum 685 <https://doi-org.proxy.library.uu.nl/10.1007/s12027-020-00637-3> accessed 27.06.2024

[3] Sikora (n 2) 686

[4] *Ibid* 685

[5] Sikora (n 1) 57

[6] Commission, 'The European Green Deal' (Communication) COM (2019) 640 final 2 <https://commission.europa.eu/publications/communication-european-green-deal_en> accessed 27.06.2024

[7] Commission, 'WHITE PAPER On Artificial Intelligence - A European approach to excellence and trust' COM (2020) 65 final 2 <https://commission.europa.eu/publications/white-paper-artificial-intelligence-european-approach-excellence-and-trust_en> accessed 27.06.2024

Indeed, the features of AI, including perception of the environment, information processing, decision making and achievement of specific goals,[8] indicate that the application of AI may have a wide range of economic and social benefits in many sectors such as climate change and environment.[9] This is because AI - by being capable of actions of intelligence[10] - automates important, but also time-consuming tasks, manages and analyses massive amounts of unstructured data revealing insights, and solves the most complex problems by combining thousands of computers and other resources.[11]

However, this technological development may give rise to new risks or negative consequences for individuals, the society and the environment.[12] Given these concerns governments around the world are actively working to regulate this technological development. Particularly, with regard to the environment, the European Commission (hereafter Commission) has emphasized the importance of ensuring the "*sustainability and ecological responsibility of AI systems*"[13] and the need to evaluate the environmental impact of AI systems throughout their lifecycle and across the entire supply chain in the "White Paper on AI - A European approach to excellence and trust".[14]

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[8] Sofia Samoili and others, 'AI Watch. Defining Artificial Intelligence. Towards an operational definition and taxonomy of artificial intelligence' (Joint Research Centre, Publications Office of the European Union, 2020) 8 <https://publications.jrc.ec.europa.eu/repository/handle/JRC118163> accessed 27.06.2024. See also Commission, 'Artificial Intelligence for Europe' (Communication) COM (2018) 237 final 1 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A237%3AFIN> accessed 27.06.2024, according to which AI "*refers to systems that display intelligent behaviour by analysing their environment and taking actions – with some degree of autonomy – to achieve specific goals*".

[9] Commission, 'Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts' COM (2021) 206 final 1 <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52021PC0206> accessed 27.06.2024

[10] Samoili (n 8) 7. Other definitions consider AI to be mechanical replication, an application of non-naturally occurring systems or a process of simulation, see Dalvinder Singh Grewal, 'A critical conceptual analysis of definitions of artificial intelligence as applicable to computer engineering', (2014) 16 (2) IOSR J of Computer Engineering 10-11 <DOI:10.9790/0661-16210913> accessed 27.06.2024

[11] Rohit Nishant and others, 'Artificial Intelligence for Sustainability: Challenges, Opportunities, and a Research Agenda' (2020) 53 Intl J of Information Management 102103 <https://www-sciencedirect-com.proxy.library.uu.nl/science/article/pii/S0268401220300967> accessed 27.06.2024

[12] Priyanka Nanayakkara and others, 'Unpacking the Expressed Consequences of AI Research in Broader Impact Statements' (AIES '21: Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society, July 2021) 799-800 <https://doi.org/10.1145/3461702.3462608> accessed 27.06.2024

[13] High-Level Expert Group on AI, 'Ethics guidelines for trustworthy AI' (Technical report, 2019) 19 <https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai> accessed 27.06.2024

[14] COM (2020) 65 final 2

In 2020, the Commission published a Proposal for a Regulation of the European Parliament and the Council laying down harmonised rules on AI (Artificial Intelligence Act) (hereafter the Proposal). This Proposal constituting a core part of the EU Digital Market Strategy, aims to establish an EU internal market for secure trustworthy and ethical AI systems and to implement a governance system and enforcement mechanisms to safeguard fundamental rights and safety. The Council of the EU has adopted its common position ('general approach') on the AIA and the European Parliament has adopted its negotiating position on the same Act.[15] Following these developments, the AIA has been formally adopted by the Parliament in its March 2024 plenary session and the Council endorsed the final text in May 2024, but the latter has not been published yet in the EU's Official Journal.

Although the Proposal focuses on safeguarding human dignity and fundamental rights by adopting a fundamental rights approach,[16] it seems to undermine the environmental risks of AI.[17] Specifically, the list of prohibited AI systems and the specific rules for AI systems with high risks to health, safety or adverse impacts on fundamental rights that the Regulation establishes do not include any hazards related to the environment unless adverse environmental impacts pose a direct threat to human rights or interests.[18] As regards to the European Parliament's legislative resolution of 13 March 2024 on the Proposal[19] (hereafter the adopted AIA) - adopted after the first reading according to the ordinary legislative procedure, several additions related to the environmental risks of AI systems have been included without sufficiently addressing the deficiencies that the Proposal seems to have.

[15] Council of the EU, 'Artificial intelligence act: Council and Parliament strike a deal on the first rules for AI in the world' (Press Release, 9 December 2023) <https://www.consilium.europa.eu/en/press/press-releases/2023/12/09/artificial-intelligence-act-council-and-parliament-strike-a-deal-on-the-first-worldwide-rules-for-ai/ > accessed 27.06.2024

[16] COM (2021) 206 final 1

[17] Luciano Floridi, 'The European Legislation on AI: a Brief Analysis of its Philosophical Approach' (2021) 34 Philosophy and Technology 218 <https://doi.org/10.1007/s13347-021-00460-9> accessed 27.06.2024

[18] Peter Gailhofer and others, 'The role of Artificial Intelligence in the European Green Deal', [Study for the special committee on Artificial Intelligence in a Digital Age (AIDA), Policy Department for Economic, Scientific and Quality of Life Policies, 2021] 10 <https://op.europa.eu/en/publication-detail/-/publication/2c3de271-525a-11ec-91ac-01aa75ed71a1> accessed 27.06.2024

[19] European Parliament, 'Legislative resolution of 13 March 2024 on the proposal for a regulation of the European Parliament and of the Council on laying down harmonised rules on Artificial Intelligence (Artificial Intelligence Act) and amending certain Union Legislative Acts' <https://www.europarl.europa.eu/doceo/document/TA-9-2024-0138_EN.pdf> accessed 27.06.2024

As a result, this Regulation is expected to establish a legal framework through which AI systems despite their environmental impact will be allowed in the internal market. From an ethical perspective, this undermines environmental protection given that AI is a major source of carbon emissions,[20] and its widespread use may result in environmental degradation. Additionally, the risk-based system of the AIA in this form, as it lacks any provisions for mitigating any adverse environmental impacts, may hinder the attainment of the objectives of the EGD.[21] Nevertheless, it is crucial to question whether there is a legitimate legal concern regarding the lack of risks related to the environmental impact of AI systems in the aforementioned legal framework on AI. In other words, it is essential to assess whether the Proposal and the adopted AIA contradict environmental protection, which is a constitutional aspect of EU Law.

2. Research Question, Sub-questions and aims

Considering the abovementioned background, this thesis will enhance the existing research further from a legal perspective, by focusing on the importance of regulating AI in accordance with environmental protection ensured within EU Law. The legal research question that I hope to respond is: "**To what extend is the European legal framework on AI in contrast with environmental protection as ensured under EU Law?**". When mentioning "*the European legal framework on AI*" in this thesis, it refers to the Commission's Proposal on the AIA and the adopted AIA representing the most up-to-date version of the AIA. In order to answer the main research question, it is important to answer the following sub-questions:

- *"How does the EU legal framework ensure the protection of the environment in the EU's policies?"*. This question will be answered in Chapter II, where environmental protection under EU primary law, specifically Article 3(3) TEU, Article 11 TFEU and Article 37 CFR, will be analysed with a specific focus on non-environmental EU policy fields.

[20] Matteo Wong, 'The Internet's Next Great Power Suck - AI's carbon emissions are about to be a problem' (The Atlanti, August 2023) <https://www.theatlantic.com/technology/archive/2023/08/ai-carbon-emissions-data-centers/675094/> accessed 27.06.2024

[21] Ugo Pagallo and others, 'The Environmental Challenges of AI in EU Law: Lessons Learned from the Artificial Intelligence Act (AIA) with Its Drawbacks' (2022) 16 (3) Transforming Government: People, Process and Policy Journal 359 <https://www.emerald.com/insight/content/doi/10.1108/TG-07-2021-0121/full/html> accessed 27.06.2024

- "*How does environmental protection relate to AI technologies?*". This question will be addressed in Chapter III, which examines the dual role of AI in relation to the environment. Specifically, it focuses on the crucial role that AI plays in attaining the goals of the EGD, as well as on its environmental impact as a major carbon emitter.

- "*How does the European legal framework on AI address the environmental risks of AI systems?*". Chapter III will delve into this question by examining the legal framework of the Proposal on the AIA, and the subsequent adopted AIA. In particular, this analysis will shed light on the risk-based system of the AIA and the provisions pertaining to the environmental risks of AI systems.

- "*How, if at all, does the European legal framework on AI integrate environmental protection requirements*?". This question will be thoroughly examined in Chapter IV, where I will assess whether the provisions of the Proposal on the AIA and the adopted AIA regarding the environmental risks of AI systems are in line with the environmental integration principle.

- "*How should AI technologies be regulated to align with environmental protection under EU Law?*". Building on the previous answer, in Chapter IV, I will endeavour to provide recommendations aiming at addressing the current gaps in the approach of the European legal framework on AI concerning environmental risks associated with AI.

This thesis aims to highlight the deficiencies of the European legal framework on AI in its alignment with environmental protection guaranteed under EU Law and to provide relevant sustainable solutions. According to Article 3(3) TEU, the EU "*shall work for the sustainable development of Europe […], aiming at […] a high level of protection and improvement of the quality of the environment*". Moreover, EU institutions are obliged to incorporate the objectives of environmental policy, including those of the EGD, into EU policies and activities according to the environmental integration principle enshrined in Article 11 TFEU. In addition, Article 37 CFR binds the EU institutions, when implementing EU policies.

Given the environmental risks of AI technologies and the obligations deriving from the EU's legal framework on environmental protection, the European legal framework on AI should align with environmental protection as ensured under EU Law. While the underlying vision of the Commission's Proposal seems to focus on AI as a technology

that can provide support against pollution and climate change and for the sustainable development of information societies,[22] both the Proposal and the adopted AIA in question seem to fail to address the environmental risks of these technologies in their risk-based assessment of AI systems. Consequently, they are probably in contrast with environmental protection as ensured under EU Law and thus, the AIA should be modified. In order to have a complete picture, this thesis envisages introducing recommendations for amending the AIA and for complementing EU Law to ensure the regulation of AI technologies in an environmentally friendly way through the proposal for a Regulation on Ecodesign for Sustainable Products.

The upcoming discussion will centre around a very significant topic that has a profound impact on society as a whole. Despite the progress made by the EU Commission in introducing the Proposal on the AIA, it is crucial that the regulatory framework aligns with the environmental strategies of the EU. By doing so, the AIA, being a pioneering initiative on a global scale, will set forth the necessary standards to create a legal framework for AI.

3. Methodological approach and research

In order to answer the main research question, I will mainly deploy the evaluative method. First, I will delineate the environmental protection framework in EU primary law. Article 3(3) TEU, Article 11 TFEU and Article 37 CFR constitute building blocks of the EU legal framework encompassing the protection of the environment. With a focus on non-environmental fields, these provisions will be analysed demonstrating that within the EU legal order, it is possible to simultaneously achieve economic, social and environmental objectives.[23] The effectiveness of this framework, i.e. the degree to which the incorporation of environmental parameters into a specific measure can be subject to judicial review, will be explored in relation to each provision. This comprehensive analysis will offer valuable insights into the EU's commitment to environmental protection in the different sectors in which it operates.

Once the legal framework has been thoroughly examined, I will explore the twofold role of AI in relation to the environment in order to explain their interconnection and

[22] Floridi (n 17) 218; Pagallo (n 21) 359
[23] Sikora (n 1) 57

the importance of regulating AI systems in an environmentally friendly way. Particularly, the crucial role of AI in achieving environmental protection and the goals of the EGD as well as the environmental impact that AI systems may have will be analysed. Subsequently, I will examine the legal framework of the Proposal on the AIA and the adopted AIA establishing a risk-based system to control the AI systems before they enter the internal market with a specific focus on the provisions related to their environmental risks. This is essential in order to evaluate the alignment of this legal framework with environmental protection as ensured under EU Law.

After this analysis, I will investigate whether the European legal framework on AI is in contrast with environmental protection ensured under EU primary Law. Considering that the AIA constitutes a Regulation proposed in a non-environmental EU policy field, it must be in line with the principles enshrined in the Treaties. Given that the principle of environmental integration is one of the building blocks of environmental protection within EU Law, I will focus on it in order to assess whether there is a contradiction between the European legal framework on AI and environmental protection as ensured under EU Law.

Finally, the main research question invites us to investigate how the AIA should be modified to be in line with environmental protection ensured under EU Law. To accomplish this, I will concentrate on the risk-based mechanism included in the adopted AIA. Additionally, considering that AI technologies constitute a product, I cannot ignore an alternative approach to ensure environmental protection under EU Law which can greatly enhance EU policy-making and legislation: the environmental risks of AI technologies can be also addressed through the ESPR.

Chapter II: How is environmental protection ensured under EU primary law?

Environmental protection has evolved continuously since the establishment of the European Economic Community. It is a fundamental concept enshrined in the EU Treaties; the Treaty on the European Union, the Treaty on the Functioning of the European Union and the Charter of Fundamental Rights of the EU. In this regard, this Chapter will first delve into the overall progress made in EU Law regarding environmental protection. It will then, examine the relevant provisions of the TEU, the TFEU and the Charter to demonstrate whether legal obligations regarding environmental protection for the EU institutions arise from these provisions. The ultimate objective is to illustrate how environmental protection is ensured under this legal framework.

