Chapter 7
Evaluation of Green Employment Policies of G7 Countries for Reducing Carbon Emissions

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7.1 Introduction

Green employment policies play an essential role in overcoming the recession while helping the transition to a low-carbon and resource-efficient economy. Reducing carbon emissions is among the critical agenda items of the world. All countries have duties to reduce carbon emissions. Countries must take the necessary measures with their monetary and fiscal policies (Kafka et al., 2022; Martínez et al., 2022; Sun et al., 2022). Because the United Nations Framework Convention on Climate Change was signed at the UN meeting held in Paris in 2015 for sustainable development, and this contract entered the literature as the Paris Agreement. Within the framework of this agreement, the world needs to reduce emissions by 45% by 2030 and reach net zero by 2050 in order not to keep global warming above 1.5 °C as envisaged in the Paris Agreement. Policies are essential to comply with these targets.

Carbon emissions in the world are seen as an important problem for the future. In this context, environmental policies aimed at reducing carbon emissions have been among the priority agendas of countries. In this regard, especially developed countries have taken various actions. At the beginning of these actions, symposiums, conferences and agreements where countries came together were held. While developed countries implemented a series of policies to reduce carbon emissions, they aimed to shift employment to green sectors. This study aims to reveal the green

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employment policies on the G7 countries, representing developed countries, based on the literature review. In this context, in the second part of our study, environmental policy practices at the global level are included. In other sections, country-based employment policies are mentioned. In the conclusion part, employment policies were evaluated and suggestions were presented.

7.2 Policies and Practices for Reducing Carbon Emissions in the World

Sustainable development comes to the fore in today's world with factors such as population concentration, economic crises and environmental pollution. Since 1970, the world economy has taken decisions at both the global and national levels and set political targets in order to create an environmentally friendly production. For sustainable development and a clean environment, countries have come together many times in the past and made conferences, symposiums, and agreements. These are, respectively Stockholm Environment Conference (1972), United Nations Framework Convention on Climate Change (UNFCCC-1992), Rio Conference (1992), Kyoto Protocol (1997), Cancun Conference (2010), Doha Climate Summit (2012), Paris Climate Change Meeting (2015), Glasgow Climate Pact (2021) and Sharm El-Sheikh Climate Change Conference (2022). As a result of these meetings and agreements, the concept of a green economy developed and gained new content in the reports published by the United Nations Environment Program (UNEP) in 2009 and 2011. According to the UNEP report published in 2011, the green economy is defined as one that results in improved human well-being and social equity and significantly reduces environmental risks and ecological scarcities. Thus, in such a socially inclusive system that uses low-carbon resources effectively, public and private sector investments will be provided to increase income and employment, reduce carbon emissions and pollution, increase energy and resource efficiency, and prevent bio-diversity and ecosystem service losses. It is attached special importance to the state and fiscal policies in the green economic model (UNEP, 2011).

According to the study "Climate Change 2021: The Physical Science Foundation" prepared by the Intergovernmental Panel on Climate Change (IPCC), global warming has increased at an unprecedented rate in the last 2000 years due to the impact of human activities. The intensity of carbon emissions in the atmosphere reached its highest level in 2 million years in 2019. Concentrations of important greenhouse gases, methane and nitrous oxide, were at their highest level in 800,000 years in 2019. Since 1850, the United States has released 509 billion tons of carbon dioxide into the atmosphere, according to the Carbon Brief website, which performs research on climate change. This represents 20% of the global carbon dioxide emission rate. China is the second most polluting country in the world, after the United States, at 11%. Russia comes in second with 7%, followed by Brazil with 5% and Indonesia with 4%.

The carbon tax is one of the policies implemented to reduce carbon emissions. The carbon tax is the tax levied on the amount of carbon dioxide emissions resulting from the combustion of fossil fuels (Dinçer, Aksoy, et al., 2022; Dinçer, Yüksel, & Martínez, 2022; Dinçer, Yüksel, Mikhaylov, et al., 2022; Dong et al., 2022; Mukhtarov et al., 2022). Carbon dioxide emissions occur, especially as a result of burning fossil fuels. Producers are subject to tax per carbon dioxide emission amount due to the damage they cause to the environment as a result of burning fossil fuels (Organ & Çiftçi, 2013). When we look at the carbon tax in the world, it is difficult to come across a common carbon tax application in the global sense. Today, in 24 countries and some local regions, the carbon tax is implemented or planned in various ways according to the development level of the countries.

