

Executive Summary

Energy consumption in Cambodia has been increasing rapidly. According to the Energy Demand and Supply of Cambodia 2010–2018(2019)¹, one of the energy research reports of the Economic Research Institute for ASEAN and East Asia (ERIA), total final energy consumption (TFEC) grew at 7.2% per annum in 2010–2018. However, its elasticity over gross domestic product (GDP) was 1 because of the 7.2% growth rate of GDP in the same period. The TFEC includes biomass, whose share was significant in Cambodia (biomass share over the TFEC was still 25.5% in 2018). The growth rates of commercial energy, such as oil and electricity, in 2010–2018 were 8.1% and 18.3% per year, respectively, which were much higher than the TFEC. In the future, biomass's 25.5% share in the TFEC will surely be replaced by commercial energy, such as oil and electricity. Thus, Cambodia must formulate and implement energy efficiency and conservation (EEC) policies and programmes to curb commercial energy consumption. Unfortunately, the country has not formulated its EEC programme. Consequently, the General Department of Energy (GDE), Ministry of Mines and Energy, ERIA to come up with the EEC Master Plan for Cambodia.

The GDE plans to formulate many EEC policies and programmes but ERIA just focused on the following five EEC policies and programmes due to their effectiveness, 'quick-acting', and low cost: (i) energy service company (ESCO), (ii) growing of energy managers, (iii) standard and labelling system, (iv) education and campaign, and (v) preparation of energy efficiency indicators (EEIs). ERIA also prepared a 5-year road map (2020–2025) for each EEC policy and programme mentioned above.

Fortunately, energy prices, such as electricity, in Cambodia are relatively higher than those of its neighbouring countries due to the absence of energy subsidies. Thus, owners of many factories and buildings, which have higher energy costs, would like to reduce these costs. Given this situation, the EEC Master Plan firstly suggests that the GDE start installing ESCOs in Cambodia's energy market. The GDE will simply prepare the qualifications of ESCOs and license those that submit their application forms to the GDE. The industry and commercial sectors have a remarkable energy-saving potential, and ESCOs will realise such saving potential by applying their practical expertise and experience on the EEC. However, during the initial stage, the GDE will support ESCOs by providing them with business opportunities – retrofitting existing government buildings and creating advanced EEC designs for new ones.

An ESCO usually consists of energy managers who hold an EEC certificate from a domestic or foreign organisation, such as the Energy Efficiency Center of Japan (ECCJ). Energy managers are key role players in promoting the EEC in Cambodia. Because of their currently limited number, the GDE must increase or grow energy managers. Because of new EEC regulations which will be formulated in a few years, energy-intensive factories and buildings will be designated and mandated to assign energy managers to monitor the premises' energy consumption. Some energy managers will work for ESCOs and engage in EEC consulting work. Others will be independent and engage in energy audit work designated by the GDE. The EEC Master Plan targets 100 energy managers by 2025, and an association of energy managers will be a

¹ Ministry of Mines and Energy, Cambodia and ERIA (2019), *Energy Demand and Supply of Cambodia 2010–2018*. Jakarta: ERIA. Available at: <https://www.eria.org/publications/energy-demand-and-supply-of-cambodia-2010-2018/>

good place to organise regular advanced EEC lectures for existing energy managers in Cambodia with the strong support of the GDE.

Households in Cambodia will buy additional appliances, such as refrigerators, air conditioners, washing machines, and cooking equipment like rice cookers and microwave ovens. Their criteria for buying appliances are capacity and price. So far, they do not know the energy efficiency level of each appliance because of the absence of a standard and labelling (S&L) system in Cambodia. If households recognise the energy efficiency level of each appliance, their criteria in buying appliances will increase from two to three: capacity, price, and energy efficiency. In other words, they will buy more energy-efficient appliances, and this behaviour will surely realise energy savings in the country's residential sector. But if the GDE will promote an S&L system, it must allocate a large budget to implement such a system, which involves establishing testing laboratories and issuing labels. Thus, a long-term plan is needed to achieve an S&L system in Cambodia.

The GDE staff in charge of the EEC is aware of its promotion, but not the ordinary people. Thus, education and campaign on the EEC are particularly important for the department. Through this programme, the GDE must encourage people to understand the importance of the EEC and its practice, such as switching off electricity frequently, minimising standby power, providing simple shadings to reduce solar heat gains, etc. Also, the education and campaign programme should be linked to the S&L system. EEC education and campaigns are the first step for the GDE to promote the EEC in Cambodia and remarkable energy savings can be expected across the sectors, especially the residential sector.

To measure the amount of energy savings resulting from the implementation of EEC policies and programmes, we need benchmarks or, in other words, the current energy consumption level of appliances, equipment, factories, buildings, and households. The benchmarks are called energy efficiency indicators (EEIs). Generally, the EEIs are estimated based on survey results, which are detailed energy consumption across the sectors. The survey will be done under a new EEC regulation because before the survey, factories and buildings should report their energy consumption data to the GDE. The EEIs will also be updated every 3 to 5 years.

Many East Asia Summit countries have formulated an EEC Act, under which they promote energy savings by implementing EEC action plans. Parallel to installing ESCOs, growing energy managers, and implementing standards and campaigns, the GDE must formulate an EEC Act for S&L and prepare the EEIs. An EEC Act will make voluntary EEC policies and programmes mandatory. It comes with reasonable budget allocation to implement EEC policies and programmes, according to the road map specified by the EEC Master Plan.