ICA - Sustainable Energy Programs

Pierre Cazelles
Director – Partnerships Asia
The Copper Alliance Network

- International network of non-profit organizations in 24 countries
- Headquarters in New-York
- In Asia: offices in China (40 staff), Bangkok (4), Jakarta (2), Hanoi (2), Singapore (8), Taiwan (1), Seoul (3), Tokyo (2), Kuala Lumpur (1), Mumbai-Dehli (12)
Copper and Sustainable Energy

- Copper is the most efficient thermal and electrical conductor (40% more efficient than aluminum)
- Energy efficiency and renewable energy systems imply more copper
ICA and international cooperation

- Increasing the uptake of High Efficiency Motors (HEMs) and Drive systems in Philippine Industries: European Commission – 1.7 million Euro (starting 1st Jan 2014 – 4 years)
- China Heat Pump Water Heater Challenge Program: European Commission – 1.6 million Euro (starting 1st Feb 2013 – 4 years)
- ASEAN-SHINE (air conditioners): European Commission – 1.7 million Euro (1 Jan 2013 – 4 years)
- Establishment of the ASEAN Energy Management Scheme (AEMAS): European Commission – 1.8 million Euro (2010-2014)
- Promotion of higher efficiency power and distribution transformers in China: European Commission – 785,000 Euro (2010-2012)
- Various actions in the field of EE in South East Asia: development of technical guidebooks (motors, transformers), study on harmonization of EE standards for ACs and refrigerators in SEA, mapping of EE and RE stakeholders): UNEP
ICA and international cooperation

- With **APEC**: Harmonization of EE standards for AC in ASEAN; Distribution transformers MEPS survey; Develop training program for installers and designers in solar PV rooftop (under US lead)
- With **SEAD**: HPWH international standards review; Motor repair practices international review
- With **GEF/UNDP/UNEP**: Global Solar Water Heater program
- Key partner of **UNEP** in new **GEF** United for Energy (U4E) program
ICA and Sustainable Energy

- **Sustainable energy = 60% of ICA’s programs**

- **Renewable energy:**
  - Decentralized energy
  - Distributed generation
  - Wind
  - Solar PV
  - Solar thermal
  - Heat pump water heaters

- **Intervention:**
  - Standards and codes
  - Capacity building for technicians, installers, designers
  - Establish/support industry alliances for supply chain integration
  - Support to policy making
  - End-users awareness campaigns and education
Market Development Strategies for Solar heat industrial process in China
Who is IMSIA

- Industrial alliance.
- Represents 80% production of flat plate, heat pipe and U pipe solar collectors in Central Asia (China & South-East Asia countries) till now.
- Initiated by International Copper Association Asia

Annual meeting 2010

Annual meeting, 2011

Annual meeting, 2013

Annual meeting, 2014
Mission of IMSIA

- To promote efficient solar collectors in solar thermal industry by:
  - Influencing policies & regulations.
  - Improving codes & standards.
  - Integrating supply chains.
  - Educating end users.

International Metal Solar Industry Alliance
Structure

- Industrial Process Heating Promotion Working Group
- Solar Cooling Working Group
- Design Contest Working Group
- Technologies & Policies Research Working Group
- Copper Processing Technical Guidance Working Group
- International Market Intelligence Working Group

Software development Working Group
Strategies

1. Promote building integrated solar systems
2. Promote combined energy systems
1. Building integrated solar systems

- Background of Strategies 1: Building integrated solar system is more *safe*
1. Building integrated solar systems

- Background of Strategies 1: Building integrated solar system is better *aesthetic appeal*
1. Building integrated solar systems

- Opportunities for solar thermal industry: New urbanization

Solar water heater in rural buildings, Provided by Himin Company

Shenzhen New Sports City, Provided by COMMONPRAISE Company
2. Combined energy systems

Large size combined energy heating system, which can be used as energy station in district energy system

Solar+Heat pumps

Solar+ Boilers

Small size household combined energy heating system

Solar heat pump

Solar+Gas water heaters+Convectors

Solar+Gas boilers+Convectors
2. Combined energy systems

Annual energy cost comparison of different types of water heaters
2. Combined energy systems

- Solar + gas WH

When the water temperature from solar panels meet the requirement, gas water heater does not start;

When the water temperature from solar panels does not meet the requirement, gas water heater start.

