



International Copper  
Association  
Copper Alliance

---

# ICA - Sustainable Energy Programs

Pierre Cazelles

Director – Partnerships Asia



# The Copper Alliance Network

Cu

World Presence

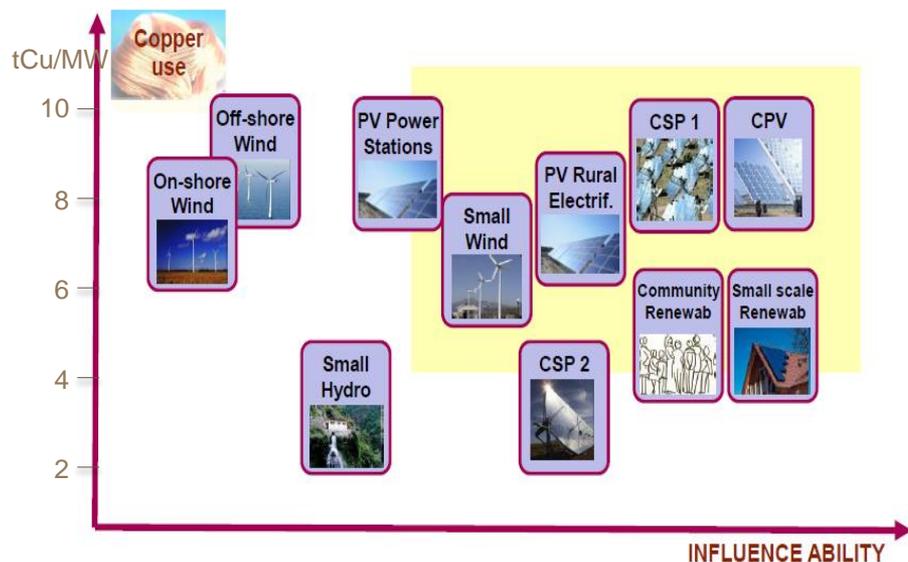


- International network of non-profit organizations in 24 countries
- Headquarters in New-York
- In Asia: offices in China (40 staff), Bangkok (4), Jakarta (2), Hanoi (2), Singapore (8), Taiwan (1), Seoul (3), Tokyo (2), Kuala Lumpur (1), Mumbai-Dehli (12)

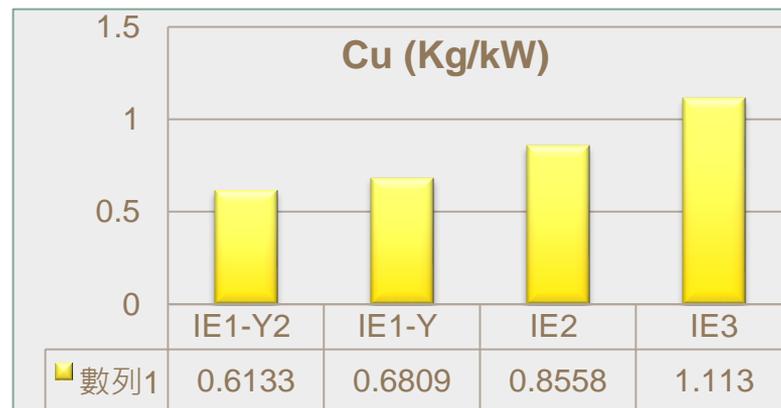
# Copper and Sustainable Energy

Cu

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



Industrial electric motors



- **Increasing the uptake of High Efficiency Motors (HEMs) and Drive systems in Philippine Industries: European Commission** – 1.7 million Euro (starting 1<sup>st</sup> Jan 2014 – 4 years)
- **China Heat Pump Water Heater Challenge Program: European Commission** – 1.6 million Euro (starting 1<sup>st</sup> 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**
- **Philippines:** Alliance for Mindanao Off-grid Renewable Energy – phase 3 – **USAID**

- 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

- **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

Cu

Copper Alliance



International Metal Solar Industrial Alliance

---

# Market Development Strategies for Solar heat industrial process in China



# Who is IMSIA

Cu

- 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

- **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**



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

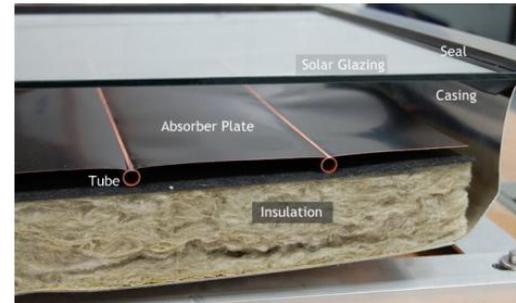


Software development  
Working Group

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

# 1. Building integrated solar systems

- Back ground of Strategies 1: Building integrated solar system is more *safe*



# 1. Building integrated solar systems

- Back ground of Strategies 1: Building integrated solar system is better *aesthetic appeal*

