

COGENERATION - EFFICIENT GENERATION OF ELECTRICITY AND HEAT



How does **combined heat and power** generation work?

The benefits of cogeneration

- High energy efficiency
- Partial or complete emission reduction (when powered by biogas)
- Long-term financial savings and the possibility of obtaining a cogeneration bonus

Cogeneration is the combined production of electricity and heat, in short **CHP - Combined Heat and Power**. It is a device that simultaneously produces two types of energy, using much less fuel than if electricity and heat were produced separately. Thanks to this, it is possible to significantly increase energy efficiency, reduce CO₂ emissions and reduce operating costs.

How does the cogeneration work?

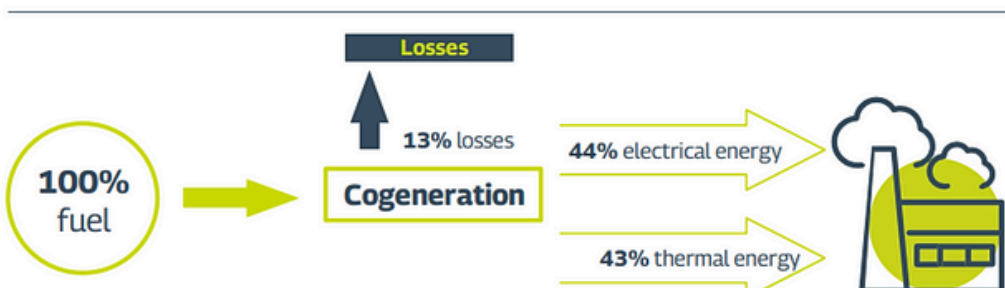
A cogenerator consists of two basic elements: a drive device and an electric generator. The drive device can be an engine with an internal combustion chamber (e.g. a popular diesel engine adapted to burn gas) or a gas turbine. What allows for such efficient production is the recovery of heat from exhaust gases (300-600°C) and the engine casing (80-90°C). Thanks to this, electricity and heat are obtained in one process, which can be used usefully.

Fuel consumption diagram

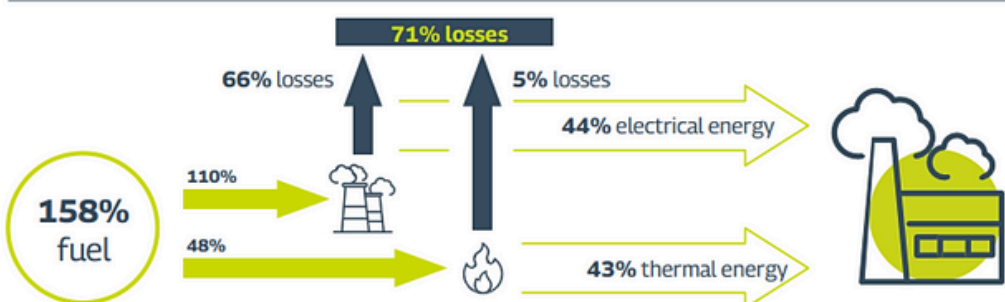
On the right you will find a diagram of fuel consumption in cogeneration and separate production of electricity and heat.

In the case of separate production, the average fuel consumption is about 158% of the fuel consumption in cogeneration when producing the same amount of heat and electricity. The losses are also greater - in the case of cogeneration, the losses are about 13%, while in separate production it is as much as 71% losses, including 66% losses from electricity production and 5% losses in heat production.

Cogeneration



Separate energy production



Investments with cogeneration in the lead role

The largest LNG-powered cogeneration unit in southern Poland - Schumacher Packaging

CLICK ON THE TITLE TO SEE THE PROJECT

EUR 5 mln

Cost of the project

3 years

Payback period

Work progress

Initially, we planned to build a cogeneration unit with a capacity of 1 MW. However, over time this plan changed and finally the cogeneration installed by DB Energy produces 4.4 MW of energy and 4 MW of heat, including 1.7 tons of steam, needed in the production process.

The plant had an existing LNG gas station for its own needs. It turned out that to power a larger cogeneration unit, twice as much gas was needed than the station could provide. We also built a transformer station, which powers the plant's power infrastructure.

Currently, production is not only dependent on two boilers in the CHP plant, but it is also possible to produce heat and steam in a gas boiler room and cogeneration. Thanks to the diversification of energy sources, these installations can be used interchangeably and energy can be saved. The cogeneration unit currently provides about 40% of the plant's energy demand.

2 cogeneration units in the Soufflet Malt House

We proposed...

Modernization of the malt dryer heat supply system by using an ammonia heat pump, supported by two cogeneration units with a total thermal power of 2.2 MW.

The cogeneration units provide almost the entire electricity demand of the plant (power of the units 2 x 0.99 kWe). Additionally, we designed and built a new source of cooling with a power of 4.2 MW at the Client's plant.

The total investment cost was

EUR 6.8 mln

and it was fully covered by DB Energy thanks to financing in

ESCO model

Cogeneration bonus

The cogeneration premium is a form of financial support. It can be used by entities that **build new or modernize existing units** that generate energy in cogeneration.

We are talking about high-efficiency cogeneration units, i.e. those whose efficiency is higher than 75%. Its aim is to promote and stimulate the development of modern energy technologies that contribute to the reduction of CO₂ emissions. The guaranteed cogeneration premium **in 2025 is PLN 133.80** for every 1 MWh of electricity produced.



CLICK AND READ OUR ARTICLE:

COGENERATION BONUS - WHAT IS IT AND WHO CAN APPLY FOR IT?



Depending on the size of the unit, various forms of support are offered as part of the cogeneration premium. For units with an electrical capacity below 1 MW, a guaranteed premium is available - awarded for each new or modernized unit that meets the emission and efficiency criteria. Due to its attractiveness, this is a form of support that we often recommend. Obtaining a premium for units with higher capacity is much more complicated and is related to, among other things, the obligation to discharge part of the generated heat into the public network, but it is also possible.

Kajetan Wiśniewski, Project Engineer at DB Energy

1445

industrial projects

We help medium and large industrial companies become part of a zero-emission future. We want to co-create factories that we could have right outside our doors. We advise, design, implement and finance energy efficiency activities. This is decarbonization that pays off.



EUR 1.3 bn

value of completed projects

9.8 TWh

total reduction in energy consumption

EUR 512 mln

annual savings of our customers

Decarbonization that pays off