



DB ENERGY

Zero-emission industry

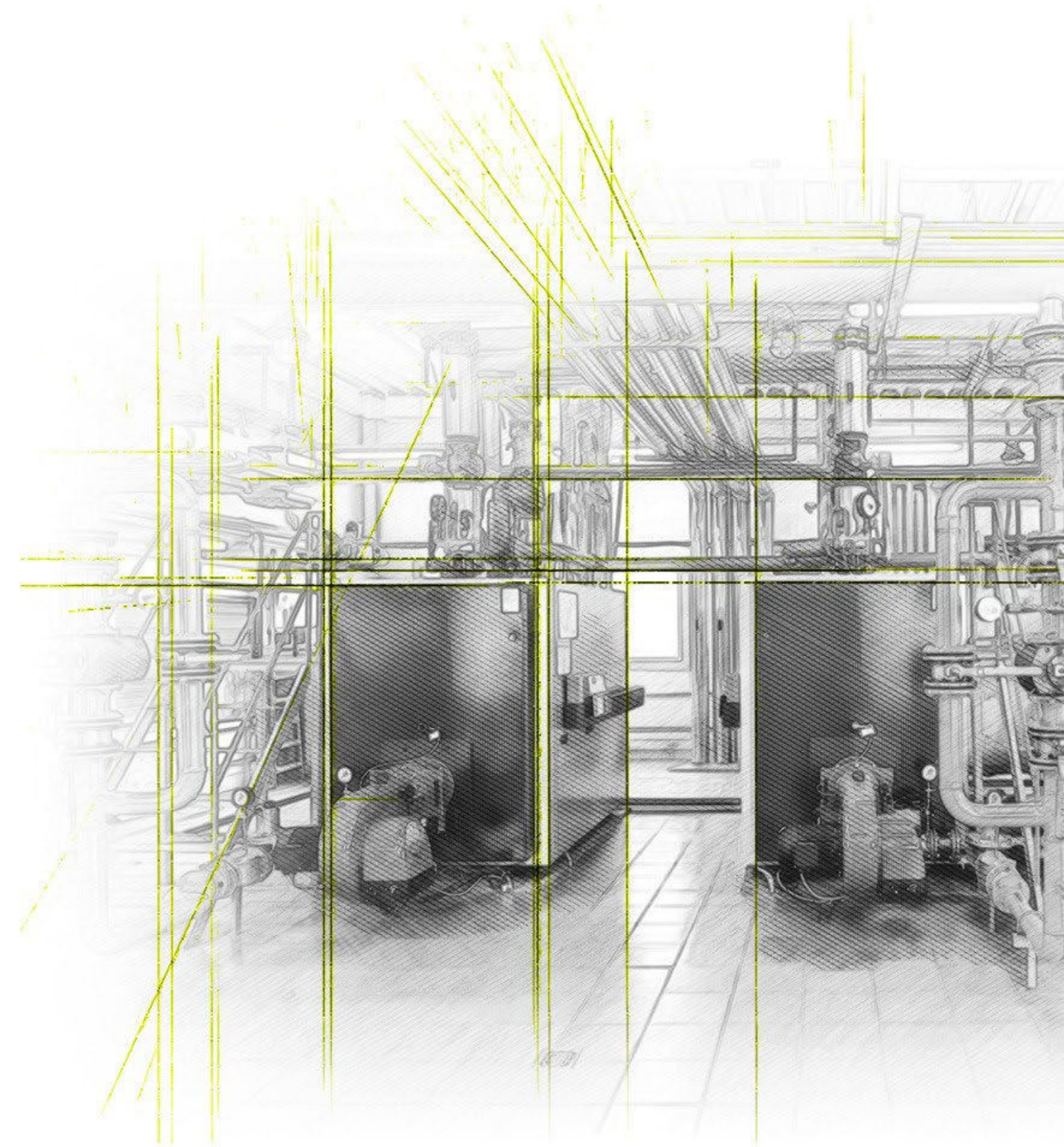
REACTIVE POWER COMPENSATION

**No charges for inductive and
capacitive reactive energy**

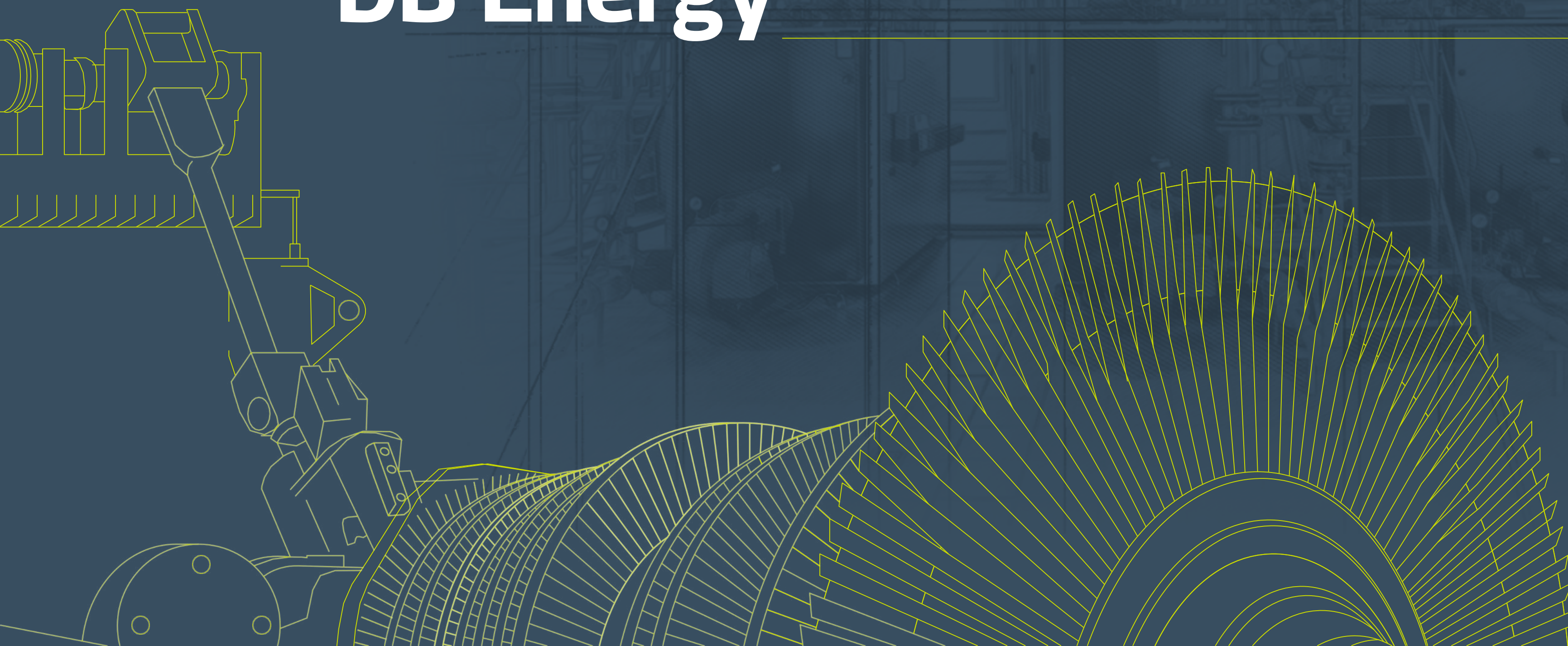
Wroclaw 2022

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DB Energy



What do WE DO?

DB Energy was founded in 2009 in Wrocław. We have been developing zero-emission strategies and improving energy efficiency in the industry for more than 10 years.



Consultancy

Walk Through Audit

Company Energy Audit

Energy Efficiency Audit

Zero emission strategies

White Certificates



Investments

energy saving investments
development

financing and project
implementation in the ESCO
model or as General Contractor

investor supervision



Diagnostics

control of installations efficiency
and their energy consumption

continuous attempts to identify
potential for further energy
efficiency improvements

measurements

Comprehensive Consulting

Complex support for our client while developing energy-saving investments.



Walk Through Audit

we identify the potential for energy-saving investments



Company Audit

an obligatory audit for large companies, we develop a long-term energy efficiency improvement plan



Energy Efficiency Audit

we provide a complete concept of an energy-saving investment



Zero-emission strategies

plant's zero emissions due to reducing CO₂ emission



Concepts and projects

feasibility studies, technical implementation concepts and construction projects for energy-saving investments

Comprehensive support for the process to improve **ENERGY EFFICIENCY**

we manage extensively the entire process to improve energy efficiency

benefits and savings are maximized for a client



SAVINGS ARE IDENTIFIED

Audits:

- Walk Through
- company energy audit
- energy efficiency audits
- zero-emission strategies



PROJECT CONCEPTS

- detailed analysis of particular energy saving investments
- guidelines for designers essential to maximize benefits and savings
- construction projects



