JUST TRANSITION PROCESS IN POLAND – STATUS AND FUTURE CHALLENGES

Jan Bondaruk
BASIC AREAS OF GIG ACTIVITY

- MINING AND GEOENGINEERING
- ENVIRONMENTAL ENGINEERING
- CLEAN COAL TECHNOLOGIES
- OCCUPATIONAL SAFETY IN THE INDUSTRY
- MATERIAL ENGINEERING
- CERTIFICATION AND ATTESTATION
- TRAINING AND EDUCATION

GIG National Research Institute

2022 facts and figures

- 3978 research and contract works for over 1825 clients
- 103,2 million zł of revenue
- 12 applications for an invention and 2 trademarks
- 17 accredited testing laboratories
- 134 people with academic degrees and titles among about 455 employees
- 60 projects: 19 national ones and 41 international
- 165 scientific publications
- 10 prizes and awards
Silesia region - heart of Polish hard coal mine sector

~78% of hard coal balance deposits occur in Upper Silesian Coal Basin

Transformation of the sector induced by economic factors

Transition of the economy carried out taking into account climate goals

Carbon neutral economy in Europe in 2050

Mines Restructuring Company: 8 non-perspective mines or parts of mines

2000
40 operating coal-mines in Silesia region

2000/2002
10% share of mining in GDP

2016
23 operating coal-mines in Silesia region

2016
9.7% share of mining in GDP

2021
20 operating coal-mines in Silesia region

2021
3.3% share of mining in GDP

2049?
NECP PL AND ENERGY POLICY OF POLAND UNTIL 2040


Integrated approach to the implementation of the five dimensions.

ENERGY POLICY OF POLAND UNTIL 2040 (PEP2040) sets the framework for the energy transition in Poland. It contains strategic decision regarding the selection of technologies used to establish a low-emission energy system. PEP2040 contributes to the implementation of the Paris Agreement concluded in December 2015 at the 21st Conference of the Parties to the United Nations Framework Convention on Climate Change (COP21), taking into account the need to achieve the transition in a just and solidary manner.

The energy transition will be based on three pillars:

- **I pillar: Just transition**
  - Transition of coal regions
  - Reduction of energy poverty
  - New industries related to renewable energy and nuclear energy

- **II pillar: Zero-emission energy system**
  - Offshore wind energy
  - Nuclear energy
  - Local and civic energy

- **III pillar: Good air quality**
  - Heating transition
  - Transport electrification
  - Climate-friendly House
1990 – 70 operating hard coal mines with the average depth = 510 m

2023 - the deepest hard coal mine operates at the level of 1290 m
More than 6400 hectares of post-industrial and post-mining areas to redevelopment in Silesia Region

Territorial just transition plans (TJTPs)

Just Transition regions in Poland

Priority Just Transition regions

- Yes
- No

JUST TRANSITION FUND IN POLAND

€ 3.85 billion for a just climate transition in Poland

€ 2.4 billion for Silesia and Western Małopolska
€ 415 million for Wielkopolska
€ 581.5 million for Lower Silesia
€ 369.5 million for Łódzkie

JUST TRANSITION FUND IN POLAND

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Coal mining employment in 2022 in Silesia region (hard coal + coking coal mines)
62,000 miners (76,000 in total Poland)

Reduction of employment
up to 2030 - 12,400 miners
up to 2049 - 49,000 miners

Estimated decrease in the number of jobs in mining-related companies (value chain)
up to 2030 - 24,500 employees
up to 2049 - 96,000 employees

<25,000 hectares of post-industrial and post-mining areas

The main objective of the TJTP is assumed to be:
• Equitable and efficient transformation of mining subregions towards a green, digital economy, ensuring a high quality of life for residents in a clean environment.

Operational objectives of 7 mining subregions embrace:
• Innovative and diversified economy
• Resource and energy efficient economy
• Strong entrepreneurship
• Balanced distribution of energy
• Repurpose of post-industrial areas for economic, environmental and social purposes
• Socially responsible transition management system
• Attractive and effective education
• Labour market support system and skills upgrading mechanism
• Comprehensive social support system to activate residents

Identification of stakeholders and stronger partnerships
MINING WORKFORCES AND VALUE CHAIN

The socio-economic contribution of mining in terms of employment can be measured on three levels:

- **direct employment** – the workforce employed by coal enterprises themselves,
- **indirect employment** – those employed at companies that produce goods or deliver services directly to coal enterprises,
- **induced employment** – those employed to provide goods and services to meet the consumption demand of directly and indirectly employed workers (Bacon and Kojima, 2011).

