



## **Gas engine power plants are an ideal solution for district heating**

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**A study conducted by the Essen-Duisburg University in cooperation with MAN Diesel & Turbo compares engines and turbines in CHP applications.**

**MAN Diesel & Turbo SE**  
Stadtbachstraße 1  
86153 Augsburg, Germany

In the generation of district heating from combined heat and power (CHP) sources, gas engine power plants offer a number of advantages over classic gas combined-cycle power plants. This is the conclusion drawn from a comparative study conducted by the Essen-Duisburg University in cooperation with MAN Diesel & Turbo. Engine combined power plants were found to be operationally superior, both in terms of energy efficiency as well as cost-effectiveness.

**Head of Media Relations  
Power & Turbo**  
Jan Hoppe

For the study, the power data of a conventional gas combined-cycle power plant and two different configurations of an engine power plant were compared. In engine power plant technology, multiple gas engines are arranged in combination, and can be individually switched on or off as required.

Tel. +49 (0) 821 – 322 3126  
jan.hoppe@man.eu  
www.mandieselturbo.com

Apart from industrial CHP, the main area of application for CHP plants in the multi-digit megawatt range is the supply of district heating. “Industrial CHP applications tend to be very specific in their requirements for heat supply”, explains Tobias Vogel, research assistant in the Department for Environmental Process and System Technology at the Essen-Duisburg University, who provided support for the study. “For this reason, we focussed on district heating applications, and specifically the district heating network of a small city, which represents a typical example for district heating production in Germany.”

A multitude of parameters were compared, such as the heat yield, electricity production, fuel consumption, fuel utilisation and financial yield of the systems. The conclusions were clear:

“All of the systems provided the necessary heat demand and met the legally required efficiency of more than 80 percent”, says Vogel. “But in the end, it must be noted that the engine combined systems have proven themselves more favourable than gas combined-cycle power plants and were opportune in terms of their energy efficiency and cost-effectiveness. The economic



optimum was shown to be achieved with a mix of engines in simple CHP mode and others with downstream coupled water- or steam-cycles.”

“The concept of engine combined power plants is not very well established in Germany yet”, explains Dr. Thomas Polklas, Development Engineer at MAN Diesel & Turbo. “But especially when considering the background of the constantly rising feed-in of renewable energies to the grid, this technology offers further advantages. As well as ensuring the supply of a municipal power network, engine combined power plants can be used for grid support in the residual load market due to their flexibility and modular construction. There is a substantial potential for additional revenues here.”

As one of the few producers in the market, MAN Diesel & Turbo manufactures both gas and diesel engines, as well as gas and steam turbines. “We have the most comprehensive CHP generation equipment portfolio in the market, which means we can advise our customers completely impartially”, says Wayne Jones, Member of the Executive Board for Global Sales and After Sales. “Our focus lies solely on the question of which technology is best suited to meet the demands and expectations of the customer”.

The full study is available for download from the following links:

Germany [http://powerplants.man.eu/docs/librariesprovider7/brochures/man-gas-engine-study\\_de](http://powerplants.man.eu/docs/librariesprovider7/brochures/man-gas-engine-study_de)

English: [http://powerplants.man.eu/docs/librariesprovider7/brochures/man-gas-engine-study\\_en](http://powerplants.man.eu/docs/librariesprovider7/brochures/man-gas-engine-study_en)

**About MAN Diesel & Turbo**

MAN Diesel & Turbo SE, based in Augsburg, Germany, is the world's leading provider of large-bore diesel and gas engines and turbomachinery. The company employs around 14,500 staff at more than 100 international sites, primarily in Germany, Denmark, France, Switzerland, the Czech Republic, India and China. The company's product portfolio includes two-stroke and four-stroke engines for marine and stationary applications, turbochargers and propellers as well as gas and steam turbines, compressors and chemical reactors. The range of services and supplies is rounded off by complete solutions like ship propulsion systems, engine-based power plants and turbomachinery trains for the oil & gas as well as the process industries. Customers receive worldwide after-sales services marketed under the MAN PrimeServ brand.