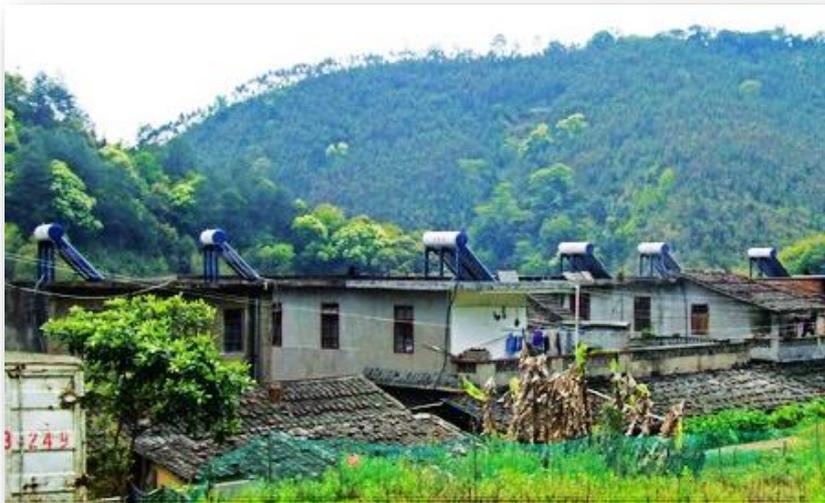


VS



# 1. Building integrated solar systems

- Opportunities for solar thermal industry: New urbanization



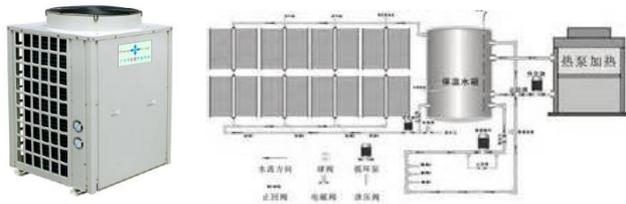
Solar water heater in rural buildings,  
Provided by Himin Company



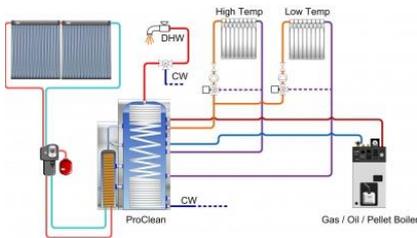
Shenzhen New Sports City, Provided by  
COMMONPRAISE Company

# 2. Combined energy systems

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



Solar+Heat pumps

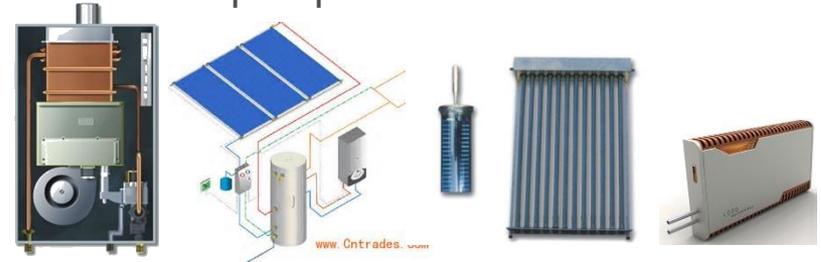


Solar+ Boilers

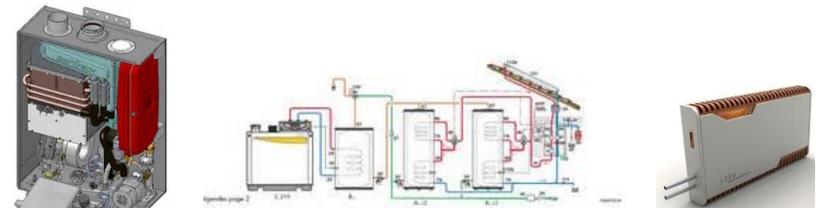
Small size household combined energy heating system



