Environmental Performance in Transition: An Empirical Examination of Greece through the EPI Framework

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10 July 2025

DISCUSSION PAPER SERIES

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LOR Discussion Paper Series No. 2501

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Abstract:

The Environmental Performance Index (EPI) is a widely recognized tool developed by Yale University and Columbia University, in partnership with the World Economic Forum, to assess countries' environmental performance using 58 performance indicators across 11 issue categories. The EPI provides a comprehensive benchmark for evaluating environmental health, ecosystem vitality and climate change. Greece, as a member of the European Union (EU), operates within a complex regulatory framework aimed at promoting sustainable development. Greece's performance in the EPI reflects both its environmental policy efforts and its exposure to regional challenges such as air pollution, biodiversity loss, and climate-related risks. In recent years, Greece has demonstrated progress in areas such as renewable energy development and climate change mitigation, although issues like waste management and air quality continue to require focused policy intervention. Analyzing Greece's EPI score offers valuable insights into its environmental priorities and the effectiveness of national strategies aimed at promoting sustainability and resilience.

Key Words: Environmental Performance Index; Climate Change; Sustainability

JEL Codes: Q01; Q50; Q58; D60

1. Introduction

An increasing body of scientific evidence underscores the deterioration of Earth's essential life-support systems upon which human well-being depends. The global economy's persistent dependence on fossil fuels continues to drive air and water pollution, ocean acidification, and elevated atmospheric concentrations of greenhouse gases (Yale Center for Environmental Law & Policy, 2024). These environmental transformations endanger numerous species already vulnerable due to widespread habitat destruction, further escalating their risk of extinction. Recent assessments indicate that humanity has exceeded six of the nine planetary boundaries that delineate a safe operating space for the Earth system, with a seventh boundary nearing transgression (Pimonenko et al., 2018).

In light of these interconnected and escalating environmental challenges, the adoption of an empirical, data-driven approach to environmental governance is increasingly critical. Robust and well-designed indicators enable policymakers and stakeholders to monitor environmental trends, evaluate the effectiveness of interventions, disseminate successful strategies, and enhance the efficiency and impact of environmental investments (Yale Center for Environmental Law & Policy, 2024; 2022; 2020; 2018; 2016; 2014; 2012; 2010; 2008; 2006).

Global environmental performance remains inconsistent. High-income nations often perform better due to stronger governance, technological capacity, and robust regulations. According to the 2024 Environmental Performance Index (EPI), which evaluates 180 countries across 58 indicators, top performers—such as Estonia, Luxembourg, Germany, Finland, and the United Kingdom—excel in ecosystem vitality and environmental health. However, despite gains in renewable energy, global greenhouse gas (GHG) emissions continue to rise, indicating a need for urgent progress (Yale Center for Environmental Law & Policy, 2024).Environmental vulnerability refers to the susceptibility of natural and human systems to environmental hazards, including both natural disasters and anthropogenic impacts. It is a multidimensional concept influenced by ecological, social, economic, and political factors that determine how communities experience and respond to environmental stressors (Turner et al., 2003). In the context of climate change, the importance of understanding environmental vulnerability has grown, as increasing variability in weather patterns and rising sea levels threaten ecosystems and human settlements globally.

As it is observed, environmental performance varies widely at an international level, with developed nations typically leading. Europe stands out due to integrated policies and collaborative frameworks. Greece aligns with this trajectory through renewable energy

expansion, lignite phase-out, and NECP commitments (Maris and Flouros, 2021). Yet challenges remain: strengthening governance, completing infrastructure modernization, and enhancing pollution control.

The structure of the paper is as follows following: Section 2 provides a literature review Climate Change and Environmental Performance . Section 3 illustrates the The Environmental Performance Index Framework. Additionally, Section 4 analyses the case of Greece, while Section 5 finalizes the outcomes of the discussion paper.

2. Literature Review

Climate change has emerged as one of the most critical challenges of the 21st century, exerting profound impacts on environmental systems, socioeconomic structures, and public health. As a result, evaluating a country's environmental performance increasingly involves the assessment of climate-related indicators, particularly those reflecting greenhouse gas (GHG) emissions, renewable energy adoption, and climate mitigation strategies. In this context, composite indices such as the *Environmental Performance Index* (EPI) play a crucial role in quantifying and comparing national efforts toward environmental sustainability and climate resilience (Wendling et al., 2020).The integration of climate change into environmental performance metrics reflects a growing consensus on the need for holistic frameworks that capture both the causes and consequences of environmental degradation. In recent editions of the EPI, *Climate Change* has been elevated to a standalone policy objective, underscoring its centrality to contemporary environmental governance (Yale Center for Environmental Law & Policy, 2022). This shift signifies not only the urgency of climate mitigation but also the increasing availability of high-resolution climate data from global institutions such as the Intergovernmental Panel on Climate Change (IPCC, 2023) and the International Energy Agency (IEA, 2022).

Environmental performance in the context of climate change is assessed through a range of indicators, including CO_2 emissions per capita, the rate of renewable energy production, industrial carbon intensity, and climate policy adoption. High-performing countries are typically characterized by strong institutional capacity, long-term climate strategies, and significant investment in clean technologies (IEA, 2022). Conversely, lower scores often reflect structural dependence on fossil fuels, inadequate policy implementation, and vulnerability to climate-induced hazards (UNEP, 2022).Importantly, cross-national comparisons must be contextualized within broader socio-political and economic realities. While environmental performance indices offer valuable insights, they must be interpreted with

caution, as variations in data availability, indicator selection, and methodological frameworks can affect comparability over time (Wendling et al., 2020). Moreover, the dynamic nature of climate change necessitates continuous refinement of performance metrics to ensure they reflect current scientific understanding and global priorities (IPCC, 2023).

