

Impact of the EU carbon policy on the globalization and ESG¹ agenda

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Academic editor: V. Faminsky | Received 10 December 2021 | Accepted 25 December 2021 | Published 16 May 2022

Citation: Panibratov, A., Fedoritenko, I., Dubova, D., & Seleznev, D. (2022). Impact of the EU carbon policy on the globalization and ESG agenda. *BRICS Journal of Economics*, 3(1), 53–71. <https://doi.org/10.3897/brics-econ.3.e86001>

Abstract

The article sheds light on the national climate policies under the influence of the EU “green” agenda towards a new wave of deglobalization. We address issues related to the main provisions of the carbon dioxide (CO₂) emission trading system implemented by the EU and posit that European climate policy can enhance the process of reducing interdependence and integration between EU member states and non-EU countries. We suggest that the EU’s global climate leadership, increased use of environmental taxes and stimulation of economic growth based on low-carbon technologies such as hydrogen, energy storage and carbon capture, utilization, and storage (CCUS) can lead to deglobalization. Based on a case study of Finland as an EU member and China as a BRICS representative, we observe the effect of the applied carbon tax on the development of national economies and propose that similar policies across the EU and around the world minimize the risks of deglobalization.

Keywords

EU Green Deal, carbon policy, ESG, deglobalization, EU, Finland, China, emerging markets.

JEL: F01, O11, O13.

¹ This abbreviation stands for: E – Environment, S – Social, G – Corporate Governance.

Introduction

European Union is seen as the main policymaker on the issues of environmental sustainability, which includes carbon pricing — a tool that is supposed to be a crucial helper in fighting climate change. The European Green Deal, approved by the European Union in 2020, is an economic development strategy that aims at achieving carbon neutrality by 2050 and decoupling (A European Green Deal, 2019). Greenhouse gas emissions are planned to be reduced by at least 55% by 2030. To implement this course, the EU sets tasks of increasing the efficiency of resource use and transition to a circular economy, restoring biodiversity, as well as reducing pollution.

The implementation of the deal will have an impact not only on the EU economy but also on the economy and foreign trade of its trading counterparties, which is associated with the proposed restructuring of energy markets and a decrease in imports of carbon-intensive products.

The environmental policy of EU countries is a mechanism of an extensive system based on legal support, economic and legal methods. The main feature is that each country implements legislative acts developed at the level of the European Union, on the individual basis of existing traditions and experience within the country.

The preparedness of the institutional environment, expressed in the mentality of the population and the legal framework in Western Europe, explains the growing interest in indirect methods of regulation, including through public participation. The existing methods of green management are divided into several groups: legislative, economic, and market instruments.

There are several environmental taxes in the EU member states which are usually combined to create an interconnected tax structure. These are targeted taxes, first of all, environmental taxes and fees levied for pollutant emissions and resource use. This paper is more specific on the topic of carbon pricing system, focusing on the advantages and disadvantages in the first part. The carbon price is the aggregate fee that is levied on carbon emissions using market instruments: direct taxes, energy-specific taxes, and price signals.

The price for avoided or released carbon dioxide (CO₂) or CO₂-equivalent emissions may refer to the rate of a carbon tax or the price of emission permits. In many models that are used to assess the economic costs of mitigation, carbon prices are used as a proxy to represent the level of effort in mitigation policies (UNFCCC).

The Global Carbon Account 2019 by the Paris Institute for the Economics of Climate Change states that “As of 1 May, 2019, there were 25 GHG taxation schemes and 26 Emissions Trading Schemes (ETS) in place worldwide. In total, jurisdictions that apply the carbon price account for about 60% of global GDP”.²

An awareness of the need for decarbonization and the development of carbon emissions schemes is being formed all over the world. The decarbonization agenda for the global economy has changed significantly over the past few years as all major

² <https://www.i4ce.org/download/global-carbon-account-2019/>

players put forward ambitious plans in this area. The EU is promoting its Green Deal initiative and putting forward new initiatives on the climate agenda.

To get a proper picture of the carbon pricing, we will start by observing the EU's activities in the field of carbon pricing and fighting climate change, then we will look at the changes in the environmental agenda caused by the COVID-19 pandemic, including the impact on the deglobalization process, and consider the carbon tax in practice on the example of two different countries in the second part.

Finland as an EU member and a developed economy, and China as a member of BRICS and an emerging economy are selected for case studies. Finland and China are of interest from the point of view of regulatory instruments, as well as significance for Russia's foreign economic strategy. Finland has set a goal to achieve "carbon neutrality" by 2035, which is one of the shortest deadlines set for the transition to green economy among all countries of the world. China's goal is to achieve carbon neutrality by 2065. Nevertheless, China's new statement is considered the most ambitious among the countries that have committed to reducing emissions because this state is the largest exporter to the EU.

1. The new "green wave" in Europe

The new "green wave" in Europe has quite pragmatic reasons:

- 1) Fighting global warming justifies huge subsidies for the New Energy Transition.
- 2) It provides a rationale for the introduction of climate charges on goods imported into the EU. Companies that are actively lobbying for the energy transition are looking forward to receiving government or other subsidies within the framework of this megaproject.

