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## **LIGNITE BASINS IN POLAND AFTER 1945**

Lignite extraction is characterized by a rapid loss of quality parameters. In general, the material should not be transported over great distances, but should be used locally. Therefore, mines supply raw materials for electricity power stations and briquette works specially built near them and in moderate quantities for local industrial customers and households. Specific coal basins are closely integrated with the energy industry and form complexes of raw materials and energy generation. This fact is taken into consideration in the historical analysis of Polish lignite basins below.

### **1. Dominance of the Turoszów Basin (1945–1957)**

Poland's resources of some minerals increased as a result of the shift of political borders after the Second World War. The largest resources included lignite deposits. In the inter-war years, lignite extraction was marginal and was used as fuel for the local community and light industry (extraction in Poland in 1937 was estimated at only just 18 thousand tonnes)<sup>1</sup>. In the areas which previously belonged to Germany there were lignite deposits on both sides of the Nysa Łużycka river, which formed the border, extending in Poland up to Głogów and Legnica. There were also deposits known to be situated in Ziemia Lubuska (Lubusz Lands) near Kostrzyn, Łagów and Sulęcín extending in the direction of Wielkopolska. The mines located there extracted 5.4 million tonnes of lignite in 1937<sup>2</sup>. During the war many of them were destroyed or devastated. Consequently, in 1945 only 40 thousand tonnes of lignite were extracted,

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<sup>1</sup> *Annual Statistics 1949*, GUS (Central Statistical Office), Warszawa 1950, p. 47.

<sup>2</sup> C. Poborski, *Zaleganie złóż i kopalnictwo węgla brunatnego w Zachodniej Polsce*, [in:] *Węgiel brunatny w Zachodniej Polsce*, GIPN, Katowice 1949, tab. 3.

while in 1946 1.5 million tonnes<sup>3</sup>. This was not much in relation to the potential output capacity and indicated an urgent need to reconstruct the mine infrastructure. The reconstruction in 1947–1949 was supported by new investments taken up in the Six-Year Plan (1950–1955). In the centrally steered economy the state decided on their size. From 1 August 1945 the association called Zjednoczenie Przemysłu Węgla Brunatnego with its registered office in Żary in Lower Silesia managed the mines. In 1950 the office was transferred to Wrocław<sup>4</sup>.

After the war the Lower Silesian Basin clearly dominated, exploited since the first half of the 19<sup>th</sup> c. The largest mine was the strip mine near Turossów which had operated from 1904. After the border moved in 1945 it found itself in the hands of the Soviet management. In June 1947 the mine was transferred into the State Treasury ownership, and German specialists and workers were gradually replaced by the Polish ones. Under the management of Zjednoczenie Przemysłu Węgla Brunatnego it bore the name “Graniczna”, up to 1951 when the state enterprise Kopalnia Węgla Brunatnego “Turów” was established. Annual extraction in the strip mine in the 1940s was a maximum of 4.3 million tonnes, and in the mid 1950s exceeded 5 million tonnes. Most of the production in “Turów” (in 1950 – 78%, and in 1955 – 68%) was exported to the “Hirschfelde” electricity power station and “Fridengrenze” briquette works situated in the Soviet Occupation Zone of Germany, built before the war in order to supply lignite from the eastern bank of the Nysa Łużycka. Some of the briquettes manufactured there ended up as furnace fuel in Poland. A permanent sale of the raw material to the GDR was possible thanks to a considerable investment made in Turossów and the surrounding area. A railway line was built and sorting plant and substantial mechanization of extraction took place by purchasing diggers, stacking machines and electric locomotives in the GDR, for which “Konstal” in Chorzów supplied the appropriate wagons.

Several small mines in the Lower Silesia and Zielona Góra voivodeship was located near the “Turów” mine which had their own briquette works, and also small electricity power stations (“Kaławsk”, “Lubań”, “Henryk”, “Maria”, “Babina”, “Smogóry”, “Sieniawa”, “Długoszyń”). Some of these were not operational, and in others deposits were exhausted successively. Lignite was also extracted from 1943 in the “Morzysław” strip mine near Konin, where geological research confirmed that there may be 200 million tonnes of raw material. The lignite which, according to plans, was to be used in the briquette works and power station which were being built, was processed

<sup>3</sup> M. Czechowski, *Gospodarcze i techniczne zagadnienia związane z węglem brunatnym*, [in:] *Węgiel...*, p. 53; W. Wasilewski, *Młodszy brat „czarnych diamentów”*, PWE, Warszawa 1967, pp. 32–34; *Rocznik Statystyczny 1961*, GUS, Warszawa 1961, p. 33.

<sup>4</sup> <http://www.ppwb.org.pl/wb/57/13.php> [accessed: 15/03/2014].

into briquettes in Germany. After rebuilding the mine, which had been devastated in the final months of the war by the Germans, in 1945 over 10 tonnes of lignite were extracted from it. The next year briquette works and a small electricity power plant started operating. As the resources in the “Morzysław” strip mine had been exhausted, the construction of new strip mines “Niesłusz” and “Gosławice” commenced. Investments were long and drawn out, therefore lignite had to be transported from Lower Silesia for the requirements of the Konin briquette works and power station (1.5 million ton annually), which was costly. The new strip mines were handed over for use successively in 1954 and 1958. To sum up, in the mid 1950s 9 mines were operating, with the key role taken by 5 belonging to Zjednoczenie Przemysłu Węgla Brunatnego – two strip mines “Turów” and “Morzysław”, and 3 underground mines “Smogóry-Sieniawa” in Ośno Lubuskie (with briquette works), “Przyjaźń Narodów” in Żary (with briquette works and an electricity power station) and “Kaławsk” near Węglińiec (with briquette works and a power station)<sup>5</sup>. In 1955 all the lignite mines employed 3.6 thousand people, half of whom worked in “Turów”<sup>6</sup>.

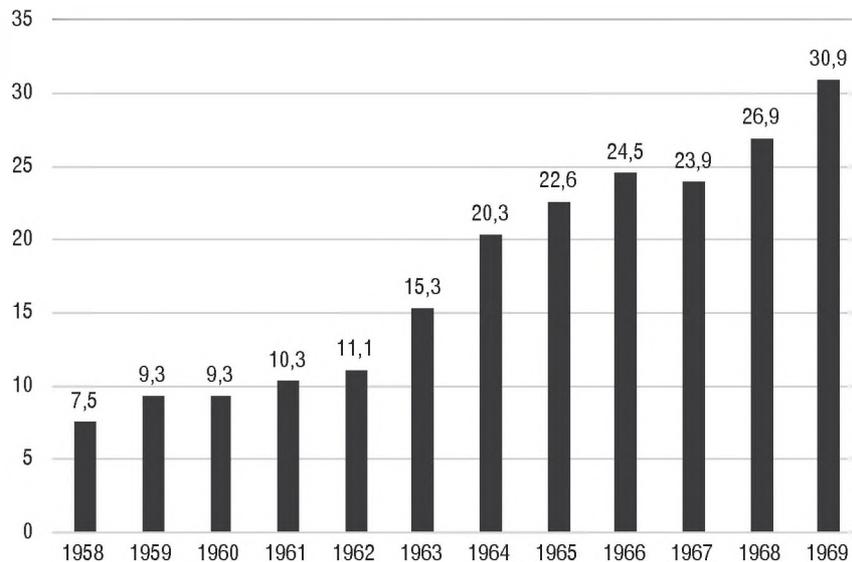
Extraction of lignite after the reconstruction of the mines and minor expansion work, in 1947–1957, totalled an annual average of 5.3 million tonnes, and a peak of 6.2 million tonnes was achieved in 1956. Therefore, it can be said that up to 1957 the pre-war lignite production was achieved once again in the areas which from 1945 were situated within Poland. As regards the export of a substantial part of lignite which was extracted to the GDR, its use for the purposes of the national energy industry was very low. Production of briquettes was more significant, which increased from 41 thousand tonnes in 1946 to 233 thousand tonnes in 1957<sup>7</sup>. The authorities strove to use rich resources of lignite in the power industry. In 1949 they decided to open a new, large power station in the Konin area. After a lengthy planning period in 1954 the building work on the power station began, and was completed in 1957<sup>8</sup>.

