CLIMATE CHANGE LAW AND THE CRISIS OF THE ENERGY MODEL IN THE CONTEXT OF TRANSITION

O DIREITO DAS ALTERAÇÕES CLIMÁTICAS E A CRISE DO MODELO ENERGÉTICO NO CONTEXTO DA TRANSIÇÃO

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Abstract

This analysis provides an overview of the legal regulation of the climate crisis, which proves to be, first and foremost, a crisis of the energy model. Its main objective is to demonstrate how the multi-level legal structuring of climate change law contributes to the mitigation actions undertaken by States in response to the effects of the crisis. The most probable hypothesis is revealed in the structuring of this cross-cutting regulatory system, fostering sustainable development (industrial, scientific, and technological) while ensuring continuous environmental protection. The issue under analysis is: how does multi-level legal and regulatory protection operate in response to the threats posed by the climate crisis, and what are its levels of enforcement within an internationalist framework that shapes the legal regime of climate change and drives the emergence of a low- or zero-emission energy model? The appropriate methodology for constructing this rationale is bibliographic research, based on a logical-deductive approach, carried out through a comprehensive study of the legal phenomenon under examination. As a result of this analysis, it is observed that the entire consolidated legal ecosystem highlights the importance of mitigation measures against climate threats and has been acting as a catalyst for the energy transition.

Keywords: Climate Change. Energy Model. Multilevel Regulation. Energy Transition.

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Resumo

Esta análise é um overview da regulação jurídica da crise climática, que demonstra ser, antes de mais, uma crise do modelo energético, e tem como principal objetivo demonstrar de que modo a estruturação jurídica multinível do direito das alterações climáticas contribui para as ações mitigatórias dos Estados frente aos efeitos da crise. Hipótese mais provável é revelada na estruturação deste sistema normativo transversal, de modo a fomentar o desenvolvimento sustentável, (industrial, científico e tecnológico) acompanhado por proteção ambiental constante. O problema em análise é: como se dá a proteção legal e normativa multinível, frente às ameaças da crise climática, e seus níveis de enforcement, numa plataforma internacionalista que desenha um regime jurídico das alterações climáticas, e força o surgimento de um modelo energético de baixas ou nulas emissões de GEE? A metodologia adequada para a construção deste racional é a pesquisa bibliográfica, de base lógico-dedutiva, revelada num estudo panorâmico do fenômeno jurídico em análise. Como resultado desta análise tem-se que todo o ecossistema jurídico consolidado sinaliza a importância de medidas mitigatórias às ameaças do clima e vem atuando como catalisador para a transição energética.

Palavras-chaves: Alterações Climáticas. Modelo Energético. Regulação Multinível. Transição Energética.

Summary: 1. Introductory Considerations. 2. The Climate Crisis and the environment as a universal legal asset. 3. The genesis of climate change law. 4. International Law and the climate change regime. 4.1. United Nations Framework Convention on Climate Change. 4.2. Kyoto Protocol. 4.3. Paris Agreement. 5. Characteristics of the climate change regime. 5.1. Transversality, regulation and multi-level protection. 5.2. Internationalist scope. 5.3. Principle-based foundation. 5.3.1 No harm principle and other foundational principles. 6. The climate crisis and European Law. 7. Approach to the climate crisis and national law. 8. Conclusive analysis. 9. Bibliographic references.

1 INTRODUCTORY CONSIDERATIONS

Postmodern society has been characterized by its total confidence in industrial, scientific, and technological development, which, by contributing to the improvement of people's lives and well-being, has been accompanied, encouraged, and protected by the law. Indeed, human activities have a broadly negative environmental impact, resulting in the progressive and widespread deterioration of the environment, including water, soil, and air pollution. Moreover, biodiversity loss is exceptionally rapid, and today there are more endangered species than at any other time in history[3].

Due to global warming, renewable energy sources have been tested as alternatives to replace the current hypercarbon-based model as a means of mitigating the impact of greenhouse gas (GHG) emissions—these gases being the root cause of the climate-environmental crisis. The current context is one of urgency for a possible energy transition, driven by a climate crisis that is already making history with the increasing number of humans, natural, and material losses. How can one analyze the phenomenon of the climate-environmental crisis without examining its causes and consequences, when humanity’s greatest challenge today is mitigating the effects of global warming? There would be little point in seeking regulatory frameworks for

[3] ARAGÃO SEIA, CRISTINA, A *Responsabilidade Ambiental da União Europeia*, Coimbra, Edições Almedina, 2022, ISBN 978-989-40-0086-0, p.15.

any clean energy source without first thoroughly understanding the entire legal ecosystem that governs this critical moment of crisis. Thus, the necessity of understanding the legal ecosystem in which the climate-environmental crisis is embedded is fully justified.

The environment has been protected under International Law (soft law) since 1911, with the North Pacific Convention for the Protection of Fur Seals. It entered a globalization context with the United Nations Conference on the Human Environment (1972), followed by the Stockholm Declaration, the Rio Declaration (1992), the World Summit on Sustainable Development (2002) – Johannesburg Declaration, and in 2012, the United Nations Conference on Sustainable Development (RIO+20). Additionally, a vast array of principles, doctrine, jurisprudence, and regulatory acts further demonstrate the importance and evolution of environmental protection at the international level[4].

This analysis starts from the premise that the climate crisis is an environmental crisis of planetary proportions and that, therefore, the environment is subject to multi-level protection under International, European Community, and national law. This legal ecosystem aims to ensure the preservation of natural environmental components as entities with intrinsic value. This analysis provides an overview of the current landscape of Climate Change Law, or simply the legal regime of climate change, with the objective of demonstrating how the climate crisis is primarily identified as a crisis of the energy model, which demands a transition to a low-emission model. This essay is part of a broader study addressing the Legal Regulation of Renewable Hydrogen in the Context of the Energy Transition – from the Paris Agreement to Carbon Neutrality. The objective of this analysis is to demonstrate how the multi-level structuring of the emerging field of climate change law contributes to the mitigation actions undertaken by States in response to the crisis. It seeks to illustrate how multi-level legal and regulatory protection operates. The appropriate methodology for this study is bibliographic analysis, which provides a comprehensive examination of the legal phenomenon under discussion.

Starting from a scenario of progress and economic growth, detached from social and environmental impact, a crisis point has been reached in which environmental protection emerges as a challenge of planetary proportions, giving rise to Environmental Law. This field aims to protect the various components encompassed by the environment, upon which the life and health of human beings depend[5]. Development brings risks to humanity, and these risks are increasingly difficult to mitigate, as from a certain point onward, the object of human intervention is no longer nature as it was originally known by humans, in its pure state. Instead, it is a nature that has been altered, intervened upon, a socialized nature with new and often still unknown characteristics[6].

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4 AMADO GOMES, Carla, *Introdução ao Direito do Ambiente*, 5ª Edição, Lisboa – Portugal, AAFDL EDITORA, 2022, ISBN: 978-972-629-758-1, p. 40.

5 SEIA, Cristina Aragão, A *Responsabilidade Ambiental na União Europeia*, Coimbra, Portugal, Almedina, 2022, ISBN 978-989-40-0086-0, p. 23.

6 BECK explica que o efeito secundário da socialização da natureza é a socialização das destruições e ameaças da natureza, a sua transformação em contradições e conflitos econômicos, sociais e políticos. Cfr. BECK, U, Frankfort del Meno, 1986, Jorge Navarro, Daniel Jimenez e Maria Rosa Borrás, Barcelona, Paidós, 1998, p. 98.

The Millennium Ecosystem Assessment concluded that, from the second half of the 20th century, humans have modified ecosystems more rapidly and extensively than at any other point in history, primarily to meet the growing demands for food, water, timber, fiber, fuel, and energy resulting from population growth. As a result, environmental protection has become a permanent concern and is currently one of the main challenges faced by the super-industrialized modern global society, aware that it cannot be an obstacle to industrial, scientific, and technological development, which are essential to economic growth[7]. The goal, therefore, is sustainable development accompanied by continuous environmental protection. The main objective of Environmental Law is, thus, to combat the negative impact of development on the environment. To achieve this, lawmakers have designed various instruments and made them available for protection, such as environmental taxation, emissions trading markets, environmental impact assessments, environmental permits, inspections and environmental sanctions, environmental management systems, eco-audits, and anti-pollution standards[8].

According to Carla Amado Gomes, Environmental Law is a relatively young field, emerging and asserting itself for the most unfortunate reasons: the sudden and alarming realization of the finite nature of natural resources, a consequence of centuries of uncontrolled exploitation, exacerbated by the industrial revolution of the 19th century. This is exactly what we are witnessing today with the overwhelming global crisis caused by the scarcity of fossil fuels[9]. By the late 1960s, the long-held belief in nature as an endless source of perpetual utility was undeniably shattered, giving rise to an intense and pressing concern that would no longer leave the political agenda, either domestically or internationally. This concern has grown exponentially with the ever-deepening civilizational crisis—the environmental climate crisis, whose devastating effects are being felt universally by all[10].