- 3) The decarbonization policy in the EU is an attempt to protect its competitiveness in the face of depletion of traditional energy resources in Europe and, accordingly, the growing dependence on imports. But from the point of view of hydrocarbon suppliers, this is an instrument of artificial limitation of competition, since green technologies receive colossal subsidies, including through taxation of traditional energy sources.

Carbon pricing and the elimination of fuel subsidies will have a greater impact on the economies of countries that are heavily dependent on fossil fuels and carbon-intensive production. A significant negative impact on employment in carbon-intensive fuel sectors can be expected.

Despite the different dynamics of the introduction of carbon taxation in different countries of the world, we observe that key players in the global market, such as China, are also introducing similar mechanisms. These mechanisms are not yet synchronized, which leads to a further process of deglobalization. However, attempts to combine them will soon grow, which can lead to mutual benefits in trade and give additional advantages to countries and economic associations (Winkler, 2021).

The ongoing gigantic transformation of the dominant part of the world economy, aimed at achieving carbon neutrality by 2050–2060, focuses on solving the climate problem. Currently, big business and governments are increasingly involved in environmental transformations of the world and national economy, processes of low-carbon development, the fight against climate change, which is facilitated by the inclusion of non-financial environmental and social factors, corporate social responsibility, and ESG criteria.

2. The EU emissions trading system

Pollutants that are presented in the fuel and energy sector, transport enterprises, industrial enterprises, etc. must have an emission permit in the amount established based on their actual level. In a cap-and-trade system such as the EU ETS, carbon prices are determined by the interaction between supply and demand for emission credits. Also, the price of carbon depends on the possibility of free transfer of quotas. If the cap market is efficient, then the marginal cost of abatement is leveled across all pollutants through emission trading, which is the simplest and cheapest way to reduce emissions.

The EU emissions trading system (EU ETS) was established to meet the targets for greenhouse gas emissions. The EU ETS was the world's first major greenhouse gas emissions trading scheme and it remains the largest. It was launched in 2005 to combat global warming and is one of the main principles of the EU energy policy.³

The EU ETS takes a traditional economic approach to tackle the problem of reducing environmental pollution. Economic incentives to reduce CO₂ emissions have been created by the institution. This method can be attributed to the classic market approach. It encourages pro-environmental behavior through market signals rather than clear guidelines on pollution control levels or methods.

The central authority establishes the volume of the total annual pollution of the environment from all sources of pollution and separately by type. Therefore, the maximum allowable emissions in the current year for certain quantities of a certain pollutant are established, which forms an annual quota. This quota is then sold to specific carbon dioxide emitting companies.

3. Carbon pricing and climate change: Legislative aspects

In terms of actions to deal with climate change, the EU is one of the main driving forces in the ongoing international efforts. By doing this, the EU will undoubtedly ensure the Brussels effect in global climate policy. The EU policy, recently announced for the new legislative period, aims to expand on previous ambitions to reduce greenhouse gas emissions (GHG).

³ https://ec.europa.eu/clima/policies/ets_en

The EU intends to effectively lead the global community of countries, offering exemplary policies and successful examples of low-carbon development and improved human well-being. The EU Nationally Determined Contributions under the Paris Agreement provide for a 40% reduction in GHG emissions by 2030 compared to 1990 levels. Somewhat later, the EU committed itself to achieving additional targets for the share of renewables in energy generation and energy efficiency.⁴

In November 2018, the European Commission presented the EU's long-term strategy "A Clean Planet for All." This strategy includes eight different emission reduction scenarios, five scenarios to reduce emissions by 80–90%⁵, and two scenarios to reach emission neutrality (net-zero emissions) by mid-century.⁶

The European Commission (2019–2024), which took office in December 2019 and is chaired by President Ursula von der Leyen, has made the fight against climate change the top priority of its mandate. On November 27, 2019, in Strasbourg, the new President quoted Vaclav Havel: "Work for something because it is good, not just because it stands a chance to succeed." Europe must be the shaper of a better global order. The Program under the title "A Union that Strives for More" encompassed 6 dimensions, such as the European Green Deal, an economy that works for people, a Europe fit for the digital age, protecting the European way of life, a stronger Europe in the world, and a new push for European political guidelines. The ETS will be extended for maritime sector, subsidies for airlines will be reduced. Immediately after the start of the new legislative period, the Commission announced the European Green Deal, which would make Europe climate neutral, for example, with zero GHG emissions by 2050.⁷

The European Green Pact is conceived as a mechanism for reallocating resources, stimulating investment shifting and labor replacement in key sectors of the economy, while supporting the most vulnerable sectors of society throughout the entire process of reducing the carbon intensity of the EU member states' economies. The European Green Pact rests on four main policy blocks:

- 1) pricing for carbon emissions;
- 2) sustainable investments (Sustainable Europe investment plan, parts of the European Investment Bank will be transformed into Europe's climate bank, 1 trillion Euro over the next decade);
- 3) industrial policy (New Circular Economy Action Plan, use of Cohesion Funds);
- 4) a just transition to a new economic model.

