

GENERATING SMARTER ENERGY

The AGL-Qenos Cogeneration Project will result in a reduction of approximately 110,000 tonnes of greenhouse gas emissions per year.

PROJECT DEVELOPER/OWNER: AGL Energy Limited
CUSTOMER: Qenos Pty Ltd (Altona Site)
PROJECT TYPE: 21MW Gas Turbine Cogeneration Plant
DATE PROJECT COMMENCED: March 2011
PRACTICAL COMPLETION: December 2012
PROJECT CAPITAL EXPENDITURE: \$45 million



Left The cogeneration unit will be capable of producing over a third of its steam requirements and will meet all of Qenos's electricity demands.

Qenos is Australia's sole manufacturer and leading supplier of world class polyethylene and polymers. Qenos recognised the need for cogeneration as the most effective, technical solution to reduce greenhouse gas emissions and rising energy costs. Qenos developed a specification and sought expressions of interest. As one of Australia's leading integrated renewable energy companies, AGL Energy Limited (AGL) was chosen for their extensive experience in cogeneration and for their technical expertise in electricity and gas networks.

AGL and Qenos signed a 15 year contract with AGL to build, own and operate the cogeneration plant, with the option to extend the agreement a further 10 years. AGL has become the sole supplier of natural gas to the site, and will operate the gas turbine and balance of the plant. The agreement takes advantage of AGL's strong position in the gas industry, utilises the dedicated team of 85+ engineers within AGL energy services and highlights AGL's energy based solutions to commercial and industrial customers.

AGL began construction of the \$45 million co-generation facility at Qenos's manufacturing plant in Altona, Victoria in August 2011 and expects practical completion by December 2012.

An existing steam boiler on the Olefins site at Altona will be decommissioned and replaced with a modern cogeneration (combined heat and power) unit. At the heart of the cogeneration unit will be a state of the art gas turbine, a Solar Titan 250 GTG, which is the first of its kind in Australia. The gas turbine cuts nitrous oxide emissions by up to 90 per cent and carbon dioxide emissions are reduced by up to 30 per cent compared to that of conventional systems.

The Qenos manufacturing process requires approximately 170 tonnes per hour of steam and has an 18MW base load power demand. The embedded cogeneration facility will have a nominal capacity of 21MW, and when coupled with a Heat Recovery Steam Generator (HRSG) will produce up to 88 tonnes of steam per hour, meeting up to half of Qenos's steam requirements and all of Qenos's electricity requirements and will have some surplus electricity for export to the grid.

"The cogeneration facility is expected to reduce greenhouse gas emissions associated with the

production of polyethylene at Qenos plant by 110,000 tonnes of carbon dioxide per annum, the equivalent of taking 26,830 cars off the road. It will also result in a substantial reduction in existing flare light offs. The co-generation facility will continue to supply steam and power to the plant in the event of grid interruptions.

The AGL-Qenos Cogeneration Project will provide a secure long term energy source and represents the largest investment in industrial or manufacturing cogeneration in 10 years. It is a demonstration of cooperation between AGL, Qenos, the government and the community", said Mario Bortolotto, Senior Project Manager at AGL.

AGL also owns and operates gas-fired cogeneration plants at Symex Holdings (4.4MW) in Victoria and in Coopers Brewery (4.4MW) in South Australia and biogas (sewage) generation at Melbourne Water's sewage treatment plants at Werribee (10MW).

AGL was formed in Sydney in 1837. It supplied gas for the first public lighting of a street lamp in Sydney in 1841 and was the second company to list on the Australian Stock Exchange.

AGL has a diverse power generation portfolio including base, peaking and intermediate generation plants, spread across traditional thermal generation as well as renewable sources including hydro, wind, landfill gas and biomass and services to 3.3 million customer accounts in New South Wales, Victoria, South Australia, and Queensland.

The company is headquartered in North Sydney, Australia and employs over 2,500 people. AGL prides itself on delivering quality service to its clients and providing value for money.

AGL's sustainability performance has been recognised domestically and internationally by independent experts including through inclusion in the Dow Jones Sustainability World Index 2010/11 and Carbon Disclosure Project ASX200/NZX50 Carbon Performance Leaders List 2010.

