Welcome

Just Transition Projects II: Projects on economic diversification, reskilling, environmental rehabilitation

Platform for Coal Regions in Transition

#CoalRegionsEU

Energy

Sixth plenary & Working Group Meetings Brussels 16-17 October 2019

HBP p.l.c. company, Upper Nitra/Trencin Region, Slovakia

Projects on Economic diversification, reskilling, environmental rehabilitation on Upper Nitra, Trencin Region conditions

Coal Mining and HBP company transition projects before EU initiative

- Brown coal and lignite have been mined underground for more than 110 years in the Upper Nitra region
- HBP a.s. currently operates 2 underground mines in the region, mining in Cigel colliery ended last year – there is big brownfield
- HBP employs 2700 people directly, at least twice as many people in the region are employed indirectly as
- We started the transformation of the company into non-mining production 10 years ago by planning new production plants using renewable energy sources
- 5 years ago we launched run the production projects of tomato greenhouse farming and indoor fish farming, both on the energy based of low-temperature geothermal energy from mine water for commercial operation
- So we have the results of our own transformation start without outside help, **we have background and tradition, we know what we want to do, we know how to do it**

- Both HBP company coalmining transformation projects before CRiTP initiative were financed from **commercial bank loans**, without Eurofunds, on the basis of financial guarantees from the company's core business - coal mining for energy purposes, but **no longer using coal as energy source**.

(Left – greenhouses in Laskar mine, right –fishfarm Handlova aerial views)

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HBP p.l.c. company, Upper Nitra Region, Slovakia

We are now on full production from indoor fishfarm - that means **900 tonnes African catfish meat** fillets (fresh / chilled / frozen / smoked) per 1 year. No antibiotics, no fish based feed are used. Water flowing whole year from coalmine at same temperature, and we use water for fishes wellfare and its thermal energy, because they need 30 grade C . There are no biological waste, all residues are used for other products. Catfish skin is used for medicinal gelatine production

=

On our Greenhouses are under full output produced **1 000 to 1 500 metric tonnes of tomatoes p.a.** in picking maturity – with colour, taste and smell as normal garden tomatoes. There are used no chemical pesticides, against harmfull isects are used predatory insects. Whole production is aquaponic semi bio-production

Cost for own transition projects

- CAPEX for low temperature mine water geothermal source greenhouses was **6 million €** by the year 2016

- CAPEX for geothermal indoor fishfarm & integrated smaller two greenhouses was **15 million €** by the year 2017

Experiences and Practices of HBP p.l.c. company in non-coal projects :

- We have been using geothermal energy (mid temperatures 60 degree of Celsius hot water from our geothermal well) for more than 20 years
- We have 7 years installed the largest heat pumps in Slovakia: 1.6 MWt and 1.2 MW thermal output, used for low temperature mine waters
- We have been growing biomass for wood chips on an experimental scale for more than 12 years
- In addition to agricultural production, we have a large machine plant used for heavy engineering and hydraulics at the site of a reclaimed former coal mine
- We do reclamation works after our mining activities for more than 40 years.

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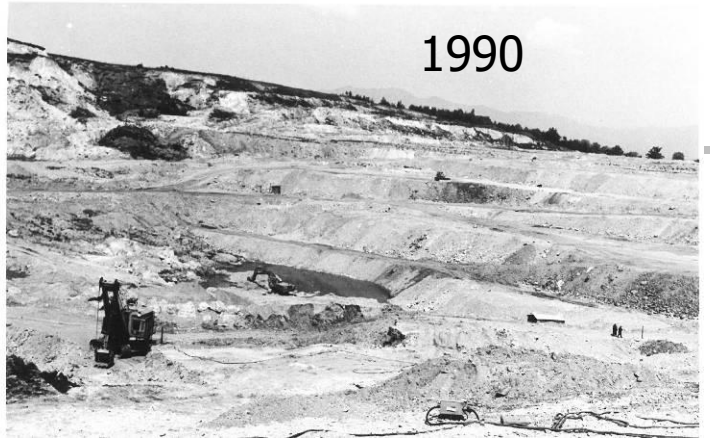
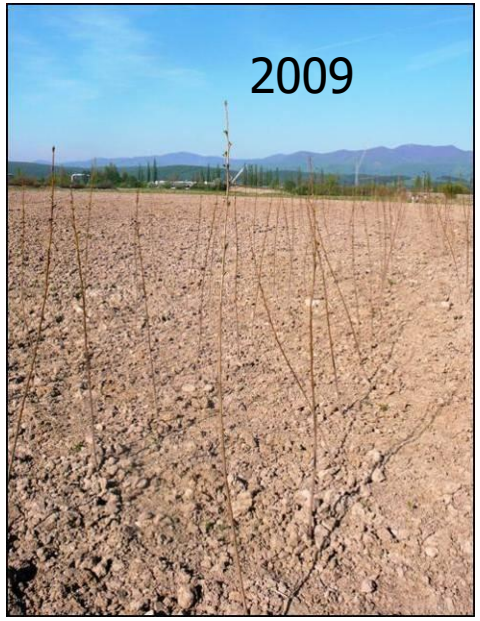
RECULTIVATION





Planning of own transformation plan and actual reality

- Prior to year 2017, we had designed our own plans and strategy for transformation from coal to other non-coal production by 2030 - with the gradual phasing out of mining and in meantime the construction of other production plants.

- Then came the EU initiative TRANSFORMATION OF COAL REGIONS, where Trencin region was selected as one of the first three pilot regions with North Greece and Polish Silesia.

- Consequently, the Slovak government shortened the General Economic Interest for domestic coal mining term until the end of year 2023, which means that we must gradually reduce and terminate coal mining **much earlier, and thus logically and fundamentally decreases the company's revenues** and turnover from the HBP p.l.c. core business - coal mining.

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HBP p.l.c. company, Upper Nitra Region, Slovakia

After the launch of the Transformation of coal regions initiative , **domestic banks became nervous, and because of the short remaining coal mining time until 2023, they refuse calls HBP p.l.c. to provide commercial loans to finance other transformation and non coal production projects:**

- Development of tourism & recreational center based on RES energy-geothermal energy, connected with the expansion of a functioning mining museum in the closed Cigel colliery – brownfield
- Biomass growing, wood biomass farm production, development of fruit growing in a region with a long tradition of fruit farming
- Actually discussed replacement of heat source for district heating network to town Prievidza from coal powerplant to heat source based on RES : geothermal sources (low temperature geothermal heat from mine waters) & biomass in winter + solar thermal instead biomass during summer season
- Expansion of HBP company railway wagon repair plant and prepared joint project of production of new freight wagon bogies together with company Tatravagónka Poprad

EUROFUNDS accessibility for transforming coal mining companies are **in fact in our country really poor**

- Mining companies that are at the focus of the Transformation of Coal Regions and as a Project Holders to Coal Mining replacement with other industry are all **BIG COMPANIES**
- All the directly involved mining companies are **mining and/or processing COAL**, which **disqualifies them from most Eurofund support schemes**, with the exception of the RFCS Framework Program, which is intended only for coal and steel research, and should be very early „dissolved" to the other EU research programmes.
- Projects aimed to switch from coal to non-coal production involve significant **strategic investments - such plans are not made by SMEs anywhere in the EU**
- Most EUROFONDs, the reallocation of which is discussed also in Slovakia, as well as in this CRiTP forum, **are designed for Small and Medium Enterprises** - and this is no one from coal mining companies!
- The reallocation mechanism of unused EU funds **does not change their settings oriented for SMEs.** They original settings after reallocation to Trencin region **stay the same as previous.**
- The share of financial participation of large enterprises with the current setting of 75% participation of non SME : to 25% share from Eurofunds is economically uninteresting - it would be interesting, if there will be opposite rate of financial participation.

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HBP p.l.c. company, Upper Nitra Region, Slovakia

One of our strategic plans to switch from coal production is to build **innovative production of new railway carriages in Upper Nitra (Trencin) region** in cooperation with Tatravagónka Poprad company

https://tatravagonka.sk/about-us/?lang=en

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- Tatravagónka Poprad company is a leader in research and development of freight wagons in the EU
- Annual production Tatravagónka is 3500 wagons of various types on 8 different production lines and 7 500 pieces of wagon bogies
- Tatravagonka cooperate with leading domestic and foreign Technical universities
- Western European countries are buyers of various types (bulk, container, tank,car, other special) wagons

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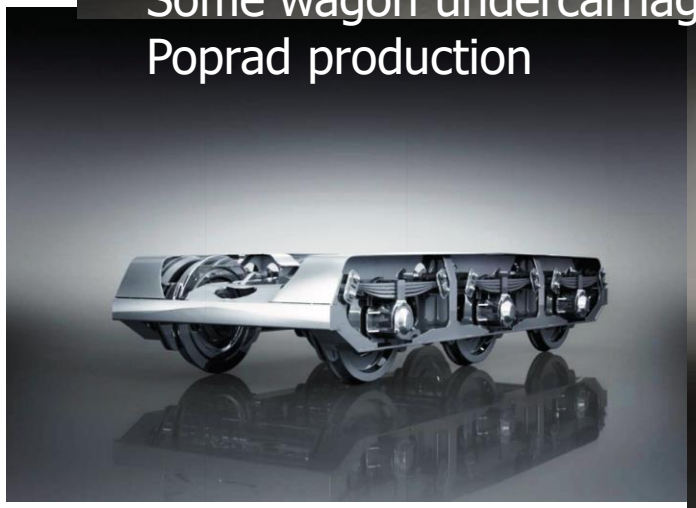
Some wagon undercarriages & wagons from Vagonka Poprad production



Advantages and skills of HBP p.l.c. for a joint project with Tatravagonka Poprad

- At present, HBP company **owns a fleet of 111 freight wagons and 6 locomotives** that carry coal , timbers steel arches and other bulk goods from- and- to company and between coalmines

- HBP company owns and manages **42 kilometers of private railways** with 98 shunting switches

- HBP owns and has been operating a **Railway wagon repair plant** with a current capacity of 300 wagons per year, of which 100 wagons (not our) per year is under complete overhauling. The wagon repair plant lies on the Cígel' mine where the mining ended at 2018 . Wagon overhauling plant works from year 2003

- We have in HBP company also **other machinery construction plant**, designed by hall dimensions for heavy machine parts and large pieces; during past years this plant produced the massive pieces of machinery for underground coal mining complexes.

- We believe in the future of rail transport in the EU, increasing its capacity and role in transport, developing rail electrification as a greener alternative to goods and raw materials transport in the EU

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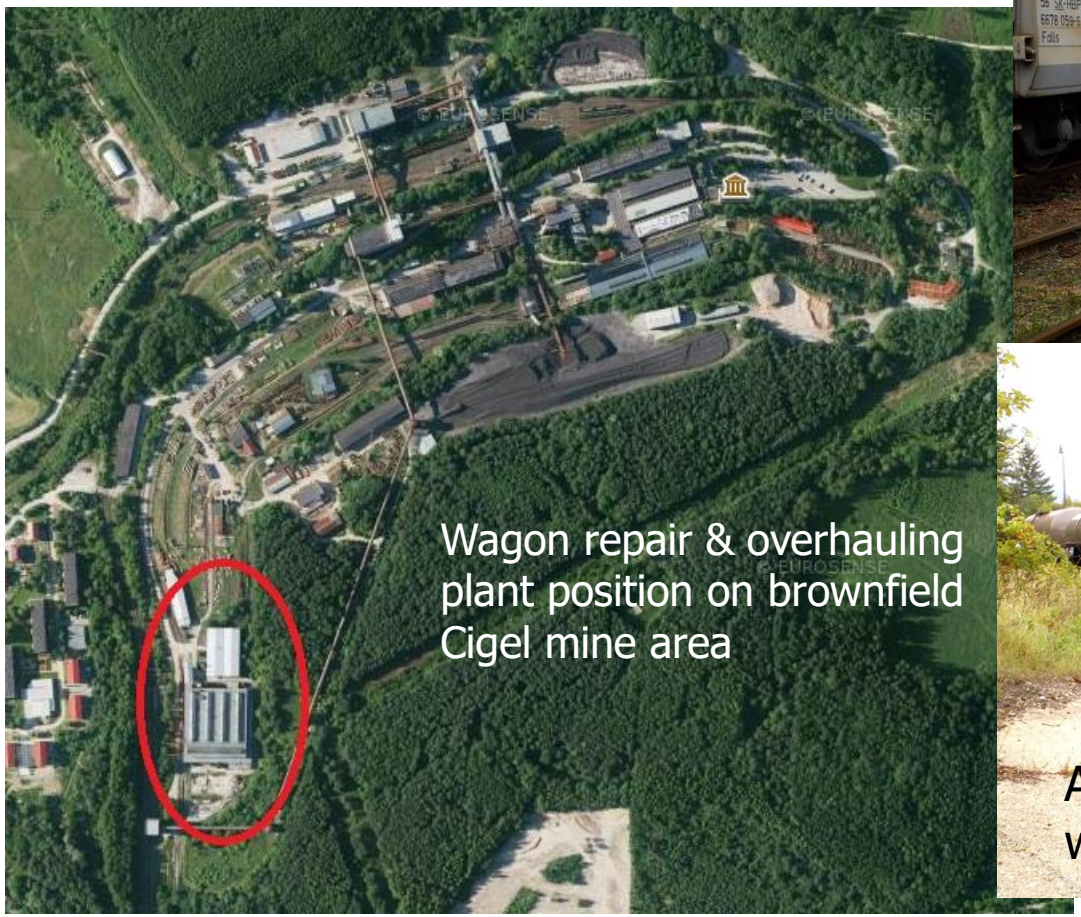
HBP p.l.c. company, Upper Nitra Region, Slovakia



