



Regional Conference on Energy Resilience through Decentralized Power Plants and Smart Grid Integration

15 September 2022
Bangkok, Thailand (Hybrid event)

Meeting Report

A. Summary of discussions

1. The regional conference brought together 127 experts and participants from the Asia-Pacific region and provided a platform to discuss and share experiences, success stories and challenges of decentralized energy generation and smart grid systems being deployed for enhancing the energy resilience among countries in Asia and the Pacific which include ASEAN+6 countries, and to identify strategies for cross-border technology cooperation and transfer. Participants from 10 member States of ESCAP, namely Bangladesh, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, Philippines, Singapore and Thailand attended the conference. The participants mainly comprised of policy makers, representatives from international organizations, R&D institutions and private sector representatives involved in electricity regulation, generation and consumption.
2. Key international and national experts deliberated on the opportunities and challenges of decentralized renewable energy-based power plants and their integration with smart grids and enabling strategies for facilitating investment and commercialization of smart grids. The experts discussed and provided recommendations on strategies for regional cooperation to enhance energy resilience through decentralized power plants and smart grids.
3. The event was jointly organized by the Ministry of Higher Education, Science, Research and Innovation (MHESI), Thailand, Thailand Institute of Scientific and Technological Research (TISTR) and the Asian and Pacific Centre for Transfer of Technology (APCTT) of ESCAP. The conference was held in conjunction with ASEAN Sustainable Energy Week 2022 (ASEW), 14-16 September 2022 in Bangkok, Thailand.
4. It was emphasized that achieving SDG 7 in the Asia-Pacific region will require low-cost renewables, modern energy solutions, optimal use of renewable energy, electric mobility, increased eco-efficiency and energy connectivity. To accelerate the progress in energy transition, the Asia-Pacific region needs to focus on rapid decarbonization of the power sector by using all technologies and strategies as well as coordinating, harmonizing and institutionalizing regulations for renewable energy and smart grids

integration. Regional power sector connectivity will contribute to energy securing across borders and ensure power system resilience in countries.

1. Decentralized energy systems allow for more optimal use of renewable energy, reduce fossil fuel use, and increase eco-efficiency. Reliable integration of decentralized renewable energy sources into smart energy grids are gaining importance to cope with the increasing energy demand. However, renewable energy market is still not vibrant in terms of decarbonization, renewable energy certificates and other global instruments.
5. Increase in renewable energy share and power grid modernization can enhance energy resilience, and vice versa. Smart grid and microgrid can be employed to facilitate digitalization and decentralization which will consequently enhance energy resilience.
6. Because of increased demand of energy, end-use sectors such as transport, industry and buildings will attract future investments particularly for renewable energy deployment, bioenergy and green hydrogen, and for establishing interconnected and regional grids. Electricity networks will play an important role in facilitating increased investments in the power sector.
7. Thailand has embarked on several policy and institutional support measures to increase the share of renewable energy in the power sector. Examples are Alternative Energy Development Plan (AEDP2018) and the Power Development Plan (PDP). Several research and development (R&D) centres have been established to develop renewable energy projects using locally available resources. Examples of demonstration plants are energy from biomass and waste, 2-stage biogas production process, and 3-stage biomass gasification technology. The ASEAN Network of Excellence Centre of Biomass Conversion Technology (ANEC) promoted by Thailand is an ambitious step towards promoting biomass energy technologies in the ASEAN countries.
8. Bangladesh has implemented many renewable energy projects for Solar Home Systems (SHS), solar irrigation pumps, solar mini grids in islands, biogas plants, improved cookstoves, solar rooftop projects, and solar streetlights. These decentralized projects are based on different business models with wider stakeholder participation. Depending on the requirements, the decentralized renewable energy business models can be of two types such as cost-saving models and revenue-earning models. For example, solar rooftop is implemented as a cost-saving model.
9. Rapid growth of Battery Energy Storage Systems (BESS), electric vehicles (EV) and green hydrogen (GH₂) is creating potential impact on the existing grids while creating opportunities, both from physical system and through financial markets.
10. Fourth industrial revolution (4IR) technologies provide effective tools for power grid revolution and resilience. These technologies can be used in the sensing, communication and computing systems of smart grids to collect, transfer and process information. Artificial Intelligence (AI) and Information and Communication technologies (ICT) provide better services while data security and privacy remain a dominant concern.
11. Smart grids through digitalization are key to increased system flexibility in modern power systems. Batteries have emerged as the most viable option for energy storage systems (ESS) for Grid Applications. Some of the approaches to build grid flexibility include: Build battery energy storage system (BESS) at solar and wind farms, Replace diesel generator (DG) sets with BESS, Promote vehicle-

grid integration, Promote smart microgrids, Promote GW-scale electrolysers for green hydrogen, Mandate district cooling system (DCS) with thermal storage, Promote electric cooking, Introduce time of use (ToU) tariff for electricity, and Create dynamic electricity markets through encouraging renewable energy buyers associations.

12. Development of commercially viable decentralized renewable energy models can be based on considerations such as sustainability of business, private sector engagement, market development and awareness, capacity development of stakeholders, quality control and monitoring services, and tailored financing packages.
13. For establishing renewable energy-based mini grids in remote and isolated rural areas using locally available natural resources, there is need for legal, regulatory and market environment. Government support, capacity building, and grant funding have been essential to attract private sector interest in solar mini grid systems.

B. General/policy recommendations

1. Regional cooperation is required on three key areas: developing policies, facilitating affordable financial investment, and accelerating R&D for implementing smart grids.
2. Strong commitment and initiatives from national governments are necessary to promote decentralized renewable energy. Linking decentralized energy solutions with livelihoods is important.
3. Complex issues of affordability, social objective of energy pricing and financial viability are key areas of regional cooperation.
4. Appropriate regulations can be developed for operation of smart grids and data security during the operation of smart grids
5. Interventions through decentralized renewable energy systems need to be scalable and replicable for wider and largescale use. Other important considerations are incentives to attract private sector participation and increasing the viability of the power distribution companies (Discoms).
6. Strengthening the local industry through technological capacity development is essential for supporting implementation of smart grids.
7. Countries can establish larger scale demonstration plants for smart grids and smart microgrids for increased adoption.
8. Small-scale renewable energy projects could be considered for carbon finance.
9. APCTT can facilitate regional cooperation through evolving mechanisms to support quality control of equipment, renewable energy resource assessment and forecasting.
10. APCTT can also play a role in establishing demonstration plants and development of standards for the industry at local level in smart grid projects implementation. Standards will be beneficial for project developers, financiers and regulators.

C. Feedback from participants

The conference was received very well by the participants, which was corroborated through positive feedbacks. 100% of the responses received indicated that the knowledge gained from the conference was highly useful in their present profession. 100% of the responses received indicated that they found the presentations and deliberations by resource persons highly informative and insightful.