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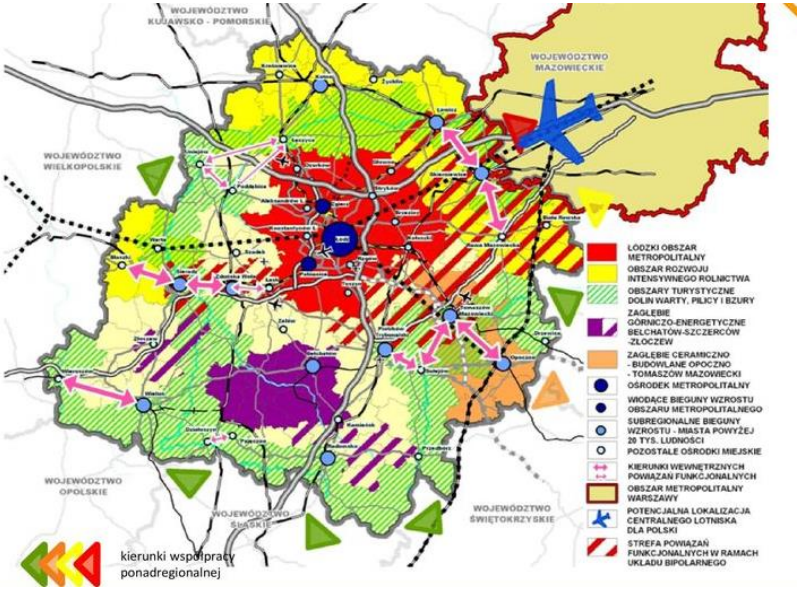
Lodz - Lodzkie Region, Poland

LODZKIE REGION, POLAND

The unique features of the region due to the emission and economy of GIE. It implements as its Priorities developing in its strategy.

Regional Intelligent Specializations (RIS)
of which at least three are inseparably connected with the emission of large quantities of post-production and waste gases requiring development:



I. Energy - including RES:

1. Technologies of **using waste or by-products** in towards improving the efficiency of oil processing, chemicals, and energy production

2**. Innovative systems for generating electricity** (also in combination) using **waste hydrocarbons** (waste hydrocarbons) and **byproduct hydrogen** in technological processes (eg production of hydrochloric acid, fertilizers, refineries);

3. Gas **cleaning technology after the gasification process** allowing the direct use of generating units (including fuel cells and gas turbines) for energy production;

4. Innovative systems connected with **biological processes and thermal gasification** using solutions for purification and refining of gas produced;

5. Technologies **reducing harmful gases in the process of energy production** using chemical and physical processes;

6. New or improved **technologies for the utilization of combustion by-products**;

7. New or improved technologies for the reduction / management of **harmful emissions compounds**, including **NOx** (also methods for reduction of ammonia slip), **SOx, dusts, heavy metals, carbon dioxide (CCU);**

8. technologies of **gas purification** created in the process of energy waste management in the scope of optimization of production;

RIS – BUILDING MATERIALS

II. Innovative building materials

(e.g. related to the permanent CO_2 connection with cement with concrete)

1. Biotechnological processes of **recovering metals from waste**.

2. Innovative technologies concerning the **utilization of by-products of combustion**.

3. The use of modern technologies in the production of **materials for construction using by-products and waste**.

4. Biotechnological **energy production using waste**.

5. The use of processing technology and **reuse of materials**.

RIS - AGRICULTURE

III. Innovative agriculture and agro-food processing

1. Innovative production of **high quality fertilizers and protection products** plant and seed;
2. Innovative methods of **waste utilization** (including RES and production of polymers, monomers and polyesters) and recycling;
3. Modern and alternative methods of **biofuels production**.

Technological advanced regions generate **promising technological solutions** and **high quality jobs** (qualified engineers and technical workers).

