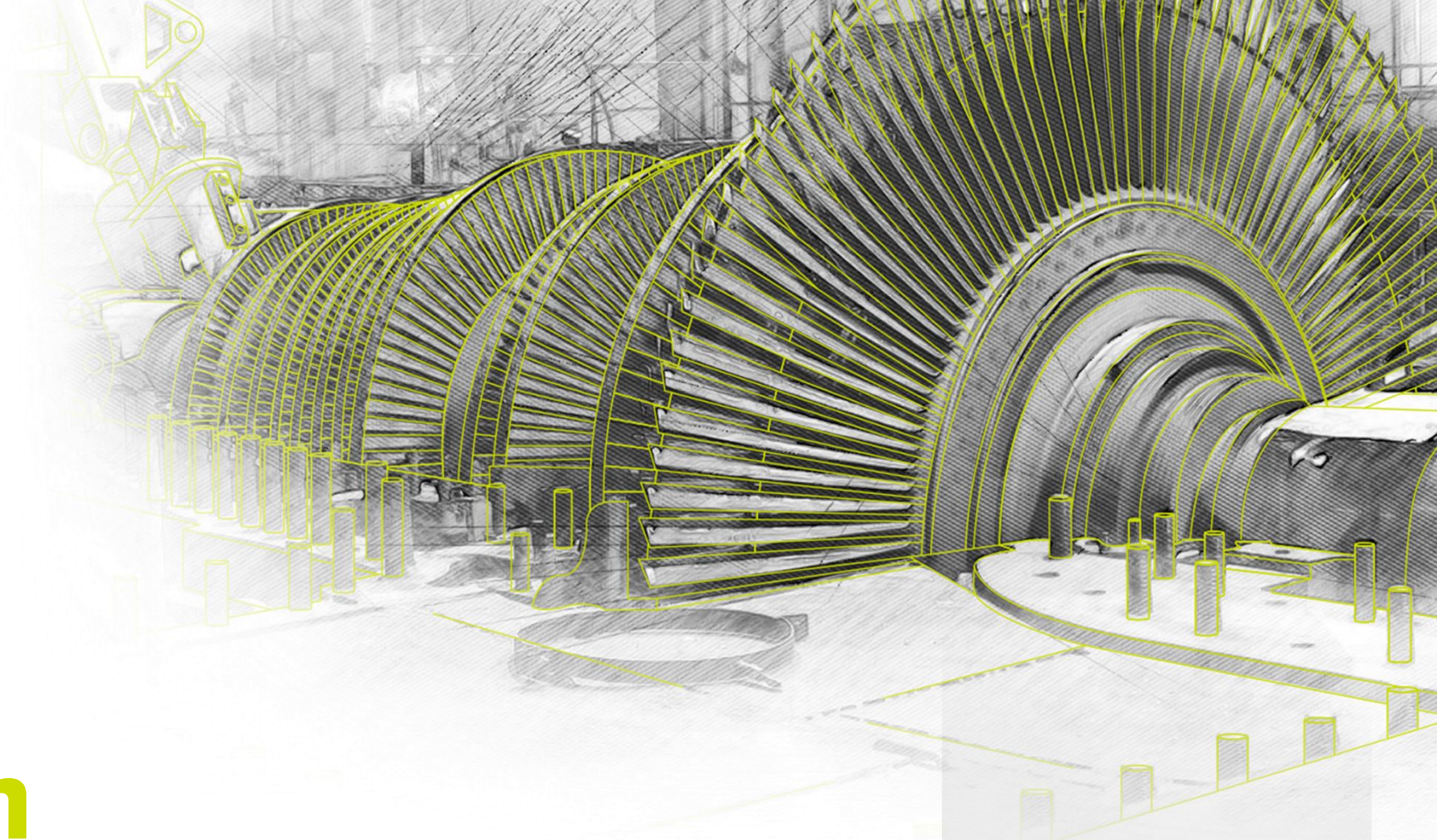




DB ENERGY

Zero-emission industry



# Cogeneration

DB Energy

Wrocław, 2026



# REDUCING EMISSIONS AND ENERGY CONSUMPTION



*We help medium-sized and large industrial companies become part of a zero-emission future. We want to co-create factories that we could have right next door. We tailor each service to your needs and requirements, advising, designing, implementing and financing energy efficiency measures. **It's decarbonization that pays off.***



**Ph.D. Eng. Piotr Danielski**

President and co-founder of  
DB Energy

# BENEFITS

## Unconventional solutions

We combine audit expertise with interdisciplinary knowledge and the best technical solutions. We implement non-obvious combinations of technologies based on detailed analyses. Thanks to this, the projects we propose deliver the greatest benefits.

## Decarbonization, that pays off

We develop, implement, and finance energy-efficient investments, enabling industrial companies to achieve real zero-emissions in a way that generates profit. By delivering projects from audit to execution, including financing, we can implement an investment for which the Client does not have to contribute a single penny.

## Real zero-emission

Where businesses are compelled to adapt to environmental regulations, that's where we step in. We support companies in increasing their competitiveness by reducing emissions and energy consumption. As a result, they become more competitive — and the environment becomes cleaner.

# MISSION AND VISION



## Mission

Implement decarbonization and energy efficiency in industry in such a way that companies want to do it and find it profitable!



## Vision

We want to help create factories that we could have in our neighborhood - zero-emission, quiet and energy-efficient.

**Decarbonization that pays off  
- additional profits thanks to energy  
efficiency.**

We make sustainable and effective investments in decarbonization that bring our clients long-term financial and environmental benefits.

# DB ENERGY OFFER

## CONSULTING

- Walk Through Audit
- Energy Efficiency Audit
- Company Energy Audit
- White Certificates
- Carbon Footprint Calculation
- Zero Emissions
- Energy Measurements
  - Cooling Source Efficiency Measurements
  - Air Compressor Efficiency Measurements
  - Boiler Efficiency Measurements
  - Fan and Pump Efficiency Measurements
- Interim Energy Efficiency Manager

## INVESTMENT IMPLEMENTATION

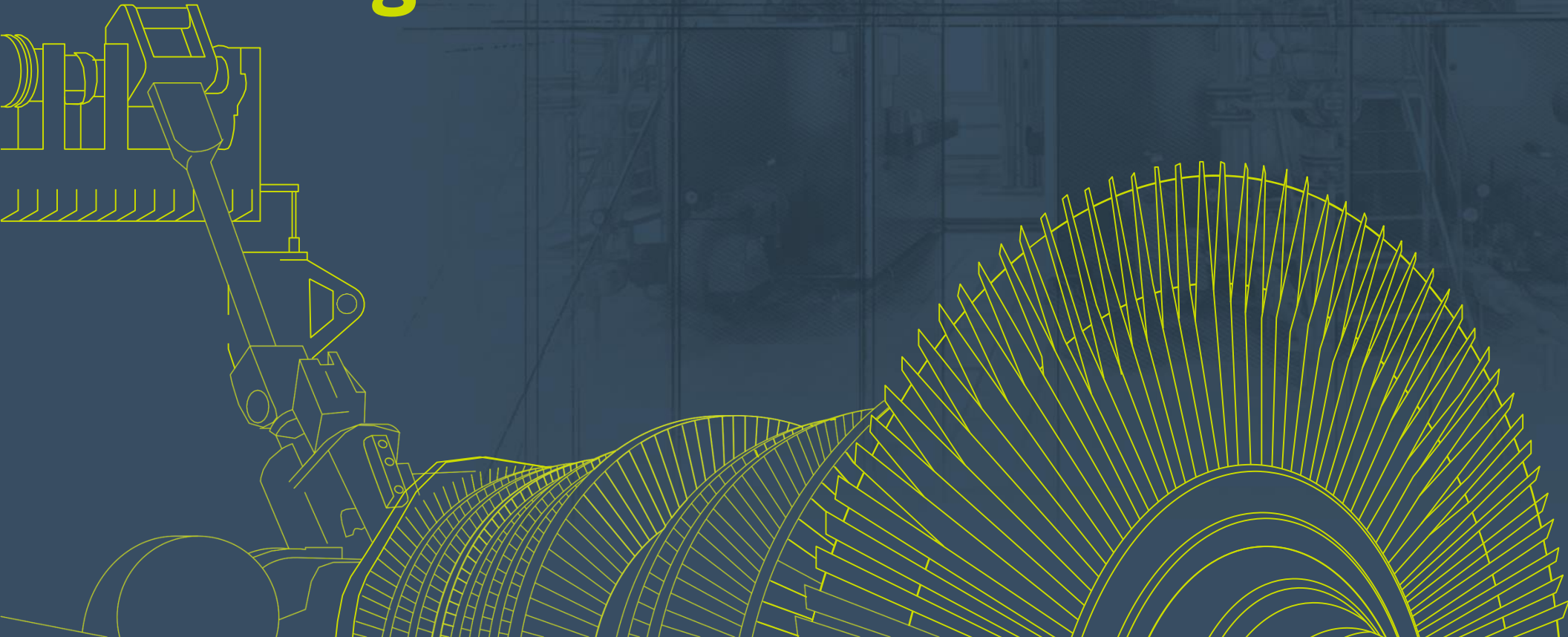
- Feasibility study
- General contracting
- ESCO investment financing
- Energy monitoring
- Interim Energy Efficiency  
Manager

