

Jenbacher J412 cogeneration technology installed atop the Deutsche Börse Group's office

Deutsche Börse, Eschborn, Germany



Background

The diversified exchange organization Deutsche Börse Group turned to INNIO's proven Jenbacher cogeneration technology to power its 21-story headquarters, which are located in the financial center of Frankfurt/Rhine-Main, Germany. Since 2010, two J412 cogeneration units have efficiently delivered the site's electrical, heating, and cooling needs from the tower's rooftop.

Combined heat and power (CHP) energy conversion, also known as cogeneration, saves about 39%** of primary energy compared to the separate generation of power and heat. That's why the EU urges member states to expand the installation of CHP plants in support of its emissions reduction and energy efficiency goals.

As part of its climate-change initiatives, the EU has committed to a strategy that builds a more secure and cleaner energy future cutting greenhouse gas emissions and primary energy consumption by 40% as well as boosting energy efficiency and the renewable share of the energy mix by 27%—all by 2030.

Solution

In November of 2010, the CHP plant highlighting two of INNIO's Jenbacher J412 cogeneration units was officially inaugurated. The plant provides 1.6 MW of reliable electrical and thermal (heating and cooling) power to support the building's operations.

Fueled by natural gas—a cleaner-burning alternative to other fossil fuels—the Jenbacher units boast long component life and extended service intervals as well as patented LEANOX* lean mixture combustion to further reduce emissions in support of Germany's environmental initiatives.

In warmer months, hot water from the cooling circuit of the two cogeneration plants serves as drive energy for two absorption chiller devices. During cold seasons, this thermal power is used to meet the building's heating requirements.

Result

This project is a prominent showcase of the progress being made by Germany's business and government sectors to support the EU's emissions reduction and energy efficiency goals. The new onsite power plant helps enhance the energy security of operations that play a vital role in supporting Germany's economy every day. And, surplus electricity is sent to the regional grid to increase energy reliability for the Frankfurt area.

While every country has its own unique, domestic and imported energy supply profile, INNIO's fuel-flexible Jenbacher gas engine technology can support CHP projects throughout the EU because the cogeneration units can use natural gas, renewable biogases, or industrial waste gases to generate onsite power.

A further benefit of installing more energy efficient CHP plants—like the one at the Deutsche Börse Group's headquarters tower—is the reduction in regional greenhouse gas emissions related to displacing the need for utilities to use fossil fuels to generate electricity for the grid.

Customer Benefits

A CHP plant with INNIO's J412 technology provides:

- Reduced operational costs through onsite power generation
- Increased revenue, and enhanced local energy reliability, with surplus electricity sent to the grid
- Increased return on investment due to use of available heat for hot water and steam generation
- Improved overall energy security
- Support for EU's goal of cutting greenhouse gas emissions and primary energy consumption by 40% as well as boosting energy efficiency by 2030.

Key Technical Data

Number and type of units	2 x J412	
Electrical output	1,688	
Thermal output	1,684	
Electrical efficiency	43.1%	
Fuel	Natural gas	
Emissions	NOx <500mg/Nm ³	CO <300mg/Nm ³
Commissioning	2010	

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**Based on IEA '16 electricity production figures for EU-28 and EIA '17 average power plant heat rate references