GOLDMAN ENERGY

THE

COGENERATION EXPERTS

COGEN | TRIGEN | ENERGY | CONSULT | DESIGN | COMMISSION | OPERATE | MAINTAIN | MONITOR

About us

‘Goldman Energy Pty Ltd.’ together with ‘Goldman Plumbing Pty Ltd.’ make up the ‘Goldman Group’. Established in 1964 Goldman Plumbing started offering services to domestic plumbing customers. Now, over 50 years later, The Goldman Group employs around 40 people offering plumbing and engineering services to a wide variety of customers.

Goldman Energy is solely focused on providing Cogeneration, and Trigeneration, projects to our growing customer base throughout Australia.

GOLDMAN GROUP HISTORY

1964	Goldman Plumbing is formed
2009	Urban Energy formed to focus on Energy Efficiency Opportunities
2010	First Cogen project at Rouse Hill Shopping Centre
2013	Qantas TG1 completed at Sydney Airport
2014	Goldman Energy formed to focus on Cogeneration
2014	North Sydney Olympic Pool reaches 12 months operation
2015	Goldman Energy passes 30 installed projects

“At **Goldman Energy** we thrive to offer the best solution to your energy needs. By understanding your needs, we can design the system around your requirement.”

SYSTEM DESIGN

- Bespoke system designs to fit any application: Our experienced engineers work closely with you to guarantee that the solution meets your requirements. Our aim is to optimise the integration into the existing system.
- Turn-key projects from start to finish, and through to ongoing maintenance and support
- Feasibility studies: Used to correctly size the unit to your electrical use to provide the most cost effective solution.
- All of your questions are answered: Our professional team includes mechanical, electrical and civil engineers
- Pump design & install This is critical to the effective operation of the facility. By understanding your pumping requirements, we will select the correct pump type and size for the job.
- Chiller selection/replacement Using Absorption Chillers from World Energy, we will design the correct Absorption Chiller for your project. Correctly sizing the Absorption Chiller ensures optimal cooling and therefore improved energy efficiency.

Qantas Trigeneration Project – 11.7MW

INSTALL

Goldman Energy's certified construction team can install and commission all of the Cogeneration and Trigeneration systems. This team, working closely with both our engineering team and our customers, ensure that the project is completed on time and to an excellent standard.

COMMISSION

This is an essential phase of the project.

Commissioning is completed by our Tedom Level 2 certified engineers. We ensure that the project is successful straight from start-up.

AUTOMATION & CONTROL

The CHP units are supplied with dedicated genset controllers to allow us to fully automate the system. The automated controls allow optimal running efficiency of the project. This significantly reduces your operating costs.

With the Comap control system, the entire operation of the Cogeneration unit can be controlled from a single internet connection.

REMOTE MONITORING OPTIONS:

1. Complete remote control of the system by Goldman Energy
2. Complete remote control of the system with a visual representation of performance and energy output
3. Full control interface to allow your operators to control the system.

Our remote monitoring will provide full diagnostics of the units. This ensures that preventative maintenance can be carried out before any issues occur. This dramatically increases uptime and cost saving.

COGEN SCHEDULED MAINTENANCE

Our qualified service technicians will provide ongoing support for all of the installed equipment. A regular maintenance schedule will be tailored to your requirements to ensure that we provide the level of service that you need.

MAINTENANCE CAN INCLUDE:

- Tedom CHP Units
- World Energy Absorption Chillers (if installed)
- Pumps
- Valves
- Electronic systems
- Project Management
- Documentation

COMAP PROGRAMMING

Comap programming is the alteration of "off the shelf" equipment to customise it to a specific application.

Our customisable monitoring systems can be designed to match your project requirements. A modular arrangement ensures that we can measure all the critical characteristics of your system. As part of the installation phase, our engineers will feedback your data to our Service Management Team.

PRODUCTS

- Distributors of Tedom Cogeneration Units
- Distributors of World Energy Absorption Chillers
- Distributors of Wilo High Efficiency Pumps

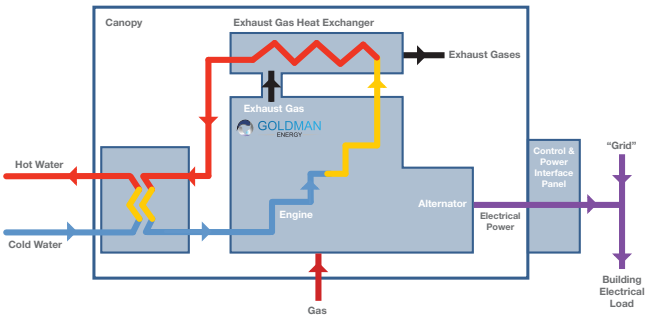
Cogeneration

Cogeneration is a highly efficient and ecologically beneficial method of power generation consisting of the effective utilisation of waste heat while producing power. During this heat and power generation process, fuel energy utilisation is up to 90% with minimal losses.

