

Possible Contributions to New Task in solar cooling and heating

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Introduction about Shanghai Jiao Tong University (SJTU);



Solar cooling research in SJTU;



Possible contributions to new task;



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Shanghai Jiao Tong University (SJTU)



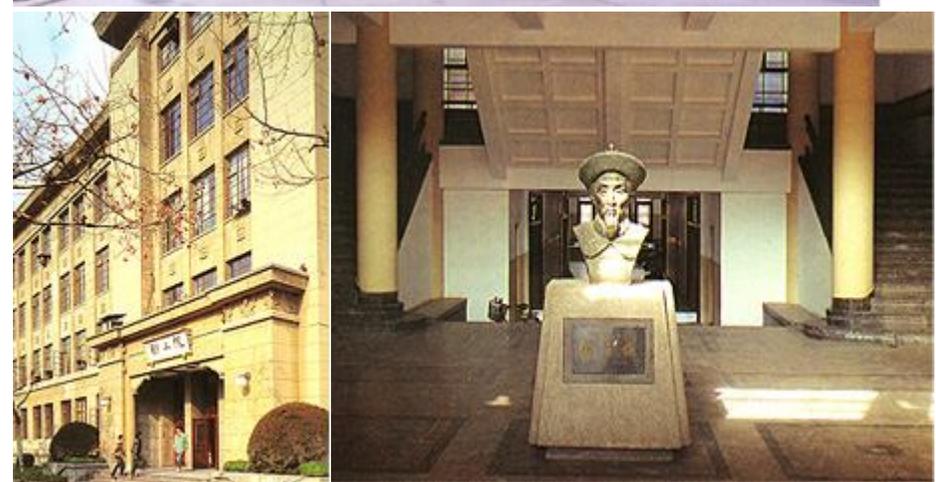
Shanghai Jiao Tong University (SJTU), directly subordinate to the Ministry of Education, is a key university in China, jointly run by the Ministry and Shanghai Municipality.



Amongst Top 4 Universities in China.



One of the strongest mechanical engineering faculties in China





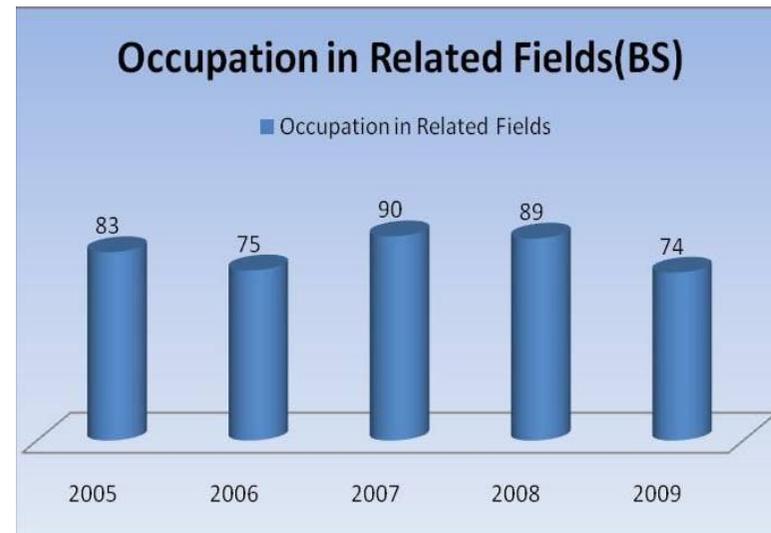
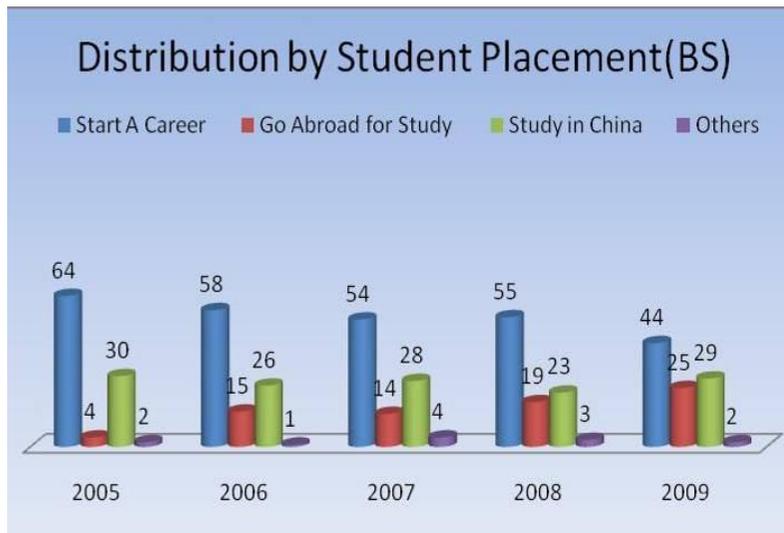
About SJTU

