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(Allemagne) : nouveaux usages et nouvelle image d'une région minière*

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Métamorphose des paysages miniers dans le bassin de lignite de Basse Lusace (Allemagne) : nouveaux usages et nouvelle image d'une région minière

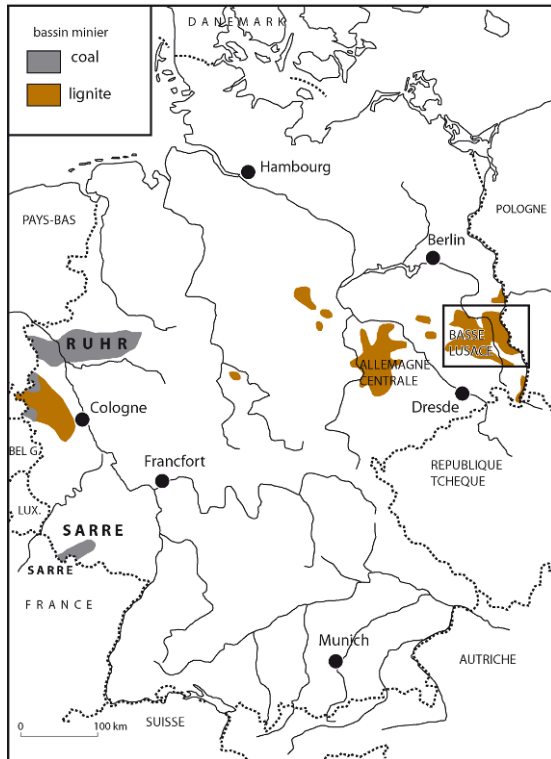
Michel Deshaies

Introduction

- 1 The economic changes that followed the fall of communism led to a rapid and deep decline in mining activities throughout Central Europe, as existing economic structures were unable to adapt to the market economy¹. In the former GDR, the context created by reunification led to the total collapse of mining activities, most of which were closed in the early 1990s². Entire regions shaped by mining for more than a century suddenly fell into a kind of lethargy resulting from the closure of mines, a very small number of which continued to operate. The end of mining has caused similar problems in all mining regions, “the unavoidable socio-economic drama of pit closure³”.
- 2 Unlike the coalfields of Western Europe, where the gradual decline in mining activities led to the emergence of new activities and a more or less successful conversion, the coalfields of the new German Länder entered the post-industrial era very abruptly⁴. With most of its mines and industrial activities closed, it was suddenly necessary to start rehabilitating a heavily degraded environment on an unprecedented scale, as communist era exploitation was particularly devastating⁵. From these transformations, the coalfields inherited a desolate landscape, whereby mining wastelands predominated in the early 1990s.

- 3 The particularly disastrous image of these regions seemed to concentrate all the problems generally attributed to old declining industrial regions⁶: degraded environment and landscapes, high unemployment rates, inadequate training of local people, loss of identity among local communities and demographic decline. In distinction to many other former industrial regions, these mining regions in the new Länder seemed to have no future, due to both their inability to find new activities and especially their inability to change an image symbolised by a degraded environment and landscape. Nevertheless, major government-supported efforts have been undertaken to change this image and rehabilitate the landscapes of most of the coalfields⁷. Apart from the former uranium basin in Saxony and Thuringia⁸, these efforts were concentrated on the lignite basins, which was by far the main mining activity in the GDR.
- 4 Since German reunification, the landscapes of the East German lignite basins, intensively mined using the open-cast method, have undergone a profound transformation as a result of the closure of most of the mines. The considerable spatial expansion of mining wastelands in the early 1990s made it necessary to conduct a rehabilitation programme involving the reforestation of large areas and the flooding of residual pits to form a lake landscape that is still under development. At the same time, the question also arose surrounding new uses for these former mining areas located in regions severely affected by the collapse of mining and industrial activities.
- 5 The landscapes of Lower Lusatia, which are still deeply marked by mining activities, were rapidly transformed into new lake and forest landscapes, where some elements of industrial heritage remain. The Lower Lusatian lignite basin region has based its conversion on this new image, the emergence of which was promoted throughout the 2000s by the organisation of an International Building Exhibition (IBA). After introducing the characteristics of the mining landscapes inherited from the large-scale exploitation of the GDR era, this article will describe the conditions under which projects leading to the creation of a new post-mining cultural landscape were developed. Analysis of studies carried out during the IBA, in addition to interviews with locals and primary stakeholders involved in the development of new projects, enable the assessment of the social, economic and environmental issues linked to the construction of these new landscapes.

Figure 1. Coal and lignite basins in Germany



Source: Geosatellitenbildatlas Deutschland, 1990.

Figure 2. Lignite mines and mining wastelands in Lower Lusatia in 1989



Source : Geosatellitenbildatlas Deutschland, 1990.

Mining Landscapes to be Rehabilitated

- 6 While open-cast lignite mining had been important in Germany since the early twentieth century, it intensified considerably in the eastern part of the country, first under the Nazi regime and then after the Second World War in the GDR. As a state with virtually no energy resources other than lignite, the GDR significantly ramped up the extraction of this poor-quality fuel, which exceeded 300 millions tonnes per year at the end of the 1980s. Lignite, extracted from huge open-cast mines in the Leipzig region and in Lower Lusatia, is responsible for the devastation of vast areas of land (Fig. 1 and 2). Although the end of mining was supposed to bring rehabilitation, recultivation or reforestation to mining wastelands, the priority given to production and the lack of financial resources as of the 1980s reduced the size of rehabilitated areas, which were much smaller than those affected by the development of mining⁹. By the time the communist regime fell in 1989, barely half of the 120,000 ha of exploited agricultural or forest land had been rehabilitated. This was due to the strictly productivist logic in force in the GDR, which pushed into the background the need to rebuild post-lignite mining landscapes¹⁰. In 1989, the landscapes of lignite basins were also characterised by the predominance of vast mineral wastelands ploughed by giant excavators¹¹ (Fig. 2).
- 7 The Lower Lusatian basin, the country's main lignite mining region, was also the most affected by the rehabilitation deficit, as production had risen steadily since the 1960s to a peak of 200 millions tonnes in 1988, at a time when there was a severe shortage of resources for recultivation¹². The high level of strata continuity allowed for the widespread use of transit bridges, such that the open-cast mines in Lower Lusatia expanded at a much faster rate than in the other basins. Recultivation, however, was unable to keep up with this pace.
- 8 Between 1970 and 1990, the areas mined for lignite in Lower Lusatia almost doubled, from 37,578 to 70,578 ha¹³, meaning that mining activities consumed more than 2,000 ha per year throughout the 1980s. While the areas rehabilitated in the 1970s were almost equivalent to those consumed by mining, only half of the areas were rehabilitated in the 1980s. Even more than in central Germany, the landscapes of Lower Lusatia were therefore marked by vast areas of ploughed, entirely mineral land – rubble left by the transit bridges. In 1992, of the 75,000 ha exploited in Lower Lusatia since the beginning of mining activities, more than 36,000 ha (Table 1) corresponded to active mines, residual pits (Fig. 2 and Photo 1), or wastelands that had not yet been rehabilitated.

