Case Study

1 King William Street, Adelaide

Trigeneration Project

KEY FACTS

Project Name:
1 King William St. Adelaide Trigeneration Project

Client: Lucid Consulting

System Supplier: Simons Green Energy

Commissioning Date: April 2014

Trigeneration system components:

ENER-G 310 Cogeneration Unit:
- Total electrical output: 310 kW(e)
- Total thermal output: 358 kW(t)

Shuangliang 250 kW Absorption Chiller:
- Total chilled output 250 kW(t)
- Cooling Tower

System provides:
- Base load electricity for the building
- HVAC Heating
- HVAC Cooling

Electricity supply arrangements:
Grid parallel with export capability to SA power network

Carbon emissions reduction: 766 tonnes per year

NABERS RATING: Increased from 2 Star to 5 Star

Background

The 1 King William Street Trigeneration project was part of a major refurbishment of one of Adelaide's most iconic buildings located at the gateway to the City. Originally constructed in the mid 1960's, the 19-storey office tower recently underwent major amenity, energy and water performance upgrades in a holistic approach to achieve a NABERS energy improvement rating from 2 to 5 Stars and a peak demand reduction of greater than 30%.

The project included the installation of a 310kW(e) Trigeneration system and roof top solar array panels.

Simons Green Energy was engaged to supply, install and commission the Trigeneration System. SGE worked closely with the consultants, analysed the energy requirements, applied accurate sizing and design rules for an embedded generation system, developed pre-acquisition and implementation plans for the system, and installed and commissioned the ultimate solution.

System Details

The combined heat, power and cooling solution comprises an ENER-G 310 Cogeneration unit, a 250 kW Shuangliang Absorption Chiller, a Cooling Tower and other associated equipment. The Cogeneration System was supplied as a complete factory-tested packaged unit, with engine, generator sets, controls and heat recovery system.

Design Methodology & Operating Principle

The 310 kWe packaged Trigeneration System provides the building with base load electrical supply during peak hours and exports power to the grid during shoulder and off-peak periods. SGE's approach was simple yet innovative, ensuring the system operates with the greatest efficiency, but at the same time being "fail safe" and fully redundant.

The Trigeneration System integrates with the onsite boilers and chillers to provide hot water for space heating in winter and chilled water for base load air-conditioning in summer. The heat output is largely dictated by the electrical load on the Trigeneration System. The Plant is controlled by SGE's unique Trigeneration control system.

SIMONS GREEN ENERGY

Specialists in energy systems for over 80 years

Case Study

1 King William Street, Adelaide – Trigeneration Project

Site Challenges

Placement & Positioning of the equipment

The equipment was positioned on the roof of the building, located on the 19th floor. To ensure this was done safely and smoothly, SGE conducted a detailed study to identify sensitive areas around the site, account for disruption, road closures and traffic management.

Adelaide's North Terrace (west bound) and the tram lines were closed for two days to allow for the 310 kW Trigeneration System to be lifted by South Australia's only 400 tonne mobile crane to the rooftop of the 19 level office tower. Finally, other critical items of equipment were placed in position. The complete lift was carried out successfully with minimal disruption, compliant with all safety requirements and completed within the requisite time period.

Noise

The office building was fully tenanted during the works, necessitating the implementation of a noise abatement regime to ensure tenants quiet enjoyment benchmarks were achieved during construction.

Multiple Stakeholder management

The team at Simons Green Energy worked closely with Lucid Consultants, contractors Hansen Yuncken and O'Connors, and client CBRE to ensure that the mechanical and electrical installation was completed in line with the set milestones and deadlines. SGE commissioned the system in April 2014.

Key Benefits

- Achieved 5 Star NABERS Rating
- Reduces carbon emissions by 30%, equivalent to 170 cars off the road each year.
- Provides 310 kW(e) of electricity at peak capacity.
- Produces up to 358 kW of heat and 250 kW(t) of cooling.
- Exports excess electricity to the grid during off peak and shoulder periods.

About Simons Green Energy

Simons Green Energy, as part of the Simons group of companies, is a leading provider of sustainable energy, heating and cooling solutions in Australia. With over 80 years of operation in the field of thermal engineering, Simons provides solutions tailored to customer's needs with reliable products, technology and service quality. Simons offers a range of sustainable and renewable energy equipment including Cogeneration & Trigeneration Systems, Waste Heat Recovery Systems and High Efficiency Hot Water Boilers. Simons will design, size, deliver, maintain and finance sustainable energy solutions and technologies Australia wide.

For further details contact us:

Sydney Head Office
Unit 1, 33 Maddox Street
Alexandria NSW 2015
Tel. +61 2 8338-8660
Fax. +61 2 8338-8661

Melbourne Office
34 Strong Avenue
Thomastown VIC 3074
Tel. + 61 3 9462-6700
Fax. + 61 3 9462-6711

E-mail: info@simonsgreenenergy.com.au
Website: **www.simonsgreenenergy.com.au**

SIMONS GREEN ENERGY

Specialists in energy systems for over 80 years