



GASCADE

THE GAS COMPRESSOR STATION MALLNOW

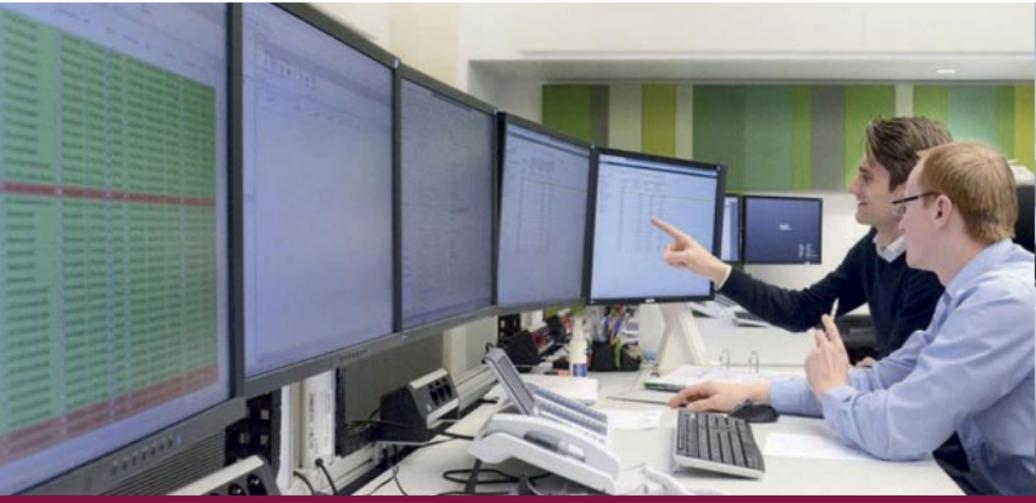


NATURAL GAS FOR EUROPE



On the path to climate-neutral supply with renewable energies, in other words, solar, wind and water, gas plays an important supporting role in Europe, since it acts as a bridge, scoring points with its large reserves, low emissions and secure transport routes. And GASCADE guarantees the latter: We make sure that gas within Germany's borders reliably reaches its respective destinations. After all, while both industrial and private demand for gas is going up, the production volume within Europe is going down. That's why gas in our pipeline network moves from the major sources in Russia and Northwest Europe both to consumers in Germany and its neighboring countries of Belgium, France, the Netherlands, Poland and the Czech Republic, and on to Southeastern Europe.

PRESSURIZING GAS



From the source to where it's used, natural gas travels many thousands of kilometers in pipelines measuring up to 1.4 meters in diameter. During this journey it loses pressure as the molecules rub against each other and the inside of the pipe.

To keep the density and hence the transport speed of the gas constant, it is compressed in natural gas compressors.

These are the core of the eleven GASCADE compressor stations that are spaced at around 250 kilometers apart in the pipeline network.

What happens in the compressor?

Several impellers are securely arranged behind each other on a rotating, cylindrical shaft in a steel casing and rotate at a speed of up to 3,600 and 10,300 revolutions per minute. This spins the molecules of the inflowing gas outward, thus compressing them more densely together. The compressors are driven by gas or electric motors located in enclosures in compressor houses for the purpose of noise control. The gas' volume is reduced when it is compressed. That means more energy can be transported through the pipeline. The pipeline's capacity increases – and so does supply security for customers.

MALLNOW COMPRESSOR STATION



The compressor station in Mallnow, Brandenburg, near the border with Poland, is one of the most important facilities in the GASCADE pipeline system. That's because Russian gas flows from it through JAGAL (Yamal Gas Pipeline Link) into the German gas pipeline network and westward. In addition, gas can be transported from Germany to Poland counter to the main direction of flow – around the clock, seven days a week. The GASCADE employees on site ensure that everything runs safely and smoothly.

Saving energy and compressing more efficiently

In October 2007, GASCADE set new standards and invested around 25 million euros in a steam turbine that is driven solely by the waste heat from the three existing gas turbines.

Since then, with an output of 20 megawatts, it has driven an additional natural gas compressor. As a result, the station's total output has risen by almost 25 percent without the need to use additional energy. Up to 3.34 million cubic meters of gas per hour can be transported. That's more than a third of Germany's natural gas requirements in the same period.

The station, spread over an area of around 4.8 hectares, includes four compressor buildings, five gas drying plants, a gas quality and gas metering station, a waste heat boiler and air condenser, a utility and an operations building, and a workshop.