Photo 1. Residual cavity of the Meuro mine in Großräschen (Deshaies, 2007). Closed in 1999, the flooding of the Meuro mine began in 2007 to form Lake Großräschen.

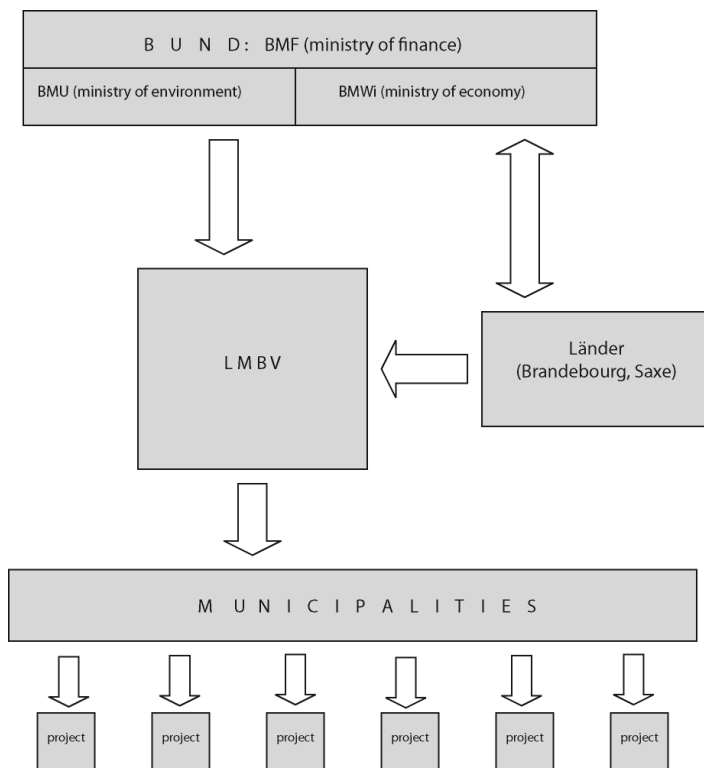


Source : LMBV, 2018.

Table 1. Areas exploited and rehabilitated in Lower Lusatia (ha).

year	Total area exploited	Active mines and unrehabilitated areas	Total areas rehabilitated	Agricultural areas	Reforested areas	Existing lakes	Other uses
1989	68,671	31,891	36,780	7,646	21,460	2,916	3,725
1992	74,744.9	36,530.3	38,214.6	8,743.7	22,631.9	3,204.2	3,634.8
2002	80,831	34,375.5	46,455.5	9,329	28,050.1	3,555.9	5,520.3
2013	86,592	31,877.6	54,714.4	9,880.1	30,374.2	7,545.9	6,914.2
2018	96,872	14,763	82,109		31,041	9,748	

Figure 3. Actors for remediation projects in Lower Lusatia.



Source : Deshaies, 2020.

- 9 Following reunification in 1990, lignite mining was privatised and reorganised. Furthermore, most mines closed as a result of the sharp decline in mining volumes, which today equates to around 70 millions tonnes per year in the three remaining mines. In 1994, a very important decision to separate brownfield remediation activity from mining activity was made by the federal government¹⁴. The production of lignite, as well as all the power plants, were transferred to VEAG (Vereinigte Energiewerke Aktiengesellschaft), a company created for the occasion which was sold in 1994 to a consortium made up of the main electrical companies in western Germany¹⁵. It was later sold to the Swedish electrical company Vattenfall, which controlled most of the electricity production in the new Länder as of 2002, until it resold all of the mines and lignite-fired power stations to the Czech company EPH (Energetický a průmyslový holding) in 2016.
- 10 The remediation of the mines was done in collaboration with actors at three institutional levels (Fig. 3). The federal government took charge of the rehabilitation of mining wastelands through public companies brought together in 1994 to form LMBV (Lausitzer und Mitteldeutsche Bergbauverwaltungsgesellschaft mbH)¹⁶. Although dependent on the Ministry of Finance (BMF), it was able to act as a relatively independent player, integrating the complementary proposals of the Ministry of the Environment (BMU) and the Ministry of the Economy (BMWi). In 1994, however, the Ministry of the Environment wanted the remediation of operations to be done in connection with economic development and tourism, while the Ministry of the Economy saw it primarily as an objective of the country's new energy policy¹⁷.
- 11 The Länder on which the old lignite mines were located (Saxony and Brandenburg for the Lower Lusatian basin, Saxony-Anhalt, Saxony and Thuringia for that of Halle-

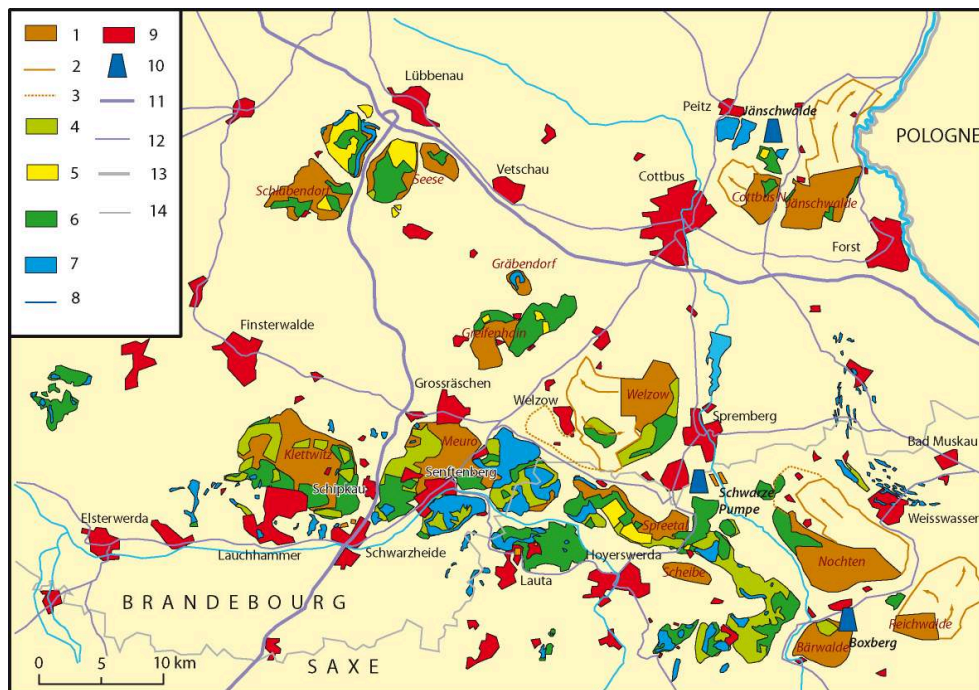
Leipzig) also had a vital interest in the remediation of former lignite mines, in order to improve the quality of life and the economic prospects in the regions concerned. This is why they negotiated a compromise with the federal government relating to the financing of the remediation operations. This compromise concluded in October 1992, provided that 75 % of the lignite mining remediation costs be borne by the federal government, the rest being covered by the Länder¹⁸. Finally, local players made up of the municipalities concerned were also asked to propose projects in which remediation and tourism development could be combined. In the early 1990s, however, the municipalities had other priorities, such as modernizing infrastructure, developing trade and preserving or creating new jobs. The brownfields that remained the property of the LMBV were not at all taken into consideration by the municipalities. It was only gradually, from the mid-1990s with the first visible successes of remediation, that the first plans integrating brownfields within development projects were born¹⁹.

