Executive Summary

This study aims to analyse the potential for deployment of the Energy Management System (EMS) in the East Asia Summit (EAS) region, and to propose, upon identifying the policy challenges common in the region, policy recommendations for the promotion of EMS. The first year of this two-year study focused on analysing the needs of the EMS and grasping the details of their current status through case studies. Based on these results, additional case studies were carried out. Based on the first year study, the second year will identify specific challenges for the advancement of EMS in the EAS region, and propose policy options.

This study chose five Association of Southeast Asian Nations (ASEAN) countries—Indonesia, Malaysia, Singapore, Thailand, and Viet Nam—as the targeted countries. These have common characteristics in terms of energy consumption, although they have some differences in other aspects such as country size, economic conditions, and how much their energy supply relies on domestic resources.

Despite such differences, these five countries—as well as the other countries in the ASEAN region—have seen a sharp increase in energy demand driven by the economic growth, and feel compelled to reduce their energy consumption. The efforts are still under way but they still need to further promote energy efficiency to control the energy demand without affecting their economies' development. The state of EMS deployment varies among these nations although, in general, they are all still at an early stage and thus still far from a full-fledged commercialisation.

Basic and common functions of xEMS technologies have four development steps:

-to visualise the energy demand by using meters or monitors;
-to monitor the energy demand by information and communication technologies;
-to control the energy demand automatically by communication;
-to integrate the distributed energy supply systems (e.g. photovoltaics, energy storage, electric vehicle, etc.).

The development of xEMS technologies started with large energy consumers. Interests in energy saving benefits within factories (i.e. their Factory EMS) and buildings (i.e. Building Energy Management System [BEMS]) are easy to coordinate due to their

small number of stakeholders. These are followed by residential use (i.e. Home Energy Management System, or HEMS) and Community Energy Management System (CEMS), which integrates the facility-level EMS into the community-level EMS.

For the case studies on the potential of BEMS deployment during the first year, the head office (Yayasan Building) of PT PLN in Indonesia and the Nonthaburi Office of the Metropolitan Electricity Authority (MEA) in Thailand were chosen among the list of candidate sites proposed by the study's Working Group members.

The case studies consisted of two steps. First, researchers analysed the potential energy efficiency based on data provided by PLN and MEA and presented their tentative results during the second Working Group meeting in Tokyo. Next, the study team conducted a more detailed site survey consisting of walk-throughs and interviews with facility personnel to identify in detail the potential energy savings.

The site survey results at PLN's Yayasan Building showed that improvements in operational practices such as the adjustments in air ventilation and inverters could lead to a potential energy savings of 4.6 percent of the total electricity consumption. Because the building is over 20 years old already, large-scale remodelling of existing facilities may also need to be considered although cost recovery may take longer. Replacement of turbo chillers is expected to achieve an additional 10 percent reduction in energy consumption.

The MEA Nonthaburi Office, because of its newer infrastructure and facilities, has an energy savings potential that is not as high as that in the PLN Office. Established just in 2012, the MEA Nonthaburi Office's new facilities are in good condition and have maintenance procedures in place. However, the site survey also showed that there is room for improvement in the control of airflow although some additional costs may be required. Improvements in operational practices and deploying these low-cost measures may lead to a total energy savings of about three percent of the total electricity consumption.

The case studies at the two sites, thus, suggest two areas to be improved in the air-conditioning systems of office buildings. One is to adjust the intake volume of fresh air from outdoors; the other is to adjust the motor power's frequency using inverters.

This study also argues that, in the long run, more attention should be paid to energy efficiency by introducing advanced building structures.

Following the results from the first year of study, the second year will proceed to undertake an in-depth analysis of a broader area of energy consumption (i.e. beyond just the office buildings): For example, to study the potential deployment of Factory Energy Management Systems and CEMS.

Finally, this study discusses policy recommendations on the promotion of EMS technologies in the EAS region, with focus on the economic impact of policy options such as subsidies, tax benefits, and tariff incentives that support Energy Service Company businesses.