Environmental performance and sustainability are critical components in addressing the ecological challenges of the 21st century. As global environmental pressures intensify—ranging from climate change and biodiversity loss to pollution and resource depletion—organizations, governments, and communities are increasingly expected to adopt sustainable practices that mitigate environmental harm and ensure long-term ecological balance (Dyllick & Hockerts, 2002). Environmental performance refers to the measurable outcomes of an entity's actions related to the environment. These may include metrics such as greenhouse gas emissions, energy efficiency, water usage, and waste management (Searcy, 2009). Improved environmental performance is often linked to the implementation of environmental management systems (EMS), regulatory compliance, and voluntary initiatives such as ISO 14001 standards.

Sustainability, in contrast, encompasses a broader concept that includes environmental, social, and economic dimensions (Elkington, 1998). Within this framework, environmental sustainability focuses specifically on conserving natural capital and ensuring that human activities do not exceed the carrying capacity of the planet (Rockström et al., 2009). Sustainable development aims to meet current needs without compromising the ability of future generations to meet their own (World Commission on Environment and Development [WCED], 1987). The intersection of environmental performance and sustainability is increasingly recognized in both policy and corporate strategy. Companies that integrate sustainability into their core operations often demonstrate enhanced innovation, risk management, and stakeholder trust (Eccles et al., 2014). Moreover, emerging frameworks such as the United Nations Sustainable Development Goals (SDGs) provide global benchmarks for aligning performance with sustainability objectives.

In conclusion, climate change is both a driver and an outcome of environmental performance. As nations seek to meet global climate targets under frameworks such as the Paris Agreement, rigorous monitoring of climate-related indicators will remain essential for tracking progress, informing policy, and promoting accountability in environmental governance. Advancing environmental performance is an essential pathway toward achieving sustainability. Through robust measurement, accountability, and systemic change, institutions can play a pivotal role in transitioning to a more resilient and equitable environmental future.

3. The Environmental Performance Index Framework

The **Environmental Performance Index (EPI)** is a data-driven ranking that evaluates the environmental health, ecosystem vitality and climate change policies of countries around the world. It was developed to provide a comprehensive framework for measuring national sustainability efforts and to facilitate the comparison of environmental performance across nations (Yale Center for Environmental Law & Policy, 2024; 2022; 2020; 2018; 2016; 2014; 2012; 2010; 2008; 2006).

The **EPI** was first introduced in 2002 as the **Environmental Sustainability Index (ESI)** by the **Yale Center for Environmental Law & Policy** and **Columbia University's Center for International Earth Science Information Network (CIESIN)**, in collaboration with the **World Economic Forum** and the **Joint Research Centre of the European Commission**. The original ESI was an experimental effort to quantify the sustainability of different countries by using a wide array of indicators. In 2006, the ESI evolved into the **Environmental Performance Index (EPI)**. This shift marked a significant methodological transformation: the EPI moved away from broad sustainability measures and instead focused on quantifiable environmental outcomes and policy targets (Halkos and Zisiadou, 2016; 2018). This change was driven by the desire to better align the index with policymakers' needs and to provide a more robust basis for environmental decision-making.

The EPI assesses countries on a variety of performance indicators, grouped into three overarching policy objectives[1]:

1. **Environmental Health** (25%) – focuses on the protection of human health from environmental harm including the following issue categories: air quality, drinking water and sanitation, heavy metals and waste management).
2. **Ecosystem Vitality** (35%) – addresses natural resource management and environmental sustainability including the following issue

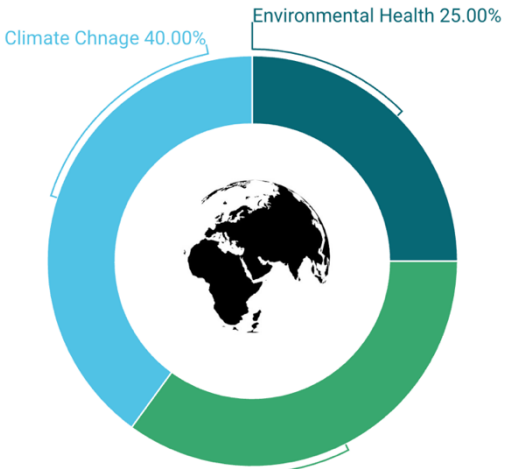

Figure 1: EPI Policy Objectives – Created by the authors

[1] The information provided are based on the latest published EPI report referring to the 2024 index. It is crucial to mention that there is a diversification among index versions and updates as described in this discussion paper.

categories: biodiversity and habitat, ecosystem services, water resources, air pollution and agriculture.

3. **Climate Change** (40%) – focuses on the the effectiveness of 180 countries in mitigating climate change, relying on historical greenhouse gas emissions data rather than stated goals or plans including the following issue category: mitigation.

Figure 2 presents the structural composition of the Environmental Performance Index (EPI). Specifically, it details the three primary policy objectives along with their associated weights, followed by the 11 issue categories nested within these objectives and the 58 individual indicators used in the assessment. It is important to note that this configuration pertains exclusively to the 2024 edition of the EPI. The EPI scores are published biennially by the Yale Center for Environmental Law & Policy in collaboration with Columbia University's Center for International Earth Science Information Network (CIESIN). Notably, the composition of issue categories, indicators, and their respective weights varies considerably among editions.

