

FACT-FINDING VISIT TO LUSATIA, GERMANY 14-16 February 2018

Lusatia: geography and history



Lusatia (German: Lausitz) is a region in Central Europe. The region is the home of the ethnic group of **Lusatian Sorbs**, a small Western Slavic nation. Lusatia stretches from the Bóbr and Kwisá rivers in the east to the Pulsnitz and Black Elster in the west. Lusatia comprises two both scenically and historically different parts: a hilly southern "upper" section and a "lower" region, which belongs to the North European Plain. The major part of **Upper Lusatia** belongs to the German state of Saxony. Its Polish part, east of the Neiße (*Nysa*) River, belongs to Lower Silesian Voivodeship. A small strip of land in the north together with the Polish part of Lower Lusatia, is incorporated into Lubusz Voivodeship. **Lower Lusatia** belongs mainly to the German state of Brandenburg. Its Polish part, to the southwest, belongs to Lubusz Voivodeship. Historically, Lusatia belonged to several different countries. It was part of the Lands of the Bohemian Crown (the so-called Czech Lands) for three hundred years, then of the Habsburg Monarchy and from it to the Electorate of Saxony. The greater part passed to the Kingdom of Prussia in 1815 and the whole region merged into Germany in 1871. After the occupation of Eastern Germany by the Red Army and the partition in 1945, the eastern part of Lusatia along the Lusatian Neisse river was given to Poland where the boundary is called the **Oder-Neiße line**. In the Polish part today Polish is spoken, and in the German part German, and Upper- and Lower Sorbian. The biggest Lusatian town is Cottbus (Lower Sorbian: Chóšebuz).

Sorbs: language and culture

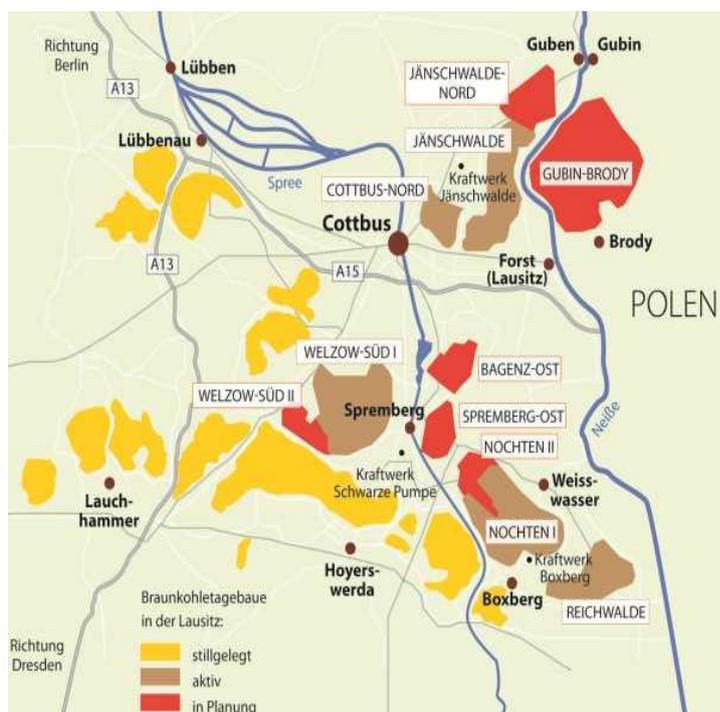
More than 60,000 of the Sorbian Slavic minority continue to live in the Lusatia region and this minority group is protected by the constitutions of both the federal states of Brandenburg and Saxony. The Sorbian languages (Upper Sorbian: Serbsce; Lower Sorbian: Serbski) are two closely related, but only partially mutually intelligible, West Slavic languages spoken by the Sorbs, a **West Slavic minority** in the Lusatia region of eastern Germany. They are classified under the West Slavic branch of the Indo-European languages and are therefore closely related to the other two West Slavic subgroups: Lechitic and Czech-Slovak. Historically the languages have also been known as Wendish (named after the Wends, earliest Slavic people in modern Poland and Germany) or Lusatian. The German terms "Wend" (Wenden) and "Wendish" (Wendisch) once denoted "Slav(ic)" generally; they are today mostly replaced by "Sorb" (Sorben) and "Sorbian" (Sorbisch) with reference to Sorbian communities in Germany.



There are two literary languages: **Upper Sorbian** (hornjoserbsce), spoken by about 40,000 people in Saxony, and **Lower Sorbian** (dolnoserbski) spoken by about 10,000 people in Brandenburg. They enjoy an official status equal to German in Lusatia. Road signs are usually bilingual. Sorbs try to protect their typical culture shown in traditional clothes and the style of village houses.

An important cultural festival for the Sorbs is **Zapust**. Modern Zapust usually consists of a carnival and a parade. Young unmarried couples wear traditional dress – the women and girls in dancing dresses and the men and boys wearing flowers given to them by their female partners. With musicians leading the way, the procession stops at the homes of distinguished villagers such as the mayor, who makes a symbolic donation to the Zapust collection box. In the evening, a dance is held.