- Its total enrollment of full-time students amounts to 30,000.
- There are 15,000 undergraduates and 15,100 candidates for Master's Degree and Doctor's Degree
- SJTU boasts 20 academic schools.
- It has five campuses, **the Xuhui**, **the Minhang**, the Qibao, the Fahuazheng Road and the Chongqing Road(south)
- Leading positions in
 - Ocean engineering
 - Mechanical engineering
 - Energy conversion and power engineering
 - Electronics and Electric engineering
 - Clinical Medicine
 - Bio-science



Students in school of mechanical engineering

- Students: 5000
 - Ph.D. Candidates 160 /year (4.5 year)
 - Master of Science 400/year (2.5 year)
 - Master of Engineering 450/year (2.5 year)
 - Undergraduate 450/year (4 year)





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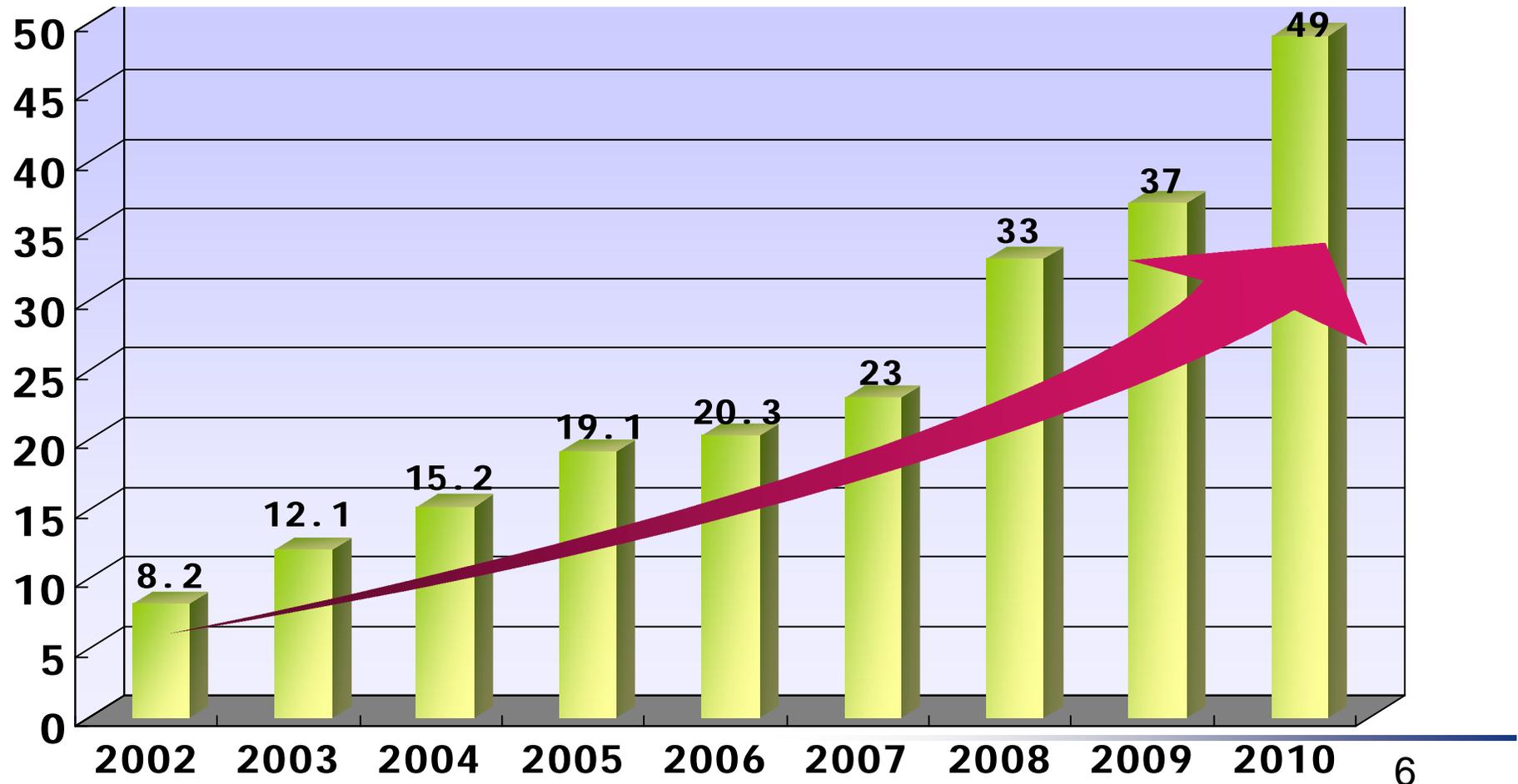
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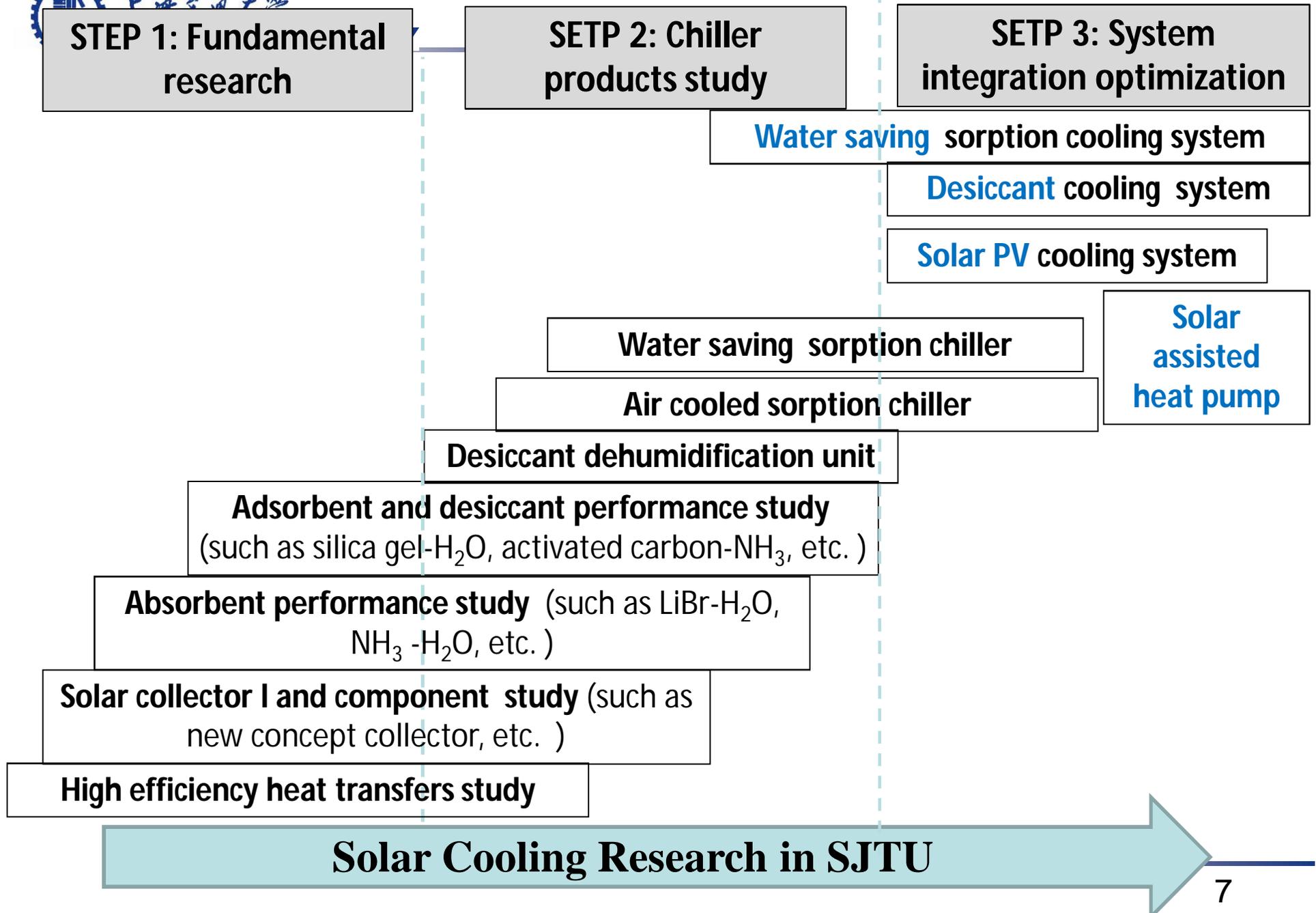
Research Funding of Mechanical Engineering school