According to the editors of the Environmental Performance Index (EPI), the index has progressively evolved to integrate new data sources and methodological enhancements. It draws upon data provided by international organizations—including the World Health Organization (WHO), the Food and Agriculture Organization (FAO)—as well as national governments. Each iteration of the EPI revises its analytical framework to incorporate scientific advancements, expanded data availability, and evolving global environmental priorities, such as increasing attention to climate change mitigation, air quality, and sustainable agricultural practices. Table 1 provides a summary of the expansion in policy objectives, issue categories, and the number of indicators included over time, along with the growing number of countries considered in the calculation of the EPI Score. Given these continual modifications, it is important to emphasize that cross-year comparisons of national EPI Scores are inherently complex and methodologically challenging. Therefore, this discussion paper focuses on the case of Greece, presenting data from all reporting years, while limiting direct comparisons to the three most recent EPI editions.

The primary rationale for this approach lies in the relative consistency of issue categories across recent EPI editions. It is important to note that in the 2020 edition, the index was structured around two overarching policy objectives: *Environmental*

Health and *Ecosystem Vitality*. At that time, *Climate Change Mitigation* was included as an issue category within *Ecosystem Vitality*.

Table 1: The evolution of EPI Composition

Year	Environmental Health Weight	Ecosystem Vitality Weight	Climate Change Weight	No. of Issue Categories	No. of Indicators	No. of Coutnries
2006	50	50	-	6	16	133
2008	50	50	-	10	25	149
2010	50	50	-	10	25	163
2012	30	70	-	10	22	132
2014	25	75	-	9	19	178
2016	40	60	-	9	20	180
2018	40	60	-	10	24	180
2020	40	60	-	11	32	180
2022	20	42	38	11	40	180
2024	25	35	40	11	58	180

However, in the 2022 and 2024 editions, *Climate Change* was elevated to a standalone policy objective, assigned a significantly greater weight in the overall score calculation and accompanied by its own distinct issue categories and indicators. Additionally, within *Policy Objective 2: Ecosystem Vitality*, while the naming of certain issue categories has changed over time, their underlying scope and thematic focus have remained largely consistent. For instance, in the most recent report (2024), the issue category previously titled *Ecosystem Services* was renamed *Forests*, and the former *Pollution Emissions issue* category was redefined as *Acid Rain* in 2022 and *Air Pollution* in 2024.

4. The Case of Greece

Europe leads globally in environmental policy through mechanisms like the European Green Deal and legally binding commitments to achieve carbon neutrality by 2050. EU member states have collectively reduced GHG emissions by over 30% compared to 1990, boosted renewable energy use, and fostered circular economy initiatives. Frameworks such as Natura 2000 protect biodiversity, and strict waste recycling directives support a transition away

from landfills. However, disparities exist: Eastern and Southeastern countries face challenges in implementation due to limited infrastructure and investment capacity.

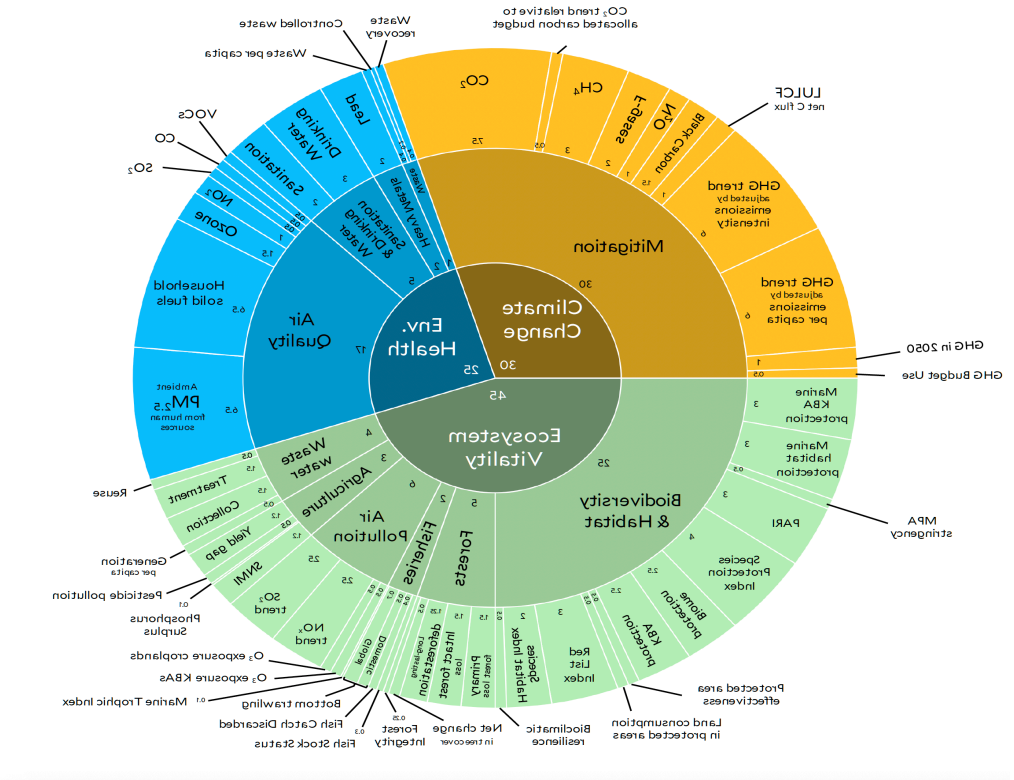

Figure 2: EPI Composition and weights for 11 issue categories and 58 indicators -Created and published by Yale Center for Environmental Law & Policy, 2024

Over the years, Greece has demonstrated strengths in several areas, such as

- *Biodiversity and Habitat Protection*: Greece benefits from a robust network of protected areas, including significant Natura 2000 sites, which cover over 27% of its territory (European Environment Agency [EEA], 2023). This reflects strong compliance with EU conservation directives.
- *Water and Sanitation*: Greece has achieved universal access to clean drinking water and sanitation, placing it among the highest performers in the EPI in this category (Wendling et al., 2022).
- *Wastewater Treatment*: Greece has improved urban wastewater management in line with the EU Urban Wastewater Treatment Directive (European Commission, 2022).

