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1. The metallurgical, chemical, and power industries of Czechoslovakia are based on fuel resources constituting large deposits of hard (black) coal and soft subbituminous (brown) coal in Bohemia, Moravia, and Slovakia. The hard coal mines are located in the mining districts of Kladno, Svatonovice Nyrany, in Bohemia, and Ostrava Karvinna, Oslavany in Moravia and Silesia. The soft coal mines are located in the mining districts of Teplice, Chomutov, Most, Duchcov, Falknov in northwest Bohemia, Ratiskovice in south Bohemia, and Handlova, Novaky in Slovakia. The development of the mining industry and the properties of individual kinds of coal mined in these districts are discussed below.

HARD (BLACK) COAL

Ostrava-Karvinna Mining District

2. This mining district is the most important and best developed in Czechoslovakia. Large scale development and advanced mechanization of the mines is due to the extensive use of this coal not only as high grade fuel but also as the only source of metallurgical coke and many byproducts for the chemical industry. The coal is mined from a depth of 900 - 2,000 feet by highly mechanized power equipment. Heating value of this coal ranges from 9,900 - 13,500 BTU/lbs (5500 - 7500 kcal/kg). Ash content is very low and there is practically no moisture. Sulphur content is rather low. Baking properties of this coal make excellent coke used by the large metallurgical industry at Vitkovice, Kladno, and Trinec, and it is also exported in large quantities. Low grade fines are used as fuel for large power stations at Ignat (65,000 KW), Trebovice (75,000 KW),

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Karolina (65,000 KW), Frantisek (45,000 KW), Barbora (60,000 KW), Trinec (25,000 KW). These stations, with 335,000 KW installed capacity, supply power to the industry of north Moravia, Silesia, and part of west Slovakia by means of a 100,000-volt network.

Oslavany (Moravia) Mining District)

3. Baking hard coal mined in this district from a depth of about 1500 ft has considerably more ash and sulphur than that of Ostrava-Karvinna. High sulphur content limits the use of produced coke for house heating and industrial fuel purposes. Heating value of better grade coal is 7,000 - 10,000 BTU/lbs (3900 - 5500 kcal/kg). Low grade coal with a very high ash content is burned in the power station of Oslavany from which 75,000 KW supplies all west Moravia, inclusive of Brno, by means of a system of high voltage lines.

Svatonovice (Bohemia) Mining District

4. This coal is very similar in properties to that of Oslavany, but no coke is produced in this region. Better grades are used as household fuel and industrial fuel in the northeast part of Bohemia. Low grade coal and fines are burned in the power station at Porici from which 35,000 KW is delivered to this industrial part of Bohemia.

Kladno (Bohemia) Mining District

5. Hard black coal of the Kladno district, having a heating value of 7,000 - 10,000 BTU/lbs (3900 - 5600 kcal/kg), is deposited in layers up to 45 ft thick in a depth of 500 - 1,000 ft. This non-baking coal is considerably different from that mentioned above and cannot be used for the manufacture of coke. All coke used by blast furnaces of the former Prague Iron Industry in Kladno must be manufactured from Ostrava coal. (Large coke ovens recently built at Kladno can use only 15 percent of Kladno fines plus 85 percent of Ostrava baking coal.) Better grades having the advantage of short hauling distance to Prague are extensively used as household fuel. Fines and low grade coal, having only 4,300 - 6,000 BTU/lbs (2400 - 3300 kcal/kg), are consumed by the local power stations of Lany and Schoeller, having respectively 20,000 KW and 40,000 KW (20,000 KW under construction), which feed the Kladno steel industry and the public network of central Bohemia. Geological conditions of these old mines are rather difficult. Mechanization of mining is not adequate and most of the mines can be considered obsolete.

