

# 3E Assessment of Energy Transition Pathways in Taiwan: An Integrated Energy Systems Perspective

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## Abstract

Taiwan's energy transformation is now facing severe challenges, not only to supply sides but also to demand sides. In addition, the air pollutants emissions from power generation have been discussed widely to further influence the power planning. This study proposed an integrated energy systems model, Taiwan Integrated Sustainable MOdel (TISMO), to figure out the impacts on energy, economy and air-pollution from the uncertainties of energy transition pathways. The results present the aggressive energy transition policy, such as low-carbon electricity generation and energy savings, can help reduce greenhouse gas (GHG) emissions and improve the air quality. Moreover, the strategies, including carbon trade and cap, new green power technology, etc., should be considered to combat about 20 million tonnes (MT) of an emission gap to reach Taiwan's Nationally Determined Contributions (NDCs) target under the scenario analysis. As for the economic impacts of energy transformation, the economic output seems vulnerable to lower share of cheap coal-fired generation. But the renewable energy investments, which were not evaluated in this study, are suggested to have potential positive spillover effects through industrial linkage. Finally, some policy challenges, such as land securement and grid connection constraints, are pointed out for future research.

Keywords: Scenario Analysis, Energy Transition, Taiwan TIMES model, AIM/CGE, TISMO.

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• The views expressed are those of the individual authors and do not reflect those of Industrial Technology Research Institute and Bureau of Energy, Taiwan.

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