1. From the concept of environmental protection to the European Green Deal

As there is uncertainty about what the "environment" encompasses,[24] environmental protection as a concept does not have a univocal definition.[25] According to the legal scholars, environmental protection is linked to the notion of a legal obligation to protect and improve ecosystems, environmental components and human health.[26] In this context, "protection" implies the need to safeguard and preserve the environment from numerous threats in order to pass it on to the future generations.[27] Moreover, environmental protection is tied to the concept of environmental justice, which means that it is intricately connected to the recognition of environmental rights, gradually gaining constitutional status worldwide.[28]

At the EU level, the original text of the EEC Treaty did not include any explicit provision regarding the protection of the environment, only an indirect reference to the protection of health and life of humans, animals or plants. This was likely due to the fact that the primary goal of the original Treaties was the establishment of a common

[24] James R. May, Erin Daly, '*Global Environmental Constitutionalism*' (Cambridge University Press 2014) 91
[25] Sikora (n 1) 8
[26] *Ibid* 12
[27] Delphine Misonne, *'Droit européen de l'environnement et de la santé: l'ambition d'un niveau élevé de protection*' (Limal 2011) 10
[28] Sikora (n 1) 25

market.[29] However, the European Community was influenced back to the 1970's by a global trend raising the awareness of the importance of antipollution measures and the energy crisis.[30] In particular, the reason why a homogenous policy in antipollution measures was taken at the European Community level was the potential risk of distortion of competition due to sectorial measures left to the initiative of the single Member States.[31]

The chains of events began when in 1971 the EEC Commission released the "First Communication on Environmental Policy", emphasizing the necessary enactment of a program centred on environmental protection. Subsequently, the European Community adopted a series of Environmental Action Programs outlining specific objectives and principles for environmental protection.[32] These programs provided guidance for the enaction of specific measures at Community level, although they were not legally enforceable.[33] In the initial two Environmental Action Programs, spanning from 1972 to 1981, the preventive action against pollution and "the polluter should pay" principles were set.[34]

Given that environmental policy actions by the Community were difficult to be based on a legal basis of the Treaty Establishing the EEC, the Commission adopted a broad interpretation of Articles 2, 100 and 235 of the EEC Treaty to find some sort of legitimacy. This interpretative approach was confirmed by the European Court of Justice,[35] and the environmental policy at the Community level expanded even further as it became evident with the Third Action Program carried out from 1982 to 1986. The

[29] Francis Jacobs, 'The Role of The European Court of Justice in The Protection of The Environment' (2006) 18 (2) J of Environmental Law 185
[30] Noa Vardi, Vincenzo Zeno-Zencovich, 'From Rome to Nice: A Historical Profifile of the Evolution of European Environmental Law' (2004) 12 (1) Penn St Envtl L Rev 221 <https://elibrary.law.psu.edu/pselr/vol12/iss1/14/> accessed 27.06.2024
[31] Vardi (n 30) 221
[32] Commission, 'First Communication of the Commission about the Community's policy on the environment', SEC (71) 2616 final 1 where the Commission sought to establish a clear definition of the concept of environment - based on a generally accepted understanding - which defines it as "*all the elements which, interacting in complex fashion, shape the world in which we live and move and have our being*".
[33] Vardi (n 30) 222
[34] The first two Environmental Action Programs focused on drinking water quality, water protection, waste prevention of water, air quality and protection.
[35] Case C-91/79 *Commission v Italy* [1980] ECLI:EU:C:1980:85; Case C-92/79 *Commission v Italy* [1980] ECLI:EU:C:1980:86

focus was on the influence of the internal market by environmental policies.[36] In this process of evolution, the Court has played a pivotal role also with its landmark judgment in the *ADBHU* case, in which it recognized environmental protection as "*one of the Community's essential objectives*",[37] without justifying its introduction as an essential objective by reference to any external source or support.[38]

In 1987, the Single European Act introduced several significant changes related to the environment within the EEC. These changes were enacted with the overarching goal of expanding the domains under the competence of the Community. Specifically, the new Articles 130R, 130S and 130T TEC provided for objectives and principles of environmental action,[39] for procedural aspects and for a safeguard clause with the possibility for the Member States to adopt even stricter measures, respectively. Furthermore, the integration principle was introduced according to which "*environmental protection requirements shall be a component of the Community's other policies*". After the SEA, the Fourth Action Program was adopted for the period from 1987 to 1992,[40] aiming at the protection and improvement of environmental quality, at the protection of human health, at a rational management of natural resources, at the development of research and activities at international level, at the integration of environmental policies with other Community policies, and at the coordination and harmonisation between the single national environmental policies.[41]

In 1992, the Maastricht Treaty significantly modified the decisional procedure outlined in Article 130S, by replacing the existing unanimity with a qualified majority, allowing for a greater flexibility in the adoption of environmental policy actions. Additionally, the integration of "environment" into Articles 2 and 3 of the Treaty underscored its importance within the objectives and the policies of the Community, respectively. The Fifth Action Program was enacted in the same year, covering the period between 1993

[36] Elisabeta-Emilia Halmaghi, 'Environmental Action Programs of The European Union – Programs Supporting the Sustainable Development Strategy of The European Union' (2017) 21 (2) Scientific Bulletin 88 <https://sciendo.com/article/10.1515/bsaft-2016-0040> accessed 27.06.2024
[37] Case C- 240/83 *Procureur de la République v ADBHU* [1985] ECLI:EU:C: 1985:59, paras 12-13
[38] Jacobs (n 29) 187
[39] Several of these objectives and principles had been previously developed in the Action Programs.
[40] Commission, 'The continuation and implementation of a European Community policy and action program on the environment' (Communication) COM (1986) 485 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A51986DC0485> accessed 27.06.2024
[41] Vardi (n 30) 233

and 2000 and focusing on sustainable development.[42] Inspired by the 1992 Rio Agenda in which sustainable development emerged as a key topic, this program aimed at reassessing the European Community's policies and actions towards sustainability.[43] One of the key principles was the integration of the environment into all major policy areas, particularly in those policies that cause environmental degradation.[44]

In light of these developments, the Treaty of Amsterdam encompassed the objective of a "*balanced and sustainable development*" in Article 2 without explicitly defining the concept and the objective of achieving a "*high level of protection and improvement of the quality of the environment*" as well. Thus, it can be argued that the focus of the Treaty on sustainable development which requires the responsible use of natural resources, while taking into consideration the economic and environmental interests of both the present and the future generations, gave rise to a principle of environmental protection.[45] Moreover, the new Article 3c established the integration of the environmental situation within the communitarian policy in order to foster sustainable development.[46] This underscores the fact that sustainable development cannot be guaranteed without environmental protection.[47] Therefore the integration should be approached in a vertical and in a horizontal way, which implies the implementation of legal, systematic provisional measures in the environmental field, as well as the consideration of the situation about the environment at the level of all of the communitarian policies.[48] In the following years, the Sixth Environmental Action

[42] Commission, 'Europe's environment: What directions for the future? The global assessment of the European community program of policy and action in relation to the environment and sustainable development, Towards sustainability' (Communication) COM (1999) 0543 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A51999DC0543> accessed 27.06.2024

[43] Luis A. Avilés, 'Sustainable Development and the Legal Protection of the Environment in Europe' (2012) 12 (3) Sustainable Development Law & Policy 31 <https://www.academia.edu/77865054/Sustainable_Development_and_the_Legal_Protection_of_the_Environment_in_Europe> accessed 27.06.2024

[44] Halmaghi (n 36) 89

[45] Avilés (n 43) 31

[46] According to Article 3c TEC, "*environmental protection requirements must be integrated into the definition and implementation of the Community policies and activities referred to in Article 3, in particular with a view to promoting sustainable development*".

[47] Dan Cristian Duran and others, 'The components of sustainable development - a possible approach' (2015) 26 Procedia Economics and Finance 808 <https://www.sciencedirect.com/science/article/pii/S2212567115008497> accessed 27.06.2024

[48] Lucretia Dogaru, 'The importance of environmental protection and sustainable development' (2013) 93 Procedia - Social and Behavioral Sciences 1346 <https://www.researchgate.net/publication/273852254_The_Importance_of_Environmental_Protection_and_Sustainable_Development> accessed 27.06.2024

Program was introduced covering the period between 2002 and 2012,[49] insisting on objectives already set in the past as well as on climate change, biodiversity, environment and health, quality of life, natural resources, and waste.[50]

Nevertheless, it was the Treaty of Lisbon that shaped significantly the legal framework that ensures the protection of the environment in the EU's policies. Firstly, Article 3 (3) TEU includes the Union's commitment to the objectives of sustainable development and a high level of protection and improvement of the quality of the environment. Hence, it is evident that environmental protection and sustainable development remain significant objectives of the European Union.[51] Secondly, it contains three environmental integration principles in Articles 11, 13 and 194 (2) TFEU; a general principle and two specialized principles focusing on animal welfare and the Union's energy policy. Furthermore, the Environment Title (Articles 191-193 TFEU) explicitly addresses climate change, firmly placing it within the ambit of EU environmental policy, and a new Title on Union energy policy (Title XXI) has been introduced. Finally, Article 37 CFR provides for the integration of a high level of environmental protection and the improvement of the quality of the environment into the policies of the Union. This is significant considering the legal status of the Charter as outlined in Article 6 (1) TEU which stipulates that the rights, freedoms and principles of the Charter hold the same legal value as the Treaties.[52] In this context, according to the Seventh Environmental Action Program, called "Living well within the limits of our planet" covering the period from 2013 to 2020, the European Union has "*agreed to make greater efforts to protect our natural capital, stimulate growth and innovation characterized by resource efficiency and low-carbon and protect the health and welfare of humans – within the planet's natural limits*".[53]

[49] Commission, 'Our future, our choice' - The Sixth Environment Action Program' (Communication) COM (2001) 0031 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52001DC0031> accessed 27.06.2024

[50] In terms of environmental changes that the Treaty of Nice introduced in 2001, the revised second paragraph of Article 175 modified the specific areas requiring unanimous decisional procedure.

[51] Hans Vedder, 'The Treaty of Lisbon and European Environmental Law and Policy' (2010) 22 (2) J of Envtl L 287 <https://www-jstor-org.proxy.library.uu.nl/stable/44248736> accessed 27.06.2024

[52] Avilés (n 43) 31

[53] European Parliament and Council Decision (EU) 1386/2013 on a General Union Environment Action Program to 2020 'Living well, within the limits of our planet [2013] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013D1386> accessed 27.06.2024

Following this, the EGD was presented by the Commission in December 2019 demonstrating that environmental protection has become a "*prerequisite of the further evolution of the Union*".[54] This strategy aims to transform the EU into a fair and prosperous society by increasing the EU's greenhouse gas emission reductions target for 2030 to at least 50% and towards 55% compared with 1990 levels in a responsible way.[55] The ultimate objective is to achieve carbon neutrality by 2050. In order to accomplish this, the EGD is set to have a significant impact on all sectors of the European economy through a series of legal developments and political commitments.[56] The roadmap consists of a multitude of actions that will drive the transition towards a sustainable future, such as climate ambition, clean affordable and secure energy, industrial strategy for a clean and circular economy, sustainable and smart mobility, greening the common agriculture policy, preserving and protecting biodiversity, zero pollution and toxic-free environment, mainstreaming sustainability in all EU policies (specifically all new Commission initiatives should be in line with the objectives of the EGD and promote innovation from 2020), and the European Climate Pact.[57] Building upon the EGD, the Eight Environmental Action Program which was announced for the period up to 31 December 2030 fosters an integrated policy and implementation approach. Its objective is to accelerate the green transition to a climate-neutral, sustainable, non-toxic, resource-efficient, renewable energy-based, resilient and competitive circular economy in a just, equitable and inclusive way, and to protect, restore and improve the state of the environment by, inter alia, halting and reversing biodiversity loss.[58]

Nevertheless, the advancements in environmental protection within EU Law also occur at the level of EU secondary law. Based on the EU's shared environmental competence enshrined in Article 4(2)(e) TFEU, a wide array of legislative measures constitutes the body of EU secondary environmental law. Due to the environmental and socio-

[54] Sikora (n 1) 57
[55] COM (2019) 640 4
[56] Elena Loredana Pîrvu, 'The European Green Deal – a Feasible Ambitious Initiative?' (2020) 10 (1) J of Danubian Studies and Research 276 <https://dj.univ-danubius.ro/index.php/JDSR/article/view/483> accessed 27.06.2024
[57] Commission, 'ANNEX to the European Green Deal' (Communication) COM (2019) 640 final <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0640> accessed 27.06.2024
[58] European Parliament and Council Decision (EU) 2022/591 General Union Environment Action Program to 2030 [2022] <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32022D0591> accessed 27.06.2024

economic diversity between Member States directives are more prevalent than regulations. Some of them are designated as 'framework directives', as the Water Framework Directive (2000/60/EC), the Waste Framework Directive (2008/98/EC), and the Marine Strategy Framework Directive (2008/56/EC), since they establish the fundamental policy principles and objectives for specific environmental problems.[59]

Taking everything into account, although a precise definition of the concept of environmental protection has not been established within EU Law, it constitutes a notion that has evolved historically, transforming from a technical policy issue into a constitutional aspect of EU Law.[60] Initially, the European Community aimed to prevent wars and jointly control resources with the internal market serving as a means to these ends.[61] Nonetheless, the EU's goals have evolved and a high level of environmental protection has been raised to the status of a European Union target.[62] More specifically, the concept of environmental protection permeates the EU legal order as a high level of protection and improvement of the quality of the environment constitutes one of the EU objectives according to Article 3 (3) TEU and according to the principle of environmental integration (Article 11 TFEU, Article 37 CFR) where it is rooted,[63] it serves as a prerequisite for fostering sustainable development.

2. Environmental protection under the EU Treaties

2.1. Environmental protection as one of the EU's objectives - Article 3(3) TEU

According to Article 3(3) TEU, the Union shall work, inter alia, for the sustainable development of Europe aiming at a high level of protection and improvement of the quality of the environment. On the one hand, this provision constitutes a concrete expression of the EU's overarching goal of promoting peace, its values and the well-being of its citizens outlined in Article 3(1) TEU. On the other hand, it includes a general objective of the EU in relation to Articles 191-193 TFEU which give effect to

[59] Josephine van Zeben, 'Environmental Law' (The Oxford Encylopedia of EU Law, Oxford Public International Law, March 2022) <https://opil.ouplaw.com/display/10.1093/law-oeeul/law-oeeul-e112> accessed 27.06.2024
[60] Sikora (n 2) 685
[61] Elisabetta Manunza, 'Public procurement Law as an Expression of the Rule of Law: On How the Legislature and the Courts Create a Layered Dynamic Legal System Based on Legal Principles' (2023) 32 (5) Public Procurement L Review 326 <https://dspace.library.uu.nl/handle/1874/433111> accessed 27.06.2024
[62] Case C-195/12 *IBV & Cie* [2013] ECLI:EU:C:2013:598, Opinion of AG Bot, para 82
[63] Sikora (n 2) 685

it.[64] More specifically, the aim to reach a high level of protection and improvement of the quality of the environment enshrined in Article 3(3) TEU is a general objective that applies to the definition and the implementation of all EU policies.[65] Hence, it serves as the basis of a horizontal principle of a high level of protection and improvement of the quality of the environment.[66] In contrast, the same objective based on Article 191(2) TFEU shall be ensured as regards to the environmental policy of the Union, and thus its scope of application is limited and specified.

