

Increasing Global Climate Ambition and Implications for Korea

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I. Introduction

Since the adoption of the Paris Agreement, wider and decisive actions to tackle climate change and reduce greenhouse gas (GHG) emissions have been called for in the international community. 2020 has been a notable year for parties to review their nationally determined contributions (NDCs) and submit long-term low greenhouse gas emission development strategies (LEDS). Many countries are seeking a sustainable economic recovery plan that reflects climate change and environmental considerations to overcome the crisis posed by COVID-19. The private sector has also been trying to expand environmentally sustainable investments and disclose relevant information on climate change while avoiding further investments in fossil fuels.

Major GHG emitters such as China, the United States (U.S.), European Union (EU),

Japan and Korea have pledged to move forward carbon neutrality by the middle of this century. To realize carbon neutrality, reduction efforts must be strengthened until net emissions reach zero. While the situation calls for significant changes across society, only a handful of countries, including the EU, have presented actual pathways or specific implementation plans for carbon neutrality up to now. The EU has established sectoral action plans for the European Green Deal, including a plan for introducing a Carbon Border Adjustment Mechanism (CBAM). The issue of GHG reduction is expected to affect not only domestic economic and industrial policies, but also diplomatic and international trade sectors. In this context, this study aims to propose policy recommendations by analyzing measures to strengthen GHG reduction targets and the economic impact of the EU's CBAM.

II. Analysis on CO₂ Emissions Embodied in International Trade

As of 2015, trade-related emission accounted for 27.2% of the total carbon dioxide (CO₂) emission from 65 economies, ASEAN and other regions.¹ Based on the OECD's emission data, we analyzed the status of CO₂ emissions embodied in international trade, mainly in the EU and Korea. We found that many Asian countries such as China were net exporters of CO₂ embodied in trade while developed countries were mainly net importers in 2015. By country, the EU imported over 500 million tons of CO₂ in trade, which is the second largest net imported amount after the U.S. On the other hand, Korea was a net exporter of 48 million tons of CO₂.²

To analyze the economic impact of introduction of the EU's CBAM, we estimated additional costs assuming that the EU imposes a tax of 30 euros (36 dollars) per ton of CO₂ embodied in imported goods from non-EU countries. These results can be considered equiva-

lent to the costs of imposing a certain percentage of tariffs. The tax was assumed based on OECD benchmark values, which are the 'low-end' estimates of the costs of damage caused by CO₂ emissions currently and in 2030.³ We also referred to the annual average of carbon prices (approximately 30–40 dollars per ton of CO₂ eq.), that are scheduled for implementation or have been implemented in the EU and United Kingdom over the last three years.⁴

Among the EU's major trading partners,⁵ India would be required to pay extra costs equivalent to the highest tariff rate of 4.6%, while China would be faced with the largest cost of over 11.9 billion dollars in scale with a tariff rate of 2.6%. Russia, a major exporter in the mining and quarrying sector, is in second place with 3.9%. Korea would be charged a cost equivalent to 1.9% tariff rate. By sector, tariff rates on metals would be higher than other sectors with large imports, such as machinery and equipment. Indeed, the impact of introducing the CBAM will be determined by various factors such as the structure of global value chain between countries.⁶

¹ Yamano and Guilhoto. 2020. "CO₂ emissions embodied in international trade and domestic final demand, Using the OECD Inter-Country Input-Output Database: Methodology and Results," p. 25.

² OECD Stat., "Carbon dioxide (CO₂) emissions embodied in international trade (TECO₂)." (Accessed on October 30, 2020).

³ OECD. 2018. "Effective Carbon Rates 2018: Pricing Carbon Emissions Through Taxes and Emissions Trading," pp. 14–15.

⁴ World Bank. 2018–20. "Carbon Pricing Dashboard, Map & Data," https://carbonpricing-dasboard.worldbank.org/map_data (Accessed on November, 13, 2020).

⁵ U.S., China, Switzerland, Russia, Turkey, Japan, Norway, Korea and India.

