

SUPPLY YOUR OWN POWER AND HEAT

with Jenbacher propane gas-fueled combined heat and power units

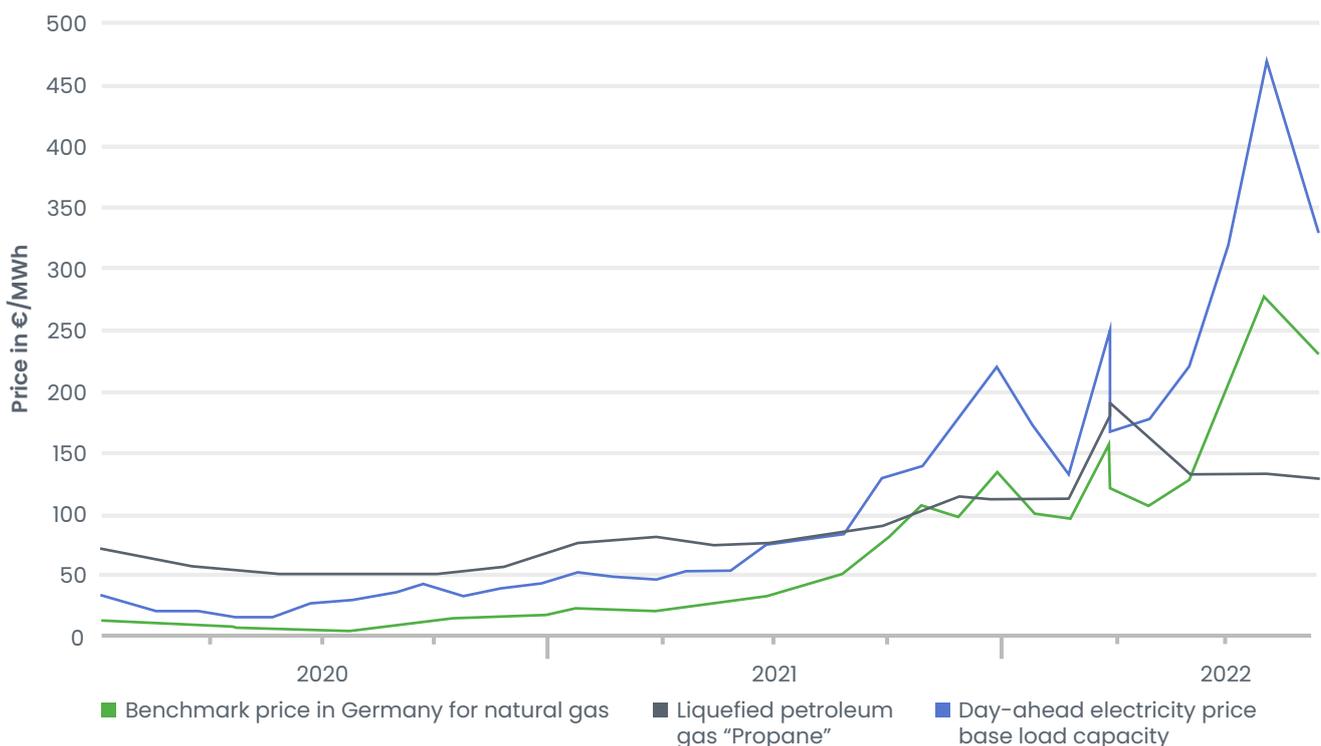


Current challenges and solutions for the manufacturing sector in Germany, Austria, and Switzerland

As a result of soaring energy costs, energy-intensive manufacturing companies face financial challenges serious enough to threaten their very existence. The good news is that there is an alternative to the public grid. Investing in your own combined heat and power (CHP) unit, installed at or near the point of use, can cover part or even all of your power and heat requirements. One of the main energy sources used to operate these units is

propane gas. In June 2022, the price of propane gas undercut pipeline gas for the first time, making it an attractive proposition compared to sourcing electricity from the grid. Moreover, the European Commission is encouraging businesses to switch from pipeline gas to alternative energy sources in order to prevent severe interruptions and potential shortages in pipeline gas supplies.

Energy sources and electricity price trends in Germany



What is propane gas?

Propane is a colorless, combustible gas that can be liquefied using compression.

Propane: HD-5: C_3H_8 > 95% (vol) (DIN 51622/ÖNORM C1301)

GPL (Italy): GAS DI PETROLIO LIQUEFATTO: > 85% (vol) C_3H_8 / < 15% (vol) C_4H_{10}

Both HD-5 grade and GPL are defined as propane gas in the more detailed analysis below.

Fuel flexibility is the key to a financially sustainable and future-proof solution

A Jenbacher J620 CHP unit can run on propane or pipeline gas, switching between them as needed: the ideal solution to pipeline gas shortages and pipeline gas price volatility. Fuel-flexible Jenbacher solutions make your business more resilient by allowing you to respond to a rapidly changing price environment.