There are no further specifications about what constitutes a high level of environmental protection.[67] Even though the CJEU through the interpretation of the Treaties has played an important role in the European integration, it has refrained from defining the specific requirements of a high level of environmental protection on the grounds that it would interfere with the discretion of the EU legislator regarding the appropriateness of EU measures, limiting itself to examine manifest errors of assessment made by the legislators.[68] However, it should be noted that according to the CJEU's case law, [69] a high level of environmental protection ensured under Article 191 TFEU does not mandate that any EU policy in the environmental field must necessarily ensure the highest level that is technically possible.[70]

In terms of its legal implications, this provision lacks enforceability.[71] Despite its legally binding nature, Article 3(3) TEU does not refer specifically to the individual measures of a policy, but rather to the EU's policies as a whole.[72] Given that the policies shall pursue a high level of environmental protection, it also can always be contended that they are on their way towards achieving this goal.[73] Additionally, building on the

[64] Sikora (n 1) 78
[65] Hermann-Josef Blanke, Stelio Mangiameli, *'The Treaty on European Union (TEU) - A Commentary'* (Springer 2013) 173
[66] Blanke (n 65) 173
[67] Helle Tegner Anker, 'Competences for EU Environmental Legislation: About Blurry Boundaries and Ample Opportunities' in Peeters and Eliantonio (eds) in *Research Handbook on EU Environmental Law* (Edward Elgar Publishing 2020) 8
[68] Case C-343/09 *Afton Chemical* [2010] EU:C: 2010:419, para 28; Case C-5/16 *Poland v Parliament and Council* [2018] ECLI:EU:C: 2018:483, para 150
[69] Case C-284/95 *Safety Hi-Tech* [1998] EU:C: 1998:352, para 49; Case C-341/95 - *Bettati v Safety Hi-Tech* [1998] ECLI:EU:C:1998:353, para 47
[70] Delphine Misonne, 'The Importance of Setting a Target: The EU Ambition of a High Level of Protection' (2015) 4 (1) Transnational Environmental Law 18 <https://doi.org/10.1017/S2047102514000284> accessed 27.06.2024
[71] Sikora (n 1) 75-76
[72] Ludwig Kramer, *'EU Environmental Law'* (Sweet & Maxwell 2015) 13
[73] Kramer (n 72) 13

earlier discussion regarding the lack of a definition for "a high level of environmental protection" by the CJEU, it becomes clear that the provision cannot be enforced, as doing so would result in a violation of the wide discretion of the EU institutions.[74] Nevertheless, as one of the fundamental objectives of the EU it serves as an interpretative tool of the Treaties' provisions giving effect to them.[75]

2.2. Environmental protection under the fundamental principle of environmental integration - Article 11 TEU

The concept of environmental integration has its origins in International Law as a fundamental component of sustainable development. It was initially introduced in Article 13 of the Stockholm Declaration and further reinforced in Principle 4 of the Rio Declaration on Environment and Development as adopted by the United Nations Conference on Environment and Development in Rio de Janeiro in 1992.[76] By using the term environmental integration, the transversal character of environmental law is reflected given that each component of the environment relies on one another making any intervention inevitably generate a significant impact.[77]

At the EU level, environmental integration constitutes one of the oldest integration clauses of the EU primary law which were progressively introduced as part of the Union's broader policy coherence efforts.[78] It first emerged as a concept in the First Environmental Action Program and was initially included in EU primary law in 1987 through the addition of a title on the environment by the SEA.[79] The Amsterdam Treaty

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[74] *Ibid*

[75] Case C-379/15 *Association France Nature Environnement* [2016] ECLI:EU:C: 2016:603, para 35; Case C-129/16 *Túrkevei Tejtermelő Kft.* [2017] EU:C: 2017:547; Case C-723/17 *Craeynest and Others* [2019] ECLI:EU:C:2019:533, para 33

[76] Hannes Veinla, 'Scope and Substance of the Integration Principle in EC Law and Its Application in Estonia' (2008) 14 Juridica Intl L Review University Of Tartu 4 <https://www.juridicainternational.eu/article_full.php?uri=2008_XV_4_scope-and-substance-of-the-integration-principle-in-ec-law-and-its-application-in-estonia> accessed 27.06.2024. According to the Principle 4, "*In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it*".

[77] Hermann-Josef Blanke, Stelio Mangiameli, '*Treaty on the Functioning of the European Union –A Commentary Volume I: Preamble, Articles 1-8* ' (Springer 2021) 307

[78] Gracia Marín Durán and others, '*Environmental Integration in the EU's External Relations: Beyond Multilateral Dimensions*' (Bloomsbury Publishing Plc 2012) 26. Namely, new grounds of integration requirements have been introduced such as requirements linked to the promotion of a high level of employment and consumer protection requirements (Articles 8–13 TFEU).

[79] Ludwig Kramer, 'The genesis of EC environmental principles' (2003) 7 Research Paper in Law 4-5 <https://aei.pitt.edu/39393/> accessed 27.06.2024. According to Article 130r (2) ECC "*environmental protection requirements shall be a component of the Community's other policies*".

significantly elevated the status of the environmental integration to a principle, by including it among the general principles of the Treaty and linking it with sustainable development (Article 6 TEC).[80] Thus, it is argued that the EU legislature underscored through this formulation that this principle links environmental policy and all other policies and activities carried out by the EU.[81]

In the Lisbon Treaty, the environmental integration principle enshrined in Article 11 TFEU states that "*environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development*". Specifically, the classification of the environmental integration duty as a principle can be justified by the "strong" wording of the relevant provision associated with the fundamental objective of sustainable development, its sufficiently abstract content and its adoption by the EU Courts as a standard to review the validity of the EU secondary legislation adopted in a specific sector and its potential impact on the environment.[82]

The rationale behind this principle is that environmental concerns should not be restricted solely to an explicitly designated "environmental policy", but rather integrated into other policy areas such as agriculture, energy, internal market, trade, fisheries, transport, industry, tourism, economic and financial affairs in order to effectively enhance environmental protection.[83] The reason for this is that environmental policy is not a standalone collection of specific actions aimed at protecting natural elements. The environment can be affected by other policies and thus greening all EU policies is necessary.[84] Hence, the question arises: how exactly is this principle understood?

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[80] Jan H. Jans, 'Stop the Integration Principle?' (2011) 33 (5) Fordham Intl L J 1538 <https://ir.lawnet.fordham.edu/ilj/vol33/iss5/8/> accessed 27.06.2024

[81] Durán (n 78) 25

[82] Vasiliki Karageorgou, 'The Environmental Integration Principle in EU Law: Normative Content and Functions also in Light of New Developments, such as the European Green Deal' (2023) 8 European Papers 164-165 <DOI:10.15166/2499-8249/645> accessed 27.06.2024

[83] Kleoniki Pouikli, 'Towards mandatory Green Public Procurement (GPP) requirements under the EU Green Deal: reconsidering the role of public procurement as an environmental policy tool' (2021) 21 ERA Forum 706 <https://doi.org/10.1007/s12027-020-00635-5> accessed 27.06.2024

[84] Kramer (n 72) 21

As to its legal strength, the integration of environment-related requirements into the other policies constitutes a legally binding obligation ('*must be integrated*').[85] According to the CJEU case law, Article 11 TFEU reflects the principle whereby all EU measures must satisfy the requirements of environmental protection.[86] However, this does not mean that the achievement of environmental integration requirements precedence over other EU policies objectives.[87] The EU institutions have to strive to balance all the EU objectives,[88] and achieve them through their policies which is also mandated by Article 7 TFEU.[89] Nonetheless, the process for resolving potential conflicts between environmental protection and another EU policy is not specified in Article 11 TFEU.[90] Considering this, EU institutions have a wide margin of discretion in implementing this principle assessing competing principles or interests.[91]

However, their discretion is constrained by the objective of sustainable development, as outlined in Article 11 TFEU. This necessitates legislative instruments or decisions to ensure a sufficient level of environmental protection in order to contribute to the attainment of the aforementioned objective.[92] It is argued that their discretion is further

[85] Kramer (n 72) 21. In contrast, the other integration clauses (Articles 9, 12, 13 TFEU) use the terms 'shall aim at' or 'shall take into account'.

[86] Case C- 62/88 *Greece v Council* [1990] ECLI:EU:C:1990:153, para 20; Case C-300/89 *Commission v. Council* [1991] ECLI:EU:C:1991:244, para 22; Case C-379–98 *Preussen Elektra* [2001] ECLI:EU:C:2001:160, Opinion of AG Jacobs, para 231 '*as its wording shows, [Article 11 TFEU] is not merely programmatic: it imposes legal obligations*'; Case C-440/05 *Commission v. Council* [2007] ECLI:EU:C:2007:625, para 60

[87] Case C-161/04 *Austria v Parliament and the Council* [2006] ECLI:EU:C:2006:66, Opinion of AG Geelhoed, para. 59; Joined cases C-204/12 to C-208/12 *Essent Belgium NV* [2014] ECLI:EU:C:2013:294, Opinion of AG Bot, para 97. See also by analogy the Case C-233/94 *Germany v Parliament* and Council [1997] ECLI:EU:C: 1997:231, para 48

[88] Julian Nowag, '*Environmental integration in competition and free-movement laws*' (Oxford University Press, 2016) 30

[89] Kramer (n 72) 21; See also Ester Herlin-Karnell, Theodore Konstadinides, *'The Rise and Expressions of Consistency in EU Law: Legal and Strategic Implications for European Integration*' (2012-2013) 15 Cambridge Yearbook of European Legal Studies.

[90] Jan H. Jans, Hans H.B. Vedder, '*European Environmental Law*' (Europa Law Publishing Groningen, The Netherlands 2008) 18. Jans and Vedder argue that such conflicts should be resolved based on the case law established by the CJEU in accordance with the principle of proportionality.

[91] Kramer (n 72) 22

[92] Karageorgou (n 82) 165; Elisa Morgera, Gracia Marin-Duran 'Commentary to Article 37 – Environmental Protection of the EU Charter of Fundamental Rights' in Peers, Hervey, Kenner and Ward (eds) in *Commentary on the EU Charter of Fundamental Rights* (Hart 2021) 17. Regarding the legal significance of the environmental integration principle, there are three views on the matter in the scholarship. According to the first interpretation, the principle can be considered largely as a procedural tool, and thus the EU decision-makers have simply the duty to 'take into account' environmental concerns in the development of other Union policies while enjoying a broad discretion as to whether or not to adjust such policies in practice. Based on the second interpretation, integration of environmental concerns into other Union policies should be substantive, yet this does not mean that environmental protection precedence over other EU policy objectives. According to the third interpretation, environmental protection requirements shall be applied at all times in priority to other policy objectives.

limited when environmental interests are closely linked to social interests, thereby prioritizing them over economic interests to achieve the EU's aims outlined in Article 3(1) TEU.[93]

Another central issue that arises is the content of the "environmental protection requirements" that must be integrated. This includes the objectives outlined in Article 3(3) TEU and Article 191(1) TFEU, as well as the principles laid down in Article 191(2) TFEU.[94] Therefore, the measures taken in other policies should focus, among other things, on preserving, protecting and improving the quality of the environment as well as promoting sustainable development.[95] This broad interpretation results in the EU institutions having a general obligation to integrate all the relevant environmental aspects into the adoption of other policies.[96]

Regarding its material scope of application, the environmental integration principle applies to all policies of the EU, such as the Common Agricultural Policy, the Fisheries Policy and the internal market policies, as well as to EU activities.[97] In other words, it applies not only to the adoption of policies or legislation, but also to the adoption of individual decisions, like those related to competition and state aid decisions. Its application shall take place both at the stage of definition and at the stage of implementation, which means that the principle is relevant at all stages of the EU legislative processes (policy objectives' definition, development of proposals, adoption and review of policies and legislation) as well as in the adoption of further implementing acts and enforcement measures.[98]

When considering legislation in other policy areas, it is argued that the principle of environmental integration requires compliance with environmental protection requirements in both procedural and substantive law.[99] For example, procedural

[93] Inci Kıran, 'The Analysis of Constitutional Role of Sustainability in EU Public Procurement Law' (Master Thesis, Utrecht University 2023) 12
[94] Durán (n 78) 29
[95] Case C-157/96 *The Queen v Ministry of Agriculture, Fisheries and Food and Commissioners of Customs & Excise, ex parte National Farmers' Union and Others* [1998] ECLI:EU:C:1998:191, paras 63-64; Case C-180/96 *United Kingdom v Commission* [1998] ECLI:EU:C:1998:192, paras 99-100
[96] Nowag (n 88) 25; Jans (n 90) 17
[97] Karageorgou (n 82) 166. This is further confirmed by Article 7 TFEU which requires the Union to ensure consistency between all its policies and activities.
[98] Durán (n 78) 30
[99] Pouikli (n 83) 706; Geert Van Calster, Leonie Reins, '*EU Environmental Law*' (Elgar European Law series 2017) 23-24

integration is present in the Environmental Impact Assessments which are obligatory under the EIA Directive for certain projects,[100] while integration into substantive legislation can be found into the Regulation on shipments of waste which includes legal rules for environmental protection in relation to trade measures.[101]

The addresses of the integration requirements are the EU institutions, particularly the Commission, the Council and the European Parliament. When performing their tasks in accordance with the Treaties, they have the obligation to ensure that the environmental integration duty is fully realized promoting sustainable development sufficiently.[102] Furthermore, as the integration concerns also the 'implementation', other EU institutions, such as agencies may be covered.[103] As for the EU Member States, the environmental integration principle does not have implications for them.[104] However, it is argued that based on the duty of loyalty and cooperation in Article 4(3) TEU, the Member States have duties emerging from the overarching objectives and the principle-based rules of the Treaties.[105] Besides, according to Article 291(1) TFEU the 'implementation' of EU binding legal acts constitutes an obligation of the Member States. Therefore, there are indirect implications for the Member States and thus, they have the responsibility to follow the objective of sustainable development codified in the environmental integration principle.[106]

