

Economic impact assessment of immediate shutdown of all nuclear power plants in Japan

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Abstrak

This study assesses the environmental and economic impacts of the immediate shutdown of all Japan's nuclear reactor. For the assessment, we regard a gradual nuclear power phase-out scenario as the basis for a 40-year operational time limit of plants as a reference scenario. A multi-regional, recursive dynamic computable general equilibrium model based on Version 841 of the Global Trade Analysis Project database is constructed. The simulation results indicate that an immediate nuclear shutdown increases CO₂ emissions through an increase in fossil fuel electricity generation and decreases real GDP losses in Japan. From a sectoral view, an immediate nuclear power shutdown has a negative impact on Japan's energy intensive and trade-exposed sectors. In addition, we find that an immediate nuclear shutdown has a negative after-effect on the economy. This is caused by shrinking investment spending during the immediate nuclear power shutdown. Overall, we find that the Japanese economy would face significant economic and environmental impacts from an immediate nuclear power shutdown. However, our model does not incorporate potential negative costs associated with nuclear usage, such as the risk of a nuclear accident or the cost of final disposal sites for nuclear waste, which may be sizeable. To derive conclusions for Japanese energy policy, we must consider the potential negative costs of nuclear usage. The results of this simulation study represent the first step in answering key questions on energy policy.