PGE Energia Ciepła

Key information about the company

Prowadzimy w zielonej zmianie

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Who are we

Who are we?

Company of the PGE Capital Group, leader of the District Heating sector;

Poland's largest producer of electricity and heat in the high-efficiency cogeneration process.

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Who are we?

PGE Energia Ciepła in figures:

Electrical Capacity installed **2.5 GWe**

Heat Capacity installed **6.8 GWt**

Annual electricity production **9.62 TWh**

Annual heat production **45.85 PJ**

District heating network **672 km**

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Strategy of PGE Energia Ciepła

Strategy of PGE Energia Ciepła

In 2020, PGE Polska Grupa Energetyczna published a new strategy outlining the Group's transformation plan and the roadmap to generation decarbonisation and announced the target of achieving climate neutrality by 2050.

PGE wants to **stimulate the transformation and development of the domestic district heating sector, contributing to improvement of the environmental quality**, the competitiveness of the economy and the level of social welfare as well as to energy security at the local and national levels.

An important element of the Strategy adopted is the investment process in gas units, which will enable **the decarbonisation of the heating sector**.

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Where we go

Vision of the PGE translates into three strategic priorities

Leader of sustainable energy transition

Clean energy

Modern energy services

Efficient and effective organisation

New direction is inevitable

Energy transition will proceed.
Without decisive action by the Polish energy sector, we will face many **threats:**

1. **Investments** in the development of renewable sources will be stunted

+

Financial assistance and customer funds will not be used for the overall transition

↓

Lower value added for the domestic economy

2. **Offer and service channels** will not meet customer expectations

+

Customers will leave companies with an unfavourable image, unattractive product offer and not very friendly service model

↓

Energy sector **will lose years of building social trust**

3. **Conventional energy generation** will be subject to increasing pressure from the environment

+

The levels of margins and production volume will not allow for **covering expenses** of maintenance

↓

Problems with (re)financing will increase together with **loss of liquidity**

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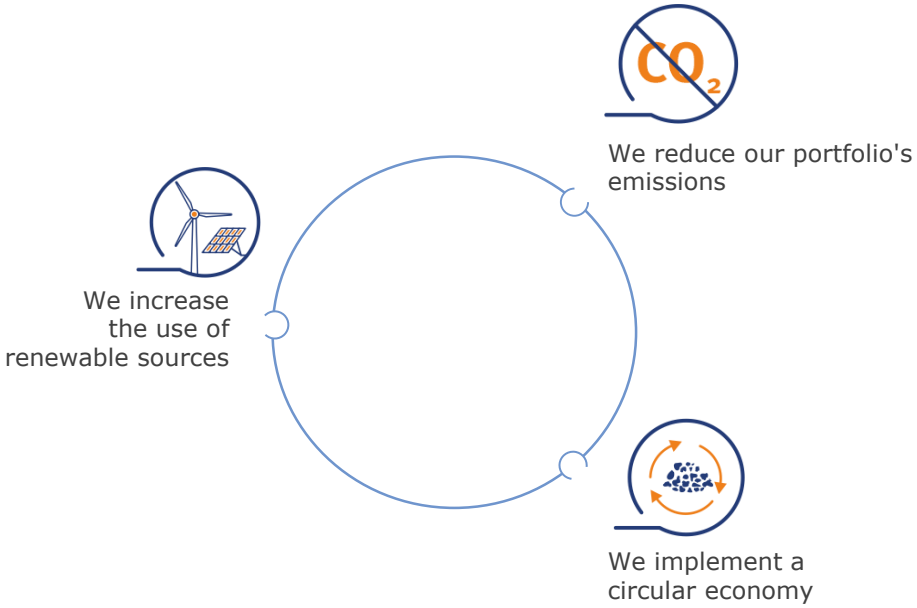
New direction is inevitable

Clean energy

As a leader of transition, we declare to reduce our impact on the natural environment.

We plan to reduce the greenhouse gas emissions by changing the technology, expanding the renewable energy portfolio and enabling our clients to participate in the transition.

We want to promote a circular economy and achieve climate neutrality by 2050 at the latest.



