

environment and quality of life

Mobilization of heavy metals from fossil-fuelled power plants, potential ecological and biochemical implications

- I - Electricity demand, installed capacity and geographical location
of the fossil-fuelled power stations
in the territory of the European Community

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PREFACE

The pressing need to produce more electrical energy by fossil fuelled power plants with a greater use of coal may result in increased mobilization of heavy metals by fossil fuelled power plants with increased contamination hazard for man and environment.

Because of the complexity of the possible interactions between heavy metals with environment as well as man, the nature of the risks that the toxic metals mobilized by fossil-fuelled power stations represent is problematic and involves multidisciplinary efforts to establish dose-effect relationships which could serve as a basis in determining maximum permissible release rate for the environment and maximum permissible doses for man.

Research reports of the JRC on this subject have been divided into a series of five reports with the purpose of examining and evaluating critically the available data giving a list of topics which may serve as a guide-line for a research project which should be undertaken to study the EC situation. They are:

Mobilization of heavy metals from fossil-fuelled power plants, potential ecological and biochemical implications

- I Electricity demand, installed capacity and geographical location of the fossil-fuelled power stations in the territory of the European Community;
- II Definition of the problem using a critical path approach, motivation, objectives and research programme to study the European situation;
- III Heavy metal content in coals burnt in the European power plants;
- IV Assessment studies of the European situation;
- V Natural radionuclides in coals and coal ashes from European conventional power stations and evaluation of a potential environmental impact.

This work is the first of the series and provides technical basis for the calculations of the minimum and maximum amounts of heavy metals which may be annually mobilized by the conventional power plants of the European Community.

INTRODUCTION

For the assessment of the mobilization of heavy metals from fossil-fuelled power plants operated in the territory of the European Community (EC) basic data on electricity production by conventional thermal power plants are required.

The present report gives a short outline of statistics on electricity production in the countries of the EC for the last 10 years laying emphasis on conventional thermal power plants. Data on the amount of electricity produced and kind and quantities of fuels burnt by the power plants of the single member states are reported.

The conventional thermal power stations situated in the EC are listed and their geographical location is shown by separated maps for each member state.

1. Electricity production in the European Community

In 1978, electricity consumption in the European Community has been 1,082,000 GWh. In comparison with 1977, this means an increase of the demand of 4.2%. Variation in electricity demand for 1977 in respect to 1976 has been 3.2% (1).

Figure 1 shows the total electricity generation of the countries of the European Community during the last 18 years. From 1960 to 1973, growth in electricity production was characterized by a doubling time of 10 years with a little bend in the only 1967. Period from 1973 to 1977, however, shows a much lower increase of electricity production, namely of an average of 2.3% per year, which corresponds to a doubling time of about 30 years.

For the first time after the second world war, a decrease (- 1.8%) in electricity production in the countries of the European Community happened in 1975.

Again in the beginning of 1975, forecastings by the Commission of the European Community of 30.1.75 (2) predict on average annual growth rate of 7.2% for the period between 1975 and 1980, of 7.9% for the period from 1980 to 1985, and of 8.7% for the period from 1985 to 1990.

The expected gross electricity generation for 1980 should be 1640 TWh, for 1985 2400 TWh and for 1990 3650 TWh, whereby about 1000 TWh should be covered till 1985 by conventional thermal power plants.

It is very likely that these previsions had to be corrected to lower values as a consequence of the world wide low economic growth in the last five years.

2. Breakdown by source of energy

In 1977, which has been a year with a very high hydroelectric capability factor of 1.22, total gross electricity generation in the countries of the EC has been 1,134.4 TWh, as shown in Figure 2.

864.5 TWh (76.2%) have been generated by conventional thermal power stations, 154.6 TWh (13.6%) by hydroelectric, 112.9 TWh (10.0%) by nuclear power plants and 2.5 TWh (0.22%) by geothermal power plants.

In 1978, total electricity production in the member states of the EC amounted to 1186 TWh, of which 917 TWh (77.3%) produced by conventional thermal power stations, 142 TWh (12.0%) by hydroelectric plants, 125 TWh (10.5%) by nuclear power stations and 2 TWh (0.2%) by geothermic stations.

In Table 1, the electricity generation of the single member states of the EC for the year 1977, according to the energy sources used, is listed.

France and Italy show the highest portion of hydroelectric generation. The values for 1977 are extremely high because of the very high hydroenergy capability factor of 1.28 for France and 1.19 for Italy.

Member states with the highest portion of electricity produced by nuclear reactors in 1977 are Belgium (25.3%), Great Britain (13.1%) and the Federal Republic of Germany (10.8%).

Italy is the unique member state of the EC where electricity is produced by geothermic power stations, the so-called soffioni or blowers (2.501 TWh in 1977).

Member state with the highest portion of electricity produced by conventional thermal power plants in 1977 is Denmark (99.9%), member state with the lowest portion is France (54.0%).

Member state with the highest portion of electricity generation by hard coal combustion is Great Britain (64.9%) together with Denmark (46.5%), whereas Germany (25.9%) and Ireland (22.9%) show the highest portion of electricity produced in 1977 by brown coal or respectively peat combustion.

Ireland (65.0%) and Italy (51.1%) are the member states with the highest portion of electricity generation by combustion of fuel oil.

The Netherlands (76.8%) and Luxembourg (60.5%) show the highest portion of electricity produced by combustion of natural and derived gases.

3. Electricity production by conventional thermal power plants

Figure 3 shows electricity production of the EC by conventional thermal power plants according to the various fuels burnt (hard coal, fuel oil, natural and derived gases, brown coal) for the period from 1969 to 1977 together with the hydroelectric capability factor.

Besides small variations due to the hydrocapability factor of a certain year, one can observe the following trends:

- power production by hard coal combustion shows a minimum in the period from 1972 to 1974, from 1975 hard coal combustion is increasing steadily and arrives in 1977 again to the value of 1969. It is to expect, that hard coal combustion (indigenous and imported) in the near future will be the most important fossil fuel in power production in the European Community;
- fuel oil combustion from 1969 to 1973 shows a strong growth and has been nearly duplicated during this period. From the beginning of 1974, petroleum combustion starts to drop down, arriving in 1977 to values similar to that of 1971;
- power production by natural and derived gases has been triplicated in 1974 in comparison to 1969. Beginning from 1975, use of gases in power production shows a slight diminishing trend;
- brown coal combustion for electricity production shows a steady growth for the period from 1960 to 1976, corresponding to the trend of 10 years doubling time. The relative high value of 1976 and the low value of 1977 are to be explained with the big variation of the hydroenergy capability factors for these years and the increasing of nuclear energy production in 1977. As brown coal-fired power plants are used mainly in the basic load range, in years with high hydroelectric energy capacity they can work at lower load.

Table 2 gives an overview on the amounts of fossil fuels in millions of metric tons burnt per year in the countries of the EC by coal- and oil-fired power plants during the period from 1970 to 1978.

Tables 3 and 4 give the amounts in metric tons and the respective calorific equivalent of fossil fuels burnt for power production in the single member states of the EC for the year 1977. Of the 150 millions of tons of **hard coal** burnt in 1977, the United Kingdom burnt more than half (54.8%) followed by the Federal Republic of Germany (24.0%) and France (13.3%).

