

New building: EXPO Centre Shanghai

EXPO heats with the Sun and with ELCO

EXPO Shanghai attracts millions of visitors from China and every corner of the globe. It is a visiting card for China, so it is essential that everything runs like clockwork, even behind the scenes. The ELCO solar installations at the Shanghai World EXPO are an excellent demonstration of our competence in outstanding renewable energy solutions to a wide specialist audience. In China, and all over the world, ELCO was responsible for all aspects of the design of the Shanghai project - from the steel structure to the solar heating system, control system, installation and commissioning. ELCO is also responsible for all interfaces.



Builder
Government of PR China

Planning company
East China Architectural Design & Research Institute Co. Ltd.
Street: No.151 Hankou Road
Shanghai City
Post Code: 200002

BENEFITS

Efficiency

- Maximum utilisation of solar energy
- Total energy savings of 35 %
- Reduces CO₂ emissions by 28 tonnes every year

Convenience

- It supplies hot water immediately
- The hot-water temperature remains steady at 50 °C throughout the day

- Multiple hot-water supply solution meets the diverse requirements of the conference centre

Reliability

- Includes an anti-legionella solution
- Includes multiple protection to keep the system in a safe mode
- Over-pressure and anti-freeze protection

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One of the most important renewable-energy projects in China

Starting point

Provision of one of the largest and most important pavilions at the EXPO, the so called "EXPO Centre", with domestic hot water. The centre covers an area 350 m long from East to West and 140 m wide from North to South (a total construction area of 140,000 m²). The solution has to provide and guarantee a huge amount of hot water and meet all different kinds of requirements.

The requirements on the new system

The solar panels produce hot water for the entire EXPO Centre, including the main kitchen and all sanitary facilities. After the EXPO, the building's complete infrastructure will be used as a conference centre. This means that the system must be capable of providing sufficient volumes of hot water for conferences and full-occupancy events. On the other hand, it must not overheat if there are no events in the centre for a few days.

The ELCO systems have met this challenge successfully. They are completely reliable and very easy to maintain. Another very important point is that the outside wires and accessories of the solar tubes in the installation on the roof of the bus station are not visible to EXPO visitors. Aesthetically, the project is seamlessly integrated into the structure of the main building, the EXPO Centre. In addition, the shade provided by the installation ensures pleasant temperatures in the waiting area of the bus station in the humid heat of the Shanghai summer.

The new system

The solution is a solar water-heating system with a total area of 310 m² which is sited on the peripheral parking roofs around the EXPO Centre. Its heat source is gas-fired boilers, and its daily hot-water capacity is 28 tonnes.

- The system uses solar power as its secondary heat source.
- There are two heat-collecting areas and four independent heat storage and supply sections.
- The system is the only solar plant constructed for one of the five main pavilions, which will remain in use after the exhibition (the so called "remaining pavilions"). So the system is used to provide domestic hot water during and after the EXPO 2010 exhibition.

It is recognised and praised as one of the most important environment-friendly, renewable-energy projects after ELCO's project in the Olympic Village in Beijing. True to the theme "better city, better life", the project with its new environmental solution system reinforces the idea of the 2010 exhibition in Shanghai and promotes the aim of its customers perfectly.

Equipment

Tube collectors	AURON 20 DF (Direct-flow tube collectors) number of pieces: 140
Rated output	28,000 litres daily hot water production

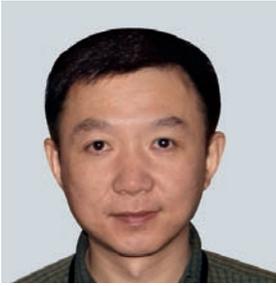
Savings

146,800 kWh energy savings every year

30 % more energy savings thanks to this new additional system

Reduces CO₂ emission by 28 tonnes every year





“Do you think ELCO was a good choice for this exceptional project?”

“Yes, I was absolutely satisfied. That is why we are planning to propose ELCO for two further projects in the next few months.” Mr. Zhang, responsible architect

Interview with architect Mr. Zhang

Mr. Zhang, one of the best known architects in China, and his team are responsible for the planning and execution of the EXPO Centre. In the following interview he gives his impressions of the cooperation with ELCO.

Mr. Zhang, how would you describe the work of the ELCO consultant installers and specialist staff?

Right from the start, the team was very “professional”. The ELCO consultants gave me and our team great support during and after the whole implementation phase.

One of the major challenges for all concerned was the extremely short timeframe. How did the ELCO team cope?

The ELCO team of experts have shown and proved that they can cope with this pressure and the difficult circumstances. They worked fast, and succeeded in completing their tasks excellently and on time. Sometimes the ELCO consultants had to work and be present on site around the clock, and even work through the night.

What were the special structural demands?

The EXPO Centre is the government’s most important conference building in Shanghai, so the installation and the system had to fit in, and not impair the building’s appearance, body structure and design. That’s why the solar plant was not installed on the roof of the building as usual, but on the roof of the waiting area of the bus station. The big solar panels therefore had to fit perfectly on the roofs and at the same time had to be invisible to the visitors.

EXPO Shanghai

The EXPO 2010 World Exhibition, from 1 May to 31 October 2010, is being held on a 5.28 km² site spread across both sides of the Huangpu River in the gigantic metropole that Shanghai is. China is the second Asian country after Japan (EXPO 2008 in Aichi) to stage a world exhibition in the 21st century. Fittingly for the country’s size, the People’s Republic of China hosted the largest world fair to date with 70 million visitors and at least 240 exhibitors.

Installation address:

East side of Lupu Bridge B
EXPO Park street:
No. 33, Fushan Road
Shanghai City
Post Code: 200050



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Extreme flexibility in hot water and auxiliary heating

AURON DF

AURON DF is a direct-flow vacuum-tube solar collector which has been developed for both domestic hot water and auxiliary heating. With regard to solar efficiency and collector annual return, AURON DF provides convincing, optimal results. The extreme flexibility of the mounting system guarantees optimal alignment towards the sun. Combined with the innovative hydraulic construction of the collectors, all variations relative to the roof, wall and ground are possible. By turning the tubes, the absorber surface can be oriented to provide the optimum angle to the sun.



Technical specifications, evacuated-tube solar collectors		AURON 15 DF	AURON 20 DF
Number of vacuum tubes		15	20
Effective absorber surface	m ²	1.5	2.0
Gross collectors surface	m ²	2.6	3.5
Capacity heat carrier (including tubes) l		4.3	5.7
Measurements (w x h)	mm	1,380 x 1,910	1,380 x 1,910
Weight (pitched/flat roof)	kg	51	68

- Excellent for solar warm water production plus auxiliary heating.
- Extremely flexible mounting system.
- Installation for pitched roof, flat roof, ground and facades.
- Optimal hydraulic connection.
- High consistency and longevity.
- Most efficient use of solar energy.
- Suitable for retro-fitting.
- Easy to extend.

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