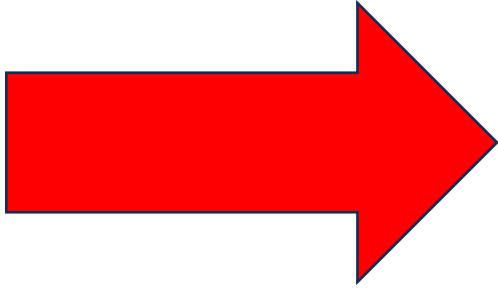


Rybnik Hydrogen District

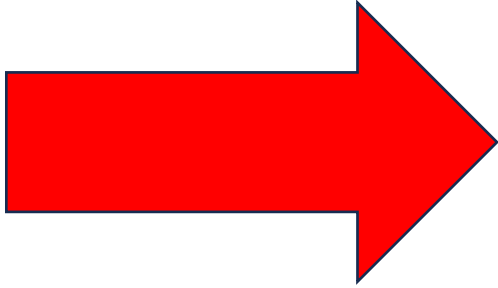


Where We Started – Two Key Decisions

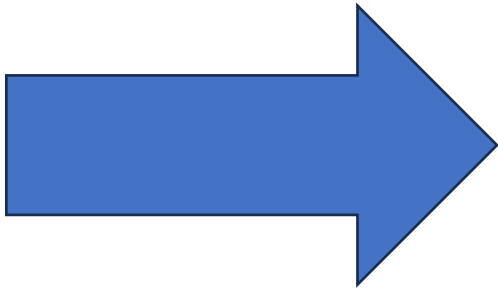


Decision to purchase buses with co-financing

Funds from the National Fund for Environmental Protection and Water Management / National Recovery Plan (KPO)



Decision to establish an internal entity and entrust it with 50% of the transport market



Decision to transfer vehicles to the municipal company under an entrustment agreement



Financing – Stage I

Funding institution:

National Fund for Environmental Protection and Water Management

Program budget:

- Up to PLN 1,200,000,000:
 - Non-repayable support: up to PLN 1,000,000,000
 - Repayable support: up to PLN 200,000,000

Forms of support:

- Grants and loans, according to the priority program.

Initial support level for Rybnik: 40% of net costs

Final support level: 65% (project in a medium-sized town at risk of socio-economic decline)

After switching to the National Recovery Plan (KPO): 75% of net costs

Total value: PLN 66,149,680

Co-financing: PLN 34,957,147.97 (NFOŚiGW) + PLN 5,378,022.76 (KPO)



Financing – Stage II

Funding institution:

National Fund for Environmental Protection and Water Management

Program budget:

Up to PLN 480,435,670:

- Non-repayable support: PLN 276,679,011 (target: PLN 2,055,268,688, subject to KPO activation)
- Repayable support: PLN 203,756,659

Forms of support:

Grants and loans.

Projects in municipalities or metropolitan unions over 100 000 residents receive +10% support (up to 100% eligible costs).