## TECHNOLOGIES

- Cogeneration
- Photovoltaics
- Heat recovery
- Refrigeration
- Compressed air
- Drive control
- LED lighting
- Energy management systems

# Cogeneration

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## COGENERATION



Cogeneration is the combined production of electricity and heat, abbreviated as **CHP - Combined Heat and Power**. It is a device that simultaneously produces several types of energy, using much less fuel than if, for example, electricity and heat were produced separately.



Want to learn more about cogeneration?

**We have two articles for you in our knowledge base:**



What is cogeneration and why should you implement it in your company?



Cogeneration bonus - what is it and who can apply for it?

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**Director of Product Management**

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# COGENERATION

## How does cogeneration work and where is it effective?

Cogeneration produces electricity and heat simultaneously. It can also produce cooling (trigeneration) or steam. It is suitable for plants that consume large amounts of these utilities, such as the food, paper, and chemical industries.

A typical 1 MW cogeneration unit fits into a 3x12m space. The drive unit can be an internal combustion engine or a gas turbine. The entire unit is housed in a soundproof container.

It will bring the best results in facilities that use electricity and heat at a consistently high level throughout the year. We usually recommend selecting a unit in such a way that no energy surpluses are generated.

# COGENERATION

**COGENERATION (CHP - Combined Heat and Power)**  
is the simultaneous generation of electricity and heat or cooling.

Natural gas

Nitrogenated natural gas

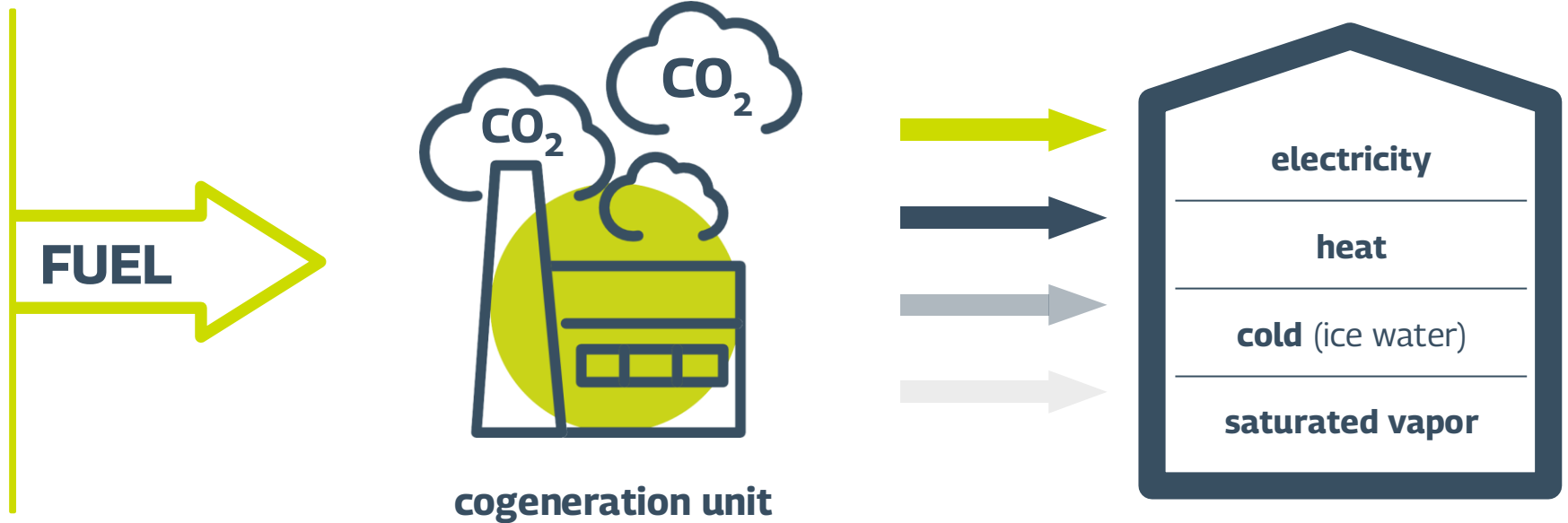
Biogas

Mine gas

Syngas

Coke oven gas

Coal



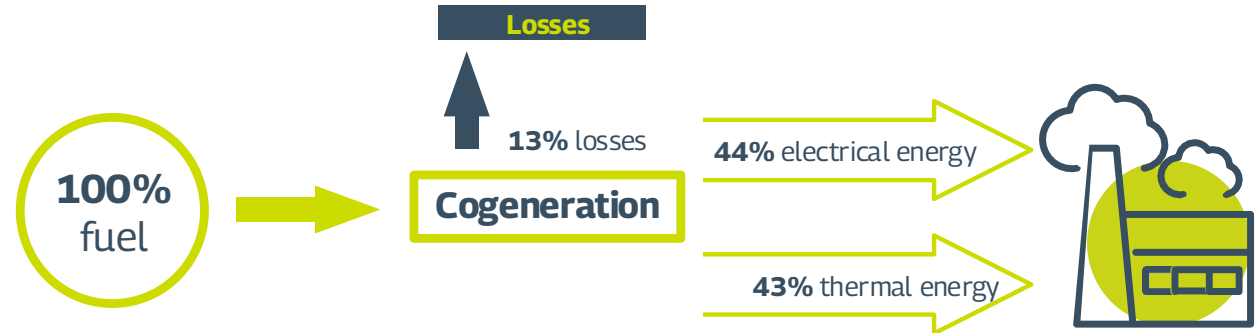
# COGENERATION PROFITABLE

## Why is cogeneration profitable?

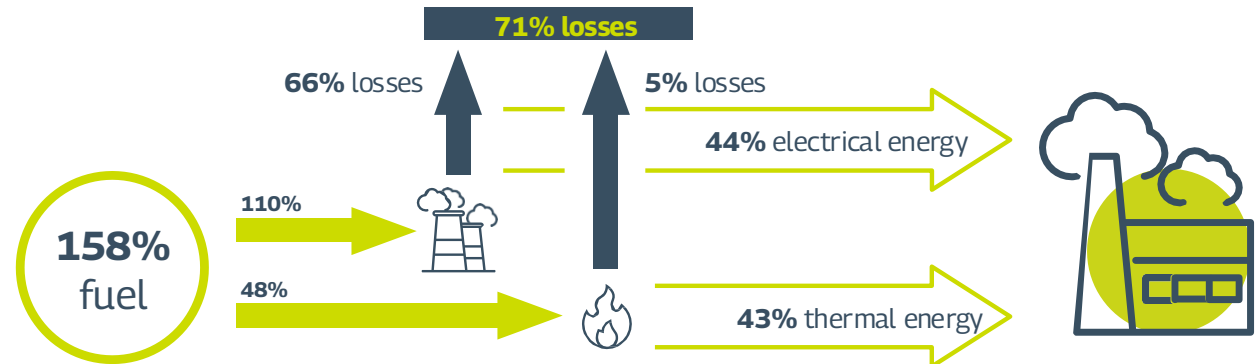
it allows energy losses to be prevented while simultaneously generating electrical energy, thermal and cooling energy.

it allows energy transfer losses to be prevented while generating energy on site - in a client's industrial plant.