55% - Industry Fund

45% - Competitive Fund from Government

Fund (US\$ 1M)







Thermally driven chillers in SJTU



Adsorption chiller



Adsorption ice making unit



Single effect LiBr-H₂O



Rotary desiccant cooling



Two stage desiccant cooling



Single/Double effect LiBr-H₂O



Recent development



Solar assisted CO2 heat pump with air cooled absorption cooling;



Solar driven single/double effect absorption cooling system with **Fresnel collector**



Solar driven double effect absorption cooling with **parabolic collector**



Desiccant chiller driven by **solar air collector**



Use of **desiccant coating** technology in solar air conditioning.



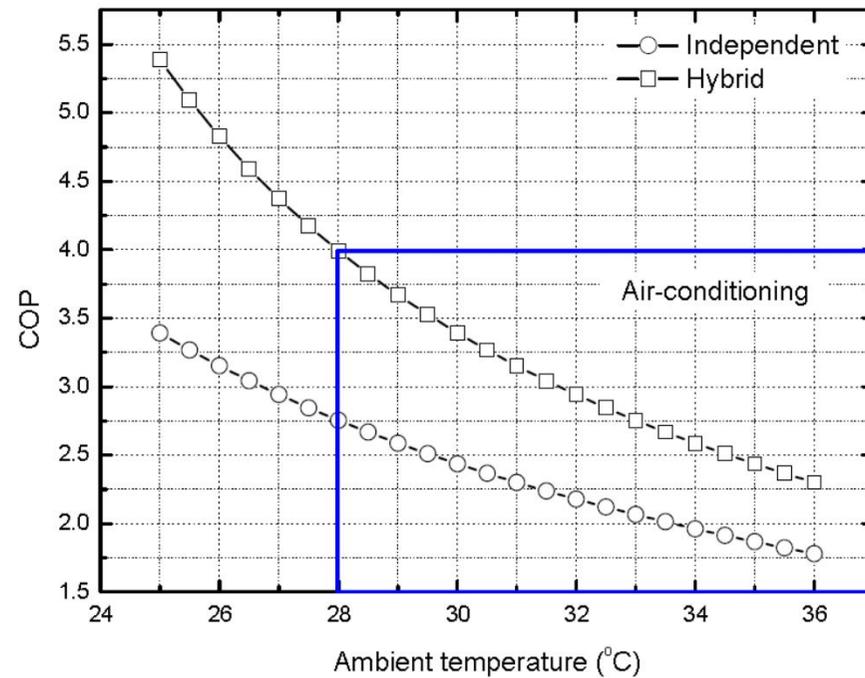
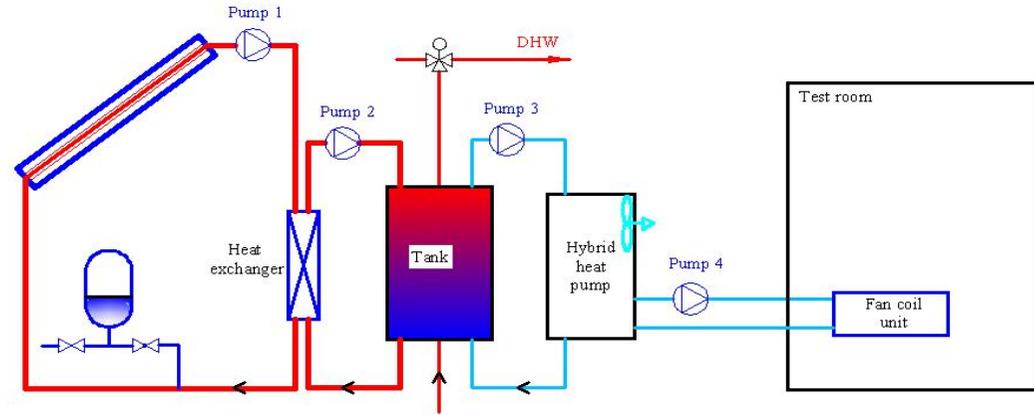
Solar combined cooling and heating