<table>
<thead>
<tr>
<th>Case</th>
<th>76% operating cost saving; 6 years payback</th>
<th>First cost/RMB</th>
<th>Annual operating costs/RMB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1: Combined energy</td>
<td></td>
<td>3,800</td>
<td><strong>97.65</strong></td>
</tr>
<tr>
<td>Case 2: Gas only</td>
<td></td>
<td>1,800</td>
<td><strong>410.63</strong></td>
</tr>
</tbody>
</table>
2. Combined energy systems

- **Solar + heat pump**

When the water temperature from solar panels meet the requirement, heat pump water heater does not start;

When the water temperature from solar panels does not meet the requirement, heat pump water heater start.

Evaporator / solar collector panels
Achievements

- From 2008, IMSIA integrated the supply chain successfully in the past 7 years.
  - 10 solar water heater manufacturers joined IMSIA as core members.
  - 122 design institutes as close partner.
  - 8 leading real estate developers as close partner.
Achievements

- Held series training seminars on solar building design and mandatory policies implementation with the support from local government.
  - In 14 cities, including Chengdu, Hefei, Ningbo, Kunming, Zhengzhou and Shanghai, etc.
  - More than 3000 architects and HVAC engineers from 112 design institutes and 62 solar water manufacturers attended the training seminars.
Achievements

- Held series training lectures on solar building design in 15 universities, including Tsinghua University, Tongji Universities, South-China Polytechnic University, etc.
  - Influenced more than 2000 student architects.
Achievements

- Influenced more than **20** codes and standards, such as:
  - *Technical Regulation For Solar Heating Technology*
  - *The Flat Plate Collector*
  - *Vacuum Tube Collector*
  - *With Auxiliary Heat Source Is Solar Water Heater Technology Conditions*
  - *Solar Gravity Heat Pipe*
  - *Heat Pipe Seamless Copper And Copper Alloy Pipe*
  - *The Oxygen-free Copper Superconducting Heat Pipe*
  - *Heat Exchanger Structure And Processing Method Of Solar Guidance*
  - *Solar Heat Collector Structure And Processing Method Of Instruction*
  - *Technical Specification For Solar Heating Engineering*
Technologies & policies research working group

- Conducted researches on market promotion and technology implementation.
  - Market survey
  - CDM and solar thermal
  - Solar building design guideline
  - Handbooks on solar building operations.
- IMSIA participated in the preparation of the **standard on General Technical Requirements of Solar Thermal Components Used in Buildings**, the review meeting on the final draft was held on 20 Jan 2014.
Technologies & policies research working group

- IMSIA promoted the concept on combined energy domestic hot water system.
Technologies & policies research working group

- Got financial support from Energy Foundation for the Research on the Adaptability of Building Roof Utilization
Technologies & policies research working group

- Market survey for Thailand, Philippine, Malaysia, and other ASEAN countries.
Solar heat industrial process working group

- China Solar Heat Industrial Process Research Report, the present situation and prospects – with Shanghai Jiaotong University, 2009
- First solar heat utilization technology seminar on industrial and agricultural, Jiangsu Changshu, 2011
Education and Training Working Group

- IMSIA held series workshops and training seminars nationwide.
Solar Cooling working Group

- Develop solar air conditioning market, promote the international communication of solar energy cooling.
- Under the advocate of the IMSIA and the United States of America SunEnergyNet, Set up a working group of the international solar energy air conditioner by the relevant experts in the field of solar energy air-conditioning and business;
Design Contest Working Group

- IMSIA Cup Solar Building Design Contest.

Winning teams:

2011  
2012  
2013  
2014
Design Contest Working Group

- GMO Cup International Best Solar Buildings in Operation Contest.

The press conference on Sep 28

The expert review meeting on Nov 27

2014 Press conference
Solar building design software development working group

- Published solar building design software, Feb 2013
- Version 2.0, June 2014.
Thank you

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