The environmental integration principle has served several functions in the judicial review. In particular, the CJEU has used Article 11 TFEU in determining the correct legal basis by stating that the environmental integration principle allows for the pursuit of environmental objectives through measures established under a legal basis other than Article 192 TFEU.[107] In its previous version, the provision was also applied by the Court for the expansion of the EU environmental competence in the field of criminal

[100] Directive 2011/92/EU of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification)
[101] Regulation (EC) No 1013/2006 of the of 14 June 2006 on shipments of waste
[102] Beate Sjåfjell, 'The environmental integration principle - A necessary step towards policy coherence for sustainability' in Ippolito, Bartoloni, Condinanzi (eds) in *The EU and the Proliferation of Integration Principles under the Lisbon Treaty* (Routledge 2014) 113
[103] Durán (n 78) 30
[104] Durán (n 78) 30-31; Karageorgou (n 82) 165
[105] Sjåfjell (n 102) 118
[106] Sjåfjell (n 102) 117; Veinla (n 76) 6
[107] *Greece v Council* (n 86), paras 18-20; *Commission v Council* [1991] (n 86), paras 22-24; Case C-336/00 *Republik Österreich v Martin Huber* ECLI:EU:C:2002:509, para 36; *Commission v. Council* [2007] (n 86), para 60; Case C-411/06 *Commission v Parliament and Council* [2009] ECLI:EU:C:2009:518, Opinion of AG Maduro, para 17

law by enacting secondary EU Law provisions, which was necessary to ensure that the laid down rules on environmental protection were fully effective.[108] Moreover, the environmental integration principle has been used to interpretate EU legal provisions other than those of environmental legislation for the promotion of the environmental objectives.[109]

Nevertheless, the consideration of the environment when shaping EU sectoral policies constitutes a principle whose degree of legal enforceability is not easily inferred from the CJEU case law. It can be argued that its legal enforceability is probably limited[110] due to the lack of clarity regarding the substantive content of the principle, the consequences of integration and the specific obligations that arise from it in association with the objective of sustainable development.[111] The CJEU has only indirectly examined the compatibility of secondary legislation in a traditionally economic area with the objective of environmental protection in light of the environmental integration principle.[112] The Court has also ruled that the Commission, pursuant to the Articles 37 CFR, 11 TFEU, 194(1) TFEU and the EU rules on environmental protection, bears a positive obligation to assess whether the activity for which aid is granted, is in line with EU environmental legislation when assessing whether state aid is compatible with Article 107(3)(c) TFEU.[113]

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[108] Case C-176/03 *Commission v Council* [2005] ECLI:EU:C:2005:542, para 48

[109] Case C-379/98 *Preussen Elektra* [2001] ECLI:EU:C:2001:160, paras 73-76; Case C-573/12 *Ålands Vindkraft AB* [2014] ECLI:EU:C:2014:2037, paras 77-80; Case C-549/15 *E.ON Biofor Sverige AB* [2017] ECLI:EU:C:2017:490, paras 64-70

[110] Gyula Bándi, 'Principles of EU Environmental Law Including (the Objective of) Sustainable Development' in Peeters and Eliantonio (eds) in *Research Handbook on EU Environmental Law* (Edward Elgar Publishing 2020) 42

[111] Pouikli (n 83) 706; Karageorgou (n 82) 173

[112] Case C-513/99 *Concordia Bus Finland* [2002] ECLI:EU:C: 2002:495, para 57

[113] Case C-390/06 *Nuovo Agricast SrL* [2008] ECLI:EU:C:2008:224, paras 50-51. The Court held that "*it is clear from the general scheme of the Treaty that the procedure under Article 88 EC must never produce a result which is contrary to the specific provisions of the Treaty (see, inter alia, Case C-204/97 Portugal v Commission [2001] ECR I-3175, paragraph 41, and Case C-456/00 France v Commission [2002] ECR I-11949, paragraph 30). Accordingly, State aid, certain conditions of which contravene other provisions of the Treaty, cannot be declared by the Commission to be compatible with the common market (see Case C-113/00 Spain v Commission [2002] ECR I-7601, paragraph 78 and the case-law cited there)*"; Case C-594/18 *Austria v Commission* [2020] ECLI:EU:C: 2020:742, para 100. This judgment reversed the ruling that was adopted by the General Court [Case T-356/15 *Austria v Commission* [2018] ECLI:EU:T:2018:439] stating that the Commission is not obliged to assess the compatibility of state aid with EU environmental legislation, as environmental protection does not constitute *per se* one of the components of the internal market (paras 514-518). Similarly, in the Case T-57/11 *Castelnou Energía v Commission* [2014] ECLI:EU:T:2014:1021, the Court stated that the Commission is obliged to evaluate the conformity of an activity for which aid is granted with the EU environmental legislation when the aid aims to accomplish environmental protection goals (paras 187-189).

Considering the limited case law mentioned above, it is argued that the Court should concentrate on what the environmental integration principle in Article 11 TFEU entails for every EU Law area.[114] In case that the Court deals with Treaty infringement cases against a Member State, actions against other EU institutions for Treaty's infringement, preliminary rulings regarding the interpretation of EU Law, or evaluates the legality of legislative acts by the other EU institutions, it is obliged to adhere to the environmental integration principle and ensure that all the EU institutions involved also have implemented it.[115] Particularly, the Court should declare the secondary legislation to be void if it leads to environmental degradation breaching this integration principle,[116] since the latter is amenable to judicial review.[117] In any case, the Court can limit itself to verify that the competent institution manifestly exceeded the limits of its discretion or misused its powers[118] given that the environmental integration is important as a Treaty-based principle.[119]

2.3. Environmental protection in the EU Charter of Fundamental Rights - Article 37 CFR

While the Charter of Fundamental Rights in Articles 51 and 52 makes a distinction between 'rights' and 'principles', it does not contain a clear list of rights and principles.[120] Articles 51(1) and 52(5) CFR reflect the reluctance of several Member States to include certain economic and social rights in the Charter.[121] As a result, social and economic rights have emerged in the form of principles, that shall be observed.[122]

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[114] Beatle Sjåfjell, 'The legal significance of Article 11 TFEU for EU institutions and Member States' in Sjåfjell and Wiesbrock (eds) in *The Greening of European Business under EU Law: Taking Article 11 TFEU Seriously* (Routledge 2015) 63 < https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2530006 > accessed 27.06.2024

[115] Sjåfjell (n 102) 113

[116] Durán (n 78) 32

[117] Jans (90) 21

[118] Case C-331/88 *The Queen v Minister of Agriculture, Fisheries and Food and Secretary of State for Health, ex parte: Fedesa and others* [1990] ECLI:EU:C:1990:391, para 8; Case C-120/97 *Upjohn v The Licensing Authority* [1999] ECLI:EU:C:1999:14, para 34

[119] Sjåfjell (n 102) 115

[120] Eloise Scotford, 'Environmental Rights and Principles in the EU Context: Investigating Article 37 of the Charter of Fundamental Rights' in Rayfuse, R and Bogojevic, S (eds.) *Environmental Rights in Europe and Beyond* (Hart Publishing 2018) 10

[121] Koen Lenaerts, 'Exploring the limits of the EU Charter of Fundamental Rights' (2012) 8(3) European Constitutional Law Review 399 <https://discovery.ucl.ac.uk/id/eprint/10047282/> accessed 27.06.2024

[122] Jasper Krommendijk, 'Principled Silence or Mere Silence on Principles? The Role of the EU Charter's Principles in the Case Law of the Court of Justice' (2015) 11 European Constitutional Law Review 334 <https://doi.org/10.1017/S1574019615000164> accessed 27.06.2024. Article 51(1) CFR provides that "*[the institutions and bodies of the Union] shall therefore respect the rights, observe the principles and promote the application thereof in accordance with their respective powers*". It is argued that the verbs

Unlike classic civil and political rights, they are not subject to individual legal action, rather they guide policy making by the legislator.[123]

The classification of social and economic rights as principles in the meaning of Article 52(5) CFR does not necessarily classify them as general principles of EU Law. General principles are general rules, that can be enforced and directly relied upon.[124] The 'principles' mentioned in the Charter addressed to the institutions, bodies, offices and agencies of the Union, and to the Member States "*only when they are implementing Union law*",[125] are programmatic and aspirational provisions in nature. Therefore, they are judicially cognisable in the interpretation and in the ruling on the legality of legislative or executive acts that implement them.[126]

Article 37 CFR, entitled 'Environmental protection' appears within the 'Solidarity Title' among social and economic rights. It states that "*a high level of environmental protection and the improvement of the quality of the environment must be integrated into the policies of the Union and ensured in accordance with the principle of sustainable development*". According to the Explanatory notes, the legal content of this provision does not express a fundamental right, but rather a principle.[127] This has been confirmed by the CJEU which held that this provision "*only contains a principle providing for a general obligation on the European Union in respect of the objectives to be pursued in the framework of its policies*" and not an individual "*right to bring actions in environmental matters before the Courts of the European Union*".[128] Article

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"respect" and "observe" are synonymous. However, it is also contended that the obligation to "observe" the principles carries less weight than the obligation to "respect" the rights.

[123]Explanations relating to the Charter of Fundamental Rights [2007] OJ C 303/17 (Explanatory Notes) 35, the principles do not "*give rise to direct claims for positive action by the Union's institutions or Member States authorities*"; Lord Goldsmith, 'A Charter of Rights, Freedoms and Principles' (2001) 38 Common Market Law Review 1205 <https://www.biicl.org/files/3272_goldsmith.pdf> accessed 27.06.2024 The Courts can use the principles enshrined in the Charter only when they interpretate or review acts adopted by the Union and by the Member States, only when they implement EU Law.

[124] Paul Graig, Grainne de Burca, '*EU LAW*' (Oxford University Press 2020) 582

[125] Takis Tridimas, 'Fundamental Rights, General Principles of EU Law, and the Charter' (2014) 16 Cambridge Yearbook of European Legal Studies 382 <DOI: https://doi.org/10.1017/S1528887000002676> accessed 27.06.2024

[126] Sikora (n 1) 130-131

[127] Ottavio Quirico, 'Integrating Human Rights and Environmental Duties: Prospective Implications of Article 37 of the EU Charter of Fundamental Rights' (2021) 39 (1) Intl L J 56 <https://www.bu.edu/ilj/files/2023/01/Quirico.pdf> accessed 27.06.2024. In addition, Article 37 does not include the phrase "*everyone has the right to*" which is the customary formulation of typical subjective rights, rather it addresses EU institutions, notably the Commission, Parliament and Councils. Moreover, it can be argued that Article 37 CFR is sufficiently clear and unconditional. Therefore, it creates obligations directly binding for EU Member States vis-a-vis their citizens.

[128] Case T-600/15 *Pesticide Action Network Europe v Commission* [2016] ECLI:EU:T:2016:601, para 47

37 CFR demonstrates the absence of a consensus among EU Member States regarding the recognition of a substantive human right to a healthy environment, as well as on a procedural environmental right.[129] Likewise, neither the Aarhus Convention nor the ECHR contained such a 'substantive' human right.[130] Nonetheless, this does not mean that its legal effects as a principle cannot indirectly impact the legal protection of individuals.

According to the Explanatory notes of the Charter, the principles outlined in Article 37 CFR have been based on Articles 2, 6 and 174 of the EC Treaty, now replaced by Article 3(3) TEU and Articles 11 and 191 TFEU, while also incorporating elements from the provisions of some national constitutions.[131] Specifically, Article 11 TFEU constitutes the main source of Article 37 CFR as regards to the meaning of environmental integration in EU Law. Nevertheless, it is important to note that these two legal provisions are not identical, which means that Article 37 necessitates an authoritative legal interpretation.

One difference that emerges from the language of these two provisions is that Article 37 CFR refers to a 'high level of environmental protection' and to the 'improvement of the quality of the environment'. Regarding the term 'high level of environmental protection', as mentioned earlier the CJEU has stated that such a level of protection does not necessarily have to be the highest that is technically possible given that Member States are allowed to adopt and maintain more stringent environmental protection measures than those adopted at EU level based on Article 193 TFEU.[132] By using the expression 'improvement of the quality of the environment' it is possibly implied that any measure leading to environmental deterioration is not in alignment with Article 37 CFR.[133] On the other hand, Article 11 TFEU refers more broadly to 'environmental protection requirements' which includes the objectives outlined in

[129] Morgera (n 92) 10
[130] The European Court of Human Rights has dynamically greened the ECHR by emphasizing existing human rights in the Convention, relying mostly on the right to life (Article 2 ECHR) and the right to respect for private and family life: *Kapa and others v Poland* App no 75031/13, 75282/13, 75286/13 και 75292/1314 (ECtHR, 14 October 2021); *Verein Klimaseniorinnen Schweiz and others v Switzerland* App no 53600/20 (ECtHR, 9 April 2024)
[131] Explanatory Notes (n 123) 27
[132] Misonne (n 70) 18
[133] Morgera (n 92) 13

Article 3(3) TEU and Article 191(1) TFEU, as well as the principles laid down in Article 191(2) TFEU.[134]

Moreover, Article 37 CFR solely pertains to the integration of environmental concerns into the policies of the Union, whereas Article 11 TFEU encompasses the Union's activities as well. Thus, the Charter takes a more stringent approach excluding activities that are not explicitly identified as 'policies' of the EU in the Treaties.[135] Additionally, both Article 37 CFR and Article 11 TFEU are linked to 'sustainable development', but in a different way. Article 11 TFEU emphasizes the importance of the realisation of sustainable development as a broader 'objective' of environmental integration, whereas Article 37 CFR highlights sustainable development as the guiding principle for environmental integration.[136]

The literal interpretation of Article 37 CFR suggests that the principle of environmental integration under the Charter is more restrictive than that of the EU Treaties. Nonetheless, there is a compelling argument that Article 37 CFR should be interpreted in light of Article 11 TFEU, one of its sources, for ensuring a balanced and cohesive connection between the Charter and the EU Treaties.[137] This is important considering the legal implications of Article 37 CFR which places a legal obligation on the EU institutions, similar to Article 11 TFEU, to integrate environmental considerations into Union policies.[138] When read narrowly and in isolation, its justiciability and enforceability as a principle of the Charter are limited under Article 52(5) CFR.[139] It can be only invoked to interpret or assess the legality of legislative or executive acts that implement the principle of environmental integration. It does not apply to the interpretation or legality of EU acts that do not implement the principle. This is inconsistent with Article 11 TFEU articulating the environmental integration principle, a principle of EU Law, which the CJEU has been applied to review the legality of EU

[134] Durán (n 78) 29
[135] Morgera (n 92) 14
[136] *Ibid*
[137] Morgera (n 92) 16
[138] Quirico (n 127) 58; *Essent Belgium NV* (n 87). The Advocate General Bot stated that Article 37 CFR "*does not require that priority should always be given to environmental protection*," but means that it "*be routinely balanced against the European Union's other fundamental objectives*". However, as stated earlier, when environmental interests are closely related to social interests, they should take precedence over economic interests to achieve the EU's aims set out in Article 3(1) TEU. This is because inter-generational equity and intra-generational equity will be achieved only in this way. Kıran (n 93) 10
[139] *Ibid* 19

acts regardless of whether they implement the principle of environmental integration or not.[140] Accordingly, Article 37 CFR should be interpreted in light of the principle of EU Law enshrined in Article 11 TFEU giving it a broader justiciability and enforceability than that of Article 52(5) CFR.