In conventional (coal fired) electricity generation, for every kWh of electricity generated over 1kg of carbon dioxide is produced, and over 1.5kWh of thermal waste heat is rejected to the atmosphere.

This means only approximately 40%-45% of the energy in the coal is converted into electricity. In addition to this, extra losses of around 10%-25% are associated with the transmission and distribution of electricity from relatively remote power stations to end consumers via the electricity grid. These transmission losses are greatest when electricity is delivered to the smallest consumers.

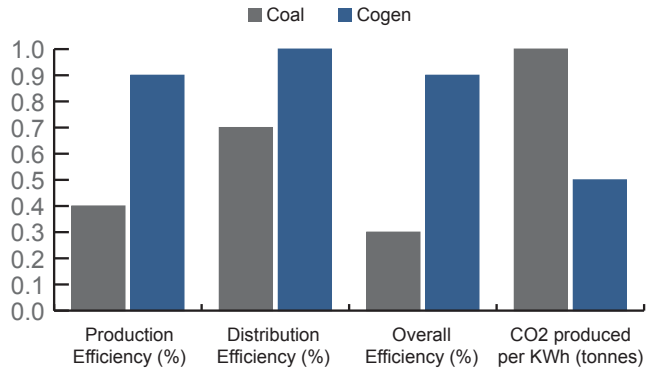
By generating electricity from natural gas, one kWh of electricity only produces around 0.5kg of carbon dioxide, that's 50% compared to coal fired electricity. There is still the 1.5kWh of thermal waste heat generated, however by utilising this waste heat, the efficiency of a cogeneration plant can reach over 90%. Further to this, because the electricity produced by a cogeneration plant is normally used locally, transmission and distribution losses are negligible.



Encompassing a range of technologies, cogeneration will always include an electricity generator and a heat recovery system. Cogeneration installations are usually sited as near as possible to the place where the heat is consumed and ideally are sized to meet the base electrical demand of the site.

ADVANTAGES OF COGENERATION

1. Increased Efficiency
2. Reduced Heat Loss and Energy Wastage leading to Lower Heating Bills
3. Reduced Distribution Losses
4. Reduced CO2 Emissions and Carbon Footprint
5. Reduced Running Costs
6. Reduced Heating Bills



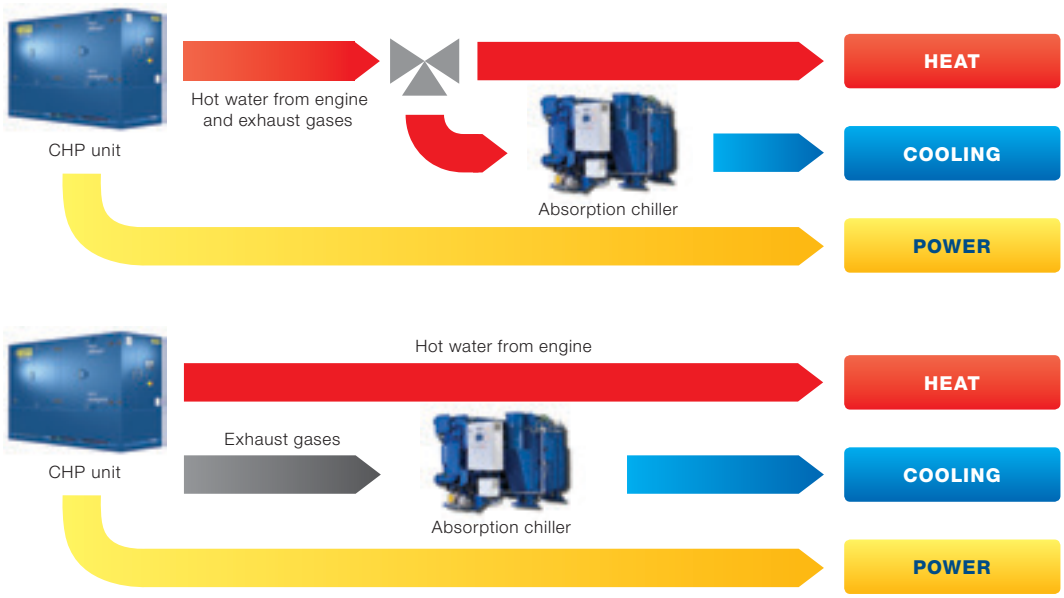
"Having CHP on site acts like your own personal power station, and all the power you generate is available for use. For this reason, governments advocate the use of CHP as a leading energy saving and carbon reduction device"