FEATURES OF LODZKIE

Other features of the region and determinants relevant to emissions:

- mine and power plant **Bełchatów** as **one of the largest issuers in Europe**
- **Veolia** - the second largest heat and power plant in Poland
- intersection of communication routes of the **TENt network transport** (linear emissions)
- **Opoczno** as the most intensive **surface emissions** related to low emission (5th in Poland)
- **Wieluń** as the one of the 5 cities selected to implementt the **circular economy model**,

BEŁCHATÓW POWER PLANT

- Point emission in the Lodzkie Voivodship is determined by the level of emissions from the **Bełchatów Power Plant**
- The **largest issuer of CO_2** in the European Union
- The **largest** coal-fired brown coal **power plant in Europe**
- **over 20%** domestic energy production
- Flue gas **desulphurization** and **denitrification** installation (implementation of an additive of organic acid for SO_2 absorption to IOS and boiler equipment in high-efficiency flue gas denitrification installations)
- Electrostatic precipitators with high efficiency of **dust extraction**

OTHER ISSUERS IN LODZKIE REGION

- **Local producers of electricity and heat** - municipal utilities and electric heating plants in
  - Piotrków Trybunalski,
  - Sieradz,
  - Pabianice,
  - Tomaszów Mazowiecki,
  - Zduńska Wola,
  - Zgierz
  - Skierniewice

- **Euroglas** - glassworks - one of the most modern in Europe,

- **Ceramika Opoczno**,

- **Cement plant WARTA S.A.**,**Trębaczew**

- **PFLEIDERER PROSPAN S.A.,** Wieruszów - producer of laminates and furniture boards.

BARRIERS FOR MARKET

Identified barriers to market development

1.Insufficient availability of data on waste streams

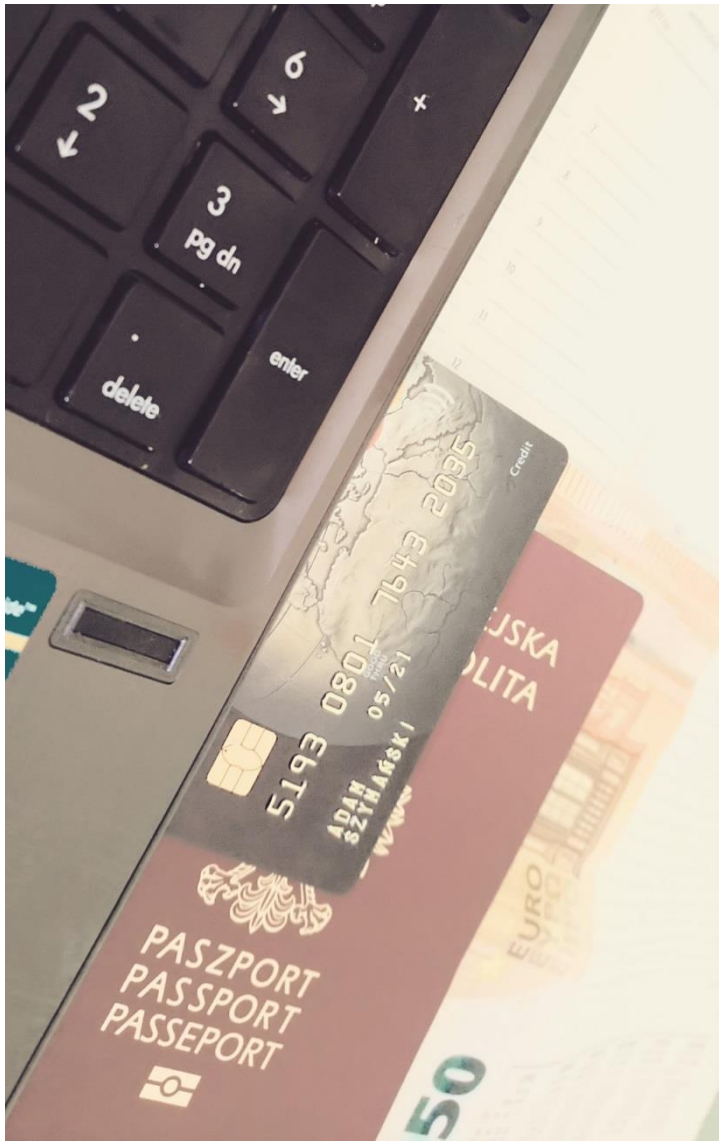
Fear of revealing sensitive data that affects competitiveness

2. GIE transport that is not in the immediate vicinity of the point source emission

3. Additional costs associated with the processing of GIEs harm competitiveness

4. Political uncertainty regarding legislation affecting a business case

5. The risk of industry relocation (carbon leakage) due to the impact on the economy and business



POSSIBILITIES

Recognized during the April workshop session - selected **factors** stimulating symbiosis with the industry:

a. The register of wastes operating in the industry and the applicable register, also at the regional level

b. such tools should support communication and exchange of information on challenges and threats between industrial sectors

c. stimulating the competitiveness and economic viability of GIS-related projects

d. Back information from the regional market and market demand for products obtained using GIE