- 12 In 2013, the results of mining wasteland rehabilitation were already impressive. In just twenty years, more than 16,000 ha (i.e. 20 % of the total area exploited since the nineteenth century) had been converted (*Wiedernutzbarmachung*). This was mainly done through the replanting of forests (8,000 ha) for half of the area, and the creation of lakes (4,300 ha) in the residual pits (Table 1). However, few new areas (about 1,000 ha) had been converted to agricultural areas, due to poor soil quality and the restructuring of the agricultural sector in the new Länder. Nonetheless, areas given over for other uses (an additional 3,300 ha) had increased significantly. These include the development of business parks and recreation areas, as well as the installation of photovoltaic parks and wind farms, which are all examples of the creation of a new post-mining landscape²⁰. As such, while the pre-mining landscape was characterised by the predominance of forest and crops, as well as the presence of a few ponds (less than 1 % of aquatic areas), the new post-mining landscape consists of huge lakes, covering about a quarter of the area, amidst vast forests resulting from reforestation operations. Agricultural areas, on the other hand, have significantly decreased.

The Creation of a New Post-Mining Lake Landscape

- 13 In a region devastated and severely affected by the economic collapse that followed reunification, facing substantial abandoned mining areas and a need to rebuild an acceptable living environment, LAUBAG (which from 1994 onwards became LMBV) implemented a vast rehabilitation programme using traditional methods that had been proven for decades²¹: cleaning up former mining sites, restructuring mines to stabilise slopes, and carrying out ecological restoration, reforestation and recultivation of mining wastelands. By the late 1990s, the new post-mining landscape, consisting of large lakes in residual pits and new forests planted on rubble plateaus, was beginning to take shape²² (Fig. 4). At the same time, in view of the disappearance of most of the jobs in the lignite sector,²³ there was also the question of the creation of new economic activities, and therefore the use of the rehabilitated areas. The municipalities and the two Länder sharing the basin, Saxony and Brandenburg, were interested in remediation as a means of enhancing the attractiveness of their region²⁴. LMBV also aimed to support the reuse of these spaces by seeking investors for new activities, in order to prepare the economic conversion of the region.²⁵

Figure 4. Landscapes of the Lower Lusatian lignite basin in 1996.



1. Areas undergoing mining operations, or closed since 1990; 2. Boundary of the authorised mining area; 3. Boundary of the planned mining area; 4. Areas undergoing rehabilitation; 5. Agricultural areas; 6. Reforested areas; 7. New lake in a former mine; 8. Access channel between the new lakes; 9. Urban area, or village; 10. Power plant; 11. Motorway; 12. Bundesstraße; 13. Boundary between Länder; 14. International border.

Source: Wolfram Pflug, 1998, modified.

- 14 While timber forest covers most of the rehabilitated areas, the creation of several dozen new lakes, the largest of which covers several hundred ha (Fig. 4), has made it possible to envisage a new future for tourism around these bodies of water, which have been successfully restored to a high quality²⁶. On most of the lakes that have already been created, or are in the process of being created (Photos 2 and 3), a number of projects have been carried out to develop beaches, water sports centres, protected “natural” areas (*Naturschutzgebiet*) and tourism infrastructure (Table 2). Large mining wasteland areas have been redeveloped locally to support new uses, such as the *Eurospeedway Lausitz* race track, which opened in August 2000 to host American style racing events. As part of the mining wasteland rehabilitation process, an original initiative has led to the creation of a botanical garden and a geological discovery trail (*Findlingspark*) on the erratic boulders extracted from mining rubble around the Nochten mine (Photo 4). In the northern part of the basin, on the shores of Lake Schlabendorf, which is under construction, the Heinz Sielmann Foundation has purchased 3,300 ha of former mining areas in order to turn it into a nature conservation area. From the visitor centre located in the last remaining house from the days of mining, you can explore a strange landscape (the *Naturlandschaft Wanninchen*) of sand dunes and marshes, home to a wide array of flora and fauna.

Photo 2. The formation of Lake Großräschen in the former Meuro mine.



The level of the lake is still about 20 meters under its final level, which corresponds to the lower edge of the inclined plane below the IBA headquarters (See logo).

Deshaies, 2012.

Photo 3. Lake Großbräschen reached its final level in October 2018.



A vineyard has been planted on the inclined plane below the IBA headquarters (See logo). The entrance to the new marina can be seen in the background.

Deshaies, 2018.

Photo 4. Findlingspark botanical garden, created on part of the mining wastelands of the Nochten mine

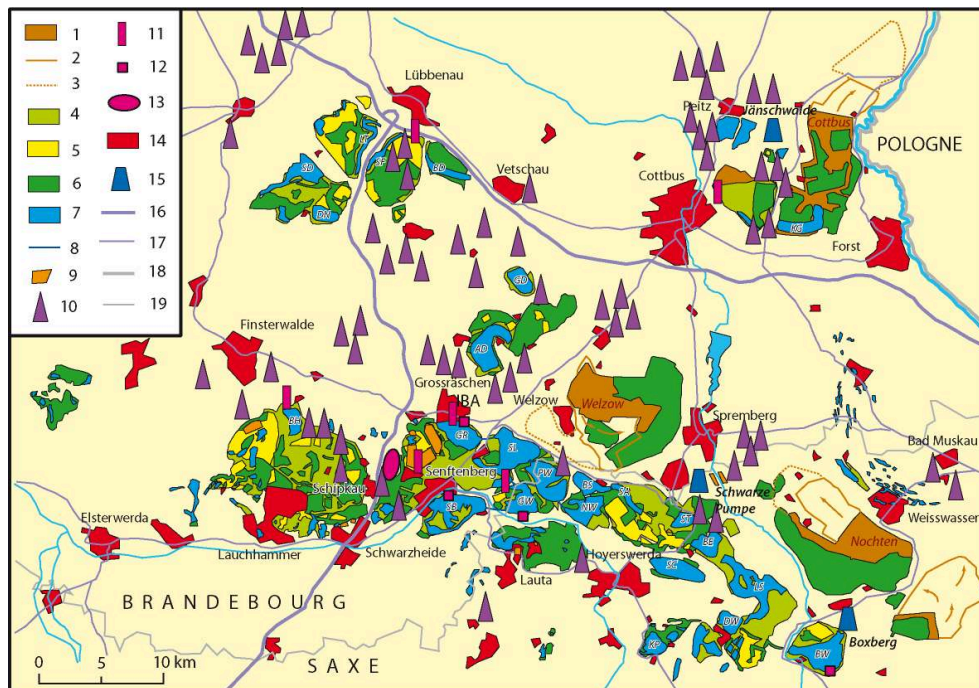


Deshaies, 2006.