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PGE will contribute to climate protection

Global challenges	PGE's aspirations	
Emissions reduction at least 55% compared to 1990	85% zero- and low-emission sources in the portfolio* **120 million tons of avoided CO_2 emissions**	2030
Increase in renewable energy generation at least 32% share of consumption	50% share of renewable energy in the portfolio >90 **TWh of accumulated generation of renewable energy**	
The Green Deal Europe's climate neutrality by 2050	0.0 net CO_2 emissions 100% of renewable energy	2050

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* assuming the separation of the coal portfolio from the PGE

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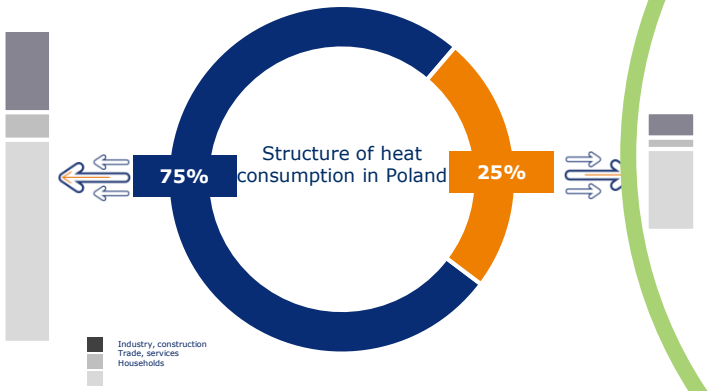
Transition of the heating up to 2030 and beyond

Business development in the individual segment

- Thermal comfort for customers outside agglomerations
- Collaboration in anti-smog programs
- Providing solutions to improve air quality

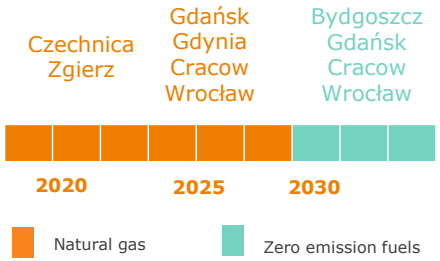
Individual heat sources → Popularisation and new connections → **District heatin**



more than **100** thousand till 2030 switched heat sources in individual heating

share of zero- and low-emission sources in heat production **>70%** till 2030

Transition of district heating towards low and zero-emission



- New installations for thermal waste treatment
- The use of renewable energy sources as sources of district heating
- Investment decisions for natural gas by 2025 at the latest; in subsequent years, necessary commercialisation of zero-emission fuels (e.g. green hydrogen) or electrification of heating

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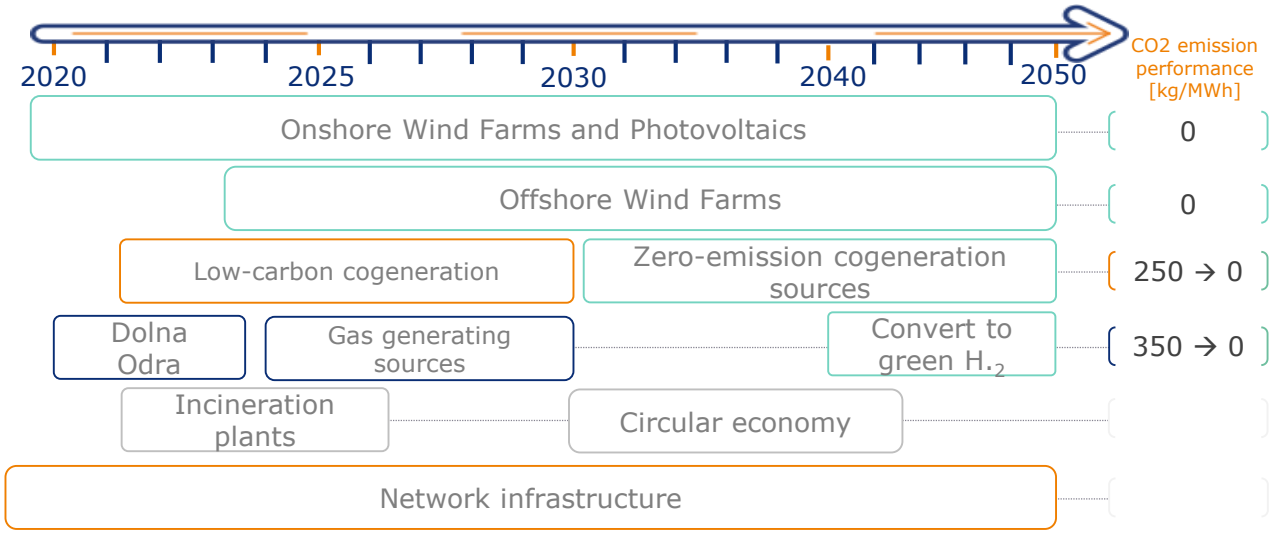
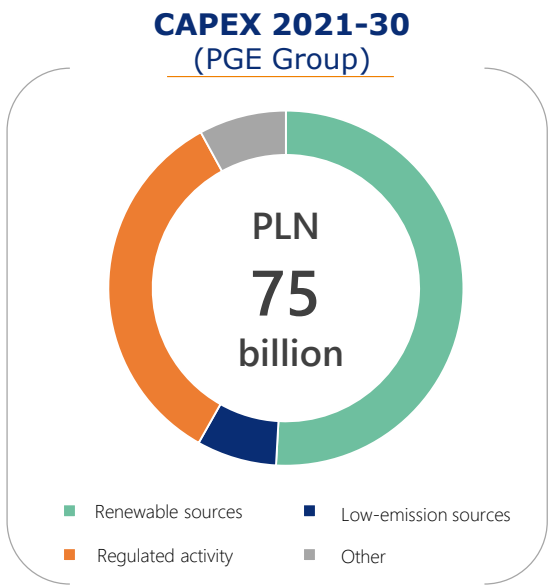
Pathway to climate neutrality





