

CAETS Energy Committee

NAEK 한국공학한림원

Chair: Chinho Park

October 15, 2020
Seoul, South Korea

Previous and Pending CEC Reports

2010: Deployment of Low-Emissions Technologies for Electric Power Generation in Response to Climate Change

2013: Opportunities for Low-Carbon Energy Technologies for Electricity Generation to 2050

2015: Transitioning to a Lower Carbon Economy – Technological and Engineering Considerations in Building and Transportation Sectors

2018: Clean Energy Technologies – Challenges and Solutions (Publ. July 2020)

2020: Solutions for High-Level Penetration of Intermittent Renewable Energy (Final Draft Pending, to be publ. Dec 2020)



Mar 2019

Seoul Meeting
Set Topic
Discussed Timeline
Brainstormed Structure



June 2019

Stockholm Meeting
Revised Questionnaire
Set Response Deadlines



October 2020

Seoul Conference
Received Country Reports
Analyzed Peer Groups
Compiled Findings
Present Final Report

March Meeting Agreements

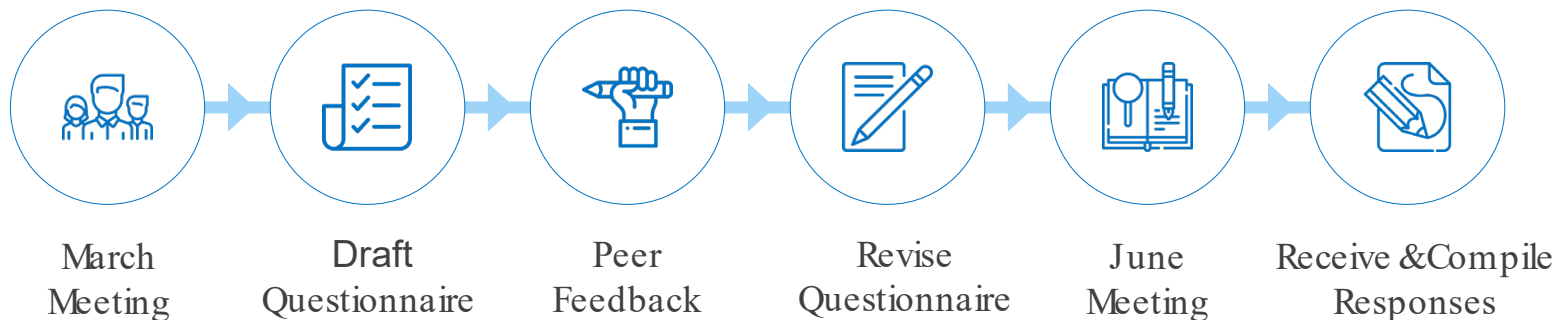
Seoul, South Korea

- Theme: Solutions for High -Level Penetration of Intermittent Renewable Energy
- Target readership: CAETS members, policy makers, energy -related international agencies
- Digital version only
- Format to juxtapose each country 's situation, strategy, and ideas from academies
- Draft a 6-page questionnaire with a clear pattern to simplify comparisons
- Contents:
 1. Compare each country 's status quo in the energy mix
 2. Showcase new technologies that offset intermittency
 3. Offer policies that control the energy market to reduce intermittency

June Meeting Agreements

Stockholm, Sweden

- Since March, drafts of the questionnaire were written and edited by member countries
- Still receiving revisions to questionnaire until July 6th
- Final questionnaire will be sent to CAETS member academies in July 20th
- Argentina, Korea delegates are currently writing exemplars to be used as guidance material
- Country responses due by Sept 20th, 2019
- Country reports will be compiled into a draft report by early next year, 2020



July 2019 ~ May 2020

Compiling Stages

- Circulated questionnaire draft
- Received and processed data from 21 contributing authors
- Biweekly check ins between CAETS and authoring NAEK authors (Rosa Chong and Chinho Park) to sort, group, compare, and peer -analyze countries into similar standing
- Drafted recommendations and solutions for each focus group

May 2020 ~ Sept 2020

Research Stages

- Solicited CAETS contributing authors for feedback on several draft versions
- Updated data to reflect 2018 measurements and tracked policy changes
- Conferred with authors on issues of contention, including scope of the report (and the decision to adapt or exclude topics like nuclear power, history of distribution investments, and categorization of waste as a nonrenewable product)

October 12, 2020 Meeting

27 Attendants from 18 Academies: Argentina, Australia, Canada, Croatia, Czech Republic, France, Germany, Hungary, India, Japan, Korea, Mexico, New Zealand, Pakistan, South Africa, Spain, Sweden, Uruguay



October 12, 2020 Meeting

Comments and Edits

- Change of Working Title: *High-Level Solutions for Intermittent Renewable Electricity*
- France (next Report author) raised the concern that mention of CO₂ emissions may be lacking. Proposed as a topic for the next report.
- Argentina/Germany expressed concern from a lack of voices from important countries in energy sector, namely, Saudi Arabia, Brazil, and Russia.
- Other proposed topics include: comparison of electricity pricing and incentives models, examination of combined cycles technologies, evaluation of nuclear as a load-stabilizing solution

October 12, 2020 Meeting

Action Items

- India (Professor Mathur) suggested NAEK host a webinar in the Spring, after a circulation of the official CAETS report comes back from publishing stage
 - Inviting government officials from all nations, international press, journal members, academies, policy and stakeholders to learn about findings
 - Draft a shorter summary, and put into the public domain
- Argentina (Professor Solanet) actively soliciting recommended speakers for next year 's conference hosted by the ANIU delegation, TBD in Buenos Aires
- Election of the next CEC Chair: Chinho Park (NAEK) => Yves Bamberger, France (NATF)
- Will circulate CAETS 2020 Report for final round of feedback, due October 23, 2020.
- CAETS Report 2020, publishing estimated December 2020.

CAETS 2020 PROGRESS

Research method



Purpose

- This report was written with an advisory purpose of informing stakeholders in various decision-making capacities who are looking for expert technological insights, as well as providing a quick overview on the approaches of various member countries.
- Given the scale and complexity of energy transition, and its interdependencies across different systems, no single solution can unilaterally achieve a complete transition. Therefore, the CAETS Energy Committee intends that this report should serve as a guide to policymakers by providing information on the specific approaches of various countries in addressing their energy transitions, which depend on the differences in their societies and economies.

Categorization of peer groups

- Countries attempting to meet energy goals must consider more novel methods to better integrate renewable resources. As such, the 21 countries were sorted into three focal groups based on their approach to intermittency:
- Group A: Large geographic interconnections to absorb variability and modulate output;
- Group B: The dispatch of secondary “spinning reserves” to quickly correct load fluctuations; and
- Group C: Investment in transmission and distribution “smart grid” systems to efficiently deliver power without compromising quality.

Status of the Report

- Finalized CAETS 2020 with final draft, edited and approved by members and authors (Oct 2020)
- Pending publishing (Dec 2020)
- Pending submission to international publications, such as the United Nations Environment Program's Global Status Report, or the International Energy Agency's World Energy Outlook (TBD)

Four Seasons Hotel, Seoul, South Korea
October 12th, 2020





Thank You