

INDUSTRIAL POWER PLANT GREIFSWALD.

High performance for
more efficiency.



Heat for natural gas. Electricity for people.

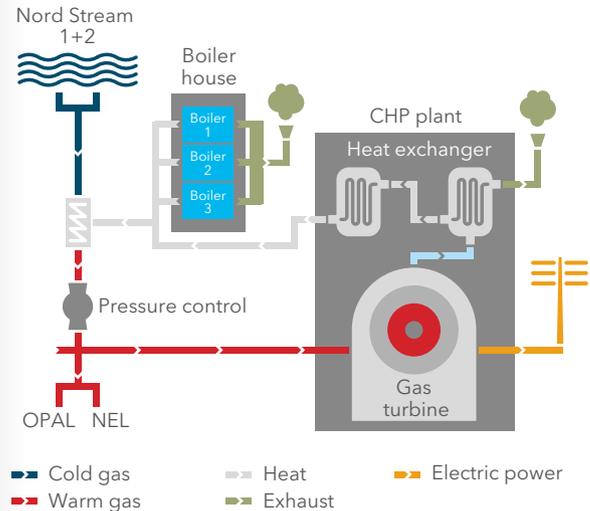
Since 2013, the highly efficient power plant in Lubmin near Greifswald, Germany, has been generating heat to warm up natural gas from the Nord Stream Baltic Sea pipeline and, at the same time, electricity for almost 50,000 households.

Natural gas from Russia has been transported to Germany through the 1,224 km-long Baltic Sea pipeline since 2011. The gas is fed into the German gas grid in Lubmin.

It arrives there at a pressure of more than 100 bar. To be able to transport it further through the gas grid at a maximum pressure of 100 bar, it must be warmed before the pressure is reduced.

This task is performed in Lubmin by a natural-gas-fired gas turbine plant using highly efficient combined heat and power (CHP).

How the CHP plant in Lubmin works.



Combined heat and power - flexible and decentralised.

Combined heat and power (CHP) technology uses fuel to generate electrical energy and useful heat at the same time. The best results are attained when natural gas is used, as it is the most environmentally friendly fossil fuel. Because the plant uses both electricity and heat at the same time, the energy efficiency rate is much higher than with conventional power plants that only generate electricity. This reduces the fuel requirements for supplying heat and electricity, and hence the plant's harmful emissions. In addition, it generates electricity and heat locally where they are needed (decentrally), which reduces the load on the energy supply networks.



Combined heat and power at the highest level.

The CHP plant sets new standards in decentralised and flexible energy generation. The highly modern gas turbine developed by Siemens has a useful heat output of around 47 megawatts and an electrical capacity of around 39 megawatts. That corresponds to up to 200,000 megawatt hours of electricity a year, which is fed into the local electricity grid.

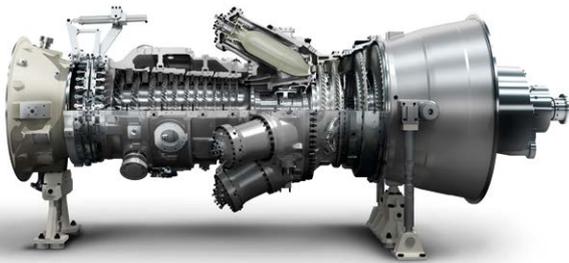


Illustration:
Courtesy of Siemens

The SGT-750 gas turbine from Siemens

Power generation:	38.1 MW(e)
Gross efficiency:	40.2%
Heat rate:	8,953 kJ/kWh (8,486 Btu/kWh)
Turbine speed:	6,100 rpm
Pressure ratio:	23.8:1
Exhaust mass flow:	113.8 kg/s (250.9 lb/s)
Exhaust temperature:	458°C

The heart of the plant is the SGT 750 gas turbine from Siemens. The turbine was deployed here for the first time worldwide and is more efficient, more flexible, easier to maintain and, above all, more environmentally friendly than conventional plants.