Wagon repair & overhauling plant position on brownfield Cigel mine area

And example of overhauled tank wagons outcoming from plant

Research & Innovations in common railway wagon project HBP & Tatravagonka

- Research and innovation should also be part of a joint project for the production of new railway bogies - for example research into possibilities for reducing the noise of carriages, reducing their weight and increasing telematics - sensors and readers on wagons, developing very silent wagons according to **EC regulation No. 2015/429 article 2 point 7.**

- We want to work together to development and manufacture innovative wagon carriages with online parameter readers, **and reduced energy consumption** at -15% less, compared to conventional chassis – by use of stronger steels to reduce wagon mass.

- It is also possible to **build a railway test tracks** for wagons with new bogies - on private lines HBP p.l.c. we have sections with unusual bends, climbs and descents, that are rare occured on conventional state rail lines.

Benefits of the joint project of new wagon bogies production plant:

- Creation of new jobs up to 300 direct and up to 800 indirect
- Support and development of innovation - cooperation with TU Slovakia, Germany,
- Transfer of research & innovation results into practice
- Human resources development and skills upgrading
- Optimization and modernization of engineering production, also railway transport modernisation
- Support for transformation in the coal region of Upper Nitra, Slovakia
- Supporting the regional economy transition
- Environmentally friendly products
- Multiplier investment effect with impact on business opportunities of subcontractors
- Dynamic simulation and production planning
- Modern technologies - laser / plasma cutting, robotic welding , thus high added value
- Establishment of a welding school - working with modern technologies - laser welding, robotic welding

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HBP p.l.c. company, Upper Nitra Region, Slovakia

Living machinery plant HBP connected with private railway to all other collieries and plants

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HBP p.l.c. company, Upper Nitra Region, Slovakia

- Planned railway carriage production in HBP machinery plant: **12 000 pieces per year**
- Planned CAPEX investment: **up to 95 mil. €** including the purchase of new modern machines and technologies
- The time of realization of the conversion of the machine room to the start of production of the chassis : **4 years**
- customers for railway carriages: **Switzerland, Germany, Austria, Luxembourg, France, Belgium , of course Slovakia & Czech republic**

Thank you for your attention!

Some questions?

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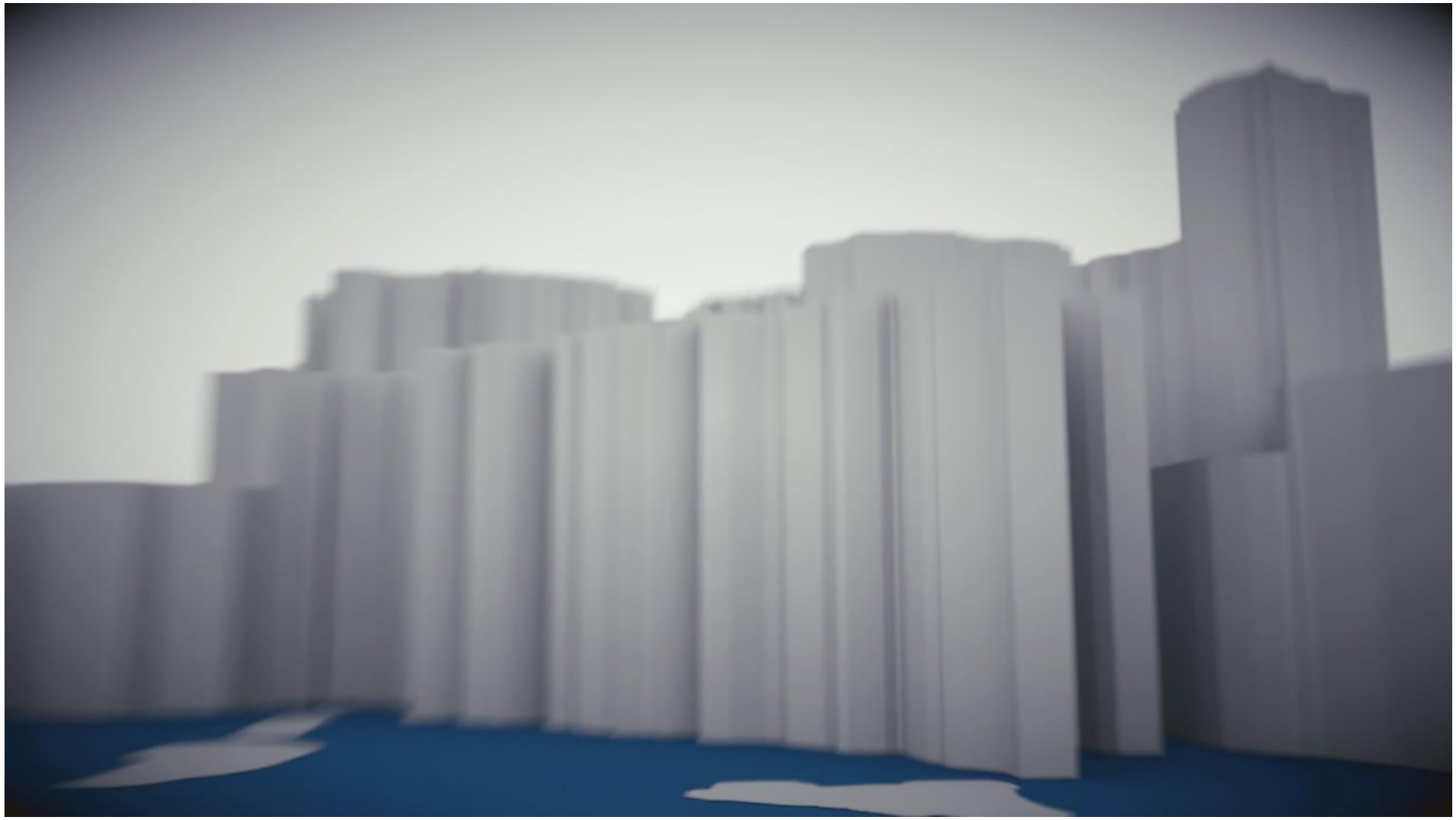


KEY CHALLENGES IN THE REVITALIZATION PROCESS CARRIED OUT BETWEEN 2006 AND 2018

COAL MINING
MUSEUM
IN ZABRZE

CONSISTENT VISION AND POLICY OF TWO LOCAL GOVERNMENTS
IN THE FIELD OF REVITALIZATION OF POST - INDUSTRIAL HERITAGE OF ZABRZE

Śląskie.

Zabrze

COAL MINING MUSEUM IN ZABRZE

REVITALIZATION OPERATOR

ORGANIZATION AND COORDINATION OF WORKS CONDUCTED BY PERSONNEL OF VARIOUS SPECIALTIES

LEGAL FRAMEWORKS

Distributed and unstructured ownership

No regulations in terms of conducting works in tourist facilities subject to the requirements of the Geological and Mining Law

No regulations in terms of the possibility to activate and present mining machines and devices to tourists

NEED TO CHANGE THE GEOLOGICAL AND MINING LAW

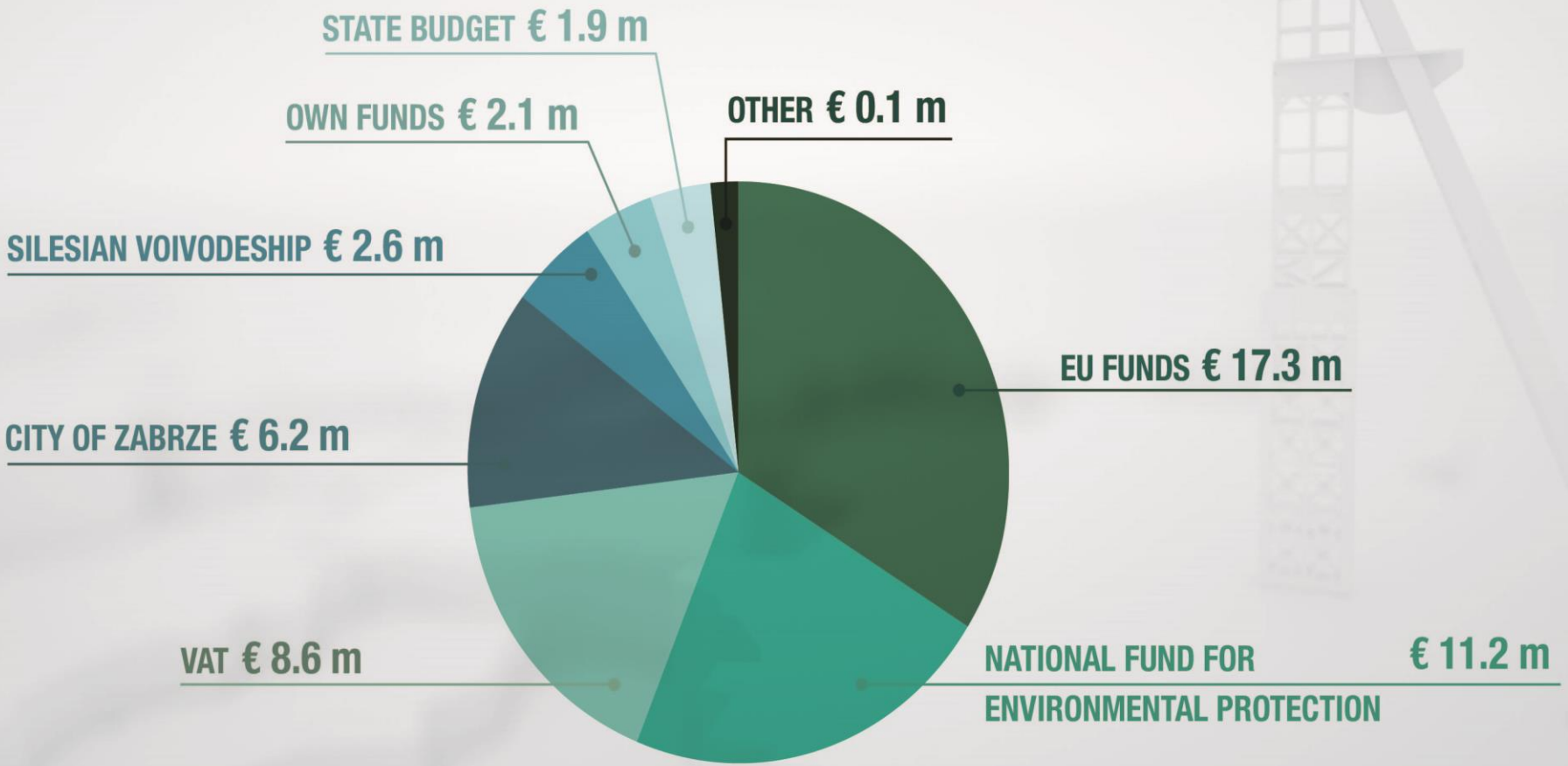
COMPLEX FINANCIAL ASSEMBLY

NO DEDICATED FUNDS FOR REVITALIZATION WORKS ON POST-INDUSTRIAL AREAS

7 projects

EUR 50 million

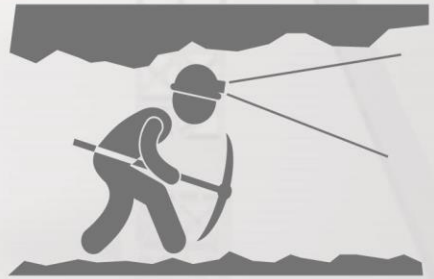
DIVERSIFICATION OF FINANCING SOURCES



TECHNICAL AREA

Poor technical condition of facilities and historical undergrounds

No good practices in conducting revitalization works based on the infrastructure of the closed down mining plants