<sup>5</sup> J. Przedpełski, *Rola przypadająca węglowi brunatnemu w polskiej gospodarce narodowej*, [in:] *Węgiel brunatny...*, pp. 82 i 88; J. Jaros, *Historia górnictwa węglowego w Polsce Ludowej (1945–1970)*, PWN, Warszawa-Kraków 1973, pp. 111–112, 132, 165–166; S. Żuk, *Kopalnia Turów fundamentem polskiego górnictwa węgla brunatnego*, <http://www.ppwb.org.pl/wb/79/7.php> [accessed: 14/06/2015]; *Porozumienie między Ministerstwem Przemysłu i Handlu RP a Zarządem Handlu Zagranicznego Radzieckiej Administracji Wojskowej w Niemczech o dostawach węgla brunatnego i energii elektrycznej podpisane w Warszawie 10 grudnia 1947 roku*, [in:] A. Kochański, *Polska 1944–1991. Informator historyczny*, vol. I, Wydawnictwo Sejmowe, Warszawa 1996, p. 217; *Wyimki: kronika 65-lecia Kopalni Węgla Brunatnego „Konin”*, E. Galantkiewicz (Ed.), KWB „Konin”, Konin 2010, p. 6–7, 11–12; S. Kiełczewski, *Ekonomiczne przesłanki rozwoju górnictwa węgla brunatnego w Polsce*, DBPG, Wrocław 1965, p. 21 and further.

<sup>6</sup> *Turów. 30 lat Kopalni Węgla Brunatnego 1947–1977*, Poltegor, Wrocław 1977, p. 25; *Rocznik Statystyczny 1966*, GUS, Warszawa 1966, p. 178.

<sup>7</sup> *Rocznik Statystyczny 1966...*, p. 129.

<sup>8</sup> *Elektrownia Konin: 1958–1983*, J. Danielak et al. (Ed.), Elektrownia „Konin”, Konin 1983, p. 4 and further.

**Graph 1. Extraction of Lignite in Poland in the Years 1946–1957 (in million tonnes)**

Source: W. Wasilewski, *Młodszy brat „czarnych diamentów”*, PWE, Warszawa 1967, p. 33; *Rocznik Statystyczny 1961*, GUS, Warszawa 1961, p. 93.

## 2. Konin Basin Opens for Mining, Turszów Basin Retains Its Dominant Position (1958–1970)

From the second half of the 1950s the outlays on the prospecting for and extraction of lignite were considerably increased, because of the policy of expanding the raw materials and energy-generating base due to the electricity deficit which was hitting the industry harder and harder. The geological research commenced in the mid 1950s recorded deposits of lignite in Greater Poland (Adamów, Józwin, Kazimierz Biskupin, Pątnów), in Zielona Góra (Cybinka, Gubin, Mosty, Trzcianka) and Łódź voivodeships in the region of Bełchatów. In 1956 the Council of Ministers adopted a resolution to “secure the bases for development of the lignite industry”, and the president of the Council of Ministers issued an order “to appoint a commission to deal with issues of the use of lignite deposits in the energy industry”. Lignite was to be the fundamental input in the growth of electricity generation. The assumption for the years 1960–1965 was an increase of almost 50 percent whilst, at the same time, maintaining the use of hard coal on the same level as in 1960. The plan assumed that in 1964 21% of electricity would be obtained from lignite, and in 1970 it would

be 35% of the entire production<sup>9</sup>. Consequently, in the years 1950–1955 413 million zł was spent on investment in lignite mining, in the years 1956–1960 it exceeded 3.4 billion zł, and in the years 1961–1965 – 9.2 billion zł<sup>10</sup>. The loan obtained from the GDR in 1957 totalling 400 million Marks was an important source for the financial and material aspect of implementing the investment program. The loan enabled Poland to obtain assistance in planning and training employees as well as deliveries of machinery for strip mining. The loans were repaid mainly through the export of output from “Turów” to power stations in the GDR<sup>11</sup>.

The increased financial outlay was channelled into the expansion of lignite basins in the Turoszów and Konin areas. In 1959 the Council of Ministers adopted a resolution to build the “Turów” Mining-Energy Complex. The expansion of the “Turów” strip mine and construction of the “Turów II” strip mine with a target extraction of 10–11 million tonnes commenced, exceeding the national level of lignite production in 1960. The works were conducted in extremely difficult conditions, due to the lack of transportation and accommodation infrastructure and the adverse location of the deposit in a narrow pass between the boundaries with Czechoslovakia and the GDR. The preparatory works included the construction of a 30-kilometre road from Zgorzelec-Bogatynia and a parallel railway line. The “Turoszów sack”, just as previously Nowa Huta had done, drew people from all over Poland and became one of the largest building sites at the end of the 1950s and beginning of the 1960s, engaging the workforce of up to 10 thousand. The necessary machinery was purchased in Czechoslovakia and the GDR. The extraction of lignite began in May 1962 and in 1970 16.5 million tonnes were achieved with an employment level exceeding 5.1 thousand people. The raw material (apart from the decreasing export to the GDR) was designated for the “Turów” power station which was being built at the same time. Its fixtures and fittings came from Poland and the Soviet Union as well as England, Austria, and West Germany. In July 1962 two power units of 200 MW capacity each were started up in the power station, in 1963 the power was increased to 800 MW, and in 1964 up to 1200 MW. The target power of 2000 MW,

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<sup>9</sup> J. Kaliński, *Przemiany strukturalne w gospodarce polskiej w latach 1944–1970*, SGH, Warszawa 1991, p. 97 and further; A. Kochański, *Polska 1944–1991...*, vol. I, p. 629, 639; A. Bober, *XX-lecie polskiej energetyki*, „Życie Gospodarcze” 1964, no. 37, p. 3; in: *Energetyka w latach 1959–1965*, „Życie Gospodarcze” 1959, no. 4, p. 4.

<sup>10</sup> W. Wasilewski, *Młodszy...*, p. 42; *Rocznik statystyczny inwestycji i środków trwałych 1946–1966*, GUS, Warszawa 1968, p. 62.

<sup>11</sup> W. Wasilewski, *Młodszy...*, p. 84; J. Mossakowski, *Ewolucja programu rozwoju przemysłu węgla brunatnego w Polsce*, „Węgiel Brunatny” 1968, no. 1, p. 63; *Umowa z 17 kwietnia 1957 między rządem PRL a rządem NRD o współpracy przy budowie kopalni odkrywkowych węgla brunatnego w PRL*, [in:] A. Kochański, *Polska 1944–1991*. Informator historyczny, vol. II, Wydawnictwo Sejmowe, Warszawa 2000, p. 34.

from 10 power units was achieved in 1971, and its workforce exceeded 1800.<sup>12</sup> Because of the establishment of the Turów Mining and Energy Complex the pace of urbanization quickened, resulting in the development of Bogatynia and Zgorzelec. The population of Bogatynia increased from 5.3 thousand in 1950 to 11.8 thousand in 1970 and in Zgorzelec from 13.6 to 28.5 thousand<sup>13</sup>, respectively. In the mid-1960s the centre called Turosszowski Okręg Przemysłowy joined the numerous groups of Polish industrial centres. Its name, however, ought to be associated with Turosszów Valley, as in 1973 Turosszów became a rapidly developing district of Bogatynia.