To conclude, Article 37 CFR can contribute to the objective of a high level of protection and improvement of the quality of the environment in combination with Article 11 TFEU.[141] Any piece of EU legislation causing a harmful effect on the environment violates the principle of environmental integration enshrined in both Articles and may be annulled by the Court.[142]

3. Conclusion: Ensuring environmental protection through the principle of environmental integration

Based on the analysis provided, it can be inferred that environmental protection is a well-established concept in the Treaties of the EU. However, its explicit definition is not found in the analysed provisions. This does not diminish the importance that environmental protection has obtained in the EU legal order. Article 3(3) TEU is noteworthy as it constitutes one of the building blocks of this concept. According to this provision a high level of protection and improvement of the quality of the environment is a general objective that the Union shall strive to achieve. While the precise content of this provision has not been explored by the CJEU, it is clear that it does not mandate that any EU policy in the environmental field must ensure the highest possible level of protection.[143] Furthermore, as an objective it may not be enforceable, but it does impose a horizontal legal obligation on the EU institutions to strive for this specific objective in the exercise of their duties.

Building upon this, Article 11 TFEU plays a crucial role in pursuing the aforementioned objective. It establishes a principle that requires all EU measures to incorporate environmental protection requirements to ensure environmental protection in the pursuit of sustainable development. The significance of this provision towards

[140] *Concordia Bus Finland* (n 112); *Nuovo Agricast SrL* (n 113)
[141] Sikora (n 1) 134
[142] Morgera (n 92) 16. However, such a breach may be difficult to prove because of the broad margin of discretion of the EU political institutions [*Afton Chemical* (n 68)].
[143] Misonne (n 70) 18

environmental protection lies in the fact that every EU measure – whether in the environmental and non-environmental realm – must be shaped in a way that it preserves, protects and improves the quality of the environment with a view towards sustainable development. This legal obligation is directed at EU institutions, particularly the Commission, the Council and the European Parliament which are required to integrate environmental considerations at all stages of the EU legislative processes.

In addition, the legal framework for ensuring a high level of environmental protection is further strengthened by the inclusion of Article 37 CFR given the binding legal nature of the Charter. Its status as a principle of the Charter does not elevate it to a general principle of EU Law. However, its significance goes beyond being a mere programmatic provision given its correlation with Article 11 TFEU. With regard to its enforceability, while the principle of environmental integration may appear more stringent under Article 37 CFR than that of the EU Treaties based on a literal interpretation of this provision under Article 52(5) CFR, Article 37 CFR should be interpreted in light of Article 11 TFEU, as the latter serves as one of its principal sources.

Considering this legal framework, it can be concluded that when EU institutions shape EU sectoral policies, they must exercise their power by ensuring a high level of protection and improvement of the quality of the environment. More concretely, when they shape these policies they shall take into account environmental protection requirements – i.e. the preservation, protection and improvement of the quality of the environment – to attain sustainable development. Hence while the legal obligation deriving from Article 3(3) TEU may not be enforceable, the principle of environmental integration provides a basis to hold EU institutions accountable with regard to this objective. Despite its limitations, environmental integration is a Treaty-based principle that can be directly invoked, and the CJEU shall annul secondary legislation if an EU institution clearly exceeds the limits of its discretion or misuses its powers.[144]

[144] Kramer (n 72) 23

Chapter III: The twofold role of AI in relation to the environment and the European legal framework on AI

1. AI and environment: an opportunity or a great challenge?

There are numerous reasons why AI is receiving increasing attention, one of which is its potential to make a significant contribution to environmental protection. This is because it is recognized as a key driver for facilitating the reduction of greenhouse gas emissions across various sectors.[145] Indeed, it is argued that the Sustainable Development Goals outlined in the EGD - reflecting the significance of environmental protection for the further evolution of the Union - can be achieved by the use of AI technologies.[146]

Regarding the energy sector, specifically the buildings sector, AI can play a vital role in addressing energy consumption and greenhouse gas emissions during both the use and the construction phases of the building, and in optimising renewable energy production. Furthermore, AI can optimise the design of energy-efficient vehicles in the transport sector,[147] and has the potential to greatly benefit the agricultural sector by providing solutions to improve the efficiency of irrigation water use and the proper use of agricultural inputs,[148] thereby aiding in climate change mitigation. In relation to other areas addressed by the EGD, AI can facilitate designers in accelerating the design of products, components and materials within the context of the circular economy.[149] It can also optimise and control pollutant removal from the environment,[150] contributing to the fight against pollution. Finally, it is an instrument that can help in the prediction of climate change and its precise and regional impacts enabling a more effective approach towards climate change adaptation, as well as in the planning of habitats' conservation,[151] ensuring the conservation of invaluable ecosystems.

[145] Gailhofer (n 18) 22
[146] COM (2020) 65 final 2
[147] Gailhofer (n 18) 23
[148] *Ibid* 26
[149] *Ibid* 27
[150] *Ibid* 28
[151] *Ibid* 29

Nonetheless, because of its increasing use concerns arise as AI constitutes a significant emitter of carbon.[152] During the training of AI models, significant carbon dioxide emissions are produced.[153] For instance, a single AI model training can emit carbon dioxide equivalent to the lifetime of five cars.[154] Explicitly, powering more than 17 homes for a year is equivalent to the training of Google's chatbot Meena.[155] Furthermore, since AI models process data in order to give results, the storage of data in big data centres is required which means consumption of a lot of energy.[156] However, concerns about their environmental impact may come into play from the very beginning of their lifecycle i.e. during the extraction of resources, and extend to the end of their life due to the production of e-waste that is very hard to recycle.[157] This may further exacerbate the global environmental impact of computing industry.[158]

In response to these concerns, international organizations have addressed the environmental impacts of AI with the aim of tackling these challenges. The OECD has issued a Recommendation that, recognizing the twofold role of AI regarding environmental protection, incorporates inclusive growth, sustainable development and well-being among the principles for responsible stewardship of trustworthy AI.[159] Similarly, the Council of Europe has agreed upon a Convention on AI the preamble of which acknowledges the need to address "*specific challenges which arise throughout the lifecycle of artificial intelligence systems*" and to encourage the consideration of the broader risks and impacts related to these technologies including, inter alia, the environment.[160]

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[152] Wong (n 20)
[153] Payal Dhar, 'The carbon impact of artificial intelligence' (2020) 2 Nature Machine Intelligence 423-425 <https://doi-org.proxy.library.uu.nl/10.1038/s42256-020-0219-9> accessed 27.06.2024
[154] Nishant (n 11) 7
[155] Jeremy Khan, 'A.I.'s carbon footprint is big, but easy to reduce, Google researchers say' (Fortune, 22 April 2021) <https://fortune.com/2021/04/21/ai-carbon-footprint-reduce-environmental-impact-of-tech-google-research-study/> accessed 27.06.2024
[156] Annette Ekin, 'AI can help us fight climate change. But it has an energy problem, too' (Horizon The EU Research and Innovation Magazine, September 2019) <https://projects.research-and-innovation.ec.europa.eu/en/horizon-magazine/ai-can-help-us-fight-climate-change-it-has-energy-problem-too> accessed 27.06.2024
[157] C. Vincent Müller, 'Ethics of Artificial Intelligence and Robotics' (The Stanford Encyclopedia of Philosophy, 2023) <https://plato.stanford.edu/archives/fall2023/entries/ethics-ai/> accessed 27.06.2024
[158] Pagallo (n 21) 368
[159] OECD, 'Recommendation of the Council on Artificial Intelligence' (22.05.2024) OECD/LEGAL/0449 <https://legalinstruments.oecd.org/en/instruments/oecd-legal-0449#supportDocuments> accessed 27.06.2024
[160] Council of Europe, 'Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law' (Committee on Artificial Intelligence, 17 May 2024) CM (2024) 52-final 2 <https://www.coe.int/en/web/artificial-intelligence/cai> accessed 27.06.2024

2. The European legal framework on AI

2.1. Why an EU Regulation on AI?

At the EU level, the "*sustainability and ecological responsibility of AI systems*" has already been encouraged in the "Ethics Guidelines for Trustworthy AI".[161] Furthermore, the Commission has underscored the significance of considering the environmental impact of AI systems throughout their lifecycle and across the entire supply chain in the White Paper on AI.[162] However, the Commission's efforts to formulate policy solutions for fostering a trustworthy and secure development of AI in Europe, while upholding the values and rights of EU citizens, was mainly motivated by the need to tackle the risks of AI associated with opaque decision-making, gender-based or other kinds of discrimination, intrusion in our private lives or being used for criminal purposes.[163]

According to the White Paper on AI, developing an AI ecosystem can bring a wide array of benefits to citizens, to business development by fostering new generation of products and services and to the services of public interest. In order to proactively bring these benefits of this technology to the whole of European society and economy, the Commission presented policy options to address the aforementioned challenges. Particularly, by regulating AI - a collection of technologies that combine data, algorithms and computing power - in accordance with EU's fundamental values and by leveraging its technological and industrial strengths, Europe may position itself as a global leader in innovation in the data economy and its applications as outlined in the European data strategy.[164]

After releasing the White Paper, the Commission launched an extensive stakeholder consultation where their support for regulatory intervention to address these challenges and concerns was expressed.[165] Moreover, calls for legislative actions to safeguard a

[161] High-Level Expert Group on AI (n 13) 19
[162] COM (2020) 65 final 1-2
[163] *Ibid*
[164] Commission, 'A European strategy for data' (Communication) COM (2020) 66 final <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0066> accessed 27.06.2024
[165] COM (2021) 206 final 1

well-functioning internal market for AI systems at EU level were expressed also by the European Parliament and the European Council even earlier.[166]

In light of this political context, on April 21, 2020 the Commission published the Proposal for a Regulation of the European Parliament and the Council laying down harmonised rules on AI adopting a fundamental rights approach. Considering the AI challenges that the Commission intended to tackle, the proposed rules were "*human centric, so that people can trust that the technology is used in a way that is safe and compliant with the law, including the respect of fundamental rights*".[167] According to the Explanatory Memorandum, the reasons that led to this Proposal revolve around the EU's commitment to achieve a balanced approach between the socially, economically, and environmentally beneficial outcomes of AI for the European society and the economy and the new risks and negative consequences it may bring for individuals and the society.[168] Therefore, the general objective of this Proposal is to develop an ecosystem of trust by proposing a legal framework for trustworthy AI based primarily, on Article 114 TFEU, and also on Article 16 TFEU, given that this proposal contains certain specific rules on the protection of individuals regarding the processing of personal data.

To accomplish the aforementioned objective, the Commission has chosen a Regulation as the legal instrument. This decision stems from the need for a uniform application of

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[166] European Council, 'European Council meeting (19 October 2017) - Conclusions' EUCO 14/17 8 < https://www.consilium.europa.eu/en/press/press-releases/2017/10/20/euco-conclusions-final/> accessed 27.06.2024; European Council, 'Special meeting of the European Council (1 and 2 October 2020) – Conclusions' EUCO 13/20 <https://www.consilium.europa.eu/en/press/press-releases/2020/10/02/european-council-conclusions-1-2-october-2020/> accessed 27.06.2024; European Parliament resolution of 20 October 2020 on a framework of ethical aspects of artificial intelligence, robotics and related technologies, 2020/2012(INL) <https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2020/2012(INL)> accessed 27.06.2024; European Parliament resolution of 20 October 2020 on a civil liability regime for artificial intelligence, 2020/2014(INL) <https://www.europarl.europa.eu/doceo/document/TA-9-2020-0276_EN.html> accessed 27.06.2024; European Parliament resolution of 20 October 2020 on intellectual property rights for the development of artificial intelligence technologies, 2020/2015(INI) <https://www.europarl.europa.eu/doceo/document/A-9-2020-0176_EN.html> accessed 27.06.2024; European Parliament Draft Report, Artificial intelligence in criminal law and its use by the police and judicial authorities in criminal matters, 2020/2016(INI) <https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2020/2016(INI)> accessed 27.06.2024; European Parliament Draft Report, Artificial intelligence in education, culture and the audiovisual sector, 2020/2017(INI) <https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2020/2017(INI)&l=en > accessed 27.06.2024

[167] COM (2021) 206 final 1

[168] COM (2021) 206 final, Recital 5

the new rules relating to a harmonised set of core requirements for AI systems classified as high-risk, obligations for providers and users of those systems, improving the protection of fundamental rights and providing legal certainty for operators and consumers. By its very essence, the proposed Regulation has direct applicability in accordance with Article 288 TFEU, preventing legal fragmentation and fostering the development of a single market for lawful, safe and trustworthy AI systems.[169]

2.2. Regulatory framework and scope

The Proposal on the AIA has been partially amended by the legislative resolution of the EU Parliament which was adopted after the first reading of the Proposal. Together, they constitute the European legal framework on AI. In particular, the original Proposal involves a risk-based assessment of AI systems, while the revised version introduces several changes to the proposed legal framework. In order to properly evaluate the compatibility of the European legal framework on AI in the upcoming section with environmental protection, it is essential first to analyse the Proposal and the adopted AIA with particular emphasis on the provisions concerning the environmental risks of AI.

2.2.1. General overview

The proposed Regulation will set harmonised rules that introduce minimum necessary requirements to address the risks and problems associated with AI. AI systems must comply with these requirements before they can be placed on the market and used within the Union. However, these requirements are designed not to unnecessarily restrict or impede technological development or disproportionately raise the cost of placing AI solutions on the market.[170] Consequently, the Commission endeavoured to propose a balanced and proportionate risk-based approach as legal intervention is used where there is a valid reason to concern or where such concern can reasonably be expected in the near future.

