

Nuclear Power in the Asia-Pacific Region: Current Status and Future Perspective

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1. Introduction

Asia-Pacific is the major region in the world where nuclear power generation capacity is increasing significantly over the past decades. We conducted modelling research on the future projection of nuclear power development, in order to support analysis on a sustainable and low-carbon energy path for the APEC (Asia-Pacific Economic Cooperation) region.

2. Current status of nuclear power in APEC

Among the 21 APEC member economies, 13 economies in APEC either use nuclear-based generation or have plans to develop it in the future. Currently 262 nuclear reactors are commercially operation, accounting for 60% globally. By the end of 2015, a total number of 44 reactor units are under construction in APEC, accounting for 69% in the world. It is believed APEC region has the biggest potential for the future nuclear power development.

3. Scenarios and assumptions

We design three scenarios, including Business-as-Usual Scenario (BAU), Low-nuclear Scenario (LN) and High-Nuclear Scenario (HN). We evaluate the progress of nuclear projects in each economy and incorporate their development plan as well as energy policy. The projection period is to 2040.

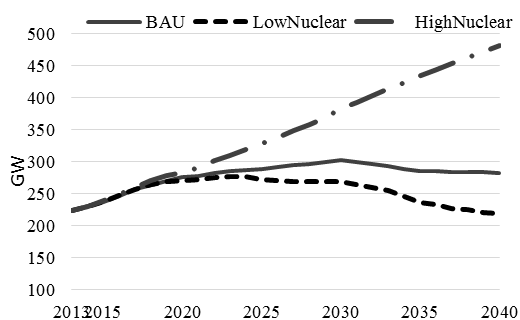


Figure 1: Nuclear capacity assumptions

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Definition of the three scenarios is as follows:

- (1) BAU: Following current development plan and licensing trends in each economy.
- (2) LN: Some new projects will be delayed; South-east Asia economies will cancel their plan.
- (3) HN: All the projects in the plan will be commissioned on time, and more capacity than planned.

4. Preliminary results and conclusion

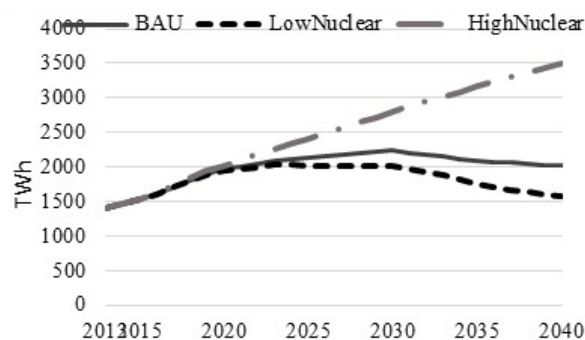


Figure 2: Nuclear power generation in APEC

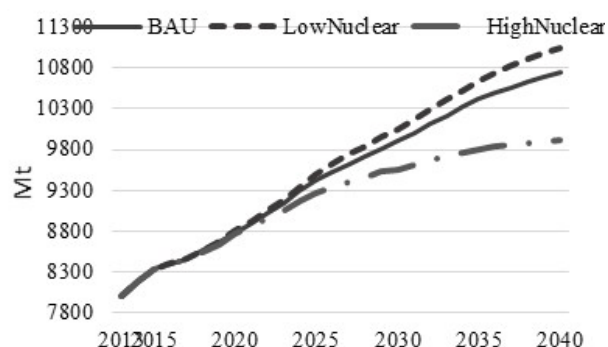


Figure 3: CO2 emissions from power sector

The modelling results show that, by 2040 HN case would reduce 1130 Mt CO₂ emission compared with LN case. The main drivers for nuclear power in APEC will be: (1) rapid growing of energy demand; (2) Environment pressure as well CO₂ emission reduction requirement; (3) Reducing the share of fossil fuel and improving the energy security.