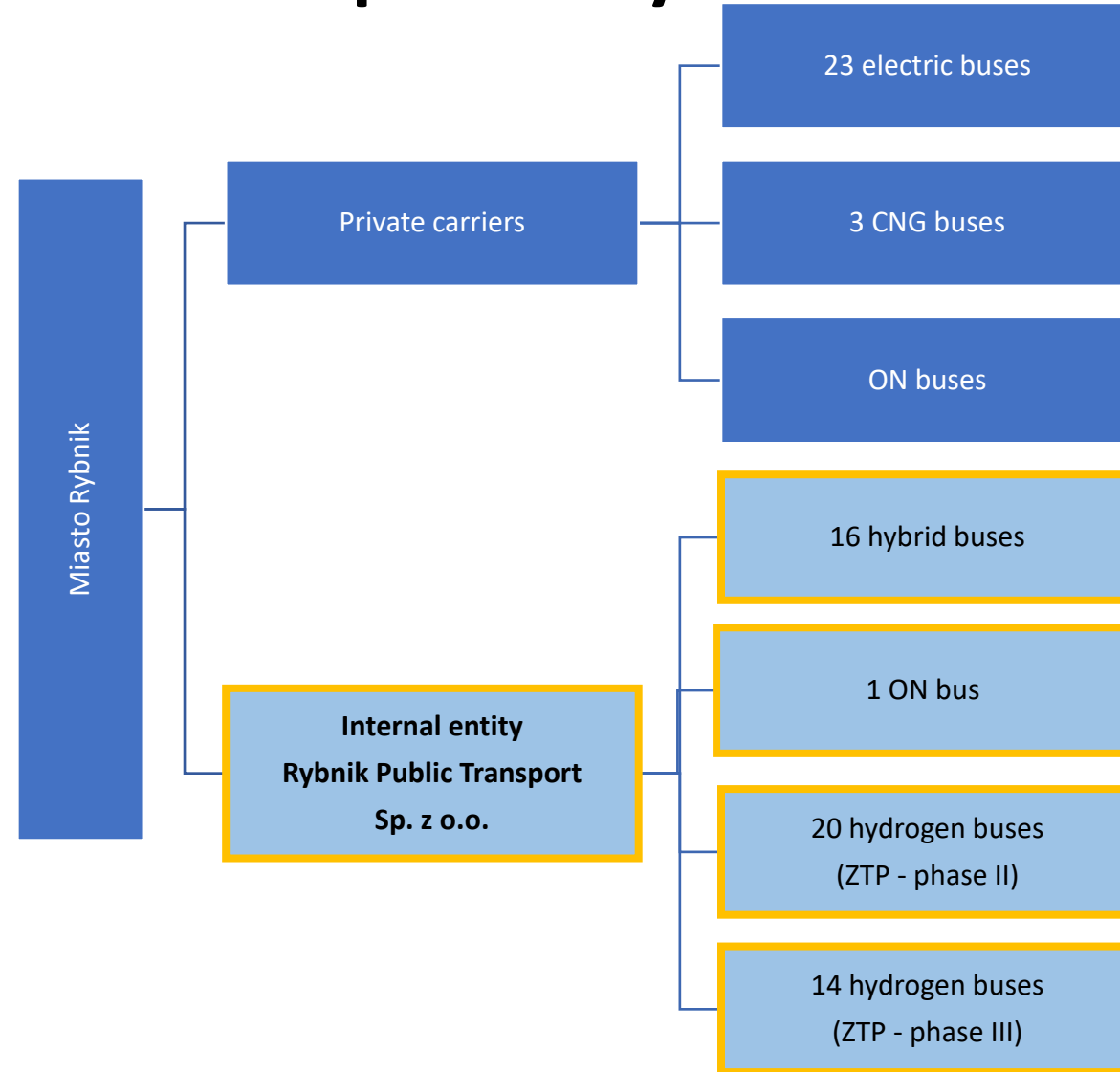
Total value: PLN 59 000 000

Co-financing: PLN 47 967 480 (KPO) + PLN 11 032 520 (own contribution)





Public Transport in Rybnik – After Changes



Demand for buses on a weekday: 76 units.