Nový Bor (Bohemia) Mining District

6. This district, located near Plzen, has a coal rather similar to that of Kladno. It cannot be used for the manufacture of coke, and all coke used by the Skoda steel industry must be imported from Ostrava-Karvinna. This coal is used for industrial and household heating purposes in western Bohemia. A power station at Zbuz (16,000 KW), using low grade coal and fines, supplies west Bohemian industry by means of high voltage lines of the Public Power Company.
7. It should be pointed out that the most important development of the hard coal industry was achieved after World War I when coke, used as the primary chemical reagent in the iron and steel industry, stimulated mechanization of the Ostrava Karvinna district. By means of coking, coal (used before only as general-purpose fuel subject to the variations of the market) became the only source of metallurgical raw materials and byproducts and also became a basic component for the heavy organic industry, with year-round steady demand and a large scale market, enabling extensive mechanization and high investment in the district of Ostrava Karvinna.

SOFT (BROWN) COAL

Teplice, Most, Duchcov, Chomutov Mining District

8. Along the northwestern border of Bohemia is deposited soft, subbituminous coal in layers 40 - 55 ft thick, in depths varying from 60 ft at the outcrops to 1,500 ft near Osek. This coal has rather different properties than the hard

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coal described above and is mined partially in strip mines and partially in deep mines similar to those of the hard coal. Seventy - eighty percent of produced coal originating from the middle part of coal layers, having only 2 - 3 percent ash, 20 - 28 percent moisture, and a heating value of 7,200 - 11,000 BTU/lbs, is high grade coal, primarily used as household fuel in Prague and Bohemia. Today this high grade coal is used as valuable raw material for the production of synthetic gasoline and fuel oil and many important byproducts used by the plastics industry and heavy chemical industry. Twenty - thirty percent of the coal, mostly from the bottom and top parts of the deposits, is low grade coal with alternating layers of clay and coal. On the top of these deposits in many mine fields is a 3 - 6 ft thick layer of shale having 30 - 40 percent of ash and 15 - 20 percent moisture. Heating value of this low grade coal is only 4,300 - 6,500 BTU/lbs (2400 - 3600 kcal/kg). Economic mining of this low grade coal is possible only in highly mechanized strip mines, and it used to be left in the mine.

9. After World War I, a conservation program of coal deposits was started and this coal became a basis for a large scale project of power stations supplying electric power to Prague and all industry in Bohemia. As a first step in this program, in 1927, the 60,000 KW power station of Ervenice was built to feed Prague by two 100,000-volt lines. This program was incorporated later in a giant German project for the manufacture of 1 million tons of gasoline from this coal, and large power stations were designed at Komorany (145,000 KW, later 270,000 KW), Herkules (150,000 KW, later 300,000 KW), STW (177,000 KW, later 270,000 KW) and Ervenice II (132,000 KW, later 262,000 KW), having a total installed capacity of over 600,000 KW and finally over 1,100,000 KW. This would make this area the main supply of electric power not only for Bohemia but also for the Hermann Goering Steel Works at Linz, Austria.
10. Of this program only the STW power station, with a capacity of 177,000 KW, was put in operation from 1942-45. Ervenice II is to go in operation during 1948, and Komorany is expected to be ready in 1950. The project of bomb-proof Hercules was given up when the war ended, and the production of gasoline was reduced to 300,000 tons a year. The size of all power stations was limited to the first step of installation because available low grade coal decreased in quantity. Even under this limitation, this area with the largest power plants is the most important source of energy and basic raw materials for the organic chemical industry and motor fuels.
11. Mine fields on the west of a line drawn from Most to Litvinov have an overburden 65 - 400 ft, and the coal is distinguished by a very high tar content in the range of 10 - 15 percent of original wet substance. These fields can be mined by means of fully mechanized equipment as open strip mines, using giant earth-moving equipment.
12. Coal fields on the east of this Most - Litvinov line have excellent coal deposited in a depth of 500 - 1,500 ft. Only conventional deep mining technique can be applied, making recovery of low grade shale hardly economical. It can be assumed that 30 - 40 percent of this coal substance was formerly left in the ground. Tar content of this coal is much lower, being only 2 - 6 percent, and it has an ash content of 2 - 8 percent, moisture 15 - 18 percent, and heating value of 8,100 - 11,000 BTU/lbs (4500 - 6100 kcal/kg).
13. Mining technique and equipment of this district originates mostly from the period between World Wars I and II, when this coal was used for heating purposes in Bohemian industry and as household fuel, meeting severe competition from hard coal and subjected to frequent depressions and seasonal fluctuations between summer and winter needs. These reasons prevented large scale operation and use of expensive mechanical equipment because it was necessary to keep first costs as low as possible. Only good quality coal was mined and after-crushing was classified by sieves to proper size for commercial fuel.
14. The importance and development of brown coal mining changed radically when extensive research proved that north Bohemian coal represents very valuable chemical raw material for manufacture of gasoline and phenolic byproducts and that it is the best basis for many petrochemicals. It was proved that north

