Report on APEC Sustainable Energy Center (APSEC)

Zhu Li
President
Contents

Part 1. Introduction of APSEC

Part 2. Main Progress in Year 2015

Part 3. Work together with EGNRET (proposed)
1. Background & Significance

**Establishment:** at the 11th Energy Ministerial Meeting (11th EMM) on 2 Sep 2014 during APEC China 2014
2. Nature

Under APEC mechanism, APSEC is directly guided by APEC Energy Working Group (EWG).

In Chinese context, APSEC accepts the guidance of its Steering Committee comprising leaders from National Energy Administration, Ministry of Foreign Affairs and Tianjin University respectively.

APSEC is affiliated to NEA, and TU is responsible for its O&M.
3. Mission & Objectives

**M:** To promote **pragmatic cooperation** on sustainable energy development among APEC economies;

**O.s:**
- promote **advanced ideas and models** of sustainable energy development across the APEC region;
- facilitate **cooperation** among member economies in information exchange, policy dialogue, technology R&D, demonstration and dissemination;
- capacity **building** in the field of sustainable energy.
4. Work Scope

Facilitate technology transfer and dissemination through practical projects:

- To provide an information platform and regularly release publications on sustainable energy development among APEC economies;
- To build an Asia Pacific knowledge network and establish an APEC expert pool on sustainable energy;
- To conduct technical exchange, dissemination and application on sustainable energy in the APEC region;
- To facilitate the participation of APEC economies in APEC-funded research projects, as well as joint industry projects such as Low Carbon Model Town project in China;
- To organize training courses to representatives from APEC economies.
5. Organizational Structure

- APEC Energy Working Group
- Expert Advisory Committee
- Steering Committee
- Research Divisions
APSEC

President

Vice-President

Marketing
  - Market and Risk Analysis

Technology
  - Strategy and Planning
  - Technology Transfer

Information
  - Demonstration Projects
  - Intelligence Network

Training
  - Databases
  - Technology Catalogue
  - Talent Cultivation

General Manager

- Research
- Administration

- Administrative Affairs
- Finance
- Liaison
6. Access ways

6.1 Logo

6.2 Microblog

6.3 WeChat

6.4 Website

• EN version http://www.apsec.org.cn/apsecen/

• CN version http://www.apsec.org.cn
7. Programs and Activities

Two Pillar Programs:
- *Clean Coal Technology Transfer*
- *Sustainable City Development*

Two Platforms:
- APEC Sustainable Energy Knowledge Network
- APSEC Strategic Partnerships

Associated Activities:
- Tours;
- Meeting events, like workshops, conferences & exhibit
- Training courses.
Main Progress in the 1st Year
1st Anniversary Celebration of APSEC
Asia Pacific Sustainable Energy Development Forum
1st APSEC Steering Committee Meeting
Sept. 11 2015, Tianjin China
CEBU DECLARATION
2015 APEC Energy Ministerial Meeting
Cebu, Philippines

14. We reaffirm our commitment towards sustainable energy development in Asia Pacific region through knowledge-sharing and facilitating technology cooperation, demonstration and dissemination. We recognize the progress made by the newly-established APEC Sustainable Energy Center (APSEC) in completing its institution building. We encourage APSEC to continue its work in expanding sustainable city development across the region, cutting-edge clean energy technologies and other programs on energy resiliency. We encourage APEC economies to support the work of this new institution.
INSTRUCTIONS FROM APEC ENERGY MINISTERS
2015 APEC Energy Ministerial Meeting
Cebu, Philippines

We instruct the Energy Working Group (EWG), together with the Asia Pacific Energy Research Centre (APERC), the APEC Sustainable Energy Center (APSEC), the Experts’ Group on Clean Fossil Energy (EGCFE), the Experts’ Group on Energy Data and Promoting Community-based Clean Energy Use in Energy Poverty Stricken Areas.

10. We instruct EWG to work with APSEC with the assistance of the LCMT-TF to undertake APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership endorsed by APEC Leaders in 2014. Construction of new buildings is an integral component for sustainable cities, and serves as an effective platform to demonstrate and apply cutting-edge technology. In line with this, we encourage Member Economies to explore strategies to drive the shift towards green buildings including zero energy buildings. This will ensure that new construction designs are incorporated in residential, commercial and even industrial structures including concepts and principles embracing energy efficiency particularly in emerging economic growth areas or second-tiered cities.
Work with EGNRET
1. Define the terminology of Sustainable Energy

- New and Renewable Energy
- Clean Energy including clean fossil fuel?
- Nonconventional fossil fuel?
2. To cooperate on the APEC Cooperative Network for Sustainable Cities (CNSC Pillar Program)

