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ENEMY OIL COMMITTEE

Western Axis Sub-Committee

ESTIMATED PRODUCTION OF SYNTHETIC OILS IN AXIS EUROPE -- 1943

June 10, 1943

THE WESTERN AXIS OIL POSITION

ESTIMATED PRODUCTION OF SYNTHETIC OILS - 1943

SUMMARY

Synthetic oils, as herein defined, are produced primarily from two types of processing - hydrogenation, and hydrocarbon synthesis (the Fischer-Tropsch process, so-called). Estimated 1943 yields are based on prewar knowledge of the plants and processes, supplemented by intelligence reports received from various sources, and especially from the study of recent aerial photographs.

The accuracy of the estimates is dependent on (1) the correct determination of the completion dates for new plant construction or extension of existing plants; and (2) the proper evaluation of reports regarding "unknown" plants - that is, plants on which aerial photographic reconnaisance is unavailable, and in regard to which intelligence reports are inconclusive. There is likewise some uncertainty as to which products are produced in the various plants, and this has some affect on the estimates of the over-all output. The capacity of the hydro plants can be expanded substantially if the availability of tar and petroleum feed stocks is increased, and if the categories of products are shifted to the heavy end, with some sacrifice in quality.

The estimated 1943 output of liquid fuels and lubricants for the various synthetic sources is estimated as follows:

SOURCE		METRIC TONS
Hydrogenation		
known plants	4,860,000	
"unknown" plants	266,000	
		5,126,000
Fischer-Tropsch		
known plants	1,424,000 (1)	
"unknown" plants	203,000	
		1,627,000
TOTAL		6,753,000 (2)

(1) This figure includes 200,000 tons of alkylate or iso-octane which is made from plant gases, both Fischer-Tropsch and hydrogenation. Satisfactory basis is lacking for all allocation as between the various plants and processes.

(2) Total products less refinery losses, refinery fuel, and gaseous products. These figures are actual production, after allowing for normal shutdowns.

THE WESTERN AXIS OIL POSITION
1943
PRINCIPAL SOURCES AND FACILITIES CONTRIBUTING TO LIQUID FUEL AND LUBRICANT SUPPLIES

HYDROGENATION PLANTS
1943
(Figures in Thousands of Metric Tons per Year)

NO.	LOCATION	NAME OF PLANT	EST. CAPACITY *
1.	Silesia	Blechhammer, North	500
2.	"	" , South	500
3.	Stettin	Poelitz	700
4.	Ruhr	Gelsenberg	400
5.	"	Scholven	350
6.	"	Wesselheim	150
7.	France	Liévin	10
8.	"	Béthune	10
9.	Sudetenland	Bruex	750
10.	Leipzig	Leuna	600
11.	"	Boehlen	400
12.	Magdeburg	Magdeburg	300
13.	Leipzig	Zeitz	500
14.	"	Luetzkendorf	125
15.	Dresden (?)	A. G. fur Kraft	100
16.	Cologne	Wesseling	200
		TOTAL	5,595

* (Expressed in terms of motor gasoline)

FISCHER - TROPSCH PLANTS
1943
(Figures in Thousands of Metric Tons per Year)

NO.	LOCATION	NAME OF PLANT	ESTIMATED SYNTHETIC CRUDE CAPACITY
17.	Ruhr	Holten	125
18.	"	Castrop-Rauxel	150
19.	"	Hoesch	90
20.	"	Homberg	190
21.	"	Krupp	100
22.	"	Essener Verein	100
23. *	Leipzig	Luetzkendorf	150
24.	"	Schwarzheide	300
25.	Silesia	Oeschowitz	110
26.	France	Kuhlmann (Harnes)	50
27.	Italy	Waldarno	30
		TOTAL	1,375

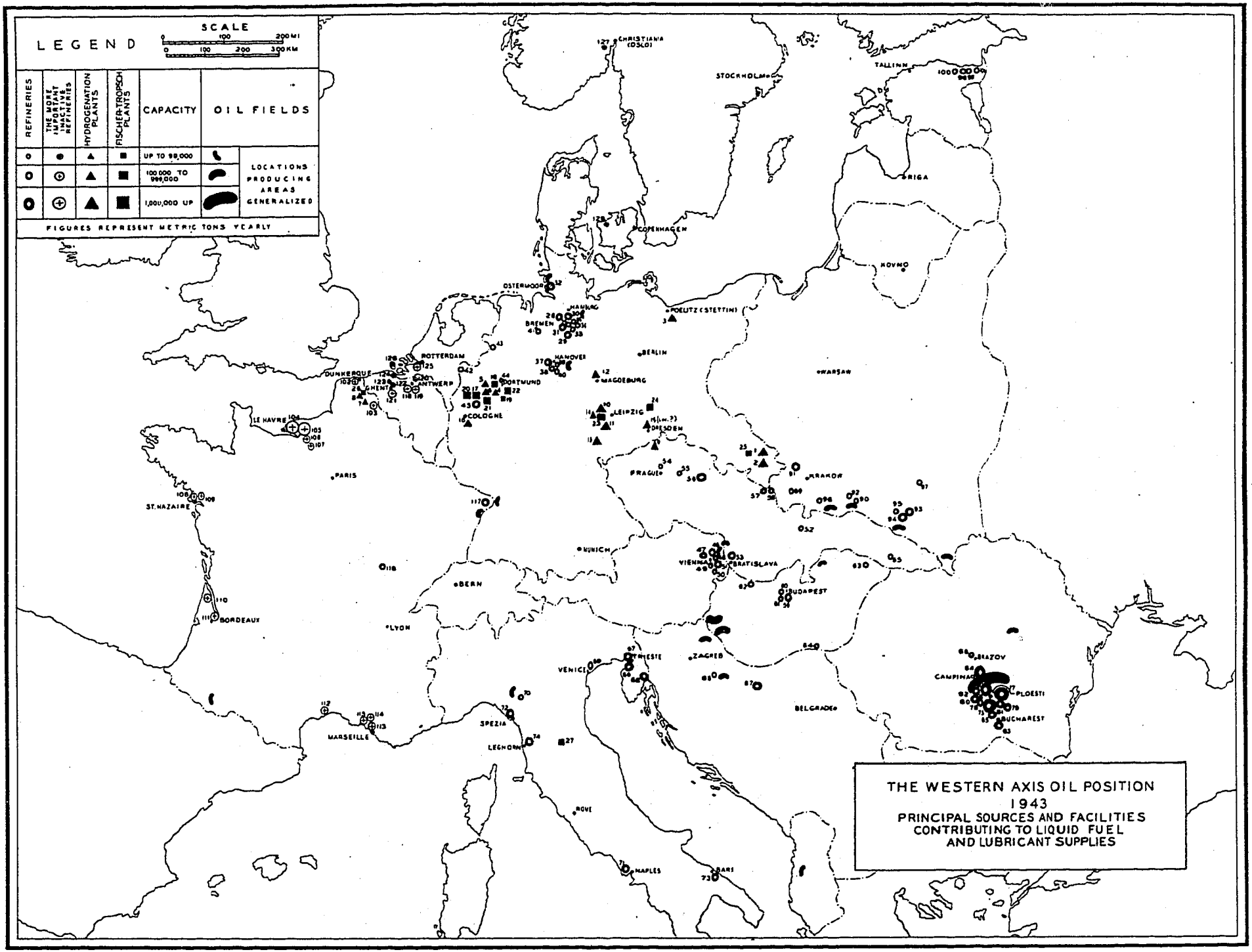
*(Location identical with No. 14 Hydrogenation plant.)