- Focus on the development of renewable energy
- Construction of modern gas capacity with low CO2 emission
- Modernisation of the distribution network enabling the integration of RES
- Optimisation of modernisation and replacement expenses
- No new coal investments
- No new investment decisions in gas sources after 2025

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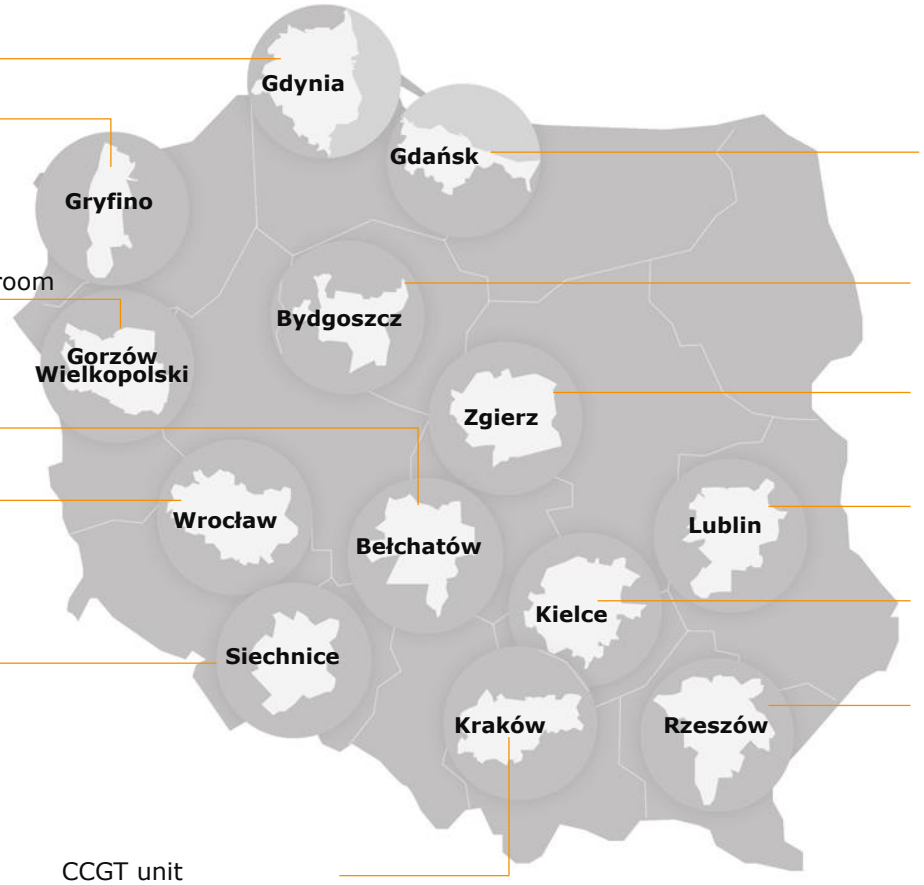
First step

