A greener future

Siemens helps improve energy efficiency of Canton Fair Complex

The convenience of new technology

It was a sunny morning in September, and bright sunshine greets Guangzhou City.

As usual, Tan Zhiwen arrived at the control room of the refrigeration station at the Canton Fair Complex early in the morning. After putting on a plain blue uniform, she turned on the cooling equipment.

The Complex is the largest exhibition venue in Asia and home to the annual China Import and Export Fair, known as Canton Fair, a barometer of China's foreign trade economy. Tan is one of the persons behind the cool air that visitors crowding the vast halls get to enjoy - an important task, yet very often taken for granted.

Rumbling pumps, all kinds of control switches and boring data — these are part and parcel of Tan's daily work. When she graduated from high school at 18, she chose a completely different career path from her girl friends, many of whom became hotel waitresses or store cashiers.

"I told myself that my career attempts should not be scattershot and I thought of the possibility of becoming a life-long technician," Tan said, in a heavy Cantonese accent.

Yet, she had never expected that she would serve as a technician for almost 20 years. Part of her job now is to record operating data of the chiller host and nearly 50 pump meters every one to two hours daily.

"Now, with the new technique, I can operate the plant more easily and accurately. I can control equipment simply by clicking. Meanwhile, the data can be automatically stored in the computer," she said with a smile.

The new technique she mentioned is part of an energy retrofit project operated by Siemens for the Complex. The goal is to improve its automation and energy efficiency.

"New technologies are emerging every day. It's never too late to learn," she said.

Thanks to Siemens' technologies, Tan Zhiwen who works at the control room of the refrigeration station can now control the equipment with a simple click.

A step forward

In the first half of 2013, Siemens provided energy-saving retrofit solutions for the Complex. The focus was on HVAC (heating, ventilation and air conditioning) and lighting systems of Area A. Prior to that, in 2012 for example, HVAC and lighting accounted for about 54 percent of the Complex's power consumption.

It is the biggest energy-saving retrofit project on a single building in China. Siemens offered tailor-made innovative solutions based on a combination of hardware and software. The new automation system is able to monitor many parameters such as indoor temperature, humidity and carbon monoxide and carbon dioxide concentration in real time and accordingly uses an optimized control algorism to achieve automation and minimize power use.

In addition, Siemens, together with a partner, customized a cutting-edge energy measurement software for the Complex. It can timely provide energy data of major equipment and analytical reports to help improve management of the Complex.

Located in Pazhou, Haizhu District of the city, the Complex stands out with a wavy roof, a style in tune with the neighboring Pearl River. Each year it hosts more than 100 exhibitions. Among its three Areas, Area A has the largest floor space, longest time of use and 13 busiest halls.

In 2004, the Complex became the venue of the spring and autumn sessions of Canton Fair. Founded in 1957, the fair has made its name as a bellwether of the country's foreign trade. It has been like a giant magnet luring businesses and modern facilities to Pazhou, transforming the barren island into a golden mile of the city.

"Complexity of the system was our biggest challenge. Difficulties included intricacy of the energy subsystems, a lack of equipment data and ongoing exhibitions during project implementation," said Hu Mengfei, Project Manager of Siemens. "We conducted repeated field investigations and adopted advanced techniques to conquer the problems."

"Siemens managed to do this thanks to its persistent innovations, rich experiences in green buildings and sharp insights on the industry trends," said Tian Cheng, a Siemens energy engineer for the project.

(Video here)

Remarkable results

The project lasts for five and a half years, and it is expected to help the Complex save around RMB2.5 million annually. In addition, Siemens offered Energy Performance Contracting (EPC) mode to ensure that energy conservation targets will be fulfilled. The saved energy expenses are used to pay for the project costs. As part of the contract, Siemens also provided financing services to relieve financial pressures of the customer.

Wang Zhiping, Director General of China Foreign Trade Center, owner of the Complex, said: "Siemens is a very professional partner. Their retrofit solutions are very helpful and highly feasible."

"We hope to provide exhibitors and visitors from all over the world with a more comfortable, smarter and greener environment of exhibition," he added.

The positive effect has already been felt by exhibitors at the 3rd China (Guangdong) International Hospitality Supplies Exhibition.

"This is my third year to attend the fair. Last summer I felt very cold in the hall and even had to wear thick clothes, while this year I feel more comfortable around here," said Ye Xia of Foshan Lixuan Textile Industrial Co. Ltd.

"Normally, the hall will be full of pungent odor after setting up newly-decorated booths. But this year the Complex is free of such odor with better ventilation," said Liu Yajie of Guangzhou Branch of Henan Tangxi Sword Co. Ltd.

Exhibitors at the 3rd China (Guangdong) International Hospitality Supplies Exhibition were impressed by the retrofitted Canton Fair Complex

Leading the future

While urbanization accelerates and population swells in China, energy shortage has become a stumbling block for sustainable development. As the country rebalances the economy and pushes for industrial upgrade, energy conservation and emission reduction will be a top priority.

Yet, since 2013, China has been lagging behind in its ambitious campaign to decrease the energy intensity per unit of GDP by 16 percent by 2015 from the basis of 2010. To reach that target, China needs to lower the energy intensity per unit of GDP by an average of 3.84 percent annually between 2013 and 2015, 1.03 percentage points higher than the first two years, according to a notice of the National Development and Reform Commission issued in mid-August. That means China still has a long way to go.

"China is now at a critical stage of the campaign. Large companies should put more efforts into R&D and develop low-carbon technologies," said Hu Chi, a researcher at the State-owned Assets Supervision and Administration Commission of the State Council.

"Developing energy-saving industries like green buildings can effectively help with energy conservation and emission reductions, and also generate economic benefits," he added.

Siemens estimates that buildings account for 41 percent of the world's energy consumption and 21 percent of CO_2 emissions.

China has become the world's second largest energy consumer, with its building construction outpacing that of many other nations. In the country's 12th Five-Year Plan (2011-2015), the government also stressed the importance of "promoting green buildings and using advanced materials and technologies to optimize industry structure and service models."

"Developing green buildings and protecting the environment should not just be catchwords, but necessary moves to pursue sustainable development," said Xiao Song, President of Siemens Infrastructure & Cities Sector Asia Pacific.

"There is great market potential in retrofit and upgrade of large exhibition halls. We have a reason to believe that the Canton Fair Complex will be a model energy-saving building in Guangdong Province and even the entire country," said Song Jiang, a Siemens energy engineer involved in the project.

Siemens engineers developed an innovative control algorithm for the automation software to make operation of the refrigeration system more energy-efficient.