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Breaking free from coal: Europe's regions forge a sustainable future with EU support

An EU-funded research initiative is guiding Europe's coal regions through the transition to renewable energy, while focusing on job creation and clean energy.

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The Maritsa Iztok Complex in southeastern Bulgaria stands as a relic of the past. Since the 1950s, its four thermal power stations have powered the region, relying on coal from three nearby open-pit mines.

This type of mining is among the most environmentally damaging, and a long-overdue transition is now underway, promising to reshape the area in the coming years.

This region, home to one of Bulgaria's largest coal mining and power plant complexes, is not alone. Across Europe, there remain 31 coal regions in 11 EU countries, with approximately 200 000 people employed in coal mines and power plants.

In neighbouring Greece, the Western Macedonia region is known for its highly polluting lignite mines and power plants. To the north, Romania's Mureș county also relies heavily on the fossil fuel industry for local employment.

The challenge facing these regions is twofold. They need to rapidly replace coal with renewable sources of energy, while supporting local communities through the transition by creating new jobs and helping people retrain for the future.

Finding shared solutions

Panagiotis Grammelis, research director at the Centre for Research and Technology Hellas (CERTH) in northern Greece, is working to make that transition fair and effective.

He leads an important EU-funded initiative that will run until the end of 2026, and is part of a multinational team helping regions in Greece, Bulgaria and Romania develop a shared strategy for moving beyond coal.

“It’s not only a technological challenge,” said Grammelis. “It’s also a social one.”

The initiative, called COALition, takes a bottom-up approach. Regional hubs bring together researchers, policymakers, businesses and communities to shape locally tailored solutions.

While each region has its own challenges, they share common goals: to advance clean energy technologies and manage the social realities of transition.

“We are leaving the coal era and moving into the renewables era,” said Grammelis. “We have common problems, common policy issues – and we want a common innovation model to address them.”

Ensuring a fair transition

The urgency is clear. Coal power in the EU has declined steadily since 2003, and in 2024, solar electricity production overtook coal for the first time.

Ensuring a fair transition to renewables is central to the EU’s goal of becoming the world’s first climate-neutral continent by 2050. This is facilitated by the Just Transition Mechanism, which will mobilise around €55 billion between 2021 and 2027 to support the shift.

In Stara Zagora, Bulgaria, where a third of jobs are tied to the local mining complex, even introducing the idea of an energy transition can be difficult.

“We’re at the very beginning and resistance is still very strong,” said Dr Rumyana Grozeva, executive director of the Stara Zagora Regional Economic Development Agency. “People don’t trust that the government can manage this well.”

Grozeva, who has spent most of her life in Stara Zagora, stressed the need for genuine community engagement.

“Transition is not just about planning, it is about communication,” she said. Encouraging conversations about the energy transition are finally starting to happen.

Grozeva’s team is working with local trade unions to identify the new professional skills that will be needed and ensure appropriate vocational training is available.

One example is a gap in hydrogen technology know-how. The team is now preparing proposals to introduce relevant training into the national curriculum.

Grozeva believes the region’s future lies in sectors like clean hydrogen, mechatronics and sustainable agriculture.

“These are the areas with the greatest potential for long-term, sustainable growth,” she said.

Hydrogen on the horizon

Stara Zagora is positioning itself as one of Europe’s two hydrogen valleys, thanks to a newly established Centre of Excellence in Hydrogen Technologies. The goal is for the region to produce 500 tonnes of clean hydrogen annually.

The long-term vision is for the entire value chain – from design and production to assembly and energy generation using hydrogen, solar and other renewables – to take place locally.

“Developing such an industrial symbiosis – and the skilled workforce to support it – could be a great opportunity for the region,” said Grozeva, who stressed the vital importance of international collaboration in promoting the exchange of best practices between the regions.

In Western Macedonia, a similar initiative led by CERTH and supported by the Just Transition Fund is piloting green hydrogen technologies from production through to storage and use. An exchange of experiences between the regions is expected to bring positive results for both sides.

The European Commission’s Joint Research Centre estimates that clean energy technologies could create up to 315 000 jobs in former EU coal regions, potentially rising to 460 000 by 2050.

But it is important that the new jobs match those that are being replaced.

“You have to substitute the high salaries of the fossil fuel sector with new positions that can offer similar rates of pay,” said Grammelis.

Looking ahead, he sees the approach developed in COALition as a potential blueprint for other regions navigating similar shifts.

“This could be a scalable model for fair energy transitions – something that could guide other areas facing the same challenges.”

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More info

- COALition
- COALition project website
- Just Transition Mechanism
- Just Transition Fund
- EU coal regions in transition