Work under difficult conditions – the need to perform inventory works of silted excavations

NEED TO CARRY OUT PIONEER WORKS BASED ON TRADITIONAL, MANUAL TECHNIQUES – DUE TO THE SPECIFICITY AND HISTORICAL NATURE OF THE SPACE

800,000 wheelbarrows with removed silt

=

20,000 ton of excavated silt

WORKS AIMED AT THE CREATION OF TWO POST-INDUSTRIAL HERITAGE COMPLEXES OF EUROPEAN SIGNIFICANCE MADE AVAILABLE FOR CULTURAL, TOURISM, EDUCATIONAL PURPOSES

More than **100 contractors**

More than **10 years** of work

GUIDO MINE

QUEEN LOUISE ADIT

KSSE
Katowice
Special
Economic Zone

KSSE - KSSENON

REGIONAL CENTRE OF CREATIVITY, INNOVATION AND ENTREPRENEURSHIP

DR JANUSZ MICHAŁEK
PRESIDENT OF KATOWICE SPECIAL ECONOMIC ZONE

About KSSE - KSEZ

Katowice Special Economic Zone

- Established in: 1996
- Shareholders
- State treasury
- Ten municipalities

KSSE

Poland
Investment Zone

International recognitions…
2019_RANKED #1 EUROPE
2019_RANKED #2 AMONG TOP 10 ZONES GLOBALLY

fDi FREE ZONES OF THE YEAR 2015

2016, 2017 & 2019

THE BEST FREE ZONE IN EUROPE
IN 2015, 2016, 2017, 2019

BUSINESS FINANCIAL TIMES RANKING

THE SECOND BEST ZONE IN THE WORLD

ACCORDING TO

BUSINESS FINANCIAL TIMES RANKING

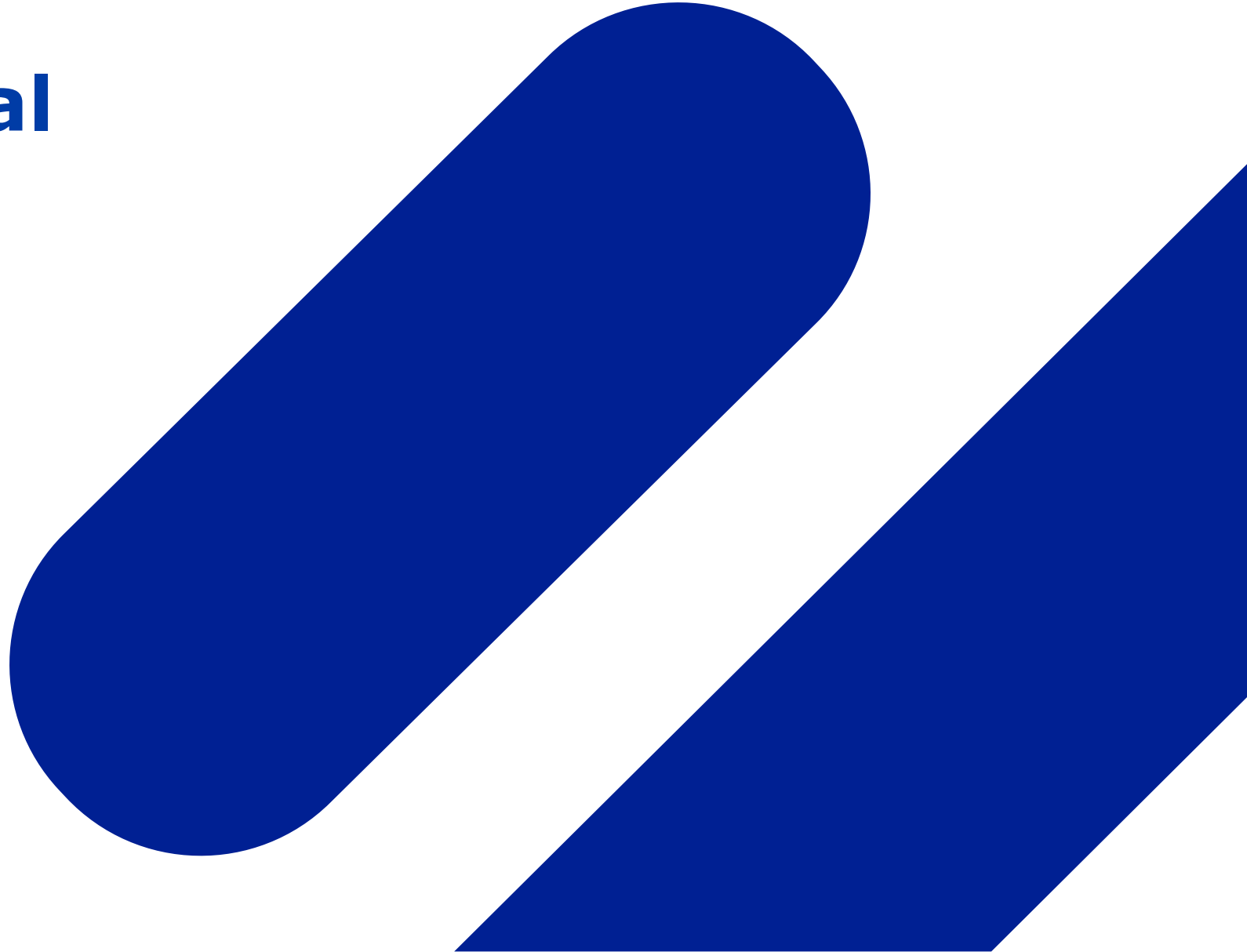
„GLOBAL FREE ZONES – 2019"

AWARDED FOR: INDUSTRY 4.0, NEW INVESTMENTS, EXPANSIONS, TECH-TRANSFER, WORKFORCE AMENITIES

fDi Magazine

fDi FREE ZONES OF THE YEAR 2019

KSSE - the zone of great potential



KSEZ in figures

- Companies: **400**
- Investment capital: **EUR 8,4 bilion**
- Employment: over **80 000**

Katowice SE Zone

- Company owned by state treasury and 10 municipalities
- Operating since 1996 at the south of Poland – in Silesia and Opole Voivodship (regions)

Main goals

- Looking for new investors (industrial, logistic, R&D, BPO)
- Selling investment plots, equipped areas
- Various sizes of plots (starting of c. 0,3 ha)
- Granting „Support decisions” for cunducting business activity
- Supporting the vocational education system (e.g. dual studies basing on the cooperation of investors)
- Linking the business (business mixers, international economical missions, conferences, etc.
- Promoting invest park-business area-innovative and modern industry - **Polish Investment Zone**

Dedicated projects

Silesian Competence Center for Industry 4.0 – lead the company through various stages of the digital transformation process, identifying the challenges faced by a given company, developing, demonstrating and testing potential solutions, preparing and implementing Industry 4.0 projects in the company

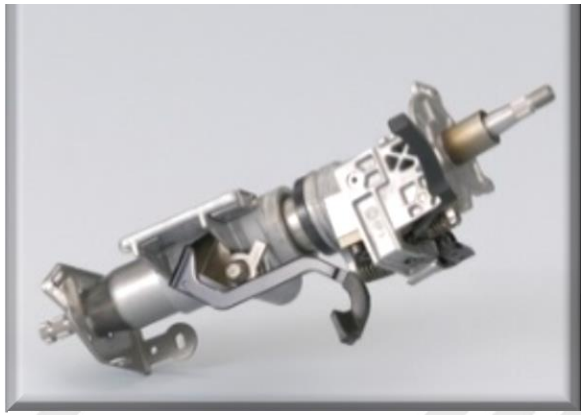
Employee+Apartment+: within two years there will be built 100 apartments of 50 m2 floorage each, fully furnished, for the amount of EUR 4,65 million. Objective: attracting staff, providing training and enabling work at the zone companies

Careers and Competences - increasing the adjustment of the vocational education system to the needs of the labor market based on the K2 Network in the central subregion of the Silesian Voivodeship (465 students, 83 teachers, 11 schools, project value PLN 7.5 million)

Dual Studies at the University of Technology - Faculty of Mechanical Engineering - Mechanics and Machine Design, so far 60 students, 50% of practical studies

Dual education – a good start in the mining and steel industry. Development of model practical apprenticeship programs and development of quality principles for dual education recommended for the Ministry of National Education

Innovator Club - club for innovators, creative, young people and students; an educational and training platform for the exchange of knowledge & experience gained through the success stories of high-achievers.

