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Germany's mining regions

Taking the chance on change

How cities and companies are coping with the coal phase-out





Get in early for the exit

The phasing out of coal is the challenge of the century for all coal mining areas. Coal has shaped these regions since the beginning of industrialisation more than 150 years ago. Jobs and companies still depend on mining and the conversion of coal into electricity.

But the coal phase-out – to be completed in Germany ideally by 2030 – also offers cities and companies a great opportunity. Companies that used to depend on coal in Germany's former coal mining regions have skills that are in high demand in the economy. Mechanical engineering, electrical engineering, automation, control technology and the concentrated organisational and technical knowledge derived from energy technology and operating power plants and logistics chains are all needed in the development of a new, fossil-free energy supply. And in many other sectors as well.

In this magazine we show how companies and cities in the German coal-mining regions are dealing with the phasing out of coal and what the German government is doing to support them.

It shows that with courage and foresight, the challenge becomes an opportunity.



Use the energy competence

Checkbox: How to shape the transformation from a coal mining area into a thriving industrial region



In the regions, companies can receive financial support for the transition to other fields from the central government.

Promote quality of life! An attractive environment is important when it comes to attracting people to the regions and keeping them there.

Building infrastructure with new roads and rail connections helps the economic development of the region. Use the chance to invest into the regions.

The opportunities in change

The phase-out of coal is coming. Cities and companies are using the time to build up new business fields and competences based on their skills from the energy sector.

The water level continues to rise. It's only a few millimetres every day, but from the edge of the old open-cast lignite mine you can clearly see the lake that will be created by the inflowing water by 2026. "For me, the past and the future of the lignite mining area come together here," says Florian Beyer. In his thirties, he's an engineer at a renewable energy subsidiary of the lignite giant LEAG. Originally trained for coal, he is now planning renewables.

On the opposite bank stands Jänschwalde power station. Producing 3000 megawatts of electrical power, it is one of the largest plants in Germany. 14 million tonnes of lignite are burnt there every year. Some of the coal came from the open-cast mine on whose edge Beyer now stands. That is the past.

The future: The power plant will be decommissioned and plans are underway for its subsequent use. There is already a wind farm on the edge of the lake and Beyer's employer is planning solar power plants with more than 4000 megawatts of capacity in the region. "We will also build a floating solar plant on the lake," says Beyer.

Coal has created key competences

The open-cast mine is becoming a bathing lake: when the last mines and coal-fired power plants end their operation in Germany ideally by 2030, this will have a massive impact on life in the old coal-producing regions.

"This is a profound intervention. Lignite is the basis of prosperity here in the coal-mining area and has shaped the skills of people and companies," explains Stefan Korb. He is responsible for economic and structural development in Cottbus, a city of 100,000 inhabitants and the capital of the Lusatia coalfield. "The world will change here when coal production ends."

In the eastern German Lusatia region, in the central German coalfields and in the former steel and coal region in the western German Rhineland, dozens of towns, hundreds of companies and around 20,000 direct employees have to prepare for a future without coal mining and coal-fired power generation.

How is Germany dealing with this structural change?

"We are investing in new technologies in the coal-mining regions, where of course jobs are lost in coal mining. We are expanding renewable energy there, we are investing in infrastructure, in roads, in railways, we are building new universities there," says Oliver Krischer as former Parliamentary State Secretary with the rank of Vice Minister in the German Federal Ministry for Economic Affairs and Climate Action (BMWK). The authorities and universities bring qualified jobs and thus purchasing power to the regions (see 8: Help from the capital).

But that is only one part of the structural change. "The yardstick for successful structural change policy will be the strengthening of Lusatia as an industrial location", the report of the so-called Coal Commission says about the East German coalfield. All social groups were represented in the Commission to set the course for the transition into the post-fossil era. The industrial location, however, does not sustain itself through state subsidies alone. The biggest push must come from the cities and, above all, the local companies.

The cities support the new beginning

The city of Cottbus wants to promote renewable energies and the coming green hydrogen economy; it wants to help companies open up new business fields in automation technology, process engineering, metal construction and lightweight construction. "The energy industry will remain a focus," says Cottbus representative Stefan Korb. This includes readily available land and fast





From open-cast mining to the future: where coal excavators were once at work, there is now space for tourism and renewable energies.



approval procedures, to offer companies new building sites.