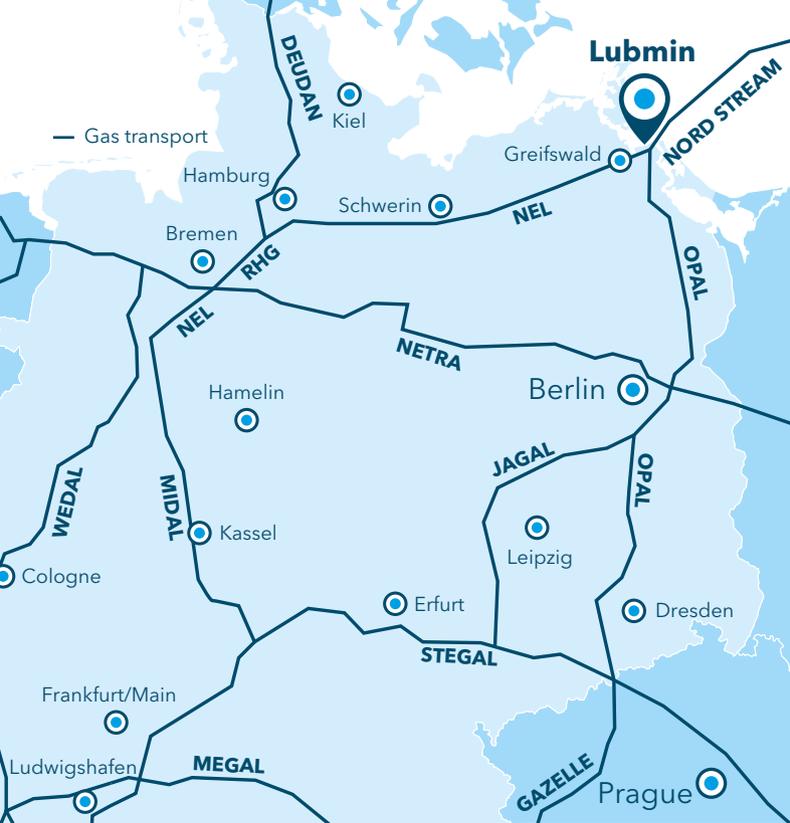
The heat from the exhaust gas is harnessed using a modern, highly efficient exhaust-gas heat exchanger from Viessmann OMNICAL. With the aid of control dampers, all or part, as required, of the mass flow of exhaust gas is fed quickly and flexibly into the exhaust-gas heat exchanger.

From nought to sixty in a few minutes.

If needed, the gas turbine can ramp up to full-load operation in just 15 minutes. Electricity generation can also be separated quickly from heat production at any time. The gas turbine can thus respond in seconds to the needs of the electricity market, irrespective of the heat requirements of the landing terminal. The CHP plant thus helps balance fluctuations in regenerative power generation in the grid quickly and flexibly. As a result, natural gas makes an important contribution to ensuring supply security in the electricity sector, making it an indispensable partner in the energy transition.

Combined heat and power improves the carbon footprint.

The effective use of heat and high level of efficiency of the gas turbine provide the Lubmin power plant with a utilization rate of around 90 per cent. A conventional plant without CHP doesn't even achieve half that. As a result, the power plant avoids releasing somewhere in the region of 40,000 tonnes of CO₂ a year, which is equivalent to the annual CO₂ emissions of around 13,000 cars.



Energy hub Lubmin.

Natural gas flows from Western Siberia to Europe through the Baltic Sea. The Lubmin landing terminal provides the link between the Nord Stream Baltic Sea pipeline and the European gas pipeline network. Here, the power plant is operated directly with environmentally friendly natural gas.

The CHP plant is a joint project between WINGAS GmbH and E.ON Energy Projects. The project company Industriekraftwerk Greifswald GmbH was established to build and run the plant.

WINGAS and E.ON as partners.

WINGAS GmbH is one of the largest natural gas suppliers in Germany. For over 20 years, we have supplied municipal utilities, regional gas suppliers, industrial companies and power plants throughout Europe with affordable and environmentally friendly energy. WINGAS procures natural gas from producers in the North Sea and Russia.

E.ON Energy Projects is a leading supplier of decentralised energy generation solutions. It implements electricity and heat generation solutions for industrial customers. In addition to developing concepts, the company builds and finances the plants and then operates them together with its customers.

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