Executive Summary

This analysis contains the following four parts.

Firstly, we collected plans and related information on the power generation outlook in ASEAN countries concerning the national power development plans and other elements. We also collected climate change policies. ASEAN countries aim to adopt decarbonisation as a long-term strategy. It is important for each country to adopt related policies such as climate change, energy security, energy mix, renewable energy, and coal. To achieve decarbonisation, policy and technology development is necessary. Each country expert supported this step.

Secondly, we collected ammonia market information and experiences regarding fuel ammonia worldwide. We estimated the potential for ammonia cost and production in ASEAN and other countries as well as ammonia import to ASEAN countries. We also considered the possibility of technology innovation for ammonia production and utilisation of existing facilities to deliver and store ammonia.

Thirdly, we estimated the effects of carbon dioxide (CO_2) reduction by ammonia co-firing in coal-fired power generation. The CO_2 reduction potential was estimated using the power plant database to select ammonia co-firing plants. For this estimation, the ammonia co-firing ratio, capacity factor, and efficiency are set as parameters. This estimation has two cases: (i) low scenario (~2030: all capacity under construction phase, 2031~: no additional capacity) and (ii) high scenario (~2030: all capacity under construction and project phase, 2031~: no additional capacity).

Finally, we identified barriers to the decarbonisation of thermal power generation such as ammonia co-firing in coal-fired power generation and the creation of ammonia supply chain amongst Japan and ASEAN countries.

We conducted two workshops to share the results of this study with Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam. Each member country participated in the workshop and was advised to actively improve this study.