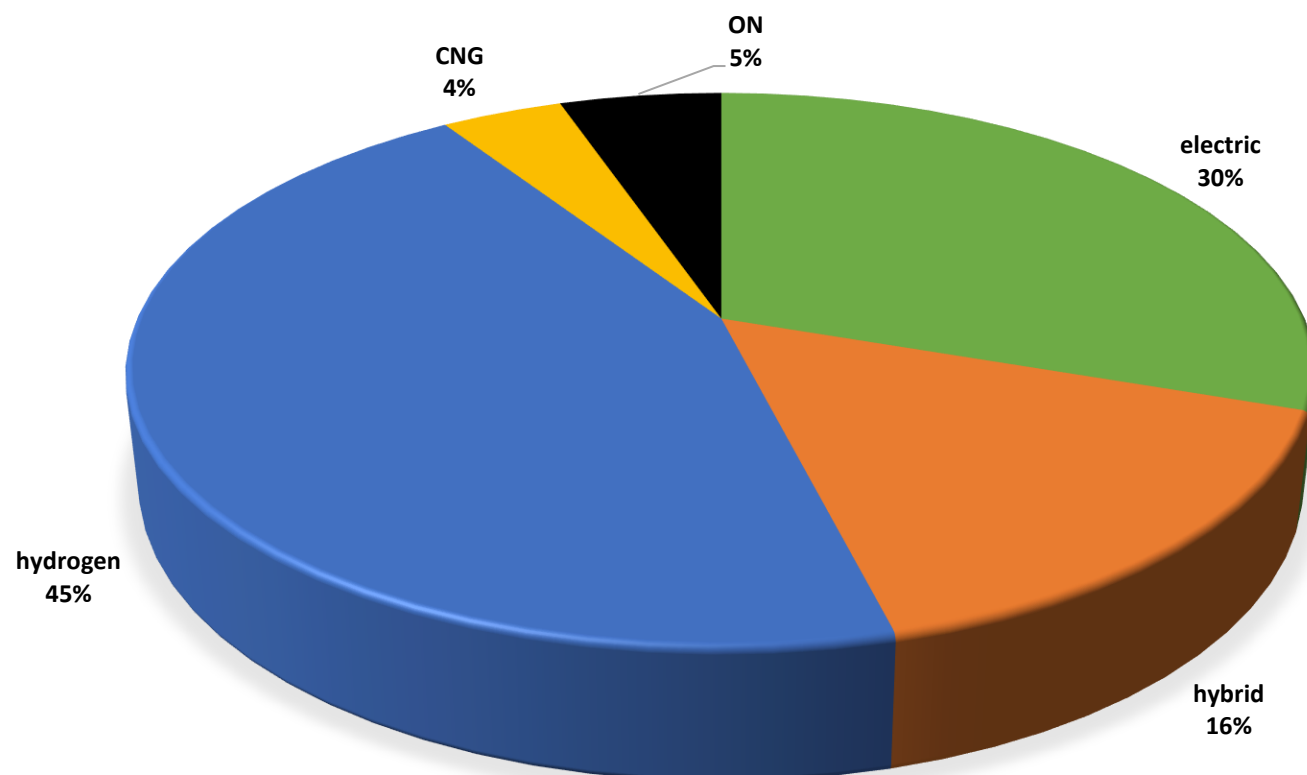




H₂



Structure of Zero-Emission Buses in 2026





Fleet Mix = Transport Safety

Reducing oil dependence through:

- Few diesel-only buses
- Hybrid fleet – low fuel use, high comfort, low emissions
- CNG/LNG fleet – comfort + low emissions
- Electric fleet – zero emissions
- **Hydrogen fleet – zero emissions, high comfort, energy security**





Operating Costs of 12-Meter Buses

Kind of fleet:	ON	ON (hybrid)	CNG	Electric	H2
Unit fuel consumption	32 ÷ 39 l/100 km	23 ÷ 28 l/100km	50 ÷ 55 Dm3/100 km	100 ÷ 110 kWh/100 km	5 ÷ 6 kg/100 km
Net fuel price	7,00 zł/l	7,00 zł/l	6,24 zł/dm3	?	63,90 zł/kg
Vehicle purchase cost (net)	> 1,5 mln zł	> 1,8 mln zł	> 1,8 mln zł	> 2,5 mln zł	>3,4 mln zł
Grant available	No	No	No	Yes	Yes
Infrastructure	None	None	None	Chargers + connection	H ₂ station (external)



Hydrogen Bus Refueling

Construction permit issued 28 Nov 2022 for Poland's 2nd public hydrogen station



Hydrogen Bus Refueling

Stationary station: fills up to 100% capacity



Official opening: 30 Oct 2023



Poland's first hydrogen refueling station expansion (all expansion costs borne by the station owner)

Work began on January 15th of this year.



Hydrogen Bus Refueling

Mobile station: transfer-type, up to 50% capacity





Operational Improvements

- Introducing refueling schedule to timetables
- Eco-driving training
- Reduced axle acceleration
- Improved energy & heat management in vehicles





Advantages of Hydrogen Buses

- Zero emissions – only water vapor produced
- Range up to 450 km per fill
- No extensive charging infrastructure
- Low noise
- Low maintenance costs (no engine oil or typical mechanical parts)
- Economic security (ETS II costs from 2027)
- Compliance with the Electromobility and Alternative Fuels Act
- Building competencies in modern energy technologies





Buses Delivered to Rybnik



Bright, step-free seating



Cameras instead of mirrors
(360° view)



Card payments in every
validator

Green Energy Center of the Western Subregion in Rybník





Circular Economy – Using Waste to Produce Hydrogen

On 15 Dec 2022, the Rybnik City Council approved the establishment of a company to transform the waste management model.