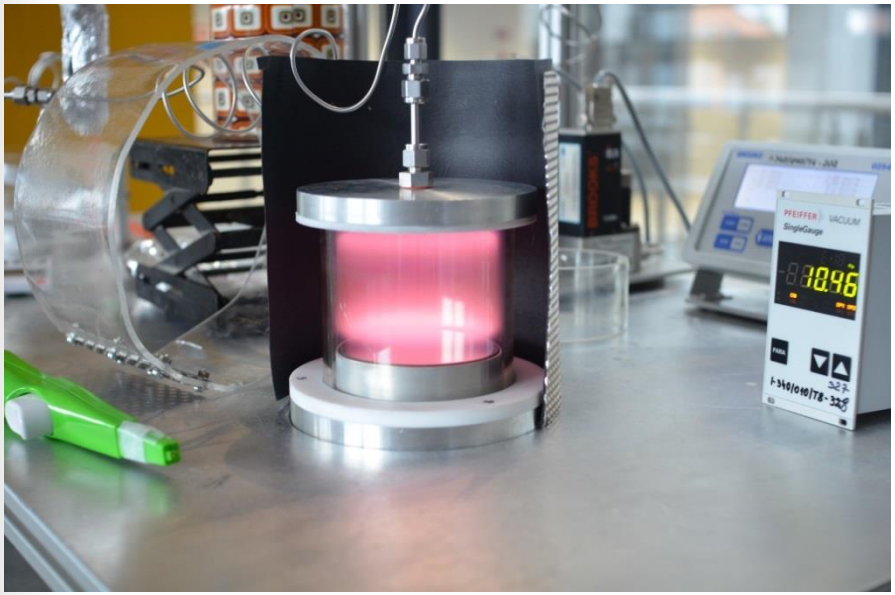
e. efficient transport and logistics

f. Inexpensive renewable energy sources for sectors related to the use of GIE

CO_2 emission – global problem with potential technological solution?

NANOTECHNOLOGIES FOR CO_2 CAPTURE

New nanocatalytic structural fillings for the processes of hydrogenation of carbon dioxide



- Plasma technology
- Thin-layer catalytic systems with high stability and activity
- Carbon dioxide conversion processes for synthetic fuels and chemical products
- Carbon dioxide as raw material perfectly fits into the new concept of the circular economy

INVITES PROJECT

Innovative Equipment for Intensified Recovery of CO_2 from Flue Gases

INVITES

- Polish - German Sustainability Research (“Stair”) – The National Centre for Research and Development
- Duration of the project: **01.10.2016 – 30.09.2019**

The National Centre for Research and Development

Project website: **newinvites.wipos.p.lodz.pl**, **rpb.technology**

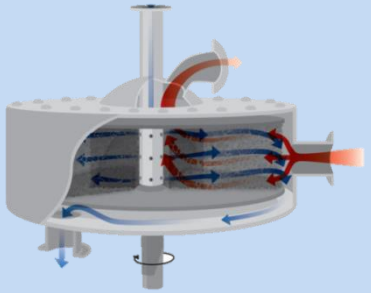
CONCEPT AND IMPACT

Challenge

25% of the CO_2 emitted by the energy sector comes from Poland and Germany

Solution

New equipment



Energy → Penalty lower by 5%

Operability → Flexibility increase by 50%

Innovation → Improved equipment

Environment → CO_2 footprint about 5% less

PARTNERS

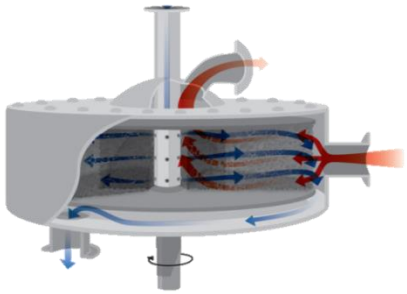
Innovative Equipment for Intensified Recovery of CO_2 from Flue Gases

INVITES

Project partners:

- **Envimac Engineering GmbH,** Germany, **(coordinator)**
- **Lodz University of Technology,** Faculty of Process and Environmental Engineering, Department of Environmental Engineering Poland
- **Omnikon Sp. z o.o.**, Poland

Lodz University of Technology



OMNIKON
INDUSTRIAL DRYERS

Project website: **rpb.technology**

Thank you for your attention

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