In 1950–1952 there was a search for crude oil in Greater Poland. An unexpected lignite deposit was discovered in the Turek area, which initially was estimated at 120 million tonnes<sup>14</sup>. In December 1958 the Council of Ministers decided to build the “Adamów” and “Władysławów” lignite strip mines and the “Adamów” power station. The following year the construction of the “Adamów” strip mine began, and a lignite seam was struck in April 1963. It was ready for exploitation in September 1964, when the railway line which linked the mine and power station was handed over for use. The scheduled extraction capacity of 3.3 million tonnes annually was achieved in 1973. Lignite was supplied to the “Adamów” electricity power station, which had a 625 MW capacity, and began exploitation in 1964. In the first half of the 1960s the construction of the “Władysławów” strip mine, however, did not take place, causing problems in the following years with supply of fuel to the power station<sup>15</sup>.

The “Konin” mine was also expanded, where strip mines “Gosławice” (1958), “Piątnów” (1962), “Kazimierz Południe”, “Kazimierz Północ” (1965) and “Józwin” (1971) were constructed. However, in 1961 because the entire deposit in the “Niesłusz” mine had been exploited it was closed. Mechanization of extraction increased, and this had an impact on its volume and capacity. Because of new investments, in 1970 over 15 million tonnes of lignite were extracted. Output was supplied to the “Konin” power station which had a 583 MW capacity and was started up in 1958, and the “Piątnów” power station with 1600 MW capacity<sup>16</sup>, functioning from 1967. The power

<sup>12</sup> W. Wasilewski, *Młodszy...*, p. 45 and further; *Encyklopedia Powszechna PWN*, vol. 1, PWN, Warszawa 1973, p. 691; W. Pietryszczew, *Węgiel brunatny w liczbach i faktach lat 1945–2005*, [http://old.teberia.pl/index\\_txt.php?id=6923&section=1&kategoria=80](http://old.teberia.pl/index_txt.php?id=6923&section=1&kategoria=80) [accessed: 14/06/2015]; T. Strumff, *Turów – brunatny skarb*, PZWS, Warszawa 1964, p. 26; *Rozwój społeczno-gospodarczy Turosszowskiego Okręgu Przemysłowego w latach 1960–1968*, WUS, Wrocław 1969, p. 3; <http://www.elturow.pgegiel.pl/index.php/wielka-budowa/>; *Turów. 30 lat ...*, p. 17 and further.

<sup>13</sup> *Rocznik Statystyczny 1971*, GUS, Warszawa 1971, p. 82; T. Strumff, *Turów...*, pp. 39–40.

<sup>14</sup> A. Piasecki, *Kopalnia Węgla Brunatnego Adamów 1959–1999*, KWB „Adamów”, Turek 1999, p. 9.

<sup>15</sup> K. Symonowicz, *200 mln ton węgla w PAK Kopalnia Węgla Brunatnego Adamów S.A.*, <http://www.ppw.org.pl/wb/87/8.php> [accessed: 15/06/2014].

<sup>16</sup> W. Wasilewski, *Młodszy...*, p. 52–53; *Encyklopedia Powszechna PWN*, vol. 1, p. 691; *Encyklopedia Powszechna PWN*, vol. 2, PWN, Warszawa 1974, p. 551; *Uchwała Rady Ministrów z dnia 20 grudnia 1958 roku w sprawie budowy kopalni węgla brunatnego „Adamów-Władysławów”*, [in:] A. Kocharński, *Polska*

stations in Greater Poland, which merged in 1970 into the PAK (Pątnów-Adamów-Konin) group, supplied  $\frac{1}{4}$  of electricity generated in Poland<sup>17</sup>.

The decision to expand the Konin Lignite Basins substantially changed socio-economic relations in this part of Greater Poland. The increasing role of industry and urbanization processes was accompanied by phenomena which had been encountered in Poland from the time of the 6 Year Plan. Mining and energy industry specialists were brought in from distant towns: Kraków, Katowice, Szczecin, Turoszów, Warszawa and Wrocław, whilst workers were frequently recruited from nearby villages. Housing construction could not keep pace with the demand. Expansion of economic and social infrastructure was struggling, trade was encountering problems with the supply of goods for the population. Expansion of mining and the power industry meant that Konin, which in 1950 had 12.1 thousand residents, in 1960 had its population increased to 20.6 thousand, and in 1970 to 40.8 thousand. The Nowe Miasto quarter was built on the right bank of the Warta river, a symbol of Konin's dynamic development<sup>18</sup>.

The "Adamów" mine and electricity power station became the fundamental factor in the development of the town of Turek and its surroundings. The number of residents rose from 7.1 thousand in 1950 to 10.9 thousand in 1960 and 18.6 thousand in 1970. In the years 1959–1964 636 flats were built for the migrants, a nursery school opened, a primary school, health centre and pharmacy, two trade pavilions and a post office<sup>19</sup>.

The basins with energy-generating raw materials suffered similar "illnesses" as other great "socialist construction sites". The most frequent ones included a large turnover of staff due to difficult living and housing conditions. There was a lack of accommodation and social, cultural and sports facilities and trading facilities. Extraction was difficult because of the outdated machinery park, which was prone to breakdowns, deficiencies in spare parts and modest technical back-up facilities<sup>20</sup>.

As a result of the expansion of the Turoszów and Konin lignite basins up to 1960, the national extraction of raw material resources increased to 9.3 million tonnes designated mainly for power stations, however, the share of lignite in generating

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1944–1991..., vol. II, p. 139; *Zarządzenie ministra górnictwa i energetyki w sprawie utworzenia Kopalni Węgla Brunatnego Konin*, [in:] A. Kochański, *Polska 1944–1991...*, vol. II, p. 474; <http://www.ppwb.org.pl/wb/78/10.php>

<sup>17</sup> A. Nałęcz-Jawecki, *Konińskie „czarne” różę kwitnące*, „*Życie Gospodarcze*” 1975, no. 16, p. 7; W. Pietryszczew, *Węgiel...*

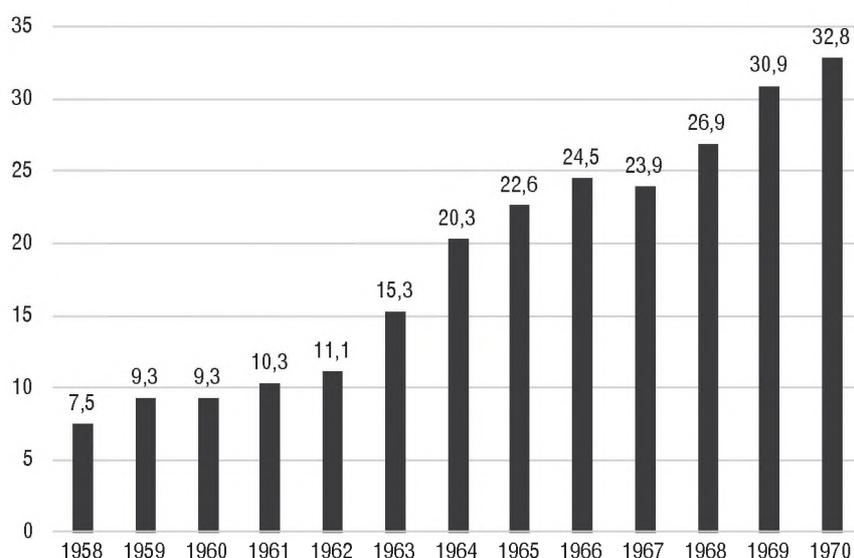
<sup>18</sup> A. Nałęcz-Jawecki, *Konińskie*, p. 7; *Rocznik Statystyczny 1971*, GUS, Warszawa 1971, p. 81; A. Żechowski, *Przemiany miast w procesie uprzemysłowienia. Studium nad miastami powiatu konińskiego*, PWN, Warszawa–Poznań 1973, p. 44.