- 15 The new lake landscape of Lower Lusatia²⁷ (*Lausitzer Seenland*), already largely built in the western part of the basin around the town of Senftenberg, has been promoted as a new tourist destination for several years. The originality of this region is that it has great potential for outdoor holidays, such as beaches, nautical activities and a wide range of sports and recreational activities (cycling, skateboarding, horse riding or quad biking), as well as industrial heritage sightseeing (the giant excavator of the old Klettwitz mine, or the old lignite-fired power plant in Plessa). Since 2015, the various lakes formed in the former lignite mines around Senftenberg have been connected by canals, meaning that you can practically sail from one lake to another (Fig. 5). Some of these bodies of water have seen the development of marinas, with catering and accommodation facilities nearby.
- 16 Within just a few years, this lake region has become an emerging tourist destination, the promotion and coordination of which is carried out by a federation, the *Tourismusverband Lausitzer Seenland*, resulting from the 2012 merger of the federations created in 2002 in Brandenburg and in 2004 in Saxony. While visitor numbers remain modest, they are nevertheless growing strongly, equating to more than 793,000 overnight stays in 2018, as compared to around 500,000 in 2014. The objective is to reach 1.5 million overnight stays by 2020, when most of the lakes will have reached their final levels.
- 17 In parallel with the development of these lake projects for tourism and recreation purposes, Germany's renewable energy development policy has given a new value to former mining areas. In the late 1990s, consideration emerged for using mining wastelands to install renewable energy production facilities, particularly wind turbines, which are required to be located away from people's homes and protected natural areas. The Land of Brandenburg was a pioneer in its desire to develop renewable energy. Having set rather modest targets in 2002 (5 % renewable energy in 2010), the 2008 "energy strategy" set a target of 20 % renewable energy in primary energy consumption for 2020. To achieve its targets, it has focused mainly on biomass and wind energy. However, the Land of Saxony is still lagging, particularly in terms of wind turbines, whose installed capacity is five times lower than that of Brandenburg.
- 18 Wind turbines are therefore mainly located in the Brandenburg part of the lignite basin. LMBV sold 1,500 ha of mining wasteland to install wind farms. In the Schipkau region, the integration of renewable energy was carried out in two stages : between 1999 and 2006. The first wind turbines were installed in 1999, at the top of the mining rubble plateaus overlooking the village of Klettwitz (Schipkau municipality), considered one of the best sites in Brandenburg.
- 19 The high availability of areas has also been capitalised upon by investors in photovoltaics, particularly following the amendment of the EEG²⁸ law in 2009, which restricted opportunities for installing photovoltaic parks on in-conversion areas such as industrial and mining wastelands. LMBV then drew up a list of suitable areas for the installation of photovoltaic parks and sought out investors. In 2011, this led to the establishment of several large photovoltaic parks in the Schipkau region on the mining wastelands of the former Meuro mine, which straddle the municipalities of Schipkau, Großräschen and Senftenberg (Fig. 5). In addition, photovoltaic installations have recently been set up in the car park of the Lusatia race track (*Eurospeedway Lausitz*). The world's most powerful onshore wind turbine (7 MW) is also installed nearby.

- 20 The installation of these wind farms, the first in the region, was favourably received by LMBV insofar as they provided justification for the huge investments made to rehabilitate mining wastelands since reunification. The demographic and economic decline of East Germany made it very unlikely that such large areas could be reused for new economic purposes. Moreover, the installation of wind farms, and more recently photovoltaic parks, has exemplified the potential ways in which these areas can be developed, which until recently remained a big question and contributed to a negative image of the region.

Figure 5. New landscapes of the Lower Lusatian lignite basin in 2016.



1. Areas undergoing mining operation, or recently closed; 2. Boundary of the authorised mining area; 3. Boundary of the planned mining area; 4. Areas undergoing rehabilitation; 5. Agricultural; 6. Reforested land; 7. New lake in a former mine; 8. Access channel between the new lakes; 9. Photovoltaic park; 10. Wind farm; 11. Landmarke, or visitors centre; 12. Marina; 13. Eurospeedway Lausitz race track; 14. Urban area, or village; 15. Lignite-fired power plant; 16. Motorway; 17. Bundesstraße; 18. Boundary between Länder; 19. International border.
Abbreviations of the new lakes: SD, Schlabendorfer See; DN, Drehnaer See; LT, Lichtenauer See; SF, Schönfelder See; BD, Bischdorfer See; GD, Gräbendorfer See; AD, Aldöberner See; KG, Klinger See; BH, Bergheider See; GR, Großräscher See; SB, Senftenberger See; SL, Sedlitzer See; PW, Partwitzer See; GW, Geierswalder See; BS, Blunor Südsee; NW, Neuwieser See; SA, Sabrodter See; ST, Spreetaler See; BE, Bernsteinsee; SC, Scheibe-See; LS, Lohsa II; DW, Dreiweiberner See; KP, Knappensee; BW, Bärwalder See.

Source: DEBRIV, 2016, modified.

Heritage Projects and Issues in a Changing Landscape

- 21 These ways of rehabilitating and transforming the region, however, seemed unsatisfactory, insofar as they eventually led to the almost total disappearance of the mining heritage, thus resulting in a certain banalisation of the landscape²⁹. As such, it appeared necessary to develop a concept to preserve the cultural heritage of the mining region³⁰. Furthermore, following the example of what had been achieved in the

Ruhr basin in the 1990s with the support of the Brandenburg Land government, policy makers of the Lausitz-Spreewald region created an IBA (*Internationale Bauausstellung*); i.e. a company in charge of initiating, coordinating and promoting projects for the rehabilitation and enhancement of the heritage and landscapes developed in the region³¹. The Government of Saxony only participated in the IBA for what concerned the area of *Lausitzer Seenland*. This IBA took the name of the prince of Pückler, a nineteenth century aristocrat who devoted a large part of his life and his fortune to landscaping English parks around his castles in Lusatia, Bad Muskau and Branitz, near Cottbus. Highly regarded as a genius landscaper, his work has spread to North America and is considered the pinnacle of garden art in Europe³². It is therefore with this source of inspiration that, between 2000 and 2010, the IBA Fürst Pückler Land contributed to staging a change of landscape and a new image of the Basin of Lusatia³³.