FINANCING AND IMPLEMENTATION

- DB Energy finances a project in the ESCO model
- DB Energy develops a project in the General Contracting model
- benefits and savings are maximized



DIAGNOSTICS AND MONITORING

- We control and diagnose in an ongoing manner energy consumption and operating efficiency of machines and devices
- We identify continuously space for further energy efficiency improvement
 - We provide long term management over implementing zero-emission strategies



Reactive power compensation



Reactive power

THE BASICS

Reactive power in a nutshell

Var - Volt Ampere Reactive – the unit which reactive power is expressed in

inductive and capacitive energy – depending of an applied device, there are two types of reactive power to be distinguished

reactive power is accountable for additional network load – charges for reactive energy have been introduced to encourage a receiver to reduce its uptake

$\text{tg}\varphi > 0.4$ – a coefficient used to calculate the reactive energy intake: if more than 40 kVarh of reactive energy is consumed for each 100 kWh of active energy, additional charges are included

reactive energy impacts the transmission network capacity – charges for reactive energy consumption, which exceeds the contract limits, are aimed at reducing the load of the transmission network

Reactive power TYPES



INDUCTIVE REACTIVE POWER

**Typical receiving devices
which generate inductive
reactive power:**

Induction motors,
transformers, transmission
lines, lighting installations
(fluorescent lamps, mercury-
vapour and sodium-vapour
lamps), induction furnaces and
compensation chokes

CAPACITIVE REACTIVE POWER

**Typical receiving
devices which
generate capacitive
reactive power:**

UPS accumulators,
computers, damaged
capacitor banks, welding
machines, inverters,
energised cables



Reactive power **OVERCOMPENSATION**

If the capacity of a bank to compensate the inductive reactive power is adjusted inappropriately, **overcompensation** may occur which accounts for:



negative value
of the **tgφ**
coefficient



faster wear and
tear of devices and
the network



additional charges for
capacitive reactive
energy

Service INCENTIVES

No charges for reactive energy



reduction of an extensive reactive energy uptake – costs reduction for a client

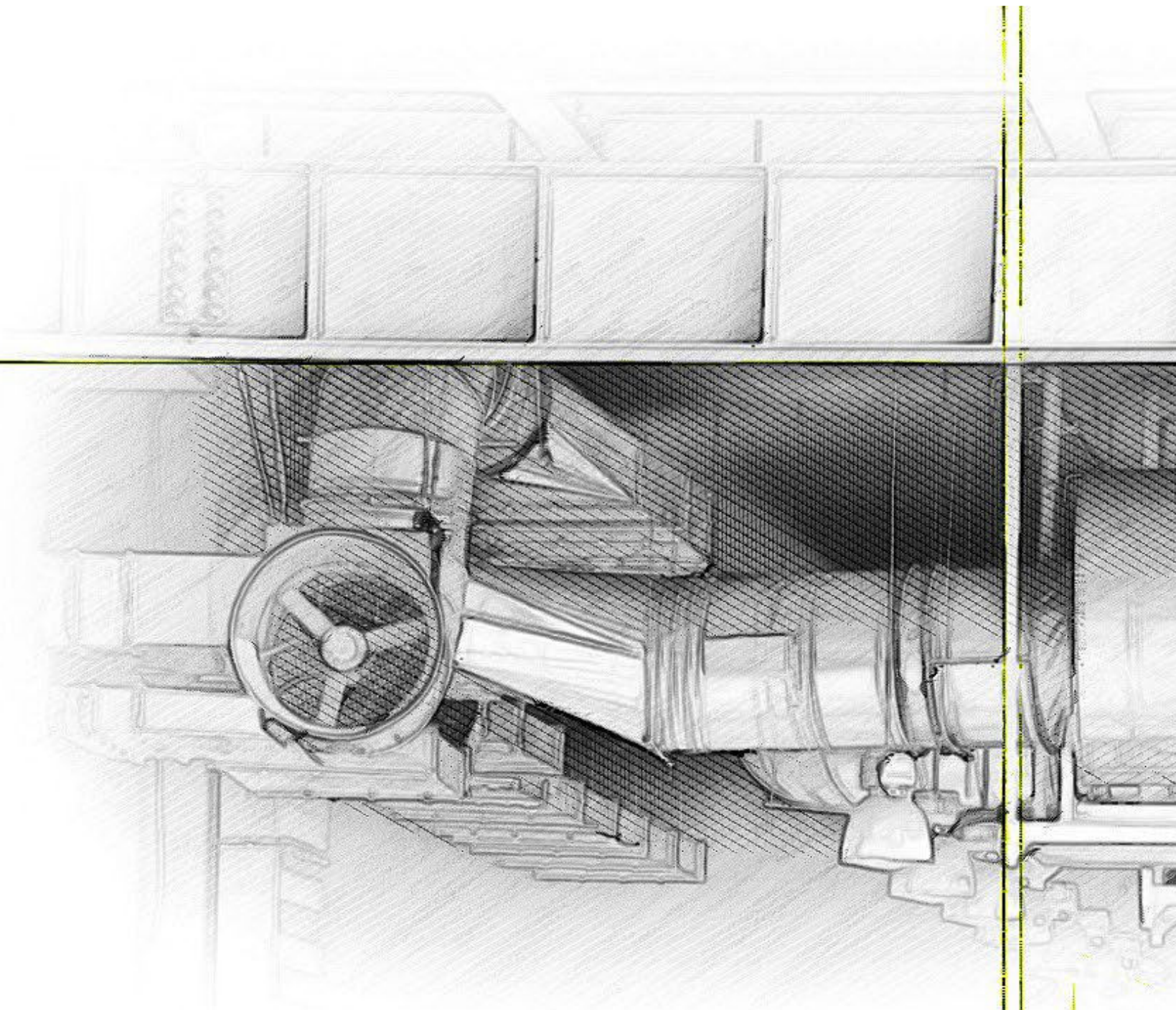
immediate savings – the service allows fees for active energy to be decreased by approx. 2%

