



DELIVERING A LOW CARBON ENERGY NETWORK FOR CITY OF SYDNEY

The City is aiming for trigeneration to supply 70% of the City's electricity needs by 2030 and reduce greenhouse emissions by 25 to 30%*

About Sustainable Sydney 2030

The City of Sydney and Cogent Energy, which is wholly owned by Origin, are working together to establish Australia's first local, low carbon energy network using trigeneration technology as part of the Sustainable Sydney 2030 plan.

Sustainable Sydney 2030 is a plan for the sustainable development of the City for the next 20 years, and beyond. The City intends to reduce its greenhouse gas emissions with a network of green infrastructure to reduce energy and water demands as well as waste collection.

Trigeneration is a significant part of the City program to reduce carbon emissions by 70% by 2030 – one of the most ambitious targets of any Australian government.

Trigeneration uses cleaner natural gas, captures waste heat that would otherwise be lost, recovers and reuses it to heat and cool buildings. Trigeneration doesn't have the transmission losses incurred by centralised power stations because electricity is generated locally. It can be up to twice as energy efficient compared with coal-fired centralised power stations and can reduce greenhouse gas emissions by 40 to 50% compared to coal-fired power*.

City of Sydney Trigeneration Solution

The traditional way electricity is generated in NSW is by burning coal at large centralized power stations. Only 38% of the available energy in the coal gets converted to electricity*. The remainder is expelled into the atmosphere as waste heat, consuming large quantities of water. There are further transmission and distribution losses sending this electricity down the wires from the power stations in the coal fields to the consumer.

With trigeneration, about 40% of the energy gets converted to electricity†, but the main difference is the heat from combustion is not lost; instead it is captured to heat water. This hot water can then be used for heating, or turned into cooling water for air-conditioning via a process called absorption chilling.

The City of Sydney project will generate electricity locally from natural gas. Cogent Energy will build a network of small low-emissions energy centres that will initially be installed to supply council buildings and privately owned buildings in the first low-carbon-zone precincts. This involves building compact gas-driven trigeneration plants which can be constructed in the basements or rooftops of city buildings or purpose built sites. The waste heat from these plants will then be distributed via a closed-loop network of pipes for heating and cooling in commercial, retail and residential buildings.

The plan is to deliver 360 megawatts or more by 2030 across the whole of the local government area with the aim to produce 70%* of the City's energy needs locally from these trigeneration systems.

City of Sydney Benefits:

- Trigeneration is a cost-effective way of achieving large scale carbon emission reduction within the City.
- It will also reduce energy costs. Local trigeneration, if installed within a building, can avoid network charges which currently make up 50% of the average electricity bill#.
- By taking heat from the Thermal Reticulation Network (TRN) and utilizing an absorption chiller, network demand charges may be significantly reduced, compared to using electric chillers. This may reduce electricity bills.
- It mitigates the impact of future cost, as network charges are expected to continue to rise as network companies upgrade the poles, wires and substations of the electricity grid.
- A study by the University of Technology, Sydney estimates this project could save up to \$1.5 billion in avoided capital investment in new coal-fired power stations and grid upgrades~.