<sup>19</sup> *Rocznik Statystyczny 1971*, GUS, Warszawa 1971, p. 81; <http://www.powiat.turek.pl/pl/43/strona/1/23/>; A. Piasecki, *Kopalnia...*, p. 32.

<sup>20</sup> H.S., *Stan maszyn i urządzeń w kopalnictwie węgla brunatnego*, „*Życie Gospodarcze*” 1963, no. 28, p. 3; W. Fiszer, *Energetyka i jej baza paliwowa*, „*Życie Gospodarcze*” 1970, no. 18, p. 5.

electricity remained below 6%<sup>21</sup>. In 1970 the national production of lignite totalling 32.8 million tonnes was already 5.5 times as high as in 1957, and used to power large electricity power plants “Turów”, “Konin”, “Adamów” and “Pątnów”, which in 1970 supplied almost 40% of the entire production of electricity in Poland<sup>22</sup>.

**Graph 2. Lignite Extraction in Poland in the Years 1958–1970 (in million tonnes)**



Source: Rocznik Statystyczny 1966, GUS, Warszawa 1966, p. 129; Rocznik Statystyczny 1971, GUS, Warszawa 1971, p. 181.

Initially, the production of briquettes from lignite was also developing dynamically, rising from 233 thousand tonnes in 1957 to 336 thousand tonnes in 1970, although in the following years it started to decrease in volume<sup>23</sup>. The attempt to launch chemical processing of lignite, as in other countries with large resources of this raw material was unsuccessful. In 1970 in extraction of lignite Poland was ranked 5th in the world after the GDR, Soviet Union, FRG and Czechoslovakia and its share in the world production was 4.1%<sup>24</sup>. The number of mines grew systematically and their average extraction increased from 208 thousand tonnes in 1946 to 4.1 million tonnes in 1970. Despite sizeable investments in Greater Poland, Lower Silesia with

<sup>21</sup> W. Wasilewski, *Młodszy...*, p. 93.

<sup>22</sup> J. Jaros, *Historia...*, p. 243; T. Lijewski, *Uprzemysłowanie Polski 1945–1975*, PWN, Warszawa 1978, p.111.

<sup>23</sup> Rocznik Statystyczny Przemysłu 1978, GUS, Warszawa 1978, p. 91.

<sup>24</sup> Rocznik Statystyczny 1971, GUS, Warszawa 1971, p. 665.

the Turossów Basin maintained its dominant position, supplying 60% of the national production<sup>25</sup>.

In 1970, besides those which were being exploited, other deposits of lignite were known to exist in Lower Silesia, in the Zielona Góra voivodeship, in Greater Poland and central Poland. The largest were discovered during the construction of the Copper Basin in Lower Silesia. Legnica Północ, Legnica Wschód, Legnica Zachód and Ścinawa had documented records of the deposits of 3.6 billion tonnes of lignite, in Cybinka in the Zielona Góra voivodeship there were 237 million tonnes, Gostyń and Czempin from Greater Poland, 3 billion tonnes. In central Poland geologists came across deposits in December 1960 in the village of Piaski near Bełchatów. Boring conducted by the Geological Institute documented the presence in the Bełchatów field of a volume of 1.2 billion tonnes, in the Szczerców field – 0.8 billion tonnes and in the Kamieński field – 148 million tonnes of lignite<sup>26</sup>. In Rogoźno, situated to the north of Łódź, the resources were estimated at 551 million tonnes<sup>27</sup>. The documented resources were a solid basis for further development of lignite mining and the related energy industry.

### 3. Origins and Dominance of Lignite Mining in the Bełchatów Basin (1971–1989)<sup>28</sup>

In October 1963 the Economic Committee of the Council of Ministers adopted a resolution regarding the preparation of the “Bełchatów” Mining-Energy Complex for construction in 1963–1965. The construction and exploitation of a mine on the Bełchatów minefield was assumed with the use of both national equipment and that originating from Czechoslovakia and the GDR. The commencement of extraction was scheduled for 1968, so that in the first half of the 1970s a level of 50 million tonnes of lignite could be extracted annually. Its customers were to be two electricity power

<sup>25</sup> T. Lijewski, *Uprzemysłowienie...*, pp. 101–102.

<sup>26</sup> *Bełchatów: szkice z dziejów miasta*, D. Boguta (Ed.), NWP, Piotrków Trybunalski 2005, p. 264.

<sup>27</sup> M. Zawadka, *Węgiel brunatny w Zagłębiu Miedziowym. Gry i manewry w latach 1957–1990* (draft version), [in:] *Regiony przemysłowe. Przeszłość – teraźniejszość – przyszłość*, conference materials, Boszkowo, 9<sup>th</sup> June 2011, p. 110.

<sup>28</sup> J. Kaliński, *Piotrkowsko-Bełchatowski Okręg Przemysłowy*, [in:] *Historia polskich okręgów i regionów przemysłowych*, vol. 1, Ł. Dwilewicz, W. Morawski (Eds.), Polskie Towarzystwo Historii Gospodarczej, Warszawa 2015, p. 126–141.

stations of 6000 MW capacity. However, in January 1964 it was decided to postpone this expensive investment until after 1980<sup>29</sup>.

Those involved in the preparation of the investment were to limit the costs of constructing the future coalfield. In subsequent projects this was reduced to mines extracting 30 million tonnes of coal annually and electricity power stations of 3000 MW capacity. At the same time the state authorities attempted to realize the investment with the aid of the countries which were the members of the Council for Mutual Economic Assistance (Comecon). Only Hungary consented to take part in the construction in exchange for an electricity supply, but its contribution proved to be inadequate. Consequently, in 1967 planning work was broken off. However, geological research and conceptual studies with the involvement of specialists from Czechoslovakia and the GDR continued.

The improvement in Poland's financial situation and investment impetus after Edward Gierek had come to power meant that planning work recommenced within the "Program of construction of a lignite strip mine and Bełchatów electricity power station". The exploitation of the Bełchatów field and then Szczerców field was assumed to achieve the extraction of 33 million tonnes annually and the construction of two power stations of a combined power of 5000 MW. Based on government decisions of 1971 and 1973 regarding preparation work to build the "Bełchatów" Fuel-Energy Complex, a series of industrial and social investments commenced. On 17 January 1975 the Resolution of the Council of Ministers regarding the construction of a mining and energy-generating complex was approved. At the same time state enterprises were established – a lignite mine under construction and the "Bełchatów" power station under construction. Their task was to build the "Bełchatów" Lignite Mine and "Bełchatów I" power station in Rogowiec and "Bełchatów II" in Osin. The mine was to attain target extraction capacity of 40 million tonnes of lignite annually by 1985, supplying turbines of 14 integrated blocks of a combined power of 5040 MW. The complex of the electricity power stations was to constitute a target 12% of power of the entire Polish power system and supply 28 billion kWh annually (one third of the production of all the professional power stations)<sup>30</sup>.

Extraction of lignite was possible once the top layers of approx. 110–130 million m<sup>3</sup> had been stripped, which required the import of special diggers, dumping conveyors

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<sup>29</sup> *Bełchatów wykorzystana szansa. Zarys monograficzny i bibliografia KWB Bełchatów 1960–1984*, Poltegor, Wrocław 1986, p. 40. *Uchwała KERM z 22 października 1963 roku w sprawie przygotowania budowy Kombinatu Górnictwo-Energetycznego „Bełchatów” w latach 1963–1965*, [in:] A. Kochański, *Polska 1944–1991...*, vol. II, p. 369.

