

GASCADE

THE GAS
COMPRESSOR
STATION
REHDEN

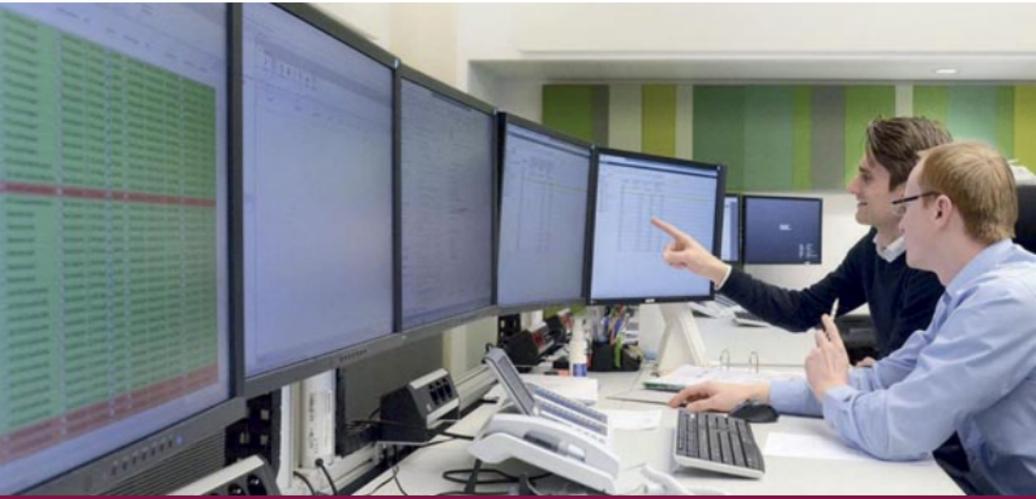


NATURAL GAS FOR EUROPE



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.

REHDEN COMPRESSOR STATION



Five of Germany's most important gas pipelines converge in Rehden, Lower Saxony, south of Bremen:

- NEL (Northern European Gas Pipeline)
- RHG (Rehden-Hamburg Gas Pipeline)
- MIDAL Central and North (Central German Pipeline Link)
- NOWAL (North-West Pipeline Link)
- and the Muenster Natural Gas Pipeline.

Here, at GASCADE's biggest pipeline node, three compressors compress the gas for its onward journey. The maximum pressure is then more than 90 bar. In total, up to 3.6 million cubic meters of natural gas an hour can flow through the station and be transported onward in any direction. By comparison: The average European household uses around 2,700 cubic meters per year.

Safe on site

The GASCADE employees in Rehden have already been ensuring the right density, a continuous flow, and secure operation since 2012. In 2016, the company added an additional compressor unit with a gas turbine to the station. Alongside the three compressors, the GASCADE employees at the site, spread over around ten hectares, look after three gas pressure control and measurement systems, a pressure reduction system, a valve station, a utility and an operations building, and a workshop. In addition, they monitor and look after a pipeline section measuring around 350 kilometers.

TECHNICAL INFORMATION

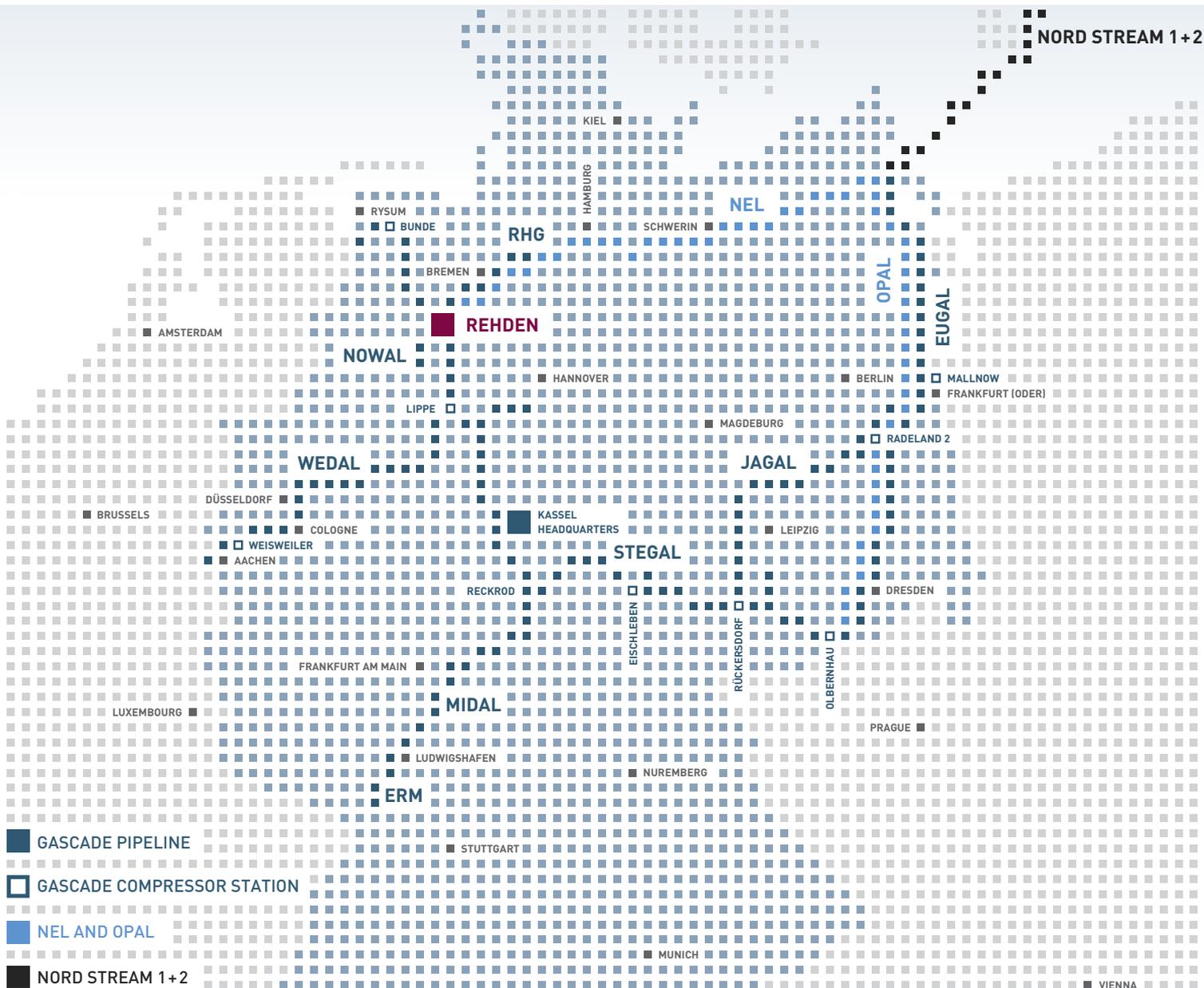


- 1** Fuel gas conditioning and warehouse **4** Compressor buildings
- 2** Operations building and workshop **5** Gas coolers
- 3** Gas pressure control and measurement system

TECHNICAL DATA

Compressor output	28.9 megawatts (2 x 11 MW, 1 x 6.9 MW)
Number of compressors	3
Type of drive	Electric motor and gas turbine
Max. operating pressure	100 bar
Capacity (m ³ /h at normal conditions)	3.6 million
Commissioned in	11/2012, expanded in 2018

GASCADE'S PIPELINE NETWORK



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