Lignite mining and electricity



Since the end of the 19th century, Lusatia had been an industrial region, producing **lignite and electricity**. The coal industry in the region, which needs vast areas of land, destroyed dozens of Lusatian villages in the past and is threatening some of them even now.

Lignite or **brown coal** is a brown fossil fuel and the lowest rank of coal. It is a softer coal with a high moisture content and contains the greatest amount of compounds other than carbon - such as sulfur and mercury. The carbon content of lignite is only about 70%. Also, lignite represents the youngest rank of fuel, with approximate ages of around 60,000,000 years. Lusatia is the **second largest** of the three German lignite regions in terms of output (61.8

million tonnes in 2014) as well as power plant capacity (currently 6.7 GW at three locations). Within Lusatia, the lignite industry is mainly centred on the districts of Spree-Neiße, Bautzen, Görlitz, as well as in the outskirts of the city of Cottbus. Each year, 170 million tons of brown coal are mined in Germany and used to produce **almost a quarter** of the country's total electricity output.

Lusatia's mining is at the centre of the debate on a socially acceptable lignite phase-out. The region is considered structurally weak, with high unemployment, low economic growth, and high levels of emigration. With the breakdown of Eastern Germany's heavy industry after reunification, tens of thousands of jobs disappeared. The region has still not fully recovered from this blow. Lusatia region's landscape is visibly shaped by surface mining. Despite plans to gradually phase out lignite mining after unification in the 1990s, the industry is still there, though with significantly less personnel than the 60,000 workers it once employed. The scars are still well visible. 26,000 people were forced to resettle to make way for the mines.

The lignite industry provides around **15,000 jobs** in Lusatia. Roughly half of those are located in power plants and open-cast mines, while the other half is with suppliers. According to state government projections, around half these jobs will be lost following the closure of the Jänschwalde power plant. Brandenburg's Energy Strategy does not envisage its closure until 2030. However, it is questionable as to whether the power plant will still be economically viable at that time. One third of its units are already slated for closure by 2023 as part of the

capacity reserve. Within a few years, thousands of jobs could be lost in Brandenburg's part of Lusatia.

The government of the Land Brandenburg has established an **energy plan** for the future: **Energy Strategy 2030**. The main goals of this strategy are: decreasing end-user energy use with 23% by 2030 (=1.1% per year); increasing the share of renewable energy to 40% by 2030; and cutting primary energy use (lignite, oil, gas, etc.) with 20%. Measures to be taken to achieve these goals include: improving system integration, developing better grids and improving storage technologies. By 2030 CO₂-emissions should be brought down with 72% against the 1990 reference values. This means lowering output to 25 million tons. Energy Strategy 2030 also includes **participation of stakeholders** and should promote acceptance of the necessary measures.

Lignite mining: environmental impact

The lignite mine sites are often rehabilitated and brought back into cultivation after mining ends, but the original ecosystem never fully recovers. In many cases, the pits are flooded to form lakes. The **negative environmental impacts** of mining include damaged ecosystems, degraded soil, acidified water, water contaminated with sulphates and sludge containing iron, as well as disturbed groundwater regimes. In Lusatia, sulphate from nearby open-cast pits threatens the water quality in the River Spree and therefore Berlin's drinking water supplies.

To ensure that the massive mining machines have stable ground to stand on, the groundwater is pumped out through deep wells that reach right below the layers of coal. This **lowers the groundwater level** for several kilometres around the mine itself. In the village of Jänschwalde for instance most old trees started dying of drought when the mine approached the village.

Surface mining of lignite results in several other environmental problems, for example, mass transfer of billions of tons of soil and devastation of nature. Among these, **water acidification** is a well-known effect. Sulphide minerals, such as pyrite and marcasite, are commonly associated with coal and most metal ores. Weathering and oxidation of these minerals take place in the host rocks and substrates of the lignite horizons when they are exposed to air. The release of the oxidation products, mainly acidity, iron and sulphate, is known as **acid mine drainage (AMD)** and can cause acid lakes forming in exhausted pits.

Subsidence is another effect of groundwater extraction. If this happens it causes cracking in the walls of houses and road surfaces. Mining companies often will not acknowledge that mining is the cause of the damage. In such cases the people affected are forced to fight for their rights for many years, or pay for the damage themselves.

Aside from the **risk of ground movement** the long-term damage caused by open-cast mining also includes chemical changes to the groundwater. Sulphur minerals that are exposed to oxygen during mining release sulphates and iron. Iron sludge is deposited on the beds of rivers as a life-threatening coating that also clogs the gills of fish and insects. The red-brown sludge can destroy almost all life in a waterway. It threatens valuable nature conservation areas, and hence tourism in Lusatia. The invisible **salinization** of the water due to sulphates can be tracked all the way to Berlin and beyond.