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Bohemian brown coal has unique qualities not found anywhere else, having very high tar content and favorable structure for hydrogenation and giving first grade gasoline with excellent susceptibility for tetra-ethyl-lead.

15. These facts were soon recognized by the German Nazi regime and a large scale project for production of 1,000,000 tons of gasoline yearly was outlined in 1936 by Mineraloelbau Gesellschaft, Berlin, in spite of the fact that this mining district was located in Czechoslovakia. The Germans' urgent need of gasoline oil for the Wehrmacht is the reason why they demanded it at Munich in 1938 as a most important area of the Sudetenland.
16. Immediately after the seizure of the Sudetenland in 1948, the construction of Sudetendeutschen Treibstoffwerken AG (STW) was started just north of Most; and also a large scale development of giant strip mines, in the vicinity of Most (Breux). This STW plant was renamed Stalin Works after the Communists came to power in Czechoslovakia. Estimated capacity of these very modern mines using full mechanization was 16,000,000 tons a year corresponding to a production of said one million tons of gasoline. This project, having been granted top priority, advanced so far that in 1942 the operation of this hydrogenation plant began, and in Apr 1944 it reached a capacity of 660,000 tons of gasoline per year. However, the development of mines could not keep pace with this gasoline production, and supplementary coal was secured from all deep mines and added to the production of the first large mine, Quico IV (now named President Benes) which had a capacity of 2,500,000 tons a year. The Germans used 30,000 to 42,000 PWs and DPs in constructing STW and another 40,000 were used in mine construction. In 1946 it was expected to start operating the Hedvika (now called F D Roosevelt) mine, having an estimated capacity of 4,500,000 tons a year. In 1947 the third mine, called Robert (and renamed Sverma), was expected to be opened with a yearly capacity of 6,500,000 tons.
17. STW was bombed by the Allies 16 May 44 and put out of operation. In September, after resuming operations, it was immediately bombed again. The plant was bombed sixteen times in all and hit by 12,500 bombs and 260 air torpedoes (mines?), but each time energetic attempts were made to re-establish production. A total of 22,000 men, including PWs, DPs and civilians, were killed and total damage was estimated at from 150 to 300 million Reichsmarks. After VE Day, most of the Germans escaped from the plant without destroying anything. The Czech Government decided to put the plant back in operation once more with reduced capacity corresponding to local needs of 300,000 annual tons of gasoline. Excess capacity of the power plant was to be used for the public power system. The operation of the power station was resumed in Jul 45 under the direction of the author of this report and delivered 20,000 - 40,000 KW to Prague. The reconstruction of the hydrogenation plant advanced very quickly and in Sep 45 it was operating. Also, the modern city gas manufacturing plant was put into operation supplying all north Bohemia, and plans for general reconstruction were outlined.
18. Large strip mines, not at all damaged by bombing or other war activities, started production and contributed decisively to the output of this mining district; but mining personnel were scarce and it was soon realized that equipment would be essential for further economic development of this mining district and the reconstruction of Hedvig (Roosevelt) was authorized by the government. Necessary heavy equipment not available from original German factories was ordered from the US, but later, after failure of attempts to secure necessary loans, ordered from the Czech Metal Industry in Vitkovice and the Skoda Works. This equipment is to be delivered in 1949-52.
19. At this time soft brown coal is used extensively for house heating in Bohemia and covers 70 - 80 percent of the fuel needs for Prague. About 4,000,000 tons of coal are used for manufacturing 200,000 annual tons of gasoline by STW at Most. This capacity is to be increased during the Five Year Plan to 400,000 tons, including 60,000 tons of 100-octane gasoline and 20,000 tons of alkylate.