⁶ Tariff rates have been roughly estimated based on the average of imports over the past five years (2014–18) and CO₂ emissions embodied in imported goods from non-EU countries in 2015. Databases used are as below. OECD Stat., "BTDixE Bilateral Trade in Goods by Industry and End-use, ISIC Rev.4," (Accessed on September 3, 2020); OECD Stat., "Carbon dioxide (CO₂) emissions embodied in international trade (TECO₂)" (Accessed on October 30, 2020).

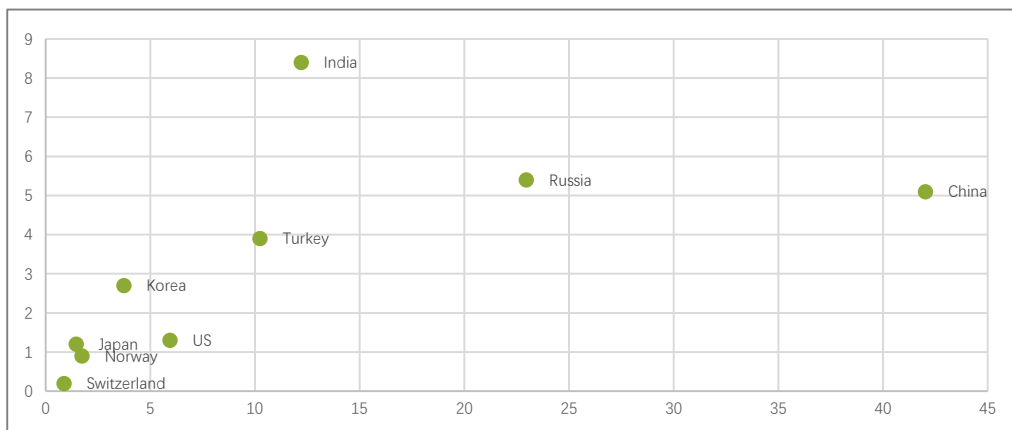
III. Economic Impact of Introduction of the EU's CBAM on Trade

We analyze the economic impact of the EU's CBAM on the production and trade patterns

of Korea and EU's major trading countries. The impact was estimated through the Computable General Equilibrium (CGE) model with GTAP data,⁷ with focus on selected industries – iron and steel, metal, non-metallic mineral products (including cements).

Figure 1. Tariff equivalent estimates based on CO₂ emission embodied in EU imports: Metal

(Unit: X-axis(million tons of CO₂), Y-axis(% , tariff equivalent))



Source: OECD Stat., "Carbon dioxide (CO₂) emissions embodied in international trade (TECO₂)."
(Accessed on October 30, 2020).

If the EU implements the CBAM, intra-regional trade increases within the EU in related sectors, while exports to the EU from other countries with less strict environmental regulation will be adversely affected. According to our results, the CBAM on iron and steel sector is expected to reduce that sector production of India and Russia by 0.86% and 1.84%, respectively, while that of Japan and the U.S. by 0.02%. Those sectors of Korea and China are negatively affected by 0.25% and 0.14%, respectively. The results are similar if CBAM is

applied to non-metallic mineral products sector, then exports to the EU and production of the sector are expected to reduce in China, India, and Russia.

IV. Policy Implications

Global efforts to reduce GHG emissions and to achieve carbon neutral goals demonstrate a commitment to strengthening relevant policy actions in the near future. As an economy

⁷ The EU is considering three CBAM options: carbon taxes on both imports and domestic production, a custom duty on imports, and an extension of the EU Emission Trading System (ETS) to imports.

highly dependent on exports, Korea is vulnerable to such external changes. This study suggests the basic strategies and policy recommendations for an effective response to introduction of carbon border adjustment measures by partner countries including the EU, and to realize Korea's low-carbon transition and carbon-neutral goals.