Power generation: environmental impact

Many different predictions have been made regarding the future utilised capacity of lignite-fired power plants. While some experts consider a substantial reduction of capacity to be necessary due to the expansion of renewable energies, others argue that the utilisation of lignite-fired power plants will decrease only when all power plants with higher marginal costs (natural gas, anthracite, etc.) will have been largely replaced, or the cost of emissions allowances as determined by the European Emissions Trading System (ETS) is drastically increased. The **decommissioning of power plants** with higher marginal costs as described above (especially of gas-fired power plants) can currently be observed in Germany. Thus, CO₂

emissions released when electricity is generated have increased despite the steady expansion of renewable energies. This is because the use of lignite to generate electricity has also risen.

On 30 September 2016 Swedish, state owned, energy company Vattenfall completed the **sale of its German lignite business** to the Czech energy group EPH and its financial partner PPF Investments. The sale included power plants Jänschwalde, Boxberg, Schwarze Pumpe, Lippendorf block R as well as open cast mines Jänschwalde, Nochten, Welzow-Süd, Reichwalde and the closed mine Cottbus Nord. Vattenfall operated six large lignite-fired power plants with a total of 15 power blocks. Boxberg III (1979/1980) and Jänschwalde (1981-89) are the oldest and most inefficient of these plants with a combustion efficiency of 35%. Correspondingly, they also have the highest intrinsic CO₂ emissions.

The newer power plants Schwarze Pumpe (1997/98), Lippendorf (1999), and Boxberg IV (2000/2012), have far higher combustion efficiencies. LEAG, or **Lausitz Energie Bergbau AG**, is a subsidiary of Czech mining company EPH, which bought the lignite operations from Vattenfall. The new owner has **scrapped plans** by former owner Vattenfall to expand one of its lignite mines. With total lignite output of 62.5 million tonnes in 2015, LEAG extracts lignite at Jänschwalde and Welzow-Süd in Brandenburg, as well as at Nochten and Reichwalde in Saxony.

In March 2017, the Supervisory Board of LEAG agreed on a concept for the Lusatia lignite mining district for the next 25 – 30 years. The mining district concept **does not foresee** the construction of new power stations at the Jänschwalde site or use of the future field Jänschwalde-Nord. "Given the political and economic framework conditions that have arisen in these federal states in the meantime, these **investments are no longer justifiable** from a business point of view," explained Helmar Rendez, chairman of the board of LEAG. The company is allegedly planning to complete the Jänschwalde open-pit mine by 2023 as scheduled. The Jänschwalde power station is then due to be operated for a period of eight to ten years with coal from the south of the mining district, in order to provide a longer planning horizon for structural and site development. LEAG is also planning to continue providing training at the Jänschwalde site.

Next to mining area 1, the Mühlrose special field in Nochten with a coal reserve of around 150 mt is due to be mined as part of mining area 2 in order to secure a needs-based supply for the Boxberg power station in the long term. Mining the Mühlrose special field requires the **relocation of some 200 inhabitants** in the Trebendorf district. LEAG still recognises the energy-related need to mine coal in sector II in Welzow-Süd. However, unlike the Nochten open-pit mine, an investment decision regarding sector II of the Welzow-Süd open-pit mine is not absolutely essential at present, according to the management of the open-pit mine. It must be made by 2020 at the latest. The company is of the opinion that better use would be made of that time by finding out how the nuclear phase-out affects the supply situation and the price of electricity, and how the **future Federal Government's energy policy decisions** will affect the generation of electricity from lignite. In its new Lusatia mining district concept, LEAG also stated that it has no plans to develop the Bagenz-Ost and Spremberg-Ost open-pit mines. Mining of the open-pit Reichwalde site will go ahead in accordance with the approved plans.

Health impact

The health impacts and external costs of the lignite-fired power plants in the German Lausitz (Jänschwalde, Schwarze Pumpe, Boxberg) as well as two Polish lignite-fired power plants in the proximity of the border (Turów, Dolna Odra) can be considered high. **Air pollution** is still an important public health issue. It enhances the risk to develop a chronic disease of the cardiovascular or respiratory system and decreases the average life expectancy in Europe by 8.6 months. About 450 000 deaths annually are caused by air pollution with **fine particulate matter**.

Exposure to particulate matter increases for example the risks for lung cancer, chronic bronchitis, ischemic heart attack, heart arrhythmia and heart insufficiency. Exposure to

elevated levels of ozone on the other hand causes acute respiratory symptoms and may cause asthma attacks. Cardiovascular and respiratory diseases are among the leading chronic diseases in Europe.

In 2016 European coal power plants emissions fell by 11% in 2016. Almost half the fall was from the UK, with a massive 58% year-on-year fall in coal emissions. Big falls were also recorded in Spain (-27%), Greece (-21%) and Italy (-17%). The biggest two coal polluters saw the **smallest reductions**: German coal power plant emissions fell only 4%, and Poland's emissions fell by only 1%. Even since 2010, the movements have been small: -5% for Germany and -7% for Poland.

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Contact: poldep-citizens@ep.europa.eu

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