<sup>30</sup> Z. Kuć, *Górnicy w środku Polski*, „*Życie Gospodarcze*” 1975, no. 6, p. 1–2; L. Froelich, *Ukłon w stronę Bełchatowa*, „*Życie Gospodarcze*” 1977, no. 25, p. 5.

and conveyor belts, including those produced by the Krupp conglomerate in West Germany. Work began with drainage of the seam and creation of a water supply system for the depression cone area, formed because of the surface mine. At the same time, the premises for technical stock were constructed and a railway line was built from Piotrków Trybunalski to Rogowiec through Bełchatów. In May 1977 the first diggers for overlay started operating, and in June the surface layers of the overlay were taken off. The first furrow ridges of lignite were extracted on 19 November 1980 and in 1984 production of the fuel already exceeded 10 million tonnes. At the beginning of 1988 a target extraction capacity of 38.5 million tonnes of lignite annually was attained, the workforce in the mine was 12.3 thousand. KBW "Bełchatów" supplied over 52% of lignite extracted in Poland, which assured it absolute dominance<sup>31</sup>.

In 1977 the construction commenced on the "Bełchatów I" power station of a target 4320 MW capacity (12 blocks of 360 MW capacity) and annual production of 26.7 billion kWh. Just as in the case of the mine, western technologies were used, purchased thanks to the foreign loans taken during Gierek's rule. Turbine sets and generators were installed on license of the Swiss Brown, Boveri & Cie. The first block in the power station was activated at the end of 1981, the sixth in 1985, and in 1988, after synchronizing the twelfth block, the electricity power station achieved the target power, becoming the largest electricity power station fuelled by lignite coal in Europe. Its workforce totalled 5.2 thousand people<sup>32</sup>. The Bełchatów Industrial Area appeared on the economic map of Poland.

Complementary ventures accompanied the investment activities in mining and the energy industry in the Bełchatów region. With a great financial outlay the development of construction of accommodation took place in Bełchatów and Piotrków Trybunalski<sup>33</sup>.

In Greater Poland lignite extraction from the "Adamów" open cast mine near Turek increased up to 1978, reaching 3.8 million tonnes annually, and thereafter started to diminish. Hence, because of the aforementioned abandonment of the decision to build the "Władysławów" mine, there was a deficit in the fuels in the energy balance sheet of the "Adamów" power station, which was the reason for the costly transportation of coal dust from Silesia. The results of the decision regarding building the "Bogdałów" strip mine, situated by the "Adamów" mine were awaited

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<sup>31</sup> A. Karpiński et al., *Jak powstawały i jak upadały zakłady przemysłowe w Polsce*, Muza SA, Warszawa 2013, p. 93; <http://www.kwbbelchatow.pgegiel.pl/index.php/o-oddziale/kalendarium/> [accessed: 15/06/2015].

<sup>32</sup> A. Karpiński et al., *Jak powstawały...*, p. 173; W. Pietryszczew, *Węgiel...*, op. cit.

<sup>33</sup> A. Niżnik, S. Pączka, *Bełchatowski Okręg Górniczo-Energetyczny*, Łódź 1979, p. 69 and further; *Bełchatów: szkice...*, p. 285.

with hope, undertaken in the first half of the 70s. Due to the technical problems the first delivery of lignite from “Bogdałów” to the power station did not take place until August 1977. In July 1976 the Council of Ministers approved a resolution on the recommencement of the construction of the “Władysławów” mine, from which the first lignite was delivered towards the end of 1977<sup>34</sup>. In 1982 the “Lubstów” mine, under construction since 1979”, belonging to KWB (Lignite Mine) “Konin”<sup>35</sup>, was started-up.

Investments in the 1970s and 1980s led to further growth in employment in Greater Poland. Towards the end of the 1980s 2.1 thousand people were employed in KWB “Adamów”, and in KWB “Konin” 3.8 thousand, however, in the PAK power stations the figure was 4.9 thousand<sup>36</sup>. New workplaces in industry were conducive to urbanization. In Konin the population was almost 80 thousand in 1989. The town, which had been the capital of the voivodship from 1975, became an important administrative centre. The population of Turek was 29 thousand, mainly because of the migration of industrial workers. In the eastern part of the town, by 1981 the mine had built almost 1000 flats, and its share in the municipal investments was 10–15 percent. Two nurseries were built, a health centre, pharmacy, hotel, club and primary school. However, the housing construction industry was unable to meet the demand, in 1985 600 workers at KWB “Adamów” were still waiting for accommodation<sup>37</sup>.

In the Turoszów Basin the “Turów” mine was extracting 24–25 million tonnes of coal annually in the mid 1970s. The majority of the raw material went to the “Turów” power station, almost 5 million tonnes to the “Hirschfelde” power station in the GDR (up to 1982), 1.5 million to the “Konin” electricity power station, and over a million tonnes were sold to the industry and the population in general<sup>38</sup>. In 1988 there were 6.4 thousand employees<sup>39</sup> in the “Turów” mine. In the 1970s, in the power industry limited to the mine, the “Turów” electricity power station was modernized, including boilers and electrostatic filters. The workforce in the power station was 2.7 thousand in 1988<sup>40</sup>.

<sup>34</sup> K. Symonowicz, *200 mln...*; A. Piasecki, *Kopalnia...*, p. 47.

<sup>35</sup> [https://pl.wikipedia.org/wiki/Kopalnia\\_W%C4%99gla\\_Brunatnego\\_Konin](https://pl.wikipedia.org/wiki/Kopalnia_W%C4%99gla_Brunatnego_Konin) [accessed: 15/03/2014].

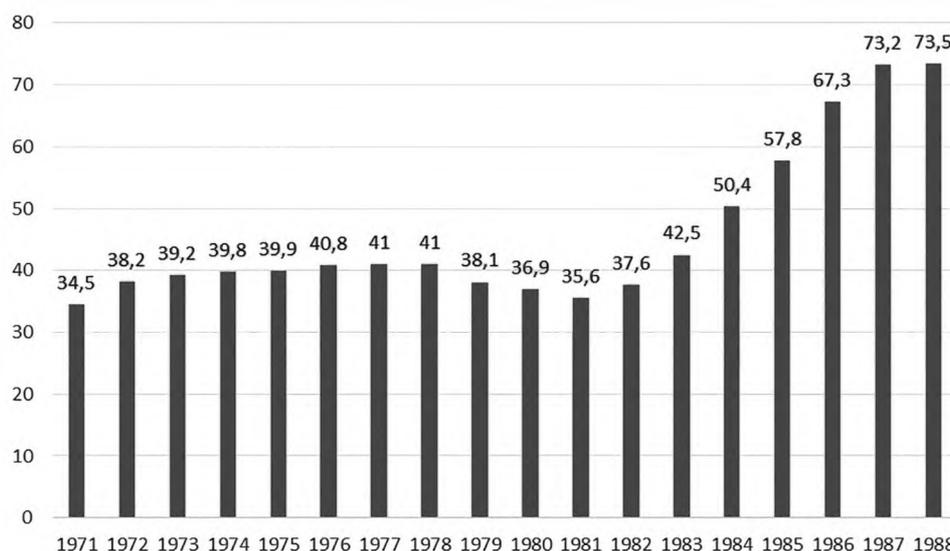
<sup>36</sup> A. Karpiński et al., *Jak powstawały...*, pp. 93, 173.

<sup>37</sup> K. Symonowicz, *200 mln...*; A. Piasecki, *Kopalnia...*, p. 194; *Rocznik Statystyczny 1990*, GUS, Warszawa 1990, p. 48.

<sup>38</sup> S. Żuk, *Kopalnia...*, op. cit.

<sup>39</sup> A. Karpiński et al., *Jak powstawały...*, p. 93.

<sup>40</sup> Ibidem, p. 173.

**Graph 3. Extraction of Lignite in Poland in the Years 1971–1988 (in million tonnes)**

Source: Rocznik Statystyczny 1976, GUS, Warszawa 1976, p. 153; Rocznik Statystyczny 1979, GUS, Warszawa 1979, p. 137; Rocznik Statystyczny 1980, GUS, Warszawa 1980, p. 142; Rocznik Statystyczny 1984, GUS, Warszawa 1984, p. 241; Rocznik Statystyczny 1986, GUS, Warszawa 1986, p. 225; Rocznik Statystyczny 1990, GUS, Warszawa 1990, p. 267.