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Falknov (west Bohemia) Mining District

20. Brown subbituminous coal mined here is essentially similar to that of Most, Duchcov, and Chomitov but is of lower grade. The economic situation in this area is handicapped by the problem of chronic surplus of fines and low grade coal having no market because of long hauling distances and an inadequate power station for burning this low grade fuel at the mine mouth.
21. The chemical industry took advantage of this cheap fuel by installing at Falknov a calcium carbide plant producing about 100 tons per day. After World War II, a large scale project for a 45,000 KW power plant and a gas plant with a capacity of 60 - 100 million cubic metres (2.1 - 3.5 billion cubic ft) of manufactured city gas, 4,000 kcal/cub metre (10,000 BTU/cu ft) were outlined. This gas plant is a high pressure gasification system producing city gas under a pressure of 15 atm (220 psi) from low grade coal by means of pure oxygen and steam, identical to that of STW at Most. Installation of this power station and gas plant is included in the Five Year Plan and the operation is expected to start in 1951-52.

Handlova (Slovakia) Mining District

22. Subbituminous coal at Handlova is mined by conventional deep mining equipment and has a quality similar to that of Falknov, having a heat value 5,000 - 8,700 BTU/lbs (2800 - 4800 kcal/kg). Known deposits are small. Commercial sizes of better grade are consumed in Slovakia as local industrial and household fuel, and low grade coal is used by a power station at Handlova delivering 6,000 - 15,000 KW to west Slovakia. Economic importance of this district is minor.

Novaky (Slovakia) Mining District

23. Considerably larger deposits of brown subbituminous coal are located in middle Slovakia near Novaky. Exploitation of these deposits has already begun and large scale projects for the chemical industry, large power stations, and synthetic gasoline manufacture are favored by military authorities because of their strategic location. Large mining equipment is already ordered and mined coal has about 25 - 30 percent ash, 40 percent moisture, and a heating value of 4,300 - 6,300 BTU/lbs (2400 - 3500 kcal/kg). This mine field is considered very important as a basis for future development of the Slovakian chemical and power industry. Chemical works producing calcium carbide, chlorine, caustic soda ash are under construction. A power station, supplying electric power to this chemical plant and 100,000-volt network of Slovakia with an installed capacity of 90,000 - 120,000 KW and using boilers and turbines from Power Station III at Most, is under construction. The project was granted high priority in the Five Year Plan for strategic reasons and in order to promote the industrial independence of Slovakia.

Bevisekovic (Moravia) Mining District

24. Mines of relatively small capacity, opened in 1933-36 by Bata, supply very low grade young lignite coal to the power station at Zlin. This lignite has 35 - 40 percent moisture, 20 - 25 percent ash, and a heating value of 4,500 - 5,500 BTU/lbs (2500 - 3000 kcal/kg). These mines are equipped with highly mechanized mining equipment making operation economical in spite of the low quality. The output is without importance to the national economy.

Mydlovary (south Bohemia) Mining District

25. In south Bohemia, there are extensive marshes with large deposits of turf which is used as fuel in the power station at Mydlovary. This station supplies 16,000 KW energy to the southern part of Bohemia. During the last years of World War II and after the war, an extension of this station, including boilers and turbogenerator (10,000 KW), was under construction and it was planned to resume operation in the fall of 1948.

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SUMMARY

26. Most important and most advanced are those mining districts where coal is not only a fuel but, first of all, a valuable and practically sole source of primary raw materials, namely Ostrava Karvinna for the metallurgical industry, and Teplice, Most, Chomutov for motor fuel and the plastics industry. These districts, having a market not subject to frequent depressions and fluctuations, are equipped with modern high-efficiency installations manned by relatively few crews. Other mining districts, producing industrial and household fuel, cannot afford higher first cost, and mining methods are more primitive, depending mostly on the miners' own skill. It should be pointed out that Most and Ostrava Karvinna are most sensitive keys to the whole industrial and economic situation of Czechoslovakia and the eastern powers. There is no substitute for metallurgical coke, and no other facility for the production of high grade gasoline and catechol exists outside of the STW plant at Most.

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