Urban centers, particularly Athens and Thessaloniki, have invested in modern treatment infrastructure.

At the same time, Greece demonstrates a dual trajectory: significant improvements in renewable energy and policy alignment with the EU, juxtaposed with persistent issues in pollution control and infrastructure (Halkos, 1994).

- **Renewable Energy and Climate Strategy**
  - *Renewables Growth*: As of 2021, 29% of Greece's electricity was generated from renewables. Projections under the National Energy and Climate Plan (NECP) include a 42.8% share of renewable primary energy by 2030 and solar capacity expanding to 14.1 GW by 2030, up from 4.8 GW in 2022 (Geoffron and De Paoli, 2019).
  - *Lignite Phase-Out and NECP Targets*: Greece aims to phase out lignite-fired electricity by 2028 and reduce non-ETS GHG emissions by 59% by 2030—exceeding the EU target of 55% (IEA, 2023).
  - *Updated Climate Plan (2024)*: The revised NECP raises the renewable electricity target to 82% by 2030 and commits to at least a 55% GHG reduction, supported by €95 billion in investments through 2030.

- **Infrastructure and Energy Storage**

Major upgrades are required for grid and storage systems. IPTO aims to boost transmission capacity from 18 to 29 GW by 2030, but grid constraints and underdeveloped storage remain barriers to increased renewable integration. An optimal portfolio combining batteries and pumped hydro totaling up to ~1.75 GW is suggested to facilitate a 60% renewable share by 2030 (Psarros & Papathanassiou, 2022).

- **Governance, Pollution, and Waste Management**

The OECD Environmental Performance Review (2020) acknowledges progress in decoupling emissions from GDP and expanding conservation but highlights persistent challenges with air pollution, waste management, and water scarcity (OECD, 2020). Enforcement gaps, outdated inspection systems, and inefficient rural waste infrastructure continue to undermine environmental targets.

Despite these strengths, several persistent challenges hinder Greece's environmental performance:

- *Air Quality:* Air pollution remains a serious issue, particularly in urban areas. Elevated PM2.5 levels are driven by traffic congestion, industrial activity, and increased residential wood burning following the 2008–2018 financial crisis (EEA, 2023).
- *Climate Change and Energy Transition:* While Greece has expanded renewable energy capacity—especially in solar and wind—it has historically relied on lignite and imported fossil fuels. The energy transition has been slowed by administrative bottlenecks and community opposition to new projects (Hellenic Ministry of Environment and Energy, 2022).
- *Land Degradation and Forest Fires:* Greece faces growing challenges with wildfires exacerbated by climate change and poor land-use practices. Illegal construction and insufficient forest management contribute to land degradation (Xanthopoulos et al., 2019).

These critical factors appear to exert a substantial influence on Greece's EPI Scores, which have demonstrated notable fluctuations over the years. Two primary explanations can be proposed for this variation. First, the set of indicators underpinning each issue category—and by extension, the overall EPI Score—has not remained consistent across different editions. Consequently, changes in the variables used may lead to different computational outcomes. Additionally, the weighting assigned to each indicator plays a crucial role in shaping the final score, further contributing to year-to-year variability. Second, the occurrence of extreme natural events in Greece in recent years may have significantly affected environmental performance. Notable examples include Hurricane Ianos (2020), Storm Daniel and Storm Elias (2023), as well as widespread wildfires in regions such as Rhodes Island, Attica, the Dadia Forest, and Evia Island. These events have both direct and indirect environmental consequences. Beyond the immediate destruction and loss, they adversely affect ecosystem services, agricultural productivity, water resources, and air quality—particularly through uncontrolled combustion—thereby impacting the overall environmental sustainability of the country.

Figure 3 depicts Greece's Environmental Performance Index (EPI) Scores from 2006 onward. Notably, in 2016, Greece achieved its highest recorded score of 85.81, ranking 21st out of 180 countries assessed in that edition. At the time, the index was calculated using only

20 indicators (as shown in Table 1), with the majority of the weighting allocated to the *Ecosystem Vitality* policy objective. It is essential to emphasize that evaluating a country's environmental performance solely based on the numerical value of its EPI Score, without reference to its relative position among other countries, may not provide an equitable or meaningful assessment. Accordingly, the EPI Report includes country rankings to contextualize performance within the broader international sample. By considering both the EPI Score and the corresponding rank, a more comprehensive understanding of Greece's environmental performance—both in absolute terms and relative to other nations—can be achieved.