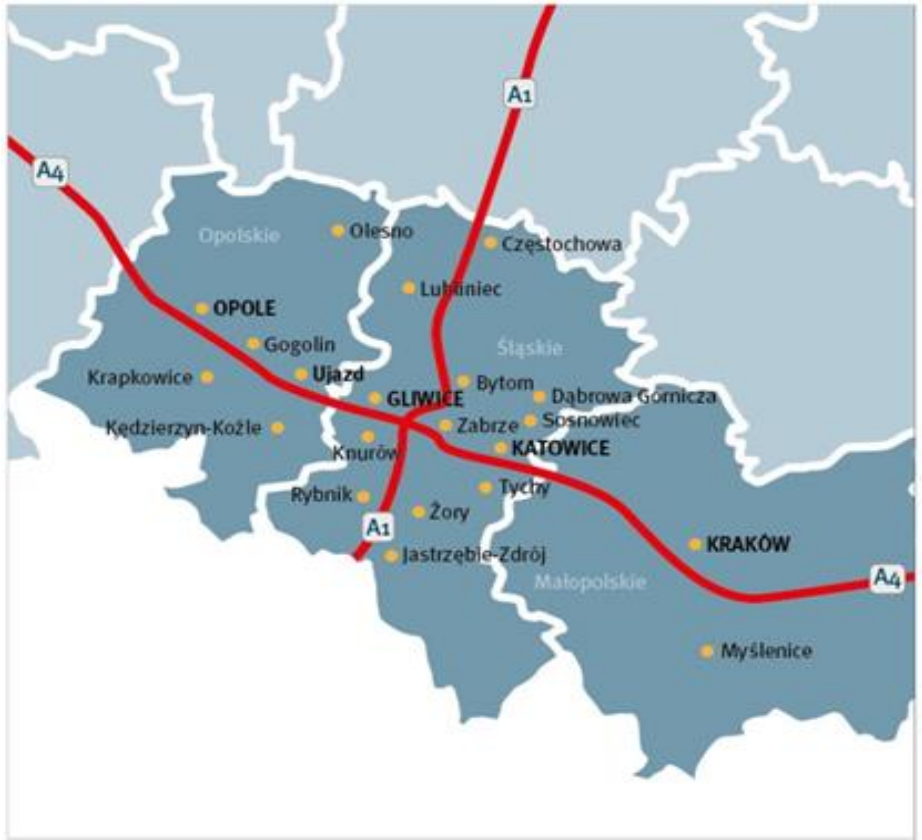


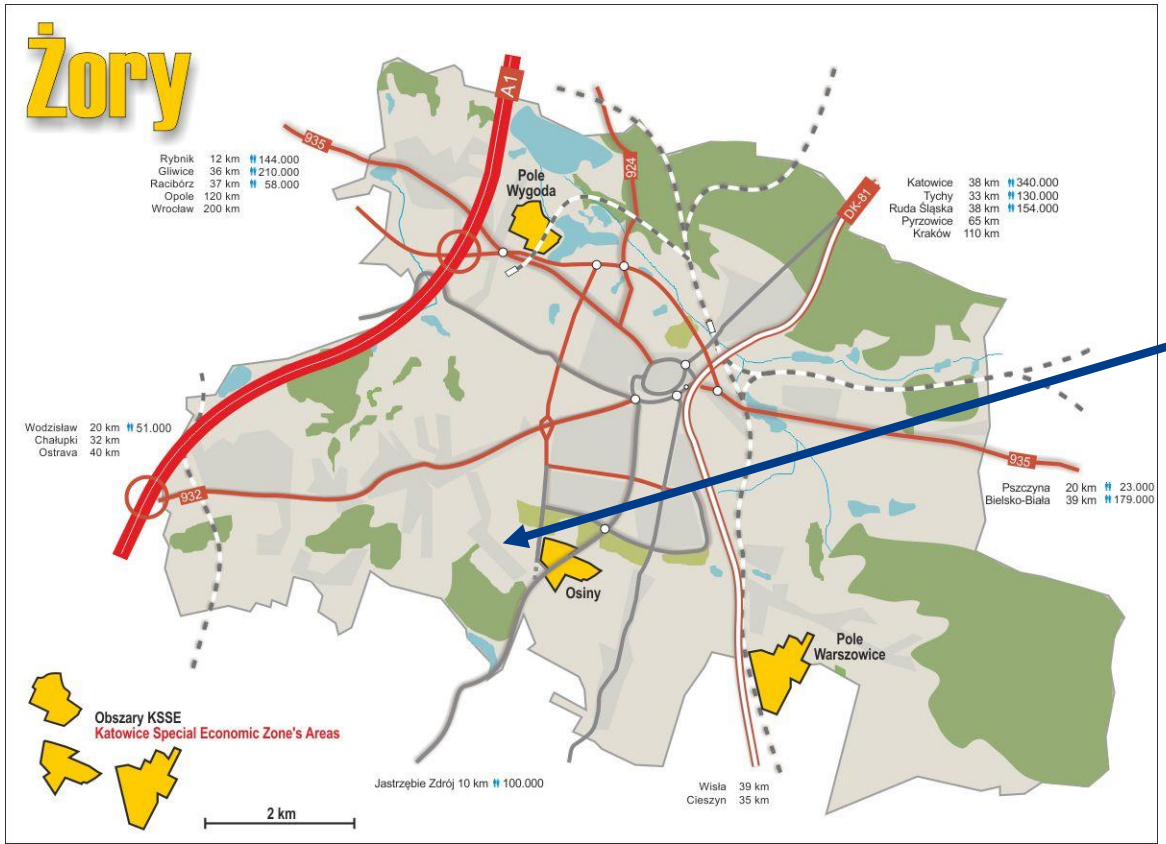
KSSE – KSSENON

Regional Centre of Creativity

LOCATION & CONTEXT

The south of the Silesian Voivodeship (Southern Poland) - one of the main mining center in Poland



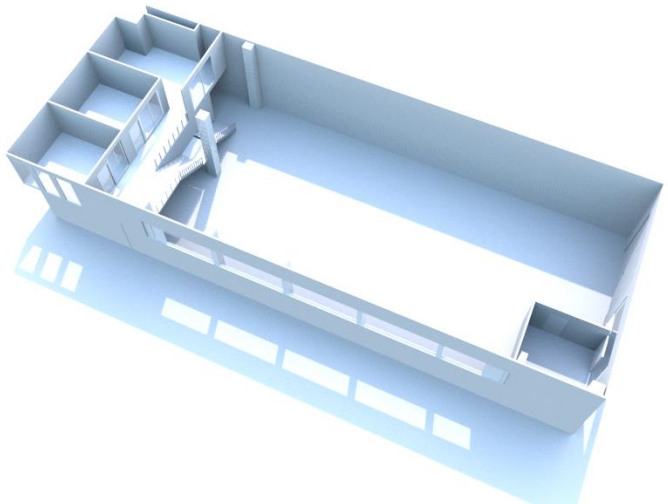


Location of the **PROJECT**

KSSE

Polska
Strefa Inwestycji

KSSENON
AKCELERATOR BIZNESOWY



The Acceleration Park...

Proffesionally from scratch

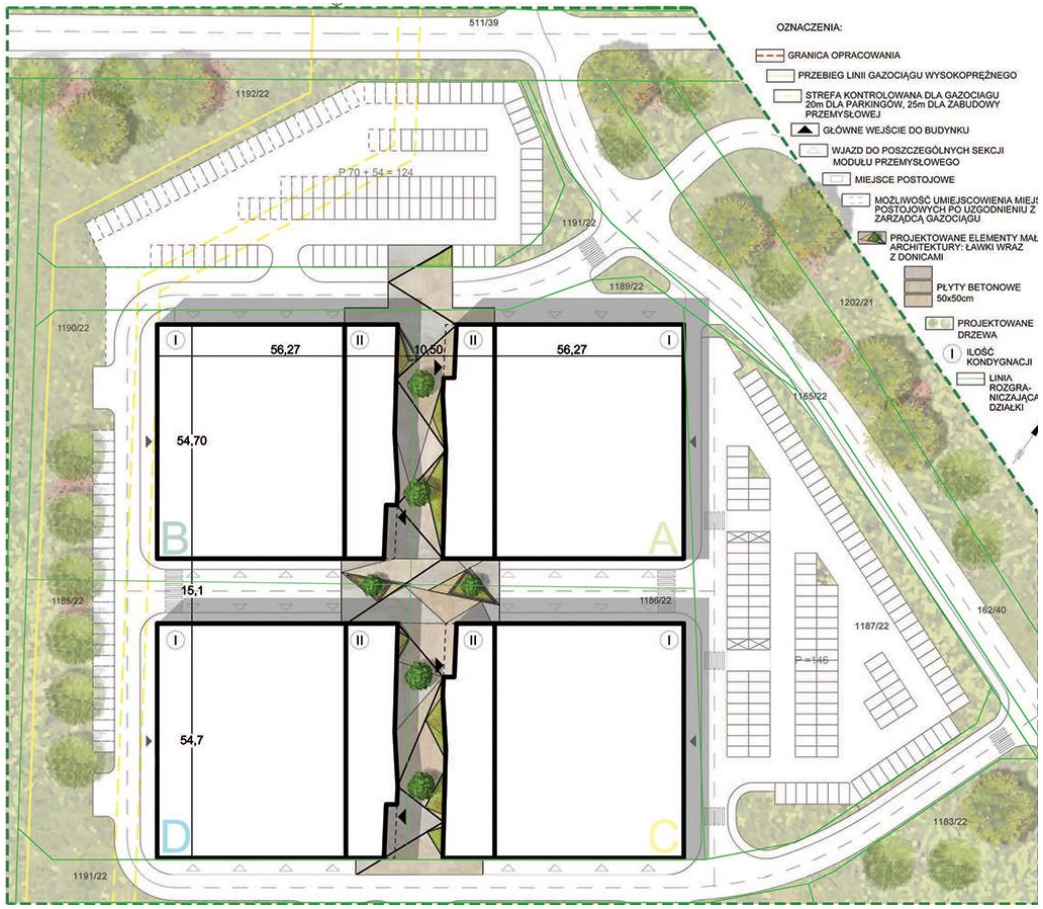
INDUSTRIAL PART: 32 small industrial halls (c. 250 – 350 m2 with the possibility of connecting) for micro, small and medium enterprises

Entrepreneurship & Innovation climate

NON INDUSTRIAL PART: a group of infrastructure of the business surrounding for lease for companies, NGO's and administration

THE MODEL - Lease for the companies for 5-6 years, then possibility of buying own piece of land and continuation of the developement

NON INDUSTRIAL PART…



- ❑ **Qualification Centre**
- ❑ **Coworking Centre**

KSSE + municipality

- ❑Bistro
- ❑ Institutions of Business Surrounding
- ❑ Post agency
- ❑ Bank, ATM
- ❑ Nursery, Kid’s Club
- ❑ Offices, consulting, legal
- ❑ Vehicle charging station
- ❑Others, i.a. Labor Office

external companies

KSSE

KSSENON AKCELERATOR BIZNESOWY

Poland Investment Zone

… not only business

Qualification Centre

- ❑ for technical school's students and other individuals that are interested in increasing own qualifications
- ❑ vocational trainings of the machine and device operation
- ❑ VR Simulation Part

Coworking Centre

- ❑ for start-ups, new enterprises, small teams, young businesses
- ❑ the address, place of work and business meetings, for creativity and crossing ideas
- ❑ access to infrastructure, computers, conference rooms, business library, office devices
- ❑ Video Content Studio

KSSE

KSSENON
AKCELERATOR BIZNESOWY

Poland
Investment Zone

- The place that connects new and growing industrial enterprises
- The cooperation of regional innovation ecosystem actor’s
- A part of cooperation’s network for the innovative and creative economy
- The creative space
- „Out of finance” effects – c. growing 50 companies (c. 30 industrial, with constant and fluent exchange in cycles of 5-6 years), c. 550 jobs within KSSENON

KSSE
Katowice
Special
Economic Zone

Thank You

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Internationalization of SMEs in the Silesian Voivodeship

Silesia

Silesian province is the key economic center in the country.

A strong economic zone with the automotive industry

Highly urbanized area

During withdrawal from the coal industry

Inter Silesia – main goals

Increase in the value of enterprises in the region

Increase in the level of exports of SMEs from the Silesian Void-ship to foreign markets

Key Factors

EUR 5 million

40 internationalized enterprises

2 internationalization models developed

Key areas

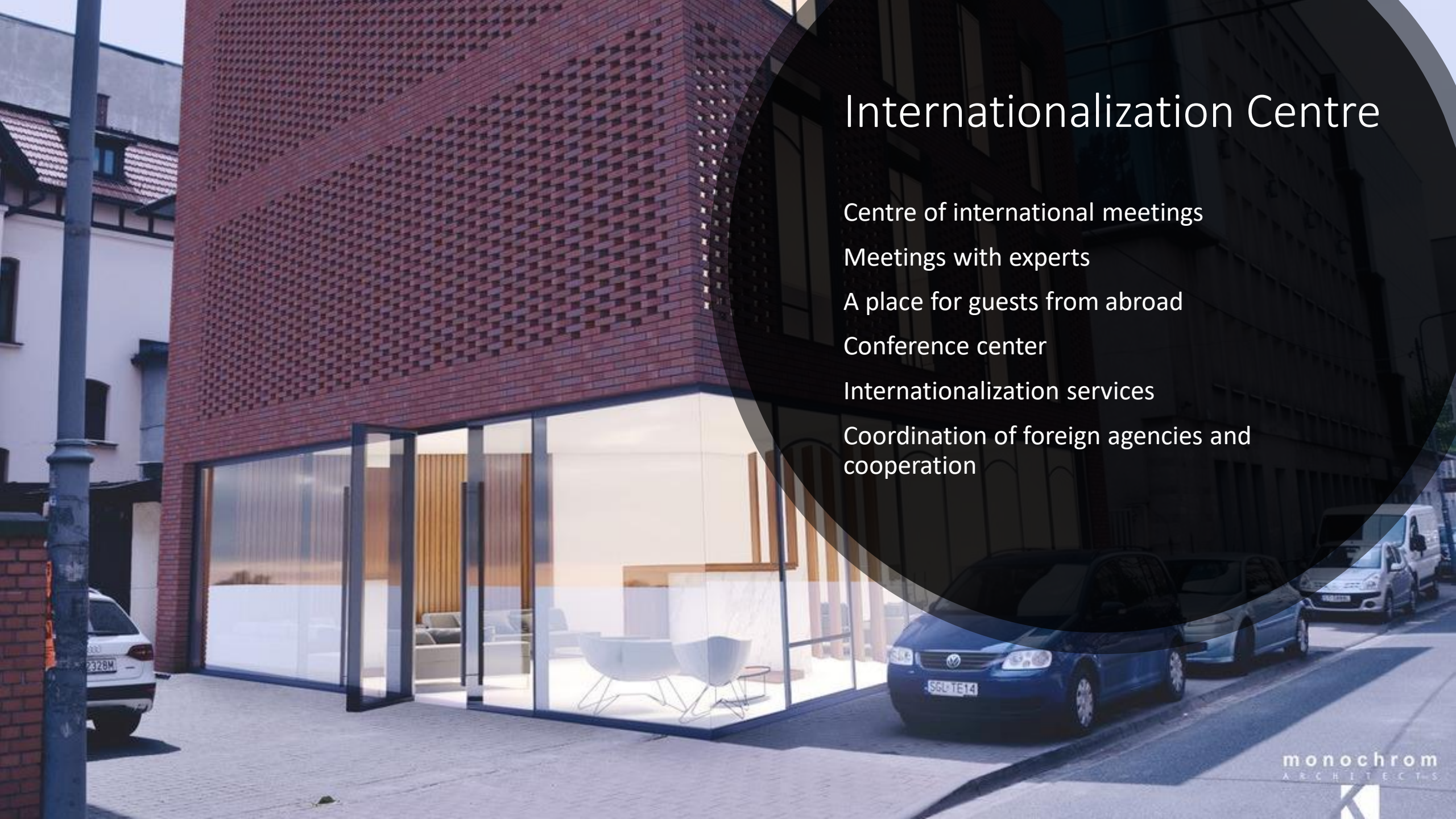
Energetics,

Medicine,

Information and communication technologies,

Emerging industries,

Green Economy.