The economic rebirth following the war and industrialization, particularly in the Northern Hemisphere, significantly increased the use of fossil fuels such as coal and oil, which are now widely recognized as partly responsible for the phenomenon of global warming. For some, the effects of climate change are already irreversible, with the increasing frequency of extreme weather events (droughts, floods, hurricanes, wildfires), rising sea levels, the disappearance of islands, and species extinction. For others, it is still possible to prevent the irreparable destruction of current living conditions on the planet, provided there is effective commitment from international community actors—States, but especially corporations—in meeting the goals of the Paris Agreement, signed in December 2015 and in force since

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7 MILLENNIUM ECOSYSTEM ASSESSMENT, *Ecosystems and Human Wellbeing: Synthesis*, Washington DC, Island Press, 2005, pp 1 e ss.; e para o caso português, PEREIRA, H.et al.,"Uma avaliação dos ecossistemas em Portugal", em PEREIRA, H., DOMINGOS, T., VICENTE, L. e PROENÇA, V. (Eds.). Ecossistemas e bem-estar humano. Avaliação para Portugal do Millenium Ecosystems Assesssment, Lisboa, Fundação da Faculdade de Ciências da U.L. e Escolar Editora, 2009, p. 687 e ss. Disponível em <http.isa.ulisboa.pt/inbio/theoeco/publications/Pereira_2009_Ecossistemas.pdf>.

8 ARAGÃO SEIA, Cristina, *op.cit*,.2022, p. 25-26.

9 AMADO GOMES, Carla, Introdução *ao Direito do Ambiente*, 5ª Edição, Lisboa- Portugal, AAFDL EDITORA, 2022, ISBN 978-972- 629-758-, p. 25.

10 AMADO GOMES, Carla, *op.cit*, 2022, p. 25.

November 2016. In other words, it would only be an attempt to limit the increase in the Earth's temperature to 1.5°C above pre-industrial levels[11].

Environmental Law emerged as a law against[12], but it has grown into a law of possible reconciliation between humankind and the environment, representing an attempt to halt the degradation of natural resources without jeopardizing the socio-economic development model that supports Western civilization. Natural environmental components call for protection, and yet Environmental Law is increasingly surrounded and absorbed by an allegedly emerging, "climate change law[13]" or simply, the legal regime of climate change.

Environmental Law, understood as both human and universal—pertaining to a healthy environment, essential for life—can be seen as increasingly violated due to the climate crisis, calling for urgent measures to transition to a low-carbon economy. Environmental protection is not confined to the territory of a single State; the management of natural resources (whether good or bad) has repercussions throughout the entire ecosystem. If the environment is viewed as a common heritage of humanity, it requires international management, which would be the ideal model. However, there are the issues of state sovereignty that prevent a common management logic[14].

The fight against the climate-environmental crisis requires multi-level governance and regulation to guide coordinated actions by States. Actions related to climate change can be structured into three categories: mitigation actions, which aim to reduce CO2 emissions or increase the capture of greenhouse gases (sinks)[15]; adaptation actions, which aim to prepare society for the inevitable effects of climate change, both present and future[16]; and geoengineering, which seeks to find technological solutions (including renewable energy sources) that could modify the climate system and reduce the potential effects of climate change[17]. These are actions aimed at eliminating or reducing environmental risks (preventive in nature) related to the climate crisis, as well as adapting the system to adjust to the variability of climate phenomena in order to mitigate damages (consequences). These are the dominant lines in the fight against climate change in international environmental discourse[18].

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11 AMADO GOMES, *op.cit.,* 2022, pp. 26-27.

12 ROMI, Rafael, *Science et droit de lénvironnement: la quadrature du cercle, in Actualité Juridique – Droit Administratif,* 1991, pp.432 segs. Sobre a reconciliação entre o homem e o meio, Jaqueline MORAND-DEVILLER*, Le Droit de L´environnement*, Paris, 1987, pp. 5 e segs, *apud* AMADO GOMES, Carla, *op. cit*, Introdução...pp. 26-27.

13 AMADO GOMES*, Carla, op., cit, p.26*-27.

14 AMADO GOMES, Carla, *Introdução ao Direito do Ambiente*, Lisboa, Portugal, AAFDL editora, 2022, ISBN: 978-972-629-758-1, p. 95-99.

15 J.M. Alwood, et al. Glossary. In O. Edenhofer, et al., coord. *Climate Change 2014:Mitigation of climate Change. Contribution of Working Group III to the Fifth Assessment Report of the IPCC*. Cambridge: Cambridge University Press, 2014, p. 1266, *apud* ROCHA,Armando, *Tratado de Direito do Ambiente*, Vol. II, Editora FCT, CIDP – Centro de Investigação de Direito Público ICJP – Instituto de Ciências Jurídico-Políticas Alameda da Universidade, 1649-014 Lisboa, 2022, p.50, ISBN: 978-989-8722-60-7.

16 J. M. Alwood, et al., cit. nota 64, p. 1251*, apud* ROCHA, Armando, *op., cit,* 2022, p. 50.

17 J. M. Alwood, et al., cit. nota 64, p. 1262, *apud* ROCHA, Armando, op*., cit,* 2022, p. 50.

18 AMADO GOMES, Carla, *op. cit, Introdução...*, 2022, p. 98.

2 THE CLIMATE CRISIS AND THE ENVIRONMENT AS A UNIVERSAL LEGAL ASSET

Given the planetary scale of the climate crisis, it is essential to consider the environment as a universal legal asset, the degradation of which threatens humanity. When analyzing the scenario that necessitates the mitigation of global warming effects, attention turns to renewable energy sources, which are tools in service of the energy transition. Thus, a panoramic study of the legal phenomenon is undertaken, beginning with its catalyst, the climate-environmental crisis, and moving through the need to shift from a fossil-based energy matrix to a low-carbon economic model, thereby realizing the transition.

Agreements, conventions, and international treaties have multiplied throughout the history of Environmental Law, aiming to give it a general and universal character. However, it was the Rio de Janeiro conference that marked the beginning of a new era, in which the approach would become global, establishing the perception of the need for a combined and holistic effort to protect the environment as a universal legal asset[19].

Economic development, coupled with population growth and globalization, has led to an increase in production, uncontrolled consumption, waste, and an unsustainable use of natural resources, accompanied by the unchecked production and accumulation of waste that the planet now struggles to absorb[20].

The Rio de Janeiro conference held in 1992 was the ideal forum to assess the state of environmental conditions. However, the conclusion reached was disheartening: the global situation was quite critical. The numerous international texts were found to be unable to address the problems, as the words did not match the actions, and the regulations remained unfulfilled, partly due to the absence of sanctions. The application of the law was often compromised as well, due to the fragmentation of regulations, which led to conflicting interpretations and legal uncertainty. Additionally, the rapid escalation of environmental problems was occurring at a pace faster than the production of international legal texts trying to confront them. Thus, the Rio conference took place in an atmosphere of skepticism, supported by a sense of great frustration over the inability to halt the degradation that had already been observed in Stockholm[21].

The climate and environmental crisis ultimately demanded a complex legal ecosystem because, after the warning issued by the United Nations (UN) through the Stockholm Conference (1972), a series of international conventions and declarations dedicated to the environment followed, at an unprecedented pace, aiming to foster a global, holistic approach. This approach is based on the perception of environmental components in their ecosystem dimension, with entities that are inseparable by borders—a perception that led to universal instruments such as the Convention on

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19 AMADO GOMES, Carla*, Direito Internacional do Ambiente* – Uma abordagem temática. Editora AAFDL, Lisboa – Portugal, 2018, p.21, ISBN (versão digital) 978-972-629-231-7.

20 SEIA ARAGÃO, Cristina, *op.cit,* 2022, p. 15.

21 AMADO GOMES, Carla, *op.cit, Direito Internacional do Ambiente,* 2018, p.21.

Biological Diversity and the United Nations Framework Convention on Climate Change[22].

As can be inferred from the presented scenario, the dramatic climate-environmental crisis that threatens the environment as a life-supporting system has been demanding a systematic customization of the legal ecosystem, with an integrated approach, as the legal system faces the greatest challenge of the 21st century. Climate change, as Carla Amado Gomes asserts[23], It is the problem of the historical debt owed by the States of the Northern and Southern Hemispheres. Industrialization contributed to the warming of the planet, jeopardizing the balance of the planetary climate system by generating increasingly extreme phenomena and, in some cases, condemning species and environmental components to extinction.