First, it is necessary to support low-carbon transition efforts in industries. Carbon pricing is a useful policy tool that contributes to reducing negative externalities of climate change, but its effectiveness may vary by sector, depending on the level of production technology or possibility of replacing fossil fuels. In particular, industries with a high dependence on fossil fuels, such as shipping and air transportation, face a relatively higher burden compared to other sectors. Thus sufficient discussions with stakeholders must be preceded in order to effectively support industries. Efforts must also be taken to share domestic and foreign policy trends and persuade the industries to reduce emissions. For example, tax incentives can influence companies' decisions, encouraging them to change their fuel sources to low-carbon energies. It is also necessary to support retraining and re-employment of workers in fossil fuel-related industries.

Second, it is also important to support low-carbon technological innovation. The development of these technologies typically takes more than 10 years, so the slower the investment takes place, the slower the transition proceeds to a low-carbon economy, which

may eventually result in a greater financial burden than expected. Furthermore, if low-carbon technologies become more productive than existing technologies, relevant innovation in the private sector can be accelerated, and the development of more advanced low-carbon technologies will sustain or further promote economic growth while responding to climate change. Therefore, it is necessary to consider practical measures to encourage low-carbon technological innovation in the private sector from a long-term perspective. Policies providing subsidies, or imposing revenue taxes on the use of existing GHG emission technologies could be considered.

Third, monitoring and response measures for the CBAM should also be prepared. There is a need to continuously monitor regulatory trends in major countries, and promote exchange and cooperation with overseas research institutes. It should be possible to participate in such discussions on how the EU will implement the CBAM and how much they will charge based on what statistics. Above all, it is necessary to discuss various policies to prepare countermeasures for the EU's CBAM. The purposes of introducing this system seem to be not only to reduce emissions, but also to protect domestic enterprises in the EU, especially in sectors with relatively less competitiveness, and to secure financial resources for the European economic recovery. On the other hand, Korean companies may face difficulties in exporting due to an increase in cost burden and weaker competitiveness. Korea could also consider taking similar measures against the EU. It will be necessary to establish environmental and trade

policies while considering that other partner countries can introduce carbon border adjustment measures.

Fourth, the private sector should expand voluntary efforts to reduce emissions and environmentally sustainable investment. It is clear that the paradigm shift towards a low-carbon economy is an irreversible trend. Global companies are already changing business models and investment activities to suit this paradigm. As corporate efforts for tackling climate change and mitigating GHG emissions have become an important condition for assessing a firm's financial value and corporate social responsibility, these issues must be reflected in decision making processes. Therefore, it will be necessary for Korean industries to make self-sustaining efforts to develop new business models through technological innovation and investment, and to rebuild competitiveness with a sense of global responsibility.

Lastly, it is necessary to actively engage in international cooperation, not only in terms of reducing GHG emissions but also responding to climate change. In order to achieve global carbon neutrality, transnational cooperation is required, including more practical efforts in policy, business and technology. First, at government level, policy exchange and cooperation with other countries can be carried out on whether a mitigation target is appropriate, whether necessary policy measures are considered and how to monitor the achievement of targets. As the transition to a low-carbon economy requires a comprehensive shift

across all areas of society, climate change issues should be set as the main agenda in multilateral consultative bodies as well as consultative groups specialized in climate change. It is also important for the private sector to learn lessons from global success cases and to proactively identify and respond to related technology and policy trends.

This study is meaningful in that it preemptively analyzes the CBAM issue raised by the EU while examining global efforts to respond to climate change and reduce emissions. However, since the EU is yet to reach a final decision on the CBAM, this study estimates its economic effect on carbon tariffs, one of the three scenarios the EU is considering. The OECD database we have used does not provide the latest emissions and product-specific emissions embodied in trade since 2015. We expect a more elaborate analysis to be possible when reflecting the EU's final decision and factoring in segmented industrial items. Further analysis is also needed on whether EU's final decision on the CBAM is in line with WTO norms, and the possibility of introducing the mechanism in countries or regions outside the EU. **KIEP**