93.5% of **brown coal** burnt in the EC was used in the power plants of the Federal Republic of Germany. Only France and Italy too are using brown coal for power production. Ireland is burning peat (3.07×10^6 tons in 1977) for electricity generation.

Italy (33.2%), Great Britain (21.7%) and France (18.9%) have had the highest consumption of all the fuel oil burnt for power production by the countries of the EC in 1977.

The Netherlands (27.4%) and the Federal Republic of Germany (40.7%) have been the greatest consumers of natural and derived gases for electricity production in the EC in 1977.

In Table 5, the electricity production in 1977 in the single member states by coal and oil fired power stations are listed together with the calculated value of MWh produced in average per each km² of territory of each single member state.

This value, of course, may give only a general indication of fossil-fuelled power plants impact in a certain member state. The impact of the single power station on its surroundings depends on specific characteristics of the station, as type of fuel, installed capacity, load factor, abatement technologies installed, geographic situation, etc.

In any case, the values of electricity production by coal and oil fired plants expressed in MWh/km² are the highest for the United Kingdom, Germany and Belgium and the lowest for France, Ireland and Luxembourg.

4. Power stations situated in the territory of the European Community

4.1. Installed capacity

In Figure 4, the installed capacity of all power stations, conventional thermal, hydroelectric and nuclear, is plotted for the period from 1960 to 1977. For all the period of these last seventeen years, the portion of conventional power plants capacity remained nearly constant, namely about 77%. Until 1977, capacity increase of nuclear power stations compensated the lower increase of hydroelectric power plants capacity.

Table 6 shows the installed capacity of conventional thermal power plants for the year 1976 for the single member states. The sum of the values for the different fuels is more than 100% because there are bivalent and trivalent power stations, which can be operated by two or even three different fuels.

4.2. Conventional thermal power stations in the territory of the European Community

In the following, the conventional thermal power stations operated in the territory of the nine member states of the EC are listed, indicating their names or location, the

undertaking, their maximum output capacity and the fuels used by each station (3). A geographical map of the main conventional power stations of each member state follows the relative list. Generally, only power stations with an output capacity greater than 250 MW_{eI} are mapped and indexed with arabic numbers, which correspond to the numbers which precede the name of the power station in the respective list. As can be easily seen from the maps, actually the regions with the highest concentrations of fossil-fuelled power plants are:

- the Ruhr-Aachen region (about 26,000 MW_{eI} output capacity);
- the zone of Middle England between Liverpool, Leeds, Kingston, Nottingham and Birmingham (about 31,000 MW_{eI} output capacity);
- the region of London (about 13,000 MW_{eI} output capacity);
- the triangle Frankfurt-Karlsruhe-Stuttgart (about 7,000 MW_{eI} output capacity);
- the region of Paris (about 6,500 MW_{eI} output capacity);
- the Saar territory together with Lorraine (about 4,500 MW_{eI});
- Artois (Lille) (about 3,000 MW_{eI}).

Although the concentration of conventional thermal power plants in the Netherlands is rather high (17,400 MW_{eI} on the total territory), it has not been taken into consideration in this context because most of the big Dutch power plants at present are operated with natural gas, which means that the emissions of trace metals caused by the fuel, are very low.

On the other hand, all the regions with a relatively high concentration of conventional thermal power plants named above are highly industrialized and populated areas, a truism, but also a fact which is most important in evaluating the potential trace metal pollution caused by coal and oil fired power plants.

It is not in the framework of this report to discuss the location of present or future fossil-fuelled power stations in the EC, although this argument will be one of the most disputed ones in the nearest time. This argument will not be discussed here, also because, besides social-economical reasons, the other emissions from fossil-fuelled power plants (SO₂, NO_x, heat) will be of greater weight with regard to the choice of a suitable location for future power plants.

4.3. Forecast for the consumption of fossil fuels by power plants in the EC

The consumption of petroleum products and natural gas, for power production probably will decline in the future, a trend which is already evident by the respective curves for petroleum products and natural and derived gases of Figure 3, which show the decrease of these two fuels for power production beginning from 1974.

The reserves of coal in the Community and in the world are bountiful for a long term. Therefore, coal, in future, should be playing a more important role in the energy supply of the Community. Utilisation of coal, however, is again of a too small importance, partly because of the high production costs of the communitary coal. But, with the increasing price of petroleum products, coal will result always more able to compete. New technologies such as coal gasification and coal liquefaction, and fluidized bed combustion of coal will accelerate this process.

In their medium-term guidelines for coal 1975 to 1985 of 30 January 1975 (2), the Commission of the European Community came to the result that solid fuels, and in particular hard coal, will be called upon to play an important part as a source of energy for electricity production. The forecast of the European Commission foresees an increasing power station hard coal consumption of about 25% higher compared to 1975, leading to the following estimates of future electricity generation in thermal power stations, as given in Table 7.

Table 7 shows a rise of coal requirements for electricity generation in the EC from 1973 to 1985 of the order of 30 millions tce, the precise tonnage depending primarily on the availability of coal and on the incidence of such environment protection measures may apply during the period. Clearly the power stations coal market in the Community is expanding. On the other hand, it is very difficult to make previsions on the imports of power stations coal from countries outside the EC (mainly USA, South Africa, Poland, Australia, CSR, USSR), depending not only on prices but also on many political factors.

Set-up of energy forecast at present times is a hazardous undertaking. Plausible changes in the basic assumptions concerning economic growth, energy savings and the rate of growth of nuclear and renewable energies would produce very different projections from the ones presented above.

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TABLE 1 : Electricity generation in 1977 in GWh - Breakdown by energy sources

Member state	B		D		DK		F		I		IRL		LX		N		UK	
	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%	GWh	%
Total production	47,099	100	335,320	100	22,436	100	210,845	100	166,545	100	9,295	100	1,330	100	58,285	100	283,280	100
Hydroelectric	453	1.0	17,588	5.5	22	0.1	77,297	37.6	52,726	32.9	1,023	11.5	274	20.6	3,710	6.2	5,232	2.0
Nuclear	11,939	25.3	36,059	10.8			17,986	8.4	3,385	2.0							40,021	13.1
Geothermic									2,501	1.5								
Conventional thermic	34,707	73.7	281,673	83.7	22,414	99.9	115,562	54.0	107,933	63.6	8,272	88.5	1,056	79.4	54,575	93.8	238,027	24.9
of which																		
hard coal	9,562	20.0	92,926	27.4	10,470	46.5	48,785	22.4	4,265	2.5	51	0.6	7	0.6	4,648	8.0	181,704	64.9
lignite and peat			88,188	25.9			2,878	1.3	1,181	0.7	2,168	22.9						
non-gaseous pe- troleum prod.	14,881	31.6	29,386	8.8	11,944	53.4	48,448	23.0	86,729	51.1	6,053	65.0	212	16.1	4,363	7.5	49,507	17.6
natural and de- rived gases	10,147	21.8	67,368	20.4			14,982	7.1	14,769	8.7			810	60.5	44,697	76.8	6,556	2.4
other fuels	123	0.3	3,805	1.2			469	0.2	989	0.6			27	2.1	867	1.5		

TABLE 2 : Electricity Generation - EUR-9, Consumption of fuels (indigenous and imported)