_We instruct EWG to work with APSEC with the assistance of the LCMT-TF to undertake APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership endorsed by APEC Leaders in 2014._

In 2014, APEC Leaders recognized that the Asia-Pacific is currently experiencing booming urbanization and realized that sustained and healthy development of urbanization is conducive to promoting innovative growth and realizing robust, inclusive and sustainable development in the Asia-Pacific. _In this light, APEC Leaders endorsed the APEC Cooperation initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership._
Urbanization

26. Under the pillar of Urbanization, we seek to identify new drivers of economic growth by pursuing urbanization and sustainable city development. We support APEC partnership initiatives on urbanization and undertake to establish a cooperative network of sustainable cities in APEC economies. We will organize forums, hold policy dialogues, and utilize international sister-cities programs to promote cooperation and share experiences on urbanization and sustainable city development.

27. We will facilitate the use of existing resources for research and capacity building on urbanization. We encourage member economies to support urbanization cooperation and urbanization-related projects, including by making voluntary contributions to establish a sub-fund within the APEC framework.

28. We applaud progress made in the APEC Low Carbon Model Town Project and the promotion activities under it. We underscore the importance of eco-city and smart city cooperation programs, and undertake to explore pathways to green urbanization and sustainable city development.
New Sub-fund to support the implementation of the Initiative

2. Eligibility Criteria for the IERG Sub-Fund

The funding of a single project applying for the IERG Sub-Fund is subject to a cap of USD150,000. All projects funded through the APEC Support Fund and its Sub-funds must primarily benefit developing economies.

Drawing on the direction set in the *APEC Accord on Innovative Development, Economic Reform and Growth* endorsed at the AELM in 2014 (Annex C of the 2014 Leaders’ Declaration), the proposed criteria are intended to be in line with the priority areas specified in the aforementioned document.

Therefore, to be considered as eligible for the IERG Sub-Fund, the project must contribute to at least one of the following priorities:

- Overcoming the Middle-Income Trap;
- Implementing the APEC Initiative of Cooperation to Promote Internet Economy;
- Implementing the APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership, including establishing a cooperative network of sustainable cities in APEC economies, organizing sustainable urban development forums and policy dialogues, and carrying forward relevant projects that advance sustainable urbanization goals;
**APPENDIX B**

**APEC Concept Note**

*Please submit through APEC Secretariat Program Director. Concept Notes of more than 3 pages (including title page) or incomplete submissions will not be considered.*

<table>
<thead>
<tr>
<th>Project Title:</th>
<th>Strategic Plan to Implement APEC Cooperation Initiative for Jointly Establishing the Asia-Pacific Urbanization Partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fund Source (Select one):</strong></td>
<td></td>
</tr>
<tr>
<td>☐ General Project Account (formerly Operational Account)</td>
<td></td>
</tr>
<tr>
<td>☐ TILF Special Account</td>
<td></td>
</tr>
<tr>
<td>☑ APEC Support Fund</td>
<td></td>
</tr>
<tr>
<td>For ASF: As per Guidebook Ch. 3, list ASF Sub-fund if appropriate for this project:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>APEC forum:</th>
<th>Energy Working Group (EWG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proposing APEC economy:</td>
<td>People’s Republic of China</td>
</tr>
<tr>
<td>Co-sponsoring APEC economies:</td>
<td>Australia, Chinese Taipei, Hong Kong China, United States, Japan, Malaysia, Thailand, Vietnam</td>
</tr>
<tr>
<td>Expected start date:</td>
<td>July, 2016</td>
</tr>
<tr>
<td>Expected completion date:</td>
<td>June, 2017</td>
</tr>
</tbody>
</table>
2. **Objectives:** Describe the 2-3 key objectives of the project. (e.g. ensure workshop participants will be able to...; to create a framework...; to develop recommendations...; to build support...; to revise strategies...; to create an action plan;...to increase knowledge in; to build capacity in... etc.)

   - To create an action plan of establishing the Cooperative Network for City Executives and to form the trend of sustainable development in APEC Cities by proposing initiatives on urban planning, green buildings, transportation, industries, economies and human lives within cities;

   - To build capacity in cities sustainable development by providing series and systematic training courses to relevant stakeholders to improve the professional knowledge, decision-making, marketing, finance essay and technical quality;

   - To increase knowledge in the technology, knowledge and products by setting up a technology, knowledge and products sharing platform for future widely popularizing and transferring this database among APEC economies through various ways;
Explanations on our FOCUS of CNSC

M: To promote pragmatic cooperation on sustainable energy development among APEC economies;

O.s:
• promote advanced ideas and models of sustainable energy development across the APEC region;
• facilitate cooperation among member economies in information exchange, policy dialogue, technology R&D, demonstration and dissemination;
• capacity building in the field of sustainable energy.