![Employment structure in mining-dependent companies by NACE sections and dependence on coal mining contracts](image)

Estimates of mining-dependent workplaces broken down by nationwide and regional impact

<table>
<thead>
<tr>
<th>Mining-dependent workplaces</th>
<th>Total (in Upper Silesia)</th>
<th>associated workplaces</th>
<th>mining-dependent workplaces (Upper Silesia)</th>
<th>mining-dependent workplaces (Poland)</th>
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<td>Upper Silesia</td>
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<td>30,210</td>
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Source: Mapping the indirect employment of hard coal mining: a case study of Upper Silesia, Poland, IBS Working Paper 07/2022, November 2022
SOCIAL AGREEMENT OF 28 MAY 2021 => MINE CLOSURE SCHEDULE

**Government - Trade Unions - Mining Municipalities - Mining Companies**

<table>
<thead>
<tr>
<th>Year</th>
<th>2021</th>
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=> mine closure schedule
**OBJECTIVES OF SOCIAL AGREEMENT**

| Mechanism for financing coal mining companies in the transition process | • covering extraordinary costs  
• subsidies for capacity reduction costs |
|---|---|
| Indexation of salaries | • inclusion of the salary costs of the companies' employees  
with the indexation mechanism of average monthly salaries  
from the previous year |
| Rules for the construction and implementation of clean coal installations | • support for investments using available resources  
• industrial-scale (TRL8/9) investments:  
  • coal gasification plant (GCC+CCS)  
  • production of low-carbon fuel,  
  • hydrogen generation,  
  • CO₂ storage in the rock mass. |
| Guarantee of employment | • employee reallocation mechanism -> mainly to other mines  
• trainings and courses within the sector |
| Social protection package for employees from liquidated coal mines | • mining leave  
• severance pay |

Relocations to other mines  
up to 2030  
2 500 miners

Retirement up to 2030  
1 800 miners
MINING WORKFORCES AND VALUE CHAIN TRANSITION

MINING REGIONS IN TRANSITION

Mining workforces

Mining-dependent workplaces

SOCIAL AGREEMENT

Direct Support (miners and coal mine operators)

Indirect support
Development of technology

Public intervention -> EU public support regulations

JTF/TJTPs

Indirect new workplaces

Direct JTF mechanism
Development of regional economy

- Vocational education in just transition process
- Support for starting a business: outplacement projects
- Social inclusion - strengthening the just transition process
- Supporting SMEs for transformation
- Use of degraded areas to develop the regional economy through business investment

EU public support regulations
STRATEGIC CHALLENGES

Reindustrialisation and revitalisation

Cooperation between the administration - industry - science

"Black to Green" sustainable transformation of the Silesia region

Finance and new business models

Innovation and integration of knowledge
ADVANTAGES OF THE POST-MINING ASSETS

Phase 1: Pre-Closure Planning
10-18 months

Phase 2: Closure
2+ years

Phase 3: Regional Transition
5-10 years

New business models and collaboration schemes

Scenarios of the redevelopment process
NEW VALUE CHAIN & SUCCESS STORIES

Katowice Coal Mine (1823–1999)
120 000 000 tons of coal

Szombierki Coal Mine - Bytom

Culture Zone - new image and functions

Katowice Coal Mine brownfield - 2001 demolition works

The Golf Club Armada
R&D PROJECTS – STATUS AND PERSPECTIVES
The aim of the project was to provide insight into perceptions of various aspects of the transformation process. The aim of the project was to collect and disseminate knowledge:

- on the socio-economic processes taking place in the region,
- effective transformation activities and tools,
- innovative technologies supporting the process of diversification towards a green digital economy,
- promoting framework directions for professional reorientation in the areas of regional smart specializations by initiating cooperation of local partners from areas undergoing socio-economic transformation and R&D with business entities.

