

3.045 Impacts of national Power Development Plan on future air and climate pollutant emissions in Thailand.

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Abstract:

Thailand's fast growing economic development contributes to a rapid increase of the national energy consumption, leading to about 250 million tons emission of carbon dioxide (CO₂), corresponding to approximately 70% of the overall national greenhouse gas emissions in 2014. At the end of 2015, Thailand released the Thailand's Integrated

Energy Blueprint (TIEB) 2015-2036 to support the Intended Nationally Determined Contribution (INDC) submitted to the UNFCCC, which stated the national commitment of CO₂ emission reduction of 20-25% during 2020-2030, comparatively to the Business As Usual (BAU). Along with CO₂, energy consumption also emits other climate and air pollutants, such as particulate matter (PM), black carbon (BC), ozone (O₃) precursors, etc. Among the five plans in TIEB, Power Development Plan (PDP) is of prime interest due to the high future demand and planned fuel mix change, consisting in increasing the proportion of clean coal technology to reduce fuel dependence on natural gas. Also, the imported power from neighboring countries is forecasted to be higher, as well as the share of improved renewable energy sources in fuel mix. This would contribute to a significant change in climate and air pollutant emissions.

In order to better understand the future national emission change, we have developed a framework for emission inventory and projection assessment, based on the Greenhouse Gas - Air Pollution Interactions and Synergies (GAINS) model. In this study, emission scenarios generated from TIEB-PDP 2015-2036 will be first described and analyzed. Emission trends of key pollutants of interest including PM, BC, and ozone precursors, especially nitrogen oxides (NO_x), will be discussed. Finally, impacts of the future emissions under different scenarios using air quality modeling system will be presented and discussed in terms of potential contribution to haze and ozone pollution.