Journal of Energy Technologies and Policy
ISSN 2224-3232 (Paper) ISSN 2225-0573 (Online)
Vol.15, No.1, 2025

The Green Economy from an Economic Growth Perspective

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Abstract
The increasing environmental crises at the global level have reshaped the understanding of sustainable development and placed the concept of the green economy at the core of economic growth policies. In this context, the green economy represents a holistic approach that envisages the redesign of economic activities within the framework of low carbon emissions, resource efficiency, and environmental sustainability principles. This article examines the relationship between the green economy and economic growth with a specific focus on G20 countries. The study first addresses the concept of the green economy on a theoretical basis and then analyzes the green economy policies implemented in G20 countries through a literature review. In addition, the performance of G20 countries is comparatively evaluated by employing indicators such as the Green Economy Index and the Environmental Performance Index. The findings reveal the effectiveness of green economy strategies in terms of sustainable growth objectives and provide policy recommendations.
Keywords: Green economy, economic growth, sustainable development, G20, environmental performance
DOI: 10.7176/JETP/15-1-08
Publication date: September 28th 2025

Introduction

In the 21st century, global economies are evaluated and guided not only by their growth rates but also by their levels of environmental sustainability. Challenges such as increasing environmental degradation, climate change, and the depletion of natural resources have led to the questioning of classical economic growth models and have highlighted the necessity of development approaches compatible with the environment. In this context, the concept of the green economy emerges as a sustainable economic model, distinguished by its objectives of adopting environmentally friendly technologies, enhancing energy efficiency, improving waste management, and reducing carbon emissions.

In particular, the United Nations Environment Programme (UNEP) defines the green economy as “an economic system that aims to improve human well-being while reducing environmental risks and ecological scarcities, characterized by low carbon intensity, resource efficiency, and inclusiveness” (UNEP, 2011). This definition underscores that economic growth should encompass not only numerical increases but also environmental and social dimensions. For both developed and developing countries, this transformation has become inevitable, paving the way for profound changes in energy systems, production chains, and consumption patterns.

This study aims to examine the effects of the green economy on economic growth within the specific context of G20 countries from both a theoretical and comparative perspective. Within this scope, indicators of green economy performance will be evaluated to provide both policy-oriented analysis and data-driven insights.

2. Conceptual Framework

The green economy is an integrative approach within the concept of sustainable development, encompassing environmental, economic, and social dimensions. It aims to minimize the negative impacts of economic activities on the environment, enhance efficiency in the use of natural resources, and achieve long-term economic growth in line with the principles of environmental sustainability. The core elements of the green economy include low carbon emissions, resource efficiency, waste recycling, the use of renewable energy, and environmentally friendly production and consumption patterns.

According to the United Nations Environment Programme (UNEP), the green economy is defined as “a low-carbon, resource-efficient, and inclusive economic system that enhances human well-being and social equity while significantly reducing environmental risks and ecological scarcities.” This definition emphasizes that the green economy is not limited to environmental protection but also incorporates social and economic objectives, making it a holistic model. Therefore, unlike traditional growth models, the green economy seeks not only to increase production but also to ensure sustainable development by preserving ecosystem balances (UNEP, 2011).

Another concept directly related to the green economy is "green growth." Green growth is defined as a policy framework that aims to achieve economic growth without exceeding environmental limits. The OECD defines green growth as "fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies" (OECD, 2011). Within this framework, the objective is to establish synergy between environmental sustainability and economic efficiency.

To measure the performance of the green economy, various indicators and indices have been developed. These indices evaluate countries' environmental and economic policies based on criteria such as carbon emission intensity, renewable energy use, energy efficiency, environmental protection expenditures, and ecological footprint. Some of the most widely used indicators include the Environmental Performance Index (EPI), the Global Green Economy Index (GGEI), and the Sustainable Development Goals Index (SDG Index). These tools make it possible to conduct cross-country comparisons and render policy-making processes more data-driven.

3. Literature Review

The relationship between the green economy and economic growth has been extensively addressed in the economics literature in recent years. While the traditional view perceives environmental regulations as constraints on economic growth, more recent approaches argue that environmental sustainability and economic development are not mutually exclusive but rather complementary processes. Jacobs (2012) asserts that environmental regulations and green investments can stimulate innovation, enhance productivity, and thereby contribute to long-term economic growth (Jacobs, 2012).

