

# Combined heat and power plant DREWAG

## CASE STUDY



### Combined heat and power plant provides flexibility and black start capability

Wärtsilä's state-of-the-art gas engine technology will provide flexibility and black start capability to DREWAG, the local utility company in Dresden, Germany. The combined heat and power (CHP) engine power plant will produce electricity and district heating simultaneously. Upon completion, it can support the restart of the Dresden grid in case of a power blackout.

DREWAG is a local utility company in Dresden, the capital of the federal state of Saxonia in Germany that supplies nearly 300,000 household and industrial customers with electricity, natural gas, drinking water and district heat. The current set up at Dresden-Reick Innovation Power Plant consists of a dual fuel cogeneration plant that is operated with natural gas or

light diesel oil, several heat accumulators, and 800 kW solar PV production together with a 2 MW battery storage. DREWAG wants to invest in a flexible CHP gas engine plant to participate in the day-ahead, intra-day and balancing power markets. In addition, DREWAG is further committed to renewable energy.

"The state-of-the-art gas engine technology provided by Wärtsilä is designed to produce minute-to-minute power when it is most valuable. It is equipped with the highest level of efficiency and emission control systems to supply safe, clean, and affordable energy for the state capital for the coming decades."

*Dr. Frank Brinkmann, Managing Director, DREWAG*

"The high level of flexibility together with the increased efficiency of the plant is a decisive step for the energy transition in Germany. And with the new Wärtsilä 31SG engines, DREWAG achieves the highest efficiency that is currently available on the market for highly flexible engine power plants."

*Melle Kruisdijk, Vice President, Europe, Wärtsilä Energy Business*

**KEY DATA**

**CUSTOMER:** DREWAG

**TYPE:** Wärtsilä 31SG based combined heat and power (CHP) engine power plant

**OPERATING MODE:** Flexible, power oriented production with district heating production, especially supply for day-ahead, intra-day and balancing power markets

**GENSETS:** 8 x Wärtsilä 31SG

**TOTAL OUTPUT:** Over 90 MW electrical and approximately 84 MW of district heating

**FUEL:** Natural gas

**SCOPE:** EPC and guaranteed asset performance agreement for ten years, with a five-year extension option

**DELIVERY:** Operational in 2021

We develop and deliver solutions and services to help our customers maximise performance and profitability throughout the asset lifecycle.

Wärtsilä will deliver a CHP engine power plant with high deployment flexibility and black start capability to DREWAG. The new 90 MW CHP plant will produce electricity and district heating simultaneously and has high electrical and overall efficiency. A side aspect of the plant is its black start capability, where the Dresden-Reick gas engine plant will be very important for the start-up of the Dresden grid in case of a blackout. Wärtsilä will supply the black start capability without the need for a separate emergency generator, as power for necessary auxiliaries is supplied by a dedicated uninterruptible power supply (UPS) system.

“The state-of-the-art gas engine technology provided by Wärtsilä is designed to produce minute-to-minute power when it is most valuable. It is equipped with the highest level of efficiency and emission control systems to supply safe, clean, and affordable energy for the state capital for the coming decades,” stated **Dr. Frank Brinkmann**, Managing Director, DREWAG.

**High efficiency and flexibility from the start of engine**

The Dresden-Reick power plant will feature eight Wärtsilä 31SG engines operating on natural gas and delivering an electrical output of approximately 90 MW. W31SG engines are extremely flexible and have the highest efficiency on the market. They are capable of reaching full output from start-up in approximately two minutes to provide immediate balancing of the grid. The plant can operate on the secondary balancing market in Germany even from stand still. That means the plant will synchronize to the grid in less than 30 seconds. This is vital as the system utilises more and more energy from intermittent renewable sources, such as wind and solar. Due to its flexibility and “fast start to full power” capability the power plant will also support Germany in its energy transition towards renewable energy sources.

In 2018, Wärtsilä delivered a 10 MW CHP plant to TEAG Thüringer Energie AG and built a 100 MW CHP plant to Kraftwerke Mainz-Wiesbaden (KMW). According to **Melle Kruidijk**, Vice President, Europe, Wärtsilä Energy Business: “This is the second major CHP engine power plant that

Wärtsilä is building in Germany, and the first with our new Wärtsilä 31SG engines. DREWAG is well known as a leader in applying the latest and most progressive technologies. This contract represents, therefore, a valuable endorsement of Wärtsilä as energy system integrator – our capabilities to understand, design, build and serve optimal power systems for future generations.”

The Dresden-Reick facility will be delivered on an engineering, procurement and construction (EPC) basis. Wärtsilä will also maintain the plant under a Guaranteed asset performance agreement (maintenance contract with guaranteed performances) for ten years, with a five-year extension option. The agreement guarantees the plant availability and starting reliability as well as safe operation of the power plant. The plant is scheduled to become operational in 2021.

“The new power plant enables us to give a concrete answer to the energy transition in Dresden. We are committed to renewable energy as well as to security of supply at the same time. The new CHP plant does both with its high deployment flexibility and black start capability”, says Dr. Brinkmann.

THE CHALLENGE	WÄRTSILÄ'S SOLUTION	BENEFITS
Need for continuous and reliable electricity and district heating to Dresden city	Wärtsilä 31SG based combined heat and power engine power plant	Efficient electricity and heat generation. Safe, reliable, clean, and affordable energy
Need to increase the share of renewables in the power system and balance the intermittency of renewable energy	Extremely flexible and efficient Wärtsilä 31SG engines operating on natural gas and reaching full output from start-up in a matter of only a couple of minutes	Minute-by-minute power production providing a perfect balance to renewables
Need to ensure that the plant will start and operate reliably in a matter of minutes	Professional maintenance of the power plant with 10-year maintenance agreement	Guaranteed maximised asset performance, availability and profitability, extremely high starting reliability and safe operation of the power plant

