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The 54th Meeting of APEC Expert Group on New and Renewable Energy Technology
Virtual meeting hosted by the Philippines, November 10-11, 2020
Workshop on Energy Transition and Scaling-up Renewable Energy

APEC Self-Funded Project (EWG 04 2020S):
Innovative Approaches for Scaling-Up Renewable Energy Deployment in APEC Region

National Energy Administration of China (NEA) Funded Project:
1. Scaling-Up Renewable Energy by Using Smart Energy Microgrid Technology
2. Development and Practice of Smart Final Energy System and Distributed Energy
Workshop on Energy Transition and Scaling-up Renewable Energy

Dr. Hongpeng LIU, Director of Energy Division, United Nations Economic and Social Commission for Asia and the Pacific, Prof. Nedjib Djilali, Fellow of the Canadian Academy of Engineering, Dr. Yongping ZHAI, Chief of Energy Sector Group, Asian Development Bank, Secretariat of EGNRET and approximately 50 experts, scholars and researchers from 10 APEC economies and 2 European economies participated in the workshop.
## Workshop on Energy Transition and Scaling-up Renewable Energy

**Agenda**

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<th>Topic</th>
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| Main Session 1 | Do Hung Nguyen, Director, Energy Division, United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)  
Topic: Energy Transition and Scaling-up Renewable Energy to Achieve the SDGs |
| Main Session 2 | Prof. N. Stulik, Former Chair of the Canadian Consortium of Engineering Professors  
Topic: Sustainable Energy and Renewable Energy Technology (CNR, EMD, APSEC)  
Topic: Virtual Meeting Hosted by the Philippines, November 10-11, 2020 |
| Session 3 | Dr. Akihiko Ono, Chief of Energy Sector Group, Asian Development Bank (ADB)  
Topic: Renewable Energy Development in Asia, ADB Perspectives |
| Session 4 | Prof. Stephen A. Schwartz, Environmental and Energy Program, University of Texas, United States  
Topic: Measurement Framework for Effective Energy Transition |
| Session 5 | Mr. Bratkovic, Group Leader of Grids and Energy Integration, Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia  
Topic: Smart Grid and Renewable Energy Grid Integration in Australia |
| Session 6 | Dr. Lawrence Mui, Adj.-Dir. Deputy Director of Energy Policy Promotion, Green Energy & Environmental Research Laboratory, Industrial Technology Research Institute (ITRI), Taiwan  
Topic: The Role of Renewable Energy in Chinese Taipei's Energy Transition |
| Session 7 | Prof. Akihiko Ono, Chief of Energy Sector Group, Asian Development Bank (ADB)  
Topic: Innovative Approaches for Scaling-up Renewable Energy in APSEC Region |

**Chair:** Prof. Akihiko Ono, Vice President of APSEC Sustainable Energy Center (APSEC)
APEC Self-Funded Project (EWG 04 2020S):
Innovative Approaches for Scaling-Up Renewable Energy Deployment in APEC Region

- **Proposing economy:** China
- **Co-sponsoring economy:** Hong Kong, China
- **Endorsed by EWG members:** 21 August 2020
- **Expected start/completion date:** 01/11/2020 - 30/04/2020

### Project summary

- The project focuses on RE power generation and **aims to explore innovative approaches for scaling-up RE application** in APEC region, which **facilitates achieving the APEC RE goal**.
- Through review, investigation and stakeholder consultation, the project will assess the RE development from performance of energy system, sustainability and energy access perspectives.
- Barriers and drives for RE development will be analyzed, suggestions and recommendations on innovative approaches will be put forward through analysis of policy, technologies, business environment, case study, etc.
- **Research results will be synthesized in project report and shared.** Presentations on the findings will be made in EGs’ meeting and APSEC’s events for members to exchange experience and disseminate relevant know-how.
APEC Self-Funded Project (EWG 04 2020S):
Innovative Approaches for Scaling-Up Renewable Energy Deployment in APEC Region

Work plan:

- May. 2021: Call for comments on initial results at EGs’ meeting/APSEC’s events, collect feedbacks from member economies.
- May. 2021 – Dec. 2021: research into specific subjects, prepare research report; share and discuss the findings in EGs’ meeting/APSEC’s events, and collect feedback.

