

# Solar heating and cooling: Current state in China and perspectives

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## Summary <sup>1</sup>

Solar heating and cooling technologies are important pathways to the sustainable future. With the efforts of researchers, manufacturers and customers, solar heating and cooling systems have been successfully implemented under different scenarios. Since China accounts for ~80% of the world solar collector production and 71% of the world installed capacity of solar water heating collectors, it is of great significance to know how the solar thermal industries develops in China.

To illustrate the current progress of solar heating and cooling in China, we present the representative engineering cases from leading industries. The presented systems utilize solar thermal power from non-concentrating solar collectors like evacuated tube collector to concentrating solar collectors like parabolic trough collectors. The aims of these systems include direct solar utilization for centralized district heating and domestic hot water supply, direct solar utilization for industrial steam and hot water production, and indirect solar utilization for commercial cooling supply via sorption chillers. These systems were installed in different areas all over China including the northeastern part, northwestern part, central part and etc. Significant energy saving effect has been achieved.

The wide spread of these advanced solar heating and cooling systems has shown the following perspectives: (1) The solar space heating and hot water supply have been successfully upgraded from distributed household units to large scale centralized systems, and thermal storage plays an important role for continuous heating supply; (2) The solar cooling via sorption chiller has been successfully applied in commercial buildings, and the auxiliary heat source or auxiliary vapor compression chiller ensures continuous cooling supply; (3) The adoption of concentrated solar collector enables the solar hot water and steam production for the applications in different industries.

With the successful promotion of large scale centralized solar heating, solar sorption cooling and solar industrial steam/hot water production, solar collector has been upgraded into solar thermal energy provider, which is not limited for water heating anymore. Middle temperature level (80-150 °C) solar thermal utilization has found its way to broader solar applications which could bring both economic and environmental benefits in industry heating, heating and cooling for commercial buildings.

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