

Canterbury Hurlstone Park RSL Club Trigeneration Project



**CANTERBURY
HURLSTONE PARK
RSL CLUB**

Background

Responding to its members' demand for sustainable facilities, Sydney's Canterbury Hurlstone Park RSL Club has undertaken a 5-year Energy and Facilities Master Plan. Designed to deliver sustainable and energy efficient facilities as part of an industry-leading entertainment, dining, hospitality and recreational experience for members and guests, the \$15 million plan includes the installation of a state-of-the-art Trigeneration System, plus upgrades to gym and entertainment facilities, parking infrastructure and air conditioning systems.

Master Plan at a glance

Stage 1 included the construction of a new gymnasium, commercial kitchen, refurbished food and beverage outlets, and indoor and outdoor areas. Stage 2 sees the construction of a new multi-storey Canterbury Rd carpark and a upgraded Club façade, the installation of a 505 kW Trigeneration Energy and a HVAC upgrade that includes new chillers and a centralised air conditioning loop. The Club's club's air conditioning upgrade will increase members' comfort, deliver new standards of energy efficiency and improve reliability and year-round performance.

What is the Trigeneration Energy System?

Trigeneration is a form of Combined Heat and Power (CHP). It is the simultaneous production of three forms of energy – electricity, heat and cooling – from a single fuel source. The Club's Trigeneration Energy System uses a natural gas-powered engine to generate electricity on-site and converts the waste heat from the engine into usable heat for space heating, domestic hot water and similar applications. A refrigeration unit, known as an Absorption Chiller, also uses the waste heat to provide cooling. The waste heat is converted into chilled water for air conditioning, refrigeration or other cooling purposes. The Trigeneration Energy System has a total efficiency of up to 85%, as compared to just 30% efficiency for coal-fired grid-supplied electricity.

Key Facts

Project name: Canterbury Hurlstone Park RSL Club - Trigeneration Project

System supplier: Simons Green Energy

Commissioning date: 11 March 2015

System details:

E500 Cogeneration Unit:

- Total electrical output: 506kW_e
- Total thermal output: 527kW_{th}

Absorption Chiller:

- Total Cooling Capacity: 411kW_{th}
- Chilled Water Capacity: 70,600 Litres/h

Fuel Source:

- Natural Gas

Application:

- The Trigeneration System will provide over 50% of the electricity to the Club
- HVAC Heating to the building
- HVAC Cooling to the building

Carbon emissions reduction:

Cut carbon emissions by 30%, equivalent to planting 15,900 new trees each year

Average cost savings:

Reduces energy costs by an average of \$185,000 per annum

Payback period: 4 years



Australian Government
Department of Industry and Science

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The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.



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Canterbury Hurlstone Park RSL Club – Trigeneration Project

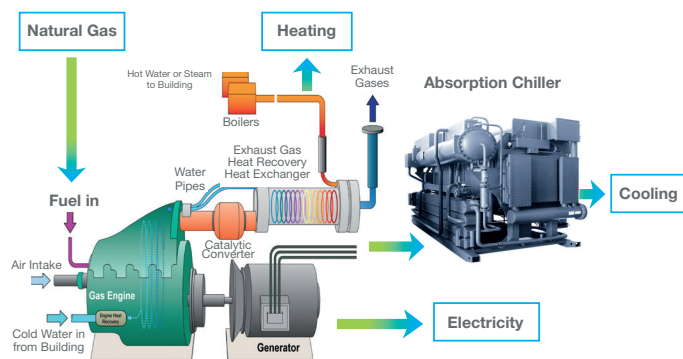


Diagram: Trigeneration system



How will the Club benefit from Trigeneration?

The Trigeneration Energy System will provide Canterbury Hurlstone Park RSL Club with cleaner electricity while converting waste heat into space heating and cooling. It will operate 15 hours a day, 7 days a week, generating 50% of the Club's electricity needs.

The Trigeneration Energy System is expected to deliver annual average savings of \$185,000 while reducing carbon emissions by 1,590 tonnes per annum, which is equivalent to taking 352 cars off the road each year. The expected return on investment is 35% per annum. This initiative was made possible with a \$583,072 grant provided by the Australian Government.

Project overview

The Trigeneration Energy System has been installed in a custom-built plant room located on the basement level behind the main club building. This location provides easy access to the Club's HVAC plant and facilitates cost-effective integration with heating and cooling services. The new plant room was specially designed to house the Trigeneration plant and incorporates acoustic attenuation in the walls, doors, and ventilation system to prevent noise from impacting on neighbouring residents.

Installation required specialist movement engineers to locate the 12-tonne Cogeneration unit and 7-tonne Absorption Chiller. The plant room was then completed enclosing the new equipment. The new plant operates automatically, controlled by a sophisticated control system, which monitors the Club's electrical consumption and space heating and cooling loads. It ensures maximum benefit is derived from the available thermal energy. The control system feeds into the Club's building management system to provide visibility to operations staff and connects to the Simons Green Energy's remote monitoring system to alert maintenance personnel, should issues arise.

Summary

The Club's Master Plan will deliver increased member comfort and sustainable, energy efficient facilities. Thanks to the funding received from the Australian Government, the project's estimated return on investment is 35%, resulting in a payback period of 4 years.

The Trigeneration Energy System alone will:

- Reduce energy costs by an average of \$185,000 per annum
- Deliver an estimated return on investment of 35% and a payback of just 4 years
- Cut carbon emissions by 30%, equivalent to planting 15,900 new trees each year
- Generate 505 kW(e) of electricity at peak capacity and produce up to 527kW of heat and 390 kW of cooling.

The Trigeneration System was commissioned in February 2015.

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