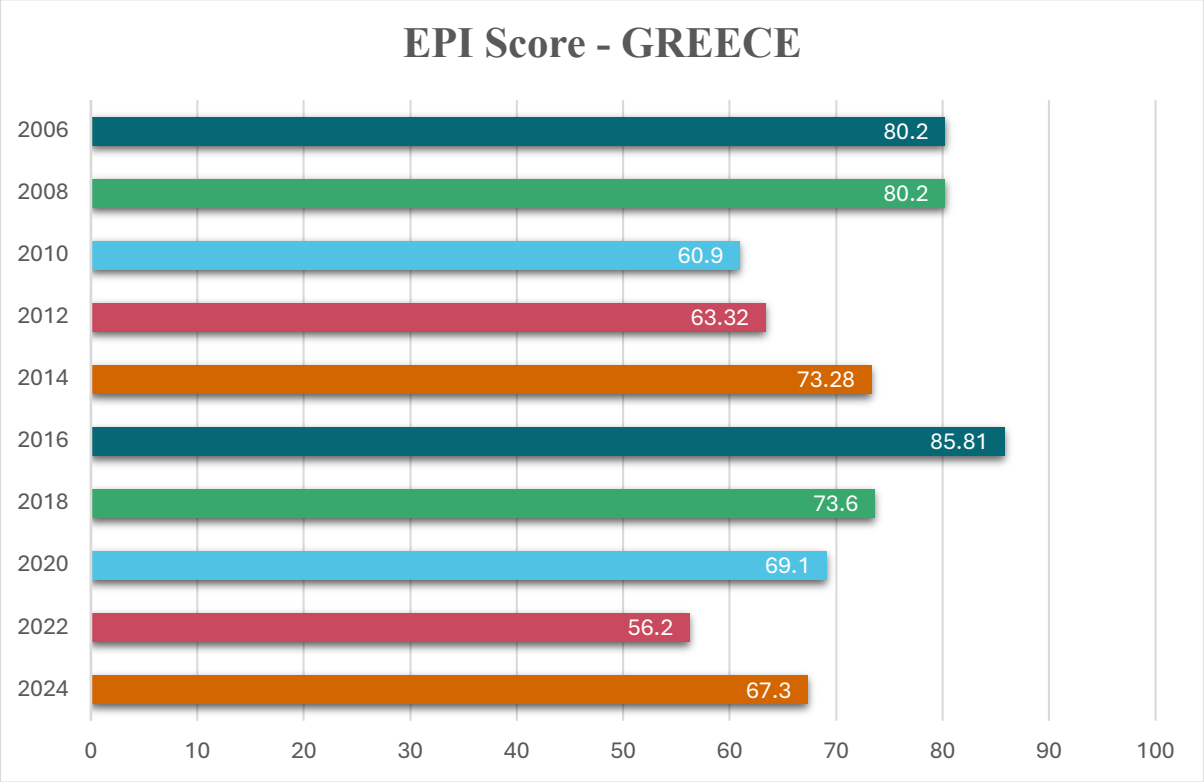

Figure 3: Overall EPI Scores of Greece (2006 - 2024) – Created by the authors

Figure 4 presents a longitudinal overview of Greece's Environmental Performance Index (EPI) trajectory since 2006, highlighting both the country's overall EPI Score and its relative ranking among participating nations. In the inaugural edition of the index, Greece ranked among the top 20 environmentally well-performing countries, with an EPI Score of 80.2. However, in 2008, despite maintaining a similar score, Greece's rank dropped significantly—from 19th to 44th out of 149 countries—following the expansion of the index to include additional issue categories, indicators, and a broader sample of countries.