- 22 Between 2000 and 2010, the IBA Fürst-Pückler-Land thus contributed to showcasing the changing landscape and a new image of the Lower Lusatian basin; the IBA logo, *See* (lake in German), playing on its English meaning. Thirty projects concentrated in nine areas, known as “landscape islands”, were initiated by the IBA.
- 23 These projects are divided into different themes representing both the industrial and mining heritage as well as the future of the landscapes of Lower Lusatia. Indeed, the IBA took into account the fact that the landscapes will change considerably in the coming decades, as a result of the gradual flooding of former mines. Making the most of this original feature was therefore necessary in order to transform the region’s image, while preserving elements of its identity³⁴. As such, several “monuments” bearing witness to the history of lignite mining and processing were preserved and even showcased. The former conveyor bridge of the Klettwitz mine has become the “Sleeping Eiffel Tower” (Photo 5). The “bio-Türme³⁵”, which are all that remains of the former Lauchhammer coking plant, have become a tourist attraction, used as a venue for various cultural events (including plays), owing their apparent similarity to a fortified castle (Photo 6).

Photo 5. The conveyor bridge of the former Klettwitz lignite mine, now the “Sleeping Eiffel Tower”.



Deshaies, 2009.

Photo 6. The Bio-Türme, all that remains of the former Lauchhammer coking plant.



Deshaies, 2009.

Photo 7. Floating houses on Lake Geierwalde.



These new floating structures, built as part of the IBA, exemplify the new image that the Lusatian lakes region is looking to acquire ; that of an innovative region with attractive landscapes.

Deshaias, 2016.

- 24 The lake landscapes under development inspired new concepts that the IBA sought to achieve in order to give the region a new image. The idea of a navigable canal linking the different lakes thus emerged during the IBA. The IBA also developed the installation of new floating structures (Photo 7) on lakes being formed and the creation of *Landmarken* as lookout points on lake landscapes in the making (Fig. 5). One of these lookout points, built in 2008 along the canal connecting Lakes Geierswald and Sedlitz, has become the most emblematic *Landmark* in the region. Made of steel with an oxidised red surface, it is nicknamed the *Rostiger Nagel* (the rusty nail). Standing 30 meters tall, it offers an exceptional panoramic view of three of the largest lakes in the *Lausitzer Seenland* (Photos 8 and 9). Near this *Landmarke*, you can also walk along the first part of a floating pontoon which, according to the initial project, was to cross the whole of Lake Sedlitz.

Photo 8. The “Rostiger Nagel” *Landmarke*, built in 2008 along the canal connecting the Lakes Geierswald and Sedlitz, has become one of the symbols of the new Lusatian lake region.



Deshaies, 2018.

Photo 9. Lake Sedlitz seen from the top of the “Rostiger Nagel”.



The lake and forested landscape provide a representative image of post-mining Lower Lusatia.
Deshaies, 2018.

- 25 In one of the only remaining active farms, Welzow, the ephemeral landscapes of mining rubble being spontaneously reclaimed by vegetation served as the basis for an original discovery tourism project. The highlight of this original tourist concept is organised tours³⁶, during which visitors are invited to share their emotions inspired by the rebirth of nature on the mining wastelands. The new energy landscapes that have emerged since the late 1990s also served as inspiration for IBA's project to use some of the rehabilitated mining wastelands for the cultivation of energy crops, including fast-growing trees.
- 26 At the end of the IBA in 2010, energy even became a unifying theme between different sites in the Lower Lusatian basin, through the creation of the Lusatian Route of Energy and Industrial Heritage (*Energie Route der Lausitzer Industriekultur*)³⁷. This new tourist route, which is linked to the European Route of Industrial Heritage (ERIH)³⁸, is a network of ten representative lignite mining and processing sites for energy production. Most of the sites constitute an industrial heritage as former brickworks (Briquetterie Louise, Energiefabrik Knappenrode), former power plants (Plessa), Lauchhammer Bio-Türme, and the former conveyor bridge of the Klettwitz mine. The former Plessa power station (Photo 9), built between 1926 and 1942, was in operation until 1992. Placed on the IBA Fürst-Pückler-Land project list in 1998, the power station has become an industrial museum. The originality of the route, however, is that it also includes active sites such as the new Schwarze Pumpe lignite-fired power plant and the Welzow lignite mine, where excursions by foot, bicycle and off-road motor vehicle are offered.
- 27 The continuation of mining operations in the last three mines operated by Vattenfall and, since 2016, by LEAG (Lausitz Energie Verwaltungs GmbH)³⁹, is behind new mining succession landscapes under development. One of the flagship projects is the use of mining rubble for the construction of a ridge, about 50 metres high and several hundred metres long, which will form the "*Steinitzer Alpen*". This is a reconstruction of a remarkable topographic feature that existed on this site before mining operations began, an ancient moraine marking the maximum extension of an ancient glaciation. This project will create a high-quality mining succession landscape that can be used for walking or hiking.

Photo 10. The Steinitzer Alpen project, in the former Welzow mine.



Photo, Deshaies, 2019.

- 28 Radically transformed by lignite mining, the landscapes of Lower Lusatia are acquiring a new identity. When mining operations cease in 2030, the region will have become a lake and woodland region with 50,000 ha of forest and more than 140 lakes covering 26,000 ha, i.e. a quarter of the former mining areas. These landscapes, which will be reminiscent of those inherited from the ice age in Mecklenburg-Vorpommern and Finland, will also be characterised by the omnipresence of renewable energy sources, especially wind power, which is still being developed.
- 29 In recent years, many new wind farms have been created or are under construction throughout Lower Lusatia, both on and nearby mining wastelands (Fig. 5). The old Klettwitz/Schipkau wind turbines were dismantled in 2014/2015 and replaced by 27 wind turbines that are twice as powerful.⁴⁰ In addition to the chimneys and cooling towers of power plants that have hitherto dominated the landscape, wind farms are becoming characteristic features of the lignite basin landscapes.
- 30 In terms of image, this region that was once extremely polluted by sulphur dioxide emissions from lignite-fired power plants and literally devastated by open-cast lignite mining, is acquiring a “greener” image. Its environment has already adopted a more pleasant feel, with its many lakes being formed in the former lignite mines. These lakes are even becoming “natural” areas that attract migratory birds. The development of renewable energy sources, through the installation of wind farms and photovoltaic parks, contributes to constructing this new image of the region. This new landscape thus appears as a palimpsest structured by the exploitation of lignite, the traces of which are omnipresent without being immediately visible, having been systematically covered by artefacts allowing for new uses. These new uses were largely developed through private projects designed in agreement with the municipalities. The multiple

private initiatives that have come into this landscape, shaped by public power embodied by the LMBV, have thus contributed to creating a common good, to the extent that they have favoured citizen re-appropriation of these spaces from which they were denied access for decades. We can indeed note that leisurely visits to the remediated spaces have been greatly increasing for over ten years⁴¹. The expansion of tourist infrastructure and access roads to the lake shores or wind farms thus greatly benefits the inhabitants of the region, who have seen considerable expansion of their spaces of leisure.