The diffuse nature of carbon emissions, the difficulty in establishing causal links, the variability of climate projections, and the lack of consensus on a binding primary norm regarding *due diligence* concerning the obligation to prevent the rise in global temperature and protect the environment are some of the variables that require more resilient and multi-level approaches to applying the law. In sum, to effectively address the crisis, it is essential not only to regulate new energy sources that replace the carbon-based model. A custom-tailored legal system is needed to handle the complexity of the situation.

3 THE GENESIS OF CLIMATE CHANGE LAW

The threats of the climate crisis to the environment have led to the emergence of a legal ecosystem resilient to the urgent demands imposed to curb the worsening of the environmental crisis. International Environmental Law has its own characteristics and, as seen elsewhere, is distinguished by its nature as the common law of humanity.

Environmental protection demands multi-level regulation, with an internationalist vocation based on principles that are universal. Due to these characteristics, it often does not resonate with established systems, requiring frequent customizations and adaptations depending on the crisis at hand. Armando Rocha argues that climate change has given rise to the structural foundations of the climate change regime, whose backbone is International Law, but which also receives support and materializes in European Union Law and National Law. This approach analyzes the legal regime of climate change concerning the protection of the environment as a universal legal asset, its foundational principles, the duty of mitigation, the instruments of International Law, and adaptation policies[24].

A regime, as a set of rules aimed at regulating human behavior, rooted over centuries in the direction of more rational management of finite resources on a planet experiencing demographic growth, faces a difficult task. If we add the goal of

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22 HEYVAERT, Veerle, *The Transnacionalização of law: Rethinking Law through Transnational Environmenthal Regulation, In Transnacional Environmenthal Law,* 2017/2, pp. 205 e segs., 233*, apud* AMADO GOMES, Carla 2018, p. 95.

23 AMADO GOMES, Carla, *op. cit*, *Direito Internacional do Ambiente,* 2018, p.301-302.

24 ROCHA, Armando, *Tratado de Direito do Ambiente*, Vol. II, Alameda da Universidade, 1649-014 Lisboa, Portugal, Editora FCT, CIDP – Centro de Investigação de Direito Público ICJP – Instituto de Ciências Jurídico-Políticas Alameda da Universidade, 2022, ISBN 978-989-8722-60-7, p.30 segs.

halting the rapid extinction of species, the degradation of marine environments due to increasing plastic and hydrocarbon pollution, unregulated extraction, uncontrolled deforestation, and, in short, the profound changes in the planet's climate that exacerbate the intensity and frequency of extreme weather events threatening the conditions of habitability as we know them, the task seems almost impossible[25].

However, it is necessary to place hope in Law and the legal system. The rules of International Environmental Law tend to stand out in the protection of a universal legal asset due to their uniqueness[26], since most environmental problems are caused by private conduct (human actions). Therefore, International Environmental Law regulates both public and private conduct through the management of common goods. This is different from classical International Law, which primarily regulates state actions. Environmental problems reveal a strong component of uncertainty that complicates their detection and management—the ecological damage takes time to reveal itself in both existence and magnitude, and the way to combat it is made more difficult by its cross-cutting nature, which often occurs.

Environmental problems have a physical and technological basis, while issues of classical Public International Law have political roots. Also, the management of environmental issues requires an intense dynamic, resulting from continuous advancements in scientific research—the dynamism inherent in environmental phenomena led to the internalization of the need for periodic updates. Environmental problems are interconnected and require a global, holistic, and de-localized approach—the protection of the environment is not restricted to the territory of a state or region, as its management has repercussions throughout the entire ecosystem. Since certain goods are the common heritage of humanity, they require international management[27].

International Environmental Law, with all its characteristics, is the foundational principle of a legal regime for climate change, customized to provide faster responses to the complex scenario of global warming[28]. The rise in the global average surface temperature is not harmless. On the contrary, even a small increase is likely to trigger a profound change in the planet's climate pattern—it is this downstream change, caused by anthropogenic GHG emissions, that demands an unwavering commitment from states to promote the mitigation of its effects. And it is exactly mitigation that serves as the central pillar of the legal regime for climate change.

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25 OLIVEIRA, Heloísa, TAVARES LANCEIRO, Ruy, AMADO GOMES, Carla, *Tratado de Direito do Ambiente*, Vol.I, Parte geral, 2ª edição, Alameda da Universidade, 1649-014 Lisboa, Portugal ICJP, CIDP, Editora FCT, 2022, ISBN 978-989-8722-59-1N, p. 74.

26 BODANSKY, Daniel, BRUNÉE, Jutta e Ellen HEY, *International Environmenthal Law: mapping the field, in The Oxford, Handbook of International Environmenthal Law,* Oxford New York, pp.1 segs; e fazendo um balanço de 30 anos de Direito Internacional do Ambiente (1990/2020), veja-se Daniel BODANSKY, *Thirty years Latter: top tem developments in International Environmenthal Law*, Vol. 30, 2019, pp.3 segs, *apud* AMADO GOMES, Carla, *op. cit*, *Introdução ao Direito do Ambiente*, 2022, p.96-99.

27 ROCHA, Armando, *Op. Cit, Tratado de Direito do Ambient*e, 2022, p.35-36.

28 ROCHA, Armando, *Op. Cit.*, *Tratado de Direito do Ambiente*, 2022, p.35.

4 INTERNATIONAL LAW AND THE CLIMATE CHANGE REGIME

The geological history of our planet has always been marked by profound changes in the climate pattern, caused by various natural factors. For this reason, climate change itself is not a novelty in the historical-geological context: what is new in the current climate change phenomenon is its anthropogenic cause[29]. Specifically, this human fingerprint arises primarily from the emission of GHGs, which triggers cascading geophysical phenomena: in overly simple terms, first, the greenhouse effect; then, global warming; and finally, climate change[30].

The developments and intense normative fragmentation demonstrate the complexity of the source system of International Environmental Law, as the central axis of regulation in the context of climate change, where, on one hand, there are hard law instruments, soft law instruments, principles, rules of law, and customs. The delicacy of environmental issues, both from the perspective of preserving state sovereignty and changing the mentality of populations, leads to an abundance of soft law in this new area of International Law, excessively flexing prescriptive norms[31].

To address the challenges of mitigating the effects of the climate crisis, its global nature allows the issue of reducing GHG emissions to be placed, in the first instance, within the realm of International Law. Given that International Law is an order primarily concerned with the coordination of interests between States and other international actors, as well as being the ideal place for adopting global values and actions, it is easy to understand that any mitigation action regarding GHG emissions should begin with its formulation in International Law instruments – whether mandatory or of mere soft law. It will be in these spaces that the formulation of rules regarding GHG emissions reduction and the containment of global warming around a reference value (1.5°C or 2°C) can be found[32].

Armando Rocha highlights that the duty to mitigate anthropogenic GHG emissions can be supported by the already mentioned general principles of law, which structure the climate change regime. In fact, the minimum content of the "no harm" principle[33] could include the duty of States to avoid anthropogenic GHG emissions[34] originating from activities taking place within their territory or under

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29 IPCC. Summary for Policymakers. In V. Masson-Delmotte, et al., coord. *Climate Change 2021:The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the IPCC*. Genebra: IPCC, 2021, pp. 5-6.

30 ROCHA, Armando, *Tratado de Direito do Ambiente*, Vol. II, Alameda da Universidade, 1649-014 Lisboa, Portugal, Editora FCT, CIDP – Centro de Investigação de Direito Público ICJP – Instituto de Ciências Jurídico-Políticas 2022, ISBN 978-989-8722-60-7, p.33.

31 DUPUY, Pierre Marie, *Soft law and the international law of the environment*, *in Michigan Journal of International Law*, 1991/1, pp. 420 segs. apud AMADO GOMES, Carla, 2022, p.99, *op. cit*.

32 ROCHA, Armando, *Tratado de Direito do Ambiente*, Vol. II, Instituto de Ciências Jurídico-Políticas Alameda da Universidade, 1649-014 Lisboa, Portugal, Editora FCT, CIDP – Centro de Investigação de Direito Público ICJP – 2022, ISBN 978-989-8722-60-7, p.50.

33 P. Sands, et al. *Principles of International Environmental Law*. 4.ª ed. Cambridge: Cambridge University Press, 2018, p. 206.

34 IPCC. Summary for Policymakers. In V. Masson-Delmotte, et al., coord. *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the IPCC*. Genebra: IPCC, 2021, pp. 5-6. *Apud*, ROCHA, Armando, 2022, p. 33- [...] A história geológica do nosso planeta foi sempre pautada por alterações profundas no padrão climático, causadas por diversos fatores *naturais*. Por essa razão, as alterações climáticas, em si mesmas, não são uma novidade no contexto histórico-geológico: o que é novo no atual fenómeno de alterações climáticas é a

their jurisdiction, particularly when the level of emissions could jeopardize the balance of the climate-environmental system, thus creating cross-border damage or affecting a collective asset. For example, since the issue of climate change is triggered upstream by an excessive concentration of GHGs, this problem is not solely caused by the emissions of a single State, but by the global aggregate emissions of all States[35]. The analysis then follows of the main international normative instruments (treaties, protocols, and agreements) that may establish metrics to quantify the duty of mitigation of GHG emissions, according to the emerging climate change regime or law.