WS:
• Facilitate technology transfer and dissemination through practical projects:
  • information platform, knowledge network, technical exchange, research projects & training courses.
3. Buildings as platform for innovative technologies

We instruct EWG to work with APSEC with the assistance of the LCMT-TF to undertake APEC Cooperation Initiative for Jointly Establishing an Asia-Pacific Urbanization Partnership endorsed by APEC Leaders in 2014. **Construction of new buildings is an integral component for sustainable cities, and serves as an effective platform to demonstrate and apply cutting-edge technology. In line with this, we encourage Member Economies to explore strategies to drive the shift towards green buildings including zero energy buildings.**
**Newly proposed**

**APEC Concept Note**

<table>
<thead>
<tr>
<th><strong>Project Title:</strong></th>
<th>Study on the cost-effective renewable energy-supply solutions based on innovative solar technologies to promote green buildings in APEC region</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fund Source</strong></td>
<td>Select one:</td>
</tr>
<tr>
<td></td>
<td>☑ General Project Account (formerly Operational Account)</td>
</tr>
<tr>
<td></td>
<td>☐ TILF Special Account</td>
</tr>
<tr>
<td></td>
<td>☑ APEC Support Fund</td>
</tr>
<tr>
<td><strong>For ASF:</strong></td>
<td>As per Guidebook Ch. 3, list <strong>ASF Sub-fund</strong> if appropriate for this project: Energy Efficiency</td>
</tr>
<tr>
<td><strong>APEC forum:</strong></td>
<td>Energy Working Group</td>
</tr>
<tr>
<td><strong>Proposing APEC economy:</strong></td>
<td>P.R China</td>
</tr>
<tr>
<td><strong>Co-sponsoring APEC economies:</strong></td>
<td>Australia, Hongkong China, United States</td>
</tr>
<tr>
<td><strong>Expected start date:</strong></td>
<td>July 2016</td>
</tr>
<tr>
<td><strong>Expected completion date:</strong></td>
<td>June 2017</td>
</tr>
</tbody>
</table>
Innovative Solar Energy Technologies

- **Heating-Cooling Solar Panel**

Heat collecting

Coolth collecting
Innovative Solar Energy Technologies

- Heating-Cooling Solar PV Panel
Innovative Solar Energy Technologies

• **Heating-Cooling Solar PV Panel**

  - Aluminum plate coupling
  - First lamination
  - Copper pipe coupling
  - Pipe welding
  - Frame installation
  - Second lamination
Building Integration Forms

- Solar Radiant Panel
  -- Roof
  -- Wall
  -- Sunshade
  -- Railing
  etc.

- PV/R
  -- Roof
  -- Wall
  -- Sunshade
  etc.
Building Energy Supply Systems

Source End

- Solar radiant Panel or PV/R
- Auxiliary Technology
  - Energy Storage
  - Heat Pump
  - Battery

Indoor End

- Air Conditioning & Ventilation
- Radiant Heating/Cooling
- Floor
- Wall
Innovative Solar Energy Technologies

- **Linear Flat Mirror Concentrator (LFMR)**
Innovative Solar Energy Technologies

- Linear Flat Mirror Concentrator (LFMR)
Innovative Solar Energy Technologies

- **Dynamic Concentrating Solar Building Skin**

Fresnel point concentrating module used between double-skin facades
Innovative Solar Energy Technologies

- **Dynamic Concentrating Solar Building Skin**

Reflective linear concentrating module used as shading components
Typical Demonstration Projects

- Building Integrated Solar Heating & Cooling System

Hotel
85000 m²

Apartment
70000 m²

School
4080 m²

Office Building
1300 m²
Typical Demonstration Projects

- Net Zero Energy Buildings

**2010 Solar Decathlon of Europe — Sunflower House (72 m²)**

**Net Zero Energy Office, Shandong Province, China (2000 m²)**
Typical Demonstration Projects

- Concentrating Solar Heating System in Inner Mongolia, China
4. Recommend APEC Visiting Researchers for APSEC through China’s Overseas Talent Introduction Programs

- Chinese Government’s “Recruitment Program of Global Experts” (1000 Talent Plan)
- Tianjin City Government’s Global Brain-Gain Initiative
- Tianjin University Outstanding Talent Program
APSEC seeks researchers in the following areas:

• Low Carbon Buildings & Sustainable City Development

• Clean Coal Technologies

• Distributed Energy Systems & Smart Grid

NB Other fields in Sustainable Energy are not excluded. You are more than welcome to propose other areas of interest to APEC economies.
Thanks for your attention!

“Joining Hands Toward Sustainable Energy Development in the Asia-Pacific Region.”