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Solar assisted CO₂ heat pump air conditioning system





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Solar PV air conditioning unit

Configuration



PV array

Performance	
Cooling capacity	0.1~7 kW
Heating capacity	0.12~9 kW
PV efficiency	12.5%
Inverter efficiency	80.2%
COP	3~4.1
Solar COP	0.3~0.41

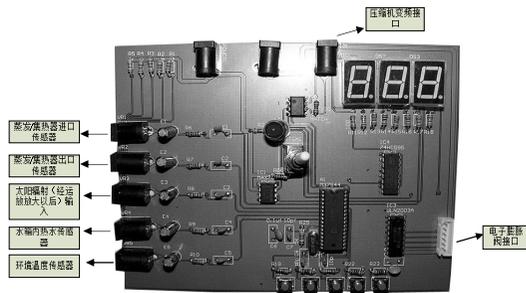
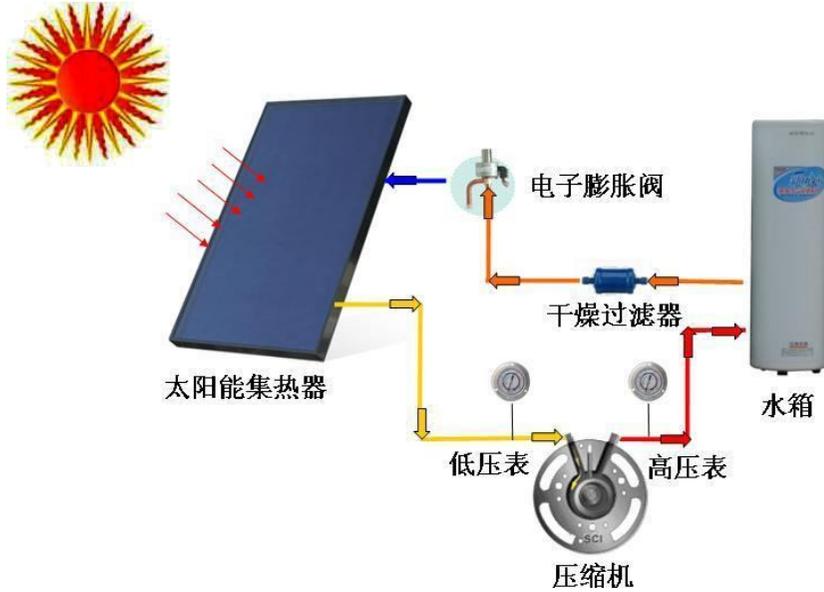