4.1 United Nations Framework Convention on Climate Change

Treaties can establish metrics to quantify the duty of mitigation of the effects and damages of the climate crisis that fall on each State. The first reference in positive law to a duty of mitigation is expressed in Article 2 of the UNFCCC (1992) (United Nations Framework Convention on Climate Change): to achieve the stabilization of greenhouse gas emissions and their concentrations in the atmosphere at a level that would prevent anthropogenic interference with the climate system[36]. Exactly, the first efforts of the convention dig into the solution for the crisis within the energy model (anthropogenic cause), rather than necessarily focusing on the climate system itself. Assertively, it seeks to address the cause, finding ways of mitigation within it.

This provision establishes the goal of the convention; however, it does not specify the duty to reduce anthropogenic GHG emissions. Although it does not mention any metric that defines what would constitute dangerous human interference, the final objective of the UNFCCC is to prevent dangerous interference with the climate system. Armando Rocha asserts that it is precisely the vague content of this article that gives the UNFCCC its usefulness and greater adaptability[37]. Another point to observe is that Article 2 does not set a quantitative target for global warming, considered acceptable for the technological and civilizational standards of the current world. It is noted that the reference of 2°C, as the maximum limit for the rise in global average temperature compared to pre-industrial values, was only formulated at the Copenhagen and Cancun Summits in 2010[38].

Another particularity of the norm is that it refers to the stabilization of GHG concentrations in the atmosphere, but not to their reduction, particularly through the capture of GHGs (carbon sinks). It does not individualize the responsibility for

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sua causa *antropogénica*. Em concreto, esta impressão digital humana decorre da emissão de GEE, que desencadeia fenómenos geofísicos em cascata: em termos excessivamente simples, primeiro, o efeito de estufa; depois, o aquecimento global; e, por fim, as alterações climáticas.

35 ROCHA, Armando, *op. Cit*., p. 51.

36 M. Oppenheimer e A. Petsonk. Article 2 of the FCCC: Historical Origins, Recent Interpretations. *Climate Change*. 2005, 73, pp. 195-226*, sobre esta disposição, apud* ROCHA, Armando, 2022, p. 51.

37 MAYER. B, cit. nota 23, p. 111, *apud* ROCHA, Armando, p. 52.

38 Cfr. ONU. *The Cancun Agreements: Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention*, Decisão 1/CP.16, § 4. Antes disso, a referência surgiu na comunidade científica e foi reforçada pela União Europeia e pelo G8.

mitigation efforts, which makes it difficult to assess the legal duty of States. From an objective point of view, it does not numerically identify the mitigation target or when it should be achieved[39].

Article 4 of the UNFCCC (CQAC) establishes some binding legal duties for all economically developed States, related to the duty of mitigation: States are obligated to adopt national policies and take climate change mitigation measures based on 1990 levels, supported by the principle of common but differentiated responsibility — urging more developed countries to take the lead in climate mitigation actions[40].

Thus, the UNFCCC (CQAC) contributed significantly with minimum parameters for the mitigation policies of States and for meeting the goals of reducing anthropogenic GHG emissions. More precise metrics must be quantified by positive law. The questions that arose after the CQAC were eventually addressed by the Kyoto Protocol, thus demonstrating the importance of this document in defining minimum standards to be followed by countries regarding climate change.

4.2 Kyoto Protocol

In 1997, the Kyoto Protocol was adopted, which aimed to concretize the mitigation effort. It established that the involved parties (States) should, either individually or jointly, ensure that their anthropogenic emissions, in terms of carbon dioxide equivalent, do not exceed the allocated quantities. The goal was to reduce their global emissions of these gases by at least 5% below 1990 levels, during the commitment period from 2008 to 2012[41].

It was established in Annex I of the Kyoto Protocol that States commit to ensuring that their anthropogenic [CO_2 eq] emissions of greenhouse gases, listed in Annex A of the protocol, do not exceed the allocated quantities. These quantities are calculated based on their quantified commitments to limit and reduce emissions outlined in Annex B[42]. The metrics established in the protocol do not allow for additional emissions, even within the established limits. Furthermore, they do not exempt States from making additional mitigation efforts as per the principle of "no harm"[43].

At the Doha Summit, it was agreed to extend the mitigation obligation for a second commitment period, from 2013 to 2020, during which the same States committed to reducing, either individually or collectively, their GHG emissions by at least 18% below 1990 levels, for the commitment period between 2013 and 2020[44].

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39 ROCHA, Armando, *Op. Cit,* 2022, p. 52.

40 ROCHA, Armando*, Op. Cit,* 2022, p.52, [tradução livre].

41 ROCHA, Armando*, Op. Cit,* 2022, p. 53, [tradução livre].

42 Cfr. n.º 1 do artigo 3º.

43 *Op. Cit*., ROCHA, 2022, p.53.

44 Cfr. n.º 1*bis* do artigo 3.º do Protocolo de Quioto, adicionado pelo § C. do artigo 1.º da Emenda de Doha ao Protocolo de Quioto à CQAC, adotada em Doha a 8 de dezembro de 2012, entrou em vigor na ordem jurídica internacional a 31 de dezembro de 2020 (i.e., no último dia de vigência do período de compromisso). Portugal depositou o seu instrumento de ratificação a 22 de novembro de 2017 e a convenção foi aprovada pelo Decreto n.º 19/2015, de 21 de outubro.

In any case, the Kyoto Protocol remains, to this day, the best example of a forecast in an international treaty for a mitigation obligation, with objective and quantifiable metrics. Therefore, it truly enshrines a duty to reduce GHG emissions, although confined and limited[45]. It can be inferred that the Paris Agreement, which is essentially a treaty on the energy model, brings, in a way, a guiding approach on how to mitigate the effects of the climate crisis through its immediate cause, namely, CO2 emissions.

4.3 Paris Agreement

The Paris Agreement (2015) on climate change covers mitigation, adaptation, and the financing of measures aimed at fulfilling the commitments related to the agenda of reducing GHG emissions.

Article 2(1) of the Paris Agreement aims to strengthen the global response to the threat of climate change, including by: limiting the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels. This provision does not establish a duty of climate change mitigation or a reduction of anthropogenic GHG emissions, or at least, it does not explicitly define such a duty as a legal obligation of States. In other words, instead of adopting wording that would set forth rights and duties, it opted for an objective-oriented wording, significantly reducing the identification of a mitigation duty. This does not mean there is no legal obligation. It simply means that its quantification is not characterized by the legal norm[46].

The Bali Action Plan (2007) urged States to adopt a shared vision for long-term cooperative action that would encompass all States, or should include "measurable, reportable, and verifiable mitigation commitments or actions, nationally appropriate." However, it was in the Paris Agreement that an objective metric was established, introducing the reference parameters of well below 2°C and, preferably, 1.5°C[47], which allowed the normative concretization of the term "dangerous" in the concept of dangerous interference with the climate system[48]. Furthermore, by stipulating an objective to achieve a balance between anthropogenic emissions from sources and removals by sinks of greenhouse gases[49] in the second half of this century[50].

The Paris Agreement is innovative in allowing States to define their contributions to the collective mitigation effort. It also includes a reporting and due

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45 MAYER. B, cit. nota 23, p. 114.

46 ROCHA, Armando, *Tratado de Direito do Ambiente*, Vol. II, Centro de Investigação de Direito Público ICJP – Instituto de Ciências Jurídico-Políticas Alameda da Universidade, 1649-014 Lisboa, Portugal,Editora FCT, CIDP – 2022, ISBN 978-989-8722-60-7, p. 55.

47 Cfr. alínea a) do n.º 1 do artigo 2.º.

48 BOYLE, A e C. Redgwell, cit. nota 15, p. 393; P. Sands, et al., cit. nota 17, p. 301, *apud*, ROCHA, Armando 2022, p. 56, *op. cit*.

49 LOPES, Thaynara, 2022, "Sumidouros de carbono". Matanativa.com.br – consultado 26/04/2024 – sumidouros de carbono são depósitos naturais que absorvem e capturam carbono da atmosfera, reduzindo sua presença no ar (oceanos, solos e florestas). A FAO (Organização das Nações Unidas para a Alimentação) afirma que o reflorestamento e a gestão do solo de forma sustentável, poderia representar uma queda de 9 gigatoneladas (Gt) de CO^2 em 2030.

50 Cfr. n.º 1 do artigo 4.º.

diligence obligation for their actions, rather than a result-based obligation. Furthermore, it is a pioneer in suggesting a future of carbon neutrality on a global scale[51].