CRUDE OIL REFINERIES
1943
(Figures in Thousands of Metric Tons per Year)

NO.	LOCATION	NAME OF PLANT	NOMINAL CRUDE CAPACITY
28.	Germany: Hamburg (Petroleumhafen)	Europaische Tanklanger	400
29.	" (Harburg)	Rhenania-Ossag	550
30.	" (Grasbrook)	" "	130
31.	" (Harburg)	Abano Asphaltwerke	400
32.	" (Ostermoor)	Mineralol & Asphaltwerke	150
33.	" (Wilhelmsburg)	Deutsche Petroleum	65
34.	" (")	Julius Schindler	40
35.	"	Ernest Schliemann	65
36.	"	Albrecht	30
37.	Hannover (Misburg)	Louraq & Nereg	300
38.	" (Peine)	Julius Schindler	20
39.	" (Vollbergen)	Deutsche Gasolin	40
40.	" (Dollbergen)	Niedersachsen-Norddeutsche	10
41.	Bremen (Oslebshausen)	Vacuum Oil Co.	80
42.	Emmerich	Deutsche Gasolin	60
43.	Salzbergen	Ersag-Wintershall	30
44.	Dortmund	Schmitz-Westfalische	20
45.	Monheim	Rhenania-Ossag	115
46. Austria:	Vienna (Floridsdorf)	Shell Floridsdorfer	100
47.	" (Korneuberg)	Credit Minier	50
48.	" (Kagran)	Vacuum Oil Co.	60
49.	" (Vosendorf)	Osterreichische Panto	40
50.	" (Schwechat)	Nova Oel und Brenns.	50
51.	" (Lobau)	Wintershall-Elwerath-I.G.	500
52. Slovakia:	Lubom	Government Refinery	90
53.	Bratislava	Apollo-I.G.	150
54. Bohemia:	Kralupy	Lederer-Benzol Verband	60
55.	Kolin	Vacuum Oil Co.	90
56.	Pardubice	Panto Werke	200
57. Moravia:	Novy Bohumin (Oderberg)	Panto Werke	60
58.	Privoz (Moravska Ostrava)	Privozer Mineralol	50

CRUDE OIL REFINERIES
1943
(Figures in Thousands of Metric Tons per Year)

NO.	LOCATION	NAME OF PLANT	NOMINAL CRUDE CAPACITY
59. Hungary:	Budapest (Czepel)	Shell Koolaz	150
60.	"	Magyar Petroleum-Dr. Freund	60
61.	"	Budapesti Asvanyolajgarak-Panto	40
62.	Almas Fuzito	Vacuum Oil Co.	90
63.	Nyirbogdany	Nyirbogdanyi Petroleum	20
64.	Szoreg	Szoregi Petroleum	10
65.	Munkacs	Bel-Karpati Petroleum	30
66. Italy:	Trieste	Aquila	300
67.	"	Siap SOCONJ	150
68.	Fiume	Agip-Romsa	150
69.	Venice (Marghera)	Agip	350
70.	Formovo Taro	Petrolifera SOCONJ	50
71.	Naples	Raff. di Napoli-Vacuum	200
72.	Spezia (Migliarina)	Nafta-Shell	400
73.	Bari	Anic	250
74.	Leghorn	Anic	250
75. Rumania:	Ploesti	Astra Romana	1750
76.	"	Concordia "Vega"	1450
77.	"	Romano Americana	1170
78.	"	Unirea Orion	730
79.	"	Unirea Speranta	440
80.	"	Colombia	535
81.	"	Petrol Block	485
82.	"	Aenia	290
83.	Bucarest	Prahova-Petrolul Bucaresti	200
84.	Campina	Steaua Romana	1500
85.	Brazi	Credit Minier	535
86.	Brasov	Photogen-Vacuum	35
87. Yugoslavia:	Brod	Vacuum Oil Co.	100
88.	Sapraq	Anglo-Yugoslav-Shell	80
89. Poland:	Czechowice (Dziedzice)	Vacuum Oil Co.	75
90.	Jedlicze	Galicja-Malopolska	75
91.	Trzebinja	Polski-Zwiazkowe-Malopolska	100
92.	Nieglowice	Jaslo-Gertenberg & Schleyer	70
93.	Drohobycz	Polmin	160
94.	"	Galicja	140
95.	"	Nafta-Malopolska	60
96.	Glinik-Mariampolski	Galicja-Malopolska	80
97.	Lwow (Zniesienie)	Przemysl Nafta-Gazy Ziemne	40
98. Estonia:	Kohtla	National Oil Shale Ltd.	12
99.	"	New Consol. Goldfields, Ltd.	12
100.	Kivioli	Estonian Shale Oil Co.	36
101.	Valvari	Olikonsortium	27
102. France:	Dunkerque	Pet. de Nord-Petrofina	450
103.	Courchellettes	SCHP-Anglo-Iranian	300
104.	Le Havre (Gonfreville)	Cie. Francaise de Raff.	1600
105.	Port Jerome	Standard Francaise, SOCONJ	1250
106.	" " (N.D. de Gravenchon)	Vacuum Oil Co.	300
107.	Rouen (Petit Couronne)	Pet. Jupiter-Shell	750
108.	St. Nazaire (Donges)	Consommateurs de Pet.	130
109.	" " (")	Pechelbronn Ouest	250
110.	Bordeaux (Pauillac)	Pet. Jupiter-Shell	500
111.	" (Bec d'Ambes)	Gironde-Texas	350
112.	Sete (Frontignan)	Socony Vacuum	300
113.	Marseilles (Martigues)	Cie. Francaise de Raff.	650
114.	" (Berre)	Raff. de Berre	550
115.	" (L'Avera)	SCHP-Anglo Iranian	400
116.	Autun	Lyonnaise, Schistes Bitumineux	15
117.	Pechelbronn (Merkwiller)	Pechelbronn	120
118. Belgium:	Antwerp-Kiel	Nadeventza	140
119.	Antwerp-Hoboken	Atlas-SOCONJ	100
120.	Antw.-Kiel	Raff.& Dist. Anversoises"Madiar	50
121.	Ghent-Terdonck	Belgo-Petroleum	100
122.	Ghent-Langerbrugge	Belgian Shell	85
123.	" - "	Belgian Cracking	20
124.	Artwelde-Rieme	Purfina-Raff. Belge	70
125. Netherlands:	Rotterdam-Pernis	Batafsche-Shell	660
126.	Flushing	Vlissingsche Asphalt	40
127. Norway:	Vallo-Tonsberg	Norsk Amerikansk	50
128. Denmark:	Kalundborg	Kalundborg-SOCONJ	20
		TOTAL	25,042