Another type of tax similar to the carbon tax is the pollution tax. The taxes used to ensure environmental efficiency and the transition to the green economy concept are generally known as "pollution taxes" and draw attention as compensatory taxes taken from economic actors who pollute the environment as a result of their economic activities. This taxation method is generally realized by taxing the ones that cause more harm to the environment at a higher level and those that do less harm to the environment at a lower level (Pal & Saha, 2015).

While motor vehicle tax is essentially a type of wealth tax, it is potentially one of the types of tax best suited to the green economy concept. Because, in terms of sectors, the transportation sector has a share of 24% in global carbon emissions. The share of the road transport sub-sector within the transport sector is 88%. As such, paying more attention to environmental priorities in the taxation of vehicles in the road transport sector, which has the highest contribution to global carbon emissions and uses fossil fuels at a high level, will be a very effective financial tool in the transition to the green economy (Yalçin, 2016). Today, 20 European countries have started to tax motor vehicles, taking into account the carbon dioxide emission of the vehicle (Odabaş & Hayrullahoğlu, 2017). Another potential tax that can be applied during the transition to a green economy is the value-added and special consumption taxes, among the indirect taxes. The value-added tax and the special consumption tax are vital financial instruments in changing the consumption patterns of individuals (Yalçin, 2016).

In addition to taxation, important initiatives exist to limit carbon emissions (Carayannis et al., 2022; Yüksel & Dinçer, 2022; Zhang et al., 2022). In several U.S. states, for instance, there are political practices regarding the energy sector. A portfolio standard is one of the most prevalent government laws, requiring electric utilities to provide a set amount of electricity from renewable or clean energy sources (C2ES, 2022). Additionally, the European Union has made steps to limit carbon emissions. These policies include incentives to increase renewable energy (wind, solar, biomass) and combined heat and power installations, enable the use of improved energy efficiency in buildings, industry, and household appliances, reduce CO_2 emissions from new passenger cars, and reduce emissions from landfills and manufacturing.

7.3   Green Employment Policies in the USA

The initiatives and action plans of the USA to reduce carbon emissions have made substantial contributions to the employment sector. Particularly as a result of the increase in renewable energy production, new employment sectors have emerged, as has green employment. According to the US Energy and Employment Report, solar power was the fastest-growing electricity generation technology in 2021, creating 17,212 jobs and expanding by 5.4%. Despite the economic slowdown caused by COVID-19, electric and hybrid vehicles have continued to create jobs. According to the report, renewable energy jobs comprised approximately 40% of all energy jobs in 2021. In addition, it has been determined that investments in solar energy generate 1.5 times as many jobs as investments in fossil fuels (Department of Energy, 2022).

There have also been times when the USA did not implement employment policies meant to cut carbon emissions. Republican presidents and the Republican Party have generally avoided engaging in American efforts to combat global warming. Ronald Reagan, George H. W. Bush Jr., George H. W. Bush Sr., and more recently, as evidenced by President Trump's actions, have all opposed adopting practices and changes to environmental and climate laws. The primary cause of this is the Republican Party's worry that neo-liberal policies and environmental action will have a detrimental impact on economic indicators, decrease earnings, and eliminate jobs. Obama, one of the US presidents, has green economic initiatives that help lower carbon emissions. The announcement of the coal moratorium is the most significant of these. Although those employed in the coal industry and several other sectors responded negatively to this circumstance, it increased employment in the USA's renewable energy sector (Kansu et al., 2021).