Although it establishes a binding mitigation obligation for all States under the principle of common but differentiated responsibility, it is up to each State to define its own obligatory content. The Agreement also marks a distinction between developed and developing States – developed States should continue to lead in meeting absolute emissions reduction targets across the economy and provide incentives to developing States. Meanwhile, developing States should continue to improve their mitigation efforts and gradually advance towards reducing emissions across their economies[52].

States have not shown much interest in assuming international obligations that bind them too tightly on climate change matters. As mentioned by the IPCC (Intergovernmental Panel on Climate Change)[53]. For this reason, treaties such as the UNFCCC (United Nations Framework Convention on Climate Change), the Kyoto Protocol, or the Paris Agreement contain legal obligations but have the skill to design a set of norms with soft, or even nonexistent, normative content[54].

Faced with this framework of insufficient obligations (low levels of enforcement) in international instruments, it becomes necessary to resort to European law, national law, and principles to ensure compliance with the duty of mitigation, even if it requires adaptation and extensive interpretation.

5 CHARACTERISTICS OF THE CLIMATE CHANGE REGIME

As demonstrated in this chapter, the climate change regime is built upon the foundations of Environmental Law, drawing from its concepts, principles, bases, and fundamentals. It can be inferred that climate change law is a subsystem of Environmental Law, perhaps an appendix to it, but of crucial importance in the current climate crisis scenario. Armando Rocha states that the legal regime of climate change has gained some autonomy in relation to Environmental Law itself and is a call to rethink the various scientific areas of law[55]. The multilevel normative protection of Environmental Law, its internationalist vocation (for reasons already

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51 ROCHA, Armando, *Tratado de Direito do Ambiente*, *Op. Cit.,* 2022, p. 56-59.

52 Cfr. n.º 4 do artigo 4.º do Acordo de Paris

53 STAVINS, R, et al. 2014: International Cooperation: Agreements and Instruments. In O. Edenhofer, et al., C*limate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*.Cambridge: Cambridge University Press, 2014, p. 1020. Como uma maior vinculação jurídica implica maiores custos de violação, os Estados podem preferir acordos mais juridicamente vinculativos para incorporar compromissos menos ambiciosos, e podem estar dispostos a aceitar compromissos mais ambiciosos quando estes são menos vinculativos juridicamente"[tradução livre] *apud*, ROCHA, Armando, 2022, p.58, *op.cit*.

54 BODANSKY, Daniel. *Legally Binding versus Non-Legally Binding Instruments.* In S. Barrett, C. Carraro e J. Melo, coord. *Towards a Workable and Effective Climate Regime*. Londres: VoxEU, 2015, pp. 155-165; D. Bodansky, J. Brunnée e L. Rajamani, cit. nota 22, pp. 213-214; L. Rajamani. The 2015 Paris Agreement: Interplay Between Hard, Soft and Non-Obligations. *JEL*. 2016, 28, pp. 337-358; P. Sands. Climate Change and the Rule of Law: Adjudicating the Future in International Law. *JEL*. 2016, 28, p. 28; P. Sands, et al., cit. nota 17, p. 304, *apud* ROCHA, Armando, 2022, p.59.

55 ROCHA, Armando, *Op. Cit* ,2022, p.111-112.

explored), and its principled foundations, lend their DNA to the legal regime of climate change and to any other regime aimed at environmental protection. The existence of the regime is undeniable; however, its effectiveness and reach can be maximized and achieve higher levels of applicability through European community law and national law, as will be explored in the following sections.

5.1 Transversality, Regulation and Multi-Level Protection

Environmental Law is characterized by its transversality within the legal sciences, which means, first of all, that potentially, legal norms from any area can be integrated into Environmental Law, as long as they pertain to that legal good, such as public law norms that, only residually, regulate environmental issues. Secondly, it is important to note that the previously mentioned bidimensionality of the components of the environmental legal good – both as objects and simultaneously as sources of the ecological functionalities that are normatively protected – carries with it a potential for conflict between norms from different areas of law, depending on whether the utilitarian or ecological perspective is taken[56].

As an area of law that regulates the comprehensive use of resources with the aim of preventing significant environmental impacts, Environmental Law emerged almost simultaneously in International Law and National Law, and shortly thereafter, in EU Law. Therefore, Environmental Law is structurally multi-level, meaning that for any given natural component or related issue, norms from all levels of the legal system apply. To regulate a particular situation, legal norms from International Law, EU Law, and National Law almost always come into play, reflecting the international nature of environmental legal situations, their scope, potential harm, and impacts[57].

The transnational nature of environmental impacts has led to Environmental Law being regulated by various international conventions across different areas, not necessarily requiring the transboundary impact on specific states. The multi-level regulation also extends to regional and local powers, particularly regarding the mitigation of climate change, at both the national and international levels. This approach reflects the need for coordination across different governance levels to effectively address global environmental challenges[58].

The search for alternatives to the current crisis scenario transcends the clear boundaries of the branches of law to be applied or a specific set of norms. However,

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[56] OLIVEIRA, Heloísa, TAVARES LANCEIRO, Rui, AMADO GOMES, Carla, *Tratado de Direito do Ambiente*, Vol.I, Parte geral, 2ª edição, Alameda da Universidade, 1649-014 Lisboa, Editora ICJP, FCT, ISBN 978-989-8722-59-1N *apud,* H. Oliveira. *Eficácia e Adequação Na Tutela Sancionatória de Bens Ambientais. RCR.* 2011, II (5), ISSN 1647-5801, pp. 205-238.

[57] SAND, P.H. *Global Environmental Change and the Nation State: Sovereignty Bounded? In G.Winter, ed. Multilevel Governance of Global Environmental Change: Perspectives from Science,Sociology and the Law. Cambridge: Cambridge University Press,* 2006, ISBN 978-0521173438, pp. 519-538, *apud* H. OLIVEIRA, R. TAVARES LANCEIRO, C. AMADO GOMES, *op. cit,* 2022, p. 67.

[58] H. P. Aust. *The Shifting Role of Cities in the Global Climate Change Regime: From Paris to Pittsburgh and Back? REC&IEL.* 2019, n.º 1, pp. 57-66. ISSN (print) 2050-0386. ISSN (online) 2050-0394. DOI, *apud,* H. OLIVEIRA, R. TAVARES LANCEIRO, C. AMADO GOMES, *op. cit*. 2022, p. 67.

it requires the jurist, in the application of the law, to integrate and engage in a genuine dialogue between sources from the entire legal ecosystem. This is necessary to respond to the urgency of the energy transition, reducing emissions, and achieving multi-level environmental regulation and protection. It highlights the importance of an interconnected and flexible legal approach to address the complexity of environmental challenges effectively.

5.2 Internationalist Scope

Given the planetary proportions of the climate-environmental crisis, a matter that knows no borders due to its magnitude, it would not be reasonable to apply only legal systems reserved for a specific territory or state, as the environment is a matter of common interest for humanity.

The current context is still marked by the sovereigntist paradigm – and this largely explains the insufficiency of more precise legal responses to environmental issues. In a global context of uncertain responsibilities, states are often reluctant to relinquish their unilateral interests in a scenario of competition for economic resources. The resolution of fully international environmental problems, such as the biodiversity crisis and the climate emergency, requires a shift to an internationalist model[59].

The trans-temporality of Environmental Law stems from the imperative to consider the long-term and even very long-term environmental effects of human action. The time of natural cycles is not the time of human life, and while it may not be feasible for humans today to fully consider geological time (deep time), the mitigation and adaptation to climate change has revealed the legal duty of public authorities to consider environmental impacts in a future time that seems remote to us[60].

As emphasized by the Hague Court, the environment is not an abstraction but constitutes the vital space that provides quality of life and health to human beings, including those who are yet to be born (*heritàge*). Therefore, States must ensure that activities carried out within their jurisdiction respect the integrity of the environment in other States and in areas outside of state jurisdiction (§29 of the opinion)[61]. As seen, both time and space are relativized in the application of Environmental Law, in relation to any threat or harm, whether climatic or otherwise.

5.3 Principle-Based Foundation

Even if unintentionally, the principles of Environmental Law play a crucial role in achieving regulatory milestones for the protection of the life-support system. In the context of recent crises (climatic, environmental, economic, energy), this is

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59 H. OLIVEIRA, R. TAVARES LANCEIRO, C. AMADO GOMES, *op. cit., Tratado de...* 2022, p. 73.

60 H. OLIVEIRA, R. TAVARES LANCEIRO, C. AMADO GOMES, *op. cit., Tratado de...2022*, p. 72 – [...] A vocação metaestatal e metageracional do dever de proteção do ambiente e, concretamente, da estabilidade climática, foi enfatizada pelo Tribunal Constitucional alemão na sua decisão de 24 de março de 2021, partindo do artigo 20a da Lei Fundamental de Bona. [...] Ao dar este passo, o Tribunal Constitucional alemão reconhece que a proteção do ambiente/estabilidade do clima é uma obrigação dos Estados para com a comunidade internacional no seu todo e que os deveres de prevenção de uma ruptura do equilíbrio ecossistêmico são invocáveis erga omnes.