Among the instruments designed to limit and reduce greenhouse gas (GHG) emissions, economic (market) instruments are considered the most flexible and effective, that is, those that create an actual "carbon price." This makes it possible to include in the cost of products those external costs that the economy and society as a

⁴ https://ec.europa.eu/clima/policies/international/negotiations/paris_en

⁵ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0773&from=EN>

⁶ https://www.consilium.europa.eu/media/40553/a-clean-planet-for-all_policy-debate.pdf

⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1596443911913&uri=CELEX:52019DC0640#document2>

whole will have to bear to overcome the consequences of emissions, “monetizing” the damage to the environment.

The most popular of these tools are carbon taxes and quota trading systems (emissions trading system and ETS).

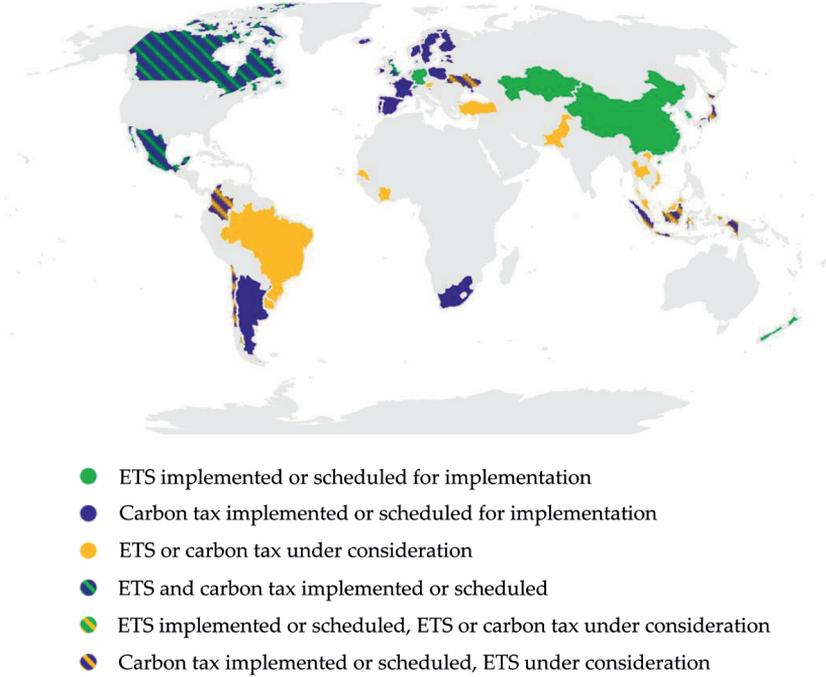


Figure. Summary map of regional, national and subnational carbon pricing initiatives. Source: The World Bank. Carbon Pricing Dashboard. https://carbonpricingdashboard.worldbank.org/map_data

As of February 2022, the World Bank counted 65 carbon pricing initiatives that are active or have a start date.⁸ The following sections will show the positive and negative aspects of introducing a carbon tax to address the problem of managing climate change and ensuring sustainable economic growth.

4. Advantages

On the one hand, global climate change is not only an ecological disaster. In essence, this is an economic and social problem. Setting the cost or price of carbon emissions can tackle the root cause of it and provide incentives for companies and individuals to rethink investment, production and consumption patterns.

⁸ https://carbonpricingdashboard.worldbank.org/map_data

By sending a clear and powerful price signal, carbon pricing provides the right incentives for a large-scale transition to a low-carbon economy. Thus, the implementation of long-term monitoring of carbon pricing evaluates the actual CO₂ emissions and contributes to sustainable development using the World Bank's Partnership for Market Readiness (PMR) platform.

On the other hand, this encourages enterprises to use the experience of partners to exchange highly specialized information on the specifics of developing carbon pricing models and the practice of developing a landmark monitoring, reporting, and verification law (MRV).

Charging carbon emissions is an important step, and many in the private sector are convinced that governments need to move in this direction to effectively tackle climate change. The number of companies preparing for a rising carbon cost is growing rapidly. In 2017, more than 1,300 companies reported internal carbon pricing, including more than 100 Fortune Global 500 companies with \$ 7000 billion in annual revenue.⁹

An effective carbon price can not only encourage companies to increase the efficiency of reducing emissions but also create tax revenues that allow the government to make environmentally friendly investments (Dong et al., 2022).

The carbon pricing system is a simple, fair and effective strategy to tackle climate change. What is more, it can provide additional benefits by reducing air pollution and stress on the road network, while at the same time helping to avoid the increased costs of mitigating environmental impacts associated with the current carbon-intensive global economic growth model.

Companies can use carbon pricing to manage risk, plan low-carbon investments and drive innovation. However, despite the progress made, 85% of carbon emissions are not yet charged; in addition, most of the current carbon tariffs are well below the levels of US \$ 40–80 per ton CO₂ by 2020 and US \$ 50–100 per ton CO₂ by 2030 (The World Bank, 2017, 4).

The World Bank-facilitated High-Level Commission on Carbon Prices, chaired by Joseph Stiglitz and Lord Nicholas Stern, has concluded that these carbon tariff targets were in line with the temperature target of the Paris Agreement (The World Bank, 2017, 25–26).