A comprehensive report published by the OECD (2011) emphasizes that green growth offers a development model that integrates environmental sustainability with economic efficiency. The report highlights that economic growth can be supported through more efficient resource use, the dissemination of environmentally friendly technologies, and the reduction of environmental damage (OECD, 2011).

The applicability and success of green economy policies, however, vary significantly across countries. According to the Climate Transparency Report (2021), countries such as Canada, Germany, and France have made notable progress in transitioning toward a low-carbon economy, whereas fossil fuel dependency remains high in several G20 countries, including China, India, and Russia (Climate Transparency, 2021). Similarly, the Environmental Performance Index (EPI), developed by Yale University, reveals considerable disparities in performance among G20 countries with respect to indicators such as air quality, water resource management, biodiversity, and climate policies (Yale Center for Environmental Law & Policy, 2022).

Structural challenges faced by developing countries in the process of green transformation are also frequently discussed in the literature. Sachs et al. (2019) emphasize that deficiencies in technological infrastructure, financial constraints, and a lack of policy coordination hinder the transition to a green economy in these countries. Furthermore, they highlight the need to strengthen public–private sector cooperation and enhance the effectiveness of international support mechanisms in order to achieve sustainable development goals (Sachs et al., 2019).

The literature also addresses not only the environmental but also the socio-economic impacts of the green economy. According to the ILO (2018) report, green transformation processes could generate millions of new jobs globally. Employment growth has been particularly evident in sectors such as energy, transportation, construction, and waste management, thereby offering significant opportunities for enhancing social welfare (ILO, 2018).

Finally, renewable energy investments lie at the core of green economy strategies and exert both direct and indirect effects on economic growth. The report published by REN21 (2021) demonstrates that the expansion of resources such as solar and wind energy enhances energy security, reduces costs, and supports sustainable growth (REN21, 2021).

4. Methodology

In this study, a comparative analysis method was employed to evaluate the green economy performance of G20 countries. Within the scope of the research, three internationally recognized indices that reflect the multidimensional structure of the green economy were taken as the basis: the Environmental Performance Index (EPI), the Global Green Economy Index (GGEI), and the Sustainable Development Goals Index (SDG Index).

These indices are based on indicators covering environmental, economic, and governance dimensions, thereby enabling the measurement of countries' sustainability efforts. For instance:

- EPI includes environmental indicators such as air quality, water resources, climate change policies, and biodiversity, and is published biennially by Yale University.

- GGEI covers areas such as green leadership, climate finance, and sustainable production and consumption, and was developed by Dual Citizen LLC.
- SDG Index evaluates countries' progress based on the United Nations' 17 Sustainable Development Goals.

The research is limited to the period 2020–2024, and all G20 countries were included in the analysis. Data were obtained from open-access institutional sources (Yale University, SDSN, Dual Citizen LLC). For each country, annual rankings and scores from the three indices were taken into account, thereby revealing cross-country differences in green performance.

This methodological approach makes it possible to compare G20 countries not only in terms of environmental indicators but also with respect to governance and policy effectiveness. Furthermore, the findings provide a critical foundation for shaping policy recommendations.

5. Green Performance Analysis of G20 Countries

The G20 countries are of critical importance to global sustainability goals due to both their economic size and their environmental impacts. These countries account for approximately 80% of global greenhouse gas emissions and thus play a decisive role in the success of environmental transformation policies. In this regard, a comparative analysis of G20 countries based on green economy indicators is highly significant for guiding sustainable development strategies.

In this analysis, data from three main indicators were utilized: the Environmental Performance Index (EPI), the Climate Change Performance Index (CCPI), and graphical data summarizing global climate trends. Presented below are three key figures based on these indicators, each evaluating the green performance of G20 countries from different dimensions.

Table 1 presents a comparative overview of the EPI scores of G20 countries as of 2022. According to the data, advanced economies such as Germany, France, and Canada stand out with high scores in areas such as air quality, biodiversity, and climate policies. By contrast, emerging economies such as China, India, and Turkey exhibit relatively weak performance, particularly in terms of carbon intensity and environmental governance.

