SEDA
NSW Government

>Case Study

# Innovative gas-fired cogeneration on display at Griffith Hospital

When Griffith Hospital, a 100-bed regional base hospital, closed down its laundry and catering services, the hospital was left with a central steam plant working under capacity.

At this point Steve Butt, Manager, Asset Management, decided it was timely to investigate the potential of cogeneration.

A high-efficiency energy system, cogeneration produces both electricity and valuable heat from the one fuel source. It offers significant economic and environmental benefits because it turns otherwise wasted heat into a useful energy source. As a result of the greater efficiency, carbon dioxide emissions and operating costs can be considerably reduced.

In 2001, Butt applied for a feasibility study under SEDA's Cogeneration Development Program and discovered he could reduce the hospital's energy bill by installing a cogeneration plant to provide space and water heating for the hospital.

The study provided an analysis of the patterns of site energy use to determine the most appropriate sized cogeneration plant for the hospital, and considered how to integrate various options into the existing systems.

Photo courtesy of Griffith Hospital.

| Cogeneration Details At-A-Glance | |
|---|---|
| Site: | Griffith Hospital |
| Cogeneration Plant Owner: | Griffith Hospital |
| Plant Configuration: | Reciprocating gas fired 220kW engine and a 211kVA generator |
| Year Commissioned: | 2003 |
| Capital Cost: | $940,000 |
| First Year Energy Savings: | $140,000 |
| Internal Rate of Return: | 12 per cent |
| Principal Contractors: | Trane |
| Greenhouse Gas Reductions: | 1380 tonnes per annum |

Other options for increasing the efficiency of energy use at the hospital were also considered.

## Getting results

Two years on and the project has been delivered as part of a seven-year Energy Performance Contract (EPC). It's the first project to flow from SEDA's Cogeneration Development Program.

According to Butt, the hospital is the last big site under the Greater Murray Area Health Service (GMAHS) with potential for an EPC.

"It's the second EPC project we've undertaken and we're satisfied our willingness to embrace new technology at this site will be extremely beneficial to the hospital," said Butt.

The hospital installed an innovative gas-fired cogeneration system which will reduce its energy bills by $140,000 each year and cut greenhouse gas emissions by over 1,000 tonnes per year, the equivalent of taking 240 cars off the road.

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Heating was provided via gas-fired steam boilers. The boilers were designed to provide heat for the laundry as well as the hospital air conditioning, kitchen, heating, and domestic hot water systems.

Now the small cogeneration plant (211 kVA) will provide 100 per cent of domestic hot water and a significant percentage of heating load.

With capital expenditure of around $940,000 and an IRR of 12 per cent, Butt says it was a "low risk investment which offers the benefits of improved quality and greater reliability and security of power supply.

The project is a good example of how effective it is to replace under-utilised equipment with new technology to provide heating and hot water.

"Our efforts are not only delivering substantial greenhouse gas savings, but also establishing Greater Murray Area Health Service as a leader in Energy Smart initiatives," said Steve.

### What you should consider

While Butt is a proponent of cogeneration he says that every potential site should be independently assessed for appropriateness.

He advises being aware of energy prices, alternative heat sources, maintenance issues and most importantly, a backup system during maintenance or failure.

"At this site we investigated the noise and fire rating of the installation, and the potential maintenance and project management issues arising from our rural location," said Butt.

### The benefits

Steve believes cogeneration "offers a significant technical opportunity for sites that have suitable energy loads."

"Most of the unknowns can be modelled with a high degree of confidence and with a good understanding of your site, its loads and consumptions you can be confident in your choice," he says.

He believes this project continues to be very worthwhile.

"We've shown that the benefits can be threefold. We've replaced an aging plant with new technology, increased our energy efficiency and are delivering financial savings year on year."

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SEDA is the NSW government authority set up to provide financial and technical assistance for those investing in the use and commercialisation of renewable energy.


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