ROPT supports the implementation of the objectives of the regional transformation plan and the regional development strategy in the social and economic dimension.
LEVERAGING THE COMPETITIVE ADVANTAGES OF END-OF-LIFE UNDERGROUND COAL MINES TO MAXIMISE THE CREATION OF GREEN AND QUALITY JOBS

The project consortium:
- UNIVERSIDAD DE OVIEDO, Spain
- GLOWNY INSTYTUT GORNICTWA, Poland
- FUNDACION ASTURIANA DE LA ENERGIA, Spain
- DMT-GESELLSCHAFT FUR LEHRE UND BILDUNG MBH, Germany
- MAGELLAN & BARENTS SL, Spain
- WEGLOKOKS KRAJ SPOLKA AKCYJNA, Poland,
- HULLERAS DEL NORTE SA, Spain,
- PREMOGOVNIK VELENJE, Slovenia.

GreenJOBS focuses on repurposing end-of-life underground coal mines by deploying emerging renewable energy and circular economy technologies to promote sustainable local economic growth and maximise the number of green, quality jobs. 2 business plans (Virtual Power Plant and a Green Hydrogen Plant).

PILOT ACTIONS

Bobrek-Piekary Coal Mine, POLAND

Premogovnik Velenje, SLOVENIA
<table>
<thead>
<tr>
<th>No.</th>
<th>Action</th>
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<tbody>
<tr>
<td>1</td>
<td>Virtual power plant</td>
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<td>2</td>
<td>Green hydrogen plant</td>
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<td>3</td>
<td>Eco-industrial park</td>
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<td>4</td>
<td>Cultural heritage and sports/recreations areas using green energy</td>
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<tr>
<td>5</td>
<td>Floating PV panels at flooded open-pit coal mine</td>
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<td>6</td>
<td>Pumped hydroelectric storage (PHS) at former open-pit coal mines</td>
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<td>7</td>
<td>Fisheries in flooded open-pit coal mines</td>
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<td>8</td>
<td>Combined-cycle gas turbine (CCGT) power plant powered by natural gas</td>
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<td>9</td>
<td>Mine gas utilization for gas-powered CHP power units</td>
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<td>10</td>
<td>Small modular reactors (SMRs)</td>
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<td>11</td>
<td>Biofuels combustion energy plant</td>
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<td>12</td>
<td>Molten salt plant</td>
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<td>13</td>
<td>Agrophotovoltaics (APV) at former open-pit coal mine areas</td>
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<th>No.</th>
<th>Mikro-action</th>
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<td>1</td>
<td>Ancillary services provided by batteries</td>
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<td>2</td>
<td>Recovery of resources from coal mining waste heaps</td>
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<td>3</td>
<td>Usage of methane from degasification units on closed coal mines</td>
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<td>4</td>
<td>Circular mining technologies for pumped water material recovery.</td>
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<td>5</td>
<td>Forest restoration at former open-pit coal mines</td>
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<td>Large scale IT infrastructure - power plant</td>
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<td>7</td>
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<td>Gravitricity</td>
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<td>9</td>
<td>Dense fluids</td>
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<td>Underground hydropumping</td>
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EXTENSION OF THE POST-MINING LAND MANAGEMENT SYSTEM IN THE SILESIAN VOIVODESHIP

Supportive tool for management of transition process.

new public e-service
database of post-mining areas
tool for the valorisation of post-mining areas
Make it easier for investors to get information about post-mining areas and help them assess their economic attractiveness.
digital repository of documents including plans, maps, photographs of post-mining areas

https://www.youtube.com/watch?v=0Ajlbo56QJE
Along with the phase-out plan, the expected outcome of the transition process is to ensure the security of the national energy system combined with climate neutrality goals.

Silesia region, due to concentration of different types of challenges, is perceived as the reference laboratory and source of good practices of the just transition process in Europe.

Post-mining period creates new models of collaboration between industry, researchers, and administration.

Reskilling mining workforce and employees of mining-dependent enterprises (value chain) is a key challenge for the well-embedded just transition.

Just transition process is implemented through an extensive support program that includes, among others:

- Regeneration, decontamination and restoration of post-mining assets
- Raising and changing the qualifications of employees and jobseekers
- Investment in SMEs, including start-ups, leading to economic diversification and economic restructuring
- Business creation through business incubators and consulting services
- Research and innovation activities and supporting the transfer of advanced technologies
WE INVITE YOU TO COLLABORATE

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