Trigeneration

These systems can also be designed to provide electricity, heat and cooling. This is referred to as Trigeneration. By installing an Absorption Chiller from World Energy the waste heat can be used to provide chilled water to be used in Air Conditioning or other applications.

TRIGENERATION TECHNOLOGY:

- Combines Cogeneration (Heat and Power) with Absorption Chillers
- Produces water at 5°C to 14°C
- Can utilise either the hot exhaust gases or the hot jacket water, or a combination of the two



ADVANTAGES OF TRIGENERATION

1. Electricity, Heating and Cooling
2. Can be incorporated into HVAC system
3. Increased Efficiency by utilising more waste heat
4. Decreased Air Conditioning costs

ABSORPTION CHILLERS from World Energy

By offering World Energy Chillers Goldman Energy can ensure that the correct Chiller is used in your project. The wide range of efficient chillers meet the highest quality standards. These units can be installed next to the cogeneration, in the same plant room, to reduce floor space.

THE CHILLER SELECTION WILL BE BASED ON:

- Chilled water requirements
- Building Thermal load
- Seasonal demand

Goldman Energy install and commission the Absorption Chillers and offer a maintenance program for long term operation of these units.

Applications

Suitable CHP applications are where there is a demand for both electricity and hot water or heating.

For example:

- Hotels, boarding houses, hostels
- Retirement houses
- Social welfare institutions
- Hospitals and clinics
- Municipal heating plants
- Swimming pools
- Water parks
- Health resorts
- Fitness centres
- Schools
- Office buildings
- Supermarkets
- Trade centres
- Agricultural establishments
- Industrial establishments
- Laundries
- Urban heating plants
- Large residential properties

North Sydney Olympic Pool Cogeneration Project – 100KW

Reference List

IVANHOE GIRL'S GRAMMAR SCHOOL TRIGENERATION

Year 2013
Installation Type Trigeneration
TEDOM Engine Size T100
Electricity Produced 100KW
Heat Produced 146KW
Cooling Capacity 108KW
C02 Saving 479 tonnes

NORTH SYDNEY OLYMPIC POOL

Year 2013
Installation Type Cogeneration
TEDOM Engine Size T100
Electricity Produced 104KW
Heat Produced 142KW
C02 Saving 367 tonnes

RSPCA NEW SOUTH WALES

Year 2010
Installation Type Cogeneration
TEDOM Engine Size T30
Electricity Produced 30KW
Heat Produced 53.9KW
C02 Saving 97 tonnes

QANTAS TRIGENERATION PROJECT

Year 2014
Installation Type Trigeneration
TEDOM Engine Size 2 x T4000 + 2 x T1500
Max Electrical Capacity 11.7MW
Max Heating Capacity 12.3MW
Max Chilled Water Capacity 23.2MW

AUSGRID (FORMALLY ENERGYAUSTRALIA) LEARNING CENTRE

Year 2009
Installation Type Trigeneration
TEDOM Engine Size T120
Electricity Produced 125KW
Heat Produced 177KW
Cooling Capacity 98KW
C02 Saving 599 tonnes

BUPA CLAYTON

Year 2014
Installation Type Cogeneration
TEDOM Engine Size T30
Electricity Produced 30KW
Heat Produced 61.6KW
C02 Saving 295 tonnes

Other projects: Launceston Aquatic Centre – 200 kW, Fitzroy Pool – 50 kW, Pinjarra Aquatic Centre – 100 kW, Rouse Hill Shopping Centre – 30 kW, University of Melbourne Neuroscience – 100 kW, Hawthorn Aquatic Centre – 120 kW, Ivanhoe Grammar Trigeneration – 100 kW, Nobel Park Aquatic Centre – 30 kW, West Pymble Pool – 80 kW, College Street NSW – 30 kW.

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