5. Disadvantages

The taxation option evokes a negative rather than a positive reaction in the business community. Such an assessment is associated with the corresponding costs, which can reduce the competitiveness of both individual enterprises and entire industries and even lead to their closure, as, for example, in the coal industry. Not to mention the associated social burden.

⁹ <https://www.actu-environnement.com/media/pdf/news-29828-prix-carbone-entreprises-cdp.pdf>

The most serious problem of the current mechanism for trading CO₂ emissions permits is the existence and widespread within its framework of opportunistic behavior of firms and entire countries, such as the “free-rider problem.” This is an economic phenomenon that manifests itself in the fact that the consumer of a public good tries to avoid paying for it. Solving this problem is important for enhancing the effectiveness of measures to improve the climate and successfully combating greenhouse gas emissions, not just CO₂. Many countries are not interested in committing themselves to the introduction of low-carbon technologies, the implementation of expensive investment projects in the field of alternative energy sources, and the overall reduction of emissions. Therefore, the benefits listed in the Advantages section are minimized.

Transitional climate risks have a direct impact on the income of the sector. Due to changes in consumer and investor preferences, as well as legislative regulation (for example, the introduction of a carbon tax), investments in environmental projects are growing in different countries due to a decrease in investments in “brown” industries. Brown Economy refers to the current or traditional 20th century economic model based on energy-intensive and resource-intensive production methods.¹⁰

6. New actors in shaping the global climate agenda

Corporations are one of the most powerful engines for the development of the “civilization of maximization.” Their traditional goals of focusing on the bottom line and profit growth are the drivers behind unsustainable production and consumption patterns.

An important feature of the modern stage of development is the attempts of corporations to change the patterns of production and consumption in society. To this end, companies are increasingly incorporating the principles of the UN Sustainable Development Goals (2016–2030) and the Paris Climate Agreement (2015) into their activities. With a commitment to society and nature conservation, ethical issues become important factors determining economic performance and competitiveness globally and in different countries: social responsibility, sustainable development, ecology, responsible investments, green finance, etc.

A positive image of a large company is no longer possible without widespread corporate social responsibility in the world, which provides for the integration of the interests of society and the environment into its business processes and its interaction with stakeholders on a voluntary basis. Companies take responsibility for the impact of their activities and decisions on society and nature, mitigation and prevention of environmental conflicts. When considering the implementation of the above policies, the criteria and abbreviation ESG (E — Environment, S — Social, G — Corporate Governance) are often used. These criteria are already applied by the largest international and national corporations.

¹⁰ <http://www.thegreenmarketoracle.com/2013/10/environmental-implications-of-three.html>

To support the greening of the economy, the UN Principles for Responsible Investment Initiative were formulated in 2006. By 2020, 2,300 financial institutions have joined these principles, and their total assets amounted to \$ 80 trillion (UN Principles for Responsible Investment, 2020). In addition, non-financial information is often provided through the Global Reporting Initiatives.

The environmental transformation of corporate goals is particularly evident in the areas of low-carbon trends, the shift towards carbon neutrality, associated with combating climate change and mitigating global and temporary conflicts. In the EU, banks have begun assessing the impact of risks related to climate change and the transition to a low-carbon economy in the financial sector. The development programs of the largest banks in Germany, Switzerland, Great Britain and the United States (Credit Suisse, Deutsche Bank, Citigroup, Barclays, UBS) are focused on a sharp increase in funding for green projects — sustainable and low-carbon development — in line with the ESG ideology.

Due to the transboundary nature of the activities of MNEs, they are embedded in an interstate context, which implies the existence of laws on environmental protection. Regulation is becoming more complex and multi-faceted. MNEs from emerging economies, as well as companies from global countries, offer to respond to the changing environmental regulations. Here we present statistics for MNEs from countries with significant economies stated in the report “New Environmental Policy Challenges” and identify possible research directions in the national economy for MNEs in this area of ESG (Panibratov et al., 2021).

7. Pandemic and deglobalization as a new reality and a shift in the environmental agenda

Signs of deglobalization have been observed in the last couple of decades, yet the world economy has entered a critically stagnating stage relatively recently, with more and more countries having lost their confidence and motivation in globalization and international trade, which has led to the worries of global economic recession (Sułkowski, 2020). The COVID-19 pandemic has added uncertainty at the national levels as the global business environment faces a terrible situation that has never occurred before, and deglobalization is taking over (Alon, 2020). While the globalization process approached its historically highest level by the end of the 20th century and was continuously progressing, the unpredictable and worldwide spread of the pandemic forced countries to retreat from global integration. Faced with dramatic uncertainty at the level of the national economy and respective social progress, governments and policymakers switched to deliberate measures to slow down the globalization process.