One of the essential policies of the USA to reduce carbon emissions to increase green employment is the Green New Deal (GND) legislation package. The GND is a text that emerged in 2019 by Senator Alexandria Ocasio-Cortez and Senator Ed Markey and was adopted with expansion in 2020 and 2021. The Green New Deal harnesses the full power of the federal government to build an inclusive, renewable energy economy, helping to survive multiple crises simultaneously. This decision sets goals to build infrastructures, modernize cities, and overhaul energy, transportation, industry and agriculture systems to achieve 100% renewable energy as soon as possible. Besides production for a clean environment, GND's most crucial contribution is a roadmap for creating high-quality jobs in the green economy with workers' wage regulations, fringe benefits, worker protections and the right to form unions. Their main goals are to radically decarbonize the US economy and regulate workers' rights while significantly reducing economic inequality (Cha et al., 2022; Galvin & Healy, 2020).

7.4   Green Employment Policies in Germany

Germany has developed environmental policies to reduce carbon emissions both within its own country and within the EU. By supporting the transformation to a green economy with the eco-innovation policy within the EU, it has been possible to increase environmentally friendly investments and create new green business opportunities. Eco-innovation is defined as a powerful tool that combines a reduced negative impact on the environment with a positive impact on the economy and society. Eco-innovation in companies leads to lower costs, improves their capacity to seize new growth opportunities and increases their reputation among customers. Eco-innovation is vital to support the transition to a circular economy and to achieve the goals of the European Green Deal (EU Commission, 2022).

The creation of green jobs is part of the European Union's overall strategy in tackling the crisis to transform economies to promote sustainable and inclusive growth. The European Commission has created four action plans to promote green employment policies and the creation of green jobs (Pociovălișteanu et al., 2015):

–   Incorporating green employment policies into national strategies
–   Educational skills needed in a green economy
–   Use of financial instruments for smart green investments
–   The creation of partnerships between labor market actors

With climate change finally coming to the fore in politics, Germany ranks first in the international arena (rank 6) in the field of environmental policies. Its score in this measure increased by 0.4 points compared to 2014. The country's CO2 intensity has decreased but remains high by international standards due to the intensity of industrial production. The energy sector is still heavily dependent on fossil fuels. Nuclear power is planned to be phased out by 2022. A carbon tax was introduced in 2021. Beginning in 2021, heating oil, natural gas, gasoline, and diesel producers will be required to pay a CO2 charge for these goods. While CO2 emissions are priced via the European Emissions Trading System, these national regulations now establish a CO2 price for the heating and transportation sectors. Starting at 25 € in 2021, this tax on CO2 emissions will climb to 55 € by 2025. The new government has reaffirmed its commitment to continue along this course (Koalitionsvertrag, 2021, p. 63).

Policies to reduce carbon emissions in Germany are not made directly through employment. In the increase of green employment, Germany's renewable energy policies have led to an increase in employment in this sector and employment has been shaped as a result of green economy policies. The solar and wind technology sectors have become important job providers in the German economy. Although there is no data on the net number of jobs created, there are reliable data on gross employment created both directly through capacity investment and indirectly through maintenance, operation and other support activities (Aşkın & Aşkın, 2019; Lütkenhorst & Pegels, 2014). Between 2000 and 2021, the number of jobs in the renewable energy sector nearly tripled. In 2021, this figure was around

344,100 people. Biomass and wind power now have the largest share (Federal Ministry of Economy and Climate Protection, 2022).

7.5 Green Employment Policies in Canada

Canada, which includes reducing carbon emissions among its priority policies, has important environmental policies for this. It has important policy implications at both the federal and state levels. Green economic policies in Canada are policies that contribute to transforming the Canadian economy into an environmentally more sustainable one. Instead of direct employment policies, Canada makes carbon pricing, which is among the environmental policies, increasing investments in the green economy, limiting the greenhouse gas emissions of enterprises, credit incentives for companies investing in the green economy, and legal regulations to prevent greenhouse gas emissions (Loiseau et al., 2016).

Canada is among the important policies to provide concessional financing to initiatives to reduce carbon emissions. This type of financing, which includes low-interest or long-term loans, will help mobilize significant and additional private and public investment in climate initiatives and will result in a shift of employment to these areas. It supports women's skills development and job opportunities in science and environmental fields to ensure that the social and economic benefits of development are shared equally. Canada attaches great importance to women's employment and provides incentives for such initiatives. It provides significant financial support, especially for this private employment (Government of Canada, 2022).

