

# Doncaster Hill Civic Precinct Trigeneration Factsheet



Manningham City Council is constructing a new \$38 million community facility, named MC<sup>2</sup> (Manningham City Square), located adjacent to the existing Civic Offices in Doncaster Road, Doncaster. Scheduled for completion in June 2012, this new building will feature a state-of-the-art trigeneration system.

## MC<sup>2</sup> Project Overview

The MC<sup>2</sup> (Manningham City Square) community facility will include a wide range of community services, including an art gallery, library and café, all of which will be connected to a trigeneration system.

This will be a landmark building with targeted minimum performance equivalent to NABERS 5-star energy rating and a Greenstar 5-star rating.

Council aims to reduce the environmental impact and ongoing running costs of MC<sup>2</sup> and adjacent buildings, by minimising the demand for electricity, heating and cooling – and supplying the baseload demand using a trigeneration system.

The trigeneration system will be installed in the basement of the MC<sup>2</sup> building. This natural gas fired unit will generate electricity (385 kW), heating and also cooling. It is anticipated that the trigeneration system will provide approximately 60 to 70 per cent of the energy requirements for MC<sup>2</sup> and the Civic Offices.

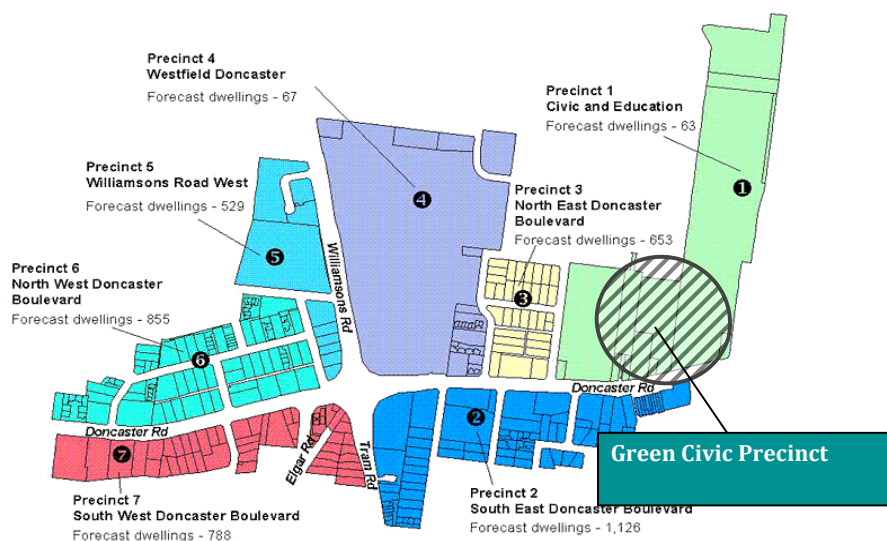
MC<sup>2</sup> is part of the Doncaster Hill Smart Energy Zone and is supported by the State Government of Victoria and the Federal Government.

## What is Trigeneration?

A trigeneration system is not an electrical substation. An electrical substation reduces or transforms very high voltage power (typically from overhead power lines) to useable voltage for use in businesses and homes.

While all large scale buildings are required to have an electrical substation the installation of a trigeneration system will significantly reduce the carbon emissions of the building.

Trigeneration systems are safe and reliable systems that are increasingly being installed in hospitals, large scale commercial and residential buildings across Australia.



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## Trigeneration – how does it work?

The trigeneration system will supply electricity, heating and cooling to MC<sup>2</sup> and the existing Civic Offices and Function Centre.

Natural gas-powered engines are used to operate the trigeneration system and supply the base electrical demand to both MC<sup>2</sup> and the existing Civic Offices. The by-product of this process is waste heat, which will be harnessed for heating or converted to chilled water for cooling through an absorption chiller.

This process dramatically reduces the carbon footprint of the buildings by reducing dependence on electricity and cooling generated from the electricity grid to a much cleaner natural gas source.

## Benefits of Trigeneration

Trigeneration systems offer an environmentally friendly way to manage a building's electricity supply on site, improve energy efficiency and reduce carbon emissions. The benefits of trigeneration include:

- A trigeneration system effectively harnesses heat and energy that would be wasted in traditional electricity supply systems.

- A trigeneration system reduces the need for high-voltage overhead power lines.
- A trigeneration system will continue to generate power in the case of blackout.
- Overall improved energy efficiency, lower operating costs and reduced carbon emissions.
- Energy savings are projected to be around 34 per cent compared to using grid electricity and this will in turn reduce greenhouse gas emissions by 47 per cent.

## Operating Hours

It is intended that the trigeneration system will operate 365 days per year, during the hours of 7.00 am to 8.00 pm on weekdays and 10.00 am to 2.00 pm on Saturdays and Sundays, in order to maximise environmental benefits. The table below provides estimates of electricity, cooling, and heating consumption that have been made assuming normal daily trigeneration system operation.

The potential consumption of electricity, heating and cooling is estimated to be:

Building	Electricity (kWh / year)	Cooling (kWh / year)	Heat (GJ / year)
Community Hub 5-star NABERS Energy rated	610,000	7,500	2,178
Civic Offices	1,110,000	30,000	2,144
Total	1,720,000	37,500	4,322