Draft Outline for Seeking comments from EGNRET members (11 Aug 2020)

Executive Summary
1. Introduction
   1.1 Overview of energy development in APEC region
   1.1.1 Energy development situation
   1.1.2 RE development situation
   1.2 Significances for scaling-up RE in APEC region
   1.3 Outline of the of the main outcomes
      1.3.1 Outline
      1.3.2 Innovations and main outcomes
2. Approach and methodology of the project
   2.1 Scope
   2.2 Assessment of RE development
      2.2.1 Performance of energy system
         (1) Electricity development
         (2) Sustainability
         (3) Energy Access
      2.2.2 Analytical framework of barriers and drives for RE development
         (1) Key stakeholders of RE development
         (2) Analysis framework
3. RE Development in APEC region
   3.1 RE development
   3.2 Energy Access
   3.3 Gap analysis
4. RE Development Approaches
   4.1 Regulation, policy and plan
      (1) RE plans and targets
      (2) Electricity target and plan
   4.2 Resources and technology
      (1) Local RE resources
      (2) Technology availability: supply chain of technology
      (3) Costs of technologies
   4.3 Enable environment / infrastructure
      (1) Government institutions setting-up and policy implementation
      (2) Resources data information for RE project development
      (3) Power system flexibility
      (4) Power grid access: technical (grid code)
      (5) Dispatching, network usage and entitlement
      (6) Utility operation
      (7) Electricity market establishment and operation
4.4 Capital and investment
      (1) Fiscal and financial policy
      (2) Investment in RE
      (3) Investment condition
      (4) RE project finance and relevant permission
      (5) RE projects tariff condition: PPA – FIT vs auction
4.5 Business environment
      (1) Source of project finance: public and private sector, international aids
      (2) Easy to do business
      (3) International collaboration
4.6 Distributed generation microgrid
      (1) National framework program of distributed system/microgrid – off grid electrification
      (2) Financial incentives for off grid solutions
      (3) Technical standards and quality of mini/micro-grid (including stand alone)
      (4) Consumer affordability: for energy and connection/installation
      (5) Policy to support low-income and low-volume and remote consumer
4.7 Promote energy access
5. Case studies
6. Summary and conclusion
7. References

Feedback from Hong Kong, China (12 Aug 2020)

First and foremost, on behalf of Hong Kong China, we support your research on ‘Innovative Approaches for Scaling-up Renewable Energy Deployment in APEC Region’ with a view to achieving our aspirational goal to double the share of renewable energy (RE) in APEC’s overall mix by 2030.

To enrich your research, our views are listed below for your consideration.

1. Performance of Energy System in 2.2.1 should not be limited only to Electricity Development/Electricity Market Development, other energy sources like gas network (for use of heating, cooking, etc. in some areas) may contribute a significant amount of energy use.

2. Resilience should also be a key factor in the study.

3. RE trading market will be an element to be considered in the report for countries that have major constraints to get access to scale up its RE system.

4. For the scaling up of RE, the double or triple handling of electricity generated from RE should be prevented.

5. Safety/Secure Access could be an important aspect in considering of scaling up RE development.

6. Grid stability should also be addressed when scaling up the RE system and how this can be overcome.

7. Reliability and Storage for scaling up RE system should also be addressed.

8. For cost analysis, crude to grave cost analysis will be a good reference in the study.

9. Environmental Effect for scaling up RE - this refer to the tackling of possible negative impact.

We are more than happy to share our views on scaling-up RE deployment to encourage more RE in APEC mix. Wishing you all the best in this project you have embarked upon.

Regards,

Jovan Cheung
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Electricity and Energy Efficiency Branch
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Feedback from Thailand (13 Aug 2020)
NEA Funded Project:
1. Scaling-Up Renewable Energy by Using Smart Energy Microgrid technology

- **Start/completion date:** 7/1/2019 - 9/30/2020

- **Project summary**
  - Examining advanced concepts of clean energy based smart energy micro-grid technology, main technical architecture, control and operation modes, relevant technical standards and key trends of technology development.
  
  - Review of system configurations and technical characteristics of the smart energy microgrid under different application environment: *industrial and commercial parks, islands, and remote areas.*
  
  - Examine internal and external factors affecting the applications of smart energy microgrid technology, including policies, incentives and relevant regulatory framework.
  
  - Likely commercial and business models for microgrid project development and operation.
  
  - Selected case studies under different application environment and background.
  
  - Assess the issues and recommendations on promoting RE based smart energy microgrid technology.
NEA Funded Project:
2. Development and Practice of Smart Final Energy System and Distributed Energy

- **Start/completion date:** 7/1/2020 - 12/31/2020

- **Project summary**
  - Investigate the current situation of final energy system, energy efficiency policy and final energy consumption structure of APEC economies.
  - Summarize and analyze the differences and problems of final energy technology and management, the mode and characteristics of final energy supply, as well as the latest development trends of technologies and policies related to smart final energy system.
  - Investigate the development status and development trend of distributed energy system of APEC economies.
  - Analyze the key technology and intelligent technology innovation of distributed energy system, as well as the characteristics and innovation practice experience in distributed energy system incentive policy and business model.
  - Summarizes the technical solutions and business models of smart final energy system, and analyzes the typical technical paths and development modes.