7.6 Green Employment Policies in UK

In the last two decades, developed countries that tend to reduce emissions have attempted to construct a legal basis for climate change readiness. In this situation, The 2008 Climate Change Act is the United Kingdom's strategy for decreasing emissions and preparing for climate change (Government Property Agency, 2022). It was created with a legal aim to reduce Greenhouse Gas (GHG) Emissions in the United Kingdom by at least 80% by 2050 (relative to 1990 levels). Then, in June 2019, supplementary legislation was enacted that increased the aim to "at least 100%." Over time, with the sanctions of international agreements and the acceleration of climate change in the world, revised the targets in law, and in June of 2019, additional legislation was enacted that increased the aim to "at least one hundred percent." (Climate Change Act 2008; Climate Change Act 2008 Order, 2019). It is expected that the transition plan to zero emissions and its implications on a legal basis are not homogenous. Therefore, it is predicted that this will mostly depend on the sectoral composition of regional employment and will vary across the United

Kingdom (Green Jobs Taskforce, 2021; House of Commons Environmental Audit Committee, 2022). According to current data, over 400 thousand individuals are employed in the low-carbon economy.To raise this target, published policy documents supporting the green economy after the law update in 2019.

The first is the ten-point plan for the green industrial revolution, which came to the fore in 2020, and the Net Zero Strategy, which the government put forward in 2021. In this framework, The ten-point plan consists of the following phases: (1) Advancing Offshore Wind, (2) Driving the Growth of Low Carbon Hydrogen, (3) Delivering New and Advanced Nuclear Power, (4) Accelerating the Shift to Zero-Emission Vehicles, (5) Green Public Transport, Cycling and Walking, (6) Jet Zero and Green Ships, (7) Greener Buildings, (8) Investing in Carbon Capture, Usage, and Storage, (9) Protecting Our Natural Environment, (10) Green Finance and Innovation

To raise this target, published policy documents supporting the green economy after the law update in 2019. The first is the ten-point plan for the green industrial revolution, which came to the fore in 2020, and the Net Zero Strategy, which the government put forward in 2021. Additionally, the green jobs task force was an essential part of the implementation phase of the ten-point plan. This structure was created with the participation of the main actors and other stakeholders, such as government, industry, and education, to seize the opportunities for the green industrial revolution. The structure, established in 2020 and designed as a transition phase, has completed its mission in 2021, transitioning to green jobs and determining the direction in the production of jobs that require high skills (Green Jobs Taskforce, 2021). Another supporting structure was the Green Jobs Delivery Group, which the government established to contribute to creating green job opportunities. The purpose of this group is to support the green business goals outlined in the net zero and energy security strategies (Prospect, 2022). A significant result was that it generated 68,000 green jobs after implementing the ten-point plan (British Energy Security Strategy, 2022).

In addition to this situation, the net zero strategies provide a framework that supports policies, expenditures, and employment. The nature of this support is two-dimensional. The first is the creation of high-quality jobs for the government's strategic goals set by its ten-point plan. The other is the continuous improvement in the intrinsic quality of jobs. In addition, the Draft Employment Law envisages regulations supporting the said objectives. In this way, it is aimed to create 190,000 jobs by 2025 and 440,000 jobs by 2030 with the policies and budget specified in the strategy (Net Zero Strategy, 2021).

7.7   Green Employment Policies in Japan

Law No. 117 on the Promotion of Measures Against Global Warming, which came into effect in 1998 and has undergone multiple amendments since then, established the legal basis for lowering carbon emissions in Japan roughly 25 years ago. In

addition to this situation, measures have been taken to change the energy policies significantly and, thus, the employment structure. For example, a carbon tax introduced in 2012 demonstrated commitment to the goals of the Paris Climate Agreement. In this new era, the guiding principles of Japan's energy policy have been energy security, environmental concerns, economic efficiency, and security (3E + S). These principles are designed to accomplish the goals of the Paris Climate Agreement until 2030, particularly the national contribution outlined in the prepared framework agreements, government plans that consider the most crucial employment sectors, and all strategy documents based on green growth.