Solar heat pump

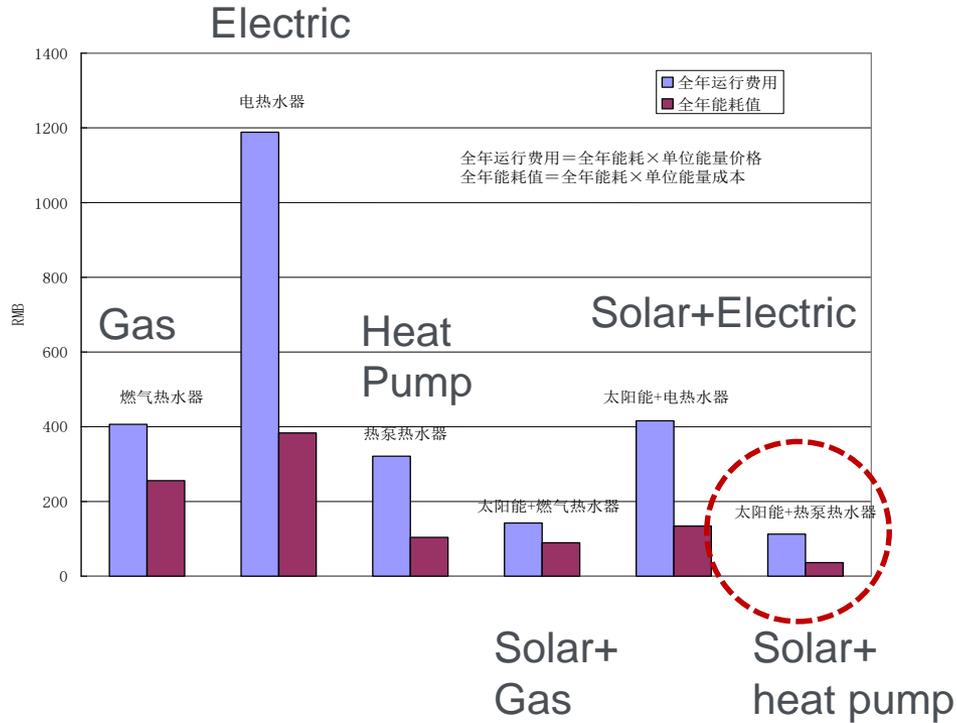


Solar+Gas water heaters+Convectors



Solar+Gas boilers+Convectors

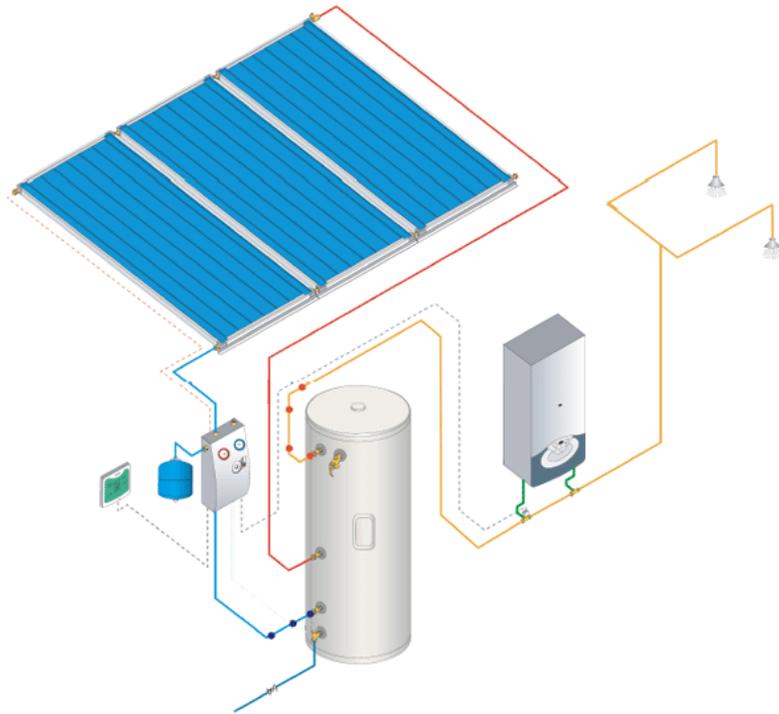
## 2. Combined energy systems



Annual energy cost comparison of different types of water heaters

## 2. Combined energy systems

### ▪ Solar + gas WH



Gas assisted solar water system

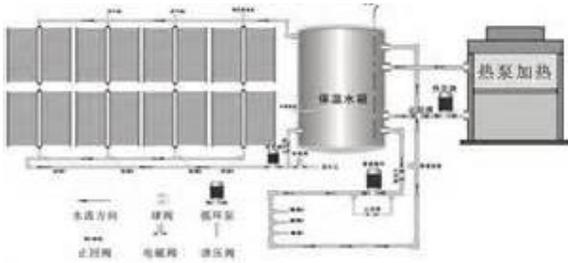
When the water temperature from solar panels meet the requirement, gas water heater does not start;

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

76% operating cost saving; 6 years payback	First cost/RMB	Annual operating costs/RMB
Case 1: Combined energy	3,800	<b>97.65</b>
Case 2: Gas only	1,800	<b>410.63</b>

## 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

- 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.