LEGEND
SCALE
100 0 100 200 300 MI
0 100 200 300 KM
REFINERIES
THE MORE IMPORTANT INDIVIDUAL REFINERIES
HYDROGENATION PLANTS
FISCHER-TROPSCH PLANTS
CAPACITY
OIL FIELDS
UP TO 99,000
100,000 TO 999,000
1,000,000 UP
LOCATIONS PRODUCING AREAS GENERALIZED
FIGURES REPRESENT METRIC TONS YEARLY
THE WESTERN AXIS OIL POSITION
1943
PRINCIPAL SOURCES AND FACILITIES CONTRIBUTING TO LIQUID FUEL AND LUBRICANT SUPPLIES
CHRISTIANA (OSLO)
STOCKHOLM
TALLINN
RIGA
COPENHAGEN
KOVNO
OSTERWOOD
HAMBURG
BREMEN
POELITZ (STETTIN)
BERLIN
WARSAW
ROTTERDAM
DUNKERQUE
ANTWERP
GHENT
HANOVER
MAGDEBURG
DORTMUND
COLOGNE
LEIPZIG
DRESDEN
PRAGUE
BRNO
LE HAVRE
PARIS
ST. NAZAIRE
BORDEAUX
MUNICH
BERN
LYON
VIENNA
BRATISLAVA
BUDAPEST
TRIESTE
ZAGREB
VENICE
BELGRADE
BRAZOV
CAMPINA
PLOESTI
BUCHAREST
SPEZIA
LEGHORN
MARSEILLE
ROME
NAPLES
BARI

The estimated capacity of the synthetic plants and their 1943 yields is discussed as follows:

Hydrogenation

The estimated contribution of the hydrogenation plants to the total supply of liquid fuels and lubricants available to the European Axis has been arrived at (1) by a plant by plant study of the known processing facilities, and (2) by a general consideration of the probable output of those plants the location and (occassionally) even existence of which can only be inferred from intelligence reports of second and third grade reliability.

Known Plants

Previous estimates of the output of the known plants have been reviewed in connection with the aerial photographs, plant lay-outs, and interpretations thereof made available from British sources.

The estimates for previous years have been revised downward after scrutiny of the aerial photographs of the plants. It is quite evident that the construction program as in progress and projected at the outbreak of the war did not in fact go forward prior to 1942 as rapidly as expected. Since then the construction rate appears to have been markedly accelerated, and the program expanded to include extensions of old plants, and the construction of at least one large plant (Blechhammer South). Estimated hydro plant capacity will thus be increased during 1943, by 33% from 4.5 to 6.0 million tons.

In respect to the capacity of Leuna, the earlier estimates of both the British and Americans appear to have been too low. Most of the essential equipment is at hand for producing over 1,000,000 tons of gasoline from coal tar, but the capacity may not exceed 500,000 tons when brown coal is the feed stock. The estimated capacity for 1943 as herein submitted, is predicated on operating 80% on coal to produce 400,000 tons of gasoline, and 20% on tar to produce 200,000 tons -- or a total of 600,000 tons of gasoline. It does not seem certain in that the rapid expansion in low temperature carbonization capacity has been fast enough to run Leuna entirely on tar. Also, the over-all oil position is best provided for when the maximum coal hydrogenation capacity is used and any L. T. C. tar over that required for the

hydro plants is worked up by normal tar refining methods.

In a following table (Table I), is shown present estimates, and various earlier estimates of the output of the respective plants. In respect to Leuna, however, earlier estimates have been left unchanged, with only the 1943 figure raised by 100,000 tons, to 600,000 tons per year.

Table II shows graphically the estimated production of liquid fuels from bituminous and brown coal in Axis Europe in the years 1939 - 1943 for each of the known hydrogenation plants (except the two relatively unimportant installations at Béthune and Liévin).

Table III shows, by months, the estimated output of the known and "unknown" hydrogenation plants, this in terms of motor gasoline. Table IV gives a breakdown of this estimated output converted to the various products which have in fact been assumed to have been manufactured.

Annex I gives a brief discussion of the most important data on each of the known hydrogenation plants.

"Unknown" Plants

There are reports of new synthetic plants on which little reliable information is available. Annex III summarizes such information as is reported on these plants, and indicates a capacity well in excess of 1,000,000 tons annually.

There is no information as to when these plants can be expected to be in full production, nor are all of them beyond doubt either Fischer-Tropsch or hydrogenation plants. Quite a few of them could well be producing low temperature tars for processing in other known plants.

Most of the plants listed in Annex III are located in the Sudentenland and Silesia. It seems reasonable that additional capacity would be projected for these regions, inasmuch as they are in regions with adequate raw materials, with a large industrial population and are relatively safe from aerial attack.

In view of the critical materials bottleneck it is to be expected that the German policy in providing for new synthetic oil capacity would be to build a small number of large units rather than a large number of small units -- or alternatively, to extend existing units. Certainly the available facts relating to the known plants would confirm that such policy is being followed.

Where plants are reported with an annual capacity of less than

100,000 tons, it is likely that the plants referred to are either Fischer-Tropsch or low temperature carbonization. The latter plants are likely to be producing tar for hydro plants and their production would not thus be independently considered in arriving at total output figures.

While available information does not offer too sound a basis for estimating 1943 production from these "unknown" plants, on the other hand it is certain that contributions to total supply are made from such sources. A somewhat arbitray figure of 500,000 tons has been set as representing the capacity of "unknown" hydrogenation plants as of the end of 1943, with 266,000 tons as the estimated actual output for the year.

Fischer-Tropsch (hydrocarbon synthesis)

The estimated output of the Fischer-Tropsch plants has been arrived at in much the same manner as in the case of the hydrogenation plants, that is, by a plant by plant consideration of the known installations, and a general appraisal of the potentialities of the plants on which information is vague or incomplete -- that is, the "unknown" plants, so-called.

Known Plants

Previous estimates have been revised wherever aerial reconnaissance (photography) has shown it to be necessary. Where no new evidence has been available, the old estimates are retained for 1943. These estimates are summarized in Tables No. V, VI, and VII while a detailed discussion of each plant is supplied in Annex II.

"Unknown" Plants

A list of "unknown" synthetic plants was presented in Annex III. Most of the plants in that list are indicated as hydrogenation, but it is believed that some of them may be Fischer-Tropsch. A rather arbitrary figure of 350,000 tons has been estimated as the probable 1943 plant capacity with the actual output estimated at 225,000 tons.

TABLE I SHOWING ESTIMATES OF PRODUCTION

HYDROGENATION PLANTS IN AXIS - EUROPE

PLANTS	1939 H	1939 OPC	1939 R	1940 H	1940 OPC	1940 R	1941 H	1941 OPC	1941 R	1942 H	1942 OPC	1942 R	1943
A. From Bit. Coal & Bit. Coal Tars	(1)												
Blechhammer - N	-	-	-	-	-	-	100	50	-	200	300	-	233
Blechhammer - S	-	-	-	-	-	-	-	-	-	-	-	-	150
Poelitz	-	-		150	-(2)	-(2)	300	100(3)	300(3)	300(4)	300(3)	500(3)	700(3)
Gelsenberg	50	250	100	325	300	200	325	350	350	325	400	400	400
Scholven	50	200	150	250	300	150	250	350	250	250	400	250	350
Welheim	27	50(5)	50(5)	80	100(5)	100(5)	100	150(5)	100	100	200(5)	150	150
Lievin	(6)	(6)	(6)	8	(6)	(6)	15	10	10	15	10	10	10
Bethune	(6)	(6)	(6)		(6)	(6)		10	10		10	10	10
TOTAL	127	500	300	813	700	450	1,090	1,020	1,020	1,190	1,620	1,320	2,003
B. Br. C. & Br. C. Tars													
Bruex	-	-	-	-	-	-	-	150	-	125	600	180	750
Leuna	135	400	400	400	400	400	400	450	450	400	500	500	600
Boehlen	60	165	165	200	175	175	200	200	200	200	200	300	400
Magdeburg	50	165	165	200	175	175	200	200	200	200	200	200	300
Zeitz	60	125	125	240	150	150	300	200	300	320	200	350	500
Luetzkendorf	-	-	-	-	-	-	125	50	50	125	100	125	125
A. G. Fur Kraft	-	-	-	-	-	-	-	-	-	-	100	100	100
Wesseling	-	-	-	-	-	-	25	50	50	200	200	200	200
TOTAL B	305	855	855	1,040	900	900	1,250	1,300	1,250	1,570	2,100	1,955	2,975
"Unknown" Plants													266
GRAND TOTAL	432	1,355	1,155	1,853	1,600	1,350	2,340	2,320	2,270	2,760	3,720	3,275	5,244