61 OLIVEIRA, Heloisa, TAVARES LANCEIRO, Rui, AMADO GOMES, Carla, *op. cit.*, 2022, p. 74.

even more so, as there is no legal ecosystem solely based on specific laws to address all situations requiring protection. Thus, even principles that are not fundamentally regarded as legal norms end up having an essential role in the construction of a broad-spectrum Environmental Law.

It is true that various interests clash with environmental protection, with economic development standing out as a significant factor, highlighting the difficulty of States in adopting clear and definitive political decisions at both the national and international levels. The consequence in the legal system is the replacement of laws with political acts—at the international level, treaties with joint declarations; in domestic law, legal regimes with public incentive policies. The lack of political will from States to approve rules is undoubtedly one of the reasons why principles hold significant centrality in the study of Environmental Law and its phenomena: environmental principles are present in all environmental policies. It is worth remembering that the climate crisis is an environmental crisis. However, there is some resistance from the judiciary in recognizing some of these principles as legal norms of customary origin, even though doctrine has already acknowledged the legal status of principles such as prevention, precaution, and the polluter-pays principle[62].

Since the climate crisis is the principal environmental issue of the present day, it is not surprising that its legal regime is shaped by principles common to International Environmental Law, such as the no harm principle, the principles of prevention, precaution, sustainable development, and cooperation. However, the specificity of the climate issue requires that these principles be configured in a special way within the domain of climate change. In addition, the unique characteristics of climate change allow for the dogmatic construction of other legal principles that are specific to its legal regime, such as the principle of common but differentiated responsibility (which is similar to the polluter pays principle, also shared with International Environmental Law)[63].

By way of example and to understand their instrumentality within a context of multi-level regulation, principles play an important role due to their characteristic of having open and adaptable content to different realities. In this study, the focus is not on the juridical nature or the level of obligatoriness of the principles; rather, emphasis is placed on their relevance in the face of the complex climate-environmental situation and the need to mitigate its effects within a legal framework that has gaps and distortions. Common principles of Environmental Law will not be treated individually in this study, as that is not its aim. However, in this section, only those principles that can regulate specific situations of the climate-environmental crisis and are closely related to it will be highlighted.

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62 OLIVEIRA, Heloísa, *Tratado de Direito do Ambiente*, Vol. I, parte geral, 2ª edição, ICJP, CIDP, Editora FCT, Alameda da Universidade, 1649-014 Lisboa, 2022, p.82, ISBN 978-989-8722-59-1 – A evolução do Direito do Ambiente permite dar conta que algumas destas declarações foram gradualmente adquirindo natureza jurídica, sobretudo através da sua incorporação em convenções internacionais, no Direito da UE e no Direito interno dos Estados.

63 ROCHA, Armando, *Op. cit.*, 2022, p.36-37.

5.3.1 No harm principle and other foundational principles

This principle establishes that a State should not engage in or permit conduct from its territory and/or jurisdiction that could cause significant environmental harm to the territory or population of another State (as well as to collective goods such as the sea or the atmosphere)[64]. This principle is related to the permanent sovereignty of States over their territory and natural resources, and it includes both a negative dimension (i.e., refraining from environmentally harmful conduct) and a positive dimension (i.e., surveillance, monitoring, and control of environmentally harmful conduct occurring in its territory and/or jurisdiction, even if carried out by private individuals)[65]. This study does not address the structural issues surrounding this principle but instead aims to demonstrate how it operationalizes the mitigation of damages related to the climate crisis.

Its binding character stems from customary law, affirmed by the International Court of Justice (ICJ), and by its nature as a *due diligence*[66] obligation, it is set forth in the preamble of the UNFCCC (United Nations Framework Convention on Climate Change), first mentioned in the Trail Smelter[67] arbitral award. As a foundational principle of International Environmental Law, it can be easily extended to the domain of climate change. In fact, this principle was originally conceived to address issues of neighboring states, where one state causes harm to another's territory, atmosphere, or collective goods. The obligations arising from the no-harm principle pertain to procedural duties, including notification, consultation, cooperation, and, especially, conducting environmental impact assessments[68].

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64 Parecer consultivo do TIJ de 8 de julho de 1996, emitido a pedido da Assembleia Geral das Nações Unidas, sobre a questão da legalidade da ameaça ou do uso de armas nucleares. ICJ Rep 226, § 29; acórdão do TIJ de 25 de setembro de 1997. Caso *Gabcikovo-Nagymaros.* ICJ Rep 7, § 53. Cfr., ainda, princípio 21 da Declaração de Estocolmo. Também o TIDM teve já o ensejo de referir-se ao princípio *no harm* em relação aos espaços marítimos para além da jurisdição espacial dos Estados: cfr. Parecer consultivo do TIDM de 1 de fevereiro de 2011. *Parecer do Tribunal Internacional para o Direito do Mar sobre responsabilidades e obrigações dos Estados no que respeita a Área.* ITLOS Rep 10, §§ 110-150*, apud*, ROCHA, Armando, 2022, p.3.

65 SANDS. P, Cfr., et al. *Principles of International Environmental Law*. 4.ª ed. Cambridge: Cambridge University Press, 2018, p. 206, apud, ROCHA, Armando, 2022, p. 36.

66 Acórdão do TIJ de 20 de abril de 2010. *Caso Pulp Mills on the River Uruguay (Argentina c.Uruguai)*. ICJ Rep 14, § 101; Acórdão do TIJ de 16 de dezembro de 2015. *Casos Construction of a Road in Costa Rica along the San Juan River / Certain Activities Carried Out by Nicaragua in the Border Area (Nicarágua c. Costa Rica & Costa Rica c. Nicarágua)*. ICJ Rep 665, § 104.

67 O caso da fundição trail (trail smelter case) – Estados Unidos x Canadá: características transfronteiriças dos danos ao meio ambiente e a responsabilidade internacional do Estado por danos ambientais – *O Caso da Fundição Trail* (*Trail Smelter Case*) teve início a partir da queixa apresentada pelo Governo dos Estados Unidos contra o Governo do Canadá à Comissão Mista Internacional, baseando-se nos termos do Tratado de Águas de Fronteira (*Boundary Waters Treaty* ou, mais modernamente, podemos dizer Tratado de Águas Fronteiriças), de 1909.A empresa Consolidated Mining And Smelting Co. of canada – do ramo de zinco e chumbo – era acusada de poluir, também, áreas em território estadunidense – mais precisamente no estado de Washington – com emissões de dióxido de enxofre (ou anidrido sulfuroso) – apud, FAZOLLO CESÁRIO, Leandro, 2010, <https://conteudojuridico.com.br/consulta/Artigos/20042/o-caso-da-fundicao-trail-trail-smelter-case-estados-unidos-x-canada-caracteristicas-transfronteiricas-dos-danos-ao-meio-ambiente-e-a-responsabilidade-internacional-do-estado-por-danos-ambientais>. consultado em: 23 mar. 2024.

68 BODANSKY, Daniel, J. Brunnée e L. Rajamani. *International Climate Change Law*. Oxford: Oxford University Press, 2017, apud ROCHA, Armando, op. cit. 2022, p.42 e 43.

The greater complexity of GHG emissions and climate change does not undermine the relevance of the principle in addressing the crisis[69], but it does present serious challenges to its application, as it remains a generic mitigation principle that is still insufficiently defined. It has been used as an aid in the reasoning behind court decisions (e.g., the Urgenda case)[70], although it has not yet had the power to definitively resolve the issues surrounding climate change.

It is important to note that the obligation placed on States, arising from Article 2 and Paragraph 3 of Article 3 of the UNFCCC, is to prevent dangerous anthropogenic interference with the climate system. The principle of "no harm" differs from the principle of prevention. The “no harm” principle is based on protecting state sovereignty against external environmental harm, while the prevention principle aims to safeguard the legal assets of the environment and climate in an autonomous and direct way. Therefore, it applies even in situations where no harm is caused to another state, its collective assets, or when the harm occurs within the territory of the state itself[71].

However, the principle of prevention complements the “no harm” principle: where it is not possible to avoid the emission of GHGs, measures should be adopted to reduce or mitigate these emissions, in order to prevent the damage they produce from being “significant”[72].

The principle of sustainable development should guide public decision-makers in environmental, climate, and sectoral public policies (particularly energy policies), but it is unclear whether legal obligations can stem from it[73]. One of the most relevant dimensions of this principle is that it obliges public decision-makers to address environmental and climate issues in a holistic manner, which includes not only the need for rational management of natural resources but also the need for economic and social development. In the climate context, not only do States reject any propositions of this principle that interfere with their sovereign decisions, but one of the structural elements of the legal regime for climate change is to allow developing States to still increase their GHG emissions. However, the goal of this provision is to allow GHG emissions to rise in order to reach their peak as soon as possible[74], thus enabling developing States to have an opportunity for economic and social development comparable to that of developed States.