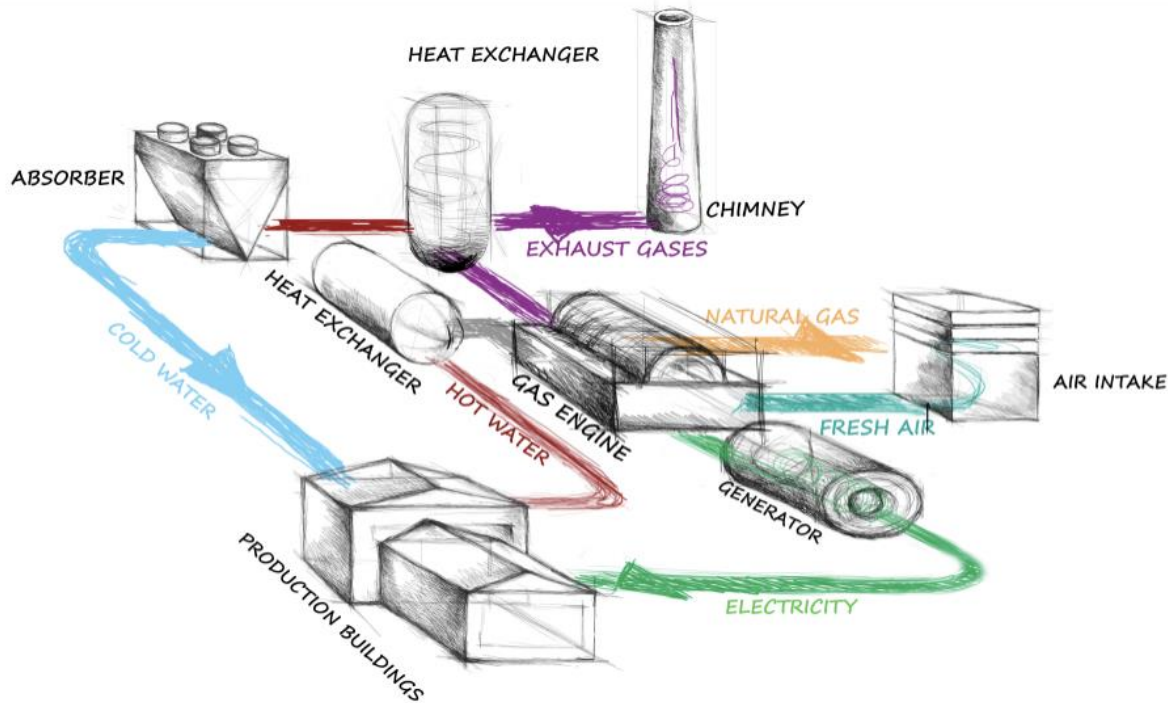
### Cogeneration



### Separate energy production



# GAS COGENERATION WORK?



cogeneration is usually driven by a standard internal combustion engine

an engine drive shaft powers a synchronous generator through a drive gear and, therefore, energy is generated

while combusting fuel, generated thermal energy is transferred into cooling oil which is stored in an engine jacket and through a flue gas exchanger it is then transferred to hot water which cools flue gases

the unit might be equipped with an aggregate to produce chilled water

the unit is additionally equipped with a cooling installation in order to enhance its performance

# GAS COGENERATION WORK?

**To keep the device in good working order and ensure its lifetime warranty, the following should be done:**

service every 1 500-2 500 h

overhaul after 25 000 - 30 000 h

major overhaul after 72 000-80 000 h of operation



# Structure of a typical COGENERATION UNIT

## FLUE GASES HEAT EXCHANGER

heat exchanger to generate thermal energy (hot water, overheated water, water steam, thermal oil) due to thermal energy recovery from flue gases

## FLUE GAS SILENCER

free-standing flue gas chimney with a two-stage silencer ( resonance and absorptive)

## MECHANICAL DRAFT COOLING TOWER

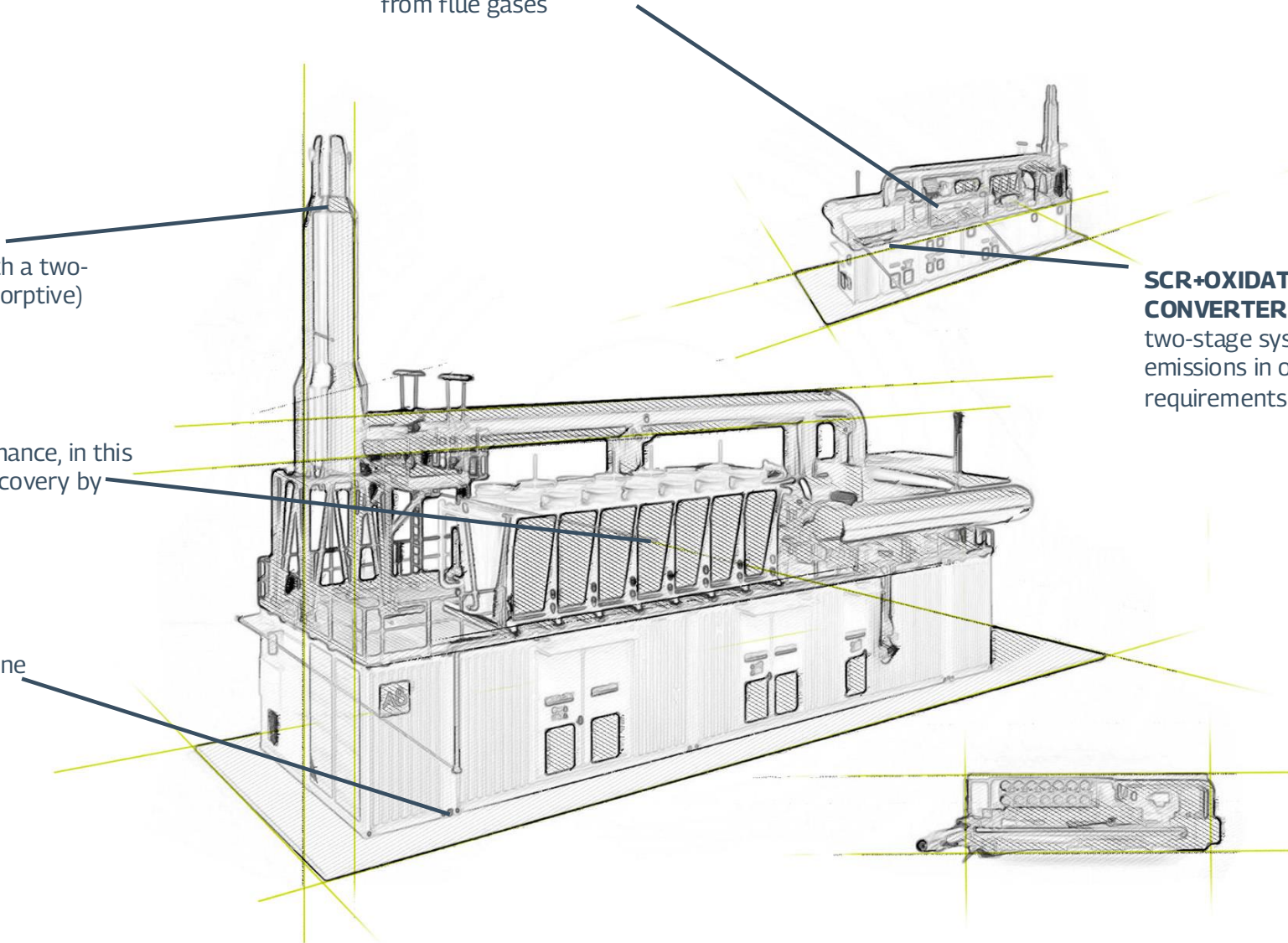
device to support constant engine performance, in this module for partial or no thermal power recovery by users