To control the spread of the pandemic and respond to the economic crisis, governments considered gradually reducing their economic dependence on other countries and nationalizing production and consumption activities (Witt, 2019). Many (advanced and developing) countries noticed their excessive economic dependence

on supplies from China. For European community and non-EU countries, the routine economic development was significantly interrupted as soon as China was closed for cooperation and trade. As a result, for the sake of greater economic security, national governments turned to loosening their economic interdependency and reducing their integration into global value chains. At the firm level, the big shock for multinational companies and top management was the discovery that existing global supply chain systems and distribution networks are very complex and easy to disrupt (Alon, 2020). MNEs are supposed to rationalize their current supply chains and even nationalize their operational activities (Witt, 2019). Furthermore, in the context of weakening economic growth, additional market and non-market mechanisms started actively expanding (Levy, 2021), e.g., nationalism and populism, trade protectionism, and the ESG agenda. Therefore, the outbreak of COVID-19 became an excuse for deglobalization in many countries, but also forced local governments to focus on national policies and priorities, where the ESG agenda played a decisive role. Yet, the rise of close-mindedness racial discrimination, populism and nationalism continue affecting economic globalization, leading to growing trade frictions and disruption of economic integration (Albertoni & Wise, 2021).

The COVID-19 pandemic has risen many questions concerning healthcare, legislation, social, economic, and environmental issues. Globalization as we know it has changed, new forms have emerged, and digitization and online platforms have transformed the way we interact and do business.

In this section we analyze the influence of the COVID-19 pandemic on carbon pricing and changes in environmental legislation. Due to the challenges of the pandemic, serious shocks are to be expected in the economic sphere. At the same time, today the need for a large-scale economic recovery plan allows policymakers to prioritize the tools we need for the future we want. In this sense, the European Union, being at the forefront in the environmental actions, can show how economic and environmental ambitions can lead to double benefits and thus encourage others to follow its example (Pons, 2020).

The outbreak of the COVID-19 pandemic made most areas of the world face prolonged isolation, crucially declining social demand, which led to great instability in the carbon market. Carbon pricing faced fluctuations and was unstable. However, to stabilize the market of carbon pricing, the European Commission has passed a “green recovery plan” (Dong, 2022). These fluctuations of the market have made the topic of carbon pricing more visible for policymakers as it is profitable for economic recovery. The energy sector plays a crucial role in decarbonizing the entire energy system, and before the COVID-19 pandemic, it was already in the process of dynamic transformation. The economic consequences of the pandemic led to a very noticeable reduction in the production of electricity based on fossil fuels, which indicates the risks associated with a shortage of coal-fired energy assets for financial entities (Hoang et al., 2021). Despite considerable uncertainty regarding short-term forecasts, it is quite possible that CO₂ emissions in the energy sector will not return to the level of 2018. Various political instruments can be effective in supporting accelerated emissions reduction over the

next few years (Bertram et al., 2021). Statistics show that the COVID-19 outbreak and the proposal of the green recovery plan changed the investment intentions of individuals, which led to a negative correlation between the carbon price and the macroeconomic situation in the short term, together with the significant reduction in carbon prices. However, with the introduction of the “750-billion-euro green recovery plan,” the carbon market gradually stabilized and carbon prices began to rise. This confirms the effectiveness of the EU’s “green recovery plan” to stabilize the carbon market during the COVID-19 pandemic.¹¹

The EU government should rationally implement the green recovery plan in the context of the COVID-19 crisis to contribute to the implementation of the Paris Agreement. According to this document, the following policy recommendations could be proposed.

Firstly, the countries of the world should rationally implement plans for a “green” economic recovery to stimulate economic growth. The COVID-19 pandemic has led countries around the world to adopt a policy of isolation. In general, the global economy is in a state of stagnation. Regardless of whether a company is under the control of carbon dioxide emission rights, the company is at risk. When the government provides emergency assistance to enterprises, it should seriously consider the impact of measures to stimulate recovery on the environment. At the same time, enterprises with outdated production facilities should be liquidated to effectively avoid the negative impact of incentive measures on the environment. Policy continuity contributes to economic recovery and will contribute to the implementation of international climate commitments.

Secondly, clean energy technologies should be expanded and the use of fossil energy should be reduced. The EU government should increase investments in wind and solar photovoltaic energy production technologies, increase the stability of electricity production from renewable energy sources and reduce the carbon intensity of corporate electricity production. Reducing society’s dependence on fossil fuel energy not only contributes to the development of a future EU strategy in the field of hydrogen energy but is also of great importance for achieving the goal of carbon neutrality.

Thirdly, it is necessary to strengthen monitoring, reporting, and verification of carbon dioxide emissions. With the further advancement of the EU environmental recovery plan and the upcoming reform of the fourth phase of the EU ETS, the carbon price will hopefully continue to rise. Although the current carbon price is gradually recovering, it has not reached the price required by the Paris Agreement climate commitments, and therefore the carbon price is expected to rise further.

In the face of rising carbon prices, monitoring, reporting, and verification of carbon emissions are crucial. Fourth, a regional carbon credit market should be created to increase the flexibility of emission reduction for relevant organizations. Emissions covered by the EU ETS account for 45% of total emissions, but there is still a long way

¹¹ <https://www.economist.com/europe/2020/11/14/the-eus-eu750bn-recovery-plan-comes-one-step-closer>

to go to achieve the goal of carbon neutrality. In the future, the EU ETS will cover more sectors and further reduce carbon dioxide emissions. Therefore, the EU should actively create a market for carbon credits in its region and increase the flexibility of compliance with the requirements of relevant agencies through the carbon credits market. In this sense, we can state that the COVID-19 pandemic has had a positive influence on the development of the environmental policy as states have to find alternative ways for economic stability.