Investment projects of PGE Energia Ciepła



CCGT unit

Gas engines

Back-up and peak load/reserve boiler room (water and steam and gas boiler)

Waste-to-energy plant

CCGT unit

CCGT unit

CCGT unit

CCGT unit Stage I Back-up and peak load/reserve boiler room (2 oil and gas boilers and 2 electrode boilers)

Cogeneration unit for gaseous fuel

Gas engines with gas and oil fired water boiler supported by solar collectors

Back-up and peak load/reserve boiler room (gas and oil fired water boilers)

Cogeneration unit

Waste-to-energy plant process line II
Back-up and peak load/reserve boiler room, gas boilers)

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Recent achievements in R&D

INNUPS technology - project assumptions

Project

- ✓ Preparation and implementation of technology decreasing the negative impact on environment – removal of heavy metals from the FGD waste water

Challenge

- ✓ Research on possibility of changing the environmental problem to business opportunity – new technology, new products

Method

- ✓ Selective and flexible – ion exchange resins for reduction of heavy metals and other elements with opportunity to recovery in concentrate form

Project co-financed from GEKON Program

Gekon Generator Koncepcji Ekologicznych

Narodowe Centrum Badań i Rozwoju

Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej

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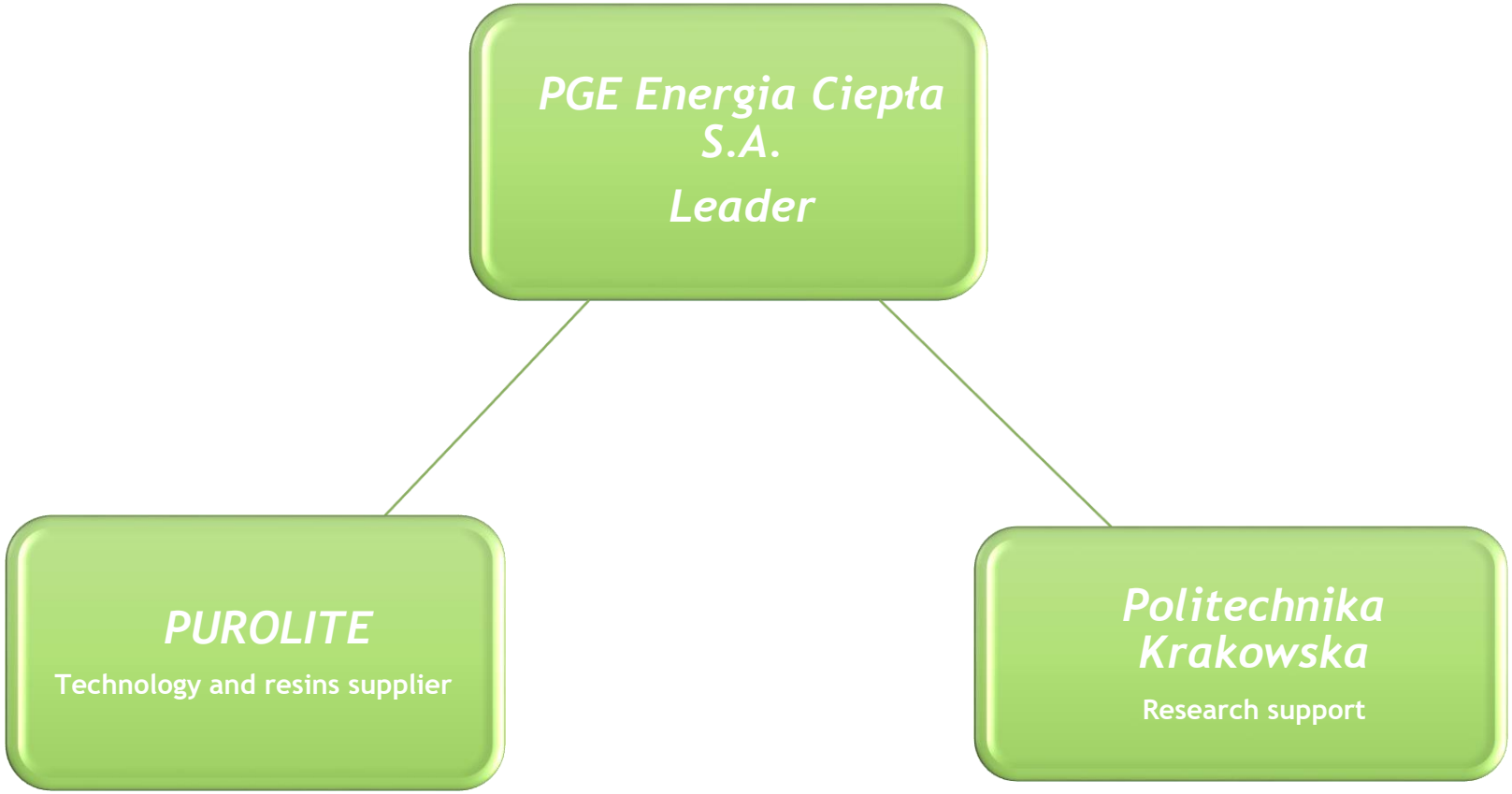
Project partners



