



POLSKA GRUPA
GÓRNICZA



Transformational Projects for a New Era

Friday, 13th December 2023

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Energy transformation of PGG S.A.

Coal phase-out plans
until 2049

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graph TD; A[Coal phase-out plans until 2049] --> B[Mining waste management]; A --> C[Revitalization of post-mining areas]; A --> D[Methane capture and management];
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Mining waste
management

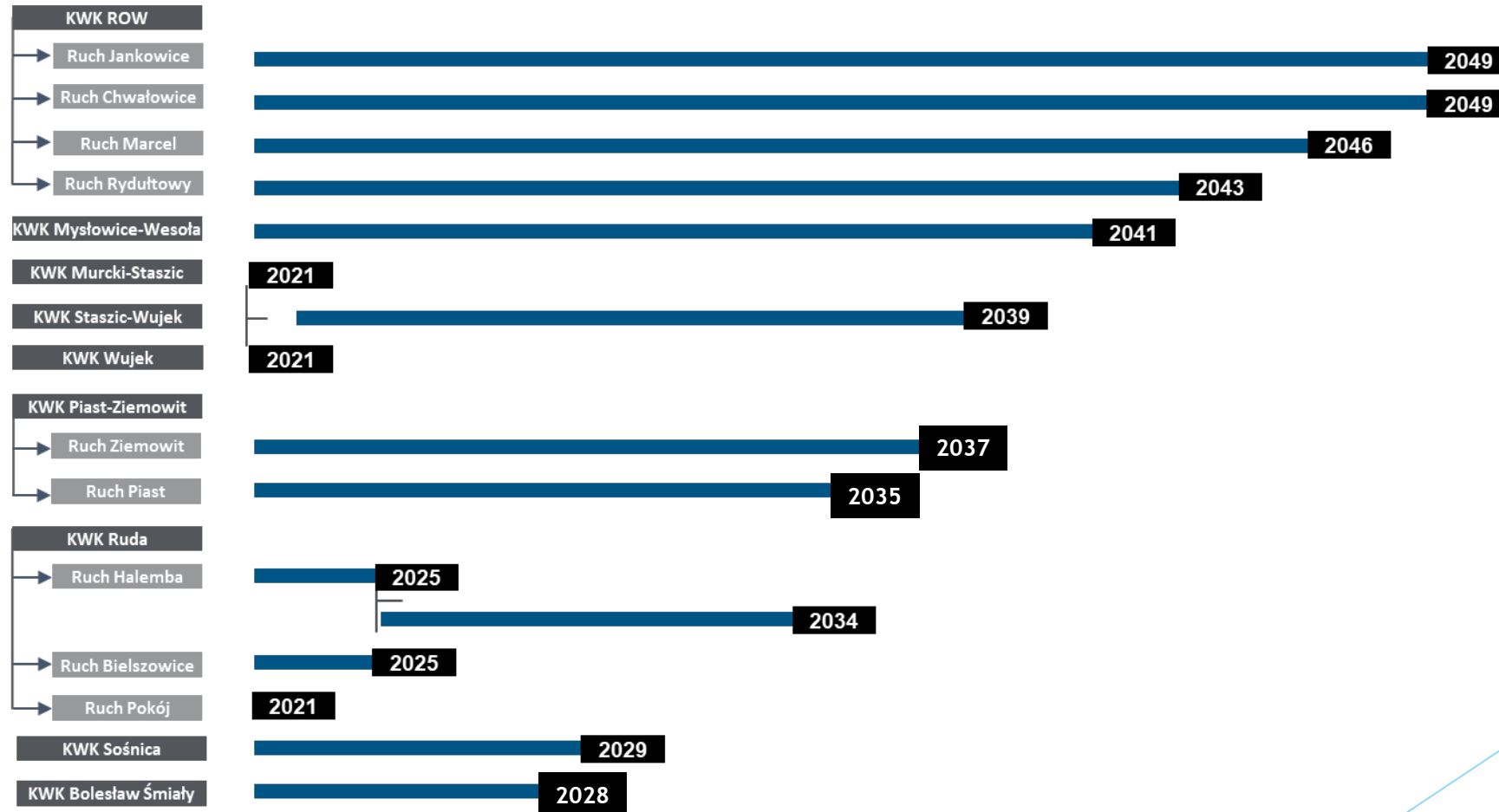
Revitalization
of post-mining
areas

Methane capture
and management

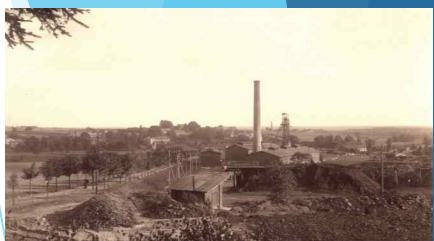
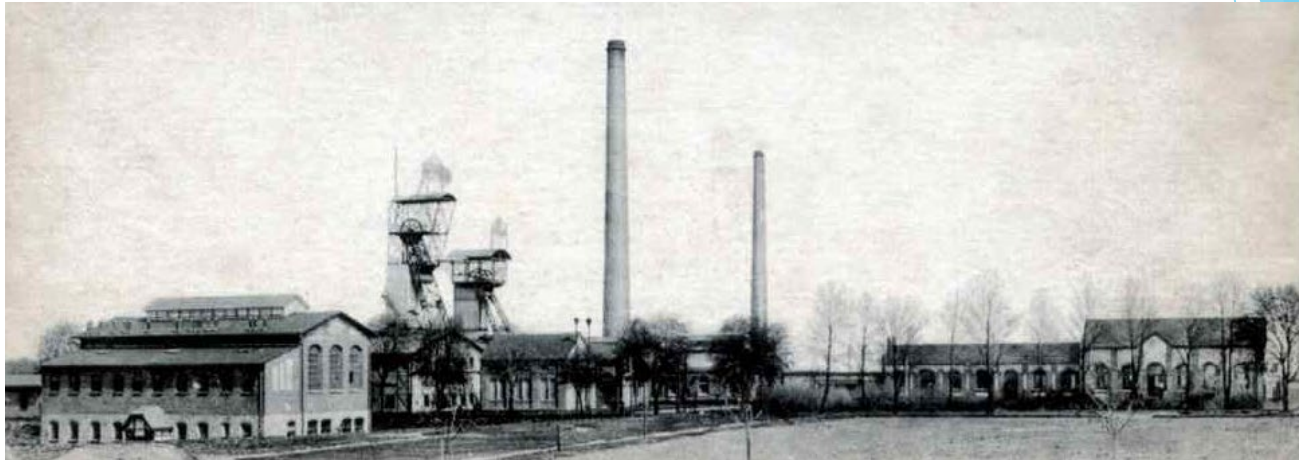
Social Agreement – May 28, 2021 signed