Analysis: The cost-effectiveness of decentralized, propane gas-fueled CHP units for the manufacturing industry

The scenario

An illustrative example of a manufacturing company connected to the public natural gas grid (separate power and heat generation with power from the grid and heat from existing heat sources)

Key benefits

- Optimizes your energy costs and ensures security of supply
- Gives you fuel flexibility

Propane gas pays off

Energy is a major operating cost for manufacturing firms. This calculated example demonstrates the energy costs you could save by incorporating a propane gas-fueled CHP unit to cogenerate power and heat exclusively for in-house use. Depending on the general conditions and the temperature levels required, this setup can deliver at least 88% total efficiency, which far outperforms the scenario where power and heat are supplied separately.

The example calculation shows that the **levelized cost of electricity (lifetime costs divided by energy production)** of a Jenbacher propane gas-fueled CHP unit is **€146/MWh** (based on 5,700 operating hours per annum).

So if we assume, for example, that electricity on the open market is priced at €400/MWh, the Jenbacher solution represents a saving of more than 60%.

Your investment will pay for itself well within a year.

HD-5 grade and GPL propane gas are not to be confused with **LPG, camping gas, and autogas**:

LPG: Liquefied Petroleum Gas: 40–50% (vol) C_3H_8 / 50–60% (vol) C_4H_{10}

Camping gas: A non-standardized butane-propane mixture whose proportions vary.

Autogas: A butane-propane mixture compliant with EN 589. Its minimum knock resistance is the same as that of butane.

400
€/MWh

~63%
saving

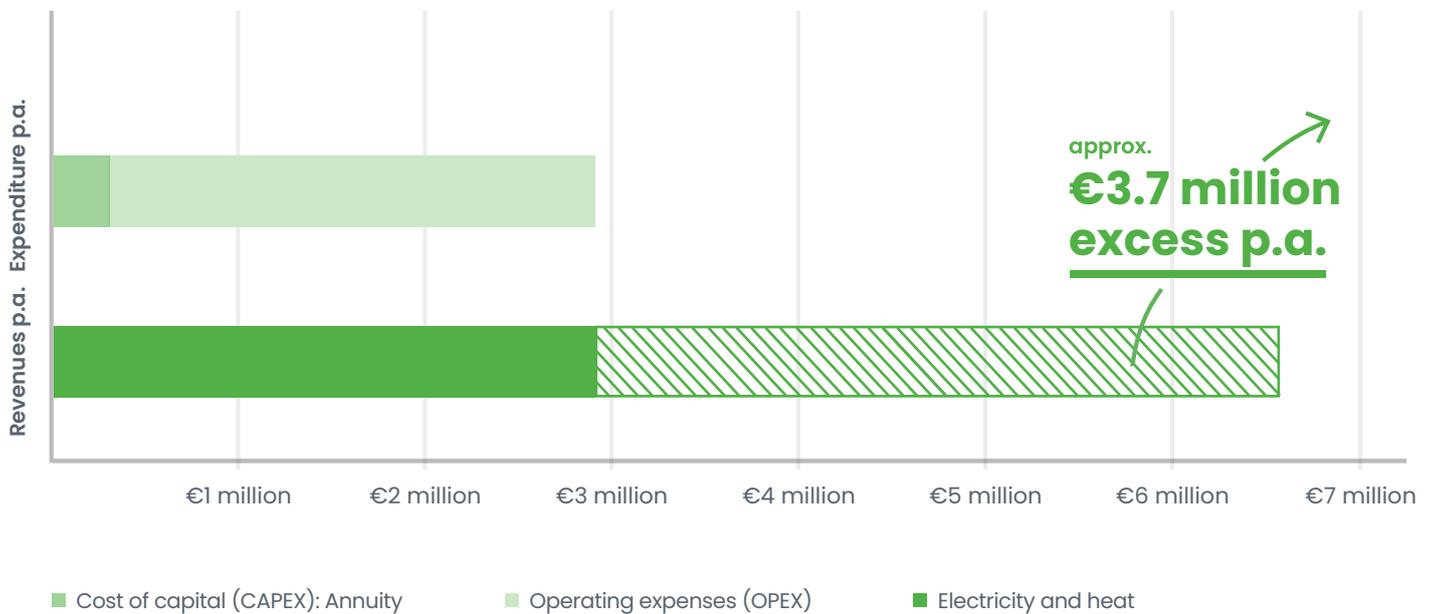
146
€/MWh

Propane gas-fueled cogeneration (CHP) with a J620 engine

Electrical output	2,431 kWel
Thermal output	2,436 kWth
Energy consumption	5,522 kW
Power generation	13,648,850 kWh per year
Heat generation	13,885,200 kWh per year



All figures rounded.