All figures in thousands Metric Tons (as motor gasoline)
H = Hartley Report Aug. 15, 1942
O.P.C. = O.P.C. Report May 1, 1942
R = Present estimate

(1) All Hartley figures in this column refer to period Sept. 1 - Dec. 31, 1942 only
(2) Assumed running entirely on petroleum oil during this period.
(3) Represents only that part of Poelitz output which is assumed to result from processing of coal or tar, and excludes output, if any, resulting from processing of petroleum oil.
(4) Auld figure, before Revision by Hartley
(5) Mostly Fuel Oil
(6) Production not included for this period

TABLE II

Estimated Production of Hydrogenation Plants
(Known Plants in Axis Europe Operating
on Coal or Coal Tars)

Capacities in thousands of metric tons
per year as motor gasoline

From Brown Coal or Brown Coal Tars

From Bituminous Coal or Bituminous Coal Tars

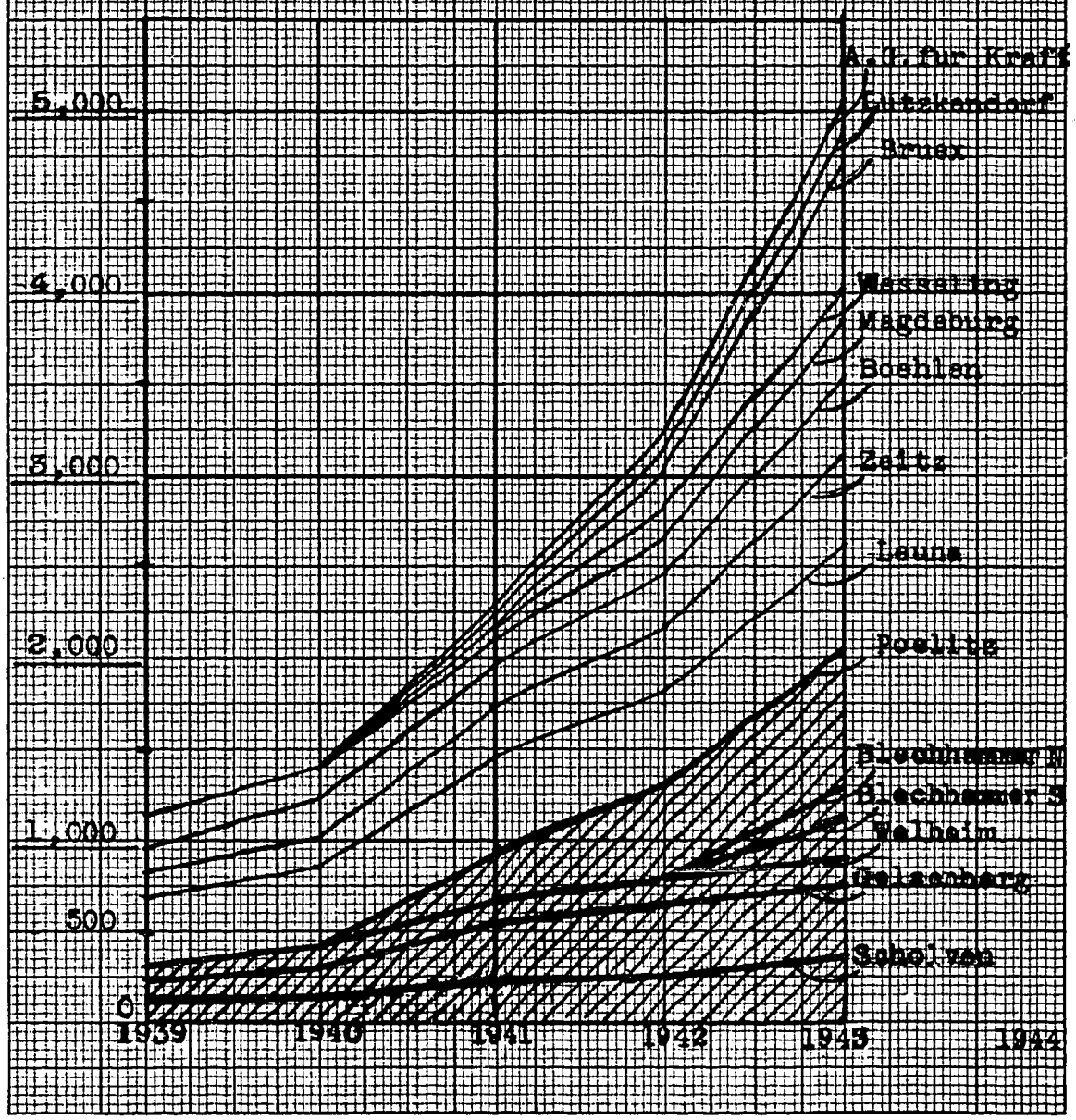


TABLE III

ESTIMATED PRODUCTION FOR HYDROGENATION PLANTS
FOR 1943 IN THOUSANDS OF METRIC TONS PER YEAR

		Jan.	Mar.	May	July	Sept.	Nov.	1943
Bituminous Coal or Tar								
1. Blechhammer N	Tar	-	-	100	300	500	500	233
2. Blechhammer S	Coal	-	-	-	100	300	500	150
3. Poelitz	Tar & Coal	700	700	700	700	700	700	700
4. Gelsenberg	Coal	400	400	400	400	400	400	400
5. Scholven	Coal	350	350	350	350	350	350	350
6. Welheim	Pitch	150	150	150	150	150	150	150
Subtotal A		1,600	1,600	1,700	2,000	2,400	2,600	1,983
French Plants								
7. Lievin	Coal	10	10	10	10	10	10	10
8. Bethune	Coal	10	10	10	10	10	10	10
Subtotal B		20	20	20	20	20	20	20
Brown Coal or Tar								
9. Bruex	LTC Tar	750	750	750	750	750	750	750
10. Leuna	Tar & Coal	600	600	600	600	600	600	600
11. Boehlen	Tar	400	400	400	400	400	400	400
12. Magdeburg	Tar	300	300	300	300	300	300	300
13. Zeitz	Tar	500	500	500	500	500	500	500
14. Lutzkendorf	Tar	125	125	125	125	125	125	125
15. A. G. Fur Kraft	Tar	100	100	100	100	100	100	100
16. Wesseling	Coal	200	200	200	200	200	200	200
Subtotal C		2,975	2,975	2,975	2,975	2,975	2,975	2,975
Total (~~A+B+C~~)		4,595	4,595	4,695	4,995	5,395	5,595	4,978
"Unknown" Plants (Subtotal D)		-	100	200	300	500	500	266
Grand Total		4,595	4,695	4,895	5,295	5,895	6,095	5,244

REMARKS: This table shows estimated production of these plants at annual rates in terms of motor gasoline. These rates are estimated from knowledge of plant equipment and which can most accurately be done in terms of making a single product — motor gasoline. The rates are calculated on a 90% service factor for the plants and do not include the very large production of gaseous hydrocarbons, part of which are used to make alkylates or isooctanes.