Social Agreement

Assumptions of the Social Agreement Schedule of mine closures



Bolesław Śmiały Mine

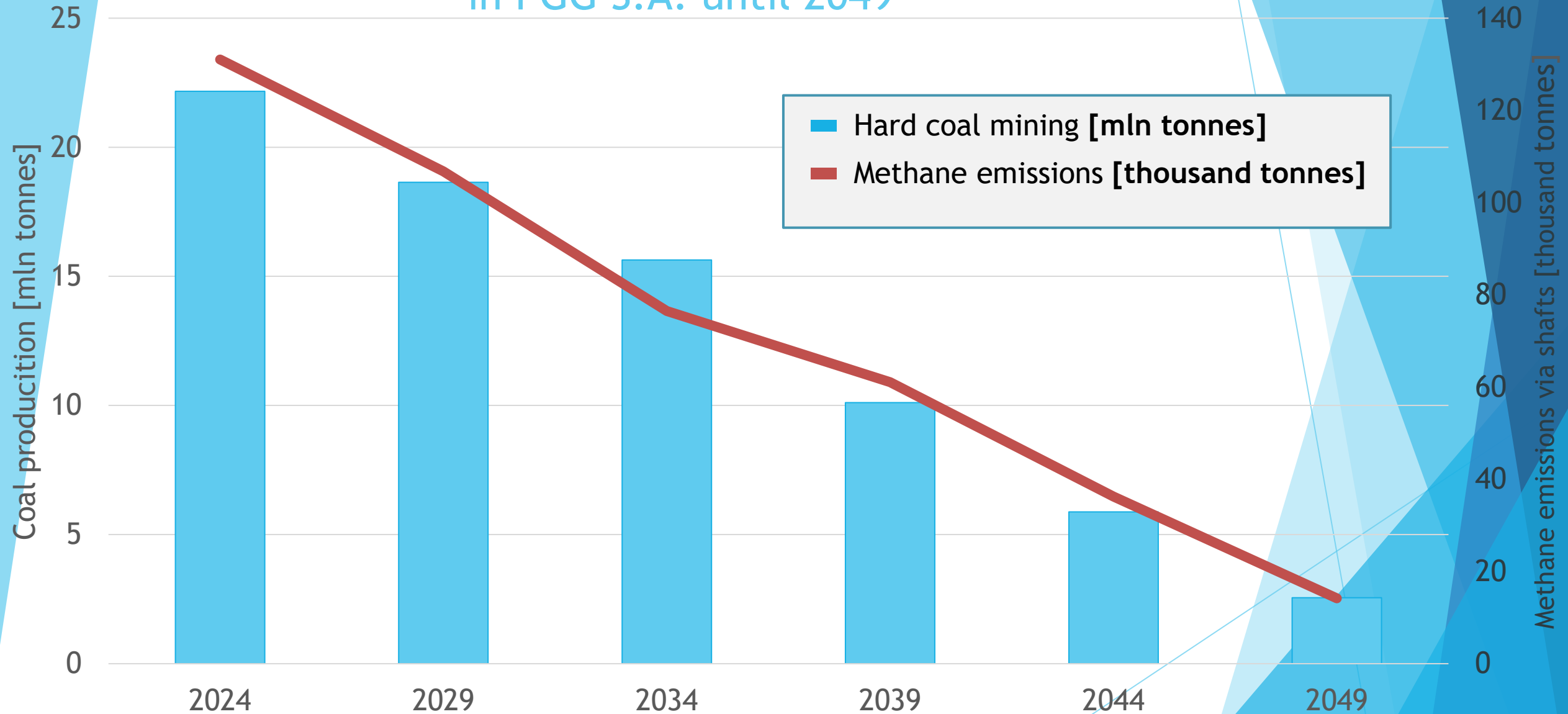


Social Agreement

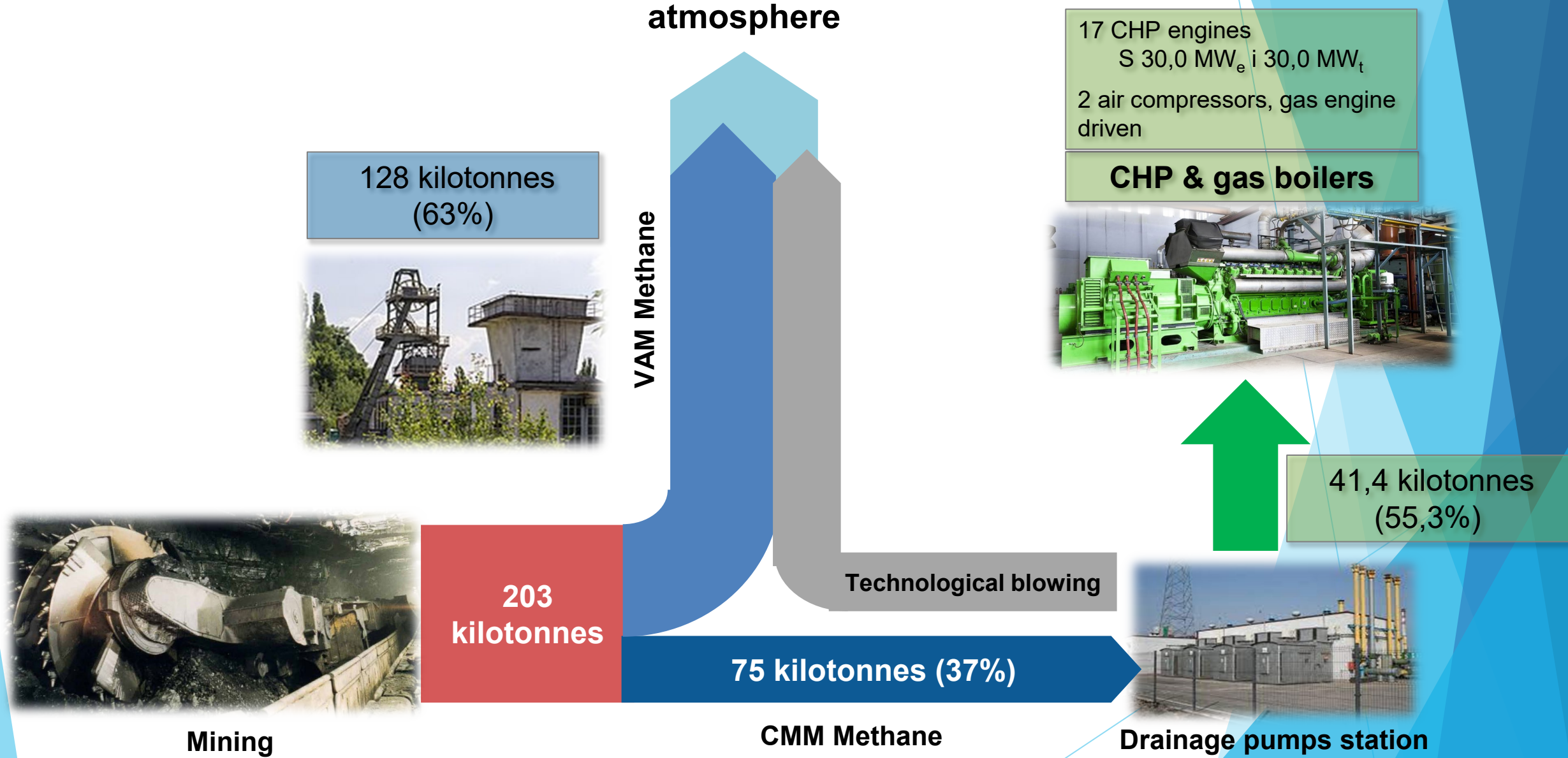
During the transition period, until Poland achieves climate neutrality, the following investments will be prepared and implemented on an industrial scale. Their implementation will take place in the order mentioned due to the scope of the investment and its importance for achieving the energy transformation goals:

- a. construction of a coal gasification installation using IGCC technology with a carbon dioxide capture unit;
- b. construction of infrastructure for transporting captured carbon dioxide to an underground storage facility;
- c. construction and adaptation of underground storage facilities for storing captured carbon dioxide in the rock mass;
- d. construction of an installation for the production of low-emission carbon fuel, the use of which will be allowed in households by 2045;
- e. construction of an installation for gasification of coal into methanol;
- f. construction of an installation for producing (capturing) hydrogen from coke oven gas;
- g. construction of a coal gasification installation for synthesizing natural gas (SNG) with a carbon dioxide capture unit,
- h. management of methane from ventilation air from a hard coal mine.

Prognosed coal production and methane emissions in PGG S.A. until 2049



Methane capture, management and emission in PGG mines



CMM methane capture and management

Current

37%

Efficiency of methane drainage

Target

48%

8
own CHP engines
+9
new CHP engines
under construction
up to 2027

30 MW_E + 30 MW_T

CHP engines

2025 - 44 MW_E + 44 MW_T

2027 - 50 MW_E + 50 MW_T

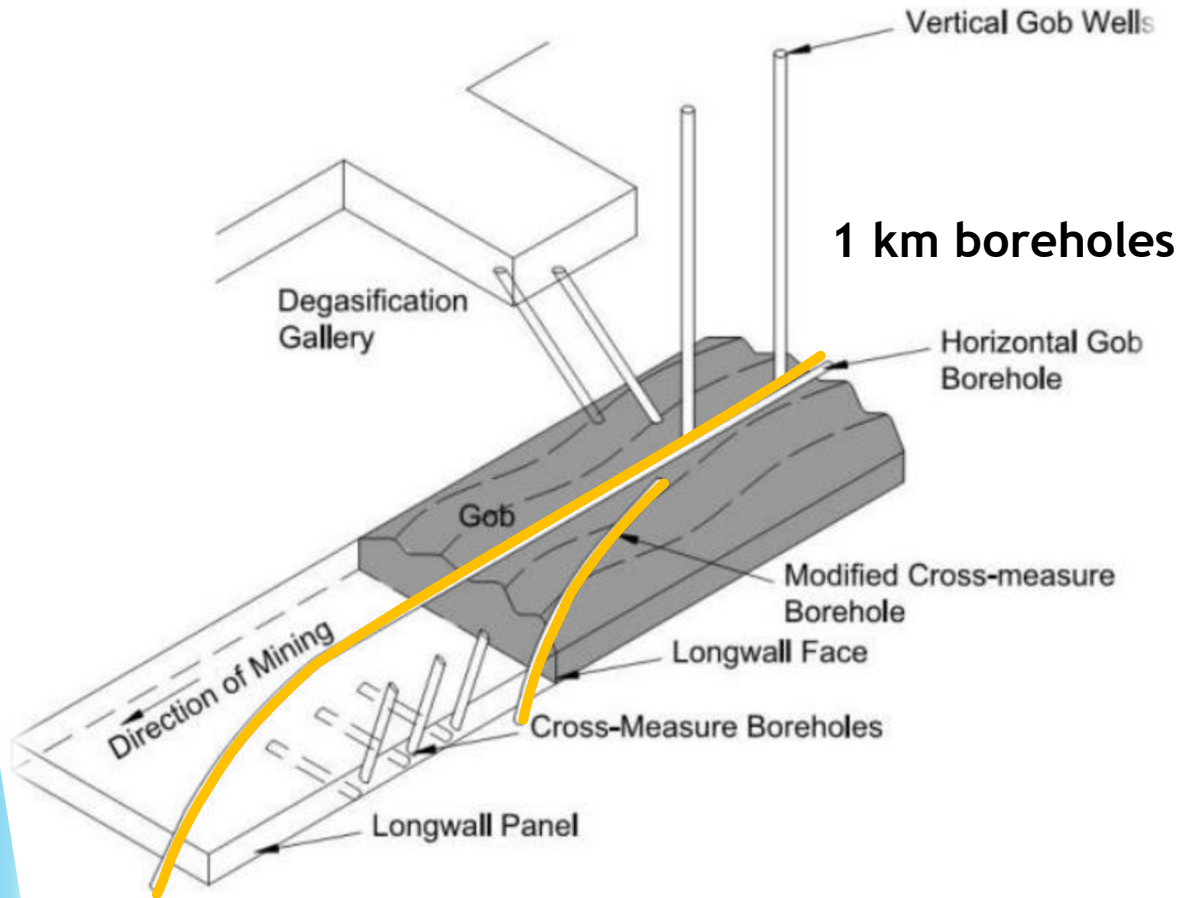
MW_E - electrical energy
MW_T - heat energy

CHP - Combustion turbine, or reciprocating engine, with heat recovery unit

DD-MET - directional drilling for methane drainage



Grant no. 847338 - DD-MET - RFCS-2018



Target:

An alternative, more effective and economical method of methane drainage from longwalls or methane capture from goafs.

Effect:

- Increasing mine safety and productivity, reducing emissions of methane to the atmosphere and reducing the costs of hazard prevention

AMM methane capture and management

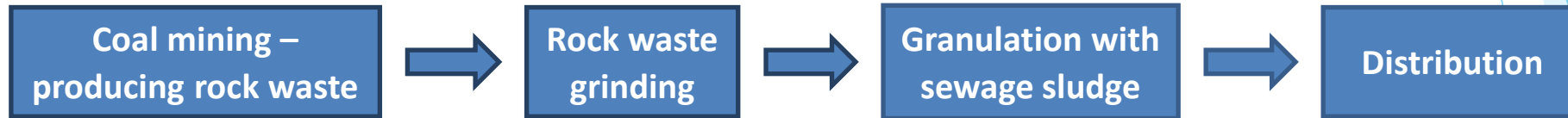
- AMM Methane capture will need to be introduced after mine closures following the coal phase-out plans
- The capturing and management of this kind of methane will use new and existing demethanation stations and available CHP engines
- The project needs EU funding in order to adapt and prepare underground mining sites
- It is estimated that the AMM methane concentrations will oscillate around 20%
- AMM management and usage will provide electrical and heat energy



€ 40 billion is needed to transform PGG with new activities that build on value chains in coal regions

Technology of post-mining waste disposal in soil-forming materials and fertilizing products

- Post-mining waste exposes the environment and people living in their vicinity to threats related to groundwater pollution, dust and fires.
- Only 2.2% of post-mining waste is managed in a way other than storage