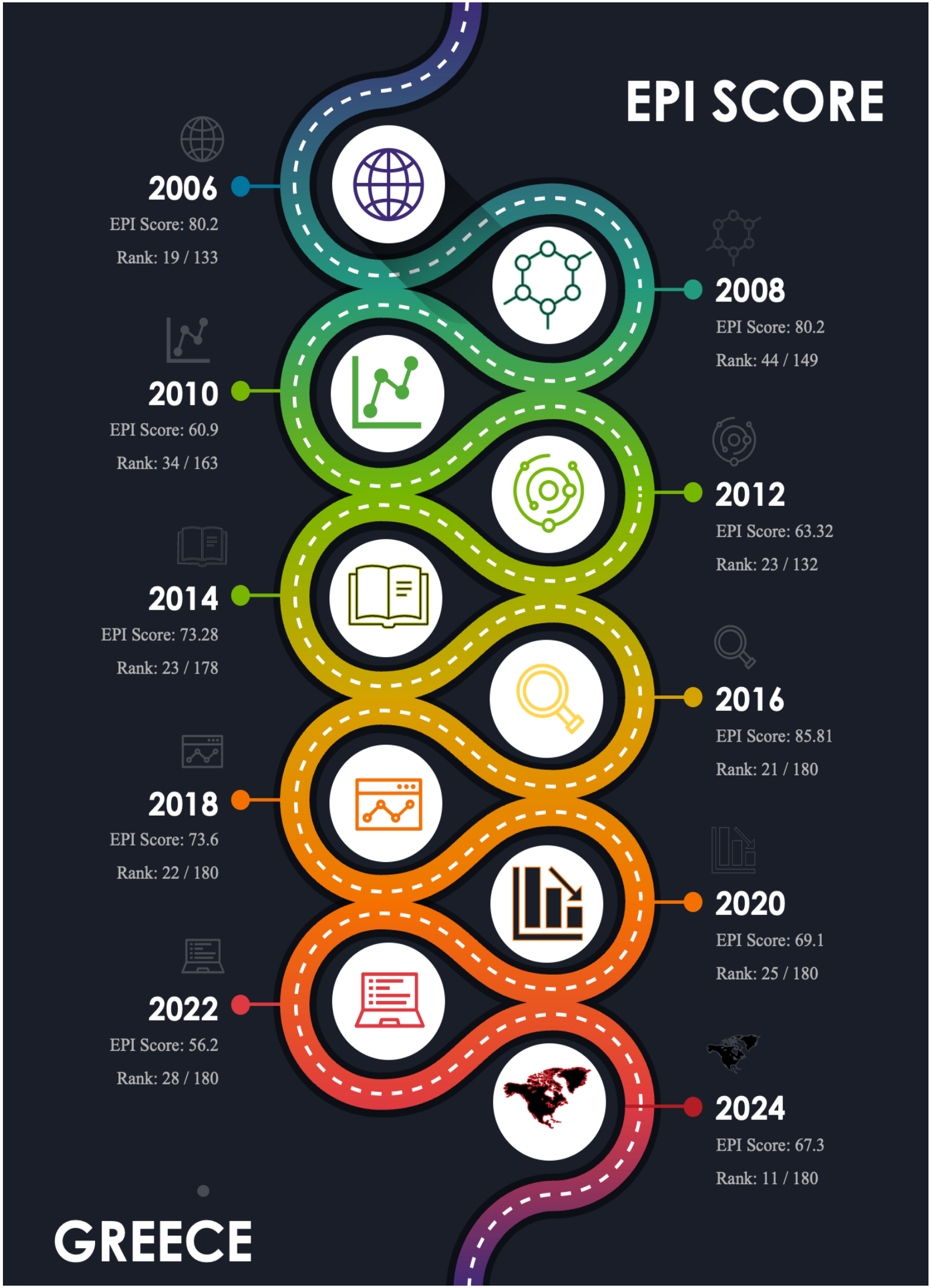

Figure 4: The EPI "Roadmap" of Greece – Created by the authors

Over the subsequent years, Greece demonstrated consistent improvement, gradually increasing its EPI Score and achieving a ranking of 21st out of 180 countries by 2016. This upward trend was disrupted in 2018, as the country experienced a decline in its score and a corresponding drop in ranking, falling from 21st to 28th position by 2022, when its EPI Score decreased to 56.2. According to the most recent report, however, Greece exhibited a significant recovery, with its EPI Score rising to 67.3 and its rank improving to 11th among all assessed nations.

To begin with, we present the scores corresponding to each Policy Objective from 2020 onwards. As illustrated in Figure 5, in the year 2020, the highest-performing Policy Objective for Greece was Environmental Health, with a reported score of 80.6. It is noteworthy that in 2020, Climate Change was categorized under Ecosystem Vitality; however, in subsequent years, it was established as an independent Policy Objective. In 2022, a marked decline was observed across all scores (see Table 2). This decline may, in part, be attributed to the reclassification of Climate Change as a standalone objective, which was assigned considerable weight and may have influenced the overall scoring of other objectives.

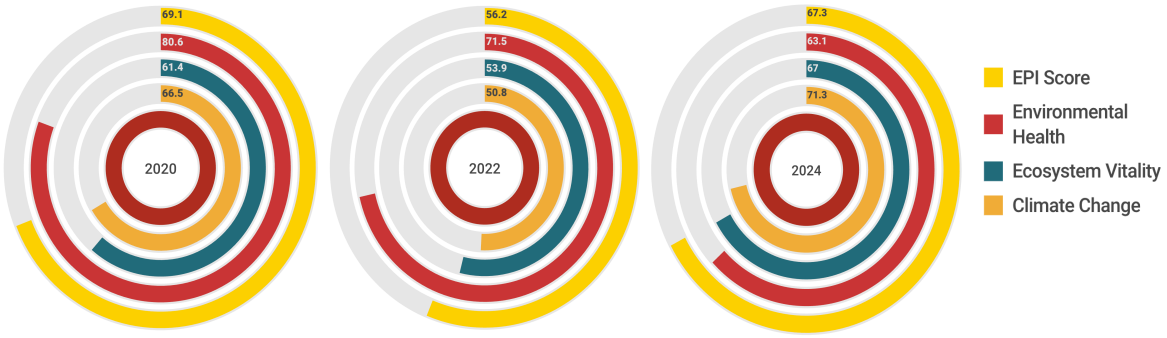

Figure 5: EPI and Policy Objective Scores – Created by the authors

Furthermore, as indicated in Table 2, there is a notable increase in the overall Environmental Performance Index (EPI) score, as well as in the scores of two out of the three Policy Objectives. Specifically, the Ecosystem Vitality score has risen by approximately 25% over the past two years, while the Climate Change score has experienced an increase of over 40%. In contrast, the Environmental Health score has shown a decline of nearly 12% since 2022.

Table 2: EPI and Policy Objective Scores

	2020	2022	2024
EPI Score – Greece	**69.1**	**56.2**	**67.3**
Environmental Health	**80.6**	**71.5**	**63.1**
Ecosystem Vitality	**61.4**	**53.9**	**67**
Climate Change	**66.5**	**50.8**	**71.3**

Figure 6 presents the performance of Greece across the four issue categories under *Policy Objective 1: Environmental Health*. According to the Yale Center for Environmental Law & Policy (2018), Greece was recognized as a global leader in the issue category *Drinking Water and Sanitation*, achieving a perfect score of 100 and securing the top position in the international ranking.