TECHNICAL INFORMATION

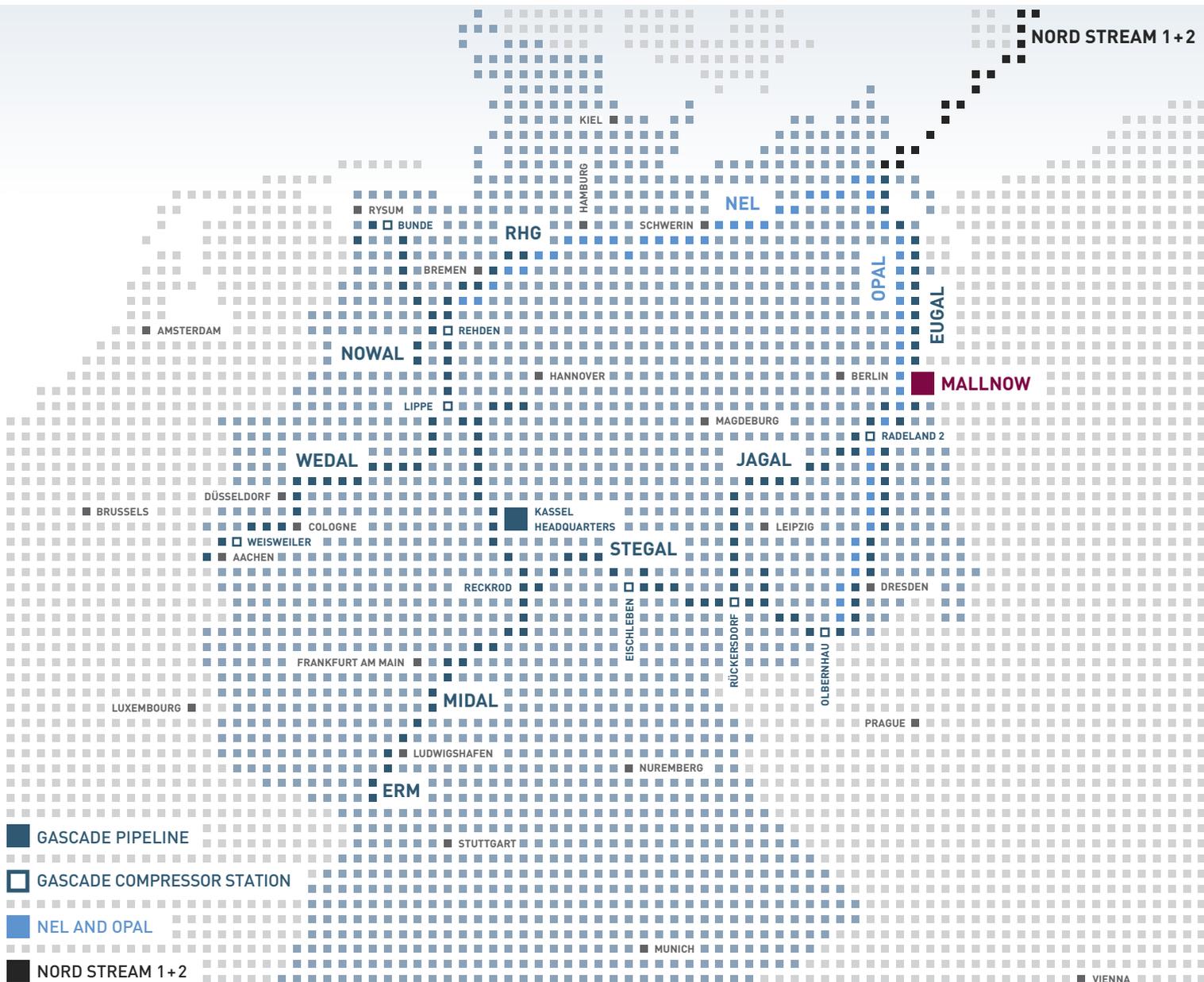


- 1 Operations building
- 2 Warehouse and workshop
- 3 Gas drying plants
- 4 Cogeneration plant
- 5 Exhaust duct
- 6 Compressor buildings with gas turbines
- 7 Waste heat exchanger
- 8 Steam turbine
- 9 Air condenser

TECHNICAL DATA

Compressor output	96.2 megawatts (3 x 25.4 MW and 1 x 20.0 MW)
Number of compressors	4
Type of drive	FT8 gas turbine Steam turbine
Max. operating pressure	100 bar
Capacity (m ³ /h at normal conditions)	3.34 million
Commissioned in	11/96

GASCADE'S PIPELINE NETWORK



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