

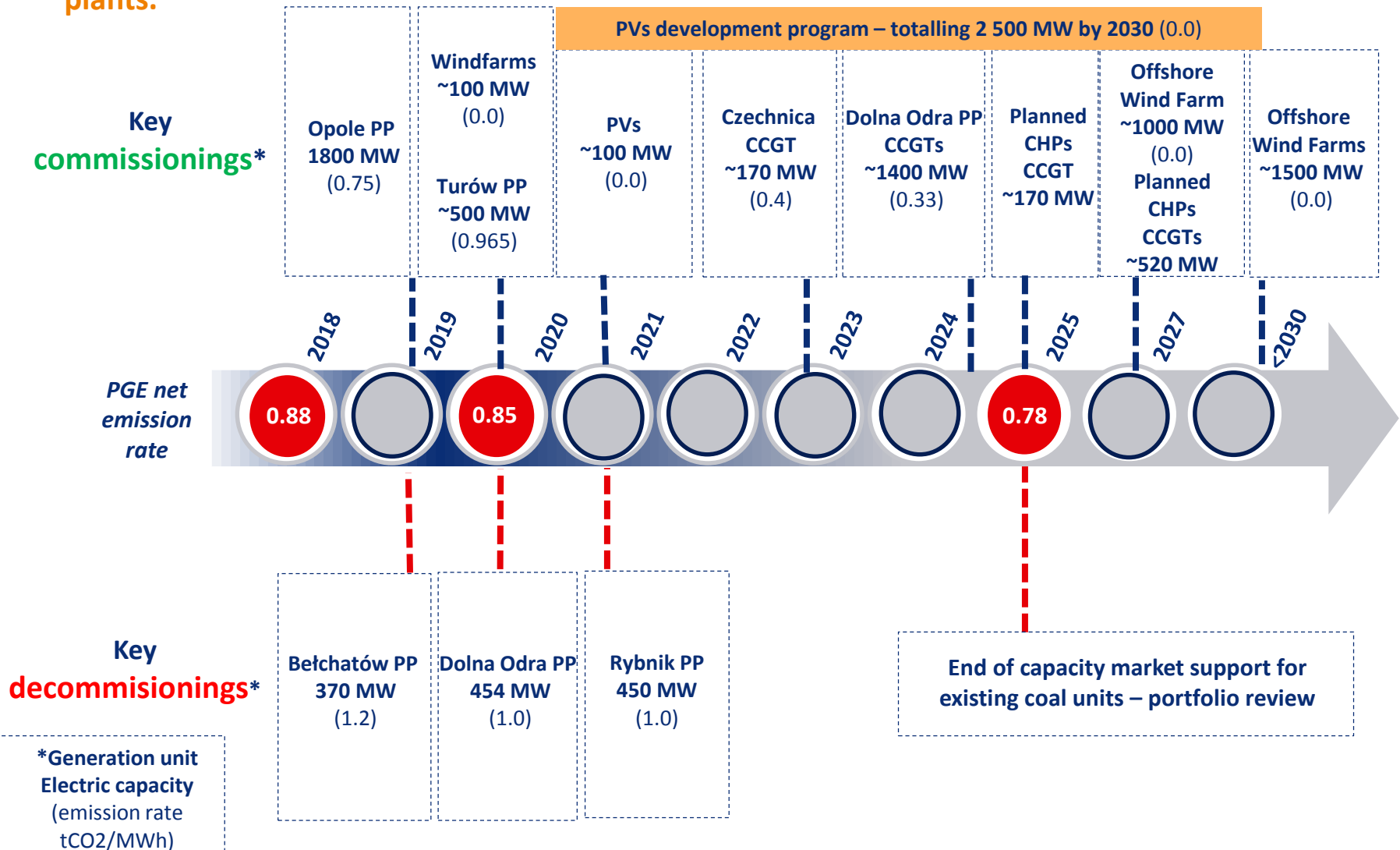
# PGE in transition

November 2019



## PGE in transition from *status quo* to green and blue

PGE is the biggest Polish energy utility and energy transformation leader with low-emission investments portfolio including offshore, PVs, as well as high-efficient CCGT power and heat plants.