Year	10 ⁶ metric tons			10 ⁶ tce		
	hard coal	brown coal and peat	non gaseous petroleum products	hard coal	brown coal and peat	non gaseous petroleum products
1978	159.0	115.7	62.9	118.3	37.2	90.5
1977	150.9	119.7	57.8	100.8	33.4	84.9
1976	143.6	131.3	64.0	102.9	32.1	100.0
1975	123.5	117.8	60.0	112.6	30.0	105.6
1974	125.6	116.7	70.6	106.8	26.9	101.5
1973	135.2	108.9	74.4	117.6	24.6	85.4
1972	126.9	98.6	70.6	118.5	24.5	74.6
1971	143.5	90.0	60.1	127.2	24.2	58.1
1970	144.2	88.9	52.3	117.3	18.7	25.8
1969						
1963						

tce = ton coal equivalent (7000cal/PC/g)

TABLE 3: Power Plants - Consumption of coals and non gaseous petroleum products for electricity production in 1977

Member state	10 ⁶ metric tons					
	hard coal		lignite and peat		Non gaseous petroleum products	
B	4.36	2.9%			3.42	5.9%
D	36.19	24.0%	111.99	93.5%	6.59	11.4%
DK	4.54	3.0%			2.79	4.8%
F	20.05	13.3%	2.81	2.3%	10.93	18.9%
I	1.56	1.0%	1.87	1.6%	19.18	33.2%
IRL	0.04	0.2%	3.07	2.6%	1.43	2.5%
LX					0.06	0.1%
N	1.47	1.0%			0.91	1.6%
UK	82.67	54.8%			12.54	21.7%
Total EUR-9	150.88	100%	119.74	100%	57.85	100%

TABLE 4: Power Plants - Consumption of coals, non gaseous petroleum products and natural and derived gases, in 1977 - calorific equivalent TJ (NCV)

Member State	hard coal		lignite and peat		non gaseous petroleum products		natural and derived gases	
	TJ	%	TJ	%	TJ	%	TJ	%
B	93,344	2.6			138,779	5.9	108,835	7.1
D	936,469	26.4	920,365	92.7	270,324	11.5	620,192	40.7
DK	112,650	3.2			112,800	4.8		
F	453,813	12.8	30,269	3.1	438,756	18.7	143,101	9.4
I	41,173	1.2	12,508	1.3	780,042	33.2	140,060	9.2
IRL	750		29,068	2.9	57,893	2.5		
LX	92				2,514	0.1	11,114	0.7
N	39,728	1.1			37,556	1.6	418,166	27.4
UK	1,869,986	52.7			509,960	21.7	83,099	5.5
EUR-9	3,548,005	100	992,210	100	2,348,629	100	1,524,567	100

(NCV : Net Calorific Value)

TABLE 5 : Electrical energy - Net production, generated by coal-and oil-fired power plants in 1977 (1976)

Member State	Production generated GW _a h	Production generated MW _a h/km ²	Density of population inhabitants/km ²	Production per inhabitant MW _a h/inhabitant
B	24,443 (24,862)	801 (815)	318	2.6
D	210,500 (225,108)	847 (906)	249	3.6
DK	22,414 (20,853)	521 (484)	117	4.1
F	100,111 (120,678)	183 (221)	95	2.3
I	92,175 (98,033)	306 (325)	183	1.8
IRL	8,272 (7,714)	118 (110)	44	2.5
LX	219 (243)	85 (94)	135	0.7
N	9,011 (7,063)	269 (211)	403	0.5
UK	231,211 (227,298)	947 (931)	229	4.1
EUR-9	698,356	459	169	2.8
in comparison				
USA	1,548,560*	169	23	7.3
Japan	356,000*	962	297	3.2
USSR	784,000**	35	11	3.2

* data of 1974 (contain electricity production by natural and derived gases too)

** data of 1974 (contain electricity production by natural and derived gases and nuclear energy too)

TABLE 6 : Conventional thermal power stations, installed capacity 1976 - MW_{el}

Member state	Number of sets	All power stations	can be operated with:			
			Hard coal	brown coal and peat	non gaseous petroleum products	natural and derived gases
D	892	69,973	27,955	14,475	25,067	19,912
F	156	30,485	11,662	678	22,617	5,925
I	342	27,755	2,435	318	27,036	10,166
N	187	16,324	1,744*		12,281*	13,641
B	113	8,449	3,238		7,510	4,004
LX		226	66		158	202
UK	603	68,338	47,881		17,244	1,699
IRL	45	2,101	106	416	1,607	
DK	75	6,780	2,806*		5,856*	
EUR-9	2,413	230,431	83,635*	14,577*	105,225*	43,370*

* only power stations of the public supply, sum often more than 100% because of bivalent and trivalent power-stations

TABLE 7 : Estimate of thermal power station output from different sources of energy

Year	Coal		Fuel oil and natural gas	
	Production of electricity in TWh	Input in millions tce	Production of electricity in TWh	Input in millions tce
1973	325	119	422	138
1977	333	121	367	119
1980	403	133	596	191
1985	467	149	528	167

