



Economic Research Institute for ASEAN and East Asia

Invitation for Proposals for ERIA FY2022 Study

‘Economic Analysis of Large-Scale Deployment of Solar PV with Battery Storage in ASEAN and East Asia’

March 2022

Background

The Economic Research Institute for ASEAN and East Asia (ERIA) is inviting research proposals for studies related to Energy Market Integration (EMI) in the East Asia region with focusing on economic analysis of large/utility scale deployment of solar PV with battery storage in ASEAN and East Asia.

ERIA is an international organization established by the 16 member countries of the East Asia Summit (EAS). It is expected to contribute intellectually to the regional efforts for ASEAN Community building and East Asia economic integration. Its role is to provide policy analyses and recommendations to Leaders and Ministers at regional meetings such as the ASEAN Economic Ministers Meeting, EAS Energy Ministers Meeting (EMM), ASEAN Summit, and the EAS.

At COP 26, despite some contradictions on the timeline for net zero emissions and other climate policies, they set forth a path to achieve the climate goals including phasing out coal, ending fossil fuel subsidies, putting a price on carbon, protecting vulnerable communities, and delivering the \$100 billion climate finance commitment. If all these can be translated into real policy actions, it will have enormous impact on investment in clean technologies, renewables, and clean fuels. The outcome of COP 26 will influence national policies across the globe towards becoming low carbon societies to limit global warming to below 2 degrees Celsius, preferably to 1.5 degree Celsius compared with pre-industrial level.

To achieve energy transitions towards carbon neutrality by 2050. It is a big challenge for ASEAN to move from its heavy dependency on fossil fuel towards a clean energy system. Our prediction is that ASEAN as a group will continue to see a rise in demand all the way up until 2050. The energy mix of ASEAN shows that coal, oil, and natural gas make up 80% of the primary energy supply. Any policy for a clean energy system, therefore, will need to redesign the system to accommodate renewable energy sources, i.e., wind, solar, hydro, geothermal, and biomass. The increase in renewables will need

to be combined with the deployment of clean technology that is still costly and thus requires solutions. The emission rate in ASEAN, and in India, continues to rise, which is goes against the Paris Agreement. Hence, AMS need to immediately take up its emission rate to achieve the climate reduction goal or the carbon neutrality goal, to avoid any harms from the rising temperature of 2 degrees Celsius. It is important to look at the types of renewable resources that ASEAN must ensure that the transition is cost affordability to ensure smooth and use locally available resources.

Solar energy has a very good potential to be included in the ASEAN energy mix, while wind energy can only work for some countries such as Viet Nam, the Philippines, and Indonesia. Some important barriers remain to deploying wind and solar power on a large scale. Above all, the two are intermittent and require battery support and backup from other renewable sources to prevent blackouts. Moreover, the deployment costs of these renewable energy sources, compared with other resources such as thermal and coal, are also high. However, if the development of ASEAN electricity integration is progressing faster, this can allow use of resources from other regions to support intermittent energy from solar and wind. For example, countries in the Mekong Sub-region that are endowed with hydropower energy resources could provide power backup for AMS that utilise solar and wind power. This combination would allow a higher integration of solar and wind power into the ASEAN infrastructure of power connectivity given the status of energy infrastructure and policy stage.

With innovation in technology and policy changes, however, ASEAN could see a net-zero emission by 2050 and the energy mix would include a higher share of solar, wind, biomass, geothermal, and hydropower. Since solar resource is abundant for all countries in ASEAN, it is very important for ASEAN to deploy large scale of solar PV renewable resources with the battery storage. Thus, this study will provide thorough analysis of this large-scale deployment of solar PV with battery storage in ASEAN.

Potential issues for study

In line with these instructions and building on our past studies, ERIA would like to invite proposals of study to promote large scale deployment of solar PV with battery storage. This year, we would like to give an special attention on renewable energy. EMI and renewable have close relationship, for example, EMI will provide larger market opportunities for renewable; it may also reduce the variability of power system; and it can offer low cost approach to manage variable and intermittence of the renewable.

We are looking for proposals that address issues related to techno-economic analysis of large/utility scale deployment of solar PV with battery storage in ASEAN and East Asia.

A list of sample themes is:

1. Deployment of renewable energy with battery storage:

- ✓ Cost and System integration of large scale Solar PV and their regional implications
- ✓ Techno-economic analysis of the large deployment of solar PV and battery storage.
- ✓ Implication of climate change mitigation and environmental policy from the solar PV and renewables.
- ✓ Intermittent renewable energy and grid extension / regional electricity cooperation.
- ✓ Energy market integration and policies for the high share of Res.

2. Issues related to trans-boundary energy trade with regards to the RE investment, infrastructure and trade.

3. Case studies in the electricity including regulatory reform to take large scale of Solar PV, improvement of competition, and domestic market integration.

4. Case studies of the Greater Mekong Sub-region (GMS - a pioneer of regional integration) in power trade and hydroelectricity development.

These themes are illustrative and proposals on other topics will be given equal consideration.

The proposal will include at least the following parts:

- ✓ Research question (s);
- ✓ Background and value added to the literature.
- ✓ Data and methodology (analytical framework)
- ✓ Expected policy implications. ERIA studies are policy orientated and it is essential that the study delivers policy implications for ASEAN and East Asia.

Together with the proposal, the lead researcher will submit a brief CV with a list of publications (if the researcher has not been a member of ERIA's EMI Working Group in the past) and a sample paper, preferable in a journal article style.



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Timeframe and administrative issues

To be fully considered, proposals should be submitted to Dr. Han Phoumin (han.phoumin@eria.org) and to Prof. Rabindra Nepal (rnepal@uow.edu.au) no later than **15 May 2022**. Early submission is encouraged. Only successfully selected proposals/authors will be notified, expectedly by end of May 2022.

ERIA will fund not less than USD 4,000 for each proposed study. At least, we will have one on-line meeting

All studies are to be finalized by end of November 2022. This deadline is firm to make it possible to report the results to Energy Policy Makers as well as to be submitted for the international book publication.