ESTIMATED 1943 PRODUCT OUTPUT,

HYDROGENATION PLANTS

(In thousands of metric tons per year)

Table III shows estimated production rates of hydrogenation plants for 1943 expressed in terms of motor gasoline. Hereunder are given the product breakdown as actually assumed. The total is somewhat less when making aviation gasoline than when making motor gasoline as shown in Table III, and somewhat more when making diesel oil or lubricants. (For further details, see Annex IV).

	Capacity as Motor Gasoline	Product Breakdown Assumed				
		Aviation	Motor	Diesel	Lubes	Total
A.*	1,983	990	775			1,765
B.	20		20			20
C.	2,975	150	1,425	1,300	200	3,075
D.	266		266			266
	5,244	1,140	2,486	1,300	200	5,126
				Gaseous losses, etc.		118
						5,244

* Products are broken down by plant groupings (A, B, C and D), as these plants are grouped in Table III.

TABLE V

ESTIMATES OF PRODUCTION OF FISCHER-TROPSCH PLANTS IN AXIS EUROPE

PLANTS	1939			1940			1941			1942			1943
	H	OPC	R	H	OPC	R	H	OPC	R	H	OPC	R	
Holten	30	60	60	80	90	90	100	100	100	100	100	100	125
Castrop-Rauxel	10	40	40	60	60	60	100	80	60	100	100	60	150
Hoesch	20	20	20	100	50	50	100	80	60	100	100	70	90
Homberg	25	50	50	100	80	100	100	100	150	100	100	150	190
Krupp	20	40	40	60	60	60	100	80	80	100	100	100	100
Essener Verein	20	40	40	50	60	60	50	80	80	50	100	100	100
Luetzkendorf	50	-	-	100	30	60	200	60	100	200	100	150	150
Schwarzheide	70	95	95	250	125	125	300	150	200	350	150	250	300
Deschowitz	-	20	-	30	50	30	50	80	50	50	100	60	80
Sub-Total	245	365	345	830	605	635	1100	810	880	1150	950	1040	1285
Kuhlmann	-(1)	-(1)	-(1)	13	-(1)	-(1)	25	30	30	25	30	30	30
Valdarno	-(1)	-(1)	-(1)	-(1)	-(1)	-(1)	-(1)	-(1)	-(1)	-(1)	20	20	30
"Unknown" Plants													225
GRAND TOTAL	245	365	345	843	605	635	1125	840	910	1175	1000	1090	1570

All figures in thousands of Metric Tons of primary product
H = Hartley Report Aug. 15, 1942
OPC = O.P.C. Report May 1, 1942
R = Present estimate

(1) Either no production during this period or production not taken into account

TABLE VI

ESTIMATED PRODUCTION OF FISCHER-TROPSCH PLANTS FOR 1943 EXPRESSED IN THOUSANDS OF METRIC TONS PER YEAR

	Jan.	Mar.	May	July	Sept.	Nov.	1943
Germany							
Holten	125	125	125	125	125	125	125
Castrop-Rauxel	150	150	150	150	150	150	150
Hoesch	90	90	90	90	90	90	90
Homberg	190	190	190	190	190	190	190
Krupp	100	100	100	100	100	100	100
Essener Verein	100	100	100	100	100	100	100
Lutzkendorf	150	150	150	150	150	150	150
Schwarzheide	300	300	300	300	300	300	300
Deschowitz	70	70	70	80	90	110	80
SUBTOTAL	1,275	1,275	1,275	1,285	1,295	1,315	1,285
Franco & Italy							
Kuhlmann (Harnes)	30	30	30	30	30	30	30
Valdarno	30	30	30	30	30	30	30
SUBTOTAL	60	60	60	60	60	60	60
"Unknown"	100	150	200	300	300	300	225
TOTAL	1,435	1,485	1,535	1,645	1,655	1,675	1,570

REMARKS: This table shows the estimated capacity of the plants in terms of the annual rate of production of primary product (synthetic crude oil). The rates are predicated on a 90% service factor for the plants.

ESTIMATED 1943 PRODUCT OUTPUT,
FISCHER-TROPSCH PLANTS
(In thousands of metric tons per year)

Table VI shows the estimated production rates of the Fischer-Tropsch plants for 1943 in terms of primary product. Hereunder are shown the estimated workup into final products, wherein there is an estimated loss (refinery fuel, gas, etc.) of approximately 9%. Part of the gaseous products are used in combination with the gaseous products from the hydrogenation plants to produce synthetic alkylates and iso-octanes.

Source	Primary Product	Motor Gasoline	Diesel Oil	Lubes	Total
German Plants	1,285	770	375	25	1,170
French & Italian	60	36	18	-	54
"Unknown" Plants	225	135	68	-	203
	1,570	941	461	25	1,427
				Losses	143
					1,570

THE SYNTHETIC OIL PLANTS OF GERMANY

HYROGENATION (BERGIUS) AND SYNTHESIS (FISCHER-TROPSCH)

There are fourteen (14) known hydrogenation plants in Germany proper with an estimated total capacity of 5,575,000 tons per year, and nine (9) synthesis plants having an estimated total capacity of 1,285,000 tons annually. The combined total of these twenty-three (23) plants gives an estimated annual capacity of 6,860,000 tons, all of finished products.

These synthetic oil plants in Germany may be grouped as follows:

Central area (10 plants)	3,925,000 T.	57.3 Per cent
Western area (10 plants)	1,855,000 T.	27.0 Per cent
Eastern area (3 plants)	1,080,000 T.	15.7 Per cent
Total: 3 areas, 23 plants	6,860,000 T.	100.0 Per cent

20
Name: CHEMISCHEWERKE ESSENER STEINKOHLE A.G.
Location: Kamen (near Dortmund)
Affiliation: (Harpen & Essener Steinkohlen)
Type: Synthesis (Fischer - Tropsch)
Raw Material: Watergas (Coke)
Capacity: 100,000 T/Yr.
Tankage: Unknown
Per cent: 1.4

10
Name: BRAUNKOHLEN BENZIN A.G. (Brabag II)
Location: Magdeburg (Rothensee)
Affiliation: (Ass'n Middle German Lignite Mines, I.G. Farben and Reichs Werke Hermann Goering)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar.
Capacity: 300,000 T/Yr.
Tankage: 41,000 T.
Per cent: 4.3

2
Name: HYDRIERWERKE POELITZ A.G.
Location: Poelitz (N. of Stettin; W. of River Oder)
Affiliation: (I.G. Farben)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal and tar.
Capacity: 700,000 T/Yr.
Tankage: 60,800 T. (Minimum)
Per cent: 10.3