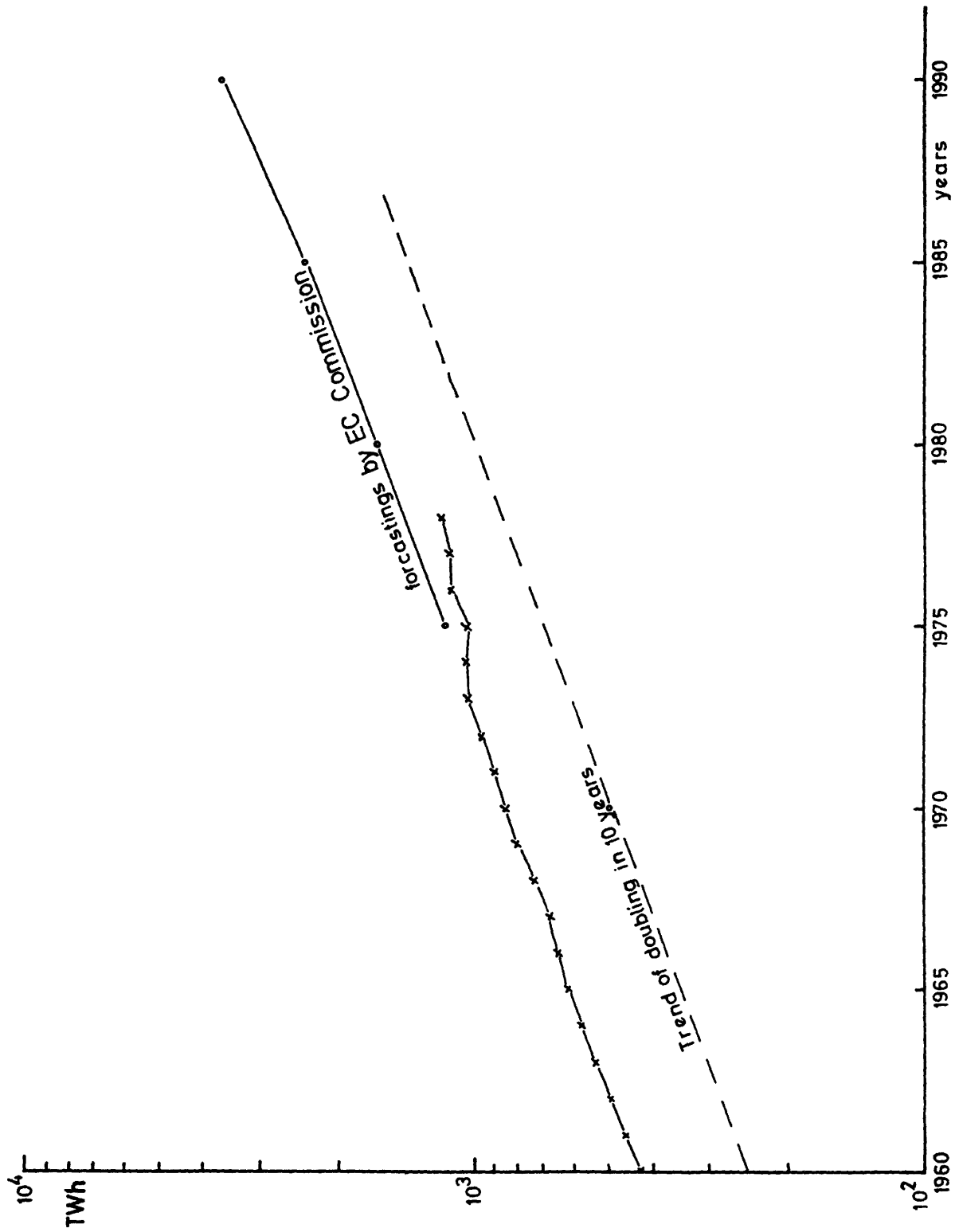


Fig.1 EUR-9 Electrical Energy Total Generation

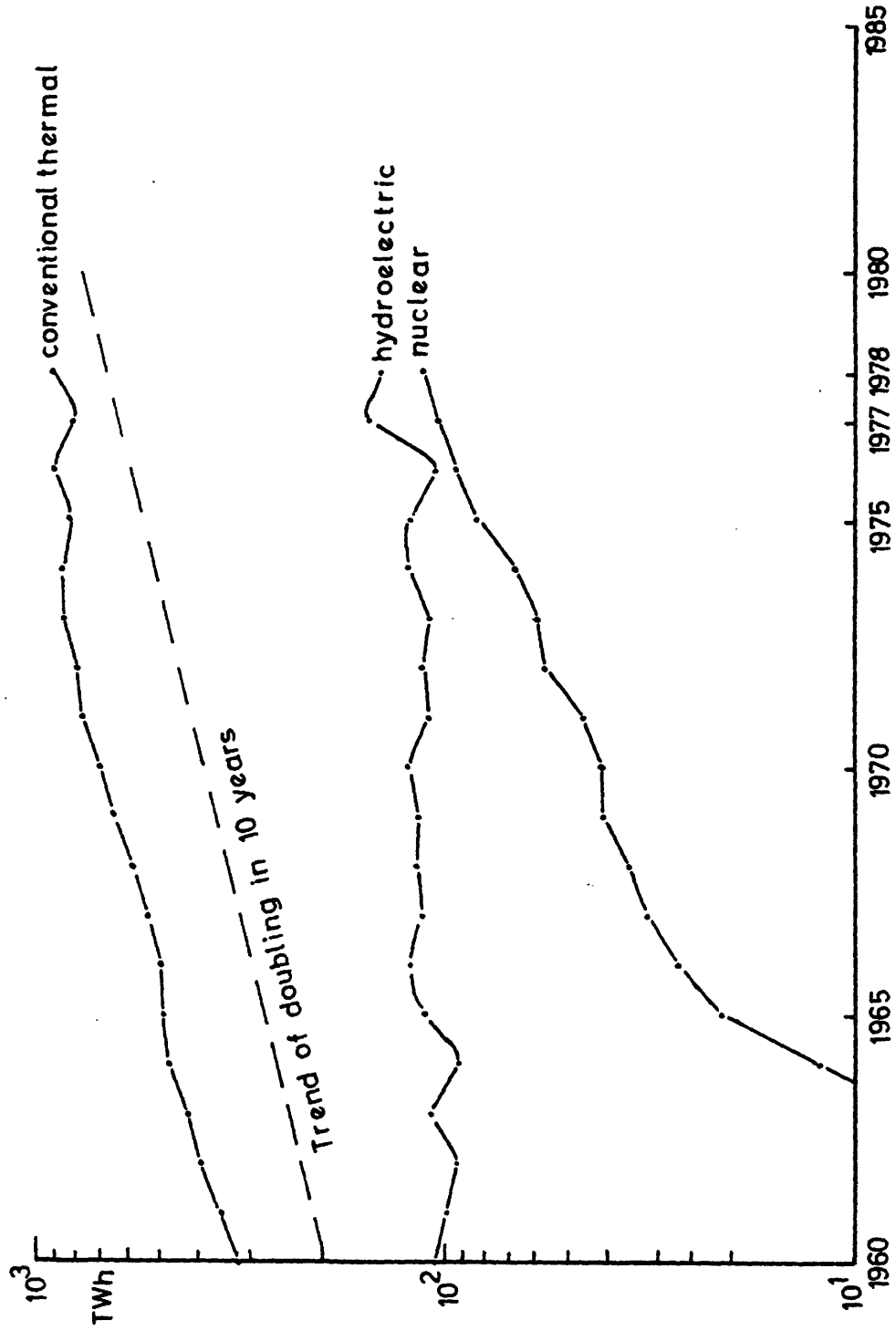


Fig. 2 EUR-9 Electrical Energy Generation

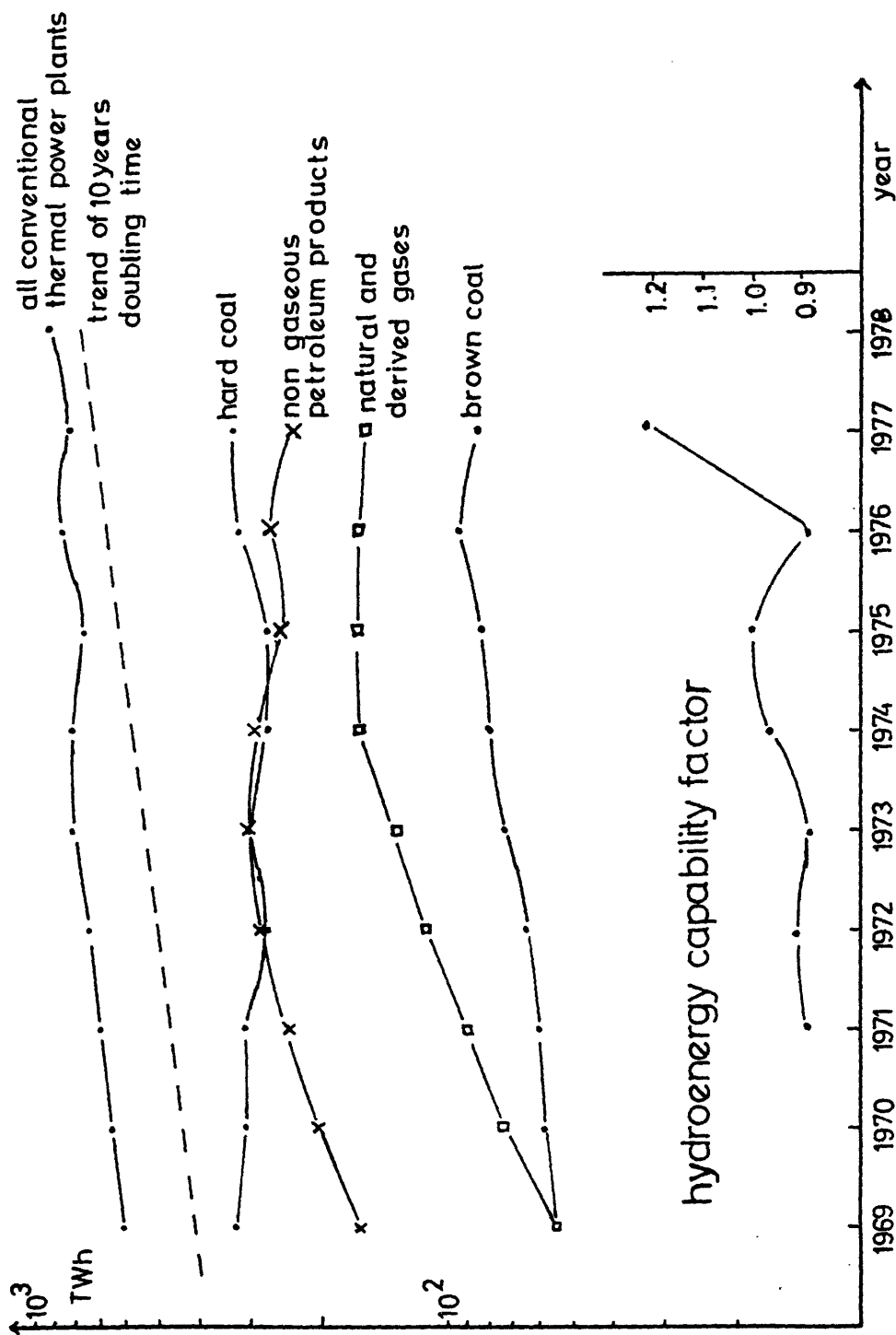


FIG.3 EUR-9 Electrical energy
Net production [TWh] by conventional thermal power plants

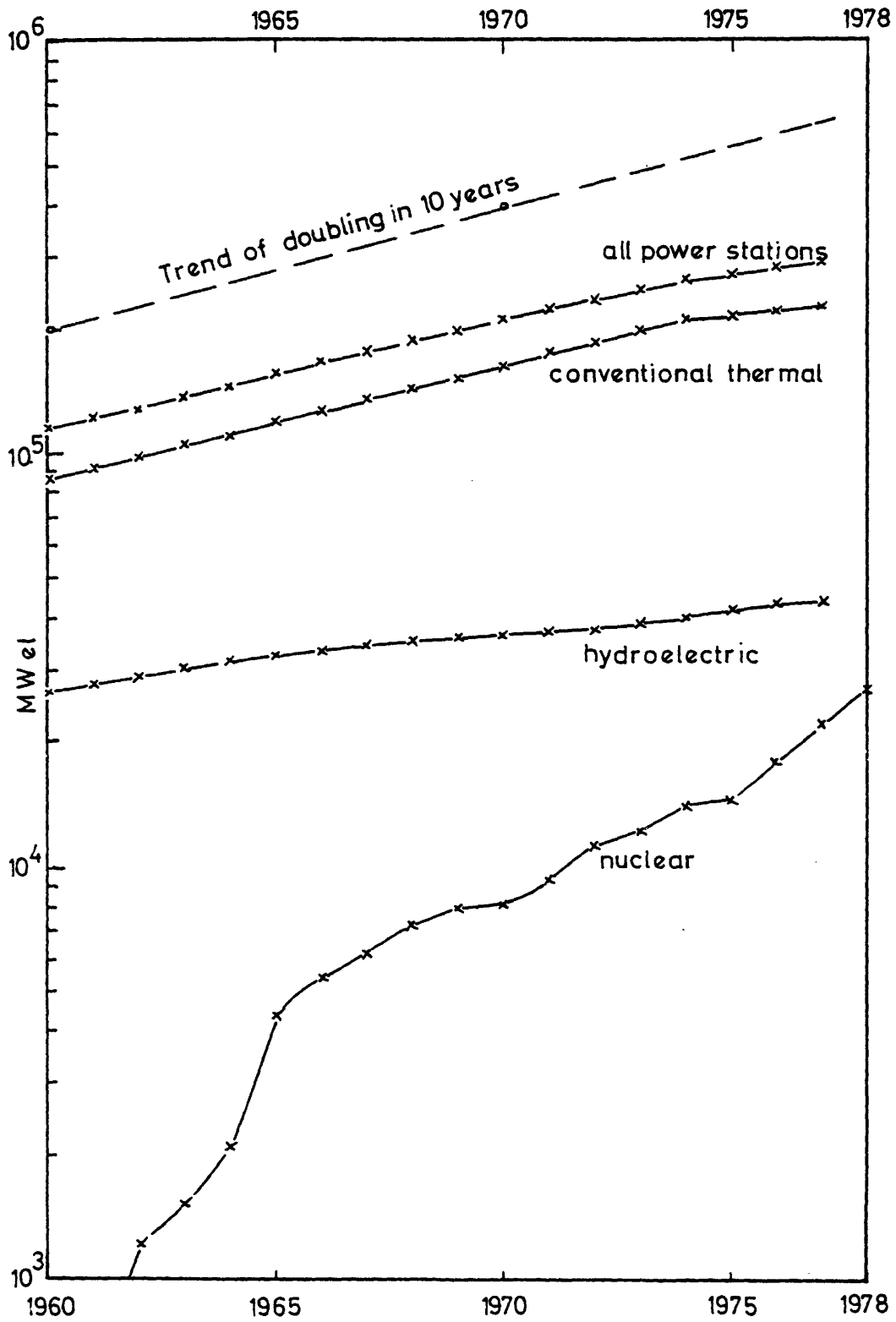


Fig.4 EUR-9 Installed Capacity

**Geographical maps of the conventional
thermal power stations in the EC.
(of 250 MW and more.)**

N



B



LX



Conventional thermal power stations - Belgium

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
1	Amercoeur	UNERG	272	c + oil + NG
	Auvelais	UNERG	117	c + oil + CG
	Baudour	Intercom	116	c + oil + CG
	Bressoux	Intercom	157	c + oil + NG
	Drogenbos	Intercom	270	oil + NG
	Farciennes	UNERG	110	c + oil + FG
	Gent	Town of Gent	143	c + oil
2	Kallo	EBES	560	c + NG
3	Langebrugge	EBES	254	c + oil + CG
4	Langerlo - Genk	EBES/UKEC	677	c + oil
5	Les Awirs	UNERG/Intercom	650	c + oil + CG
	Merksem	EBES	109	oil + CG
6	Mol	EBES	287	c + oil + NG
	Monçeau-Fontaine	EBES	118	c + oil
		Intercom a.o.		
	Monçeau sur Sambre	Intercom a.o.	217	c + oil + FG + NG
	Péronnes	Charbonnage de Ressaix-Péronnes	143	c + oil + CG
	Pont-Brûlé	Intercom	366	oil + CG
7	Rodenhuize	EBES	414	c + oil + FG
8	Rulen	Intercom	997	oil
	Schaerbeek	Intercom	161	c + oil
9	Schelle	EBES	533	c + oil + CG
	Waterschel	UKEC	117	c + oil + CG
	Angleur	Socolié	100	oil
8	Rodenhuize 4	EBES	280	oil + FG