Indeed, intergenerational solidarity becomes a crucial foundation of the legal regime for climate change, inspiring and shaping its solutions, even though it is not exactly operational in a clear-cut way. However, there is nothing preventing the constitutions of each State from serving as a normative support to identify this

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69 MAYER, B. cit. nota 23, pp. 70-71. Em sentido contrário, cfr. A. Zahar. Mediated versus Cumulative Environmental Damage and the International Law Association’s Legal Principles on Climate Change. *Climate Law*. 2014, 4, p. 217, *apud* ROCHA, *op. cit*, 2022. p. 39.

70 DE SADELEER, N. *Environmental Principles: From Political Slogans to Legal Rules*. 2.ª ed. Oxford: Oxford University Press, 2020, p. 87, *apud* ROCHA, *op. cit*, 2022. p. 39.

71 OLIVEIRA, Heloísa, *op. cit*. nota 27, p. 108; P. Sands, et al., cit. nota 17, p. 212.

72 ROCHA, Armando, *op.cit,* p.40.

73 ONU. Comissão Mundial sobre Meio Ambiente e Desenvolvimento. *Our Common Future*. Cap. II. Oxford: Oxford University Press, 1987, § 1.

74 Cfr. n.º 1 do artigo 4.º do Acordo de Paris *apud,* ROCHA, Armando, *2022, p.42 segs.*

principle of intergenerational solidarity. As demonstrated by the German Constitutional Court in 2021, which identified this principle in Article 20-A of the German Constitution, highlighting a protective dimension for future generations in the context of state climate action. This recognition emphasizes that the obligations of the present generation extend to safeguarding the rights of future generations, a key element in addressing the long-term impacts of climate change[75].

The "polluter pays" principle allows for the preventive function of environmental and climate harm and makes the economic operator bear the environmental cost associated with producing a risk or environmental damage. The rationale, of course, is not to legitimize the production of harm to the environment or the climate system, but rather to mark the legal censure of such conduct. Thus, the expectation is that the economic operator, by internalizing this cost, will be incentivized to adopt less harmful behavior for the environment or climate; similarly, if the operator is able to pass on this cost to the consumer, the added cost of acquiring a good or service encourages the consumer to choose a product or service that is less harmful to the environment or climate (consumer-pays principle)[76]. In the context of climate change, the refractions of this principle can be found, for example, in carbon market mechanisms or carbon taxation, whose economic costs discourage activities that emit greenhouse gases and signal their legal censure[77].

The principle of common but differentiated responsibility seeks to translate, in the context of international relations, an idea similar to the polluter-pays principle[78], suggesting that, while the climate effort is a shared undertaking, there are states that have a greater responsibility in this effort due to their past carbon footprint[79]. At its core, it is based on Principle 7 of the Rio Declaration, in which the principle of common but differentiated responsibility is referred to as a cornerstone of the International Environmental Law framework[80]. ollowing this, paragraph 1 of Article 3 of the UNFCCC (UN Framework Convention on Climate Change) establishes as the cornerstone of the international legal regime for climate change the principle known as common but differentiated responsibilities and respective capabilities[81].

Due to its cross-cutting nature and multilevel governance, the climate change regime ultimately impacts European Union (EU) law and national law. To understand how environmental protection is addressed in the face of the climate crisis at the European and national levels, the following provides a brief analysis.

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75 Cfr. 1 BvR 2656/18, § BvR 78/20, 1 BvR 96/20 e 1 BvR 288/20, decisão de 24 de março de 2021, § 193.

76. SADELEER. N. cit. nota 25, pp. 31 e ss. *apud* A. ROCHA, 2022, p. 46-47.

77 OLIVEIRA, Heloisa, cit. nota 27, p. 116.

78 KHAN. M, Polluter-Pays-Principle: The Cardinal Instrument for Addressing Climate Change. *Laws*. 2015, 4, p. 639, *apud* A. ROCHA, 2022, p. 48.

79 MAYER. B, cit. nota 23, pp. 74-75.

80 Sobre este princípio, cfr. H. Oliveira, *Tratado de Direito do Ambiente*, 2022, cit. nota 27, pp. 89-91.

81 Cfr., ainda, o n.º 2 do artigo 2.º do Acordo de Paris, *apud* ROCHA, Armando *op. cit*, 2022, p. 48.

Given that the climate crisis is an environmental crisis of planetary proportions, the environment is subject to multilevel protection under International Law, European Union law, and national law. After analyzing the environmental normative ecosystem at the international level, this section briefly examines how legal protection is structured at the European level.

Since around the 1980s, the European Union has been focused on seeking global support and efforts to mitigate the effects of the climate crisis. To achieve this, it became a party to the UNFCCC (United Nations Framework Convention on Climate Change), the Kyoto Protocol, and the Paris Agreement.

The current wording of Article 191 of the Treaty on the Functioning of the European Union (TFEU) establishes that the EU's environmental policy includes promoting international measures to address regional or global environmental issues, notably combating climate change[82]. As a result, a European climate change law is being systematized[83], composed of various regulations and directives specifically related to climate change, alongside instruments adopted in sectoral areas, such as energy law, competition law, and financial markets law.

It is argued that the climate crisis is not only an environmental crisis but also a crisis of the sustainability of the energy model. Therefore, the way the EU has been gathering efforts to foster a European climate policy centered on the topics of climate mitigation, greenhouse gas (GHG) emission reduction, energy efficiency, and renewable energies becomes even more significant, implicitly affirming the legal duty of mitigation. This policy has been systematized and concretized in the legal instruments, briefly outlined in this analysis[84]:

The Directives 2001/77/EC, of the European Parliament and Council, dated September 27, 2001 (promotion of electricity produced from renewable energy), and 2003/30/EC, of the European Parliament and Council, dated May 8, 2003 (use of biofuels and other renewable fuels in transport), were repealed by Directive No. 2009/28/EC, of the European Parliament and Council, dated April 23, 2009 (use of renewable energy), which was later repealed by Directive (EU) No. 2018/2001, of the European Parliament and Council, dated December 11, 2018 (promotion of the use of renewable energy);

Directive 2002/91/EC, of the European Parliament and Council, dated December 16, 2002 (energy performance of buildings), was repealed by Directive No. 2010/31/EU, of the European Parliament and Council, dated May 19, 2010;

Directive 2003/87/EC of the European Parliament and Council, dated October 13, 2003, establishes the emissions trading system (ETS) for greenhouse gases (GHG);

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82 A. Rocha, 2022, p. 60, Cfr. n.º 1, 4.º travessão, do artigo 191.º

83 Isto é, o tratamento integrado dos diplomas normativos que, ao nível da União Europeia, estabelecem medidas de mitigação ou adaptação às alterações climáticas (cfr. E. Woerdman, M. Roggenkamp e M. Holwerda, coord. *Essential EU Climate Law*. Cheltenham: Edward Elgar, (2021, p. 10) *apud* A. ROCHA, 2022, p.60.

84 *Op. Cit, p. 60-61*

Directive 2004/8/EC, of the European Parliament and Council, of February 11, 2004 (promotion of cogeneration based on the demand for useful heat), repealed by Directive No. 2012/27/EU, of the European Parliament and Council, of October 25, 2012 (energy efficiency);

Directive 2006/32/EC, of the European Parliament and Council, of April 4, 2006 (efficiency in the final use of energy and energy services), also repealed by Directive 2012/27/EU.;

Directive 2006/40/EC, of the European Parliament and Council, of May 17, 2006 (emissions from air-conditioning systems installed in motor vehicles);

Regulation (EC) 842/2006, of the European Parliament and Council, of May 17, 2006 (fluorinated greenhouse gases), repealed by Regulation (EU) 517/2014, of the European Parliament and Council, of April 16, 2014.;

Directive 2009/28/EC, of the European Parliament and Council, of April 23, 2009 (promotion of the use of renewable energy), also repealed by Directive 2018/2001/EU;

Directive 2009/31/EC, of the European Parliament and Council, of April 23, 2009 (geological storage of carbon dioxide). Common to all these regulations is the implementation of an inherent duty of mitigation. Thus, Article 1 of the aforementioned Directive No. 2003/87/EC, by stating that its purpose is to promote the reduction of GHG emissions and, in doing so, contribute to the reduction levels considered scientifically necessary to avoid dangerous climate change, logically presupposes the existence of a prior duty of mitigation arising from International Law and that, through the operation of the directive, falls on Member States. It is observed that the duty of mitigation is a presumption and arises indirectly in the regulations; however, this does not remove the responsibility to adopt all concrete measures and sectoral policies, even though the obligation of such instruments may be questionable[85]. For example, in relation to paragraph 1 of Article 1 of Directive No. 2009/31/EC on the geological storage of CO2 (carbon sinks), which states that its purpose is to contribute to the fight against climate change; or in relation to Article 1 of Regulation (EU) 517/2014, which states that the purpose of the regulation is to protect the environment by reducing emissions of fluorinated greenhouse gases.