## GAS CONNECTION FLANGE

point for connection with a client's pipeline

## SCR+OXIDATION CATALYTIC CONVERTER

two-stage system to reduce NO<sub>x</sub> and CO<sub>2</sub> emissions in order to meet the local requirements



# Structure of a typical COGENERATION UNIT

**ENGINE**  
reciprocating internal combustion engines operating in the Otto cycle are dedicated to apply a wide range of gas engines (natural gas, biogas, APG, mining gas, synthetic gas) which are characterized by flexibility in their application

**ACCUSTIC SCREENS FOR INLET AIR**  
Number of noise barriers dedicated to screen deeply noise generated by a cogeneration module and to provide an optimal combustion/cooling air flow in the engine room

**ELECTRIC GENERATOR**  
alternator connected with the crankshaft to transform mechanical power to electrical power

**ELECTRICAL SWITCHBOARDS**  
switchboards to connect an alternator to the energy grid

**UREA TANKS**

**OIL TANKS**  
2 tanks to store lubricating oil (fresh and wasted) equipped with water-tight tubs

**ARRESTER**  
A panel in an alternator preventing from voltage surge

**HYDRAULIC CIRCUIT TO SPREAD AND RECOVER THERMAL ENERGY**

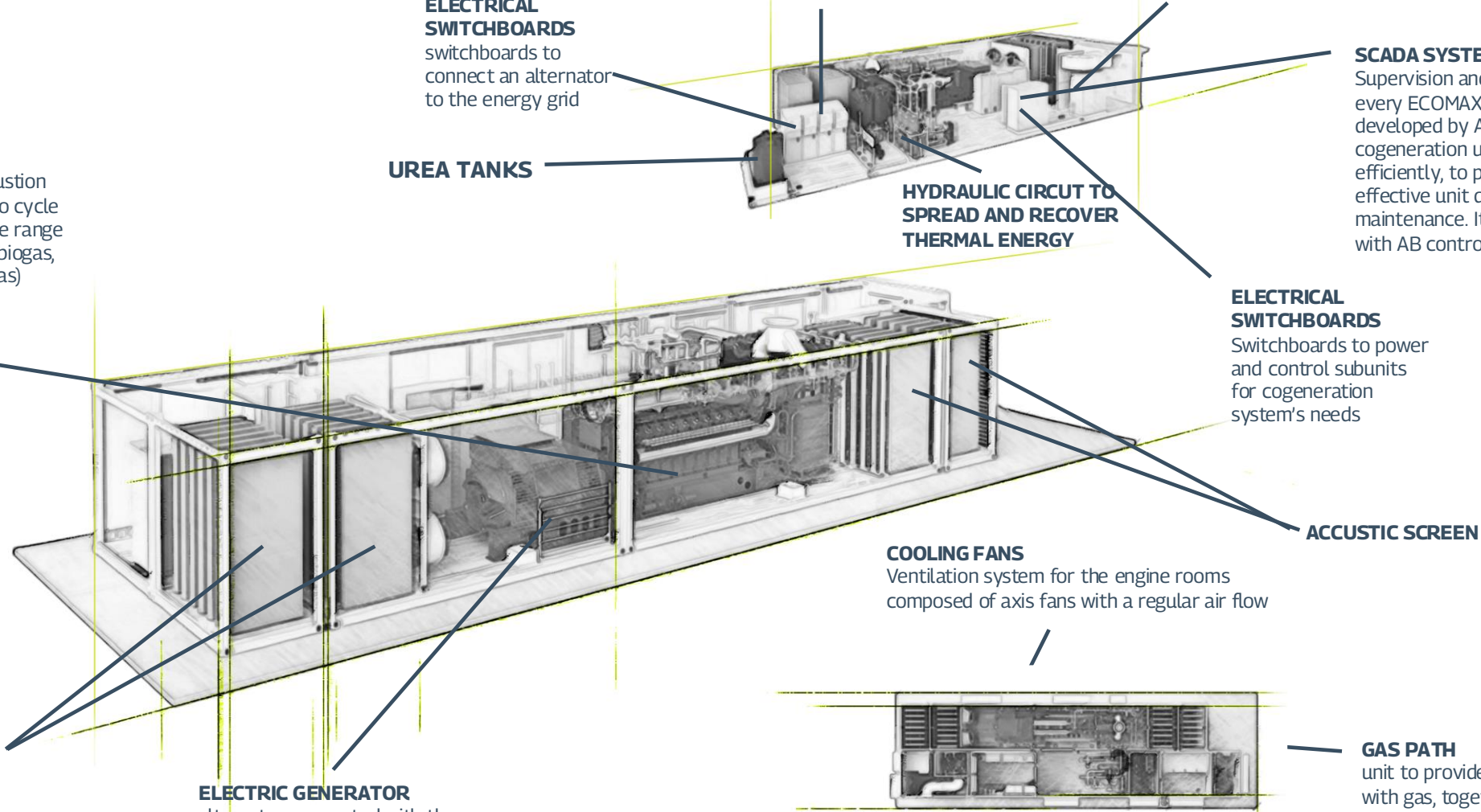
**SCADA SYSTEM**  
Supervision and control system of every ECOMAX® subsystems, developed by AB in order to manage cogeneration unit optimally and efficiently, to provide excellent and effective unit diagnostics and maintenance. It is connected online with AB control room

