CASESTUDY

Greenview Building | Bejing – China

Delivering energy savings in a multi use large scale luxury development

Greenview Building is the first luxury green building in Beijing. The building offers its occupants a luxury environment while being energy efficient.

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Projekt Overview

Its external Glass Shell makes great use of the natural daylight creating a bright airy space while creating a low energy design. Greenview is a 30,000 m² building. The total construction area is 200,000 m², which consists of 144,000 m² at the ground floor level. This building complex comprises of 4 towers which all include an environmentally friendly roof. The height of the highest tower is 78 meters while the lowest one is 41.7 meters. This project is located in the heart of Chaoyang District, Beijing city. Two of the towers comprise a reception area, a shopping center, a luxury office space and hotel accommodation.

Greenview Building is a sample of a large-scale luxury and modern building complex including the functions of office, service, leisure, entertainment and retail. The project has become a symbol among construction buildings in Beijing. The ABB Cylon® Building Energy Management System has played a fundamental role in this project. The ABB Cylon® BEMS doesn't only control the lighting, air conditioning and the level of humidity at all times, but also monitors the energy usage of the building. The ABB Cylon® BEMS ensures occupant comfort within the building while actively reducing energy consumption and costs.

Project Summary	
Applications:	Monitoring, Cooling, Heating, Air handling, Lighting, Metering, Natural ventilation, Lift monitoring, Electrical Supply Management, Fire Alarm
Points:	19,000
Number/Type of Building:	4 buildings
Network:	Ethernet, Modbus
ABB Cylon® Hardware Installed:	UnitronUC32 series
ABB Cylon® Software Installed:	UCC, UEM

"Using the ABB Cylon® BEMS allows me to monitor and control every subsystem. I can achieve the goal of energy saving and provide users with a comfortable working environment." Harry Yu , Technical Director, CNA

Solutions Benefits

Flexibility – Such an integrated building requires flexibility of control. ABB Cylon® Controls solution was selected due to the high level of flexibility offered by the advanced freely programmable controllers. These allow the Facilities Manager to easily monitor the project in real time.

Energy Efficiency – The aim of this project was energy savings. ABB Cylon® Building Energy Management System can provide real time energy consumption data. The Facilities Manager can monitor energy consumption in the whole building. He can analyse the generated daily, weekly and monthly reports on energy usage in different areas of the building and thus create a suitable building energy control plan.

Electrical Load Management – While there is grid back-up the wind turbines are expected to contribute the lion's share (80%). Electricity generated from the rooftop equipment is stored in lead-acid battery packs in the basement. Inverters convert the electricity to AC before linking in with the lighting circuits. If needed, charging from the grid is done at off-peak periods.

Control of Cooling Time Schedules – Summertime cooling is achieved by circulating water through the structure at night dissipating surplus heat through the floor and ceiling of the basement which is cooled by evening air descending from the open roof light.

ABB Cylon® Solution
Core to the whole design system being effective in its objective, is the ABB Cylon® BMS, which keeps things running smoothly and enables accurate monitoring of the heating and ventilating system and of the solar/wind power electricity system. The Unitron system makes it possible to maximise the rate of extraction of energy from the bedrock. At extreme conditions the BMS can hold the temperature from the cooling side of the heat pump circulating through the borehole at 1.1 Degrees Celsius, the lowest temperature possible before ice will begin to form on the heat pump.

At other times, the controls strategy is to maximise the coefficient of performance of the system – typically of the order of 4.75 at water off the cooling side of the heat pump of 2.5-3 Degrees Celsius. The measured energy yield is higher than that predicted by a model of dry bedrock, suggesting some heat transfer by water circulating through cracks and fissures. The energy stored in the thermal reservoir heats the building via a grid of 20 mm diameter embedded coils in the exposed slabs. Covering as large a radiating surface as possible allows a relatively low distribution temperature of between 20 and 35 Degrees Celsius, which in turn leads to the high cop of the heat pump. In summer, the building is largely ventilated by natural means, with fresh air inlets into the atrium at low level and a high level roof light providing the openings. The rooflight is opened and closed by pneumatic rams under control of the ABB Cylon® BMS – in cold or wet conditions, the rooflight closes to protect the interior and also to conserve energy.