Table 1. Environmental Performance Index (EPI) scores of G20 countries, 2022

Perm	*Country*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*EPI ranking*
		Air quality	*Health impacts*	*Water sanitation*	*Agriculture*	*Biodiversity habitat*	*Climate energy*	*Fisheries*	*Forests*	*Water resources*	
1	Australia	98.33	100	100	66.46	83.08	47.67	19.37	100	92.33	3
2	Germany	78.5	100	100	65.31	100	62.77	13.4	31.35	95.18	6
3	UK	95.82	100	100	66.03	70.11	54.24	0	43.06	97.93	12
4	Italy	80.85	100	63.51	58.87	79.77	63.41	24.93	55.41	91.44	22
5	Canada	97.85	100	95.9	62.52	58.4	59.85	21.54	16.64	80.42	24
6	Japan	84.79	99.2	100	46.48	73.53	43.54	25.34	55.41	71.26	26
7	France	89.44	100	100	65.55	54.45	49.83	0	37.94	83.8	27
8	USA	96.41	95.33	86.48	61.53	63.35	56.45	3.34	14.35	63.66	33
9	Saudi Arabia	84.45	94.68	83.48	92	93.7	46.63	6.43	0	28.54	35
10	South Korea	62.24	96.93	85.92	46.98	50.4	41.55	22.24	33.76	83.68	43
11	Mexico	87.09	76.67	46.2	55.21	62.32	51.35	25.34	19.87	37.45	65
12	Turkey	84.07	66.06	71.43	56.67	32.62	46.52	21.9	52.35	48.93	66
13	South Africa	94.4	47.51	36.08	79.2	63.96	49.87	2.52	100	27.86	72
14	Russia	94.36	83.12	45.17	16.93	53.39	61.02	12.73	35.07	21.5	73
15	Brazil	97.64	68.59	50.44	74.51	66.74	53.82	24.68	10.81	10.87	77
16	Argentina	99.64	85.07	75.7	96	44.88	16.79	15.68	0	11.75	93
17	Indonesia	75.31	67.55	24.29	51.85	78.08	45.25	25.8	7.75	0.02	112
18	China	18.81	76.23	33.15	33.85	66.63	65.16	14.68	25.34	18.18	118
19	India	23.24	50.04	26.28	58.4	39.18	35.24	22.64	35.07	10.49	155

Source: Wolf et al. (2022)

Figure 1 presents the Climate Change Performance Index (CCPI) results for 2024, comparing the success levels of G20 countries in combating climate change. While EU countries such as Denmark, Sweden, and Norway are ranked in the "high performance" category, countries such as the United States, China, Russia, and Turkey continue to be classified under the "low performance" group. This outcome is closely associated with the limited applicability of climate policies, the insufficient scale of renewable energy investments, and the lack of success in reducing carbon emissions.

Figure 1. Climate Change Performance Index (CCPI) ranking, 2024
Source: Germanwatch, NewClimate Institute & CAN (2023)

Figure 2 illustrates key climate variables such as global greenhouse gas intensity, surface temperature increase, and carbon emission trends. These graphical data reveal the contribution of G20 countries to global warming and highlight the inadequacy of current climate policies. The global average temperature increase has reached 1.15°C, while CO_2 concentration has risen to approximately 150% of pre-industrial levels. Such figures underscore the growing risk of deviation from the Paris Agreement targets and emphasize the necessity of more radical environmental policies.