In the Zielona Góra voivodeship the “Przyjaźń Narodów” and “Kaławsk”<sup>41</sup> underground mines were closed in the years 1972–1973. Nevertheless, work continued on plans to develop mining on the newly discovered seams in Lower Silesia. In 1974 a “Study of mining and economic exploitation of lignite deposits Legnica” was compiled. It assumed the construction of mines, Legnica-Zachód and Legnica-Wschód, together with a power station of considerable capacity<sup>42</sup>. The realization of the project met with successful resistance from some of the politicians and economists, and above all, the environmentalists, both in the PRL (Polish People’s Republic) period, and after 1989.<sup>43</sup>

To sum up, the 1970s saw a fairly moderate increase in lignite extraction from 34.5 million tonnes in 1971 to 41 million tonnes in the peak year of 1978. Ten years later 73.5 million tonnes were extracted, mainly due to the substantial investments in the region around Bełchatów. KWB “Bełchatów” doubled the volume of extraction

<sup>41</sup> J. Skowroński, A. Koźniar, *Brunatny skarb na Łużycach*, [accessed: 14/06/2015]; Z. Kasztelowicz, M. Sikora, *Zarys historii i teraźniejszości branży węgla brunatnego w Polsce*, [www.ppwb.org.pl/wb/7815.php](http://www.ppwb.org.pl/wb/7815.php) [accessed: 14/06/2015]

<sup>42</sup> M. Zawadka, *Węgiel brunatny...*, p. 111.

<sup>43</sup> A. Kochański, *Polska 1944–1991*. Informator historyczny, vol. III/1, Wydawnictwo Sejmowe, Warszawa 2005, p. 425.

during the decade. Consequently, electricity generation from lignite also rose twofold. In 1988 the share of electricity from lignite was in excess of 36% of the total production of energy<sup>44</sup>.

#### 4. Stabilizing the Domination of the Bełchatów Basin (1989–2014)

The socio-economic crisis at the end of the 1980s interrupted the preparation work on the Szczerców field in the Bełchatów Basin. It did not recommence until 1998, and the exploitation of lignite commenced in 2009. Towards the end of 2011 the extraction in Bełchatów mines totalled 38 million tonnes annually, and in subsequent years almost 42 million tonnes of lignite annually, constituting over 50% of the national extraction<sup>45</sup>. The Bełchatów Basin has held the dominant position in Polish lignite mining for over 30 years, not allowing for any major changes of extraction over time. The Konin Basin extracted approx. 32%, of the national average and Turoszów Basin approx. 18% of the national extraction, the extraction in KWB “Sieniawa” with a share of 0.15%<sup>46</sup> was of minimal significance.

Up to 2010 “Bełchatów I” electricity power station attained 4440 MW capacity, i.e. 15% of the power installed in the Polish power industry, engaging over 4 thousand employees<sup>47</sup>. In 2006 work commenced on the construction of the largest energy block in Poland of 858 MW capacity, often referred to as the “Bełchatów II” electricity power station. A unit with high technical and environmental parameters was supplied by Alstom’s Polish subsidiary. Handed over for use in 2011, it was the key in the modernization of the Polish energy industry. The combined power installed in the “Bełchatów” power station at the end of the year totalled 5298 MW, which was 19% of the power of the entire Polish energy industry. The annual energy production on average was 27–28 million MWh, exceeding 20% of national production<sup>48</sup>.

In 1999 with the transformation of KWB “Bełchatów” and the “Bełchatów” electricity power station into single shareholder companies of the State Treasury, the process of ownership and organizational changes commenced. After five years

<sup>44</sup> Z. Kasztelewicz, M. Sikora, *Zarys...*; Rocznik Statystyczny 1990, GUS, Warszawa 1990, p. 267.

<sup>45</sup> <http://www.pgegiel.pl/index.php/kopalnie/kopalnia-wegla-brunatnego-belchatow/> [accessed: 15/03/2015].

<sup>46</sup> The author’s calculations.

<sup>47</sup> <http://www.elbelchatow.pgegiel.pl/> [accessed: 15/03/2015].

<sup>48</sup> <http://www.elbelchatow.pgegiel.pl/>; <http://www.pgegiel.pl/index.php/elektrownie/elektrownia-belchatow/> [accessed: 15/03/2015].

KWB “Bełchatów” SA and the electricity power station Bełchatów SA became part of the state holding company BOT (“Bełchatów”, “Opole”, “Turów”) Górnictwo i Energetyka, and in 2007 part of the Polska Grupa Energetyczna. In 2010, as a result of consolidation, as PGE Górnictwo i Energetyka Konwencjonalna S.A. – Oddział Kopalnia Węgla Brunatnego “Bełchatów”, became part of the PGE Górnictwo i Energetyka Konwencjonalna SA owned by the State Treasury<sup>49</sup>.

The lignite basin continued to have a positive impact on the town of Bełchatów, as well as on other communes (gmina) in the region, contributing to their budgets. The income received by the local budgets was land tax and 60-percent participation in the so-called exploitation charge for each tonne of coal extracted. The commune of Kleszczów, in whose area KWB “Bełchatów” operated, was the richest in Poland. The annual income of the commune, which had just short of 5 thousand residents, was over 150 million zł, and the decided majority of this came from the mine. The income of the commune allowed for both the provision of a high level of public facilities, and economic development, creating new jobs<sup>50</sup>.

It is estimated that the construction of the mine and electricity power station in the Bełchatów area did not have a negative impact on the natural environment. The consequence of the concentric depression formed around the mine was compensated by a water supply system, and the loss of the produce from cultivated land was financially compensated by the mine. Great importance was attached to land reclamation, on which coal extraction had ended. In the case of the electricity power station the high-capacity desulphurization system restricted their negative impact on the environment.

According to specialists’ estimations, the resources of the “Bełchatów” open mine were sufficient to supply the electricity power station up to 2019 and in the “Szczerców” open mine, up to 2038. Some proved that the exploitation of lignite seams in Bełchatowski Okręg Przemysłowy is possible up to 2050<sup>51</sup>. However, study works and policy decisions regarding the form which this centre was to take mid-21<sup>st</sup> century were essential. The possibility of creating extensive water areas designated for recreation and sport in the exhausted mines was emphasized. Germany, which utilized a similar terrain in Saxony, was able to share its wealth of experience on this subject.

In Greater Poland by the end of 1988 a new strip mine, “Koźmin” in KWB “Adamów” was created. Extraction commenced in October 1991, and at the beginning of the 21<sup>st</sup> century this was considerably extended. At the same time, fields where resources had been exhausted were closed down. Entire mines were also closed

<sup>49</sup> <http://www.kwbbelchatow.pgegiel.pl/index.php/o-oddziale/kalendarium/> [accessed: 06/04/2015].

<sup>50</sup> [http://www.zepak.pl/pl/spolki\\_pak/gornictwo/pak\\_gornictwo](http://www.zepak.pl/pl/spolki_pak/gornictwo/pak_gornictwo) [accessed: 06/04/2015].