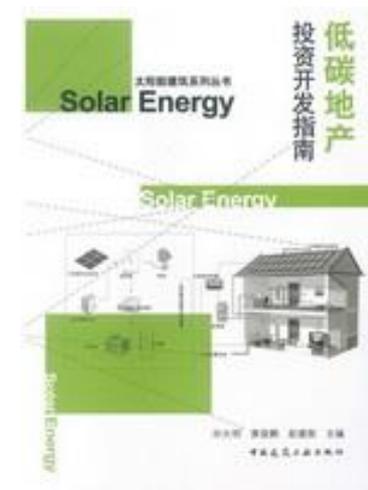
- Held series training seminars on solar building design and mandatory policies implementation with the support from local government.
  - In **14** cities, including Chengdu, Hefei, Ningbo, Kunming, Zhengzhou and Shanghai, etc.
  - More than **3000** architects and HVAC engineers from **112** design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



- 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.



- 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*



- 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.



- IMSIA promoted the concept on combined energy domestic hot water system.



Flat-plate solar collectors + Gas water heater



Flat-plate solar collectors + Gas boilers + Copper radiators



Flat-plate solar collectors + Air-source heat pump heater



Flat-plate solar collectors + electric heater

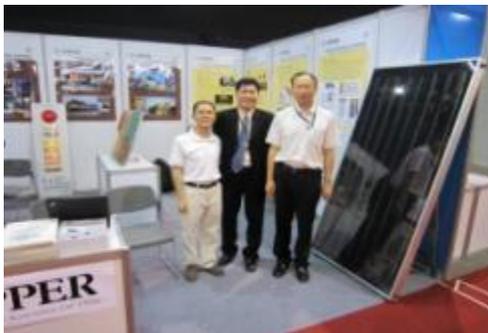
# Technologies & policies research working group

Cu

- Got financial support from Energy Foundation for the Research on the Adaptability of Building Roof Utilization



- Market survey for Thailand, Philippine, Malaysia, and other ASEAN countries.



Bangkok,2011



Kuala Lumpur,2010



Manila,2012

# Solar heat industrial process working group

Cu

- 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



The research report in 2009



The conference in 2011



The conference in 2014

# Education and Training Working Group

Cu

- IMSIA held series workshops and training seminars national wide.



Kunming



Kunming



Zhengzhou



Zhengzhou



Hefei



Hefei



Ningbo



Ningbo

# 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

Cu

- IMSIA Cup Solar Building Design Contest.

Winning team s:



2011



2012



2013



2014



# Design Contest Working Group

- **GMO Cup International Best Solar Buildings in Operation Contest .**



The press conference on Sep 28

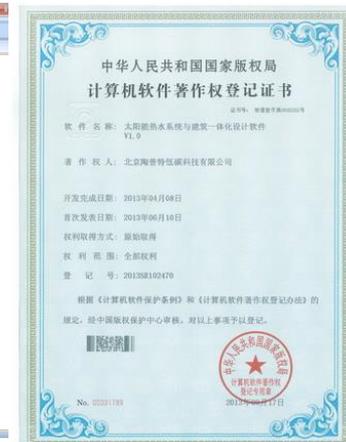
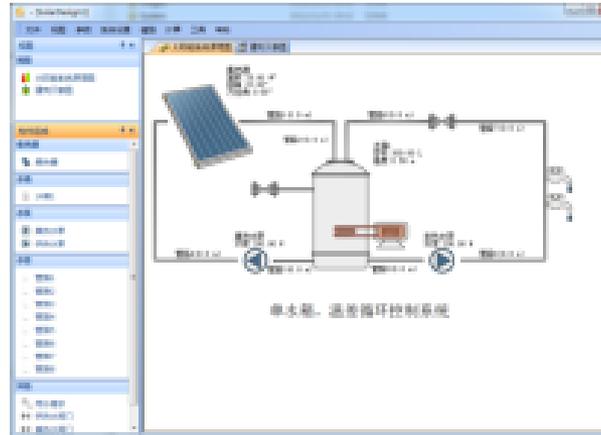


The expert review meeting on Nov 27



2014 Press conference

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



# Thank you

**Pierre Cazelles**

**Director – Partnerships Asia**

International Copper Association – Beijing Office

Tel: +86-159-0100-7376

Email: pierre.cazelles@copperalliance.asia

**ISMIA Secretariat**

**Joseph Huang – Secretary General**

International Copper Association – Beijing Office

Email: joseph.huang@copperalliance.org