Conclusion

- 31 Those who still retain the image of landscapes devastated by the lignite mining of the Lower Lusatian basin in 1989 will struggle to recognise the region's current landscapes. The 29 years since German reunification and the collapse of lignite production have brought considerable changes to the landscape. The closure of most of the mines has led to a major mining wasteland rehabilitation programme and a new landscape of vast forests and lakes. But these changes are not only limited to the appearance of the landscapes, as the creation of an International Architectural Exhibition (IBA) has enabled new concepts to emerge, substantiated by projects designed to give meaning to these changes and to forge a new image for the region. As such, Lower Lusatia is in the process of establishing a new identity for itself as a tourist region, based around the three main concepts that emerged during the IBA period: the new lake areas, the showcasing of industrial heritage and the energy landscapes. Indeed, it is the combination of these three elements that now makes this region unique⁴². This strategy for redeveloping the mining region through landscape rehabilitation must combine ecological restoration and socio-economic development by creating new opportunities⁴³.
- 32 It is uncertain whether this is enough to enable the renewal of a region whose demographic decline shows no sign of abating. In twenty years, between 1993 and 2014, the Lower Lusatian basin lost more than a quarter of its population, down from 500,000 to 365,000 inhabitants⁴⁴. Far from slowing down compared to trends in the years following reunification, recent population loss has been as high as in the 1990s. Between 2010 and 2014, the region lost an average of 6,000 inhabitants per year. According to forecasts from statistical services, the region could lose another 60,000 inhabitants between 2015 and 2030. Lower Lusatia's undoubtedly more positive image and the new activities created are not enough to halt the loss of young people, who are becoming increasingly fewer, while the ageing of the population is already very evident.
- 33 Furthermore, there is uncertainty about the future of the lignite sector. This uncertainty is firstly illustrated by Vattenfall having sold all its mines and lignite-fired power plants in 2016 to the Czech company EPH. Despite the very steep decline in this sector since reunification, it is still the region's biggest employer (with 8,000 direct jobs and 16,000 indirect jobs). A further reduction in lignite production would therefore have a major impact on employment. Uncertainty has recently further increased with the recommendations of the coal commission appointed by the German government in June 2018. In its January 2019 report, it recommends closing all the country's coal and lignite power plants by 2038. One of the Lower Lusatian power plants may even be

closed within the next five years. However, as the opinion of this commission is only advisory, it is not clear whether these recommendations will be implemented in the near future. Although the image of Lower Lusatia is today decreasingly associated with lignite and increasingly with lake landscapes dedicated to beach and nature tourism, it still seems too early to permanently abandon mining, which has been its primary source of wealth for more than a century and a half.

BIBLIOGRAPHY

- Guy Baeten, Erik Swyngedouw and Louis Albrechts, "Politics, Institutions and Regional Restructuring Processes : From Managed Growth to Planned Fragmentation in the Reconversion of Belgium's Last Coal Mining Region", *Regional Studies, Taylor & Francis Journals*, 33 (3), 1999, pp. 247-258.
- Günter Bayerl, *Periphery als Schicksal und Chance : Studien zur neueren Geschichte der Niederlausitz*, Münster, Waxmann Verlag, 2011.
- Andreas Berkner, "Braunkohlenbergbau, Landschaftsdynamik und territoriale Folgewirkungen in der DDR", *Petermanns Geographische Mitteilungen*, 3, 1989, pp. 173-190.
- Andreas Berkner, "The lignite industry and the reclamation of land-developments in the Rhenish, Central German and Lusatian mining areas since 1989", *Beiträge zur Regionalen Géographie*, 52, 2000, pp. 186-201.
- Andre Bleicher 2007, *Die Institutionalisierung eines organisationalen Feldes – das Beispiel der Elektrizitätswirtschaft*, Dissertation, Brandenburgische Technische Universität, Cottbus, [en linge] <https://opus4.kobv.de/opus4-btu/frontdoor/index/index/year/2007/docId/322>
- Michel Deshaies, « La reconquête des anciens bassins uranifères en Allemagne orientale », *L'Information géographique*, Paris, Armand Colin, vol. 70, 2006, pp. 41-56.
- Michel Deshaies, *Les territoires miniers : exploitation et reconquête*, Paris, Ellipses Marketing, 2007.
- Michel Deshaies, « Les nouveaux paysages des bassins miniers dans les nouveaux Länder ». *Bulletin de l'Association des Géographes Français*, 88-2, 2011, pp. 209-222.
- Karl Eckart et al., *Social, economic and cultural aspects in the dynamic changing process of old industrial regions. Ruhr District (Germany), Upper Silesia (Poland), Ostrava Region (Czech Republic)*, Münster, LIT Verlag, 2003.
- Horst Förster, "Altindustrieregionen in West- und Osteuropa", *Petermanns Geographische Mitteilungen*, 116, 1996, pp. 21-54.
- Martina Gelhar, *Industrietourismus am südlichen Niederrhein-Analyse von Grundlagen, Angebotsstrukturen und Entwicklungspotentialen unter Berücksichtigung räumlich-historischer Aspekte*, Bergisch-Gladbach, 2005.
- Martina Gelhar, "Altindustrieregionen zwischen Verfall und Neuorientierung", *Geographische Rundschau*, Februar, 2, Westermann, Braunschweig, 2010, pp. 4-9.

IBA, Neue Landschaft Lausitz, Katalog 2010, Berlin, Jovis, 2010.

Heiderose Kilper and Gerald Wood, "Restructuring policies: the Emscher Park International Building Exhibition", In P.N. Cooke, (ed.), *The rise of the rustbelt*, Palgrave Macmillan, 1995, pp. 208-220.

Gerhard Lintz and Peter Wirth, « Erfolgsfaktoren der Sanierung und Entwicklung von Bergbauregionen », *GeoScape*, 4 (supplement), 2009, pp. 222-238.

Gerhard Lintz and Peter Wirth, "Koordination als Lernprozess- Braunkohlesanierung und Tourismusentwicklung im Lausitzer Seenland", In H. Karl (Hrsg), *Koordination raumwirksamer Politik, Forschungsberichte der ARL 4*, 2015, [on line] https://shop.arl-net.de/media/direct/pdf/fb/fb_004/fb_004_12.pdf

Marie-Ange Maillet, « De l'Angleterre à la France en passant par l'Allemagne : le prince Hermann de Pückler-Muskau (1785-1871) et sa contribution à l'art du jardin paysager », In *Jardins d'Allemagne : transferts, théories, imaginaires*, Paris, H. Champion, 2014.