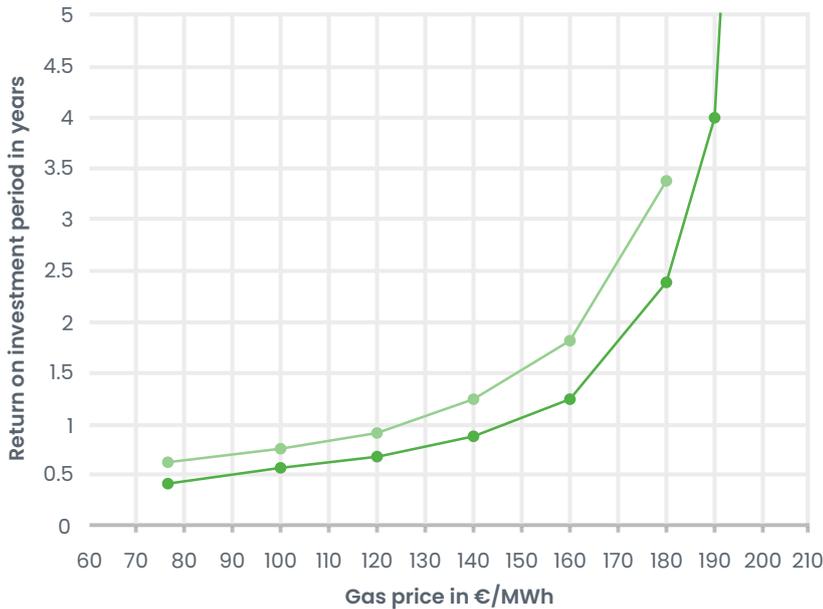


Return on investment period: about 0.6 years

Assumptions:

- Propane gas: €0.076/kWh
- Grid electricity price: €0.4/kWh
- Value of heat: €0.08/kWh
- Annual operating hours: 5,700
- Based on a 10-year observation period; 4% interest p.a.

Propane gas versus pipeline gas



ROI period in years

In the example we used, the plant is guaranteed to operate cost-effectively at a long-term propane gas price of €76/MWh for as long as the price of natural gas exceeds €116/MWh.

The levelized cost of electricity in the example is €146/MWh.

- Propane gas in €/MWh
- Pipeline gas in €/MWh

Fuel flexibility is the key to a financially sustainable and future-proof solution

It is exactly in times like these, when energy prices are constantly changing, that our customers can use their Jenbacher solutions to respond flexibly by using other energy sources. The fuel-flexible Jenbacher J620 CHP unit can also operate at its customary high overall efficiency using pipeline gas – so if the price trend reverses, you still win.

What our customers say

»The energy-cost subsidies announced by government are not enough to offset rocketing electricity prices. To keep our operations cost-effective and viable, we opted for two high-efficiency Jenbacher CHP units, making us less dependent on the volatile energy exchanges. And if prices move back in favor of pipeline gas, we are perfectly placed to take advantage of that – thanks to the fuel-flexibility of our Jenbacher solution.«

Michael Deutsch, Managing Director, Friedrich Deutsch Metallwerk Ges. m.b.H.

The “Ready for Hydrogen” option makes it easier for your unit to be converted to run on hydrogen – once it is more easily accessible – instead of on today’s conventional fuels.



Innsbruck-based Metallwerk Friedrich Deutsch, which produces ski edges as well as special metal parts for major automotive manufacturers, is responding to the energy crisis by setting up its own power plant and investing in two fuel-flexible, propane gas-operated INNIO Jenbacher CHP units.

In general, “Ready for H₂” Jenbacher units can be converted to operate on up to 100% hydrogen in the future. Details on the cost and timeline for a future conversion may vary and need to be clarified individually.

INNIO is a leading energy solution and service provider that empowers industries and communities to make sustainable energy work today. With our product brands Jenbacher and Waukesha and our digital platform myPlant, we offer innovative solutions for the power generation and compression segments that help industries and communities generate and manage energy sustainably while navigating the fast-changing landscape of traditional and green energy sources. INNIO is individual in scope, but global in scale. With our flexible, scalable, and resilient energy solutions and services, we enable our customers to manage the energy transition along the energy value chain wherever they are in their transition journey.

INNIO is headquartered in Jenbach (Austria), with other primary operations in Waukesha (Wisconsin, U.S.) and Welland (Ontario, Canada). A team of more than 4,000 experts provides life-cycle support to the more than 55,000 delivered engines globally through a service network in more than 100 countries.

INNIO’s improved ESG Risk Rating again secures the number one position across more than 500 companies globally in the machinery industry assessed by Sustainalytics.

For more information, visit INNIO’s website at www.innio.com
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