# CCGT units in Dolna Odra Power Plant

## Regional impulse for development

1.4 GW

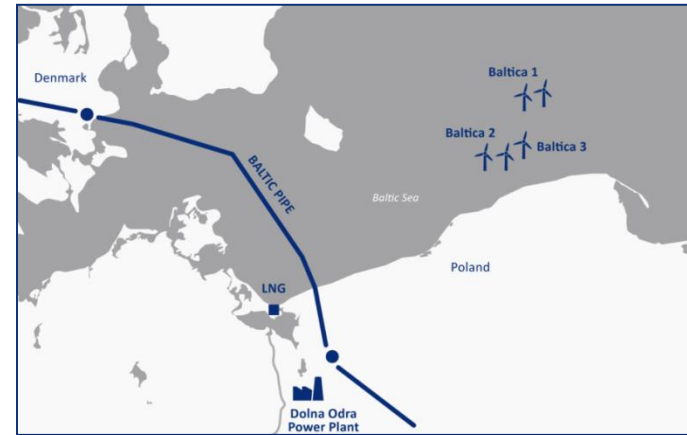
- Flexible system balancing – the only power plant in north-western Poland, the main area of wind farm development.
- Facilitating and backing-up RES development.
- Gas fuel secured thanks to proximity of the LNG terminal and the Baltic Pipe route (scheduled commissioning in Q4 2022).
- Expected revenues from the capacity market (potentially 17-year contract) as a guarantee of return on investment.

## Technical assumptions

- CCGT units of H/J class
- Total net capacity: ~1 400 MW (2x 700 MW)
- Net efficiency: ca. 63%
- CO<sub>2</sub> net emission: ca. 0.3 tCO<sub>2</sub>/MWh

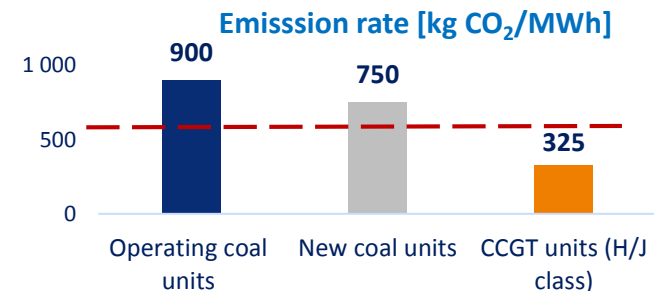
## Project schedule\*

Jan 2019	Units declared in general certification for capacity market 2024 delivery
Q2 2019	Process of choosing the General Contractor launched
Dec 2019	Capacity market auction
Dec 2019	Final Investment Decision
Q4 2019/ Q1 2020	Choice of the General Contractor
Q4 2023	<b>Commissioning</b>



## Q3 Status:

- Project is at the stage of selecting the General Contractor. Expected settlement at the turn of 2019 and 2020.
- Other preparatory works on track: obtained grid connection consent and completed arrangements with Gaz-System.
- Works are aimed at entering the capacity auction in 2019, which translates into the **commencement of commercial operation on January 1, 2024**.



\*Project schedule depends on the date of the gas connection

# 4 Offshore wind farms

2.5 GW

- Baltica 3 area – connection agreement of 1 045 MW
- Baltica 2 area – technical conditions for connection of 1 498 MW
- Potential participation of partners in project (in talks with Orsted)

1 – 2 GW

- Baltica 1 area
- Potentially other projects

## Technical assumptions (Baltica 2 i Baltica 3)

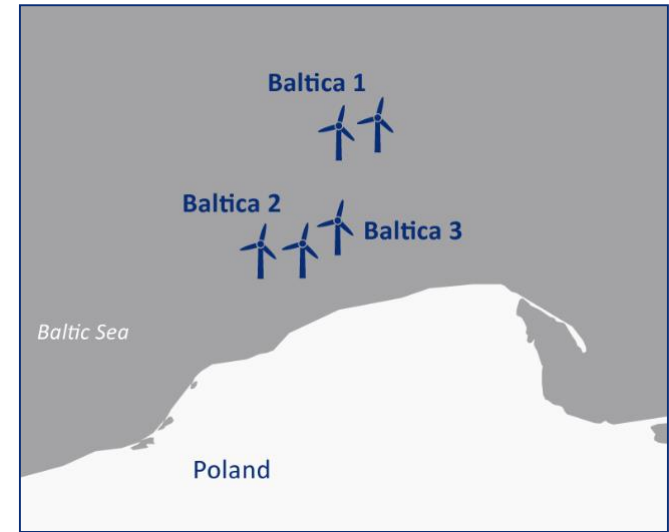
- **Max. capacity:** 2.5 GW
- **Turbine type:** 10 MW (base scenario), up to 13 MW
- **Distance to shore:** ca. 35 km
- **Depth:** 23-50 m

## First offshore wind farm schedule

2019	Environmental decision for wind farm
2020	Closing of the sale of the 50% stake
2022	Process of choosing the suppliers to be launched
2023	Final Investment Decision
2026	<b>Commercial Operation Date</b>