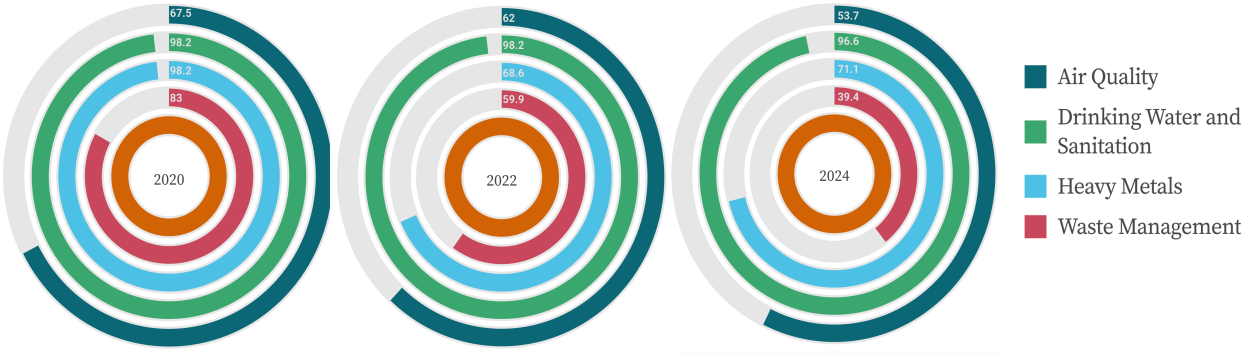

Figure 6: Environmental Health Issue Categories Scores – Created by the authors

However, as illustrated in Figure 5, while *Drinking Water and Sanitation* continues to represent the highest-performing category within this objective, a downward trend in its score has been observed since 2020. Notably, this decline coincides with a series of severe hydrometeorological events, including Hurricane Ianos in 2020—which resulted in extensive flooding in the Thessaly region—and subsequent extreme weather events such as Storm Daniel and Storm Elias in 2023. These incidents appear to have contributed to the observed reduction in performance, with scores falling to 98.2 and 96.6 in the years following these events.

Table 3: Environmental Health Issue Categories Scores

	2020	2022	2024
Air Quality	67.5	62	53.7
Drinking Water and Sanitation	98.2	98.2	96.6
Heavy Metals	98.2	68.6	71.1
Waste Management	83	59.9	39.4

As shown in Table 3, Greece exhibits a relatively modest performance in the area of *Air Quality*, while a particularly sharp decline is observed in the *Waste Management* category, where performance has deteriorated by more than 50% since 2020. Similarly, the *Heavy Metals* category recorded a 30% reduction in performance between 2020 and 2022, followed by a marginal improvement in the most recent index results, reaching a score of 71.1.

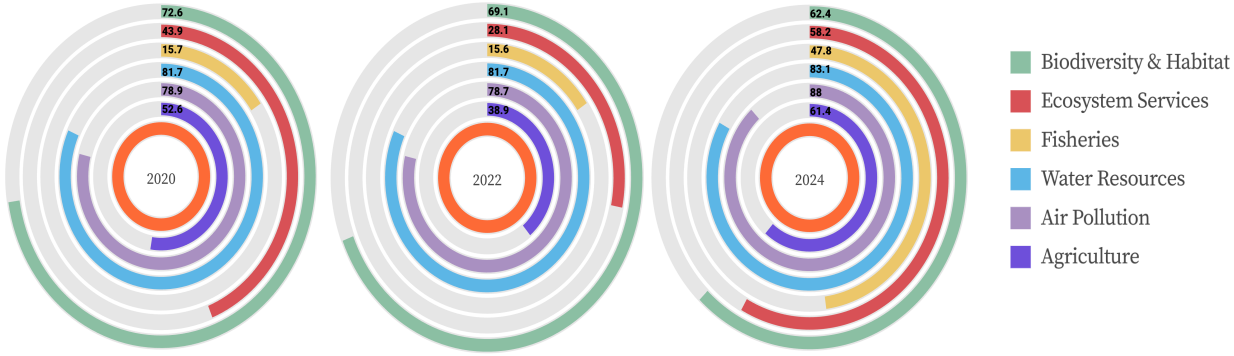

Figure 7: Ecosystem Vitality Issue Categories Scores – Created by the authors

Turning to the second Policy Objective, *Ecosystem Vitality* (as presented in Figure 7 and Table 4), a substantial decline is observed across nearly all issue categories in the year 2022. Notably, the most pronounced decrease occurred in the *Ecosystem Services* category, which fell by approximately 39%, while the *Water Resources* category remained stable. It is important to note that the *Air Pollution* category underwent terminological changes in previous editions—referred to as *Pollution Emissions* in 2020 and *Acid Rain* in 2022. Similarly, the category previously labeled *Ecosystem Services* was renamed *Forests* in the 2024 edition. Interestingly, with the exception of *Biodiversity and Habitat*, all other categories demonstrated

improvement between 2022 and 2024, with *Ecosystem Services* (now *Forests*) exhibiting a particularly notable increase of 106% during this period.

Table 4: Ecosystem Vitality Issue Categories Scores

	2020	2022	2024
Biodiversity & Habitat	**72.6**	**69.1**	**62.4**
Ecosystem Services	**43.9**	**28.1**	**58.2**
Fisheries	**15.7**	**15.6**	**47.8**
Water Resources	**81.7**	**81.7**	**83.1**
Air Pollution	**78.9**	**78.7**	**88**
Agriculture	**52.6**	**38.9**	**61.4**

5. Conclusion

Greece faces a complex interplay between natural hazards and environmental performance. As a country highly susceptible to seismic activity, wildfires, and extreme weather events—exacerbated by the growing impacts of climate change—Greece must navigate significant environmental risks. While recent improvements in certain Environmental Performance Index (EPI) indicators, such as Ecosystem Vitality and Climate Change mitigation, are encouraging, persistent challenges remain in areas such as Environmental Health and disaster preparedness. The increasing frequency and intensity of natural hazards underscore the urgency of integrating risk reduction strategies into environmental policy. Enhancing resilience through comprehensive planning, sustainable land management, and investment in adaptive infrastructure will be crucial for safeguarding both ecosystems and communities. Ultimately, Greece's environmental performance will depend not only on policy ambition but also on its capacity to anticipate, adapt to, and mitigate the multifaceted impacts of natural hazards.

In conclusion, Greece's Environmental Performance Index (EPI) trajectory reflects both progress and ongoing challenges. While the recent improvements in the Ecosystem Vitality and Climate Change Policy Objectives—particularly the substantial gains observed over the past two years—indicate a positive shift toward environmental sustainability, the decline in the

Environmental Health score highlights areas requiring further policy attention and investment. The establishment of Climate Change as a standalone policy objective underscores the increasing prioritization of climate action within national environmental strategies. Moving forward, sustained improvements in Greece's EPI score will likely depend on the country's ability to balance environmental protection with economic and social priorities, strengthen institutional frameworks, and enhance the implementation of evidence-based environmental policies. Continuous monitoring and adaptive governance will be essential to ensure long-term progress across all dimensions of environmental performance.