According to Article 3 of the Proposal "*AI system*" is defined as software that is developed with one or more of the techniques and approaches listed in Annex I (machine learning, logic and knowledge-based approaches, and statistical or Bayesian

[169] *Ibid* 7
[170] COM (2021) 206 final 3

approaches) and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with. Considering the evolving nature of AI and the need to align the definition agreed by the OECD, the definition has been amended to "*a machine-based system designed to operate with varying levels of autonomy, that may exhibit adaptiveness after deployment and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments*". [171]

In terms of its material scope, the Regulation will apply to all AI systems. However, the obligations imposed on both private and public providers and deployers inside and outside the EU whose AI systems will be placed or used in the EU market, vary depending on the legal regime applied to AI systems based on their level of risk. Specifically, the AIA is a risk-based Regulation addressing the risks arising from AI systems and pertaining to product safety and to fundamental rights. The legal regimes of AI systems vary based on their classification. These classifications encompass systems that pose: i) unacceptable risks, ii) high risks, iii) limited risks and iv) minimal risks, with more stringent regulatory requirements corresponding to higher levels of risk.

The Proposal provides for four categories of AI systems identified as "*unacceptable risk*" (Title II) which contravene Union values: two of them are related to manipulation, one of them is related to social scoring, all of which are prohibited in their entirety, and the last one, which includes "real-time" and "remote" biometric identification systems, is prohibited with the exception for specific law enforcement purposes if accompanied by an independent authorisation regime.[172] The EU Parliament has expanded this list by not only banning the use of biometric identification systems for real-time use, but also for ex-post use. Additionally, biometric categorisation systems using sensitive characteristics, predictive policing systems, emotion recognition systems and AI

[171] European Parliament, 'Parliament's negotiating position on the artificial intelligence act' (at a glance - Plenary – June 2023) <https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/747926/EPRS_ATA(2023)747926_EN.pdf> accessed 27.06.2024

[172] Michael Veale, Frederik Zuiderveen Borgesius, 'Demystifying the Draft EU Artificial Intelligence Act' (2021) 4 Computer L Review International 99 <https://repository.ubn.ru.nl/handle/2066/245672> accessed 27.06.2024

systems using indiscriminate scraping of biometric data to create facial recognition databases are also prohibited according to the adopted AIA.

Regarding the "*high-risk*" AI systems, the Proposal sets the classification rules by identifying two main categories of high-risk AI systems (Title III, Chapter 1 of): those that are (parts of) a product or a safety component already subject to specific EU harmonisation legislation on health and safety; and those that fall into one of the Annex III categories, such as educational and vocational training, employment and migration and asylum management.[173] In the second Chapter, requirements and obligations to these high-risk AI systems are introduced in order for them to be placed in the market. With its resolution, the Parliament added that AI systems falling into one of the Annex III categories must pose a significant risk to qualify as high-risk (Article 6) and that the deployers of high-risk systems have an obligation to perform a fundamental rights impact assessment (Article 27).

The compliance of high-risk AI systems with the abovementioned requirements is ensured through a conformity assessment procedure outlined in Article 43 of the adopted AIA prior to their placing on the market or putting into service.[174] For high-risk AI systems listed in Annex III, this assessment is conducted based on internal control with the provider responsible for ensuring that the requirements outlined in Chapter III, Section 2 of the adopted AIA are fulfilled. For AI systems used in biometrics, providers can self-assess conformity only if they have applied harmonised standards or common specifications that demonstrate compliance of a high-risk AI system with the requirements listed above (Articles 40, 41). If these standards or specifications are not applied, or do not exist, a conformity assessment body - a body that performs third-party conformity assessment activities[175] – must conduct the assessment. For the high-risk AI systems subject to the laws listed in Annex I, Section A, their conformity must be assessed according to the applicable harmonisation law.

It is clear that the adopted legal framework follows the New Approach or the New Legislative Framework in which standardisation plays a key role to ensure the

[173] Sybe de Vries and others, 'Internal Market 3.0: The Old "New Approach" for Harmonising AI Regulation' (2023) 8 (2) European Papers 594 <https://www.europeanpapers.eu/en/e-journal/internal-market-30-old-new-approach-harmonising-ai-regulation> accessed 27.06.2024
[174] Recital 123 of the adopted AIA
[175] Article 3 (21) of the adopted AIA

providers' compliance with this Regulation. In other words, compliance with harmonised standards serves as a means for providers to demonstrate conformity with the requirements of the AIA.[176] Under this regime, manufacturers are required to conduct pre-marketing controls and a complete conformity assessment procedure to ensure the safety and the performance of their products.[177] This legislative technique enhanced the free movement of goods by relieving the EU legislature from the heavy responsibility to issue sector-specific technical specifications through the EU decision-making process. Thus, this regime allows the EU legislature to balance the interest of free trade with public, non-economic interests, such as safety, health or environmental protection.[178]

As for the "*limited-risk*" AI systems, three categories of such systems are provided: chatbots, emotion recognition and biometric categorisation systems, and systems generating 'deepfake' or synthetic content. These systems need to meet specific transparency obligations such as labelling, to ensure that humans are informed.[179] Finally, AI systems with "*minimal*" or "*no risk*", such as spam filters or AI-enabled video games, will be subject to voluntary codes of conduct.[180]

Moreover, the enforcement of the proposed Regulation is characterized by a multi-layered structure, as it will be ensured through a governance system at the Member States level which will build upon existing structures, and through a cooperation mechanism at the Union level. Comprehensive support to this endeavour will be provided by the establishment of a European Artificial Intelligence Board. In addition, the EU Parliament introduced the establishment of an AI Office, an EU body which will facilitate the drawing up of codes of practice at the Union level aiming to support the harmonised application of the AIA.

[176] Recital 121 of the adopted AIA
[177] Veale (n 172) 102
[178] Vries (n 173) 588
[179] Lilian Edwards, 'The EU AI Act: a summary of its significance and scope' (Report, Ada Lovelace Institute, April 2022) 14 <https://aistandardshub.org/research/the-eu-ai-act-a-summary-of-its-significance-and-scope/> accessed 27.06.2024
[180] Edwards (n 179) 15

2.2.2. Provisions related to the environmental risks of AI

In relation to the environmental risks of AI, the Proposal mentions in its Explanatory Memorandum that the right to a high level of environmental protection and the improvement of the quality of the environment (Article 37 CFR) is pertinent particularly with regard to the health and safety of people.[181] Moreover, it is mentioned that additional requirements for the placement of AI systems on the Union market, such as environmental sustainability, may be applied on a voluntary basis.[182] However, the list of prohibited AI systems and the specific rules for AI systems with high risks to health, safety or adverse impacts on fundamental rights outlined in the Regulation do not encompass any hazards related to the environment. Therefore, only adverse environmental impacts of AI systems that directly threaten human rights or interests will be deemed as an adverse impact on fundamental rights and those AI systems will be classified as high-risk.[183]

In contrast to the Proposal, it is notable that the adopted AIA has made efforts to adopt a more environmentally friendly approach. This is evident from its Recitals, which highlight that the Regulation aims to enhance the functioning of the internal market by establishing a uniform legal framework for the development, the placing on the market, the putting into service and the use of AI systems in the Union, while ensuring a high level of protection of health, safety, fundamental rights including democracy, the rule of law and environmental protection, against the detrimental effects of AI systems.[184] This commitment is also expressly stated in the first Article of the adopted AIA. Thus, according to Recital 2, the Act should be applied in accordance with the values of the Union as enshrined in the Charter, facilitating inter alia environmental protection. Moreover, Recital 27 makes a reference to the 2019 Ethics guidelines for trustworthy AI in order to encourage the application of the seven non-binding ethical principles for AI in the design and use of AI models, especially in the drafting of codes of conduct under this Regulation. These principles encompass the promotion of social and environmental well-being, meaning that the development and the use of AI systems should be carried out in a sustainable and environmentally friendly way.

[181] COM (2021) 206 final 11
[182] COM (2021) 206 final 36
[183] Gailhofer (n 18) 10
[184] Recital 1 of the adopted AIA

When it comes to the classification of AI systems, the adopted AIA, similar to its Proposal, does not classify AI systems that pose a clear threat to the environment as unacceptable risk. Regarding the high-risk AI systems, it is worth mentioning that the adopted AIA acknowledges in Recital 48 that the fundamental right to a high level of environmental protection enshrined in the Charter and implemented in Union policies should be taken into account when assessing the severity of the harm that an AI system can cause, including in relation to the health and safety of individuals. While this approach may initially seem promising, it mirrors the Explanatory Memorandum of the Proposal, which solely addresses environmental risks posed by AI systems that directly jeopardize human rights or interests. This is further confirmed by the fact that the adopted Act does not provide any requirements to mitigate the adverse environmental impact of high-risk AI systems. Besides, the fundamental rights impact assessment of high-risk AI systems (Article 27) focuses specifically on risks of harm that may affect categories of persons or groups of persons without taking into account any environmental aspect.[185]

Moreover, it is noteworthy that the adopted AIA included in the second paragraph of Article 40, titled "*Harmonised standards and standardisation deliverables*", a provision according to which the Commission shall issue standardisation requests asking for "*deliverables on reporting and documentation processes to improve AI systems' resource performance, such as reducing the high-risk AI system's consumption of energy and other resources consumption during its lifecycle, and on the energy-efficient development of general purpose AI models*". These standardisation requests for deliverables do not correspond to any of the specified requirements of the Section 2 of the third Chapter.

Furthermore, after the placement of AI systems in the market, according to Article 73 of the adopted Act providers are obliged to report to the relevant authorities any serious incidents resulting from their use which includes among others serious damage to the environment without any further implications. Finally, similar to the Proposal, both providers and deployers should be encouraged to "*apply on a voluntary basis additional*

[185] The effectiveness of this tool is questioned as it is expected to turn into a formalistic procedure in which the substantive content and the real-world effects will not be evaluated. Nathalie A. Smuha, Karen Yeung, 'The European Union's AI Act: beyond motherhood and apple pie?' (SSRN, 24 June 2024) 17 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4874852> accessed 27.06.2024

requirements related, for example, to the elements of the Union's Ethics Guidelines for Trustworthy AI, environmental sustainability."[186]

3. Conclusion: Superficial environmental considerations in the European legal framework on AI

In spite of the environmental concerns surrounding AI, the European legal framework on AI does not consider environmental protection seriously. On the one hand, the Commission has taken an anthropocentric approach by categorising AI systems which pose a clear threat to the safety, livelihoods and rights of people as unacceptable or high-risk AI systems. Only when environmental threats directly endanger human rights or interests will they be considered in the risk-based assessment. On the other hand, despite the absence of environmental risks in its risk-based system and the lack of relevant requirements, the adopted AIA seems to adopt an approach aligning with environmental protection by incorporating standardisation deliverables that aim to improve the resource performance of AI systems. It is therefore, crucial to assess the alignment of the European legal framework with Articles 11 TFEU and 37 CFR, where environmental protection is anchored under EU Law.

[186] Recital 165 of the adopted AIA

Chapter IV: The overlap of the AI Act with environmental protection as ensured within EU Law

After conducting a comprehensive analysis of the provisions aiming at protecting the environment during the EU's policies as well as of the European legal framework for regulating AI systems placed and used in the Union market, I will examine the extent to which the European legal framework on AI is in contrast with environmental protection as ensured under EU Law. To address the main research question of this thesis, it is crucial first to answer whether the European legal framework on AI is in contrast with the environmental integration principle. This is because this principle translates the Union's objective to achieve a high level of protection and the improvement of the quality of the environment into the policies of the Union, as outlined in Article 3(3) TEU, into concrete action. It obligates EU institutions to incorporate environmental protection requirements into their policies even when dealing with non-environmental matters. Additionally, this principle is reinforced by the Charter, highlighting the constitutional significance of environmental protection in the EU legal system.

Thus, if the European legal framework on AI aligns with the aforementioned principle by integrating environmental protection requirements, it is not in contrast with environmental protection as ensured under EU Law. Otherwise, recommendations must be made to ensure that the proposed legal framework aligns with the EU primary law, namely Articles 3(3) TEU, 11 TFEU and 37 CFR.

1. Is the European legal framework on AI in contrast with the environmental integration principle?

1.1. The hierarchy of norms: Should the AI Act be in line with the environmental integration principle?

Before assessing whether the provisions outlined in the Proposal on AIA and the adopted AIA are in contrast with the principle of environmental integration, it is essential to first address the fundamental question of why the proposed Regulation should align with the aforementioned principle. In essence, the alignment of the proposed Regulation with the environmental integration principle pertains to the

hierarchy of norms within the EU legal order. Hierarchy is the principle that establishes the structure in a complex system of norms ensuring the stability and the predictability of the legal system in question.[187] Particularly, secondary law is always subject to primary law without any exceptions. Within the EU level even prior to the Lisbon Treaty there was a clear hierarchy between primary law and secondary law.[188] After the Lisbon Treaty, the hierarchy of the EU norms consists of five main tiers where the legal acts lower down the hierarchy are subject to those of higher status: the Treaties and the Charter, general principles of law, legislative acts, delegated acts and implementing acts.[189]

In this regard, the AIA will be a legislative act implemented through a Regulation. As a legal act positioned lower in the hierarchy than the Treaties, the Chapter and the general principles of law,[190] it is imperative for the AIA to adhere them. While the CJEU has not explicitly recognized the principle of environmental integration as a general principle of EU Law, this principle stems from the provisions of the EU Treaties and the Charter (Articles 11 TFEU and 37 CFR). Consequently, it is crucial for the proposed Regulation to align with this principle and fulfil the resulting obligations.

1.2. The material and personal scope: Is the principle of environmental integration applicable to the Proposal on the AI Act and the adopted AI Act?