For more information contact Danni Calkin at AGL Energy Services, Level 21, 101 Miller Street North Sydney NSW 2065, phone 02 9921 2046, fax 02 9921 2676, email: EAdmin@agl.com.au website: www.agl.com.au

FORWARD THINKING

It would be surprising if anyone with power industry experience did not marvel at the engineering achievement in transporting a Heat Steam Recovery Generator (HSRG) about the height of a 6-storey building and weighing approximately 130 metric tonnes (MT), 14,500 km around the world and then rolling the 111 MT boiler into place and lowering it onto the foundation at the Qenos Cogeneration Plant.

Accord Logistics (Aust.) were contracted by UGL to use their expertise and experience to transport the HSRG in a four-stage process, with a total time frame of about two-and-a-half months. The fully assembled HSRG and associated equipment left the manufacturers in Texas and was transported by road and by ship to the final destination at Altona, Victoria.

Having highly skilled, professional staff with over 25 years experience who can think outside of the square was vital in overcoming the obstacles presented in this project. "The main challenge in transporting the HSRG equipment was the timeframe for delivery. The equipment was delayed in production in the USA while the committed time for shutdown at Qenos remained the same. We were able to charter a newly built vessel with engine efficiencies and reduced carbon output to meet the short transit time at a competitive cost for our client. Having the right connections is critical in the project cargo business. It is about contacts and networks and about knowing who provides the specific services", said Elton McKay, General Manager of Accord Logistics.

Accord Logistics (Australia) Pty Ltd was established in 1988. The Australian team of 8 experienced staff across a number of industries and network of trusted International Agents offer Companies requiring transport of heavy lift, project-related and oversized cargos comprehensive logistics services with a hands-on approach. Their portfolio offers all facets of international freight forwarding, customs clearance with strength in ocean project cargo offering delivery within Australia and around the world.

For more information contact Accord Logistics (Australia) Pty Ltd, Unit 13/34-36 Ralph Street Alexandria NSW 2015, phone 02 9669 2333, fax 02 9669 2322, email: elton@accordlogistics.com.au, website: www.accordlogistics.com.au



Below Accord Logistics (Aust.) were contracted by UGL to transport the Heat Steam Recovery Generator onto the foundation at the Qenos Cogeneration Plant.

Below ALS industrial provided Inspection, Non Destructive Testing and consulting of power system equipment at Qenos Cogeneration Plant.



MODERN & INNOVATIVE

ALS Industrial has been entrusted by a number of construction companies to provide independent inspection of equipment and materials for the Qenos Cogeneration Plant in Altona, Victoria. ALS Industrial is Australia's leader and largest supplier of testing, inspection, certification and verification to ensure Qenos is compliant with current regional, national and international standards and regulations.

ALS industrial will have up to 20 of their highly experienced team providing Inspection, NDT (Non Destructive Testing) and consulting of power system equipment at Qenos Cogeneration plant. Modern and innovative technology and up-to-date equipment are employed to ensure all of ALS testing services are founded on accuracy and quality of service.

ALS Industrial's 'core' business is the supply of integrated condition monitoring, NDT, inspection and asset management services. "We provide engineering lead solutions utilising our highly experienced people. This provides our customers with optimised and efficient inspections and a high level of confidence with regard to regulatory compliance," said Keith Langdon, Melbourne Manager at ALS Industrial.

ALS Industrial have contracts with QENOS and Dow Chemicals. ALS Industrial have recently provided QC and QA services to the Minerva Gas Plant Victoria and are providing inspection services for the Robinson Road Augmentation project. ALS Industrial Division was formed 1954 and employs over 600 highly experienced engineers, scientists and technicians located across 20 branches across Australia. ALS Industrial has worldwide capability and is able to access the combined expertise and experience of a truly global group. All ALS Industrial services are AS/NZS ISO 9001:2000 Quality Assured and/or NATA accredited.

ALS Industrial is a subsidiary of ALS Limited (formerly Campbell Brothers Limited), an Australian based public company that began operations in 1863. ALS Limited is one of the largest analytical laboratory and testing services groups in the world with over 11000 staff in over 300 locations in 50 countries across 6 continents.

