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Security of Supply Concerns and Environmental Impacts of Electricity Capacity Expansion in Thailand

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Abstract

To meet its growing electricity demand Thailand needs an extensive expansion of its electricity capacity in the foreseeable future. The country faces twin challenges in this respect: a) Continued dependence on gas for power generation adversely affects the security of electricity supply by deteriorating fuel diversity and raising vulnerability to the Thai economy; and b) A diversification other fossil fuels could in turn impose additional environmental degradation. Therefore, the objective of this paper is to explore an acceptable solution balancing these two concerns. The paper employs the electricity capacity expansion planning approach and simulates alternative capacity expansion paths for Thailand between 2011 and 2025. The analysis contains four scenarios, each of which is subjected to two fuel price assumptions. It was found from the simulation results that natural gas is likely to remain the major fuel for electricity generation during the planning horizon and consequently the impact from gas dependence to security of supply will continue in the near future. An addition of new coal-fired power plants could improve security of supply but its environmental impact remains a crucial concern. Nuclear power could offer the least cost solution for electricity generation while appreciably reducing environmental emissions but a large scale penetration of this technology within the planning horizon is unlikely.

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