In October 2014, the European Council agreed on a new climate and energy action framework for 2030, aiming to adopt a binding European target of at least a 40% reduction in domestic greenhouse gas emissions by 2030, compared to 2005 levels. This demonstrates an implicit recognition of a legal duty to mitigate, acknowledging the obligation for States to adopt measures. The European Green Deal, adopted by the European Commission, is an ambitious document in its objectives and aims to be a pact between the EU and its citizens. By 2030, a reduction of at least 50% in GHG emissions compared to 1990 levels is expected, with the goal of achieving carbon neutrality by 2050.

It is in this context that Regulation (EU) No. 2021/1119, of the European Parliament and the Council, of June 30, 2021 (European Climate Law), was adopted, establishing the legal framework to achieve climate neutrality. Its Article 1 is clear

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[85] ROCHA, Armando, *op. cit., p.62 segs.*

in setting the objectives of the irreversible and gradual reduction of anthropogenic GHG emissions from sources, and the increase of removals through carbon sequestration and capture. By 2050, the EU's goal shifts to achieving negative emissions. In this way, European law has created a roadmap for carbon neutrality[86]. Also, without prejudice to social and economic considerations, a regime for compliance assessment and adjustment of targets every five years was established[87], thus aiming to provide some predictability to economic investors[88].

Alongside the European Climate Law, it is also important to mention the EU Emissions Trading Directive (CELE), which establishes the legal framework for the trading of GHG emission allowances in order to promote emission reductions. Article 4 of the CELE Directive states that Member States must ensure that, from January 1, 2005, no installation carries out any activity resulting in emissions related to that activity, unless the operator holds a permit issued by the competent authority. In other words, the rule established by the CELE Directive is the prohibition of GHG emissions unless a permit is obtained[89].

It can be concluded that there is a prior mitigation duty stemming from International Law, which, through the operation of the directive, is assigned to the Member States. It is observed that the duty of mitigation is an assumption that arises in legal instruments as an implicit obligation; however, the responsibility to adopt all concrete measures and policies remains, even if the obligation of such instruments is questionable. The evaluation and adjustment regime for emission reduction targets every five years, which is expected to provide some predictability for economic investors, can be an important indicator regarding investments in new renewable energy sources.

7 APPROACH TO THE CLIMATE CRISIS AND NATIONAL LAW

In the Portuguese case, there is full incorporation of international and European obligations through the operation of Article 8 of the Portuguese Constitution, meaning that, as Portugal is a Member State of the EU and a party to the CQAC, the Kyoto Protocol, and the Paris Agreement, the previously outlined mitigation obligations are also part of the normative framework in effect within the Portuguese legal order. Thus, there is an effort for climate action through internal legal instruments (the LBC, adopted by Law 98/2021, of December 31, inspired by the European Climate Law). The mere existence of this legal instrument already fulfills a socially and politically relevant interest, particularly lending credibility to the efforts and commitments of the Portuguese state in international and European frameworks[90].

he success of mitigation efforts largely depends on the actions of each State at the national level, as States are the primary authors and implementers of legal

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86 Cfr. UE. Conselho Europeu. Conclusões do Conselho Europeu de 23 e 24 de outubro de 2014. Processo C-169/14 apud A. ROCHA, p.61 e segs.

87 ROCHA, Armando, Cfr. artigos 6.º e 7.º.

88 ROCHA, Armando *Op. Cit*, p. 63 segs.

89 ROCHA, Armando*, Op. cit.,* p.64.

90 SETZER, J. A e M. Nachmany, cit. nota 137, p. 52, *apud* ROCHA, *op. cit.,* 2022, p.64-65.

norms and public policies. They also aim to ensure a sustainable and irreversible trajectory of reducing greenhouse gas emissions[91]. To this end, Portugal commits to achieving climate neutrality by 2050, which translates into a neutral balance between GHG emissions and the sequestration of these gases by various sinks[92], with the government tasked with assessing the possibility of bringing this target forward to 2045[93]. The LBC establishes an obligation for sovereign bodies to set national targets every five years for a thirty-year period[94], with each review being more ambitious[95].

In line with these sectoral targets and the planning instruments for mitigation, the government approves sectoral mitigation plans every five years. Finally, the decree also refers to several measures, such as the gradual elimination, by 2030, of subsidies and tax benefits related to fossil fuels or their use, the strengthening of the carbon tax, the creation of a category of tax deductions benefiting IRS taxpayers who purchase, consume, or use environmentally sustainable goods and services, the prohibition of coal use (from 2021) and fossil-origin natural gas (from 2040) in electricity generation, and the prohibition of the sale of new vehicles powered exclusively by fossil fuels (from 2035)[96].

The LBC went further than the European Climate Law in establishing a legal duty of mitigation, as well as in defining a right to climate balance, at least with the objective dimension that can be associated with subjective rights, allowing for judicial claims against the Portuguese State's climate inaction and demanding public and private entities to fulfill the duties and obligations to which they are bound[97].

Thus, the law sets precedents for climate litigation before constitutional courts, as was the case in the aforementioned ruling issued in 2021 by the German Constitutional Court. The Karlsruhe Court stated that climate action is required under the fundamental rights to life, health, physical integrity, and private property[98], but it failed to derive any legally useful consequences from this response.

Parallel to the right to climate balance (which is difficult to enforce on the debtor's side), the legislation establishes other climate-related rights: the right to intervene and participate in administrative procedures related to climate policy[99], as provided in Article 6 of the Aarhus Convention, Article 267(5) of the Portuguese Constitution, and Article 12 of the Administrative Procedure Code; the right to take legal action to defend subjective rights and legally protected interests, as well as to exercise the right to public and class action, in line with the provisions of the Code of Procedure in Administrative Courts (CPTA) and the Law on Popular Action

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91 Cfr. alínea c) do artigo 3º.

92 Cfr. n.º 1 do artigo 18º.

93 Cfr. n.º 2 do artigo 18º.

94 Cfr. n.º 1 do artigo 19º.

95 Cfr. n.º 5 do artigo 19º.

96 ROCHA, Armando, *op. Cit*. p. 66-67.

97 Cfr. n.º 2 do artigo 5.º.

98 ROCHA, Armando, *op. cit.,* 2022, p. 68 -Cfr. 1 BvR 2656/18, § BvR 78/20, 1 BvR 96/20 e 1 BvR 288/20, decisão de 24 de março de 2021, §§ 144-150, 171 e 177.

99 Cfr. n.º 1 do artigo 6º.

(LPPAP)[100]; the right to promote the prevention, cessation, and remediation of risks to climate balance[101]; and the right to request the immediate cessation of activities that pose a threat or cause harm to climate balance[102]. It is reaffirmed that the broad scope of the legal text allows for the enforcement of the right to climate balance before Portuguese courts.

8 CONCLUSIVE ANALYSIS

It is concluded that this holistic and global approach to the legal ecosystem of the climate crisis necessitates the energy transition, demonstrating how multilevel environmental protection is achieved and, in a similarly comprehensive perspective, how the legal framework for climate change mitigation addresses global warming. At the international, European, and national levels, it has been observed how this integrated ecosystem seeks to confront climate threats while preserving natural environmental components. Mitigation actions for greenhouse gas (GHG) emissions begin with the formulation of international legal instruments (UNFCCC, Kyoto Protocol, Paris Agreement) under the realm of soft law. The duty of mitigation is also supported by general legal principles that structure the climate change regime. The lack of political will among states to approve binding regulations is undoubtedly one of the reasons why these principles hold significant prominence in environmental law studies. Environmental principles are present in all environmental policies, even if the judiciary hesitates to recognize some of them as customary legal norms. A normative path is being paved within the climate change regime, establishing metrics that quantify the duty to mitigate GHG emissions. While this duty is binding on all states, each state is responsible for defining the specific content of its obligations. This path will inevitably lead to the pursuit of solutions and innovations in the energy sector, as discussions on mitigating GHG emissions are inseparable from the development of new renewable energy sources. Regardless of the debates surrounding the binding nature and effectiveness of the instruments presented, the responsibility of states to adopt concrete measures and policies for a secure energy transition is undeniable. This responsibility ensures that the proposed targets are met at the international, European, and national levels.

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[100] Cfr. alínea a) do nº 2 do artigo 6.º.

[101] Cfr. alínea b) do nº 2 do artigo 6.º.

[102] Cfr. alínea c) do nº 2 do artigo 6.º.

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