The city also wants to present itself as attractive with green spaces and parks, pubs and culture as well as the beautiful surrounding countryside so that it offers its citizens and, of course, skilled workers in technical professions a high quality of life and a beautiful living environment. One piece of the puzzle is the lake that is being built directly on the outskirts of Cottbus in place of the old lignite mine: The large Cottbus Baltic Lake.

Companies are in the midst of change today. Like Actemium BEA, many have been developing and manufacturing equipment for the coal industry as technical service providers.

Companies have prepared for the coal phase-out

"We were still demonstrating against the coal phaseout at the government headquarters in Berlin in 2016," explains Actemium BEA Managing Director Bernd Loose. The headquarters of the mechanical engineering company are located in the "Schwarze Pumpe industrial park", once the largest energy site in East Germany.

Where the coal industry has retreated, areas for attracting new industries have sprung up. The company Altech Advanced Materials is planning a factory for battery



Purest transformation story: In 1990 EMIS started with power plant service in Lusatia. Today the company provides control and safety technology for roller coasters and builds renewable energy plants.



"We believe that structural change in Lusatia offers countless opportunities" - The Dock3 Lusatia start-up centre in the middle of the Schwarze Pumpe industrial park.

anodes designed for 10,000 tonnes per year. And in the "Dock3 Lausitz" new offices and workshops are to attract the founders of the coming energy age.

For decades, the Actemium BEA company was like a part of the regional energy company, LEAG. But in the same year that Managing Director Loose and his employees went to Berlin to demonstrate, he realised: The end of coal is only a matter of years away. Loose: "That's when we started to restructure the company."

Success through early change

Conversion takes time. Above all, Loose built on the existing qualifications of his people. "Electrical engineering systems and automation systems like those needed in the coal industry are in demand in many industries," says Loose. Today, Actemium BEA supplies conveyor belts to industries wordwide. Transport and sorting systems are also needed in the processing of waste. And in the course of the conversion from diesel to electric, cities from Nuremberg to Hamburg have ordered charging stations for their fleets from Loose. "Despite the changes, the number of employees at our company has not decreased," says Loose about his company with around 200 employees.

The sooner one starts to change, the sooner successes will show. A few dozen kilometres away from Actemium BEA's headquarters, the company EMIS shows what can be done with the skills built up in the coal industry. "Right where we are standing, the city's coal-fired power plant still stood in 1990," says EMIS Managing Director Benjamin Oppermann. Back then, 27 employees dared to spin off from a coalbased company. Today EMIS has 13 branches all over Germany and employs 500 people. From power plant technology, they have transferred their expertise in building switchgear to other industries: today they build the control and safety technology of roller coasters all over the world and for the food industry. For 20 years, EMIS has also been involved in the expansion of renewables: From planning transformer stations to servicing wind turbines to the latest business field, the development of photovoltaics: EMIS now builds small rooftop systems as well as large ground-mounted systems.

Given that coal mining and energy from coal have shaped the four German coal-mining areas for more than 150 years, structural change will not be over in 2030. "I don't want to say it's easy either," says Managing Director Oppermann, summing up his experience of the transition from servicing coal to an industrial service provider. "But the most important thing is to have the courage for new things and to be aware of your technical and organisational competences."

This is how the company has turned the challenge into a success.

"The power must come from the old coalfields themselves"

Economist Professor Dr Oliver Holtemöller on experience with structural change throughout industrial history. And what today's coal regions can learn from it.

Mr Holtemöller, how many countries besides Germany are on the verge of phasing out coal?

Oliver Holtemöller: At the UN climate summit in Glasgow in late 2021, 46 countries committed to phasing out coal by the 2030s or 2040s. Out of these, the most important country in terms of coal consumption is South Korea. Other countries in the top 10 of consumption such as China, India and the USA are not among the 46. The higher the share of coal in economic output, the greater the challenge, of course. But it is also clear that if the world wants to achieve climate neutrality, there is no more room for CO2 emissions from coal-fired power plants.

Are the strategies countries are using to phase out coal similar?

They vary considerably. The social conditions and also the importance of coal are very different in the countries. In Germany, all the important interest groups from the environmental movement to industry are behind the phasing out of coal. And mining generally is very well respected in society. So there is great willingness to help the former coal-producing regions with structural change. In Romania, for example, it is quite different – there the miners have a different political history and society is hardly willing to help them now.

What role does the type of coal use play?