Wolfgang Müller-Michaelis, "Die Altlastensanierung im ostdeutschen Braunkohletagebau", In *Wasser und Boden. Zeitschrift für Wasser- und Abfallwirtschaft*, 45 (2), 80-83, 1993.

Brigitte Nixdorf, Markus Hemm, Andreas Schlundt, Markus Kapfer, Heinz Krumbeck, *Braunkohletagebaue in Deutschland, Abschlußbericht*, Brandenburgische Technische Universität, Cottbus, 2000.

Wolfram Pflug, Braunkohletagebau und Rekultivierung. Landschaftsökologie, Folgenutzung, Naturschutz, Berlin, Springer, 1998.

Helmut Rippl (Hrsg), *Der Parkschöpfer Pückler-Muskau. Das gartenkünstlerische Erbe des Fürsten Hermann Ludwig Heinrich von Pückler-Muskau*, Weimar, 1995.

Robert Shaw, "The International Building Exhibition (IBA) Emscher Park, Germany: A Model for Sustainable Restructuring?", *European Planning Studies*, 10 (1), 2002, pp. 77-97.

Markus Schrader, "Altindustrieregionen der EG", In *Schätzl : Wirtschaftsgeographie der Europäischen Gemeinschaft*, Paderborn, 1993, pp. 111-166.

Martin Schultze, Karl-Heinz Pokrandt, Wolfram Hille, "Pit lakes of the Central German lignite mining district : Creation, morphometry and water quality aspects", *Limnologica*, may 2010, pp. 148-155n [on line] <https://core.ac.uk/download/pdf/82518799.pdf>

Friedhelm Schulz, *Drei Jahrhunderte Lausitzer Braunkohlenbergbau*, Lusatia Verlag Bautzen, 2005.

Peter Wirth and Gerhard Lintz, "Rehabilitation and development of mining regions in Eastern Germany. Strategies and outcomes", *Moravian Geographical Reports*, 14 (2), 2006, pp. 69-82.

Torsten Thurmann, *Die Internationale Bauausstellung (IBA) Fürst-Pückler-Land. Konfliktumgang und Lernpotenziale in regionalen Netzwerken*, Verlag Dorothea Rohn, Detmold, 2013.

Peter Wirth and Gerhard Lintz, "Strategies of Rehabilitation and Development in European Mining Regions", In *Good (Best) Practice Cases in Regional Development after Mining and Industry. Grazer Schriften der Geographie und Raumforschung*, Universität Graz, 2007, pp. 75-85.

Peter Wirth, Barbara Černič Mali and Wolfgang Fischer (eds), *Post-Mining Regions in Central Europe, Problems, Potentials, Possibilities*, Oekom Verlag, München, 2012.

NOTES

1. Horst Förster, "Altindustrieregionen in West- und Osteuropa", *Petermanns Geographische Mitteilungen*, 116, 1996, pp. 21-54; Peter Wirth, Barbara Černíř Mali and Wolfgang Fischer (eds), *Post-Mining Regions in Central Europe, Problems, Potentials, Possibilities*, Oekom Verlag, München, 2012.
2. Peter Wirth and Gerhard Lintz, "Rehabilitation and development of mining regions in Eastern Germany. Strategies and outcomes", *Moravian Geographical Reports*, 14 (2), 2006, pp. 69-82.
3. Guy Baeten, Erik Swyngedouw and Louis Albrechts, "Politics, Institutions and Regional Restructuring Processes: From Managed Growth to Planned Fragmentation in the Reconversion of Belgium's Last Coal Mining Region", *Regional Studies, Taylor & Francis Journals*, 33 (3), 1999, pp. 247-258; Peter Wirth and Gerhard Lintz, "Strategies of Rehabilitation and Development in European Mining Regions", In *Good (Best) Practice Cases in Regional Development after Mining and Industry*, Grazer Schriften der Geographie und Raumforschung, Universität Graz, 2007, pp. 75-85; Peter Wirth et al., *Post-Mining Regions in Central Europe...*, *op. cit.*
4. Förster, "Altindustrieregionen in West- und Osteuropa", *op. cit.*
5. Michel Deshaies, *Les territoires miniers : exploitation et reconquête*, Paris, Ellipses Marketing, 2007.
6. Markus Schrader, "Altindustrieregionen der EG", In *Schätzl: Wirtschaftsgeographie der Europäischen Gemeinschaft*, Paderborn, 1993, pp. 111-166; Gelhar, 2010 ; Peter Wirth et al., *Post-Mining Regions in Central Europe...*, *op. cit.*
7. Peter Wirth and Gerhard Lintz, "Rehabilitation and development of mining regions in Eastern Germany...", *op. cit.*; Gerhard Lintz and Peter Wirth, "Erfolgsfaktoren der Sanierung und Entwicklung von Bergbauregionen", *GeoScape*, 4 (supplement), 2009, pp. 222-238.
8. Michel Deshaies, « La reconquête des anciens bassins uranifères en Allemagne orientale », *L'Information géographique*, vol. 70, Paris, Armand Colin, 2006, pp. 41-56.
9. Andreas Berkner, "Braunkohlenbergbau, Landschaftsdynamik und territoriale Folgewirkungen in der DDR", *Petermanns Geographische Mitteilungen*, 3, 1989, pp. 173-190.
10. Michel Deshaies, *Les territoires miniers : exploitation et reconquête...*, *op. cit.*
11. Andreas Berkner, "Braunkohlenbergbau, Landschaftsdynamik und territoriale Folgewirkungen in der DDR", *Petermanns Geographische Mitteilungen*, 3, 1989, pp. 173-190 ; Andreas Berkner, "The lignite industry and the reclamation of land-developments in the Rhenish, Central German and Lusatian mining areas since 1989", *Beiträge zur Regionalen Géographie*, 52, 2000, pp. 186-201.
12. Andreas Berkner, "Braunkohlenbergbau, Landschaftsdynamik und territoriale Folgewirkungen in der DDR", *op. cit.*; Michel Deshaies, *Les territoires miniers : exploitation et reconquête*, *op. cit.*
13. Michel Deshaies, *Les territoires miniers : exploitation et reconquête*, *op. cit.*
14. Gerhard Lintz and Peter Wirth, "Koordination als Lernprozess. Braunkohlesanierung und Tourismusentwicklung im Lausitzer Seenland", In H. Karl (Hrsg), *Koordination raumwirksamer Politik, Forschungsberichte der ARL* 4, 2015, [on line] https://shop.arl-net.de/media/direct/pdf/fb/fb_004/fb_004_12.pdf
15. Andre Bleicher, *Die Institutionalisierung eines organisationalen Feldes – das Beispiel der Elektrizitätswirtschaft*, Dissertation, Brandenburgische Technische Universität, Cottbus, 2007, [en ligne] <https://opus4.kobv.de/opus4-btu/frontdoor/index/index/year/2007/docId/322>
16. LMBW is a public company owned by the Bund which is responsible for the rehabilitation of former lignite mines in East Germany. After the rehabilitation of mining areas, it can also sell them to buyers. Since 2007, its headquarters have been located in Senftenberg, in the Lower Lusatian basin.
17. Gerhard Lintz and Peter Wirth, "Koordination als Lernprozess. Braunkohlesanierung und Tourismusentwicklung im Lausitzer Seenland", *op. cit.*