increased efficiency of electric power devices and installations

quick payback period for a client, if the project is financed by them

retrofit adjusted to client's real needs

TO REDUCE REACTIVE ENERGY UPTAKE



In order to prevent reactive energy charges, compensation devices are implemented. That stands for the most commonly used solution. Among compensation devices the following are to be found:

capacitors or capacitor banks to compensate the inductive reactive energy

compensation chokes to compensate the capacitive reactive energy

Where to begin and which information is necessary?

REACTIVE ENERGY UPTAKE REDUCTION

It is financially-viable to reduce reactive energy uptake when:

costs for reactive energy consumption, which exceeds the contract limits, amounts to min. PLN 500 net each month

charges for reactive energy consumption **are of permanent and cyclical nature** (they are not incidental)

Necessary information:

Has a system to compensate reactive power been installed?

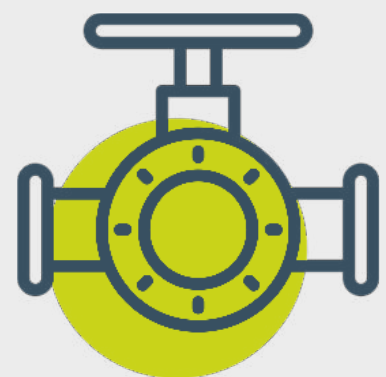
Have charges for inductive or capacitive energy been detected? Perhaps both of them?

Is the following set of data available

- 15-minute measurement data for active or reactive energy
- 12 latest VAT invoices?

We reduce reactive energy consumption **IN ALL INDUSTRY SECTORS**

These are clients who experience frequent reactive energy uptake which exceeds the contract limits:



wastewater
treatment plants

pumping stations



hotels



wood processing
plants

sawmills

paper mills

printing houses



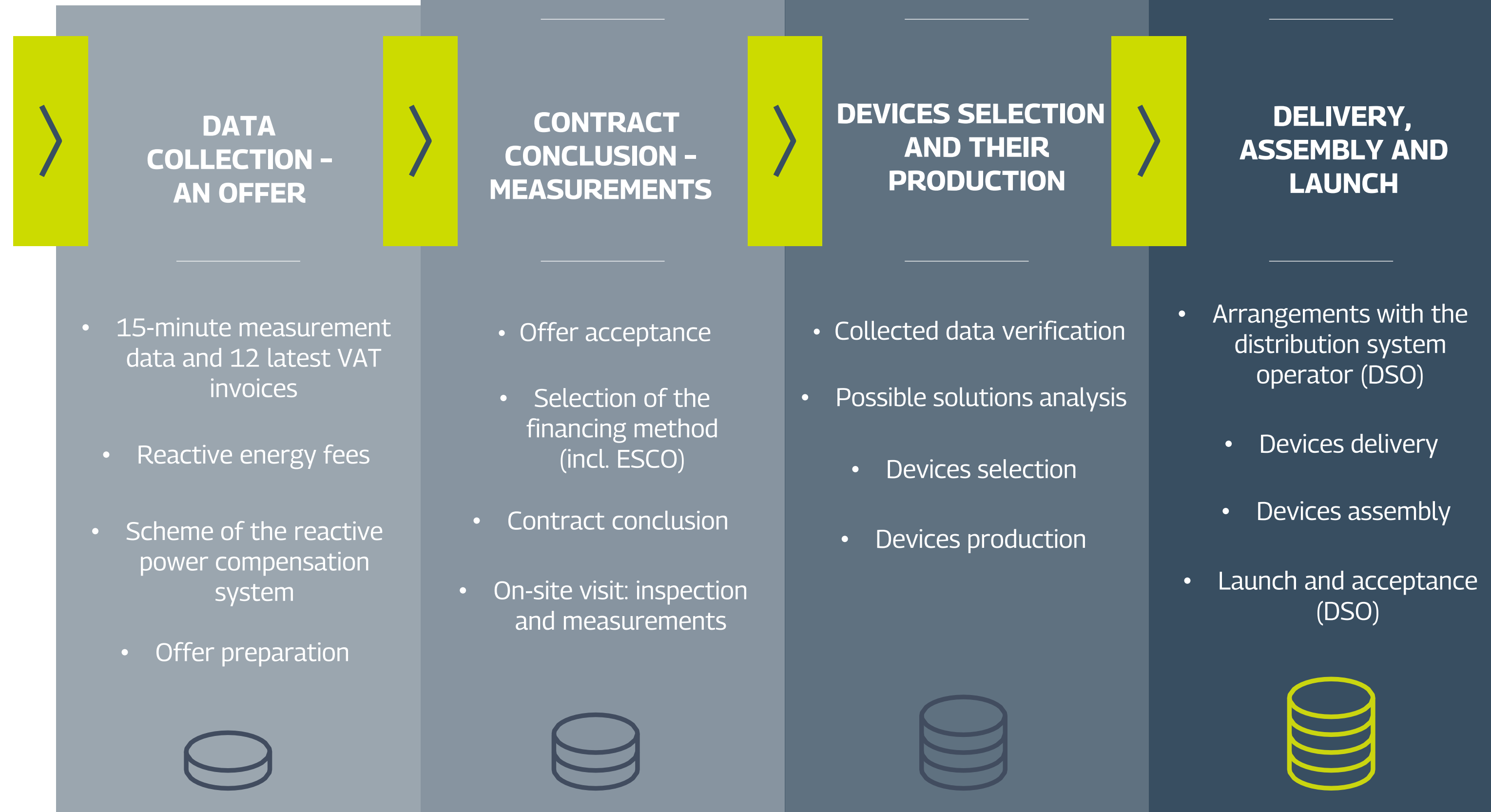
concrete plants



mechanical
plants

Comprehensive process management AIMED AT REACTIVE ENERGY REDUCTION

We consider client's investment plans which allows **the reactive energy to be reduced maximally**



DB Energy the market leader



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YEARS OF EXPERIENCE IN THE INDUSTRY

1 200

industrial audits

EUR 1.3 bn

value of energy-saving investments

EUR 400 ml

value of the annual savings generated by the designed investments

9.3 TWh

annual energy savings generated by the designed investments

EUR 133 ml

value of the requested White Certificates

We reduce annual energy consumption **IN ALL INDUSTRY SECTORS**



Mining
industry

28%



Food
industry

20%



Wood, paper
and chemical
industry

26%



Building
industry and
infrastructure

24%



Metal
industry

22%

They have **trusted us**



Selected CLIENTS



Contact FOR CLIENTS



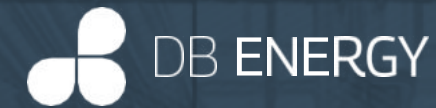
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European Union
European Regional
Development Fund



DB Energy conducts the R&D project titled "Development of an innovative drive diagnostics system (DiagSys) based on electrical signal measurements characteristic of mechanical damage to rotating machine components, together with a specialized analyser of machine operating status and efficiency (APPS 3)". The project is financed under the Intelligent Development Operational Programme 2014-2020, under sub-measure 1.1.1. "Industrial research and development work carried out by enterprises". No. of the competition: 1/1.1.1/2015. Value of the project PLN 5,974,021.85. Value of co-financing PLN 3,727,676.11.