Internationalization Centre

Centre of international meetings

Meetings with experts

A place for guests from abroad

Conference center

Internationalization services

Coordination of foreign agencies and cooperation

monochrom
ARCHITECTS

Internationalization Platform

All information in one place

Internationalization community - people and companies

Networking and connecting cooperants

Internationalization services online

Quick search for people and contractors

Services support internationalization

Export Audit

Consulting

Office space for internalization

Forrign Agencies Network

Academy of Internalization

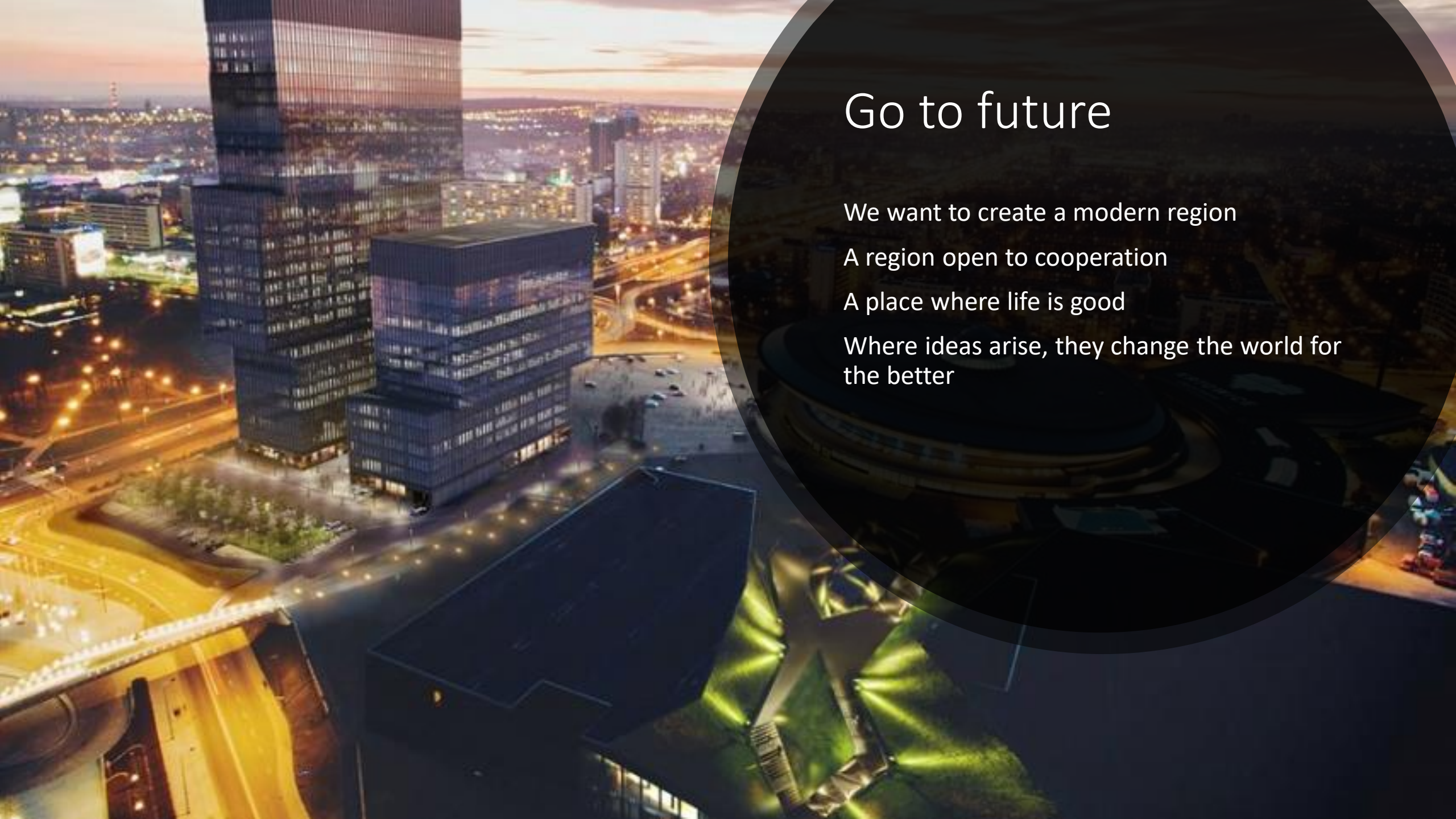
Others activities

Venture Capital for innovation

Center for commercialization MedTech R&D

An entrepreneurial education program for high schools

Financial services for business development



Go to future

We want to create a modern region

A region open to cooperation

A place where life is good

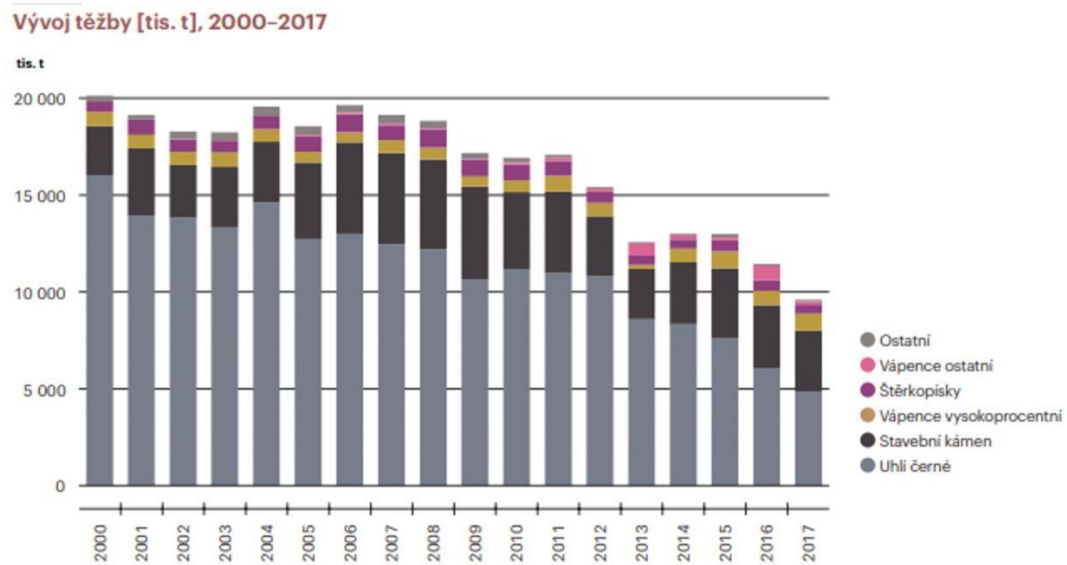
Where ideas arise, they change the world for the better

Invite to cooperation

We invite you to cooperate and develop our regions together

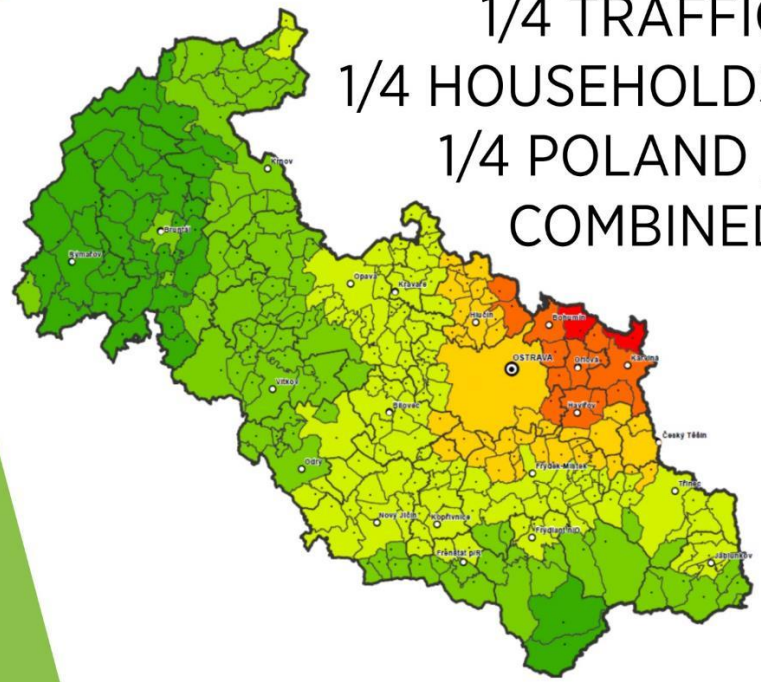

Moravian-Silesian
Region

COAL MINING DECLINE, THOUSANDS OF TONS, 2000 - 2017

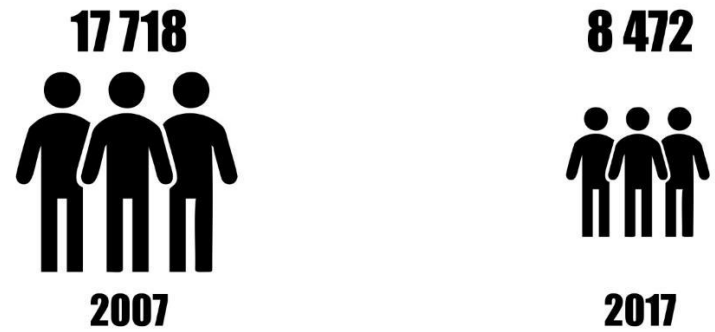


AIR POLLUTION, 2015

1/4 INDUSTRY
1/4 TRAFFIC
1/4 HOUSEHOLDS
1/4 POLAND / COMBINED



EMPLOYED IN MINING SECTOR IN MS REGION



MAIN CHALLENGES OF MORAVIAN-SILESIAN REGION

Brain Drain
Population expected to shrink in the future

Ageing
Population 65+ expected to double in 2050

Air pollution, brownfields

One of the most polluted regions in EU mainly in the areas with high population density, need for revitalisation of unused buildings and areas

Low area of enterpreneurial intensity
Lowest ration of SME‘s per 1000 inhabitants

Lack of skilled workforce, higher unemployment rates,
Projected suply doesn‘t correspond with projected demands

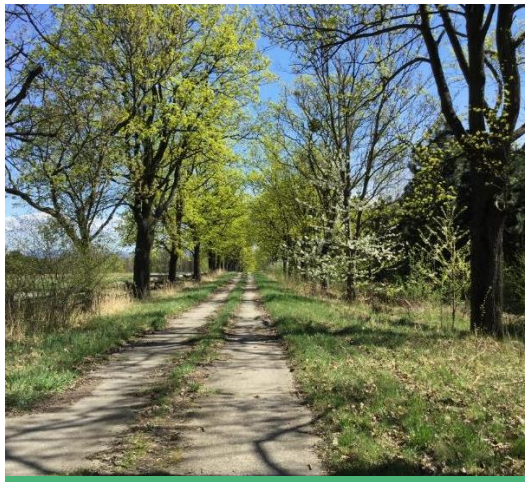
Vulnerability to the climate changes is increasing (water, heat, land use)
Territorial disparities

Global EU trends

Digitalisation, decarbonisation, just transition for greener Europe, global youth transfer, clean energy

TRANSFORMATION OF POST MINING LANDSCAPE IN KARVINA

mining sites
operating
facilities
=
significant landmarks



forced out
settlements
=
empty land with remains

abolished mining
and industrial
infrastructure
=
ecological burdens and brownfields

Memorandum of co-operation signed by 36 key stakeholders

IP LIFE POST-COAL MINING LANDSCAPE ADAPTATION

WHY?