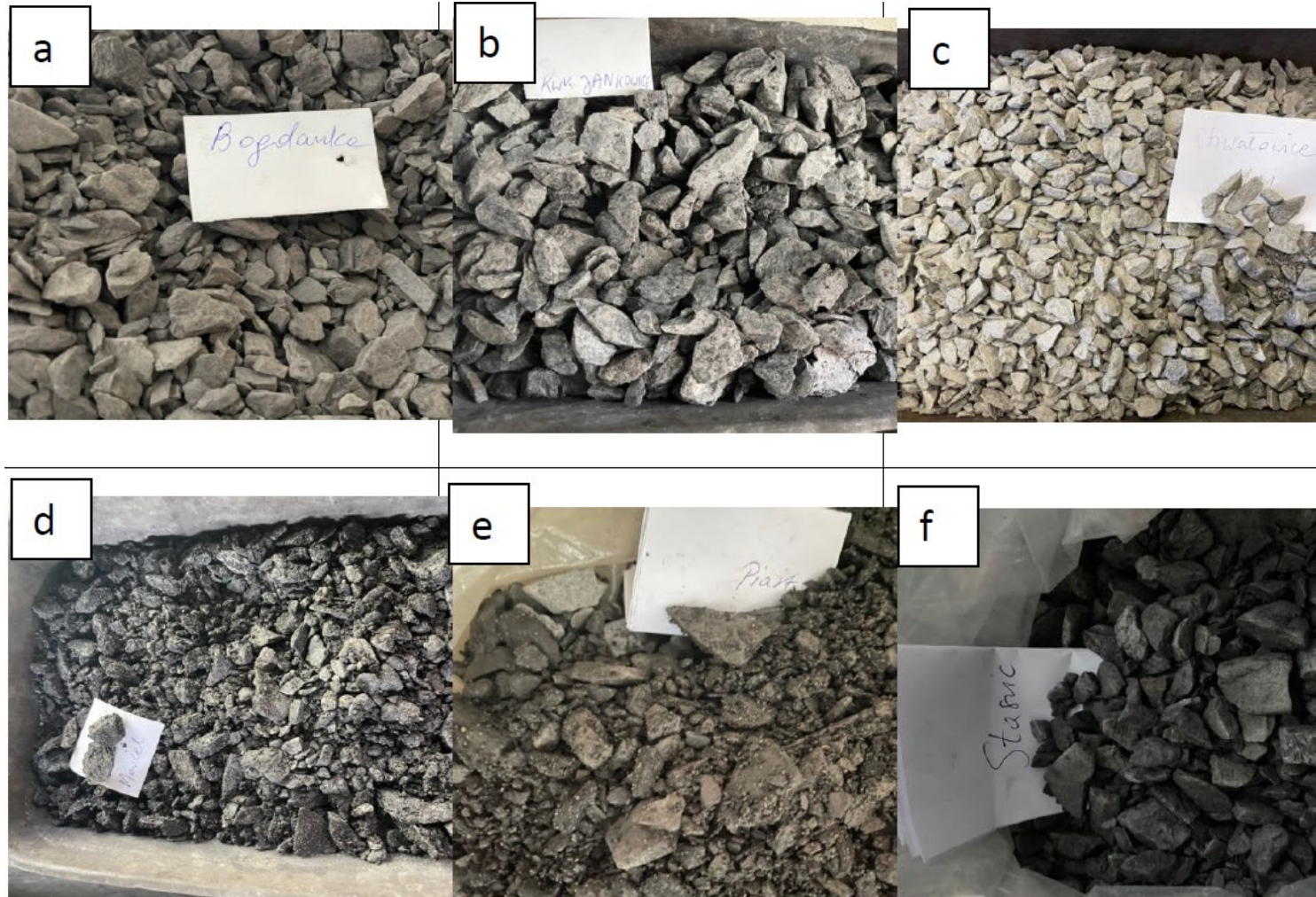


The implemented project is aimed at the management of rock waste from coal mining, and in particular its usage in producing soil-forming materials and fertilizers enriched with organic substance from sewage sludge.



MINRESCUE Project (RFCS funded)

- ▶ Advanced physical and chemical characterization of Coal Mining Waste Geomaterials (CMWGs) and their treatment - Grant no. 899518 - MINRESCUE - RFCS-2019



- a) LW Bogdanka
- b) PGG Mine Jankowice
- c) PGG Mine Chwałowice
- d) PGG Mine Marcel
- e) PGG Mine Piast
- f) PGG Mine Staszic

MINRESCUE project provides innovative solutions for recycling of CMWGs and their application in construction industry

**Ecological rehabilitation and long term monitoring
of post mining areas**



Thank you!