<sup>51</sup> <http://www.ppwb.org.pl/wb/78/2.php> [accessed: 06/04/2015].

down, as in the case of “Bogdałów” mine (1991), in which a water reservoir and recreation areas were created. In 2012 the same happened to the “Władysławów” mine. Consequently, in 2014, apart from “Koźmin”, extraction continued in the oldest mine, “Adamów”, where since 2008 machinery from the “Władysławów” has been used. At the beginning of the 1990s, wide scale reclamation of the exploited fields took place. On part of the “Adamów” mine the “Przykona” reservoir was created, with a surface area of approx. 123 ha<sup>52</sup>. The lifespan of KWB “Adamów”, with an extraction capacity of 4.5–5.0 million tonnes annually, was anticipated to end in 2023, giving rise to scenarios of transfer of its workforce teams to KWB “Konin”<sup>53</sup> which had more resources of lignite. A realistic threat that mining would cease arose, which for many years had a significant effect on the development of Turek and its surroundings. It specifically applied to the commune of Przykona, whose income from the mine after 1990 constituted on average 67% of the budget. Towards the end of the century this made Przykona the richest commune in the Wielkopolskie voivodship<sup>54</sup>.

KWB “Konin”, in which the old open pits were gradually exhausted, waited for new investments up to the 1990s. In 1995 the mine “Kazimierz Północ” was handed over for use and in 1999 the same happened to “Józwin” (the “Józwin IIB” field). At the beginning of the century the open pits “Drzewce” (“Bilczew” field – 2005 and “Drzewce A” field – 2010) and “Tomisławice” (2011) were created. Meanwhile, the open pits “Kazimierz Południe” (1997), “Pątnów” (2001), “Józwin” (2003), “Lubstów” (2009) and “Kazimierz Północ” (2011) exhausted their resources. Consequently, at the beginning of the second decade of the 21st century lignite was supplied by the open cast mines “Drzewce”, “Józwin IIB” and “Tomisławice”<sup>55</sup>. In 2012 the life-span of KWB “Konin”, with an extraction capacity of 15 million tonnes annually, was defined as up to 2037<sup>56</sup>. This provided strong grounds for further development of Konin and its surroundings. In fact, in 1999 the town lost its status as the capital of the voivodship, however, remained an important centre of socio-economic and political life in eastern Greater Poland.

The ZE PAK electricity power stations, operating on the terrain of the basin, were expanded and modernized, in accordance with European Union requirements. Efforts were made to decrease the level of emission into the atmosphere and a possibility of burning biomass, apart from lignite. The “Adamów” power station obtained this

<sup>52</sup> K. Symonowicz, *200 mln...*, op. cit.

<sup>53</sup> <http://www.ppwb.org.pl/wb/78/2.php> [accessed: 06/06/2015].

<sup>54</sup> K. Symonowicz, *200 mln...*, op. cit.

<sup>55</sup> <http://www.ppwb.org.pl/wb/78/10.php> [accessed: 06/06/2015]. [https://pl.wikipedia.org/wiki/Kopalnia\\_W%C4%99gla\\_Brunatnego\\_Konin](https://pl.wikipedia.org/wiki/Kopalnia_W%C4%99gla_Brunatnego_Konin)

<sup>56</sup> <http://www.ppwb.org.pl/wb/78/2.php> [accessed: 06/06/2015].

capacity, which, irrespective of production of electricity also supplied the town of Turek with thermal energy and supplied steam for technological purposes to nearby enterprises. Since 2012 in the “Konin” power station onwards one of its power units has been adapted to burn biomass. The power station also supplied heat to Konin, guaranteed by the 255 MW power unit which was handed over for use in 2012. The Pątnów power station also obtained the capacity to burn biomass after its 5 power units were modernized, the primary aim of which was to limit emission of harmful compounds into the atmosphere. In 2007, as a result of the construction of a 464 MW power unit, the “Pątnów II” electricity power station was started up. At the end of 2014 the combined power from the ZE PAK electricity power station totalled 2462 MW, constituting approx. 6.2% of the power installed in electricity power stations in Poland<sup>57</sup>.

Towards the end of 1994 a process of ownership changes in mines and electricity power stations began in the Wielkopolska Basin, involving transformation of a complex of electricity stations into a single shareholder company of the State Treasury – Zespół Elektrowni Pątnów-Adamów-Konin SA. According to the Statute of ZE PAK SA its fundamental activity was the generation and sale of electricity and production and distribution of heat. In March 1999, Elektrim SA became a strategic investor in ZE PAK SA, and the organizational transformation in the Company isolated a few dependent companies, including KWB “Konin” SA, Kopalnia Węgla Brunatnego “Adamów” SA, Elektrownia “Adamów” SA, Elektrownia “Konin” SA, Elektrownia “Pątnów” I SA and Elektrownia “Pątnów” II SA. In 2012 ZE PAK SA was admitted onto the Stock Exchange in Warsaw<sup>58</sup>.

In 2014 ZE PAK was the fifth generator of electricity in Poland as regards the installed generating capacities and the quantity of electricity generated, with a share of approx. 7.1%. It was in the second place after the Bełchatów Basin, amongst the lignite-fuelled electricity producers. It covered almost all the demand for heat of Konin, Turek and the surrounding areas<sup>59</sup>.

In Lower Silesia KWB “Turów” had an extraction capacity of 15 million tonnes of coal annually, and a lifespan of up to 2040–2045<sup>60</sup>. Extraction, depending on the demand of the “Turów” electricity power station, fluctuated between 10 and 11 million tonnes annually. Investment outlays made in 2002–2011 of a value of 1.2 billion zł covered basic machinery, construction of new conveyor belt systems, automation and

<sup>57</sup> <http://zepak.com.pl/pl/o-nas/informacje-o-firmie.html>; <http://ri.zepak.com.pl/pl/o-spolce/informacje-ogolne.html> [accessed: 06/06/2015].

<sup>58</sup> <http://zepak.com.pl/pl/o-nas/informacje-o-firmie.html> [accessed: 06/06/2015].

<sup>59</sup> <http://ri.zepak.com.pl/pl/o-spolce/informacje-ogolne.html> [accessed: 06/06/2015].

<sup>60</sup> <http://www.ppwb.org.pl/wb/78/2.php> [accessed: 06/04/2015].

computerization, as well as loss adjustment of damage caused by sudden flooding in August 2010<sup>61</sup>.

KWB “Turów” had an important impact on the regional economic development, starting from the creation of over 3.6 thousand jobs. In addition, the mine paid approx. 40 million zł annually into the budget of Bogatynia, in the form of taxes and various charges, which was approx. 30% of the income of the commune. As part of its environmental policy it reclaimed former mining areas, purified waters in mines and reduced noise pollution. In 2001 KWB “Turów” was deleted from the list of the 80 most cumbersome plants for the natural environment<sup>62</sup>.

From 1993 the modernization of the “Turów” power station was ongoing, with the participation of ABB Power Generation Ltd, Pyropower Corporation and Elektrim SA. In effect, by 2011 6 modern power units had been adapted to burn biomass. Power generated in the electricity power station reached 1900 MW, thus maintaining its position as the third power station in terms of size in Poland, fuelled by lignite<sup>63</sup>. As part of the further development of the energy industry based on lignite, in May 2015 the symbolic inauguration took place of the construction of a new power unit in the “Turów” power station of 450 MW capacity, which was to be started up towards the end of 2019<sup>64</sup>.

The ownership transformation of the “Turów” mine and “Turów” electricity power station commenced in 2000, when single shareholder companies of the State Treasury were established as a result of commercialization. After four years KWB Turów SA together with Elektrownia Turów SA were incorporated into the state holding company BOT Górnictwo i Energetyka, and in 2007 into Polska Grupa Energetyczna. In 2010 due to the consolidation process they became part of PGE Górnictwo i Energetyka Konwencjonalna S.A. – Oddział Kopalnia Węgla Brunatnego “Turów” into PGE Górnictwo i Energetyka Konwencjonalna SA, belonging to the State Treasury<sup>65</sup>.