18. Wolfgang Müller-Michaelis, "Die Altlastensanierung im ostdeutschen Braunkohletagebau", In *Wasser und Boden. Zeitschrift für Wasser- und Abfallwirtschaft*, 45 (2), 80-83, 1993.
19. Interview with "Bürgermeister" von Schipkau, Großräschen, Senftenberg.
20. Wolfram Pflug, *Braunkohlentagebau und Rekultivierung. Landschaftsökologie, Folgenutzung, Naturschutz*, Berlin, Springer, 1998.
21. *Idem*.
22. Michel Deshaies, *Les territoires miniers : exploitation et reconquête*, *op. cit.*
23. In 2013, 8,000 jobs remained in the lignite sector in Lower Lusatia, as compared to 75,000 in 1989.
24. Gerhard Lintz and Peter Wirth, "Koordination als Lernprozess. Braunkohlesanierung und Tourismusentwicklung im Lausitzer Seenland", *op. cit.*
25. Interview with doctor Uwe Steinhuber, LMBV.
26. Brigitte Nixdorf, Markus Hemm, Andreas Schlundt, Markus Kapfer, Heinz Krumbeck, *Braunkohlentagebauseen in Deutschland, Abschlußbericht*, Brandenburgische Technische Universität, Cottbus, 2000; Martin Schultze, Karl-Heinz Pokrandt, Wolfram Hille, "Pit lakes of the Central German lignite mining district : Creation, morphometry and water quality aspects", *Limnologica*, may 2010, pp. 148-155n [on line] <https://core.ac.uk/download/pdf/82518799.pdf>
27. <http://www.lausitzerseenland.de/de.html>
28. The EEG (Erneuerbare Energien Gesetz) Renewable Energy Act of 1 April 2000, which establishes a system of favourable feed-in tariffs for renewable energy producers for 20 years.
29. Interview with Martin Konzag, municipality of Schipkau.
30. Peter Wirth et al., *Post-Mining Regions in Central Europe...*, *op. cit.*
31. IBA, *Neue Landschaft Lausitz, Katalog 2010*, Berlin.
32. Helmut Rippl (Hrsg), *Der Parkschöpfer Pückler-Muskau. Das gartenkünstlerische Erbe des Fürsten Hermann Ludwig Heinrich von Pückler-Muskau*, Weimar, 1995; Marie-Ange Maillet, « De l'Angleterre à la France en passant par l'Allemagne : le prince Hermann de Pückler-Muskau (1785-1871) et sa contribution à l'art du jardin paysager », In *Jardins d'Allemagne : transferts, théories, imaginaires*, Paris, H. Champion, 2014.
33. Torsten Thurmman, *Die Internationale Bauausstellung (IBA) Fürst-Pückler-Land. Konfliktumgang und Lernpotenziale in regionalen Netzwerken*, Verlag Dorothea Rohn, Detmold, 2013.
34. Interview with Professor Rolf Kuhn, director of IBA.
35. Coke production produced large quantities phenol-rich wastewater, which was purified in tower-shaped wastewater treatment plants using bacteria. These were known as Bio-Towers.
36. <http://www2.bergbautourismus.de/Besucherzentrum/>
37. <http://www.energie-route-lausitz.de/>; see also <http://www.iba-see2010.de/de/projekte/projekt24>
38. <http://www.erih.net/de/regionale-routen/deutschland/lausitz.html>
39. The lignite mining company Vattenfall sold all its lignite mines and power plants to the Czech company EPH, which has set up a subsidiary, LEAG.
40. This is known as a repowering operation.
41. Interviews with Martin Konzag, municipality of Schipkau, Professor Rolf Kuhn, director of IBA and personal observations.
42. Günter Bayerl, *Periphery als Schicksal und Chance: Studien zur neueren Geschichte der Niederlausitz*, Münster, Waxmann Verlag, 2011.
43. Peter Wirth and Gerhard Lintz, "Rehabilitation and development of mining regions in Eastern Germany", *op. cit.*; Peter Wirth et al., *Post-Mining Regions in Central Europe*, *op. cit.*
44. This development is calculated on the basis of the population of the two main towns, Cottbus and Hoyerswerda, in addition to that of the two Landkreises of Spreeneiße and Oberspreewald-Lausitz.

ABSTRACTS

Since German reunification, the landscapes of the East German lignite basins, which have been shaped by open-cast mining, have undergone a profound transformation as a result of the closure of most of the mines. Many large lakes have been created in the old pits to support the development of new tourism activities. Huge mining wasteland areas have been reforested or used to install wind farms and photovoltaic parks. These developments have been encouraged by the creation of an International Architecture Exhibition (IBA Fürst Pückler Land) to promote the idea of social renewal through the construction of new landscapes. These projects, supported by private investors, have given a new image and new values to landscapes that exist as a result of mining. This article analyses the process of transforming mining landscapes into post-mining landscapes characterised by the importance of lakes and second-hand nature, as well as by the enhancement of industrial heritage and the development of renewable energy.

Depuis la réunification allemande, les paysages des bassins de lignite d'Allemagne de l'Est, façonnés par l'exploitation à ciel ouvert, ont connu une profonde transformation résultant de la fermeture de la plupart des mines. De nombreux lacs de grandes dimensions ont été constitués dans les anciennes excavations, afin de servir de support au développement de nouvelles activités touristiques. D'immenses surfaces de friches minières ont été reboisées ou utilisées pour implanter des fermes éoliennes et des parcs photovoltaïques. Cette évolution a été favorisée par la mise en place d'une Exposition Internationale d'Architecture (IBA Fürst Pückler Land) destinée à favoriser l'idée d'un nouveau social par la construction de nouveaux paysages. Ces projets portés par des investisseurs privés, ont permis de donner une nouvelle image et de nouvelles valeurs aux paysages issus de l'exploitation minière. L'article analyse le processus de transformation de paysages miniers en paysages de succession minière caractérisés par l'importance des lacs et d'une nature de seconde main, ainsi que par la mise en valeur du patrimoine industriel et le développement des énergies renouvelables.

INDEX

Keywords: Lignite basin, Post-Mining Landscape, Industrial Heritage, Germany, New Länder

Mots-clés: Bassin de lignite, Paysage post-minier, Patrimoine industriel, Allemagne, Nouveaux Länder

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