In this direction, significant progress has been made in the last 7 years. The framework agreement submitted to the UN in 2015 set the target of reducing greenhouse gas emissions by 26% by 2030 compared to 2013. Then, in 2016, the measures against global warming and the government action plan, prepared based on the 1998 law, were approved by the cabinet. In 2018, the new strategic energy plan was approved, the first document in which renewable energy is positioned as the primary power source for the economy and all sectors. It has been announced that there has been a decrease in greenhouse gas emissions since the implementation of the said documents began, and Japan is progressing with great determination to become a 2050-neutral carbon society by 2050. The "Green Growth Strategy Through Achieving Carbon Neutrality in 2050", which aims to be a neutral society and envisages structural reforms and innovation investments, was prepared in coordination with other ministries under the Ministry of Economy, Industry leadership, and Trade and announced in October 2020 (D'Ambrogio, 2021). The strategy draws attention to 14 key sectors and assigns a key role for growth. This positive expectation underlines the importance of sectors that grow with supportive policies and create employment opportunities from the employment point of view (METI, 2022).

According to the International Renewable Energy Agency (IRENA), renewable jobs decreased from 241,000 in 2019 to 220,000 in 2020. Recently, Japan adopted IRENA's 1.5-degree scenario, which prioritizes a technological path and investments. Although there is a decrease in the number of jobs, it is expected that the number of jobs will increase after adopting a roadmap with this new policy understanding. According to the Planned Energy Scenario (PES), it is expected to be 290,000 in 2030 and 340,000 in 2050, with a more modest increase. On the other hand, the IRENA scenario estimates 800,000 in 2050. Therefore, the policy followed has significant potential in terms of creating employment (IRENA, 2021, 2022).

7.8   Green Employment Policies in Italy

In Italy, awareness and importance of the potential benefits of increased renewable energy sources and energy efficiency, including reducing polluting and climate-changing emissions, improving energy security, and economic and employment opportunities for families and the production system is increasing markedly

(Bhuiyan et al., 2022; Kou et al., 2022; Xu et al., 2022). For this purpose, policies and planning prepared at the national level is a citizen-oriented strategy, including producers, consumers and businesses (Ministry of Economic Development, 2019).

Within the Green New Deal framework, each member country's National Energy and Climate Plan (NECP) to reduce carbon emissions by 2030 is one of the most up-to-date and essential steps in this regard. At the same time, this approach is a requirement of the EU legislation and directives of which it is a member. In this context, at the end of 2019, Italy enacted Law No. 160, encouraging new initiatives to transpose EU directives into domestic law (European Commission, 2019). Additionally, like Germany, Italy also attaches importance to eco-innovation in the creation of green business opportunities within the framework of the European Green Consensus (Fabrizi et al., 2022).

Nearly half of Italy's emissions come from transport and "other emissions", including buildings. Between 2005 and 2019, energy industry emissions fell by 42%, placing the industry in third place in overall emissions. Italy has reduced its emissions by 13% by 2020 compared to 2005. It carries out strategies to reach its target of 33% by 2030. In 2019, Italy had 18% Renewable Energy Source (RES). The country's 30% target for 2030 is focused on wind and solar energy. However, while energy efficiency initiatives focus on buildings and transportation, businesses and households are supported (European Parliament, 2021). According to a 2018 report by a consortium of stakeholders in the Italian mobility and energy sector (1), the transition from a fossil fuel-fueled system to one based on locally produced renewable energy is expected to generate 19,225 additional jobs in 2030 and more than 50,000 jobs in 2050 (European Climate Foundation, 2018). In the report published by the IMF on Italy's labor productivity, it is predicted in the model study that the carbon tax will contribute positively to employment and revive labor-intensive sectors in the transition to renewable energy. Based on the model study, the employment-supporting aspect of tax policy regulations in the energy transition process becomes more visible (IMF, 2022).

Since 2000, 18 policies have been developed and put into practice on a legal basis in Italy. Most of the policies are in the role of supporting and setting national targets in sectoral terms. Italy's other policies are generally based on climate change and national strategies. The 2007 Climate Change Action Plan, 2013 National Energy Strategy, 2015 Climate Adaptation Strategy, and 2019 Italy's Integrated National and Energy Climate Plan are prominent policies. These policies support reducing carbon emissions by specifying targets such as energy security and energy efficiency, and as a result, incentives that contribute positively to employment are vital (Grantham Research Institute, 2022).