For more information contact ALS Industrial Division, 294 Arden Street North Melbourne VIC 3051, phone 03 9236 8000, fax 03 9329 6838, email: keith.langdon@alsglobal.com

ELECTRICAL SUPPLIES MADE EASY

Located in Altona North in Melbourne, AWM Electrical and Data Supplies has been operating for 20 years and have been proudly catering for the needs of industrial and major projects, electrical contractors, data and communication installers, MRO and Industrial Maintenance.

AWM have a reputation for wide reaching knowledge and industry expertise which ensured that when Qenos chose AWM as their electrical supplier their supply worries were over.

AWM began delivery of electrical supplies to contractors at Qenos in January 2012, organising the purchase and onsite delivery of materials such as flameproof light fittings, cable ties, glands, ladder tray, power cables and light poles as per specification. Their commitment to service

and attention to detail means there is a rapid turnaround between receiving a quote and the arrival of the items at the requested location.

AWM are an established Australian electrical wholesaler and part of the of MM Electrical Merchandising (MMEM) purchasing group which gives them access to more than 200,000 products. AWM maintain electrical contracts for many of Australia's industrial and commercial companies including One Steel, Toyota, Mobil and Qenos. Dedicated account managers and a team of specialists oversee the accounts, supplying materials to support scheduled and unexpected maintenance and repairs. AWM also advise customers on developing schemes specifically aimed at reducing energy wastage and carbon emissions associated with lighting and data management.

Below The team at AWM Electrical and Data Supplies, Melbourne.

Denny Kavanagh Manager at AWM credits the success of their company to their 16 highly experienced staff. "Our staff have hands on experience across a number of industries and a record of customer service which is second to none. We offer the best of both worlds, with full personal service and advice on products of a local branch and the worldwide buying power of a global network assuring the best pricing. Our friendly staff will offer cost-effective solutions, innovative problem solving and fast delivery".

For more information contact AWM Electrical and Data Supplies, 115 Dohertys Road North Altona VIC 3025, phone 03 9369 1211, fax 03 9369 1251, email: Alton.mgr@mmem.com.au



ELTEK'S RECTIFIER SOLUTIONS SETTING NEW STANDARDS

Below

Eltek Australia was the manufacturer of the power supply system on the \$45 million Cogeneration Project.



The Cogeneration Plant at Altona is yet another successful example of the technological and innovative edge of Eltek Australia, who was the manufacturer of the power supply system on the \$45 million Cogeneration Project. Eltek was the obvious choice as a leader in the industry and with their solid working relationship with UGL built through working together on other substantial projects around Australia.

For the control of the gas fired turbine at the Qenos Cogeneration Plant, Eltek used the award winning Flatpack2 HE rectifier/converter module. "The Flatpack2 HE is the result of a combination of intensive research over many years and innovative design which has produced an efficiency rate of up to 96.5%, the most efficient rectifier in the industry. The Flatpack2 rectifier has significantly impacted the environmental effort to lower the power consumption of industrial and

telecommunication operations as well as the emission of carbon dioxide. Additionally, because less energy is wasted the Flatpack 2 HE also reduces operational costs and life-cycle costs" said Manager of Industrial Products at Eltek Australia, Ian Rowlands.

Eltek also supplied the DC/AC Inverter INV222 which includes innovative switching technology and the SP2 controller with state-of-the-art functionality and extensive, flexible remote communication capabilities. Management and monitoring can be done from the front panel or via PC. The inverter is compact and guaranteed to be long-lasting and virtually maintenance free.

Eltek has over 40 years' experience as a power conversion specialist. Eltek is supported by a global network with offices in 40 nations, customers in more than 100 countries and employs approximately 2900 people. Eltek

provides critical, cutting-edge power solutions and services across a variety of industries including telecom, railway and metro, power utilities, solar energy and electric vehicles. Rectifier and Inverter systems are all assembled in Australia at their facility in Belrose NSW. Eltek can produce bespoke systems to create reliable, unique and technically innovative solutions to meet their client's exact requirements.

Recent projects have included supply of rectifiers and inverters to the cogeneration plant at Kwinana Power Station and future projects the supply of 100 solar hybrid sites for the National Broadband Network for Telstra.

For more info contact Eltek Australia Pty Ltd, 22 Narabang Way, Belrose NSW 2085, phone 02 9479 4200, fax 02 9479 4292, email: Ian.Rowlands@Eltek.com, website: www.eltek.com

GARLOCK KEEPING THE CONNECTION STRONG

Qenos Cogeneration Plant can be satisfied that their seals and joints are in good hands with Garlock. Gaskets and seals do not get a lot of attention until they fail to function properly but a high quality seal can make a significant difference by reducing downtime, increasing efficiency and helping maximise profitability.

