

Economic Impacts of Low-carbon Transition in Korea

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In April 2023, the Republic of Korea announced the first master plan for carbon neutrality and green growth and proposed the revised pathway for 2030 Nationally Determined Contributions. While targeting the same level of net greenhouse gas emissions, it revised the sectoral emission reduction targets and greenhouse gas removals, including CCUS and international GHG mitigation. It slightly reduced the burden of the industrial sector and enhanced reduction targets of the power sector and other sectors, such as hydrogen, CCUS, and international greenhouse gas removals. Achieving the NDC targets and Net Zero becomes an important agenda for Korea, and the study applies a global dynamic recursive computable general equilibrium (CGE) model to analyze the impacts of achieving NDC targets as well as reaching Net Zero. The study sets three scenarios, which are business-as-usual, NDC extension, and Net Zero transition scenarios. The NDC Extension scenario assumes the achievement of the NDC targets and the continuation of emissions reductions, but it fails to achieve Net Zero by 2050. The Net Zero transition scenario assumes the carbon prices in 2030 and in 2050 suggested by IEA's World Energy Outlook 2022. This analysis examines the impacts of those transition scenarios on the Korean economy and employment. The result indicates the NDC extension scenario, which achieves NDC targets but fails to achieve Net Zero, could bring a slight increase in GDP relative to the BAU level, while the Net Zero scenario brings a slight reduction in GDP relative to the BAU level. Moreover, both NDC extension and Net Zero scenarios bring some increase in employment. Although it shows some overall benefits, sectoral reallocation seems inevitable. Particularly, non-renewable electricity, oil, and petroleum and coal product sectors could experience a substantial reduction of production and investment, as well as employment, relative to the BAU level. This result suggests the national policies for facilitating the sectoral reallocations to achieve the low-carbon transition and supporting people and industries that could be negatively affected by the low-carbon transitions. Moreover, the low-carbon transitions could bring co-benefits, though not incorporated in this study.