EBES : Société Réunies d'Énergie du Bassin de l'Escaut
 Intercom : Société Intercommunale Belge de Gaz et d'Électricité SA
 SEMO : Société Belgo-Française d'Énergie Nucléaire Mosane
 UKEC : Union des Centrales Électriques de Campine

c : hard coal
 NG : Natural gas
 FG : Furnace gas
 CG : Coking gas

Conventional thermal power stations - Netherlands

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
1	Amsterdam/Hemweg	GEB	499	c + oil + NG
2	Bergum	PEB	656	NG
3	Borssele	PZEM	394	NG
4	Buggenum/Maas-centrale	PLEM	750	c + oil + NG
	Delft	GEB	104	NG
	Diemen	PEN	386	oil + NG
	Dongecentrale	PNEM	118	NG
5	Dordrecht/Merwedehaven	GEB	531	oil + NG
6	Geertruidenberg/Amer	PNEM	1717	c + oil + NG
	's-Gravenhage	GEB	186	c + oil
	Groningen/Helpman	EGD	142	c + oil
7	Groningen/Hunze	EGD	667	c + oil + NG
	Hengelo	IJC	194	c + oil
	Leeuwarden	PEB	155	c + oil
8	Lelystad/Flevo	PGEM	846	oil + NG
9	Nijmegen/Gelderland II	PGEM	309	c + oil
9	Nijmegen/Gelderland Zuid	PGEM	260	c + oil
10	Rotterdam/Galileistraat	GEB	393	oil + NG
11	Rotterdam/Maasvlakte	GEB/EZH	1024	oil + NG
	Rotterdam/Schiehaven	GEB	189	oil
12	Rotterdam/Waalhaven	GEB	977	c + oil + NG
13	Utrecht/Lage Weide	PEGUS	656	c + oil + NG
	Utrecht/Merwedekanaal	PEGUS	147	c
14	Velsen	PEN	1094	c + oil + NG
15	Vlissingen/Zeeland	PZEM	273	c
16	Zwolle/Harculo	IJC	707	c + oil + NG
17	Eems	EGD	600	NG
18	Maasbracht	PLEM	600	oil + NG
1	Hemweg	GEB	520	oil + NG
18	Maasbracht	PLEM	600	oil + NG
	Merwedekanaal	PEGUS	100	NG
6	Amer	PNEM	647	c + oil
9	Nijmegen/Gelderland	PGEM	618	c + oil
19	Harculo	IJC	320	c + oil

EGD : Elektriciteitsbedrijf voor Groningen en Drenthe
 EZH : NV Elektriciteitsbedrijf Zuid-Holland
 GEB : Gemeente-Energiebedrijf

IJC

EGD : Elektriciteitsbedrijf voor Groningen en Drenthe
EZH : NV Elektriciteitsbedrijf Zuid-Holland
GEB : Gemeente-Energiebedrijf
IJC : NV Elektriciteits-Maatschappij IJsselcentrale
PEB : Provinciaal Elektriciteitsbedrijf in Friesland
PEGUS : NV Provinciaal en Gemeentelijk Utrechts Stroomleveringsbedrijf
PEN : Provinciaal Elektriciteitsbedrijf van Noord-Holland
PGEM : NV Provinciale Gelderse Elektriciteits-Maatschappij
PLEM : NV Provinciale Limburgse Elektriciteits-Maatschappij
PNEM : NV Provinciale Noordbrabantse Elektriciteits-Maatschappij
PZEM : NV Provinciale Zeeuwse Energie-Maatschappij

c : hard coal
NG : natural gas

Conventional thermal power stations - Luxembourg

There are no big coal or oil-fired power stations in the territory of Luxembourg.

DK



IRL



Conventional thermal power stations - Denmark

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
1	Aarhusvaerket	MIES	230	c + oil
2	Amagervaerket	Town of Kopenhagen	256	c + oil
3	Asnaesvaerket	IFV	760	c + oil
4	Endstedvaerket	SHA	201	c + oil
5	Fynsvaerket	FI	620	c + oil
6	Kyndbyvaerket	IFV	934	c + oil
	Masnedövaerket	SEAS	184	c + oil
7	Nordkraft	Nordkraft	454	c + oil
8	H.C. Orsted vaerket	Town of Kopenhagen	247	c + oil
9	Skaerbaekvaerket	Faellescentral	492	c + oil
10	Stigsnaesvaerket	SEAS	413	oil
11	Studstrupvaerket	MIES	415	c + oil
	Svanemöllevaerket	Town of Kopenhagen	131	c + oil
	Vendsysselvaerket	NEFO	133	oil
12	Vestkraft	Vestkraft	500	c + oil
	Vendsysselvaerket	NEFO	300	oil + c
4	Enstedvaerket	SHA	620	c + oil
3	Asnaesvaerket	IFV	670	oil under construction

IFV	:	Elektricitetsseiskabet isefjordvaerket Interessentskab
Faellescentral	:	Interessentskabet Den sydostjyske Faellescentral Skaerbaekvaerket
FI	:	Interessentskabet Fynsvaerket
MIES	:	Interessentskabet Midtkraft Elektricitetselskab
NEFO	:	Interessentskabet Nordjyllands Elektricitetsforsyning NEFO
Nordkraft	:	Interessentskabet Nordkraft
SEAS	:	Sydostjaellands Elektricitets Aktieselskab
SHA	:	Sonderjyllands Hojspaendingswaerk Andelsselskab
Vestkraft	:	Interessentskabet Vestkraft

