

Thailand LCS Scenarios towards 2050: The LCS Roadmap and Peak CO₂

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Abstract

The research team has constructed Thailand's LCS scenarios for use as a basis of discussion on sustainable Thailand. The LCS scenario methodology involves i) development of GHG inventory, ii) quantification of socio-economic activity level in 2050 according to available information from Thailand's officers, and iii) development of GHG mitigation roadmap towards 2050 by using the AIM/Enduse model. Two LCS scenarios were proposed: The LCS roadmap and the peak CO₂ scenarios. This study divided into three sub-periods: short term, medium term and long term periods. The short term roadmap is intended for the proposed Thailand's Nationally Appropriate Mitigation Action (NAMA), while the long term roadmap is provided for discussion of sustainable Thailand including Thailand's peak CO₂ scenario. The annual greenhouse gas emissions of Thailand in the base year of 2005 are 183,287 kilo-ton (kt) of CO₂.

In the short term period of 2010-2020, Thailand's NAMA will contribute in CO₂ reduction of 20%. In the 2050BAU scenario, the GHG emissions will increase to 840,371 kt-CO₂. That is 4.6 times higher than the emission in the base year 2005. By adopting the selected feasible GHG mitigation measures available by 2020, 2030 and 2050, the GHG emissions in the 2050LCS can be decreased by approximately 29.2% to 594,665 kt-CO₂. LCS actions include both supply-side and demand-side actions such as increasing the use of carbon capture storage (CCS) in power generation and industries, more utilization of bio-fuels, renewable energy (RE), promoting modal shift in transportation, and increasing energy efficiency (EE) in buildings and industries. In 2050, these CO₂ countermeasures will result in transformational changes in not only supply side but also demand side while Thailand's NAMA will not result in such changes.

However, the Thailand's LCS roadmap, which is based on selected feasible GHG mitigation measures, could not achieve the 2 degree target. Therefore, many rigorous LCS actions to achieve the peak CO₂ target within 2050 are proposed. Results from AIM/Enduse analyses show that Thailand could meet the peak CO₂ emissions during 2040 - 2045 at 393 Mt-CO₂ emissions. The peak CO₂ scenario shows that CO₂ can be reduced by approximately 48.3% from 770 to 393 Mt-CO₂. This Peak target will not be achieved if they are not planned and implemented in the early stage. In addition, measuring, reporting and verification (MRV) of LCS actions are of necessity.