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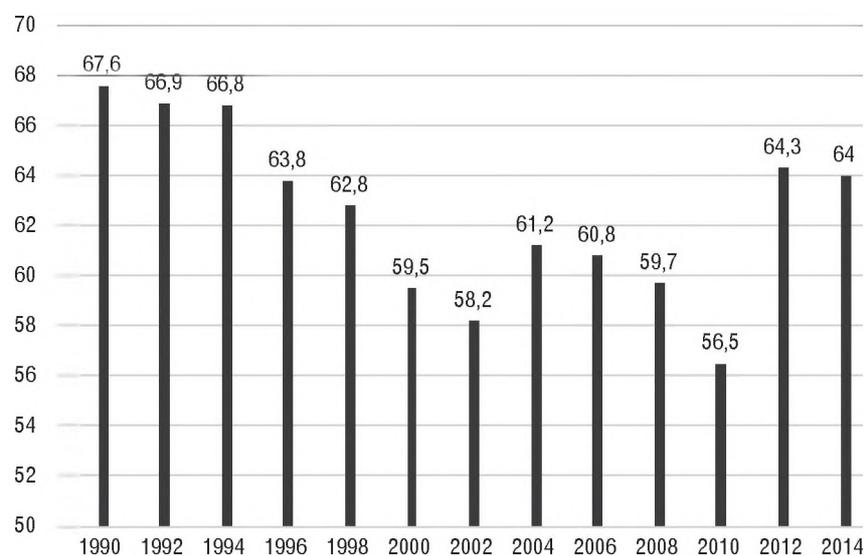
<sup>61</sup> S. Żuk, *Kopalnia...*, op. cit.

<sup>62</sup> KWB Turów – *odpowiedzialna gospodarczo i społecznie*, <http://www.ppwb.org.pl/wb/78/8.php> [accessed: 14/06/2015].

<sup>63</sup> [https://pl.wikipedia.org/wiki/Elektrownia\\_Tur%C3%B3whttp://www.elturow.pgegiek.pl/index.php/kierunek-modernizacja-i-rozwoj/](https://pl.wikipedia.org/wiki/Elektrownia_Tur%C3%B3whttp://www.elturow.pgegiek.pl/index.php/kierunek-modernizacja-i-rozwoj/) [accessed: 06/06/2015].

<sup>64</sup> <http://www.elturow.pgegiek.pl/index.php/2015/05/19/uroczysta-inauguracja-budowy-nowego-bloku-w-elektrowni-turow/> [accessed: 06/06/2015].

<sup>65</sup> <http://www.ppwb.org.pl/wb/79/7.php>; <http://www.elturow.pgegiek.pl/index.php/wazne-daty/> [accessed: 06/06/2015].

**Graph 4. Lignite Extraction in Poland in the Years 1989–2014 (in million tonnes)**

Source: Rocznik Statystyczny 1990, GUS, Warszawa 1990, p. 267; Rocznik Statystyczny 1997, GUS, Warszawa 1997, p. 365; Rocznik Statystyczny Przemysłu 2008, GUS, Warszawa 2008, p. 32; Rocznik Statystyczny Przemysłu 2014, GUS, Warszawa 2014, pp. 32, 33; K. Szamałek, M. Tyimiński, Węgiel brunatny, [http://geoportal.pgi.gov.pl/surowce/energetyczne/wegiel\\_brunatny/2014](http://geoportal.pgi.gov.pl/surowce/energetyczne/wegiel_brunatny/2014) [accessed: 14/06/2015].

In 1997, the liquidation of the state enterprise KWB "Sieniawa" commenced. In the underground mine from 1981 onwards lignite was extracted to cater for local demand. After the liquidation, which ended in 2002, luckily for the region, a private investor came forward. Kopalnia Węgla Brunatnego Sieniawa Sp. z o.o. continued its extraction. The entire production from Sieniawa was delivered to local heat and power stations, boiler-rooms on housing estates, individual customers and to plants using lignite for purposes unconnected with energy. The mine, which never had any connections with the professional energy industry, extracted 0.1 million tonnes of lignite annually and had a documented records base of resources of over 100 million tonnes of high quality lignite<sup>66</sup>.

\* \* \*

Extraction of lignite in Poland reached the peak of 73.5 million tonnes in 1988. After 1989 the level achieved was nowhere near 70 million tonnes, and in 2009–2010 it

<sup>66</sup> KWB „Sieniawa” – najstarsza polska kopalnia, <http://www.ppwb.org.pl/wb/78/11.php> [accessed: 14/06/2015]; Kopalnia Węgla Brunatnego „Sieniawa” Sp. z o.o., <http://www.ppwb.org.pl/wb/78/2.php> [accessed: 14/06/2015].



by the exploitation of the deposit at Legnica, but they also occurred in Rogóżno and Złoczew in the Łódź voivodeship.

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## Polish Lignite Basins after 1945

Lignite mining in Poland started after World War Two, as a result of the change of western borders. Until the 1970s, the Lower Silesian Turoszów Basin played the primary role, despite competition from the Konin Basin in Greater Poland. In 1978 both basins, together with several smaller mines, provided 41 m tonnes of lignite. Ten years later the number rose to 73,5 m tonnes, mostly thanks to investments in the centrally located Bełchatów Basin, which has since dominated the sector. Overall production never recovered after 1989, with Poland falling from the 5<sup>th</sup>, to the 8<sup>th</sup> place among the largest lignite extractors between 1989 and the beginning of the 21<sup>st</sup> century. Recently about one third of the energy in Poland has been based on lignite, similarly to Bulgaria, Romania and Turkey (while in the Czech Republic, Serbia, and Montenegro it has amounted to 69%).

Keywords: Poland 1945–1989, Poland after 1989, lignite, mining, energy generation.

## Bassins de lignite polonais après 1945

L'exploitation minière de lignite en Pologne a commencé après la deuxième guerre mondiale, en raison du changement de frontières occidentales. Jusqu'aux années 1970, le bassin de Turoszów de la Basse Silésie a joué le rôle principal, malgré la concurrence du bassin de Konin en Grande-Pologne. En 1978, les deux bassins, ainsi que plusieurs mines plus petites, ont fourni 41 millions de tonnes de lignite. Dix ans plus tard, le nombre s'élève à 73,5 millions de tonnes, principalement grâce aux investissements dans le bassin de Bełchatów situé dans le centre, qui a depuis dominé le secteur. La production globale n'a jamais été récupérée après 1989, la Pologne passant de la 5<sup>ème</sup> à la 8<sup>ème</sup> place parmi les plus grands extracteurs de lignite entre 1989 et le début du 21<sup>ème</sup> siècle. Récemment, environ un tiers de l'énergie en Pologne était basée sur le lignite, similaire à la Bulgarie, la Roumanie et la Turquie (alors qu'en République tchèque, en Serbie et au Monténégro, elle s'est élevée à 69%).

Mots-clés: Pologne 1945–1989, Pologne après 1989, lignite, exploitation minière, production d'énergie.

## **Польские лигнитовые бассейны после 1945 года**

Добыча лигнита в Польше началась после Второй мировой войны в результате изменения западных границ. До 1970-х годов главную роль играл нижнесилезский Турошовский бассейн, несмотря на конкуренцию со стороны Конинского бассейна в Великой Польше. В 1978 году оба бассейна вместе с несколькими меньшими шахтами предоставляли 41 млн тонн лигнита. Десять лет спустя добыча увеличилась до 73,5 млн тонн, в основном благодаря инвестициям в центрально расположенный Белхатовский бассейн, который с тех пор доминировал в этом секторе. После 1989 года общий объем производства никогда не был восстановлен. Польша пала с 5-го на 8-е место среди крупнейших стран-добытчиков лигнита в период с 1989 года по начало XXI века. В настоящее время около одной трети производства энергии в Польше основывается на лигните, аналогично как в Болгарии, Румынии и Турции (в то время как в Чешской Республике, Сербии и Черногории – 69%).

Ключевые слова: Польша 1945–1989, Польша после 1989 года, лигнит, добыча полезных ископаемых, производство энергии.