Lignite, electricity and heat

Nochten and Reichwalde Opencast Mines

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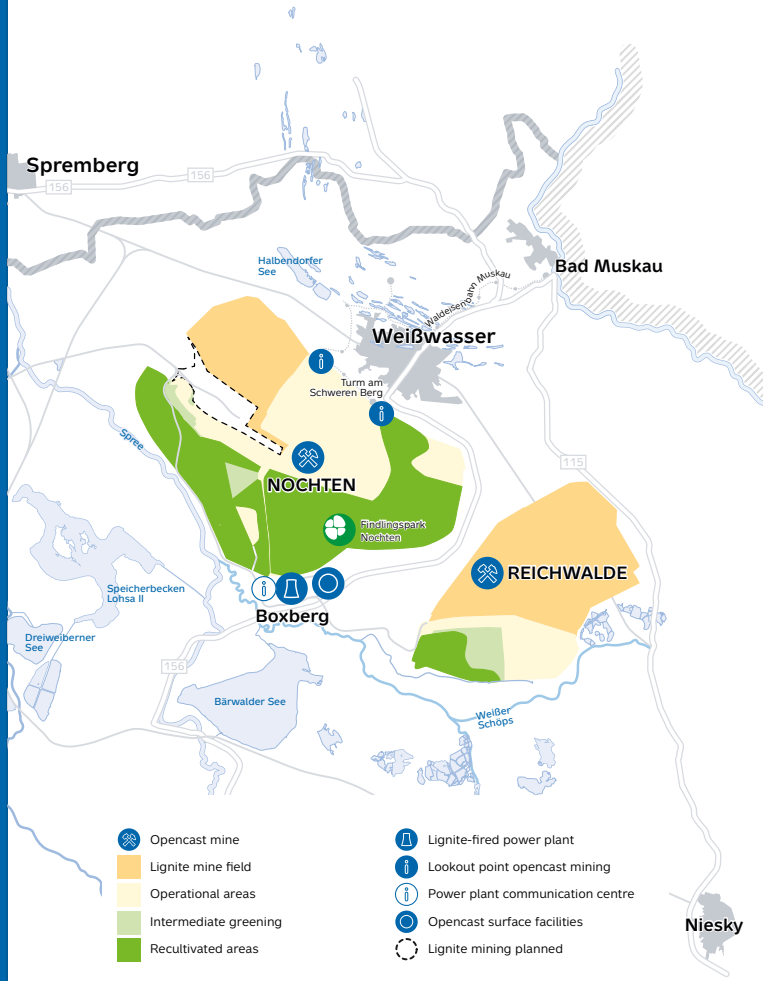
Lusatia in the south of Brandenburg and northeast of Saxony is the second largest lignite mining district in Germany. In opencast mining, lignite is extracted without subsidies and converted into electricity and heat in nearby power plants safely, efficiently and in an environmentally friendly manner.

Location and overview

The reserves of Nochten and Reichwalde are in the Free State of Saxony, near to the town Weißwasser. Nochten opencast mine was opened up in 1968 and delivered lignite to the Boxberg power plant site for the first time in 1973. The development of the Reichwalde opencast mine began in 1985, the first coal delivery followed two years later. Mining was stopped in October 1999 for an intermediate period. Almost ten years later, the demand for lignite increased again with the construction of a new 675 megawatts power plant unit at the Boxberg site. After extensive modernisation measures Reichwalde resumed coal production in 2010.

Mining preparation and water

A prerequisite for safe opencast mining is keeping the deposit free of water. Filter wells with submersible borehole pumps lower the groundwater level to below the lignite layer. Water treatment plants treat the raised water mainly as process water for Schwarze Pumpe and Boxberg power plants. A portion is transferred to the peripheral area of the mine or serves to flood Hermannsdorfer Lake in Nochten's postmining landscape.



Approx.

30 million t

of lignite are mined annually in Nochten und Reichwalde opencast mines.

Uncovering the lignite

The upper layers of soil above the raw material are extracted in the so-called pre-cut. This is carried out in Nochten deploying a bucket wheel excavator type SRs 6300 – with a height of 65 metres and a bucket wheel diameter of 17 metres the largest in the Lusatian mining district. The overburden extracted in the pre-cut is transported by kilometres of conveyor belts to the side of the opencast mine already coaled out, where it is dumped as the uppermost soil layer for the rehabilitation of the land later.