**ELECTRICAL SWITCHBOARDS**  
Switchboards to power and control subunits for cogeneration system's needs

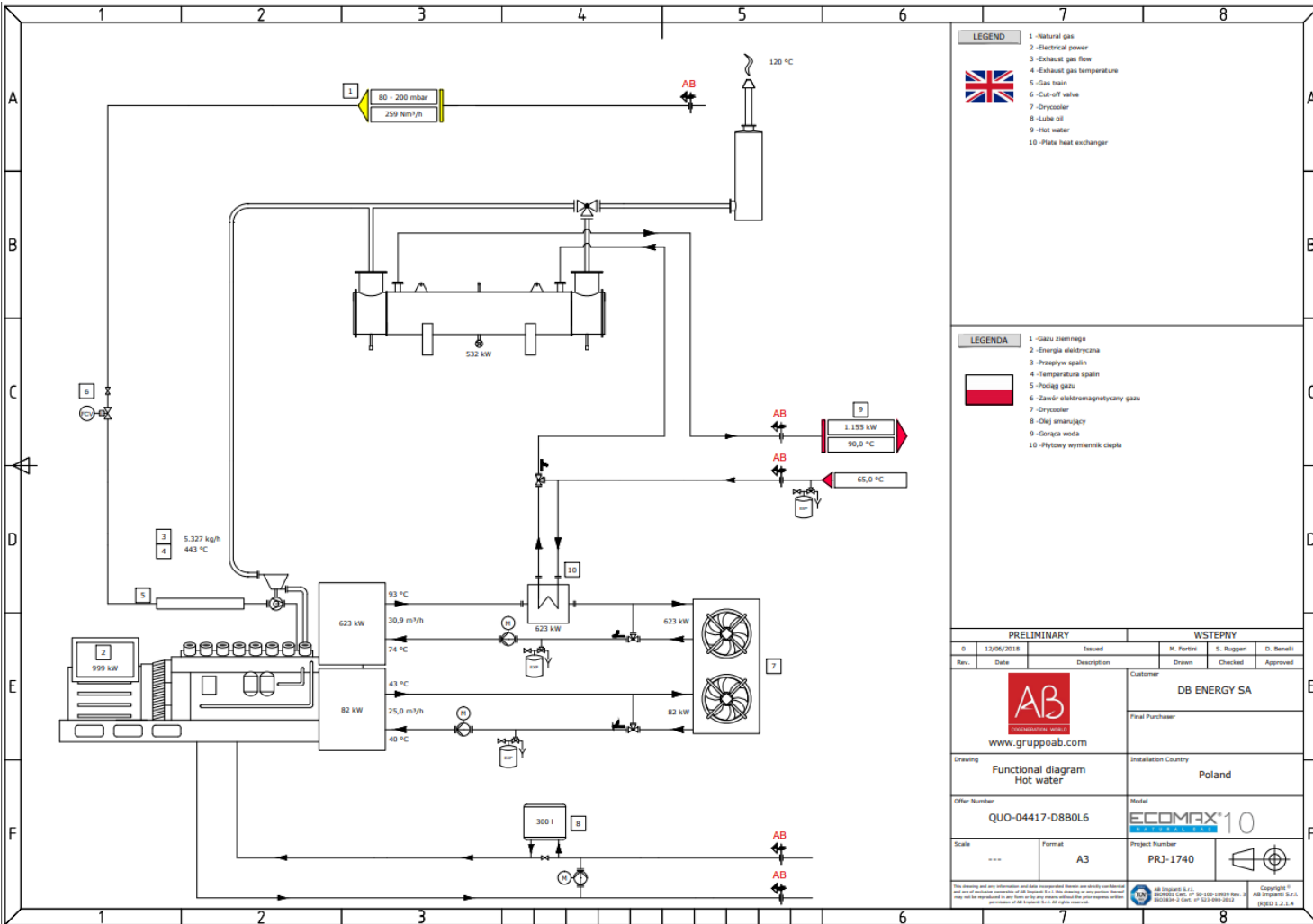
**COOLING FANS**  
Ventilation system for the engine rooms composed of axis fans with a regular air flow

**ACCUSTIC SCREEN**

**GAS PATH**  
unit to provide the main engine with gas, together with control and measuring device and automation



# SCHEME OF AN EXAMPLATORY INSTALLATION



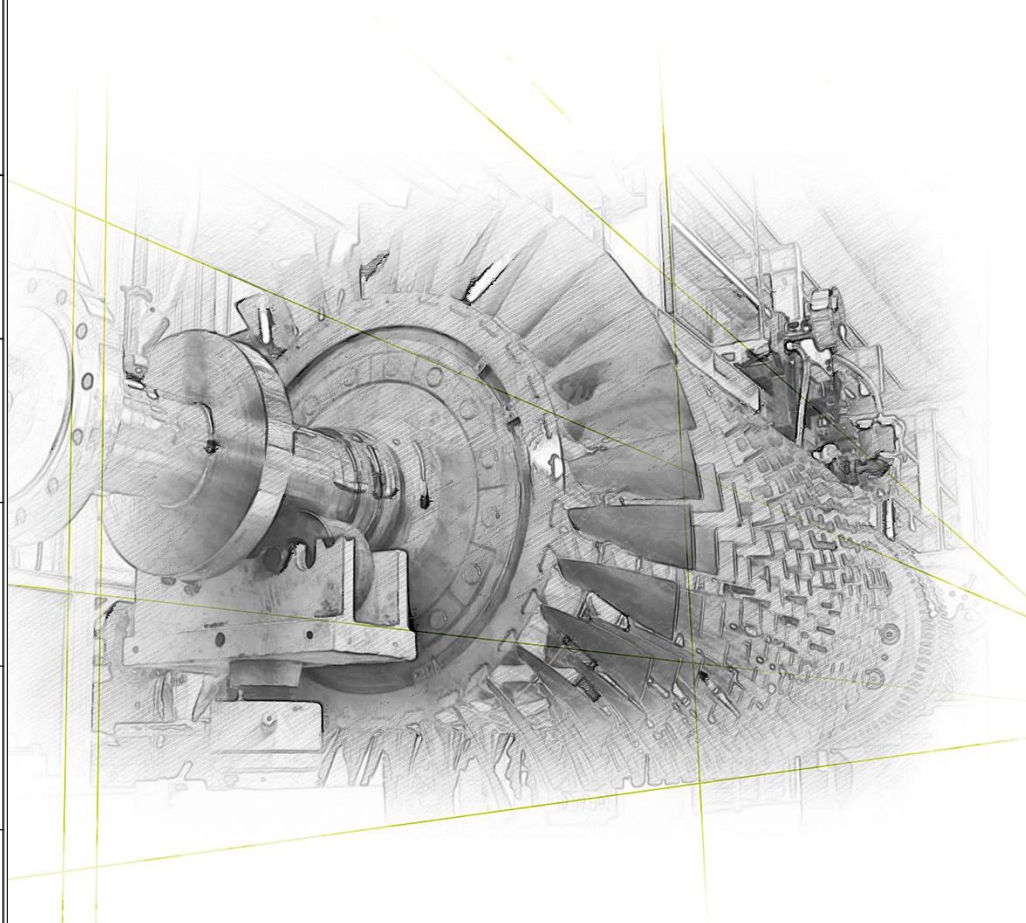
**LEGEND**

- 1 - Natural gas
- 2 - Electrical power
- 3 - Exhaust gas flow
- 4 - Exhaust gas temperature
- 5 - Gas train
- 6 - Cut-off valve
- 7 - Drycooler
- 8 - Lubr oil
- 9 - Hot water
- 10 - Plate heat exchanger

**LEGENDA**

- 1 - Gazu ziemnego
- 2 - Energia elektryczna
- 3 - Przepływ spalin
- 4 - Temperatura spalin
- 5 - Pociąg gazu
- 6 - Zawór elektromagnetyczny gazu
- 7 - Drycooler
- 8 - Olej smarowniczy
- 9 - Ciepła woda
- 10 - Płytkowy wymiennik ciepła

PRELIMINARY		WSTĘPNY			
0	13/06/2018	Issued	M. Fortes	S. Ruggieri	D. Nerioli
Rev.	Date	Description	Drawn	Checked	Approved
 www.gruppoab.com		Customer	DB ENERGY SA		
		Final Purchaser			
Drawing		Installation Country	Poland		
Offer Number		Model	ECOMAX <sup>®</sup> 10		
Scale	Format	Project Number			
---	A3	PRJ-1740			



# COGENERATION UNIT?

## Cogeneration is particularly effective in plants that:

They consume electricity and heating or cooling energy throughout the year.