19
Name: RUHRBENZIN A.G.
Location: Holten (Sterkerade)
Affiliation: (Ruhr Chemie)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 125,000 T/Yr.
Tankage: 31,000 T.
Per cent: 1.9

9
Name: HYDRIERWERKE SCHOLVEN A.G.
Location: Scholven - Buer
Affiliation: (Hibernia A.G.)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal
Capacity: 350,000 T/Yr.
Tankage: Unknown
Per cent: 5.2

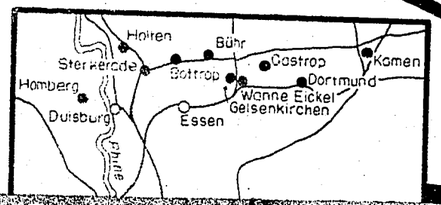
18
Name: GEWERKSCHAFT VIKTOR
Location: Castrop - Rauxel
Affiliation: (Kloeckner - Wintershall)
Type: Synthesis (Fischer - Tropsch)
Raw Material: Watergas (Coke)
Capacity: 150,000 T/Yr.
Tankage: 22,700 T.
Per cent: 2.1

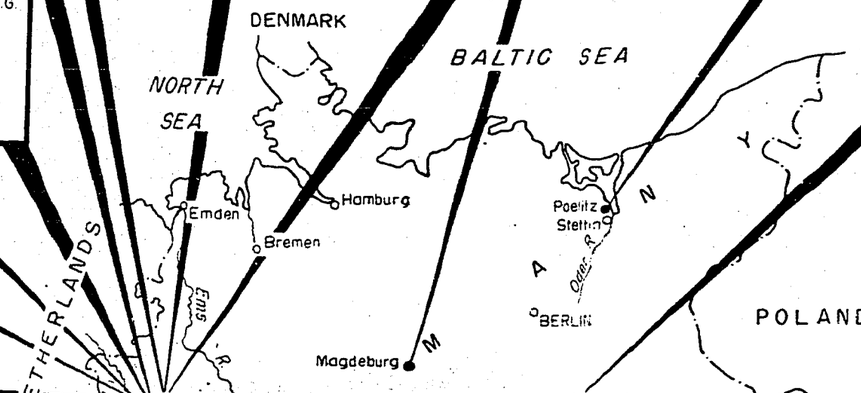
22
Name: HOESCH BENZIN A.G.
Location: Dortmund (Wambelerholz)
Affiliation: (Hoesch)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 90,000 T/Yr.
Tankage: 23,400 T.
Per cent: 1.3

15
Name: BRAUNKOHLEN BENZIN A.G. (Brabag IV)
Location: Ruhland - Schwarzheide
Affiliation: (Ass'n Middle German Lignite Mines, I.G. Farben and Reichs Werke Hermann Goering)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Brown coal)
Capacity: 300,000 T/Yr.
Tankage: 44,000 T.
Per cent: 4.3

7
Name: GELSENBERG BENZIN A.G.
Location: Gelsenkirchen
Affiliation: (Gelsenberg Group)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal
Capacity: 400,000 T/Yr.
Tankage: 87,000 T.
Per cent: 5.9

21
Name: KRUPP TREIBSTOFFWERKE A.G.
Location: Wanne Eickel
Affiliation: (Krupp)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 100,000 T/Yr.
Tankage: Unknown
Per cent: 1.4





INDEX TO PLANTS

Plant	Hydrogenation (Bergius)	Annu
1	"	75
2	"	70
3	"	60
4	"	50
5	"	50
6	"	40
7	"	40
8	"	35
9	"	30
10	"	20
11	"	15
12	"	12
13	"	10
14	"	
Total: 14 Plants		5,57
	Synthesis (Fischer-Tropsch)	
15	"	30
16	"	19
17	"	15
18	"	12
19	"	10
20	"	10
21	"	9
90	"	6
23	"	
Total: 9 Plants		1,28
Combined Total: 23 Plants		6,86

4
Name: OBERSCHLESISCHE HYDRIERWERKE
Location: Blechhammer North (6 mi. E of Coset)
Affiliation: (I.G. Farben)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal tar.
Capacity: 500,000 T/Yr.
Tankage: 70,000 T.
Per cent: 7.3

THE SYNTHETIC OIL PLANTS OF GERMANY

HYROGENATION (BERGIUS) AND SYNTHESIS (FISCHER-TROPSCH)

here are fourteen (14) known hydrogenation plants in Germany with an estimated total capacity of 5,575,000 tons per year, ine (9) synthesis plants having an estimated total capacity 285,000 tons annually. The combined total of these twenty-(23) plants gives an estimated annual capacity of 6,960, tons, all of finished products.

synthetic oil plants in Germany may be grouped as follows:

ntral area (10 plants)	3,925,000 T.	57.3 Per cent
stern area (10 plants)	1,855,000 T.	270 Per cent
stern area (3 plants)	1,080,000 T.	15.7 Per cent
al: 3 areas, 23 plants	6,860,000 T.	1000 Per cent

20
Name: CHEMISCHEWERKE ESSENER STEINKOHLE A.G.
Location: Kamen (near, Dortmund)
Affiliation: (Harpen & Essener Steinkohlen)
Type: Synthesis (Fischer – Tropsch)
Raw Material: Watergas (Coke)
Capacity: 100,000 T/Yr.
Tankage: Unknown
Per cent: 1.4

10
Name: BRAUNKOHLEN BENZIN A.G. (Brabag II)
Location: Magdeburg (Rothensee)
Affiliation: (Ass'n Middle German Lignite Mines, I.G.Farben and Reichs Werke HermannGoering)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar.
Capacity: 300,000 T./Yr.
Tankage: 41,000 T.
Per cent: 4.3

2
Name: HYDRIERWERKE POFLITZ A.G.
Location: Poelitz (N. of Stettin; W. of River Oder)
Affiliation: (I G. Farben)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal and tar
Capacity: 700,000 T/Yr.
Tankage: 60,800 T. (Minimum)
Per cent: 10.3

19
Name: RUHRBENZIN A.G.
Location: Holten (Sterkerade)
Affiliation: (Ruhr Chemie)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 125,000 T/Yr
Tankage: 31,000 T
Per cent: 1.9

9
Name: HYDRIERWERKE SCHOLVEN A.G.
Location: Scholven - Bühr
Affiliation: (Hibernia A.G.)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal
Capacity: 350,000 T./Yr.
Tankage: Unknown
Per cent: 5.2