c : hard coal

Conventional thermal power stations - Ireland

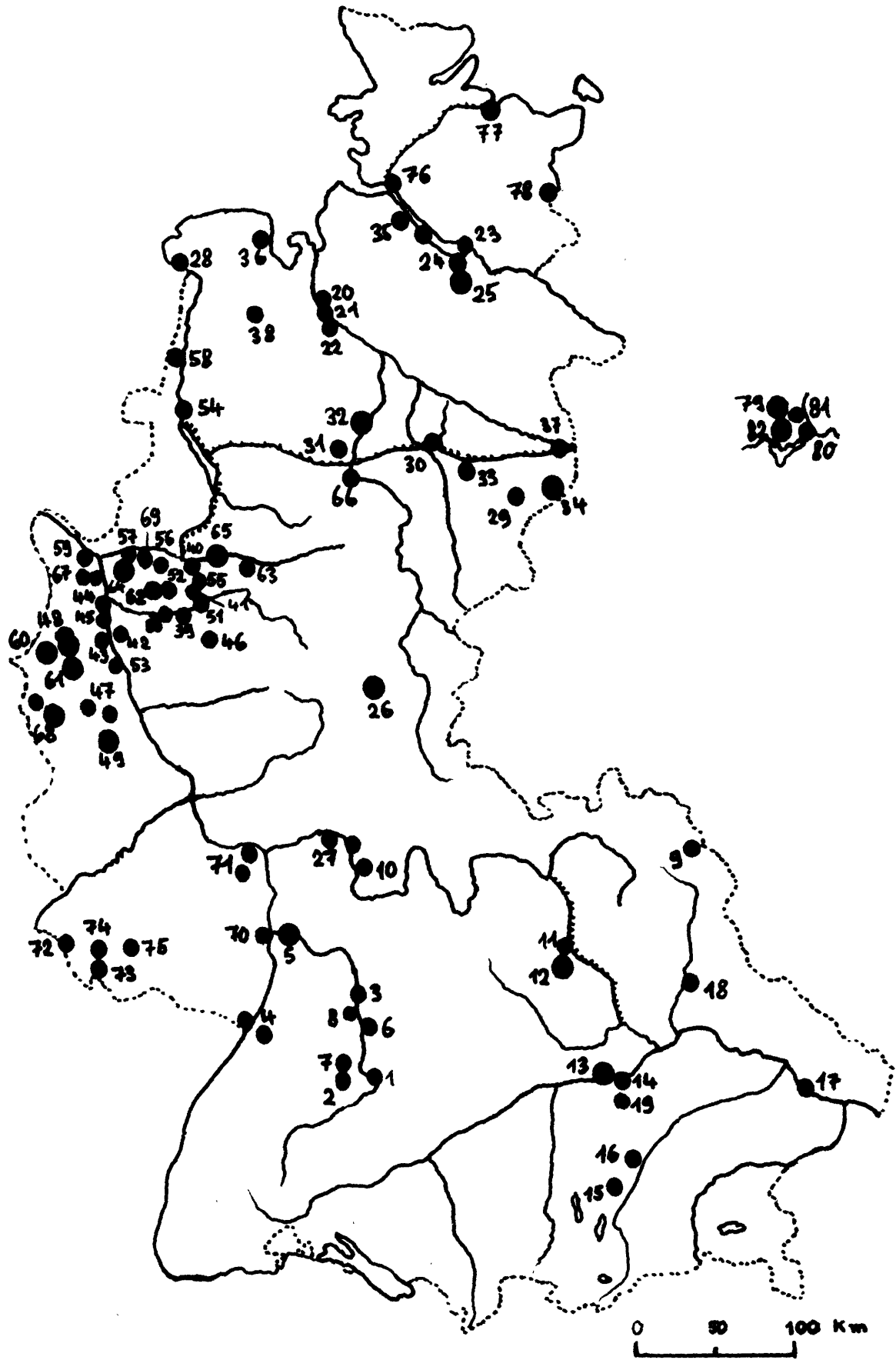
Number in geographical map	Location or name	Undertaking	Max. output capacity MW_{el}	Fuel
1	Great Island	ESB	121	oil
1	Ringsend	ESB	263	c + oil
2	Poolbeg	ESB	268	oil
	Tarbert	ESB	240	oil
2	Poolbeg	ESB	257	oil
	Aghada	ESB	257	NG under construction

ESB : Electricity Supply Board

c : hard coal

NG : natural gas

D



Conventional thermal power stations - Federal Republic of Germany and Western-Berlin

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
BADEN-WUERTTEMBERG				
1	Altbach	Neckarwerke AG	678	c + oil
2	Gaisburg	TW Stuttgart	297	c + oil
3	Heilbronn	EVS	560	c + oil
4	Karlsruhe/ Rheinhafen KW	Badenwerk	661	c + oil
5	Mannheim	GKW Mannheim AG	1419	c + oil + NG
6	Marbach	EVS	567	c + oil
7	Münster	TW Stuttgart	197	c + oil
8	Walheim	Neckarwerke AG	250	c + oil
BAYERN				
9	Arzberg	Bayerische Elektri- tät's-Lieferg. Ges.	384	L + oil + NG
10	Aschaffenburg	Bayernwerk	483	c
	Dettingen	RWE	147	c + oil
11	Frauenaurach	GKW Franken AG	388	c + oil
12	Gebersdorf	GKW Franken AG	969	c + oil + NG
13	Ingolstadt	Bayernwerk	1048	oil + RG
14	Irsching	Isar-Amperwerke AG	826	oil
15	München-Süd	Stw. München	321	c + NG
16	München-Nord	Stw. München	172	c
17	Pleinting	Ilse-Bayernwerk	694	oil
18	Schwandorf	Bayernwerk	648	L
19	Zolling-Anglberg/ Leiningerwerk	Isar-Amperwerke AG	254	c + oil
15	München-Süd	Stw. München	197	NG + oil under construction
9	Arzberg	BELG	122	NG + L
BREMEN				
20	Bremen/Farge	NWK	500	c
21	Bremen/Hafenkraft- werk	Stw. Bremen AG	375	c + oil + NG
	Bremen/Hastedt	Stw. Bremen AG	215	c + NG
22	Bremen/Mittelsbüren	Stw. Bremen AG	412	FG + oil
21	Bremen/Hafenkraft- werk	Stw. Bremen AG	300	c under construction
HAMBURG				
	Hamburg/Hafen HKW	HEW	228	oil
23	Hamburg/Neuhof	HEW	375	c + oil
	Hamburg/Tiefstack	HEW	216	c
24	Hamburg/Wedel	HEW	713	c + oil
25	Hamburg/Moorburg	HEW	1000	NG + oil

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cont.

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
HESSEN				
26	Borken	Preag	330	L
	Frankfurt/Gutleutstr.	Stw. Frankfurt	158	c + oil
	Frankfurt/Niederrad/HKW	Stw. Frankfurt	130	oil + NG
27	Grosskrotzenburg/Staudinger	Preag	795	c + oil
	Kassel	KW Kassel GmbH	132	c + NG
	Wölfersheim	Preag	112	L + oil
27	Grosskrotzenburg/Staudinger	Preag	630	oil + NG
NIEDERSACHSEN				
	Afferde	EW Wesertal GmbH	155	c + oil
28	Emden	NWK	739	c + oil + NG
29	Hallendorf	Peine-Salzgitter AG	310	c
30	Hannover/HKW	Stw. Hannover AG	155	c + oil + NG
30	Herrenhausen	Stw. Hannover AG	248	c + oil + SG
31	Lahde/Heyden	Preag	296	c + oil
32	Landesbergen/Robert Frank	Preag	1079	NG + oil
33	Mehrum	GKW Hannover-Braunschweig GmbH	200	oil + NG
34	Offleben	BKB	709	L
35	Stade/Schilling	NWK	341	oil
36	Wilhelmshaven	NWK	670	c + oil
37	Wolfsburg	VW	304	c + oil
38	Huntorf	NWK	290	NG
33	Mehrum	Preag/Hann. Braunschweig	650	c + oil + NG under construction
NORDHEIN-WESTFALEN				
	Alsdorf/Anna	EBV	141	c + CG
39	Bochum/Springorum	VKR	282	c
40	Datteln	VKR	273	c
41	Dortmund/Gustav Knepper	VKR	470	c
	Dortmund/Harpen	Harpener AG	138	c
42	Düsseldorf/Flingern	Stw. Düsseldorf AG	274	c + oil
43	Düsseldorf/Lausward	Stw. Düsseldorf AG	612	c + L + oil
44	Duisburg	Stw. Duisburg AG	430	c + NG
45	Duisburg/Huckingen	RWE	282	NG + FG
	Duisburg-Ruhrort/Hermann Wenzel	ATH	216	c + FG
46	Elverlingsen	KEW Mark AG	440	c + NG
	Essen-Karnap	RWE	127	c
47	Fortuna II & III	RWE	834	L
48	Frimmersdorf	RWE	2376	L
	Gelsenkirchen/Bismarck	Texaco	156	c
	Gelsenkirchen/Horst	Veba-Chemie	104	c