7.9   Green Employment Policies in France

There are many policies in the fight against climate change in France. Some of these offer national and directly inclusive content. The National Low Carbon Strategy (Stratégie Nationale Bas-Carbone SNBC), published in 2015, is one of them. It concerns all sectors of activity in scope and has binding provisions for citizens, communities, and businesses. It also provides guidelines to ensure the transition to a low-carbon economy in all business sectors (Dinçer et al., 2023; Eti et al., 2022; Kayacık et al., 2022). It sets carbon budgets and caps that will not exceed every 5 years until 2033. This strategy paper has two objectives:

– Achieve carbon neutrality by 2050
– Reducing the carbon footprint of the French people

On the path to the strategy's 2050 carbon neutral aim, it is a desirable objective that the low carbon transition will gradually improve the quality of life, including environment and health, and positively impact employment. The document emphasizes sector-based governance and seeks to cut emissions by promoting sectoral energy efficiency. In this context, governance's correct and systematic operation can be viewed as a form of indirect employment support for a carbon-neutral economy (Ministere De La Transition Ecologıque et Solidaire, 2015).

Another policy of France regarding climate change is the National Climate Change Plan. The National Low Carbon Strategy was revised in 2017 and had a role in accelerating the implementation of the provisions of the Paris Agreement with the energy and climate law that came into force in 2019 (one of the first European countries to pass a carbon-neutral law) and current legislation aims to reduce emissions by 40% by 2030 relative to 1990 levels. (Ministere De La Transition Ecologıque et Solidaire, 2020; Tapolsky, 2021).

Between 2015 and 2035, an estimated 100,000–350,000 additional jobs are projected to be created yearly. In the strategy document prepared by the Ministry of Ecology, Sustainable Development, and Energy for decision-makers, it is suggested to promote the National Low Carbon Strategy policies for the creation of regional approaches to managing jobs and skills, with an emphasis on the development of qualifications in the construction industry. In addition, it is emphasized that the policies established for the agricultural sector (food security guarantee, approaches that protect public health, natural resources, rural and social dynamics, and the environment) provide opportunities for green growth and job creation while preserving competitiveness (Ministere De L'Ecologie, du Developpement Durable et de L'Energie, 2015).

France places a premium on educational materials that promote the transition to a sustainable lifestyle. For this reason, key industries in France (industrial sectors associated with digitalization, environmental change, economic dominance, and production relocation) are bolstered for "strategic professions of the future" in education (García Vaquero et al., 2021).

7.10   Conclusion

As a result of the environmental policy practices of developed countries, green business opportunities come to the fore. In general, when the employment policies of the G7 countries are examined in the literature, it is difficult to say that there are direct employment policies aimed at reducing carbon emissions. G7 countries include green employment on their agenda as an indirect result of their environmental policies. This result is also emphasized in some studies in the literature.

In recent years, transformations related to economic, social and political risk factors have been accelerating worldwide. This transformation strengthens the precautionary and implementation tendencies towards both risk and new opportunities for countries with strong industrial infrastructures and developing depending on industrial production (Eti et al., 2023; Li, Yüksel and Dinçer, 2022; Mikhaylov et al., 2022; Yüksel et al., 2022). For this reason, developed countries have given priority to renewable energy investments to achieve sustainable-centered economic transformation and as a result, they have focused on policies to integrate employment into green sectors. At this point, they have implemented important policies such as improving educational skills for green sectors, financial incentives for increasing green investments, eco-innovation, tax measures to reduce fossil fuel-based jobs, and sector-based greenhouse gas emission limits.

Developed countries should attach importance to the implementation of a just transition for employment to shift to green sectors in reducing carbon emissions. In this framework, it is considered important for developed countries to diversify active employment policy tools to increase the quality of employment while ensuring a fair transition (Fang et al., 2021; Haiyun et al., 2021; Li, Yüksel and Dinçer, 2022; Yuan et al., 2021). For this, it is recommended to make separate programming for green employment or just transition in active employment policy programs. Because adapting the low-skilled workforce of these countries to the green sector faster will contribute to the development of employment policies.

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