Hydrogen Production – Stage I

Biogas Plant

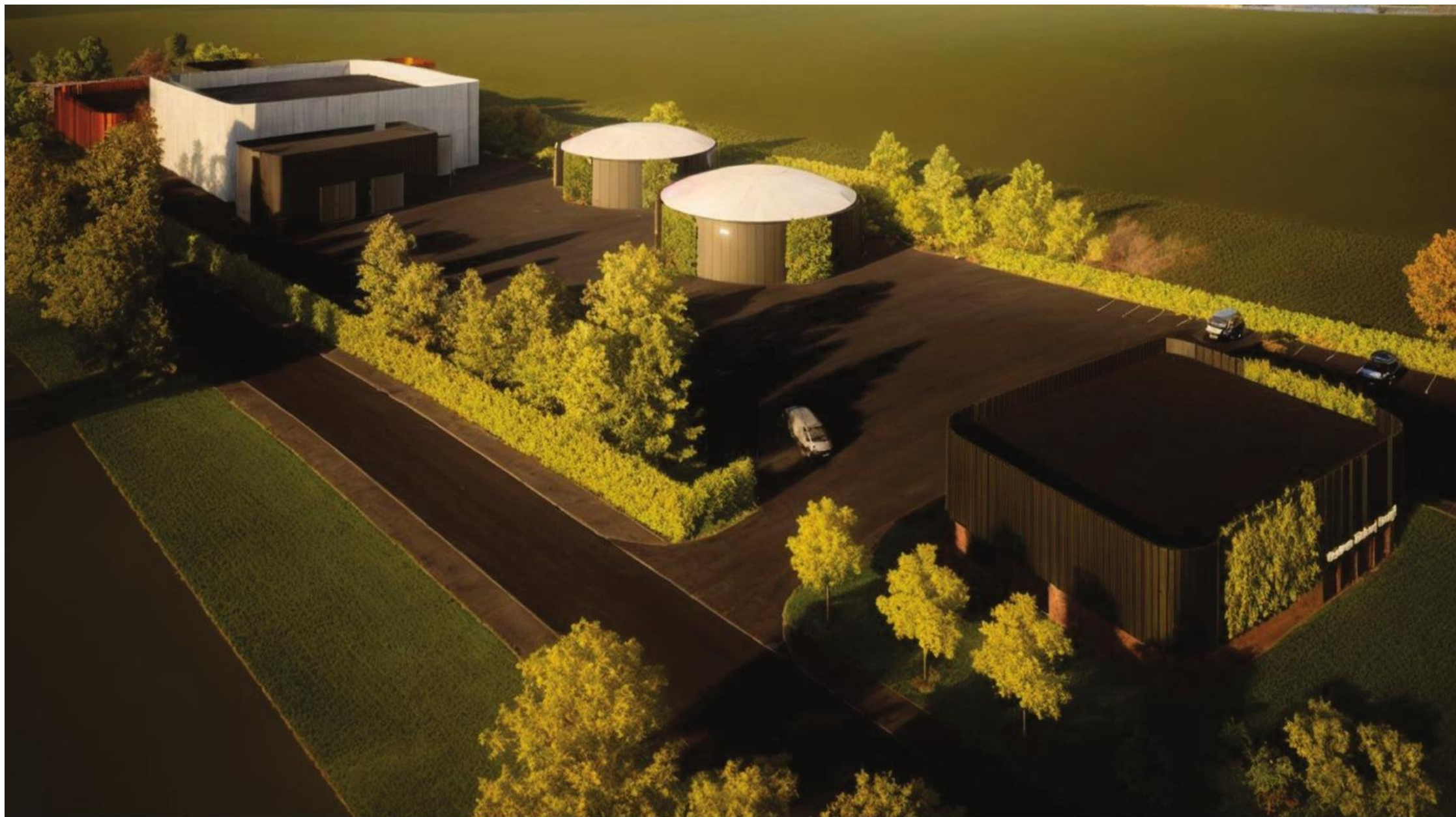
Funding:

National Fund for Environmental Protection and Water Management

Total cost: **96 mln zł netto (118 mln zł brutto):**

- 42,49% costs ($\approx$ 40,8 mln zł) grant from NFOŚiGW,
- 42,49% costs ($\approx$ 40,8 mln zł) – loan from NFOŚiGW; 15 years,
- 15% costs (14,5 mln zł) – own funds.





H₂



H₂

ROW 2.0 – Rybnik Hydrogen District 2.0

Joint project of Rybnik City and Silesian University of Technology.

Goal: transform the Rybnik Coal District into a Hydrogen District – a center of modern, sustainable energy technologies.



Center for Renewable Energy Sources and Hydrogen Technologies in Rybnik

The primary objective of the project is to provide research and development support for the process of a just transition in the region, in line with the European Union's energy and climate goals.

The activities and research outcomes on renewable energy and hydrogen technologies generated by the **Center for Renewable Energy Sources and Hydrogen Technologies in Rybnik** will play a significant role for the entire region.