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Solar assisted heat pump



Electrical COP can approach 5-8



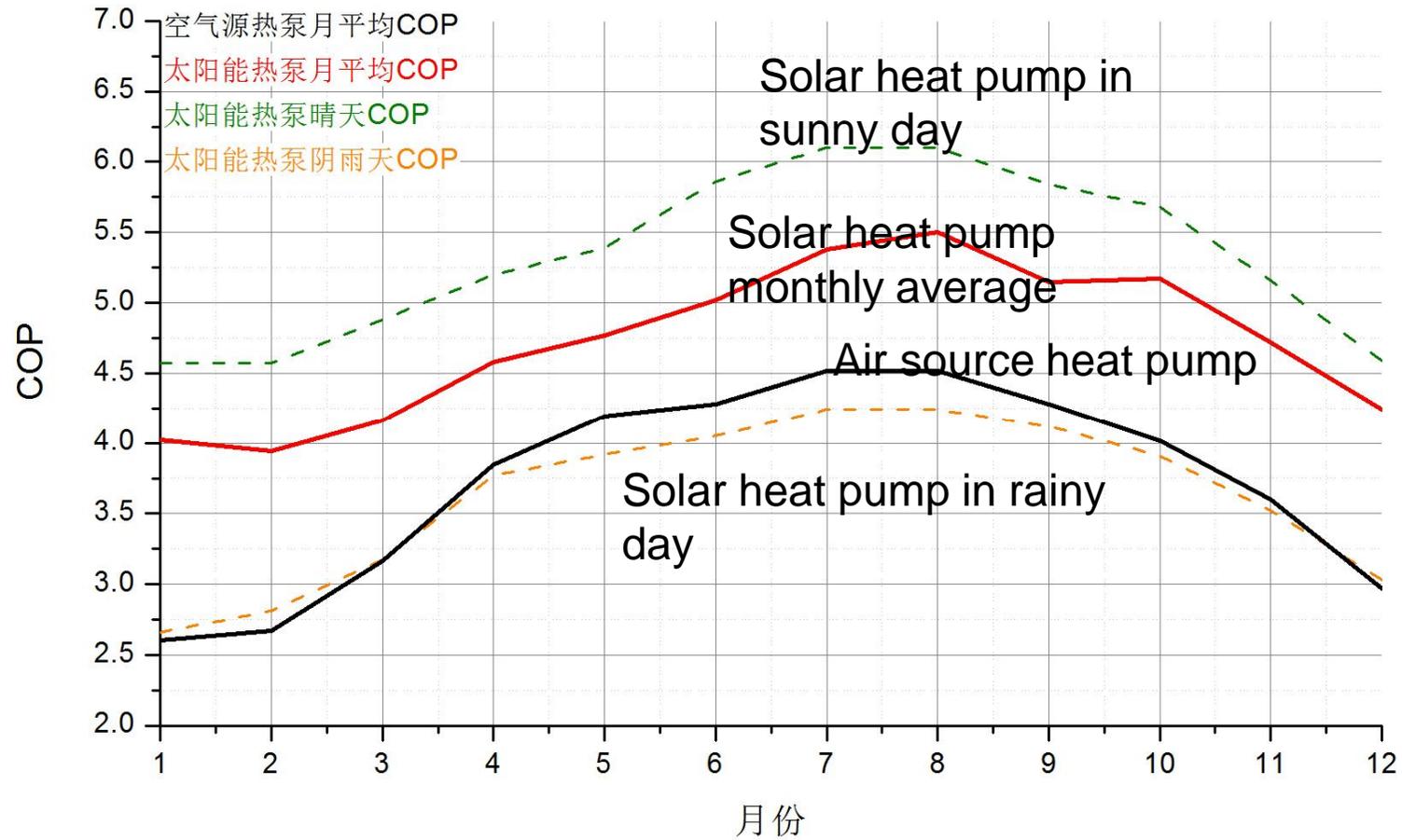
Solar assisted heat pump—Evaporator/collector

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Performance of solar assisted heat pump





Possible contributions to new task



In terms of our background and the expertise at present, we would like to join the activities for

- Subtask A: Components, systems & Quality
- Subtask D: Dissemination & Market deployment





Solar PV air conditioning system

- PV and VC air conditioning matching;
- Data acquisition
- Improvement in VC air conditioning unit
- ...



Solar assisted heat pump

- Direct expansion solar heat pump for domestic hot water supply
- Solar assisted heat pump for cooling and heating
- PV/T hybrid heat pump/ components and systems



Market potential investigation of China

- Solar assisted heat pump
- Solar PV air conditioning
- ...



Trade off of the technology and the market

- Life cycle analysis
- Bottleneck analysis
- ...

Thanks for your attention

谢谢