**Example:**

food, chemical, paper, and steel industry plants

They need a reliable source of electricity and heating and/or cooling

**Example:**

hospitals, medical centers

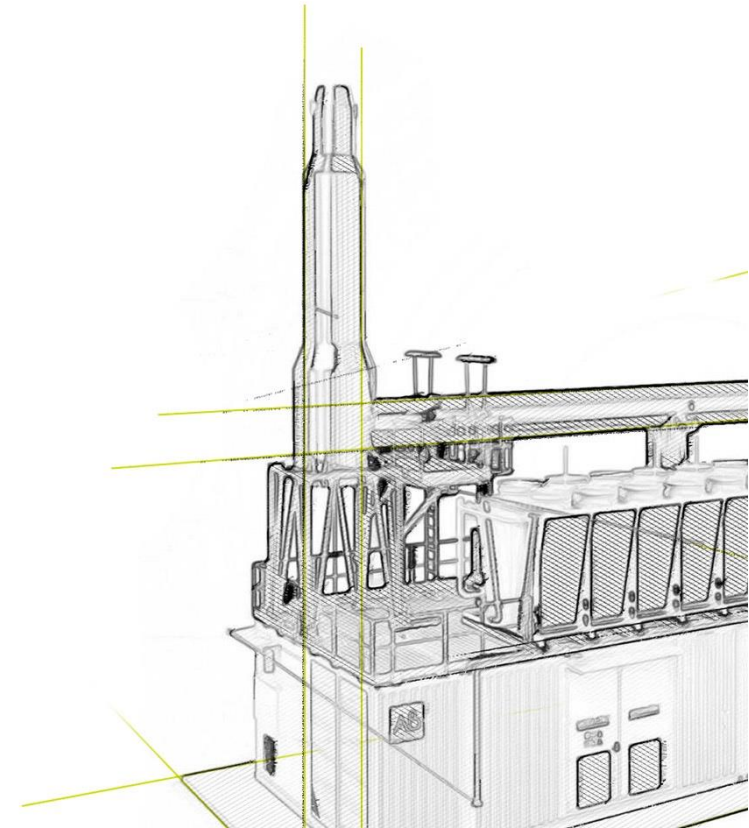
**Additionally:**

The scalability of the systems makes them suitable for both small and large companies.

# SELECTION OF A COGENERATION UNIT

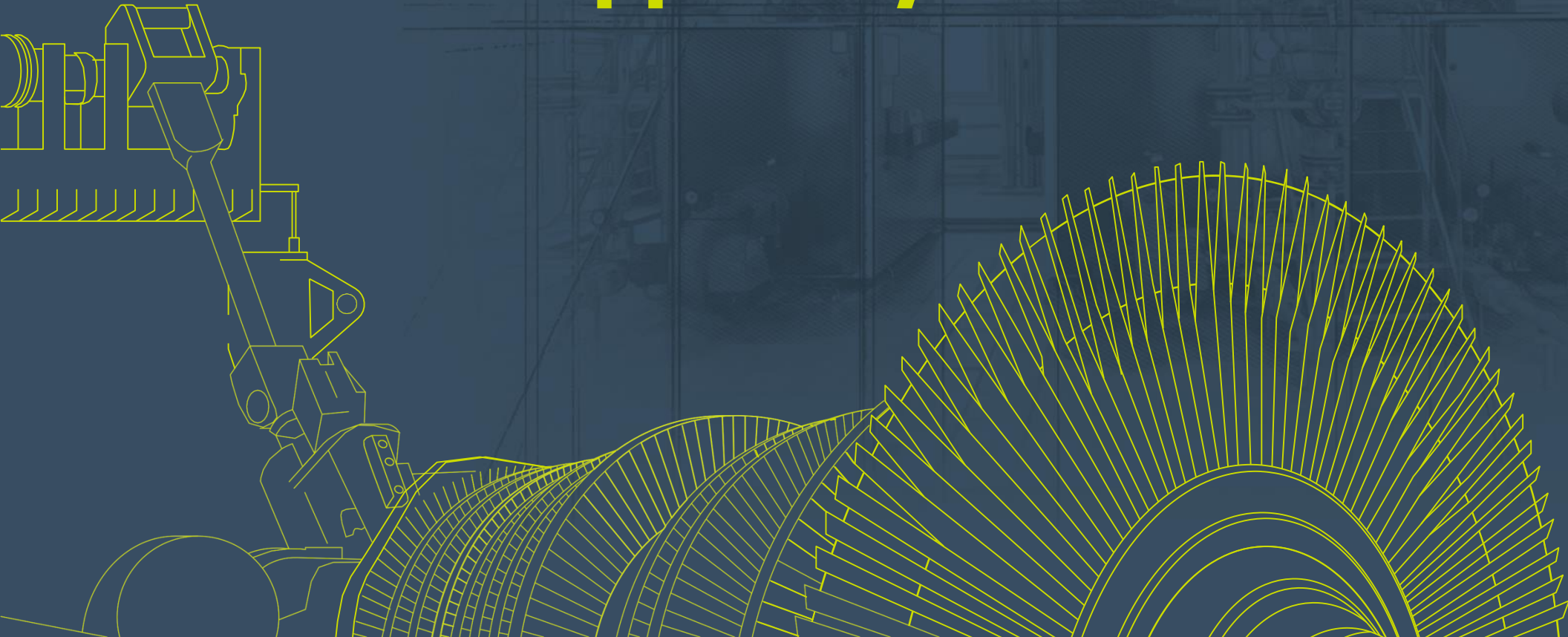
**When selecting a cogeneration unit, attention should be paid to:**

- Environmental conditions,
- Electricity consumption by the plant,
- The plant's heat energy requirements and parameters,
- The plant's cooling requirements,
- Compliance with support system requirements.



# Benefits and support systems

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# COGENERATION BENEFITS

- **savings starting from PLN 2 million per year** - reduction in the costs of purchasing electricity, heat, or cooling
  - **lower cost of electricity generated in cogeneration by over 30%** compared to electricity purchased from the power grid
  - **investment without expenditure** - financing and implementation by DB Energy in the ESCO model
- **increased energy production efficiency means 40% better fuel utilization** compared to conventional methods
  - **significant reduction in variable distribution costs, including capacity charges, by up to 83%**
  - **obtaining support systems, including guaranteed bonuses**
- **low-emission energy source** - 40% reduction in CO2 emissions - environmentally friendly operation
  - **reliability, independence and power supply security**; partial independence from grid power supply; reduction of unplanned downtime
  - **possibility of settlement under the DB Energy concession**

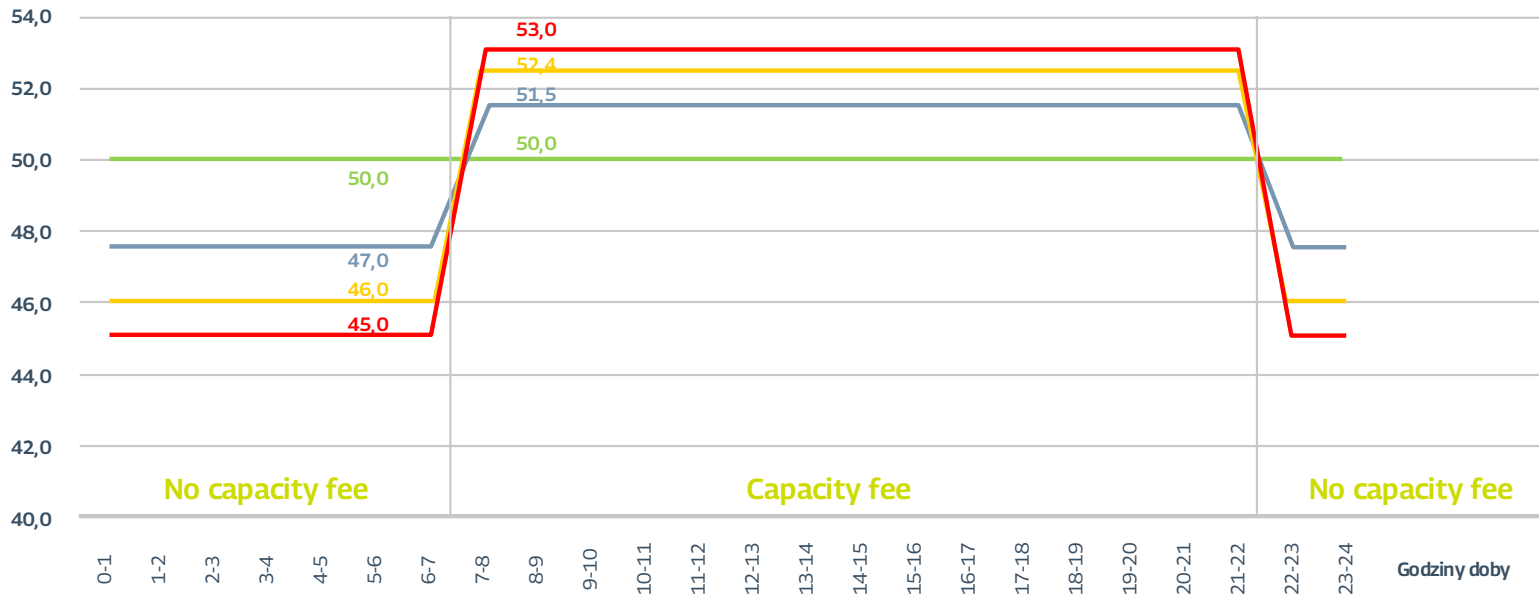
# The benefits of having your own energy source