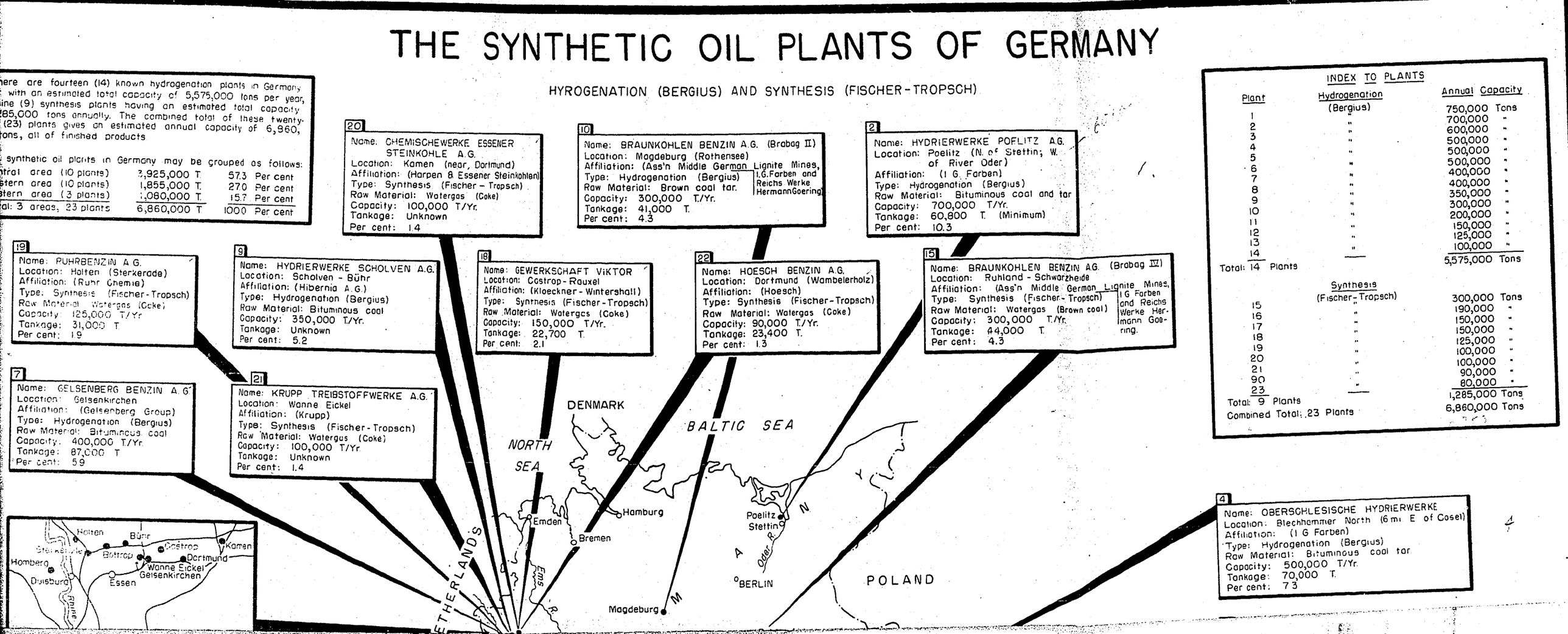
18
Name: GEWERKSCHAFT ViKTOR
Location: Castrop-Rauxel
Affiliation: (Kloeckner-Wintershall)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 150,000 T/Yr.
Tankage: 22,700 T.
Per cent: 2.1

22
Name: HOESCH BENZIN A.G.
Location: Dortmund (Wambelerholz)
Affiliation: (Hoesch)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 90,000 T./Yr.
Tankage: 23,400 T.
Per cent: 1.3

15
Name: BRAUNKOHLEN BENZIN AG. (Brabag IV)
Location: Ruhland - Schwarzheide
Affiliation: (Ass'n Middle German Lignite Mines, I G Farben and Reichs Werke Hermann Goering.)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Brown coal)
Capacity: 300,000 T./Yr.
Tankage: 44,000 T.
Per cent: 4.3

7
Name: GELSENBERG BENZIN A.G.
Location: Gelsenkirchen
Affiliation: (Gelsenberg Group)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal
Capacity: 400,000 T./Yr.
Tankage: 87,000 T
Per cent: 5.9

21
Name: KRUPP TREIBSTOFFWERKE A.G.
Location: Wanne Eickel
Affiliation: (Krupp)
Type: Synthesis (Fischer-Tropsch)
Raw Material: Watergas (Coke)
Capacity: 100,000 T/Yr.
Tankage: Unknown
Per cent: 1.4



INDEX TO PLANTS

Plant	Hydrogenation (Bergius)	Annual Capacity
1	"	750,000 Tons
2	"	700,000 "
3	"	600,000 "
4	"	500,000 "
5	"	500,000 "
6	"	500,000 "
7	"	400,000 "
8	"	400,000 "
9	"	350,000 "
10	"	300,000 "
11	"	200,000 "
12	"	150,000 "
13	"	125,000 "
14	"	100,000 "
Total: 14 Plants		5,575,000 Tons
	Synthesis	
	(Fischer-Tropsch)	
15	"	300,000 Tons
16	"	190,000 "
17	"	150,000 "
18	"	150,000 "
19	"	125,000 "
20	"	100,000 "
21	"	100,000 "
90	"	90,000 "
23	"	80,000 "
Total: 9 Plants		1,285,000 Tons
Combined Total: 23 Plants		6,860,000 Tons

4
Name: OBERSCHLESISCHE HYDRIERWERKE
Location: Blechhammer North (6 mi. E of Cosel)
Affiliation: (I G Farben)
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal tar
Capacity: 500,000 T/Yr.
Tankage: 70,000 T.
Per cent: 7.3

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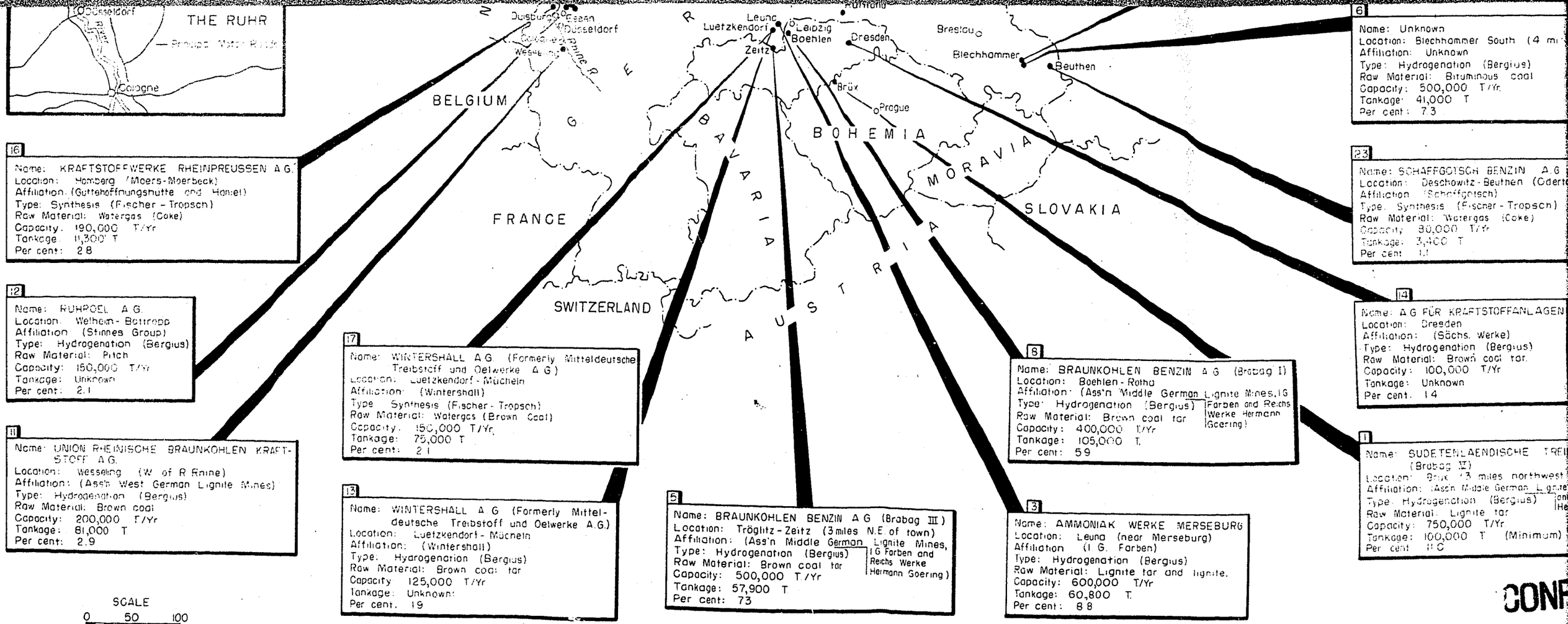