How coal is used also plays a role. In Germany, coal is mined and used to generate electricity in power plants. Ultimately, this affects a manageable number of locations. In Poland, however, people still use coal intensively for heating; there, not only would the coal miners have to be considered, but also hundreds of thousands of coal-fired heating systems would have

Help from the capital

The German government is supporting the four German coal-mining areas with around 40 billion euros in funding over the coming decades. A selection of the priority investments: Conversion from coal-based to a renewable energy system Establishment of scientific-technical research institutions, such as Fraunhofer and DLR Research projects and pilot plants for the production and storage of green hydrogen Extension and modernisation of railway lines and suburban railways Expansion of motorways and federal roads Expansion of broadband networks and fast internet connection Financial support for a higher quality of life in the former coalfields, such as social infrastructure and event venues to be replaced. In Austria, by contrast, practically no

to be replaced. In Austria, by contrast, practically no coal is mined, but the steel industry generates very high emissions. The conditions for phasing out coal can be very, very different.

What should a country or region do if it wants to implement a coal phase-out?

In the history of economic upheavals, one thing is very clear: the longer a region holds on to a dying technology, the deeper the economic wounds. Success in structural change requires a willingness to shape this change. To this end, politics should strengthen the creative milieus on the ground. Because in the end, the will to shape change must come from these regions. Structural change cannot be planned from the capital alone.

What should policy-makers in coal phase-out countries do for local people?

In addition to economic development, services of general interest play a central role. The state has the task of maintaining or creating equal living conditions in the former coal-mining regions. This includes hospitals and schools. Of course, this also includes a recreational infrastructure. These services of general interest are a central government task and cannot be provided by the private sector of the regions alone. They are also important so that well-qualified people do not leave the region. This includes the expansion of infrastructure with railways and roads and a good range of education and universities. In the long term, ideas and spin-offs of companies will also come from the universities.

Are there any examples of this?

Germany gained experience with structural change through the political turnaround in 1990. Along with the capital Berlin, the area around the city of Jena is the region that has developed most successfully economically in the area of the former GDR. What happened there? There was a strong optical industry with many well-connected players. They succeeded in expanding their centre of competence. Politicians specifically promoted the optical industry, research in universities specialised in the field and qualified workers were also traditionally available. This strategy has been successful.

Can the coal industry also build on existing strengths if it changes course early enough?

This is an industry with a lot of experience – in electrical and power plant technology, in the planning of large projects and organisation, in supplying energy



Professor Dr Oliver Holtemöller heads the Macroeconomics Department at the Leibniz Institute for Economic Research Halle (IWH) and observes structural change in coal-mining regions across Europe

to large areas. This is where we have to start and use these competences for other or new fields of business. It is not very promising when politicians want to build something for which there is no basis in the region.

How fast does structural change happen?

Politics should not promise people quick successes. Structural change takes decades even in good cases. Look at German reunification. After reunification in 1990, the East started at 30 per cent of the labour productivity of the old West Germany and has caught up to 85 per cent today. If you know today that the old industries will die out in the long term, then you should tackle structural change as quickly as possible. Because then the old industries are still agile and can supply ideas, investments and labour.

How can you tell how well structural change is working?

For example, we look at net migration. In other words, how many people leave the region on balance. In the end, people vote with their feet on whether change works.

Landscape after open-cast mining

In Germany, open-cast mining has torn holes in the landscape that together cover many hundreds of square kilometres. When the open-cast mines are closed, these old pits are usually flooded with water from nearby rivers. They become bathing lakes and sailing areas for locals and tourism.

Germany has more than half a century of experience with this recultivation of old open-cast mining areas. In the mining areas in the east of Germany, lignite is usually limited to a single seam underground, meaning the open-cast pits are relatively shallow and filled with water after only a few years.

In the western coalfields, on the other hand, several seams were mined that were on top of each other. The pits that remain today are up to 400 metres deep, and the lakes created here are amongst the deepest bodies of water in Germany!

Decades can pass before these holes are full of water. Follow-on use is becoming more and more sophisticated. Holiday settlements are being built on the edges of the lakes, the regions are discovering tourism and promoting themselves as surfing and sailing destinations. Harbours for sailing boats, beach bars and new residential areas with a view of the water are being built on the new shores.

And the former coal companies (who often own the land) are planning floating solar plants on the lakes, which often cover more than 60 square kilometres, and wind farms on the edges.

Nature, which has been battered by open-cast mining, is also getting its due again: wetlands, small pools and wetland reserves that people are no longer allowed to enter are being created at many former coal mines. Where coal goes, tourism and nature follow.



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