<2030

>2030



## Q3 Status

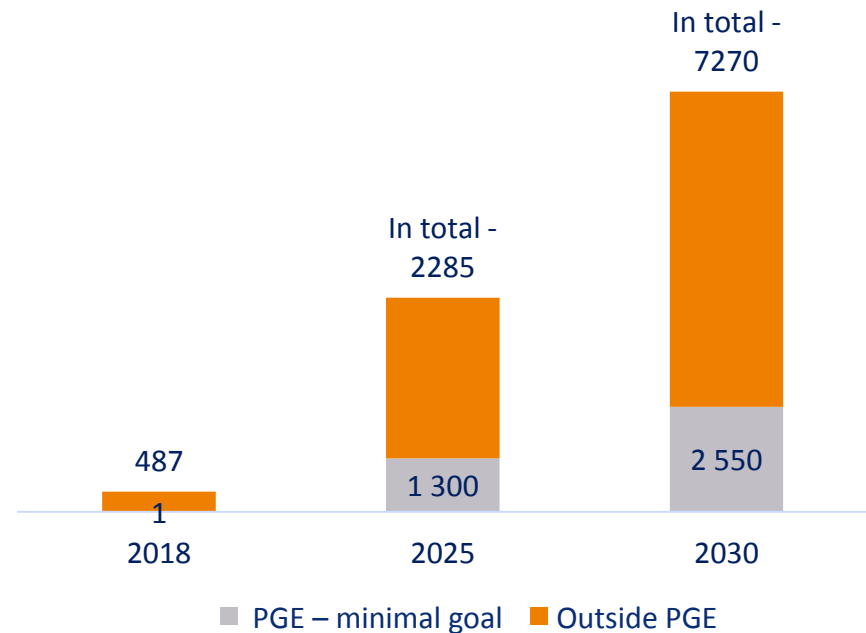
- Act extending the period of validity of Permits for Construction of Artificial Islands, i.e. location permits for offshore wind farms from max 10 to max 17 years.
- Acquiring an industry partner: due diligence has been completed, entities participating in the process submitted binding share purchase offers. Based on the offers PGE started talks with Orsted.
- Letter of intent with PKN Orlen on cooperation for the development of offshore wind energy.

# The leader of photovoltaic development in Poland

## PV program in PGE Capital Group

- Indicative aim to reach **25% share** in Polish RES segment till 2030.
- With the assumptions of the PEP2040 project, we want to start the construction program of **~ 2.5 GW** of photovoltaic power.
- We want to **use the potential of sites** belonging to the **PGE Group**.
- Area of PGE Dystrybucja is one of the areas with very high insolation in Poland.
- Estimated **CAPEX: EUR 1.4-1.86 billion**
- Quantitative objectives of the Program will be periodically verified, among others including the final version of Polish Energy Policy 2040 as well as the potential of other RES technologies.

### Estimation of installed capacity of PV installations (MW) in Poland



# Example of Bełchatów complex transformation

## Coal dominated area as a good fit for RES transformation

PGE GiEK  
o. Bełchatów

TODAY

- **Energy complex for lignite**
- Installed capacity: ~ **5.1 GW** (11 blocks of 390 MW and 1 block 858 MW)
- Annual electricity production: ~ **32 TWh**
- Annual coal extraction: ~ **40 million tons**
- Number of employees at the Power Plant and Mine: ~ **8,000 people** (and additionally external servicing companies)
- Expected **exploitation till 2035/2040**

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FUTURE

- **Potential areas in the Bełchatów complex for PV development:**
  - Total: ~ **190 ha**
  - Potential capacity in the first stage: ~ **60 MW**
  - Expected start of operation: **2022**
  - Estimated CAPEX ~ **35 – 45 mln EUR**
- **Potential areas in the Bełchatów complex for wind farms development:**
  - Locations:
    - Mount **Kamieńsk** (extension of existing 30 MW wind farm)
    - Mount **Szczerców** (outside dump)
  - Potential additional capacity: ~ **70 MW**
  - Estimated CAPEX: ~ **100 mln EUR**

These projects will be **an important contribution to the start of the Bełchatów transformation.**

**Financial scale** of the future transformation of coal dominated areas will be **several dozen larger** than above mentioned projects altogether and **difficult to achieve without EU funds support.**



Kamieńsk Windfarm – one of the oldest windfarms in Poland  
<https://pgeeo.pl/Nasze-objekty/Elektrownie-wiatrowe/Kamienk>

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