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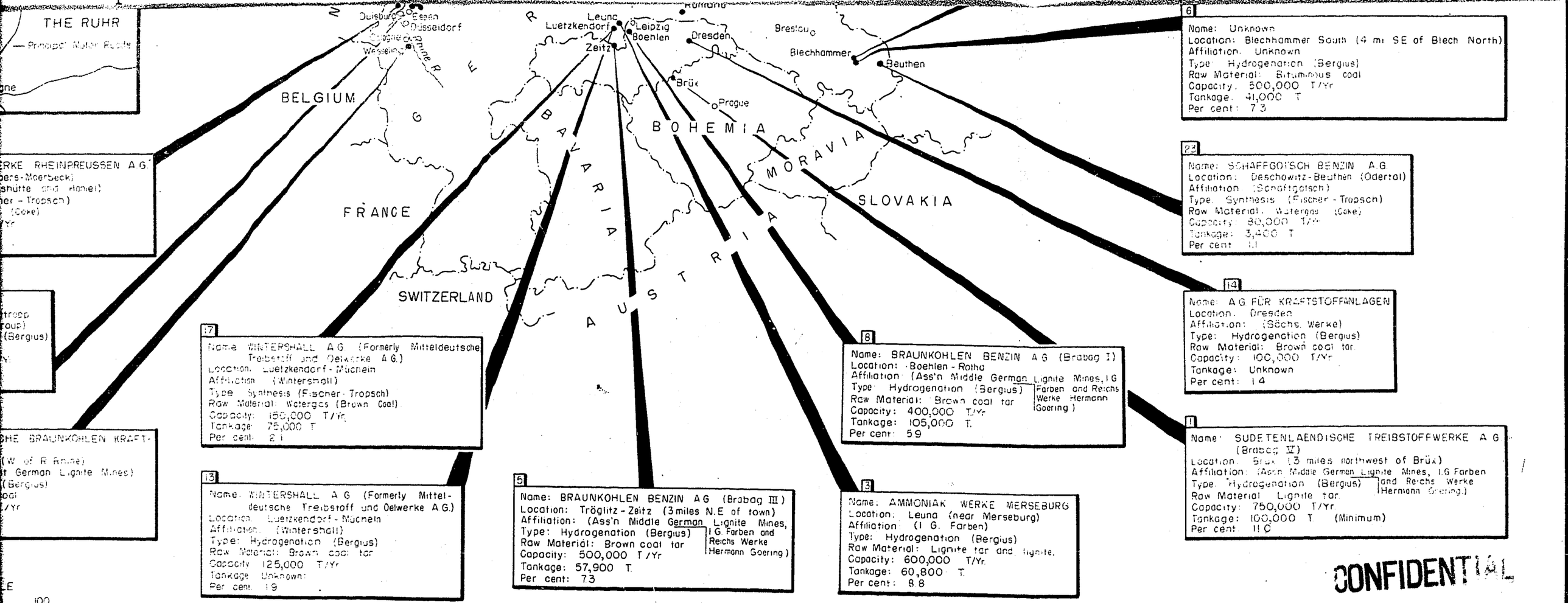
DATA AS OF JULY 1, 1943



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(Bergius)
oal
T/Yr

17
Name: WINTERSHALL A G (Formerly Mitteldeutsche Treibstoff und Oelwerke A G.)
Location: Luetzkendorf - Mücheln
Affiliation: (Wintershall)
Type: Synthesis (Fischer - Tropsch)
Raw Material: Watergas (Brown Coal)
Capacity: 150,000 T/Yr.
Tankage: 75,000 T
Per cent: 2 1

13
Name: WINTERSHALL A G (Formerly Mitteldeutsche Treibstoff und Oelwerke A G.)
Location: Luetzkendorf - Mücheln
Affiliation: (Wintershall)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar
Capacity: 125,000 T/Yr
Tankage: Unknown
Per cent: 1 9

5
Name: BRAUNKOHLEN BENZIN A G (Brabag III)
Location: Tröglitz - Zeitz (3 miles N.E of town)
Affiliation: (Ass'n Middle German Lignite Mines, I G Farben and Reichs Werke Hermann Goering)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar
Capacity: 500,000 T/Yr
Tankage: 57,900 T.
Per cent: 73

3
Name: AMMONIAK WERKE MERSEBURG
Location: Leuna (near Merseburg)
Affiliation: (I G. Farben)
Type: Hydrogenation (Bergius)
Raw Material: Lignite tar and lignite.
Capacity: 600,000 T/Yr.
Tankage: 60,800 T.
Per cent: 8 8

8
Name: BRAUNKOHLEN BENZIN A G (Brabag I)
Location: Boehlen - Rotha
Affiliation: (Ass'n Middle German Lignite Mines, I G Farben and Reichs Werke Hermann Goering)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar
Capacity: 400,000 T/Yr.
Tankage: 105,000 T.
Per cent: 59

6
Name: Unknown
Location: Blechhammer South (4 mi SE of Blech North)
Affiliation: Unknown
Type: Hydrogenation (Bergius)
Raw Material: Bituminous coal
Capacity: 300,000 T/Yr
Tankage: 41,000 T
Per cent: 7 3

23
Name: SCHAFFGOTSCH BENZIN A G
Location: Deschowitz - Beuthen (Odertal)
Affiliation: (Schaffgotsch)
Type: Synthesis (Fischer - Tropsch)
Raw Material: Watergas (Coke)
Capacity: 80,000 T/Yr
Tankage: 3,400 T
Per cent: 4 1

14
Name: A G FÜR KRAFTSTOFFANLAGEN
Location: Dresden
Affiliation: (Sächs. Werke)
Type: Hydrogenation (Bergius)
Raw Material: Brown coal tar
Capacity: 100,000 T/Yr
Tankage: Unknown
Per cent: 1 4

1
Name: SUDETENLAENDISCHE TREIBSTOFFWERKE A G (Brabag IV)
Location: Brüx (3 miles northwest of Brüx)
Affiliation: (Ass'n Middle German Lignite Mines, I.G Farben and Reichs Werke Hermann Goering)
Type: Hydrogenation (Bergius)
Raw Material: Lignite tar
Capacity: 750,000 T/Yr.
Tankage: 100,000 T (Minimum)
Per cent: 11 C

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PREPARED BY THE EUROPEAN AXIS SUB-COMMITTEE OF THE ENEMY OIL COMMITTEE
DATA AS OF JULY 1, 1943

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MAP 8

NO 621, DRAWN IN THE CARTOGRAPHIC SECTION, O.E.W, JULY, 194