

# Trigeneration for Citigen

E.ON awarded Edina UK Ltd the contract to replace the existing CHP engines at its prestigious Central London Citigen project. Two new MWM TCG2032V16 high efficiency gas-powered generators will be installed, with a further two to follow. Each engine produces 12MW of heat and is coupled to an 11kV alternator, reports UKPN.

Work is reportedly well under way at E.ON's Central London Citigen project where two new MWM TCG2032V16 high efficiency gas powered generators are being installed. These are due to be commissioned by the beginning of 2015, reports Edina.

Powered by natural gas, the MWM TCG2032V16 genset is capable of generating 4.4MWe and is renowned for its rugged reliability, high efficiency and low operating costs.

A large scale CHP-based community energy system has been operating in the City of London since 1993. It comprises a central power station and a district energy network supplying heating and cooling to customer sites, and is one of only two such systems in the UK.

Following a competition Citigen (London) Ltd was selected as the 'ESCO' (Energy Services Company), and has developed and operated the system to date. Since 2002 Citigen has been a wholly-owned subsidiary of E.ON (UK) plc.

Citigen's CHP system is based at a central power station near Smithfield Market. It has been built behind the retained façade of a former cold store.

It supplies heat - as hot water - to 10 of the City Corporation's properties, including Guildhall, Smithfield Market and the Barbican Centre, via an underground pipe network.

Private customers are also supplied, including a sheltered housing unit for the elderly. Cooling (as chilled water for air conditioning systems) is also provided to 6 properties via separate parallel underground pipe network.

Chilled water is generated mainly by absorption chillers which utilise heat from the engines as their main energy source.

Electricity generated is conveyed to the local distribution grid and sold through Citigen's parent group. This type of system is sometimes known as 'tri-generation'.

The site's original CHP plant was based on two very large V18 compression-ignition reciprocating engines, adapted for dual fuel operation, capable of running on natural gas or oil.

Each engine produces 12MW of heat and is coupled to an 11kV alternator with an output of 15.6MW. Emission control equipment removes up to 95% of the NOx content of the exhaust gases.

Heat is recovered from the engine's key exhausts, turbochargers, jacket cooling, and lubricating oil. It is then transferred via heat exchangers to the district heating network. The absorption chillers are also supplied with heat. Any surplus heat produced is dissipated to the atmosphere by cooling towers.

The operating regime of the engines is dictated by prevailing electricity and gas prices. Typically one engine operates during the day but not overnight or at weekends.

When the engines are not operating heat supplies to the network are maintained by backup boilers.

Chilled water is generated by two absorption chillers each rated at 5.6 MW manufactured by Trane. Electrically-powered chillers provide a further 3.3 MW of cooling and are used when engines and absorption chillers are offline.

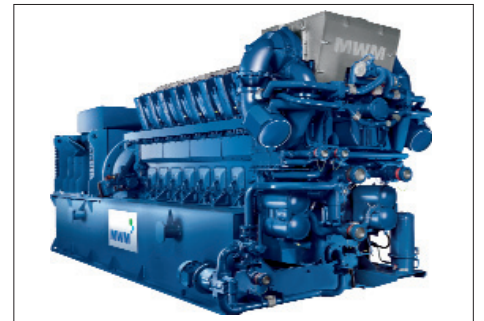
The district energy network extends for a total distance of 3.6km through the north western parts of the City, with a branch running north into Islington.

For ease of installation and access, the majority of the pipework and cables makes use of existing subways, basements and car parks with the rest buried under roads.

The City Corporation benefits directly from the CHP system in a number of ways:

- There are real financial savings to be made through lower energy charges
- There are significant CO2 emissions savings made through the the CHP operation

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- A Citigen profit sharing scheme has been established
- There is support for the Environmental Policy, Local Agenda 21, and Community Strategy
- The facility effectively eliminates the Health & Safety risks associated with cooling towers
- CFC and HCFC refrigerant gases in original cooling plant are removed
- Space savings can be made thanks to the ergonomic design of the system.

E.ON's Energy Solutions business currently supplies power and gas to over 5 million domestic, small and medium-sized enterprise and industrial customers across the UK.

With customers at its heart, Energy Solutions also offers innovative energy services and technologies tailored to meet its customers' needs.

The business is designed to help customers become energy fit by encouraging them to insulate their homes, moderate their energy usage and even to generate their own power through microgeneration systems such as ground source heat pumps and solar panels for both homes and businesses.

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