Greece's EPI performance reflects a nation at a crossroads: while EU membership provides a strong legislative and financial framework for environmental progress, implementation and enforcement continue to hinder more significant improvement. The country's moderate EPI ranking suggests that while structural foundations exist, transformative change requires stronger governance, enhanced public-private cooperation, and greater societal engagement with sustainability goals.

Greece's EPI score illustrates a nation with considerable environmental potential but hampered by structural and implementation challenges. EU legislation has provided a strong framework, yet effective enforcement, governance reform, and enhanced public participation are essential for improved environmental outcomes. As Greece faces increasing climate and biodiversity pressures, aligning national policy with global sustainability targets is imperative. Future EPI scores will largely depend on how effectively Greece can align its recovery and development efforts with ecological priorities—particularly in light of climate change, biodiversity loss, and energy transition.

Reference

Dyllick, T., & Hockerts, K. (2002). Beyond the business case for corporate sustainability. *Business Strategy and the Environment*, 11(2), 130–141. https://doi.org/10.1002/bse.323

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of a corporate culture of sustainability on corporate behavior and performance. *Harvard Business School Working Paper*, No. 12-035. https://doi.org/10.2139/ssrn.1964011

Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business*. New Society Publishers.

European Commission. (2023). *Greece's Recovery and Resilience Plan*. https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility/greece-recovery-and-resilience-plan_en

European Environment Agency (EEA). (2023). *Air quality in Europe – 2023 report*. https://www.eea.europa.eu/publications/air-quality-in-europe-2023

Halkos, G., & Zisiadou, A. (2018). Relating environmental performance with socioeconomic and cultural factors. *Environmental Economics and Policy Studies*, *20*, 69-88.

Halkos, G., & Zisiadou, A. (2016). Environmental performance index and economic welfare.

Halkos, G. E. (1994). Optimal abatement of sulphur emissions in Europe. *Environmental and Resource Economics*, *4*, 127-150.

Hellenic Ministry of Environment and Energy. (2022). *National Energy and Climate Plan (NECP)*. https://ypen.gr/nea-ethniki-stratigiki-gia-to-klima-kai-tin-energeia/

IEA. (2023). *Greece 2023*. International Energy Agency.

IEA. (2022). *World Energy Outlook 2022*. International Energy Agency. https://www.iea.org/reports/world-energy-outlook-2022

IPCC. (2023). *Sixth Assessment Report: Climate Change 2023*. Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/

OECD. (2020). *OECD Environmental Performance Reviews: Greece 2020*. OECD Publishing. https://doi.org/10.1787/cec20289-en

Geoffron, P., & De Paoli, L. (2019). Introduction: a critical overview of the European National Energy and Climate Plans. *Economics and Policy of Energy and Environment: 1, 2019*, 31-41.

Maris, G., & Flouros, F. (2021). The green deal, national energy and climate plans in Europe: Member States' compliance and strategies. *Administrative Sciences*, *11*(3), 75.

Organisation for Economic Co-operation and Development (OECD). (2020). *Environmental Performance Reviews: Greece 2020*. https://www.oecd.org/environment/country-reviews/environmental-performance-reviews-greece-2020-1f1897c4-en.htm

Pimonenko, T. V., Liulov, O. V., & Chygryn, O. Y. (2018). Environmental Performance Index: relation between social and economic welfare of the countries.

Psarros, G. N., & Papathanassiou, S. A. (2022). *Electricity storage requirements to support the transition towards high renewable penetration levels: Application to the Greek power system*. *arXiv*.

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., ... & Foley, J. A. (2009). A safe operating space for humanity. *Nature*, 461(7263), 472–475. https://doi.org/10.1038/461472a

Searcy, C. (2009). Corporate sustainability performance measurement systems: A review and research agenda. *Journal of Business Ethics*, 85(3), 243–256. https://doi.org/10.1007/s10551-008-9781-1

Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., ... & Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences*, *100*(14), 8074–8079. https://doi.org/10.1073/pnas.1231335100.

UNEP. (2022). *Emissions Gap Report 2022*. United Nations Environment Programme. https://www.unep.org/resources/emissions-gap-report-2022

Wendling, Z. A., Emerson, J. W., Esty, D. C., Levy, M. A., de Sherbinin, A., & Kim, C. (2022). *2022 Environmental Performance Index*. Yale Center for Environmental Law & Policy. https://epi.yale.edu

Wendling, Z. A., Emerson, J. W., de Sherbinin, A., Esty, D. C., et al. (2020). *2020 Environmental Performance Index*. Yale Center for Environmental Law & Policy. https://epi.yale.edu

World Commission on Environment and Development (WCED). (1987). *Our common future*. Oxford University Press.

Xanthopoulos, G., Varela, V., & Kazanis, D. (2019). Wildfire management in Greece: The need for proactive policies. *Forest Policy and Economics, 104*, 33–42. https://doi.org/10.1016/j.forpol.2019.05.002

Yale Center for Environmental Law & Policy. (2024). *2024 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2022). *2022 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2020). *2020 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2018). *2018 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2016). *2016 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2014). *2014 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2012). *2012 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2010). *2010 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2008). *2008 Environmental Performance Index*. Yale University. https://epi.yale.edu

Yale Center for Environmental Law & Policy. (2006). *2006 Environmental Performance Index*. Yale University. https://epi.yale.edu

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