The Center's operations will be based on four key pillars:

- **Hydrogen Technology Laboratory**
- **Eco-Home Energy Laboratory**
- **Mobile Laboratory for Photovoltaic Panel Diagnostics**
- **Competence Center for Renewable Energy Sources and Hydrogen Technologies**

The **Silesian University of Technology** received an EU grant of approximately **PLN 22 million** from the **Just Transition Fund** for the project "Center for Renewable Energy Sources and Hydrogen Technologies in Rybnik," which has a total estimated value of **PLN 27.2 million**.

Eco-Home Energy



Vocational Transformation of the Technical School Complex in Rybnik

Upgrading the hydrogen technology laboratory – design and construction of hydrogen-powered vehicles

The equipment includes:

- a starter kit with **12 hydrogen-powered cars** and **training tracks**, enabling students to learn about fuel cell technology,
- a **hydrogen car construction kit**, including an electrolyzer, fuel cell, and motor,
- a **hydrogen charging station**,
- a **hydrogen cartridge**.

Project value: PLN 9,833,214.60

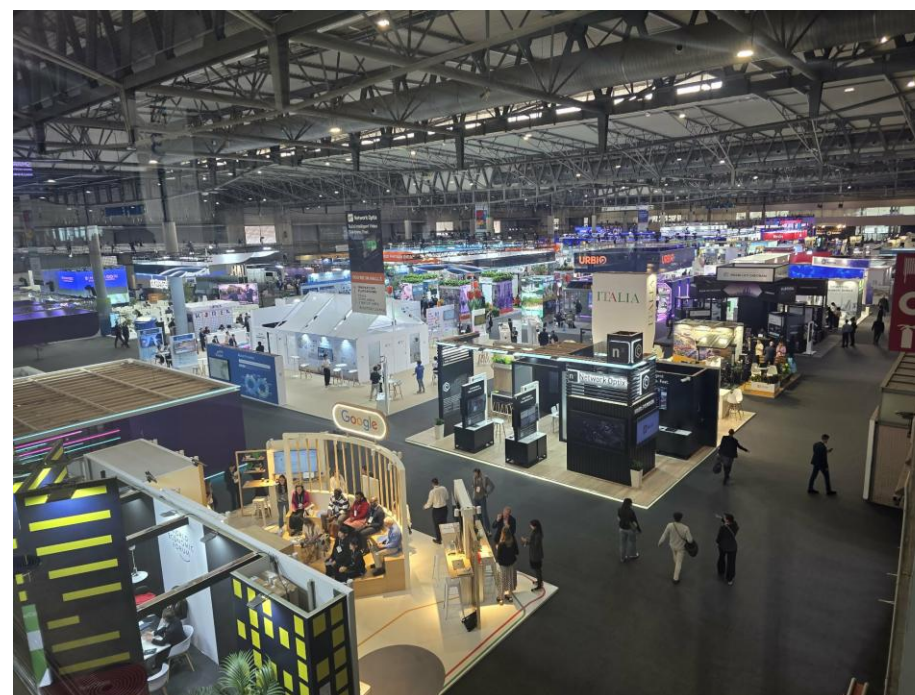


From 2025/2026, Silesian University of Technology to launch a degree in **Sustainable Consumption and Production.**



Smart City Expo Barcelona

As the only city from Poland, we were invited to this global congress to present our experiences with hydrogen technology.



Opportunities	Threats
• Zero emissions: Converting hydrogen into electricity produces only water vapor, making it 100% eco-friendly. • Long range: Hydrogen buses travel long distances without the heavy, costly batteries required by electric buses. • Fast refueling & high availability: No need for widespread charging stations. Quick refueling keeps buses on the road. • Lower maintenance costs: No engine oil and fewer mechanical parts reduce service costs. • Economic security (ETS II): Hydrogen protects the city from future carbon taxes and emission fees. • 100% grants & legal compliance: Rybnik secured 100% net subsidies today, well ahead of the 2026 zero-emission purchase mandate. • Grid independence: Operations run smoothly regardless of power grid failures or overloads. • Valuable expertise: Building unique team knowledge and skills for future energy solutions. • Fleet stability: Combining hydrogen, hybrid, and electric buses ensures maximum transport reliability and keeps Rybnik a green transport leader.	• Limited suppliers: The market currently offers only two key fuel cell manufacturers, which restricts options. • Unprepared legal & tax framework: Current regulations and tax systems do not fully support the rapid development of hydrogen technology.



Thank you for your attention.

Ewelina Włoch

City of Rybnik

www.rybnik.eu

ewelina.wloch@um.rybnik.pl