The lignite is exposed in both opencast mines by overburden conveyor bridges of type F 60. In Nochten, the equipment group consists of three high-performance bucket chain excavators and a conveyor bridge, which is 670 metres long. This makes it one of the largest mobile equipment complexes in the world. It enables removing the overburden, conveying it across the coal mine at the shortest possible distance and dumping it in one work step. The F 60 in the Reichwalde opencast mine is coupled to two bucket chain excavators and is around 500 metres long.

The lignite from the Nochten und Reichwalde opencast mines is deposited at depths of up to

100 m

Lignite mining

The lignite from the 2nd Lusatian seam is extracted directly under the overburden conveyor bridge. In the Reichwalde opencast mine, this layer of lignite is between nine to eleven metres thick, in Nochten opencast mine up to 15 metres – equivalent to a five-floor building. In both opencast mines, two bucket wheel excavators and two bucket chain excavators extract the raw material. A special feature of the Nochten opencast mine is that the 1st Lusatian seam is also mined here between the process lines of the pre-cut and the F 60. It is about three metres thick on average.

The opencast mines Nochten and Reichwalde are the main suppliers of the Boxberg power plant. Nochten lignite is also supplied to Schwarze Pumpe power plant and refinery. Coal from Reichwalde is also used in the Schwarze Pumpe and Jänschwalde power plants.