## REDUCED CAPACITY CHARGE

An average electrical energy intake from an external grid during working days

Your own energy source allows your profile of electrical energy supplied by the grid to be flat-lined, this, in consequence, results in **even 83% lower capacity fee!**

Electrical energy consumption [MWh]



Statutory end users division

- **K-4** - difference of **>15%**
- **K-3** - difference of **<10%;15%**
- **K-2** - difference of **<5%;10%**
- **K-1** - difference of **<5**

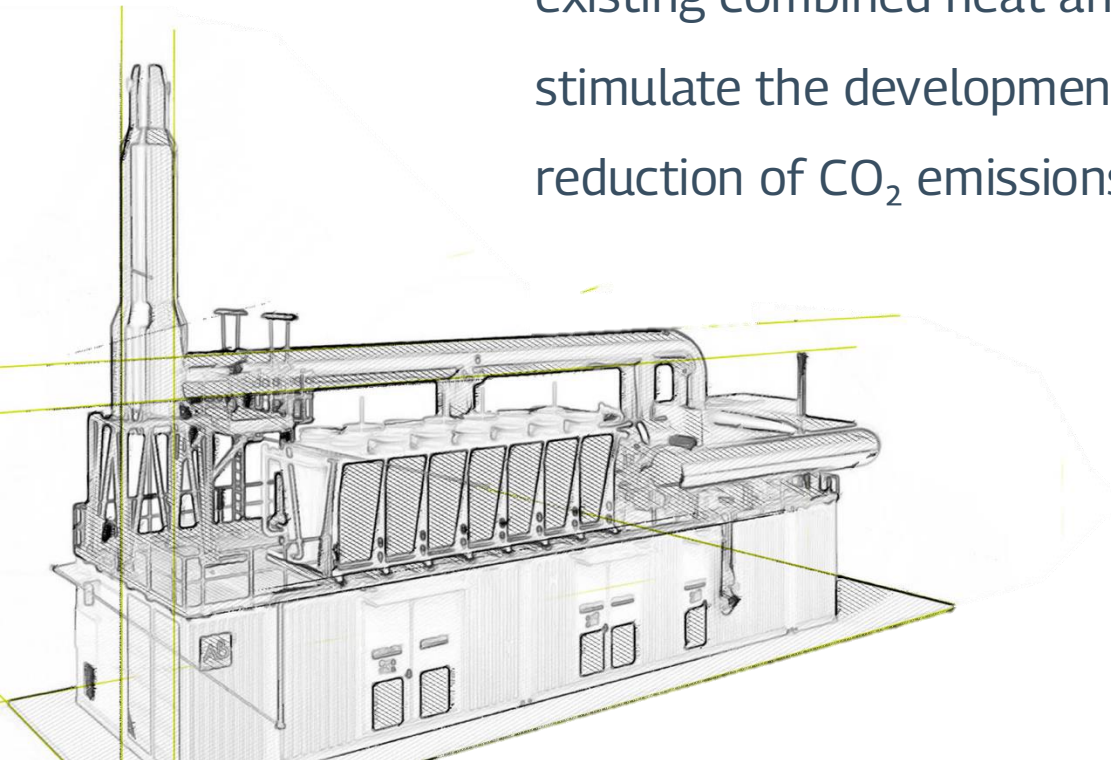
- Group K1
- Group K2
- Group K3
- Group K4

Data for the sample year 2026	Total energy consumption per year	Energy consumption during peak hours 7am-10pm on weekdays	Off-peak energy consumption on weekdays	Average energy consumption for peak hours	Average energy consumption for off-peak hours	Capacity fee amount without discount	Discount amount	Capacity fee amount with discount	Percentage deviation
		ZSn	ZPSm	ZSn	ZPSn	ZSn x 219,40 zł/MWh		Wom=A x Zk x SoM	
Group K-4	438 000 MWh	201 930 MWh	102 870 MWh	53,0 MW	45,0 MW	44 303 442 zł	<b>0 zł</b>	44 303 442 zł	18%
Group K-3	438 000 MWh	199 644 MWh	105 156 MWh	52,4 MW	46,0 MW	43 801 894 zł	<b>7 446 322 zł</b>	36 355 572 zł	14%
Group K-2	438 000 MWh	196 215 MWh	108 585 MWh	51,5 MW	47,5 MW	43 049 571 zł	<b>21 524 786 zł</b>	21 524 786 zł	8%
Group K-1	438 000 MWh	190 500 MWh	114 300 MWh	50,0 MW	50,0 MW	41 795 700 zł	<b>34 690 431 zł</b>	7 105 269 zł	0%

# COGENERATION BONUS

## Cogeneration bonus:

is a form of financial support. It is available to entities that build new or modernize existing combined heat and power generation units. Its purpose is to promote and stimulate the development of modern energy technologies that contribute to the reduction of CO<sub>2</sub> emissions.



# COGENERATION BONUS

The form of the cogeneration bonus depends on the capacity of the unit:

**<1MWel**

Guaranteed bonus for new units

**≥1MWel i ≤50MWel**

CHP bonus for new units (CHP auctions)

