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The security of cogeneration

On-site energy cogeneration gives businesses a buffer against power outages, as well as offering cost efficiencies at a time when mainstream energy costs are set to jump. DAVID REGENSPURGER explains how cogeneration works.

The heatwave that led to widespread power outages across Victoria in late January this year had a recent precedent: exactly two years beforehand a severe fire in Gippsland brought the Victorian power grid to its knees. Since that fire event in 2007 energy costs have risen to almost double historical averages. And with government taxes on carbon starting in less than 18 months, energy costs look to rise by another 50 percent within the next three years. On-site cogeneration dominates the landscape in Europe and, given the protection it offers against both grid failures and rising energy costs, Australian businesses would be wise to consider the same here.



In the same way airport security changed forever with the terrorist attacks on the World Trade Centre towers, the wholesale energy market changed forever on 16 January 2007 when fire brought down two key supply lines in southern Victoria. The outage affected more than 680,000 users, including 70,000 businesses, most of which were without power for up to eight hours. The sudden loss of power in some industrial plants meant up to a week lost in operational outages.

This single event had a dramatic impact on the energy landscape, with wholesale energy costs rising significantly. They peaked in June 2007 at almost four times the cost they had been some six months earlier. Prices have since come down, but they continue to sit at around double the historical average of the five years previous to 2007.

The heatwave that hit Adelaide and Melbourne in late January this year not only caused minor power outages, but will also have a marked impact on energy costs for large building and industrial users in 2009. Heating, ventilation and cooling (HVAC) accounts for about 50 percent of total site supply and peak demand is typically the result of air-conditioning on a hot summer day.

The record temperatures that enveloped Adelaide and Melbourne for four to five consecutive days led to air-conditioning units running at their maximum capacity. This led to demand profiles at site hitting new peak levels. Maximum demand charges typically ratchet up with each new peak demand recorded. This demand is charged every month regardless of whether the building uses the same demand volume again. As most public light and power supplies in buildings are on maximum demand tariffs, the heatwave has led to annual costs for public light and power accounts increasing by thousands of dollars. This single temperature event

will have cost millions of dollars in energy bill costs across the southern part of Australia.

To add salt to the wound, a local network service provider in Victoria (CitiPower) has already been applying an additional network tariff levy within the Melbourne CBD area to cover capital works related to the upgrade of substations, sub-transmission lines and feeder cables. This upgrade is designed to protect the supply security within the CBD from a long-standing blackout should there be major failures within the electricity network feeding the area. Business users are paying heavily for both supply security and supply capacity using grid supply.

THE VALUE OF COGENERATION

Business users can reduce their reliance on grid supply through the installation of a cogeneration plant that can be used for peak energy supply and back-up for off-peak supply. Not only can cogeneration reduce energy costs, it can also provide guaranteed supply in the event of a major loss of grid power.

Typically, the cost of a cogeneration plant has been borne by site owners; however, a few companies now offer arrangements whereby they provide a cogeneration plant on-site in return for a long-term energy contract with the site owner. This is an attractive option for building owners, as they no longer have to fund or operate the plant, but instead get guaranteed energy supply for not much more than grid-sourced supply.

While the cost of cogeneration energy is 10 to 20 percent above standard coal-fired supply, the reduction in the peak network consumption can result in savings of up to 65 percent of the total site network charges that would normally apply. Hence, the overall cost of supply to a site can actually be reduced under a cogeneration solution. Cogeneration also provides a

reduction in carbon emissions of up to 60 percent against coal-based supply. This will become another critical area of cost saving with the introduction of the CPRS (Carbon Pollution Reduction Scheme), which is due to commence from July 2010.

In summary, there are several key benefits offered by the implementation of cogeneration that add significant value for building and industrial site owners:

1. Competitive energy rates – cogeneration provides below-market, green-accredited energy, supplying total base peak load for a site.
2. Reduced network costs – as energy supply is generated on-site, costs associated with network tariffs are reduced. This can often be as much as 65 percent of total site energy supply costs.
3. Cost security – cogeneration protects site owners from rising energy costs through the provision of a long-term energy supply on-site. This supply guarantee eliminates market price shock and offers predictable energy costs that can be easily managed.
4. Supply security – cogeneration protects site owners from grid outages due to abnormal temperature patterns and severe fire events, both of which are becoming more common each summer due to the effects of climate change.
5. Carbon abatements – gas-fired cogeneration provides a reduction in carbon emissions of up to 60 percent against traditional retail supply. This reduction can be used to offset carbon emission targets, soon to be mandated by the Government.
6. Improved sustainability – cogeneration supply improves on-site energy efficiency, which supports sustainability objectives, adding the equivalent of up to two stars to existing NABERS and Green Star energy ratings.



7. Revenue opportunity – cogeneration can be used in conjunction with operation of an embedded electricity network, allowing the site owner to sell energy to tenants and providing additional revenue streams at site.

ABOUT ENERGY INTEL

Energy Intel offers energy contract management and monitoring services, as well as embedded network feasibility and implementation.

Energy Intel works in partnership with Cogent Energy Pty Ltd in implementing cogeneration solutions into large building complexes, as on-site generation can substantially increase returns made from on-selling within embedded networks.

ABOUT COGENT ENERGY

Cogent Energy Pty Ltd provides innovative cogeneration solutions that are engineered to meet the supply requirements of large buildings, including electricity, hot water and chilled water. Cogent is both an energy generator and energy retailer, and generates energy on-site to sell to site owners under long-term supply contracts.

Cogent provides a unique and holistic energy solution that is not only cost competitive, but proven in reducing energy costs at site. On-site cogeneration also provides best practice sustainability objectives and satisfies government energy efficiency and carbon reduction initiatives. **FM**

David Regenspurg is the founding director of Energy Intel Pty Ltd. David has significant experience with embedded networks, having implemented and operated more than 25 embedded network sites within Victoria since 2005. David has conducted feasibility and operational studies across sites within Victoria, Queensland and New South Wales for large property owners such as AMP, GPT, QIC, ING, Mirvac and Stockland.

He has also been involved in legislation regarding energy on-selling, writing white papers and advising government bodies such as the ESC, AER and EWOF on the operational intricacies of embedded networks.

More information

Cogent Energy

www.cogentenergy.com.au

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www.energyintel.com.au

opposite page and above: On-site energy cogeneration involves the installation of an on-site generator such as this gas-powered unit (model MTU 12V4000) from MTU Detroit Diesel Australia.