Main aspects of the project

- Coal Mines closure is coming
- Important area for future development
- Seeking new purpose/use of post-coal mining landscape
- New vision of post coal-mining landscape (part of POHO 2030)

IP LIFE POST-COAL MINING LANDSCAPE ADAPTATION

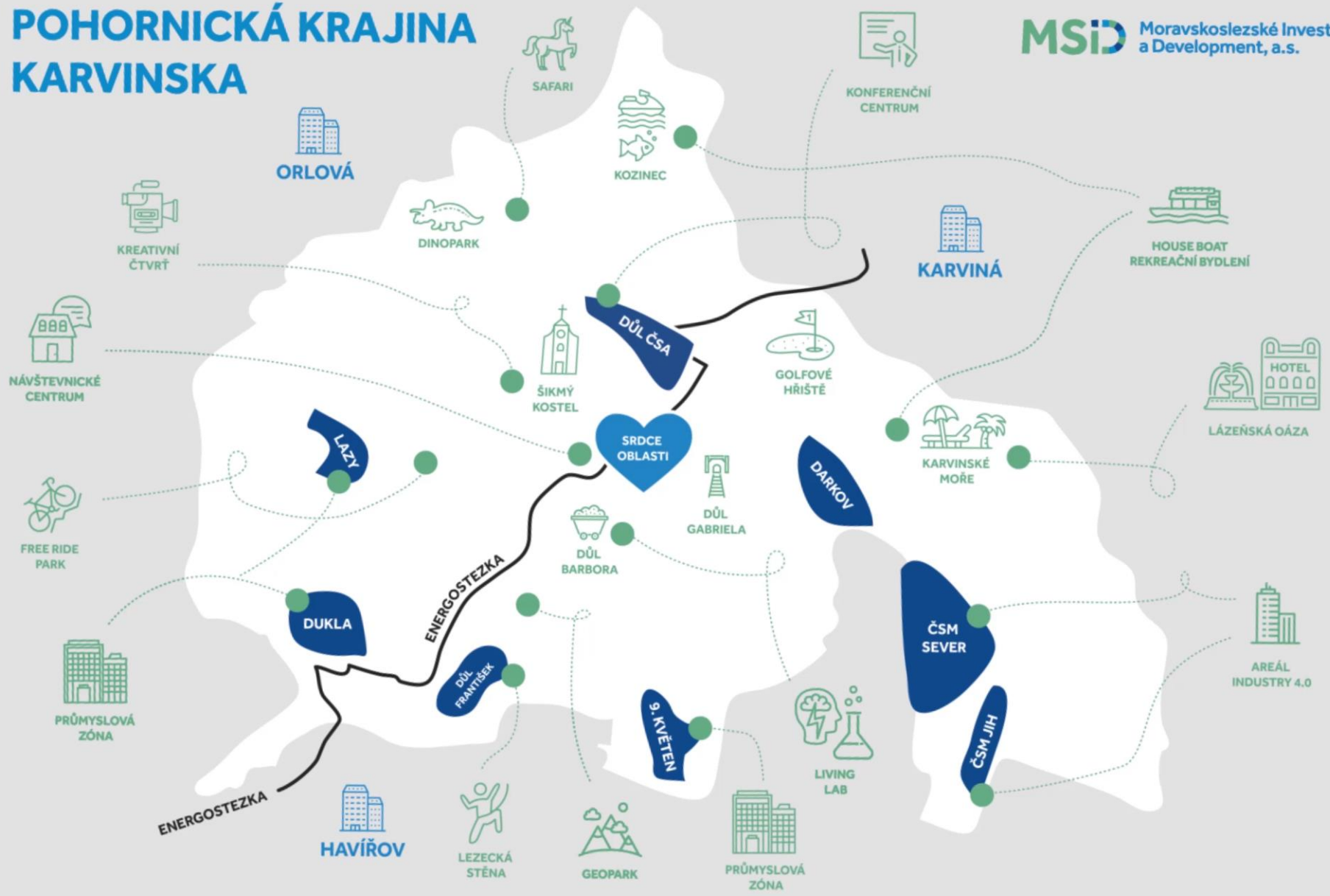
The project is focused on coal-mining landscape adaptation in the environmental and climate change

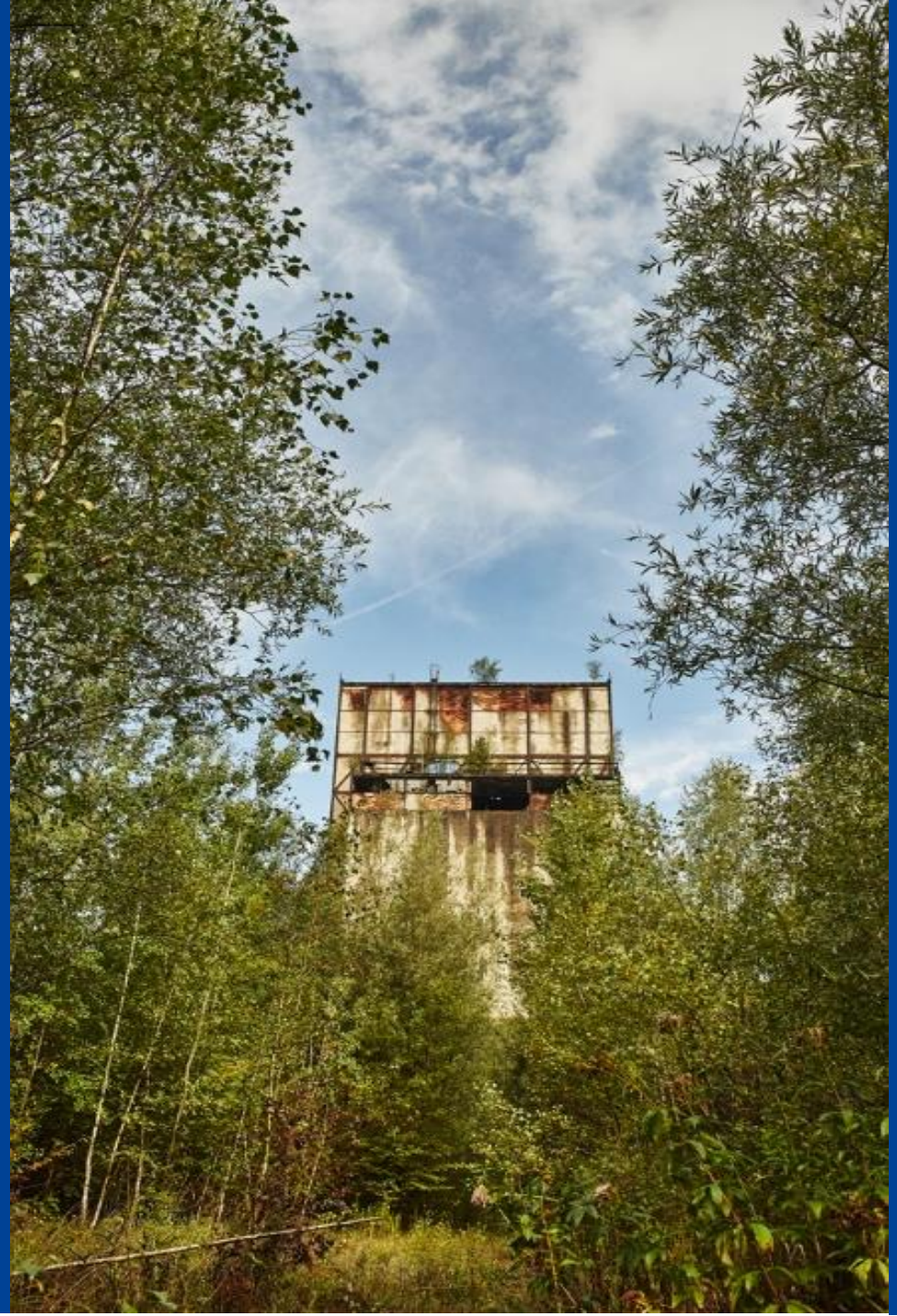
WHAT?

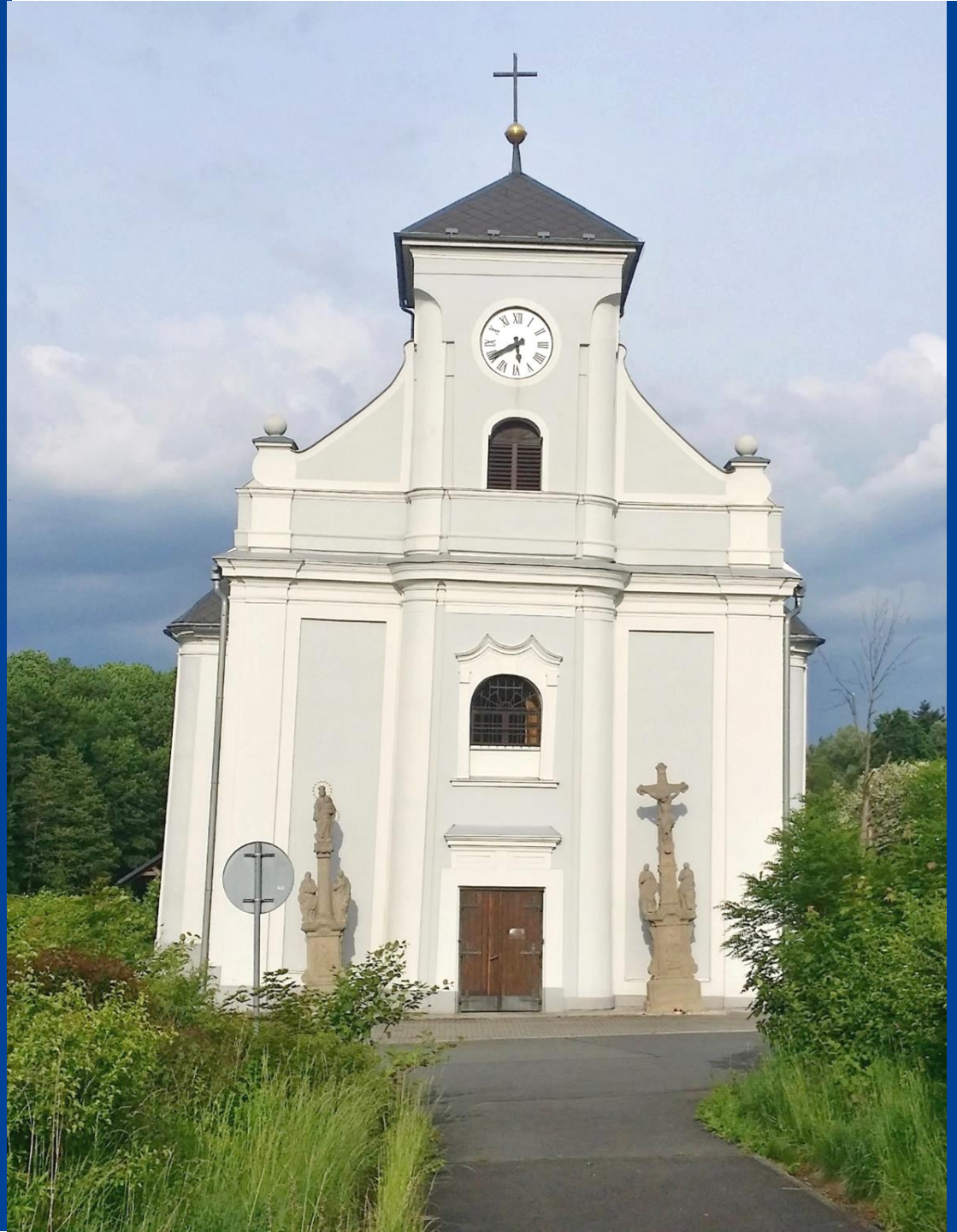
- Development of the general vision of post coal-mining landscape adaptation
- Development of the tools
- Building the capacities
- Implementation of pilot projects
- Transferring good practices

POHORNICKÁ KRAJINA KARVINSKA

MSD Moravskoslezské Investice a Development, a.s.