With 125 years of experience made Garlock the perfect choice to ensure the integrity of all joints at the Qenos Cogeneration Plant. Garlock supplied spiral wound gaskets, fibre gaskets and insulation kits. "At Qenos Cogeneration Plant one of the challenges we overcame was the accessibility to the original drawings of the joints. We were able to use our expertise in manufacturing and design to offer bespoke high quality sealing products and also access our extensive product portfolio to provide sealing solutions for any application required. Our advanced engineering capabilities and flexible approach enabled us to deliver excellent results in a demanding environment. Consistent and open communication was important with the clients and the onsite contractors" said Karyn Lodewyke, Sales Manager at Garlock.

Garlock's foundations are built on a commitment to deliver solutions and service to the world's processing industries. Garlock have a commitment

to research and development so products have innovation and experience built in. "Our products are proven to withstand extreme temperatures and pressures as well as aggressive materials which also results in decreased emissions. We can provide sealing solutions to the most challenging power issues, keeping power flowing to the people who depend on it" said Karyn.

Garlock have recently been worked with Nyrstar providing expansion joints to the Port Pirie refurbishment project and with Outotec in the Koniambo Bag house project. Future projects include the Ichthys project will be the largest oil and gas development in the Northern Territory and Queensland Curtis LNG natural gas transmission pipeline network project.



Below Garlock supplied spiral wound gaskets, fibre gaskets and insulation kits for the Qenos Cogeneration Plant.

Garlock Pty Ltd, an EnPro Industries company, is the acknowledged global leader in high-performance fluid sealing products. Products include compression packing, gasketing, hydraulic components, dynamic seals, metal gaskets, high-performance metal seals and critical-service flange gaskets, as well as expansion joints. The company employs 1,887 employees at 15 facilities in 8 countries and provides innovative products to companies in almost every major industry.

For more information contact Garlock Pty Ltd, 6/165 Rookwood Road Yagoona NSW 2199, phone 02 9793 2511, fax 02 9793 2544, website: www.garlock.com.au



TR HIRECOM LEADING THE WAY IN COMMUNICATIONS

Below Established for 15 years, TR Hirecom is Australia's largest two way radio communications rental company.



TR Hirecom is Australia's largest two way radio communications rental company. TR Hirecom was established fifteen years ago and has been hiring two way radios and systems to suit a number of industries including security, construction, manufacturing, mining and petrochemical.

"We supply an extensive variety of radio systems from simple portable radios to complex trunked two way radio systems and satellite phones. Our rental product portfolio consists of the modern, well-maintained and reliable equipment by leading names such as Motorola and

Iridium. Our equipment is delivered, ready-to-use, when you need it", said Paul Di Pasquale, National Rental Manager.

TR Hirecom's staff, whom have many years' experience in the radio industry, will offer expert advice and develop solutions suited to their client's unique requirements. TR Hirecom also offer specialised management services, including event and project planning, consultation, equipment installation, training and on-site communications management. TR Hirecom have offices located strategically across the country and can support hire anywhere in Australia.

With a reputation for exceeding customers' expectations, TR Hirecom has provided two way radio rental solutions for some of Australia's largest events, including the Sydney 2000 Olympics, World Masters Games, Australian Motor Cycle Grand Prix, V8 Supercar Series and The International Airshow. TR Hirecom has recently been awarded the contract to supply over two hundred Motorola digital radios and systems to Monadelphous for their construction contract at Port Hedland.

TR Hirecom is part of TR Pty Ltd, which is a diverse group of businesses delivering specialised technology solutions to commercial and government customers across the Asia Pacific region. TR Pty Ltd's divisions comprise of TechRentals, TR VMS, TR Vidcom, and TR Telecom, which offer services such as test and measurement, calibration and repair, audio visual and business equipment as well as satellite communications.

For more information contact TR Hirecom – Two Way Radio Rentals, 6 Joseph Street Blackburn North VIC 3130, phone 03 9896 3000, fax 03 9896 3115, email: rent@trhirecom.com.au