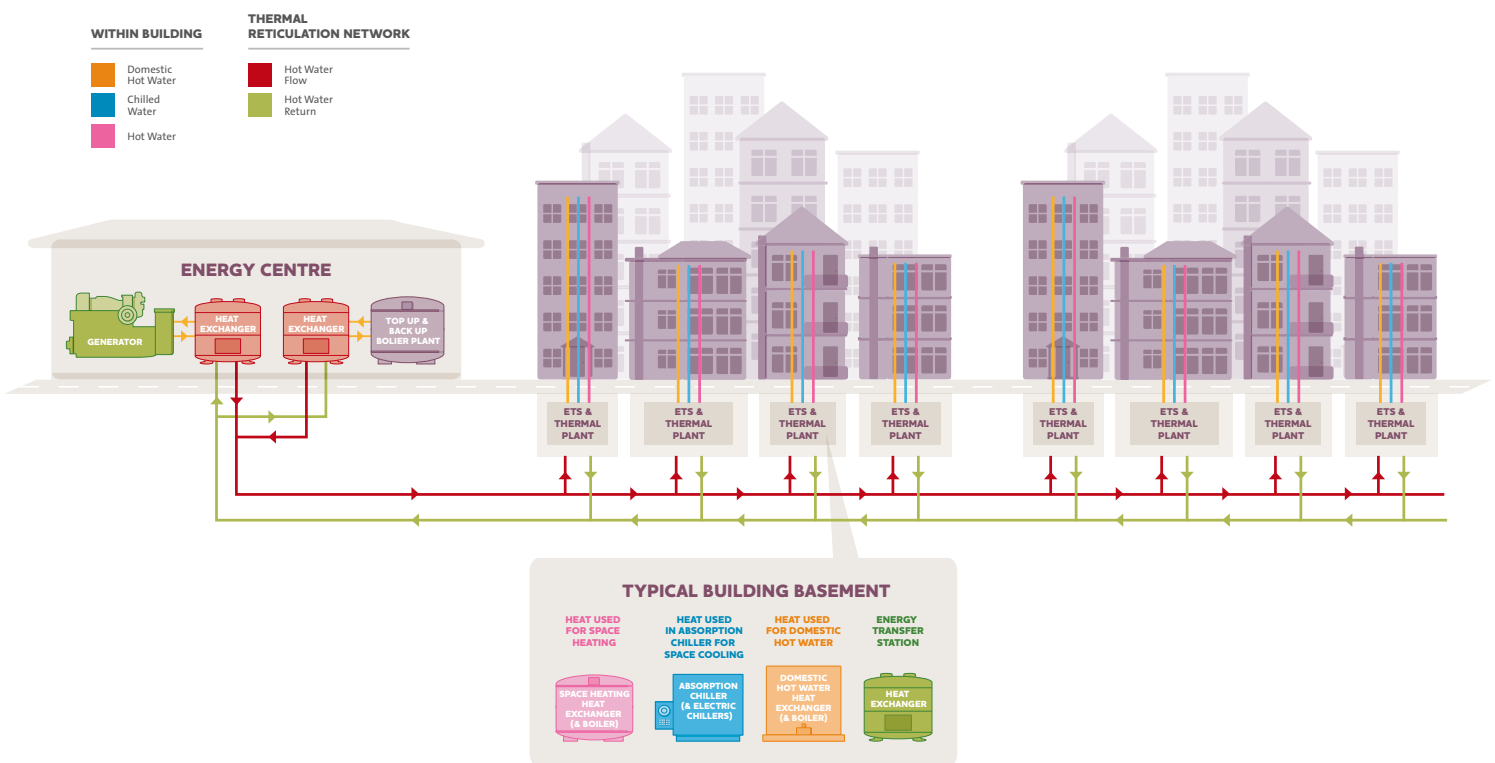
The System

The City of Sydney trigeneration installation will comprise:

- Energy Centre (EC) - compact gas-driven trigeneration plants constructed within city buildings, rooftops and purpose built sites - meeting local noise and emission requirements
- Thermal Reticulation Network (TRN) – an underground closed-loop hot water pipe network will run under the streets and laneways for buildings to receive thermal energy
- The EC and TRN form low carbon energy precincts within the city
- Energy Transfer Stations (ETS) – will be located within each building to transfer heating or cooling from the TRN into the buildings.

For More Information

To find out more about the City of Sydney project and/or the City's green infrastructure plans visit www.greeninfrastructure.net.au



FOR MORE INFORMATION

For more information about Cogent Energy go to www.cogentenergy.com.au or contact one of our consultants at (02) 9503 5034



* Climate Works and Property Council of Australia, Unlocking barriers to cogeneration – Project Outcomes Report (September 2011) (June 2009).
 ^ International Energy Agency (IEA), 'Power Generation from Coal, Measuring and Reporting Efficiency Performance and CO2 emissions' (2010)
 † CO2 savings estimations are calculated based on information from the Australian Government's National Greenhouse Accounts Factors (June 2009). # NSW Government, Industry and Investment, 'NSW Electricity Network and Prices Inquiry' (December 2010)
 ~ Dunstan, C. & Langham, E. 2010, Close to Home: Potential Benefits of Decentralised Energy for NSW Electricity Consumers, prepared by the Institute for Sustainable Futures, University of Technology, Sydney for the City of Sydney, November 2010.