

Title: AIM/CGE modeling activity 2013 - Development of a CGE model Coupled with Energy End-use Technology -

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There are two contents to be presented. One is overall activities relevant to AIM/CGE modeling and the other is introducing one of the model development activities which implement detailed energy end-use technology information.

The presentation will focus on 1) how the energy end-use technologies are treated within the model and analyze 2) the characteristics of the model behavior. The energy service demand and end-use technologies are explicitly differentiated and the share of technologies are determined by a discrete probabilistic function namely Logit function to meet the energy service demand. The new model is compared with the aggregated model under same assumptions with and without mitigation scenarios.

Although the energy supply and demand, and GHG emissions seemed not so different, there are three main differences between aggregated and detailed technologies models. First, GDP and consumption losses in mitigation scenario are lower and the detailed technologies model is 2.8% and 3.9% in 2050 while the aggregated model is 3.5% and 4.8%. Detailed technologies model can deal with the household expenditure for extra energy device cost relative to reference scenario and if it is excluded from the GDP, the loss becomes 3.4% and 4.8% in 2050. They are similar numbers with aggregated model. Second, price elasticity and autonomous energy efficiency improvement vary across regions and sectors whereas the traditional aggregated model generally utilizes a single number. Third, the magnitude of emission reduction and its factors to the climate mitigation varies among sectors. Household sector in detailed technology model has relatively higher reduction both of energy intensity and carbon factor.