The COVID-19 outbreak is still going on, and its effects on the economy and society will vary depending on how long it lasts and how far it progresses. Given the enormous uncertainty in several countries' economic environments, it is expected that a further weakening will happen in 2021. What is certain is that in the face of the growing tendency of deglobalization, all governments and multinational corporations will not surrender. Instead, they are constantly looking for new political and commercial solutions to help them recover from the recession and continue to flourish (Panibratov & Chen, 2021).

The COVID-19 pandemic has an effect not only on environmental questions but on deglobalization too. The environmental economy has changed a lot since the pandemic. This relates to many factors: low level of tourism and "eco" tourism, a small number of flights, a new reality when countries independently find solutions and learn to make their own emergency decisions at different levels within each country. This experience may have an impact on the fact that some countries are unwilling to commit to reducing CO₂ emissions. The COVID-19 pandemic is supposed to bring economic instability, a potential financial crisis will prevent many governments from imposing an appropriate level of carbon taxes or taking other effective measures. In addition, if a single carbon tax is introduced, some developing countries will need to compensate for potential losses. The current trend, exacerbated by the upcoming economic crisis, will be a potentially serious obstacle to overcome. Another threat, both in terms of efficiency and global equity, is the possibility that individual countries or blocs may focus on adaptation instead of mitigation if there is not enough support for a global agreement. These threats will only strengthen the deglobalization trend. From a more optimistic perspective, the COVID-19 pandemic provided several countries with clearer skies, which influenced the perception of the people, they began to appreciate less exposure to pollution. This means that civil societies across the globe can make authorities to reconsider the use of coal and other minerals for energy generation if the public starts demanding cleaner skies in the future (Eliott, 2020).

8. Case study: Carbon pricing in practice

In this section, particular cases of carbon-pricing experience will be observed to analyze if this is a profitable practice for the environmental situation or its impact is not that visible. We will consider two countries — Finland as an EU member and China as a BRICS member — to find possible similarities and differences in these cases. Finland was the first to put carbon pricing into practice, while Portugal adopted carbon taxation

only in 2003. Further we will consider the influence of taxation on emissions rate and on the economic condition of the country since the implementation of a particular policy can have a very ambivalent impact on society.

8.1. Finland

Finland was the first country to use carbon taxes as a tool for reducing climate change. They were adopted in the 1990s and have undergone different changes and reforms. In 1990, only 0.3% of the world's greenhouse gases were emitted into the atmosphere. Initially, this tax was based on the amount of carbon in fossil fuels, and when it was first announced, it was 1.12 euros per ton of carbon dioxide equivalent. After various amendments, in 2018, the Finnish government changed the carbon tax to \$77 per ton of carbon dioxide equivalent. The Finnish government uses the strategy of collecting revenues through the carbon tax to further distribute it in the state budget. They also reduced income tax to compensate for the increase in taxes. Such a strategy is considered to change the behavior of producers and consumers and increase the cost of goods that damage the environment during production or consumption; new jobs are also to be created by reducing the income tax. Nevertheless, carbon pricing in Finland has an ambivalent effect.

On the one hand, statistics prove that Finland has good indicators for reducing emissions and pollution. To understand this, a review was conducted of the percentage change in carbon dioxide emissions in two general, which is the impact of the carbon tax on various tax rates for overall carbon dioxide emissions in Finland and partial levels for different sources of energy, including coal, oil, natural gas, and petroleum products. Indicators show that there is a positive dynamic of reducing fuel consumption in various sectors of the economy for all energy carriers due to the carbon taxes. The reduction for oil and coal amounts to 40 to 50%, which is a significant reduction in energy consumption. Considering that coal is one of the most polluting sources, such a percentage reduction can be considered significant. Thus, we can claim that carbon taxes are profitable in fighting climate change and pollution.

On the other hand, if we consider the impact on social welfare, it doesn't have the same positive results. The results show that the factors of production have a negative percentage change, which indicates a decrease in wages and the possibility of returning real capital. It should be clearly stated that the introduction of carbon taxes in Finland will lead to a decrease in the level of well-being in this community (Mojtaba et al., 2020).

The Ministerial Working Group undertook an examination of climate actions that had been previously adopted as part of the government's mid-term policy review in the spring of 2021 to find out how adequately they would lead Finland to carbon neutrality by 2035.¹² On average, Finland's climate goal implies a 25% reduction in carbon

¹² <https://valtioneuvosto.fi/en/-/10616/government-decides-policy-positions-for-remaining-part-of-its-term-and-for-2022-2025-general-government-fiscal-plan>

emissions in each sector during each parliamentary period (4 years). The government specified actions that would be required in industries covered by carbon trading and the effort sharing sector during its budget session in September 2021.¹³

If other national measures and EU-level solutions are insufficient, the Finnish government will continue to prepare a variety of alternative measures, including national emissions trading for fossil fuels and a transport tax model based on kilometers and road types.¹⁴ The effectiveness of climate initiatives and their adequacy to meet the targets will be reassessed in the spring of 2022 or sooner based on the decision taken during the budget session.