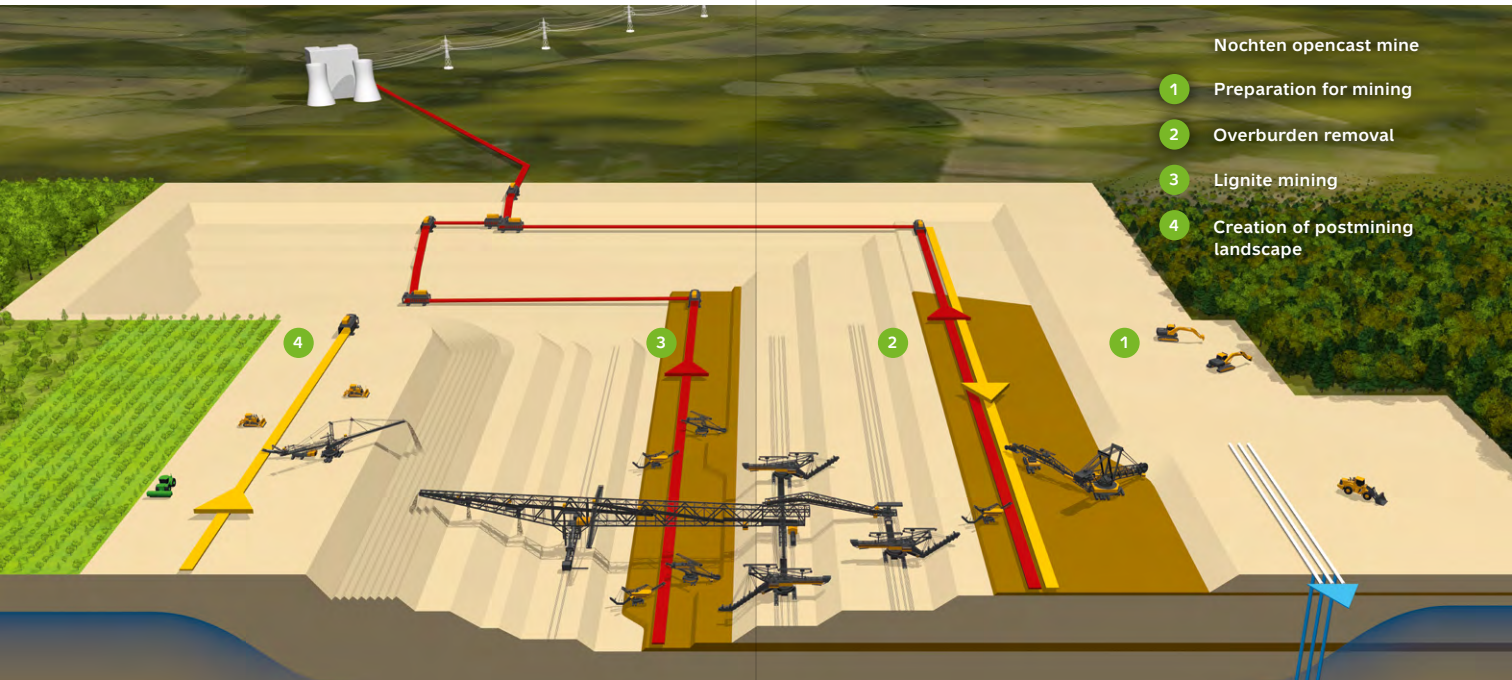
The landscape after mining

Mining of lignite is always followed by the rehabilitation of the areas, the recultivation. No ton of lignite is extracted without it being clear what the postmining area will look like.

One third of the trees newly planted for afforestation in the mining area, mainly pine, birch and English oak, now grow in the Nochten opencast mine. Experts use forest genetic maintenance measures to safeguard the genetic material of old trees, in particular sessile oaks and Scots pines, from the opencast mine forefield. The seeds obtained are used for reforestation.

Open spaces structured with smaller trees and shrubs are typical for the postmining landscape near Weißwasser. Here heather, juniper and dry grasslands dominate the landscape. A 16-square kilometre recultivation area is reserved solely for nature conservation. The future, over 200 hectares large Hermannsdorfer Lake lies within this area. With the "New Jeseritzen", a moor initial founded on peat from the opencast mine forefield is being developed immediately adjacent. Nochten Boulder Park (Findlingspark Nochten) not far from the Boxberg power plant is also an example of landscape design on recultivated areas.

As early as the 1990s, mixed forest areas were established on the inner tip of the Reichwalde opencast mine, into which open-land biotopes and agricultural land are integrated. Reforestation will remain the dominant element of the postmining landscape of Reichwalde in the coming years. The emerging forests will serve both timber production as well as recreation and nature and species protection. In addition, a 120-hectare agricultural area is being built on the southern edge of the opencast mine.



A river relocates

Until a few years ago, a canalised section of the river Weißer Schöps ran through the northern field of the Reichwalde opencast mine, which had to be relocated for the progress of mining. Between 2011 and 2014 work was carried out on a water course with a total length of 13 kilometres. The Weißer Schöps has been given a 5.4 kilometres long, completely new riverbed. Around 2.3 kilometres of the old course were renaturalised and a further 5.5 kilometres were redesigned close to nature. The result is a natural river landscape that offers a habitat for many animal and plant species and in which nature can once again take over.

A view of new land

Between Nochten opencast mine and the southern outskirts of Weißwasser, in the "Turm am Schweren Berg" is the Communication and Nature Conservation Centre Weißwasser (KNW for short). It is a starting point for excursions to the Nochten opencast mine, exhibition and event location and is open to associations, schools and public institutions. Visitors can see the growing postmining landscape of the Nochten opencast mine from the 30 metres high lookout tower. This includes a terraced natural space, which was created directly in front of the KNW. Only a few steps away there is a stop for special trips of the Muskau Forest Train (Waldeisenbahn Muskau).

Key figures for opencast mining

	Nochten opencast mine	Reichwalde opencast mine
Overburden removal theoretical volume	bucket wheel excavator SRs 6300: 14,000 m³/h	bucket wheel excavator SRs 2000: 7,700 m³/h
	overburden conveyor bridge AFB F 60: 26,800 m³/h	overburden conveyor bridge AFB F 60: 29,000 m³/h
	spreader A_2RsB 15400: 20,000 m³/h	spreader A_2RsB 10000: 10,000 m³/h
coal mining theoretical output	bucket wheel excavator SRs 1301: 2,625 t/h	bucket wheel excavator SRs 1301: 2,625 t/h
	bucket chain excavator ERs 710: 1,050 t/h	bucket chain excavator ERs 710: 1,050 t/h
Overburden : coal ratio	5 : 1 [m³/t]	5 : 1 [m³/t]
Total length of belt conveyors	pre-cut: approx. 10 km	pre-cut: approx. 10 km
	coal: approx. 17 km	coal: approx. 14 km
Recultivation under the mining law responsibility of LEAG (up to 12/2017)	approx. 2,613 ha	approx. 183 ha

Over

30 million

deciduous and coniferous trees have been planted in the opencast mines of the Lusatian region since 1994.

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