

Club Banora Tri-Generation Project



Key Facts

Project Name: Club Banora Tri-Generation Project

Site owner: Twin Towns Clubs & Resorts

System supplier: Simons Green Energy

Commissioning date: July 2014

Trigeneration system components

ENERG 230 kW Cogeneration unit:

- Total electrical output 230 kW(e)
- Total thermal output 358 kW(t)

Shuangliang 250 kW Absorption Chiller:

- Total chilled water output 250 kW(t)
- 700 kW cooling tower

System applications:

- Electricity base load for Club Banora's main building
- Swimming pool heating
- Space cooling for main building

Carbon emissions reduction: 740 tonnes per annum

Average cost savings: \$125,000 per year during the first 5 years

Payback period: 4 years

ROI: 25%



Australian Government
Department of Industry

This activity received funding from the Australian Government.



Background

Club Banora, as part of the Twin Towns Clubs & Resorts, is a community oriented Club located in Tweed Heads. Surrounded by natural beauty and family-friendly outdoor areas, the Club opened in 1986. Since then it has catered to sporting and recreational needs for local families.

It has long been Twin Towns Clubs' ethos to protect its natural environment by minimising the Club's carbon footprint. Being awarded with a SEDA Green Globe for its energy efficiency work in 1996, Club Banora has also implemented a range of sustainability projects including LED lighting, glass and cardboard recycling and waste water management.

Objective

Club Banora's facilities comprise a Golf course, a 3700 m² building and two outdoor swimming pools previously opened only during the summer months. In order to provide members with energy efficient facilities, extend the swimming club's operations and reduce operating costs, the Club installed a state of the art Trigeneration energy system in July 2014.

Applications

The 230 kW Trigeneration system operates 15 hours a day, 7 days a week and generates over 50% of the electricity required to power the Club, reducing its reliance on grid supplied power. The waste heat from the Cogeneration engine is used to heat two outdoor swimming pools with the 50m pool heated to 27 C°, which was previously unachievable due to the cost of running the existing boiler, and the 20m kids' pool heated to 32 C° during winter. Utilisation of the Cogeneration unit's waste heat offsets the use of a substantial amount of gas previously used by boilers and enables the swimming club to operate all year round, increasing pool attendance in the winter months.

During summer, when pool heating isn't required, the waste heat is diverted into an absorption chiller that provides air conditioning for the Club's main building

This project was made possible through funding from the Australian Government. Simons Green Energy was engaged to deliver a complete Trigeneration solution and worked with Club Banora and local contractors to ensure a smooth installation.



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Club Banora - Tri-Generation Project



What is Trigeneration?

Cogeneration, also known as Combined Heat and Power (CHP), is the simultaneous production of two forms of energy - electricity and heat - from a single fuel source. Cogeneration 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, heating for swimming pools and similar applications. On site Cogeneration systems have a total efficiency of up to 85%, as compared to just 30% efficiency for coal-fired grid-supplied electricity.

An Absorption Chiller is a refrigerator that uses a heat source to provide the energy needed to drive the cooling system.

Trigeneration is the combination of a Cogeneration system and an Absorption Chiller which converts gas into electricity, heating and cooling. The waste heat from the Cogeneration unit is converted into chilled water for air conditioning, refrigeration or other cooling purposes.

Installation

Site preparation for the installation of a 230 kW Cogeneration unit, a 250 kW Absorption Chiller and a 700 kW cooling tower commenced in January 2014. Both the Cogeneration unit and Absorption Chiller were trucked to the site in May 2014 and rolled into position by Simons' project engineers using specialised heavy lift equipment. The new Trigeneration system forms the major part of a plant upgrade at Banora Club which replaced two original reciprocating electric chillers.

The Trigeneration system was successfully commissioned in July 2014.

Key Benefits

The Trigeneration project received government funding of 50% of the total costs, resulting in an estimated payback period of just over 4 years. With a ROI of 25%, Club Banora is set to save approximately \$125,000 a year on energy costs over the next 20 years whilst reducing its carbon footprint by 30%.

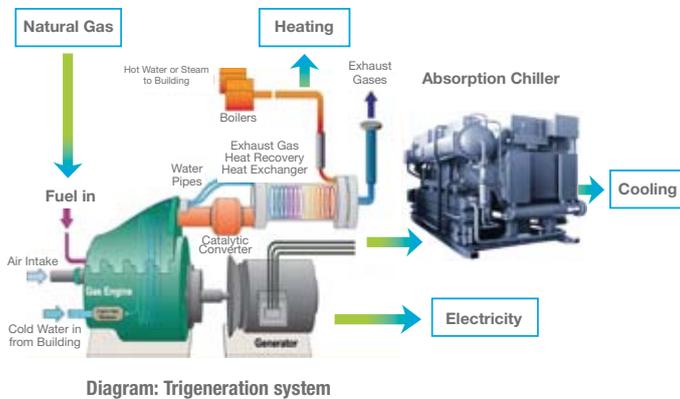
- Reduces energy costs by an average of \$125,000 a year.
- Delivers an estimated return on investment of 25%.
- Results in a payback period of just over 4 years.
- Cuts carbon emissions by 30%, equivalent to planting 7,400 new trees a year.
- Generates 230 kW(e) of electricity at peak capacity, enough to power 209 homes.
- Produces up to 358 kW of heat and 250 kW of cooling.

Rod Pain, the Executive Business Manager for the Twin Towns Group said *"investments like this make sense on so many levels. When projects meet financial benchmarks and are delivered through such a clean generation source we are all winners, both in the short term and with strong residual benefits for future generations. It's a project I've really enjoyed working on and one I'll tell my kids about when they are old enough to fully understand."*

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