Additional measures will be evaluated considering Finland's progress towards achieving its goal of carbon neutrality in other sectors, as well as the cost-effectiveness of emission reductions, the impact on competitiveness, regional and social fairness, and the precise impact assessments conducted to support this work.

8.2. China

The People's Republic of China has gained momentum over the last four decades by means of the state capitalist policy based on subsidization, forced technology transfer, and investment restrictions. China is highly integrated in global supply chains, with the United States its key trading partner (Beer et al., 2019). In March 2021, China proposed its new five-year plan with a focus on domestic consumption, innovation, and environmental goals (Fey, 2020).¹⁵ China plays an important role in carbon pricing as it accounts for almost 30% of world carbon emissions. China does not have a carbon tax, but it has a national ETS operating since 2021, and to date its carbon reduction efforts have focused largely on the rapid buildout of renewable energy infrastructure.¹⁶ It is crucial to note that the Chinese government has made a great effort to mitigate the number of emissions since 2007, and for this purpose it has announced a national voluntary target of carbon abatement aimed at reducing CO₂ emissions per unit of GDP by 60–65% by 2030 as of 2005 level. China's carbon abatement is especially challenging since its economy is more dependent on energy-intensive manufacturing industries and the primary energy source is coal (Dong, 2018, 389). China adopted its national plan "Made in China 2025." The Chinese investors are looking for innovation capabilities in Germany, especially in Baden Württemberg, Nordrhein-Westfalen, and Bayern (Rusche, 2017). Seven emission trading pilot projects were launched since 2011. The World Bank priced carbon at \$1–\$12/tCO₂ within the scope of these pilot projects. In February 2021, China established its national ETS. Initially, it encompasses only the

¹³ <https://vm.fi/documents/10616/92759783/Achieving+carbon+neutrality.pdf/31fb8f19-d983-5092-a77f-696ca68da8e3/Achieving+carbon+neutrality.pdf?t=1632914133591>

¹⁴ Ibid.

¹⁵ <https://www.aalto.fi/en/news/chinas-new-five-year-plan-to-focus-on-technological-development-and-carbon-neutrality-as-well>

¹⁶ <https://sdg.iisd.org/news/trading-begins-under-chinas-national-ets/>

electricity sector (3.500 Mt CO₂eq) but in the nearest future it should encompass all industrial sectors (Peterson, 2021).

Industry is the main source of energy consumption and greenhouse gas emissions in China and, therefore, should be a key sector for the implementation of carbon taxation policies. According to the BAU scenario observed by Dong, China's CO₂ emissions will increase from 6.8 billion tons in 2010 to 12.2 billion tons in 2030, almost doubling. However, a carbon tax can effectively reduce industrial carbon emissions after 2020 due to a higher carbon price. Total industrial CO₂ emissions could be reduced to 10.4 billion tons by 2030 (a decrease of 15.2% compared to BAU), 9.3 billion tons (a decrease of 24.1%), 8.5 billion tons (a decrease of 30.4%), 7.9 billion tons (a decrease of 35.4%), 7.4 billion tons (a decrease of 39.6%), and 7.0 billion tons (a decrease of 43.2%) after levying a carbon tax of 20, 40, 60, 80, 100 and 120 US dollars/ton of CO₂, respectively. As for GDP growth, it will continue the upward trend and will not significantly depend on the policy of taxation of carbon emissions. GDP will increase from 30.2 trillion yuan in 2010 to 110.7 trillion yuan in 2030 under the BAU scenario with an average annual growth rate of 6.7%. After the introduction of a carbon tax of 120 US dollars, GDP will decrease to 105.3 trillion yuan (a decrease of 5%) in 2030 at an average annual GDP growth rate of 6.4%. The cumulative reduction of carbon dioxide emissions in the four leading sectors (electric power industry, metal smelting and pressing sector, chemical sector, and mining industry) accounts for about 70% of the total reduction of carbon dioxide emissions (Dong, 2018, 396).

The effectiveness of a carbon tax is the ratio of the reduction of CO₂ emissions to the loss of GDP. It can reflect the impact of a carbon tax on both carbon reduction and economic development at the same time and is therefore suitable for evaluating the effectiveness of a carbon tax. Efficiency also depends on characteristics of Chinese provinces since they have different types of industry, so the result in each of them will be different. All provinces can be divided into four types, namely: special regions, regions with high efficiency, regions with medium efficiency, and regions with low efficiency. All provinces cannot achieve a win-win situation in the field of carbon reduction and economic development. A lower carbon tax will lead to increased efficiency. Therefore, it is assumed that a lower carbon price (less than \$50 per ton) is better for some provinces. It can also be found that less-developed western regions, such as Ningxia, Qinghai, Guizhou, Gansu and Yunnan, demonstrate relatively higher efficiency of carbon taxation. Thus, the introduction of a single carbon tax will greatly affect the local economy and the standard of living of the western provinces. Therefore, to resolve this contradiction, it would be advisable for the central government of China to transfer more carbon taxes to the western regions so that their welfare losses can be reduced (Dong, 2017).