Before assessing whether the European legal framework contradicts the principle of environmental integration, I must first determine whether the Proposal and the adopted AIA fall within the material and personal scope of application of Article 11 TFEU, which enshrines this principle. Article 37 CFR, which establishes this principle in the Charter, is more restrictive than that of the EU Treaties in terms of its material scope

[187] Roland Bieber, Isabelle Salomé, 'Hierarchy of Norms in European Law' (1996) 33 (5) Common Market L Review 909 <https://kluwerlawonline.com/journalarticle/Common+Market+Law+Review/33.5/119846> accessed 27.06.2024

[188] Jacques Ziller, 'Hierarchy of Norms: Hierarchy of Sources and General Principles In European Union Law' in Geburtstag, Becker, Hatje, Potacs, Wunderlich (eds) in *Verfassung und Verwaltung in Europa Festschrift für Jürgen Schwarze zum 70* (Nomos 2014) 343

[189] Graig (n 124) 141

[190] Ziller (n 188) 350. To review the legality of secondary legislation, the CJEU refers to a norm as a general principle of law.

based on a textual interpretation. Thus, it should be interpreted in light of Article 11 TFEU in order to be consistent with it.[191]

According to Article 11 TFEU, the principle of environmental integration encompasses the policies and activities of the Union. In fact, the Proposal on the AIA is an internal market policy presented as a proposed legislation under Article 114 TFEU. Besides, the Commission is subject to this provision being responsible for proposing EU legislation according to Article 17 (2) TEU. Regarding the adopted AIA, it is an essential part of the development of the legislation as it modifies the initial Proposal after the first reading by the Council of EU and the EU Parliament according to Article 294 TFEU. Hence, the principle of environmental integration permeating every stage of the legislative process[192] is indeed relevant and thus, the legal obligations stemming from this principle are applicable.

1.3 The substantive scope: How, if at all, does the European legal framework on AI integrate environmental protection requirements?

Having examined that the Regulation falls within the material and personal scope of the principle of environmental integration, the next step is to assess whether the legal obligations resulting from this principle have been fulfilled. A key aspect to explore is whether the European legal framework on AI has effectively integrated environmental protection requirements. Despite the lack of clarity regarding the substantive content of the principle, a systematic interpretation of Article 3(3) TEU, Articles 11, 191(1) TFEU, and 191(2) TFEU, and Article 37 CFR, leads to the conclusion that integration of environmental requirements involves the establishment of measures ensuring a high level of protection, preservation and improvement of the quality of the environment.[193] Thus, our goal is to determine to what extent the measures taken considering the AI-related environmental risks are suitable to preserve, protect and improve the quality of the environment, while pursuing sustainable development.[194]

[191] Morgera (n 92) 16
[192] Sjåfjell (n 102) 113
[193] Durán (n 78) 29
[194] *The Queen v Ministry of Agriculture, Fisheries and Food and Commissioners of Customs & Excise, ex parte National Farmers' Union and Others* (n 95); *United Kingdom v Commission* (n 95)

To begin with, it is undeniable that the EU institutions have substantial discretion when it comes to fulfilling their obligations under the environmental integration principle, as previously discussed in Chapter II. A careful textual and systematic interpretation of Articles 11 TFEU and 37 CFR leads us to the safe conclusion that the EU institutions enjoy this discretion regarding the manner in which they fulfil their environmental obligations. In other words, they have the freedom to decide how to ensure a high level of protection and improvement of the quality of the environment,[195] namely through substantive or procedural rules. However, despite not being obligatory to ensure the highest level that is technically possible,[196] their discretion is limited since integration of environmental protection requirements is not optional and they are still required to ensure a high level of protection and to pursue the objective of sustainable development. Therefore, measures that may lead to environmental deterioration, manifestly exceed the limit of their discretion.[197] Any contrary interpretation would render the principle devoid of substantive legal implication, reducing its function to a mere programmatic statement.

In general, the Proposal on the AIA is infused with the spirit of protecting human dignity and fundamental rights.[198] This is clearly evident in the Explanatory Memorandum accompanying the proposed Regulation on the AI. The objective is to establish rules that will be centred on humans, ensuring that they can trust that the technology is used in a way that is safe and lawful.[199] When it comes to the environmental risks of AI technologies, the Proposal focuses on promoting sustainable AI, similarly to the EGD.[200] This commitment is specifically declared in its Explanatory Memorandum where the continued relevance of Article 37 CFR is mentioned,[201] and thus, it does not have any legal implications.

With this in mind, someone would expect that the risk-based system introduced by the Proposal would encompass a comprehensive assessment of the environmental impact

[195] Pagallo (n 21) 369
[196] *Safety High-Tech* (n 69)
[197] Jans (n 90) 21
[198] Floridi (n 17) 218
[199] COM (2021) 206 final 1
[200] Natasa Perucica, Katarina Andjelkovic, 'Is the future of AI sustainable? A case study of the European Union' (2022) 16 (3) Transforming Government: People, Process and Policy 354 <https://www-emerald-com.proxy.library.uu.nl/insight/content/doi/10.1108/TG-06-2021-0106/full/html> accessed 27.06.2024
[201] COM (2021) 206 final 11

of the AI systems under the AIA. However, the AIA's risk-based approach demonstrates its commitment to a philosophy centred around the well-being of individuals. Unacceptable risk AI systems that are prohibited from being placed on the market, put into service or used are those that deploy subliminal manipulative techniques, exploit vulnerable individuals, or are used for social scoring based on factors such as social behaviour, socioeconomic status or personal characteristics, as stated in Article 5. Given that the environmental risks of AI systems are not considered in determining whether an AI system is classified as unacceptable risk, it is crucial to examine the potential classification of AI systems as high-risk based on their negative impact on the environment.

The current Proposal does not include such a provision under Article 6. However, it is worth noting that Recital 28 of the Proposal acknowledges the importance of the "*fundamental right to a high level of environmental protection enshrined in the Charter and implemented in Union policies*" when assessing the harm that an AI system can cause to the health and safety of persons.[202] Therefore, AI systems with environmental hazards directly threatening human rights or interests can be classified as high-risk AI systems and thus, they must undergo comprehensive assessments before entering the market and throughout their life cycle, as outlined in Article 7. Nonetheless, the mandatory requirements that the high-risk AI systems must comply with before being placed on the market (Articles 9-15) do not include any commitment to mitigate their adverse environmental impacts.[203] Hence, AI-related environmental hazards are only considered if they directly threaten human rights or interests, whereas their adverse environmental impact is not guaranteed to be mitigated.[204]

In this legal context, any threat or impact posed directly or indirectly to the environment cannot be considered as a "*negative impact on fundamental rights*" under Article 7 of the Proposal. This is also because Article 37 CFR does not establish a fundamental right to a healthy environment, but it introduces a principle similar to Article 11 TFEU. Hence, any impact on the environment cannot be directly invoked based on Article 37 CFR which is not subject to individual legal action.[205] Consequently, the Title III of the

[202] COM (2021) 206 final 24
[203] Pagallo (n 21) 363
[204] Gailhofer (n 18) 10
[205] Explanatory Notes (n 123) 35

Proposal does not meet the environmental protection requirements that must be integrated based on Article 11 TFEU, as it fails to ensure environmental preservation and protection.

It can be inferred that AI systems which pose risks to the environment directly or indirectly are not deemed unacceptable or high-risk AI systems and thus, they will be classified as limited or minimal risk AI systems. This classification grants them an exemption from undergoing a thorough assessment before entering the internal market. Particularly, these AI systems should adhere to minimal transparency requirements. According to the Explanatory Memorandum and Recital 81 of the Proposal, providers of non-high-risk AI systems may develop and implement their own codes of conduct which may include voluntary commitments such as those related to environmental sustainability.[206] Nevertheless, this provision does not constitute integration of environmental considerations in the AIA given that these measures do not ensure the protection of the environment. In particular, the development of such codes is optional and even if such codes were developed, a commitment related to environmental sustainability would be voluntary. As a consequence, environmental protection is not ensured through the introduction of these provisions, rather it is reduced to a discretionary matter in the field of AI systems, which goes against the very essence of the Union's objective under Article 3 (3) TEU and the principle of environmental integration.

Compared to the Proposal, the adopted AIA demonstrates a clear effort to improve the legal framework on AI in terms of environmental protection in the spirit that permeates it. Considering the classification of AI systems, even though additions have been made in the list of unacceptable risk AI systems, AI systems with environmental risks are not classified as unacceptable risk AI systems. However, it can be deduced from Recital 48 that AI systems belonging to one of the categories of Annex III of the adopted AIA may be classified as high-risk, if they pose a significant risk on the fundamental right to a high level of protection of the environment enshrined in Article 37 CFR. Specifically, it is stated that the fundamental right to a high level of environmental protection

[206] COM (2021) 206 final 16; Article 69 of the Proposal

enshrined in the Charter and implemented in Union policies should be taken into account when assessing the severity of the harm of AI systems.

Nonetheless, it is regrettable that this Recital refers to a right to a high level of protection of the environment, even though all indications suggest that such a right does not actually exist in the Charter, rather Article 37 CFR outlines the principle of environmental integration.[207] This provision entails a legal obligation of the EU institutions to introduce substantial and procedural rules into the legislation ensuring a high level of environmental protection. In any case, the environmental aspects of AI will be taken into consideration in accordance with Article 37 CFR provided that any potential harm caused by an AI system is directly linked to the health and safety of individuals. Consequently, the deficiencies mentioned earlier regarding the Proposal are not addressed in terms of the classification of AI systems.

When considering the mandatory requirements for high-risk AI systems, given that the environmental risks are not considered in the AI system's classification, there are no respective provisions mandating the mitigation of their environmental risks. This means that relevant harmonised standards, as outlined in Article 40 of the adopted AIA, will not be developed and thus, providers of high-risk AI systems that may threaten or harm directly or indirectly the environment are not obliged to conform with such standards. As a result, their AI systems can enter the internal market without undergoing any evaluation of their environmental impact.

In this context, the only provision that can be considered as fulfilling the legal obligation deriving from the principle of environmental integration is Article 40(2) which provides for standardisation deliverables on reporting and documentation processes to improve AI systems' resource performance and on the energy-efficient development of general-purpose AI models in accordance with Regulation on European standardisation.[208] In this way high-risk AI systems can be subject to a reporting process aiming at improving their efficiency in terms of energy and resource consumption. However, deliverables hold a different legal status compared to harmonised standards. They do not satisfy any harmonisation legislation requirements and thus, adhering to them does not imply a legal presumption of conformity with the specified requirements.

[207] Quirico (n 127) 56; *Pesticide Action Network Europe v Commission* (n 128)
[208] Regulation (EU) No 1025/2012 of 25 October 2012 on European standardisation

Their purpose is to support European legislation and policies, but compliance with those practices is not mandatory.[209] Therefore, non-compliance does not hinder AI systems from entering the internal market as clarified in Article 40(1).

The environmental impact of AI systems is not effectively considered even after their placement in the market. Although Article 73 requires reporting of any serious incidents resulting from the use of AI systems, including serious damage to the environment, it fails to establish provisions for their removal from the market or the implementation of mitigation measures. Finally, for the voluntary application of additional requirements related to the elements of the Union's Ethics Guidelines for Trustworthy AI, such as environmental sustainability, the same considerations apply as for the voluntary commitments related to environmental sustainability in the codes of conduct mentioned in the Proposal.

Under this legal framework, one could argue that the CJEU might not annul the AIA in its current form in a case alleging that this Act contravenes Articles 11 TFEU and 37 CFR. This would be due to the wide discretion that the EU institutions have in implementing the environmental integration principle. However, while it is true that EU policy is not bound to achieve the highest level that is technically possible, it is essential to strive for a high level of environmental protection. Therefore, the aforementioned argument would fail to consider that these provisions, which have no legal implication, merely satisfy the letter of law allowing AI systems to be traded in the internal market, even if they undermine the preservation and the protection of the environment, without contributing to the objective stipulated in Article 3(3) TEU.

Upon closer examination and with regard to environmental protection, it can be inferred that both the Proposal and the adopted AIA have adopted measures: 1) classifying AI systems as high-risk when their environmental risks directly threaten human rights or interests, 2) being voluntary in nature and 3) imposing obligations to report environmental harm caused by AI systems without legal implications for mitigating their environmental impact. In light of the principle of environmental integration, these measures do not establish firm rules that address the direct or indirect risks of AI to the environment which is crucial for ensuring a high level of environmental protection and

[209] Recitals 1, 7 and Article 2(2) of the Regulation on European standardisation

promoting sustainable development. Having regard to the aim pursued, these measures fail to take into account the environmental impact of AI systems such as resource consumption, energy consumption and carbon footprint in a forceful manner. Even if one were to argue that these "measures" will ensure environmental protection in the long term, such a claim is ungrounded since they do not entail any real commitment. As a result, they are manifestly inappropriate considering the aforementioned objective,[210] and the EU institutions have failed to fulfil their legal obligation to integrate environmental protection requirements into the European legal framework based on their own discretion.[211]

2. Filling the gaps in addressing the environmental risks of AI

The aforementioned analysis reveals that European legal framework does not align with the principle of environmental integration by formulating a legal framework that does not consider the environment sufficiently. On the one hand, the Proposal addresses environmental considerations only superficially and thus, the principle of environmental integration is addressed as being merely programmatic.[212] On the other hand, the adopted AIA takes measures to protect the environment, but it fails to fulfil the obligations deriving from Article 11 TFEU, as it only focuses on practices that do not constitute either substantive or procedural rules ensuring a high level of environmental protection. Therefore, this legal framework is in contrast with environmental protection as ensured under EU Law.

In the following section, I will provide recommendations on how the European legal framework on AI should be revised to integrate environmental protection requirements in order to be in line with environmental protection ensured under EU Law. Specifically, the subsequent suggestions concern the introduction of an Environmental Impact Assessment for AI systems in the AIA, a procedural rule, and the inclusion of AI systems as software within the ESPR, a substantive rule.

[210] By analogy *Bettati v Safety Hi-Tech* (n 69), paras 30-53
[211] It could be argued that Member States are able to impose further limitations on the marketing of AI systems based on Article 114(4-5) TFEU in order to ensure environmental protection [Veale (n 172) 109]. However, as Article 11 TFEU primarily pertains to the EU institutions and its *raison d'être* is to preserve and protect the environment in all EU policies, as other policies can have an impact on the environment.
[212] *Preussen Elektra* (n 109)

2.1. Introduction of an Environmental Impact Assessment in the AI Act

AI systems play a dual role in the realm of environmental protection: While they have the potential to facilitate environmentally sustainable development, their creation and use can lead to increased carbon emissions and energy consumption.[213] Therefore, when regulating the placement and the use of AI systems in the internal market, EU institutions must adhere to their legal obligation outlined in Article 11 TFEU by integrating environmental protection requirements. One effective approach is to introduce procedural rules, like an environmental impact assessment, into the existing legal framework.