IP LIFE POST-COAL MINING LANDSCAPE ADAPTATION

WHO?

Main beneficiary: MS region + 11 associated beneficiaries

- **Ministry of Environment of the Czech Republic**
- **3 organization established by the MS Region**
- **3 cities** in the project area
- **2 academic subjects** – VŠU - TUO, Central Mining Institute, Poland (GIG)
- **2 private companies** (landowners) - Asental Land, OKD

IP LIFE POST-COAL MINING LANDSCAPE ADAPTATION

COMPLEMENTARITY

- **Strategy on Adaptation to Climate Change** of the Czech Republic
  - IP will contribute to implementation of the Strategy on regional level
- **POHO 2030** project on development of the post coal-mining landscape
  - IP Life will set basic requirements for future development
  - POHO 2030 will multiplicate effects of pilot actions in new development and investment projects
- **EU Funding and other financial resources**
  - IP Life will create and integrate funding opportunities


Moravian-Silesian
Region
JUST TRANSITION FOR ALL

Building of a Mine Water Treatment Plant in Wałbrzych

Coal Regions in Transition, Brussels 17th October 2019

Mr. Roman SZEŁEMEJ

MAYOR of Wałbrzych

Description of the Project

Purpose of the Project:

- **Obtaining new water supply sources for the customers by building a mine water treatment plant using underground (mine) water outflowing from the former mining sites in the centre of Wałbrzych.**

Investor: Wałbrzych Municipal Waterworks and Sewage Systems Company:

Contractor: University of Science and Technology of Cracow:
(Faculty of Mining and Geoengineering)

Task of the Contractor:

- **Preparing a concept allowing the Investor to develop a project of building a mine water treatment plant.**

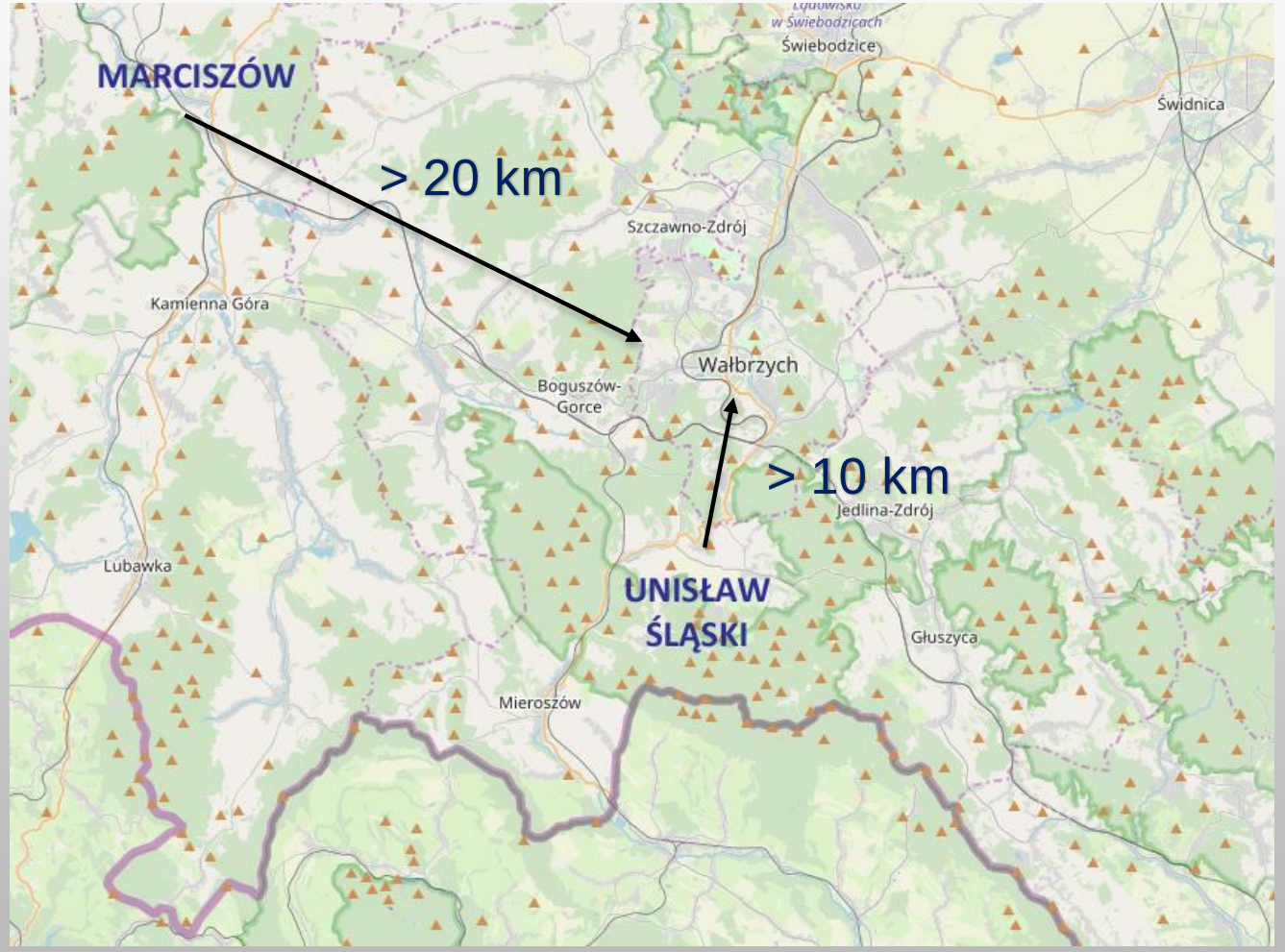
Water for Wałbrzych

The Wałbrzych Municipal Waterworks supply water for approx. 200 thous. customers in the area of several municipalities, the largest of which – Wałbrzych – has approx. 110 thousands residents.

Main water intake and treatment sites are Marciszów (Dolny i Górny) and Unisław Śląski.

Other water intake and treatment sites are mainly the local ones, some of them not connected to the entire water supply system and often sensitive to weather conditions.

The total length of the public water supply mains is 229,7 km.



Problems with water

- The geological structure of the area where Wałbrzych and its surroundings are located excludes the possible existence of any intakes able to ensure water.
- The water intakes in Marciszów and Unisław Śląski are at considerable distance.
- The location of the water sources and environmental changes result in problems with water supply:

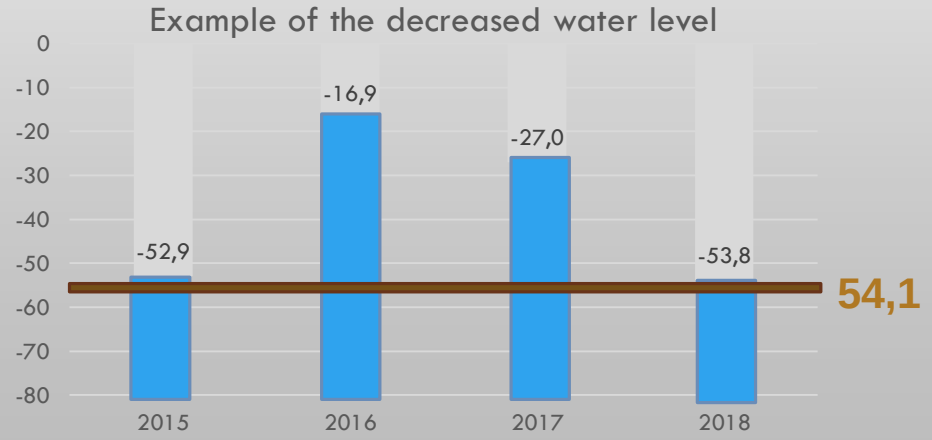
❖ Economic problems

- Need to maintain efficient energy-intensive pumping facilities
- Substantial losses on distribution networks,
- Frequent breakdowns (obsolescence and bad quality of materials used for constructions in the post-war years).

Repair of damage on the Ø 500 mm - public network (March 2017)

❖ Environmental problems

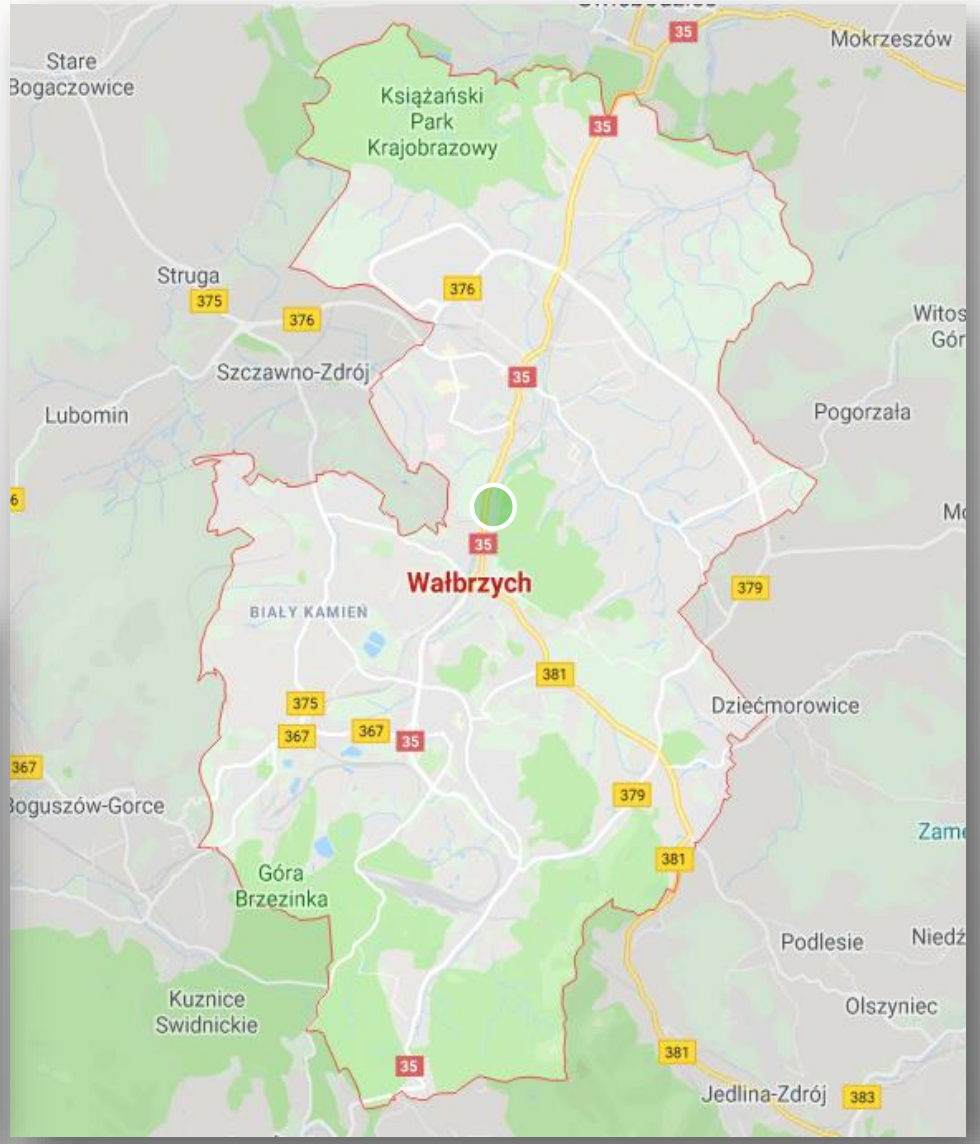
- Many years of the adverse hydrometeorological conditions which result in regular decreasing of the water level.



The pump in the well 1 is placed at the level of -54,1 m below the surface. In the years 2015 and 2018 the water level decreased drastically. Its level stopped at not much higher than the pump placed in the well.