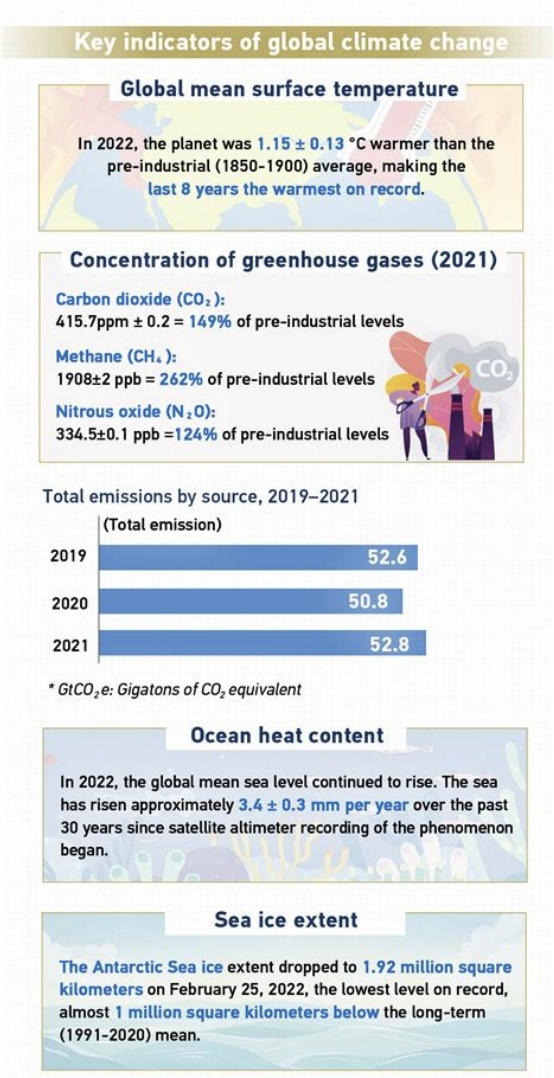

Figure 2. G20's contribution to climate change – temperature and emission trends Source: CGTN (2023)

Figure 2 above illustrates the differences in the environmental performance of G20 countries with concrete data and provides important insights into how these countries should structure their green economy policies. In line with the findings obtained, the subsequent section will present policy recommendations.

6. Policy Recommendations

The comparative analyses of G20 countries' green economy performance clearly reveal a significant degree of heterogeneity in the field of environmental sustainability. This heterogeneity poses serious obstacles to achieving common climate goals and synchronizing global environmental policies, while also underscoring the necessity of addressing national policy frameworks in a context-specific and tailored manner.

First, for countries with relatively low environmental performance, policy priorities should include the restructuring of carbon-intensive sectors, the gradual elimination of fossil fuel subsidies, and the acceleration of renewable energy investments. In particular, in countries such as China, India, Turkey, and Russia—industrialized yet characterized by carbon-intensive production structures—directing public support toward green technologies will serve as a critical instrument for mainstreaming sustainable production models.

Second, even for countries with high environmental performance, maintaining existing achievements requires the comprehensive integration of climate adaptation strategies into national development plans, the expansion of carbon pricing mechanisms, and the institutionalization of green financial instruments. In this regard, for countries such as Germany, Canada, and France, macro-level strategies should focus on promoting green innovation and strengthening financial regulations that incorporate climate risks.

Third, as a common requirement for all G20 countries, the establishment of data-driven environmental governance systems is recommended, alongside making national environmental indicators openly accessible and creating regular monitoring and evaluation mechanisms. Such practices are not only crucial for performance measurement but also for assessing policy effectiveness and enhancing public accountability.

Finally, in order for green transition processes to gain social legitimacy, it is essential to strengthen green employment policies, establish social protection mechanisms within the framework of just transition principles, and increase investments in environmental education. Sustainability objectives can only become attainable through multi-layered policies that prioritize social inclusiveness and minimize the costs of economic transition.

7. Conclusion and Evaluation

The green economy has emerged as a holistic paradigm that redefines the development approach of the 21st century, aiming to balance the tension between economic growth and environmental sustainability. In this study, the conceptual foundations of the green economy were elaborated, contemporary approaches in the literature were analyzed, and the environmental performances of G20 countries were comparatively evaluated through selected indicators.

The findings reveal significant disparities among G20 countries in terms of environmental governance capacity, carbon intensity, renewable energy investments, and climate policies. While countries such as Germany, France, and Canada have made notable progress in green transition, structural challenges persist in countries such as China, India, Turkey, and Russia. This underscores the necessity of multidimensional and context-specific policy approaches for achieving global sustainable development goals.

The policy recommendations presented in this study encompass not only technical interventions but also reform processes integrated with economic and social structures. Measures to reduce carbon emissions, the development of green financing mechanisms, environmental data management, and just transition policies constitute essential components of comprehensive strategies that take both environmental and social dimensions into account.

In conclusion, the green economy is not merely an environmental policy; it represents a new vision of development shaped at the intersection of sustainable welfare, technological transformation, and social equity. As leading actors in this transformation, G20 countries hold the potential to create significant change not only within their own economic structures but also across the global system. In this regard, strategic planning and implementation processes concerning the green economy should be approached as a critical area of responsibility that will directly influence not only the present but also the living conditions of future generations.

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