With regard to the EIA, its significance for environmental protection is undeniable. Its establishment and evolution on a global scale have been a response to the increasing political recognition of environmental protection issues such as climate change, loss of biodiversity, threats to freshwater sources and water quality, damage to marine areas.[214] The EIA emerged as a crucial component of the National Environmental Policy Act of 1969 in the USA.[215] At the EU level, the EIA was introduced for the first time with the Directive 85/337/EEC, which has been amended four times.[216] The Directive 2011/92/EU, codifying the Directive 85/337/EEC and its subsequent amendments, requiring an assessment of the effects of certain public and private projects likely to have significant effects on the environment based on factors, such as their nature, size or location, before development consent is given.[217]

Particularly, EIA is a crucial tool of precautionary environmental law,[218] aiming to prevent environmental impairment or damage by taking early measures. It is a systematic process that examines the environmental consequences of development actions in advance. Based on the findings, the competent authority can make an informed decision either proceeding with the proposed action or exploring alternative options. By integrating environmental considerations into the decision-making process

[213] Perucica (n 200) 350
[214] Richard Morgan, 'Environmental impact assessment: the state of the art' (2012) 30 (1) Impact Assessment and Project Appraisal 6 <DOI:10.1080/14615517.2012.661557 > accessed 27.06.2024
[215] Adam Barker, Christopher Wood, 'Environmental Assessment in the European Union: Perspectives, Past, Present and Strategic' (2001) 9 (2) European Planning Studies 243
[216] Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment
[217] John Glasson, Riki Therivel, '*Introduction To Environmental Impact Assessment*' (Routledge 2019) 3
[218] Gailhofer (n 18) 37

from the start, EIA ensures that every development is more environmentally conscious.[219] This makes it more than just a mechanism for environmental protection; it becomes a key driver for sustainable development.[220]

Given the environmental concerns arising due to the increased use of AI, the assessment of its environmental impacts is suggested to be developed by the governments.[221] It is true that several Member States, such as France and Germany, have developed the concept of the environmental impact assessment of AI. Particularly, given that according to the national AI strategies AI systems will be used in the environmental field to assist to a smart ecological transition, there is also consideration to measure the environmental impact of AI by systematically analysing its CO2-saving potential and reduce its energy consumption.[222]

Considering that EIA is a procedural rule that ensures environmental protection, legal scholars suggest introducing it into the AIA to integrate environmental protection requirements. Indeed, this addition would align the AIA with the principle of environmental integration, shifting its human-centric approach to a more onto-centric stance.[223] In practical terms, this means that AI systems with high, low or no risk would be approved for placement and use in the internal market as long as they meet the environmental sustainability criteria. These criteria will be developed in order to ensure that such systems do not harm the environment before their large-scale use. The same would apply for the AI systems that are deemed to pose unacceptable risks, but are subject to the exceptions outlined in the AIA.

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[219] Glasson (n 217) 7
[220] *Ibid* 4, 8
[221] Dave Rejeski and others, 'When Software Rules: Rule of Law in the Age of Artificial Intelligence' (Environmental Law Institute, 2018) 21-22 <https://www.eli.org/research-report/when-software-rules-rule-law-age-artificial-intelligence> accessed 27.06.2024
[222] Gailhofer (n 18) 46-47
[223] Pagallo (n 21) 371. Such technological systems that have been developed are: the "machine learning emissions calculator" in Alexander Lacoste and others, 'Quantifying the carbon emissions of machine learning', (Cornell University, 2019) <https://arxiv.org/abs/1910.09700> accessed 27.06.2024, the "experiment-impact-tracker" or the "carbontracker" in Peter Henderson and others, 'Towards the systematic reporting of the energy and carbon footprints of machine learning' (Cornell University, 2020) <https://arxiv.org/abs/2002.05651> accessed 27.06.2024, an "a tool for tracking and predicting the energy consumption and carbon emissions of training DL models" in Lasse Anthony and others, 'Carbontracker: Tracking and predicting the carbon footprint of training deep learning models' (Cornell University, 2020) <https://arxiv.org/abs/2007.03051> accessed 27.06.2024

The aforementioned assessment would not just concern environmental impacts that directly threaten human rights or interests, but also to those that would undermine the preservation and protection of the environment itself. Specifically, the environmental sustainability criteria included in the EIA of the AI systems should not only relate to those risks that directly pose a risk to human rights, but rather to those that concern direct environmental impact of the AI systems such as the extraction of raw materials and energy use, and indirect impacts of the use and operation of the AI application.[224]

2.2. Inclusion of AI systems into the Ecodesign for Sustainable Products Regulation

Ecodesign, as a concept, involves the deliberate consideration of a product's entire lifecycle during its development. Within this context, the environmental impact for each phase of the life cycle of the product is considered during the development process.[225] This approach encourages designers to support the possibilities to reduce the energy and materials inputs as well as to minimize emissions and waste throughout the production process, from the extraction of raw materials to the product's eventual end-of-life stage. At the EU level, the Ecodesign Directive 2009/125 was a pioneering piece of legislation aiming at regulating those products that use energy.[226] Its primary objective was to improve their efficiency and reduce their environmental impact by establishing ecodesign requirements.[227] By focusing on energy consumption, the Directive expanded its scope to encompass energy-related products as well.

To further expand the scope of ecodesign requirements that products have to meet when introduced on the market or put into service beyond energy efficiency, the Commission released a Proposal on ESPR repealing the Ecodesign Directive on 30 March 2022.[228] This Regulation is regarded as the cornerstone of the legislative initiative for the sustainable product policy with the ultimate goal of improving the environmental

[224] Gailhofer (n 18) 50
[225] Karine Van Doorsselaer, 'The role of ecodesign in the circular economy' in Stefanakis and Nikolaou (eds) in *Circular Economy and Sustainability; Volume 1; Management and Policy* (Elsevier 2022) 190
[226] Directive 2009/125/EC of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products
[227] Rosalind Malcolm, 'Analysis Ecodesign Laws and the Environmental Impact of our Consumption of Products' (2011) 23 (3) Journal of Environmental Law 495 <DOI:10.1093/jel/eqr029> accessed 27.06.2024
[228] Commission, 'Proposal for a Regulation of the European Parliament and of the Council establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC'

sustainability of products. As such, a framework outlining legal ecodesign requirements - including carbon footprints - in delegated regulations for specific product groups is provided.[229] This framework encompasses a wide range of products, ensuring a comprehensive approach to promote environmental sustainability.

Even though AI as a type of software contributes to the overall energy consumption and environmental impact of digital technologies,[230] AI systems are not included in the Regulation. It is a fact that AI systems have already been adopted in various stages of the development and production of other consumer products.[231] This highlights the need for attention when incorporating AI technology into existing products as it has the potential to alter the product's functionality throughout its lifecycle and give rise to unforeseen risks. Hence, it is essential that the AI technologies, as part of the Information and Communication Technologies, to be given priority in the ecodesign work plans of the Commission.[232] Consequently, AI systems should be subject to regulation to ensure that their development aligns with ecodesign requirements, encompassing not only energy efficiency, but also other environmental considerations.

With the incorporation of this addition to the ESPR, the AIA will align with the principle of environmental integration, and it will ensure environmental protection. In essence, the introduction of a substantive rule in the proposed Regulation is recommended. After the addition of the AI technologies into the ESPR, a new provision should be introduced in the AIA that will require all AI systems intended for market placement and use - AI systems of high risk, minimal or no risk - to meet first the ecodesign requirements of the respective delegated act of the ESPR. This approach is in line with the principle of environmental integration underscoring the Union's commitment to an environmentally sustainable future. In this way, the AIA not only will ensure that AI systems are

[229] Chris Backes, Marlon Boeve, 'Envisioning the Future of the Circular Economy', (2022) 52 Environmental Policy and Law <https://content-iospress-com.proxy.library.uu.nl/articles/environmental-policy-and-law/epl219034> accessed 27.06.2024

[230] Zuzanna Warso, 'Addressing AI Energy Consumption: Why the EU Must Embrace Ecodesign for Software' (Tech Policy Press, 13 September 2023) <https://techpolicy.press/addressing-ai-energy-consumption-why-the-eu-must-embrace-ecodesign-for-software/> accessed 27.06.2024

[231] Rob Elvin and others, Reconciling Artificial Intelligence (AI) With Product Safety Laws (December 2023, Squire Patton Boggs) 2 <https://www.squirepattonboggs.com/en/insights/publications/2023/12/reconciling-artificial-intelligence-ai-with-product-safety-laws> accessed 27.06.2024

[232] Catriona McAlister, 'ICT: a top horizontal priority in sustainable product policy' (Report, June 2023) <https://eeb.org/library/ict-a-top-horizontal-priority-in-sustainable-product-policy/> accessed 27.06.2024

trustworthy and ethical, but also the integration of environmental protection requirements and thus, environmental protection.

3. Conclusion: Absence of rules regarding environmental protection requirements in the European legal framework on AI

The principle of environmental integration requires the introduction of substantive or procedural rules in the EU's policies ensuring a high level of environmental protection and promoting sustainable development. The European legal framework currently includes several measures that, due to their nature, allow AI systems with environmental risks to enter the internal market potentially leading to environmental degradation. Consequently, environmental protection requirements have not been integrated into the AIA, and a sufficient level of environmental protection is not guaranteed. This contradicts the aforementioned principle and, as a consequence, the European legal framework is in contrast with environmental protection as ensured under EU law. Therefore, rules ensuring environmental protection in relation to the environmental impact of AI have been recommended based on regulations adopted in other EU policies. By introducing these rules, the AIA will integrate environmental protection requirements and thus, this internal market policy will contribute to the Union's objective of a high level of environmental protection.

Chapter V: Concluding remarks

Environmental protection is a concept that has gradually been incorporated into EU Law, as the Union has shifted its focus from solely ensuring peace through economic integration to embracing social and environmental progress. After the Treaty of Lisbon, environmental protection is not just a parameter that the EU institutions and Member States have to consider, as integrating the environment into the Union's objectives and policies has been firmly established. According to Article 3 (3) TEU, the attainment of a high level of protection and the improvement of the quality of the environment is one of the Union's fundamental objectives. Articles 191-193 TFEU establishing the EU's competence in the environmental policy have ensured that this objective will be pursued by the Union. However, considering that the environment can be impacted by policies from other domains, the introduction of the principle of environmental integration under Articles 11 TFEU and 37 CFR guarantees a comprehensive and consistent protection of the environment.

The Proposal on the AIA and the adopted AIA represent an internal market policy designed to ensure that the AI systems placed and used in the internal market are trustworthy and ethical. Although not an environmental policy, it is interconnected with environmental protection for two significant reasons. Firstly, AI is a powerful tool that can contribute to environmental protection, as demonstrated by its valuable role in achieving the goals of the EGD. Secondly, AI carries serious adverse environmental impacts that must be addressed and prevented to avoid further degradation of the environment and exacerbation of climate change. Before the Proposal, the EU approach seemed to acknowledge these impacts of AI and made promises to regulate it in an environmentally sustainable way.[233] However, after its release, criticism has been directed at its risk-based system for its human-centric approach and its failure to consider AI-related environmental risks.

For the purpose of this thesis, there has been a comprehensive examination of the European legal framework governing AI systems to determine if it is in contrast with environmental protection as ensured under EU Law. As environmental protection is ensured in non-environmental policies through the application of the principle of

[233] High-Level Expert Group on AI (n 13) 19; COM (2020) 65 final 2

environmental integration, a thorough analysis has been conducted to assess whether the aforementioned framework has integrated environmental protection requirements.

The Proposal on the AIA, superficially referring to Article 37 CFR in its Explanatory Memorandum, fails to establish a risk-based system that assesses the potential direct or indirect impacts of the AI systems to the environment. When it comes to the adopted AIA several amendments have been made to establish measures for environmental protection. Although the EU institutions have considerable discretion in integrating environmental protection requirements into the Union's policies, the adopted AIA has introduced measures that fail to prevent or mitigate the direct or indirect impacts of AI systems on the environment, and that are not mandatory further compromising their effectiveness in terms of environmental protection. Consequently, the current version of the Regulation has failed to integrate firm substantive or procedural rules that ensure environmental protection and support sustainable development. This means that AI systems including direct or indirect risks to the environment can enter the internal market without any limitation. Such a legal framework not only violates the mentioned principle and would require the CJEU to annul this Act,[234] but also contradicts environmental protection as guaranteed under EU Law.

In this context, recommendations have been made to align the AIA with the principle of environmental integration. These solutions encompass both procedural and substantive rules derived from existing legislation, all aimed at ensuring environmental protection. It is important to mention that this list of solutions is not exhaustive, and the EU institutions must carefully evaluate which ones best suit the legal framework. However, in the writer's opinion, the proposed solutions appear to be more effective than establishing general environmental protection requirements for high-risk AI systems. This is because conformity with these requirements would be conducted mainly through self-assessment procedures leaving room for potential exploitation by providers and thus, undermining legal certainty.[235] Furthermore, when conformity assessment bodies conduct assessments based on harmonised standards, various stakeholders can influence the standardisation process extending beyond technical considerations to encompass political dimensions.[236] In light of this, it is important for

[234] Kramer (n 72) 23
[235] Smuha (n 185) 17
[236] Barend Van Leeuwen B, 'Standardisation in the Internal Market for Services: An Effective Alternative to Harmonisation' (2018) 3 Revue Internationale de Droit Économique 323 <https://www-cairn-

the EU legislator to recognize that environmental protection is a matter of public interest and thus, instead of relying on a general framework of broad policies as in the New Approach,[237] to regulate the legal framework precisely by setting forth concrete and specific requirements.

Considering the rapid development and the widespread use of AI today, the EU institutions must seriously address the environmental risks associated with AI technologies by establishing firm rules that adhere to the principle of environmental integration that they are obligated to uphold. While some opponents argue that the principle of environmental integration is merely a procedural tool that may not be implemented in the EU's policies,[238] it is undeniable that this principle carries greater importance than ever. This is because it guarantees the coherence of the AIA - an internal market policy - with the environmental policies outlined in the EGD, in line with the objective set forth in Article 3(3) TEU to ensure a high level of environmental protection and the EU's ongoing commitment to sustainable green transition.

info.proxy.library.uu.nl/revue-internationale-de-droit-economique-2018-3-page-319.htm?ref=doi> accessed 27.06.2024; Smuha (n 185) 27

[237] Vries (n 173) 589

[238] Morgera (n 92) 17

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