Mine waters in Wałbrzych

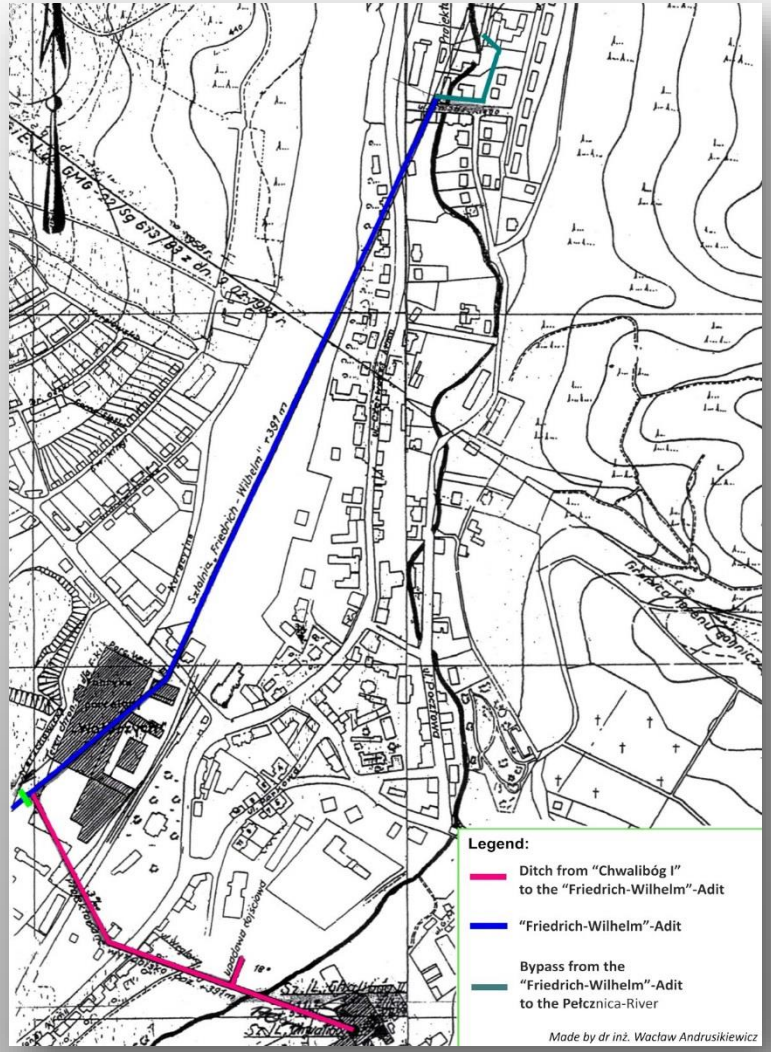
- Our potential is mine water.
- Mine (underground) water is outflowing from the former hard coal mines into the Pełcznica – River almost in the middle of the city.
- This drainage system protecting the city against flooding operates by using the former Fryderyk-Wilhelm - Adit.



Fryderyk-Wilhelm-Adit

Adit:

Completed: around 1800 .
Length: approx. 3,3 km
Ordinate: approx. 390÷391 m asl.



Chwalibóg I – ditch with the adit:

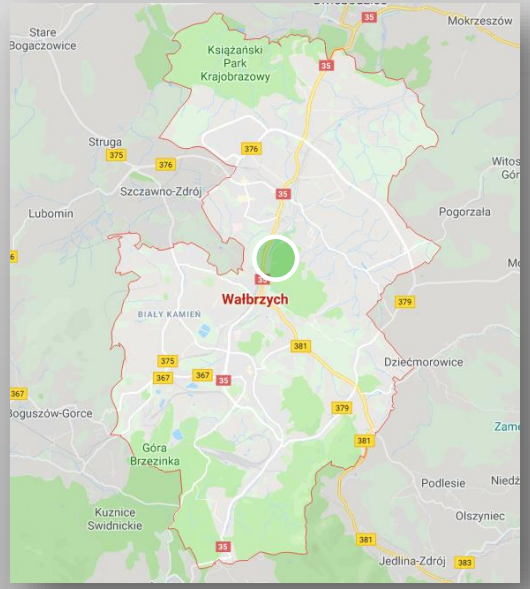
Completed: around 2000 r.
Length: approx. 530 m

Temporary water flows (test of 04.07.2019)

Wodociągi Wałbrzych

Outflow from the Fryderyk-Wilhelm-Adit:
13,5 m^3/min - *810 m^3/h - 19 440 m^3/24 h*

Pełcznica-River:
approx. 8,7 m^3/ min



Quantity of water and volume of sales

Wodociągi Wałbrzych

Outflow of mine water: 19,4 thous. m3 / 24 h

minus 15% water used for process purposes

makes 16,5 thous. m3 / 24 h

Water sales in August 2019 in selected municipalities:

Wałbrzych: 11,5 thous. m3 / 24 h
(356,2 thous. m3 / month)

Boguszów Gorce: 1,1 thous. m3 / 24 h
(33,6 thous. m3 / month)

Szczawno-Zdrój: 0,8 thous. m3 / 24 h
(23,6 thous. m3 / month)

Stare Bogaczowice: 0,2 thous. m3 / 24 h
(7,3 thous. m3 / month)

Czarny Bór: 0,1 thous. m3 / 24 h
(2,4 thous. m3 / month)

Tests of mine water

June 2018 – since this month have been made the systematic tests of the water parameters outflowing from the adit.

Once a week – the physicochemical tests are made (by an external. Independent, accredited water test laboratory).

Once a month (since January 2019 – more frequently) – bacteriological tests are made.

During that time have been made:

- **52 physicochemical tests**
- **30 bacteriological tests.**

Additionally in August 2019 the University of Science and Technology of Crocow commissioned to make the additional tests by the Environment Research and Control Centre of Katowice (Ośrodek Badań i Kontroli Środowiska w Katowicach). There were tested 54 various parameters.

In case of 13 parameters (i.e. 24% of the total)
it was stated that the standards have been exceeded.

That's why the Contractor, the University of Science and Technology of Crocow , recommends to apply the following mine water treatment methods:

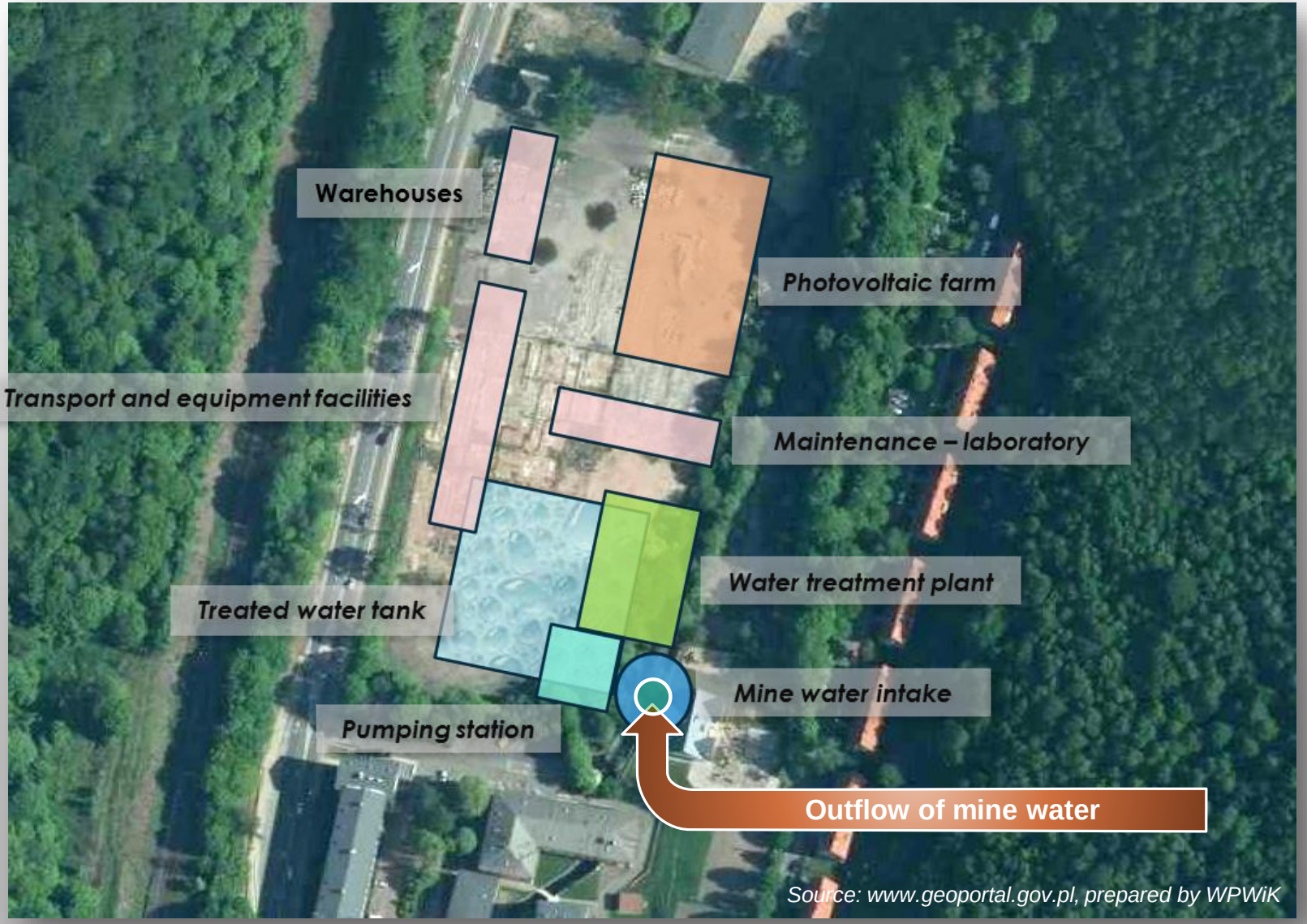
Proposed water treatment methods

1. OZONISATION
2. AERATION
3. ALKALINITY CORRECTION
4. FAST AND SLOW MIXING
5. SEDIMENTATION (RESIDUE PRECIPITATION)
6. FILTRATION
7. CARBONISATION (STABILISATION BY CO_2)
8. DISINFECTION

IN THE SEDIMENTATION PROCESS AND DUE TO FILTER RINSING SEDIMENTS ARE PRODUCED WHICH NEED TO BE DISPOSED OF. FOR THAT PURPOSE THE FOLLOWING IS MADE:

- GRAVITY CONCENTRATION
- HOMOGENISATION (GETTING A HOMOGENOUS MIXTURE)
- CONDITIONING (CHANGING THE SEDIMENT STRUCTURE)
- MECHANICAL DEWATERING
- DRYING (OPTIONALLY)
- STORAGE
- UTILISATION

New mine water treatment plant



Implementation status

Performed:

- The local inspections were carried out;
- The historical archives were obtained (from: the Wałbrzych Municipal Waterworks, the District Office of Wałbrzych, the Municipal Office of Wałbrzych, the Old Mine, the Mine Restructuring Company - Branch of Nowa Ruda-Słupiec, the private persons);
- The water laboratory tests are made (on a current basis);
- The flow volume of the Pełcznica-River and the outflow volume from the adit are controlled;
- The initial proposal of the water treatment methods was prepared.

To be performed:

Preparing a concept allowing the Investor to develop a project for building a mine water treatment plant:

- Presenting the technological solutions to purify, intake and treat mine water so that it can meet the regulations required by law;
- Identifying the adit's efficiency;
- SWOT – analysis (strong and weak points) of the presented options;
- Indicating the locations where the proposed concept technologies are already applied.

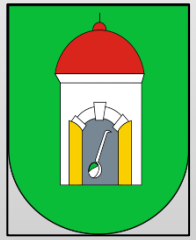
Scope of the project

The treated mine water shall be supplied to the residents of Wałbrzych:

Wałbrzych

secondly to the customers from the neighbouring municipalities:

Stare Bogaczowice

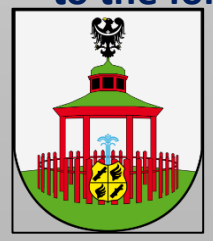


Szczawno-Zdrój

Czarny Bór

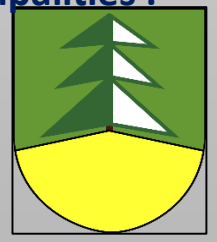
Boguszów Gorce

and also potentially, after implementation of the necessary investments in form of the public mains, to the following municipalities :



Jedlina-Zdrój

Głuszyca



Walim

Thank you for your kind attention

Mr. Roman Szełemej

Mayor of Wałbrzych

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