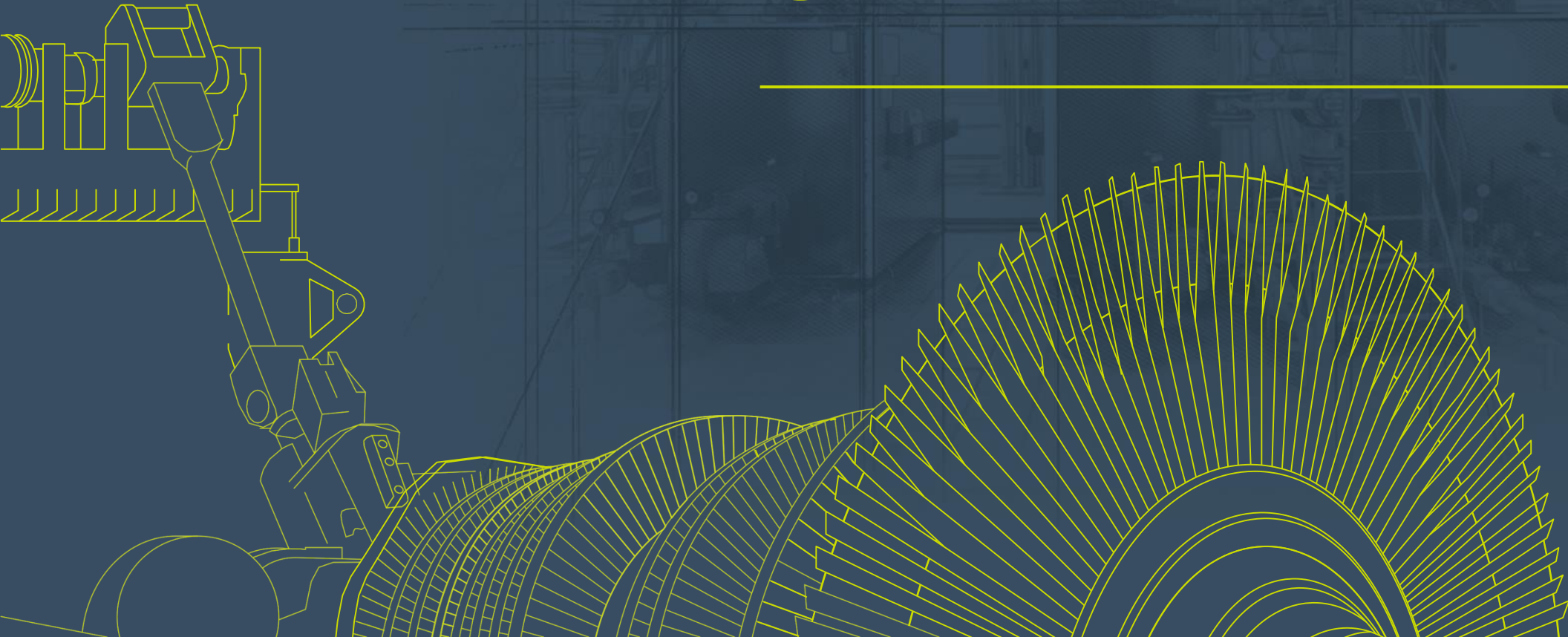
**≥50MWel**

Individual cogeneration bonus (call for applications) for new units

→ The most reliable form of support is a guaranteed bonus for small cogeneration units below 1MWel. Other bonuses for larger units do not provide 100% certainty of receiving funding.

# Projects and financing

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# Complete process support of **EFFICIENCY IMPROVEMENT**

**complex service  
for the entire  
process of  
improving  
energy  
efficiency**

**maximizing customer  
benefits and savings**



## IDENTIFICATION OF SAVINGS

### Audits:

- Walk Through
- Company Energy audit
- Energy Efficiency audit
- Zero-emission strategies



## PROJECT CONCEPTS

- detailed feasibility studies for specific energy-saving investments
- guidelines for designers necessary to achieve maximum benefits and savings
- construction projects



## FINANCING AND IMPLEMENTATION

- financing of investments by DB Energy under the ESCO model
- implementation of investments by DB Energy as general contractor
- maximization of benefits and savings



## DIAGNOSTICS AND MONITORING

- regular monitoring of energy consumption and efficiency
- continuous identification of further energy efficiency improvements
- long-term support for the implementation of a zero-emission strategy



# CHP FEASIBILITY STUDY

## Energy analyses and CHP power selection

Analysis of electricity, heat, or cooling consumption for the optimal selection of CHP unit power.



## CHP development concept on the plant premises

Land development plan with descriptions and drawings of CHP connections to the plant infrastructure and supply networks (gas, electricity, heating)



## Concept for the utilization of generated energy

Analysis of the possibilities and methods of utilizing electricity, heat, or cooling.



## Financial analysis of investments

Preparation of cash flow calculations for the optimal technical solution with the possibility of analyzing energy price change scenarios. Analysis of the possibility of using support systems.



# Selected projects

## CASE STUDIES

### Our selected projects:

#### Schumacher Packaging

The largest LNG-powered cogeneration unit in southern Poland



#### Soufflet Malt House

From audit to 40% emission reduction

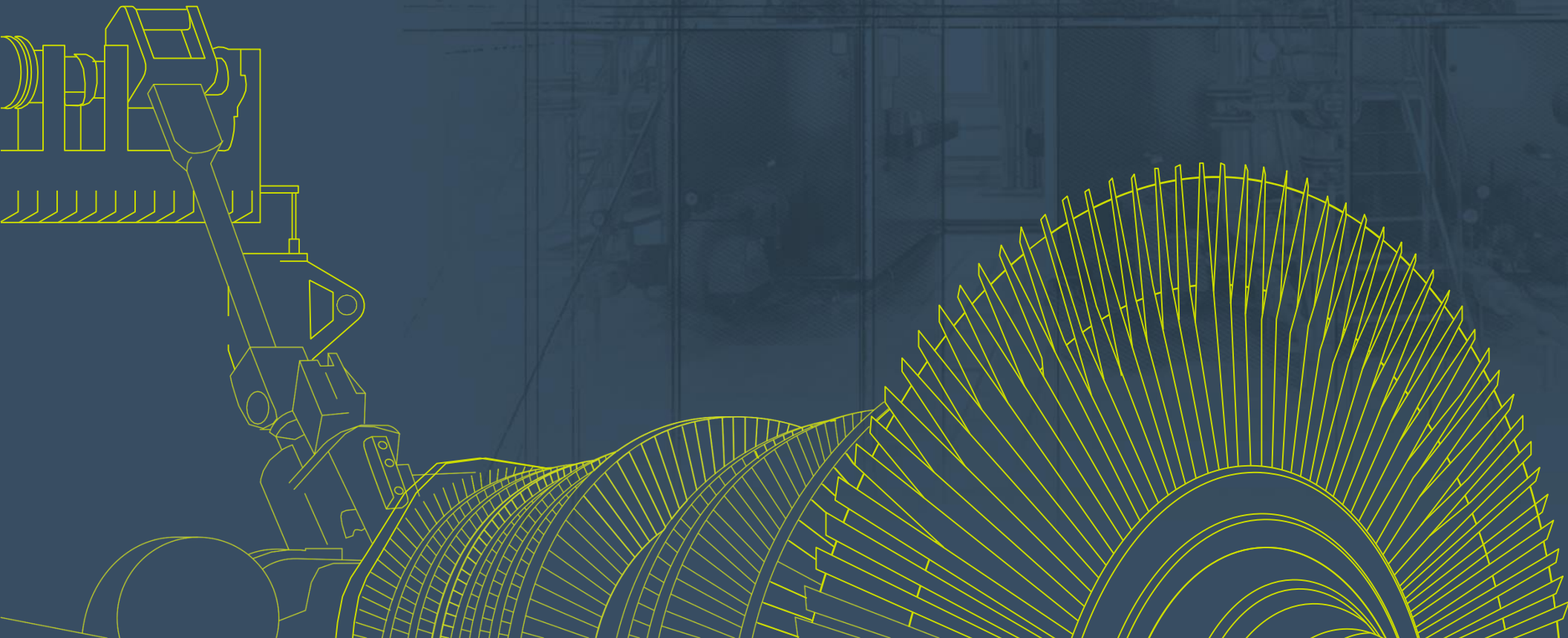


#### Simoldes Plasticos

Project from A to Z



They have  
**trusted us**



# Selected CUSTOMERS



# OUR PARTNERS



Dolnośląski Instytut  
Studiów Energetycznych



Centrum Informacji  
o Rynku Energii



ING Bank Śląski



EFESO Management  
Consultants



Last Energy



Metale.org



Izba Energetyki  
Przemysłowej  
i Odbiorców Energii



Napędy i sterowanie



Polski Przemysł



Zachodnia Izba  
Gospodarcza



Ernst&Young



Polskie Górnictwo  
Naftowe i Gazownictwo



**We operate worldwide**



**DB ENERGY**

Zero-emission industry

**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

# Additional information

We have prepared a package of materials for you:

## Newsletter

We encourage you to subscribe to our newsletter, in which we share technical, financial, and legal knowledge on energy efficiency and zero emissions once a month.



## Downloadable materials

We have also prepared a package of downloadable materials for you, concerning the products and services offered by DB Energy and the most interesting projects we have completed.



## LinkedIn newsletter

Every Tuesday, we publish the Cost-Effective Decarbonization newsletter via LinkedIn. Each week, our team creates and comments on expert content, which we present in an easy-to-understand format.



## Additional information

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| REGON 02.12.49140 Kapitał zakładowy: 347 646 zł