INNUPS Technology

- ✓ Technology is based on ion exchange resins – sorption materials that are able to exchange ions with passing solution
- ✓ Selective resins are able to remove selected ions of heavy metals from very high salinity waste water. After reaching their exchange life-time, resins are regenerated with mineral acid and alkaline solution
- ✓ Technology ensures the removal of heavy metals to the levels of BAT conclusions due to appropriate selection of ion resins, sorption process control and resins regeneration
- ✓ Boron and other metals can be recovered from polimetalic concentrate

FGD waste water

BAT conclusions levels

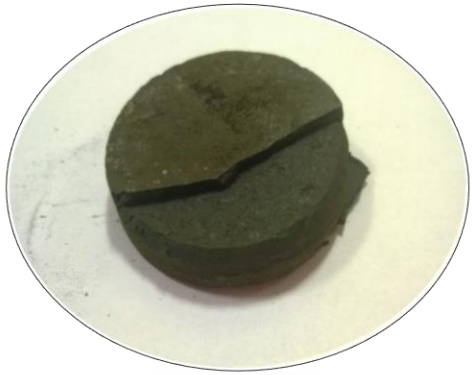
BAT-AELs		
Parameter		Daily avg.
Total organic carbon (TOC)		20-50 mg/l
Chemical oxygen demand (COD)		60-150 mg/l
Suspended solids (TSS)		10-30 mg/l
Fluoride (F^-)		10-25 mg/l
Sulphate (SO_4^{2-})		1,3-2,0 g/l
Sulphide (S^{2-})		0,1-0,2 mg/l
Sulphite (SO_3^{2-})		1-20 mg/l
Metals	As	10-50 µg/l
	Cd	2-5 µg/l
	Cr	10-50 µg/l
	Cu	10-50 µg/l
	Hg	0,2-3 µg/l
	Ni	10-50 µg/l
	Pb	10-20 µg/l
	Zn	50-200 µg/l

Obtained results

Parameter	BAT levels [µg/l]	Waste water after WWTP [µg/l]	Technology efficiency [%]
As	50	<0,01	100
Cd	5	<1	95
Cr	50	<0,01	100
Cu	50	<5	79
Hg	3	<0,01	100
Ni	50	<0,01	100
Pb	20	<0,01	100
Zn	200	<50	89
Additional parameters			
B	1 000	70	99,9

Obtained results

Polimetalic concentrate: Mn 50%, Ca 3%, Ni 3%, Co 0,7%,Fe 0,9%, S 0,03%, Zn 3% + Zr, Ce, Y, La, Nd, Sc, Ga



Fertilizer: Calcium borate (without heavy metals Pb, As, Cr, Hg)

Cooperation

Purolite®

Uniwersytet Gdański

CHEMIA UG

Wydział Chemii

AGH

WGGiOŚ

Politechnika Krakowska
Wydział Inżynierii
i Technologii Chemicznej

PK

Gekon
Generator Koncepcji Ekologicznych

Narodowe Centrum
Badań i Rozwoju

Narodowy Fundusz
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Thank you for your attention!