If we analyze the relationship between the carbon tax and social security, it becomes obvious that social security decreases with the growth of the carbon tax. It is concluded that too high a tax will reduce the purchasing power of families, which may further reduce the level of social security. Moreover, the range of social security affected by the carbon tax in the consumption link decreases with an increase in the average index of

social inequality. The impact of the carbon tax on social security tends to decrease with increasing demand for redistribution. The growth of the carbon tax in the production link first led to an increase in social welfare and then to a decrease, while taxation in the consumption and redistribution link led to a decrease in social security. This means that a small amount of carbon tax in the production chain is beneficial for social security, while too much tax is not. In addition, the carbon tax in the other two references also damages social security (Chen, 2016).

9. The impact of the EU carbon policy on deglobalization

To conclude, both countries experience a similar impact of the carbon tax as in both countries it decreases social welfare and demands economic development and a revision of the measures to implement taxation in such a way that it does not harm industries or affect economic stability. Finland does not have the same number of emissions as China, which is the world leader in CO₂ emissions.

Thus, China cannot implement the same carbon pricing tools as Finland or other EU members. In a sense, the Chinese case is unique as taxation in China should be distributed considering not only the scale of the industry and its contribution to the economy but also the geographic position of the industry and the characteristics of the region or the province where it is located, in order to implement a reasonable and efficient tax.

In this sense, the analysis of the cases proves that carbon tax influences deglobalization because similar carbon pricing tools can be applied in EU member states. EU members have similar geographical characteristics, historic and economic background, even though the industry has a different scale in each country and requires diverse tax levels. Thus, the situation outside the European Union is even more diverse since the geographical, historical and economical preconditions and carbon tax tools that are designed and applied in the EU will not work. The case of China is illustrative in this regard.

States are confidently introducing new mechanisms at the national level to control and tax CO₂ emissions. We see that in many ways taxation mechanisms in the countries of the world can be similar, the differences relate only to determining the level of parameters and the amount of taxes. Today, China is one of the leaders of the green transition (Tian et al., 2022), and the European Union is pursuing an active regulatory policy. However, it is important to note that the transition to a unified environmental policy is much slower. Moreover, there are contradictions in the introduction of taxation of CO₂ emissions in the framework of international trade. So, in July 2021, China officially expressed concern about the introduction of the CBAM mechanism by the European Union.¹⁷ Thus, the global environmental agenda is being formed more

¹⁷ <https://www.reuters.com/business/sustainable-business/china-says-ecs-carbon-border-tax-is-expanding-climate-issues-trade-2021-07-26/>

slowly than the national ones, which becomes another pillar of the deglobalization process.

10. Conclusions and policy implications

The COVID-19 pandemic was a powerful catalyst for the EU's implementation of the decisions taken to shift the economy to a low-carbon basis. Today, the EU considers the Green Deal not as one of the priority areas of development but as a key area for the economy to recover from the crisis caused by the pandemic.¹⁸ Today, one thing is clear: the price of carbon has already become a key instrument of national economic and environmental policy, and it is now turning from a voluntary initiative through the introduction of trade restrictions into an instrument of enforcement.

The European Commission announced the planned timeline for the adoption of the new legislation: in March 2020, the Commission proposed the first European "Climate Law"¹⁹ which consolidated the goal of climate neutrality by 2050. In the summer of 2020, the Commission presented a plan to "raise the EU GHG emission reduction target by 2030. The achievement of these ambitious goals, as well as the implementation of green technologies and prevention of the so-called carbon leakage, will revise and strengthen all policy instruments relevant to climate action, including the European Emissions Trading System (ETS). These policy reforms will help ensure efficient pricing of carbon emissions in all European economies, as well as outside the EU, stimulating sustainable growth in public and private investment by at least 50% and, most likely, by 55%, compared to 1990 levels."²⁰

The central element of the European Commission's strong call to accelerate Europe's transition to a green economy is high charges on all GHG emissions, which will encourage producers and consumers to switch to less energy-intensive alternatives while reducing the intensity of emissions. Currently, there is no better policy instrument that would set a sufficiently high price for emissions and create market conditions affecting climate change.

A classification of environmentally sustainable economic activities at the EU level should provide new opportunities for the development of its policies in support of sustainable finance, including the Commonwealth standards.²¹ In this realm, it will soon be possible to see the foundation for new economic and regulatory measures through the ESG perspective.

Today, systems such as ETS are segmented on a large scale and lead to deglobalization, but over time, significant harmonization in national and regional ETS systems is likely to occur. The current period of crisis may accelerate harmonization

¹⁸ https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

¹⁹ https://ec.europa.eu/clima/policies/eu-climate-action/law_en

²⁰ https://ec.europa.eu/clima/policies/eu-climate-action/law_en

²¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32020R0852>

of efforts, as the EU ETS is being actively adopted in the main regions of the world economy, including European countries and developing countries, and among them China and Russia.

Acknowledgments

This project was supported by the Russian Science Foundation grant No. RSF 22-28-20430.

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