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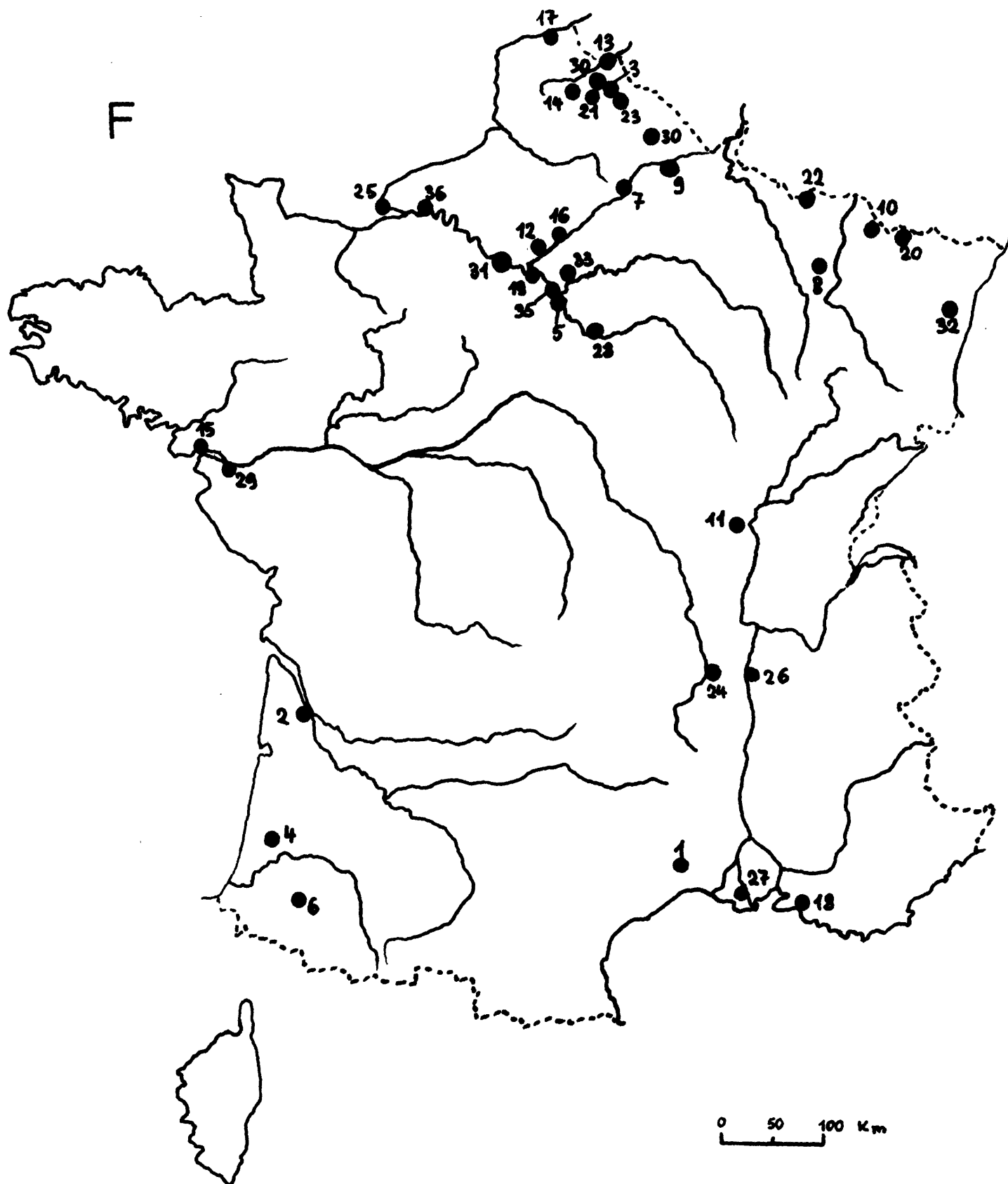
Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
49	Goldenbergwerk	RWE	763	L
	Hamborn	ATH	121	c
50	Hattingen	GKW Hattingen	275	NG + CG
51	Herdecke/Cunowerk	KEW Mark AG	278	c + NG + CG
52	Herne/GKW	Steag	564	c
	Herne/Shamrock	VKR	126	c
	Ibbenbüren	Preussag	226	c
	Kirchlengern	EW Minden-Ravens- berg GmbH	172	NG
53	Köln/Niehler Hafen	GEW Köln AG	300	NG + oil
	Köln-Nord/HKW	GEW Köln AG	169	oil + NG
	Krefeld-Uerdingen	Bayer	122	c + oil
	Leverkusen	Bayer	242	c
54	Lingen/Emsland	VEW	850	NG
55	Lünen/GK Ost	Steag	329	c
55	Lünen/Kellermann	Steag	355	c
56	Marl	BASF-KW Marl GmbH	235	c
57	Marl	CWH	417	c + NG
	Marl	Thyssen Energie GmbH	141	c
58	Meppen	RWE	585	NG
59	Möllen/GK West	Steag	658	c
60	Neurath	RWE	1986	L
61	Niederhaussem	RWE	2536	L
62	Rauxel	KLöckner-Werke	278	c
	Rheinpreussen	Texaco	147	c
63	Schmehausen/Westf.	VEW	650	c + oil
64	Scholven	VKR	2706	c + oil
	Siersdorf	EBV	140	c
65	Stockum/Gersteinwerk	VEW	1806	c + oil + NG
66	Veltheim I	Interargem	480	c + oil
66	Veltheim II	Interargem	360	NG
67	Walsum	Walsum AG	346	c
68	Weisweiler	RWE	2133	L
69	Westerholt	VKR	276	c
45	Duisburg-Huckingen	RWE	282	NG + oil
43	Düsseldorf-Lausward	Stw. Düsseldorf AG	294	oil
64	Scholven F	VKR	654	c
	Voerde/GK West 3&4	Steag	2 x 623	c planned
RHEINLAND-PFALZ				
70	Ludwigshafen	BASF	451	c + oil
71	Mainz	KW Mainz-Wiesbaden	341	c
71	Mainz	KW Mainz-Wiesbaden	319	NG + oil

cont...

cont.

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
SAARLAND				
72	Bexbach/St.Barbara	Saarbergwerke	245	c
73	Ensdorf	VSE	510	c
74	Fürstenhausen/Fenne	Saarbergwerke	301	c
75	Göttelborn/Weiher	Saarbergwerke	1011	c
	Wehrden	KW Wehrden GmbH	225	c + CG + FG
SCHLESWIG-HOLSTEIN				
76	Brunsbüttel	HEW	264	oil
77	Kiel-Förde	GKW Kiel GmbH	300	c
78	Lübeck-Siems	NWK	200	c
WEST-BERLIN				
79	Berlin/Charlottenburg	Bewag	422	c + oil
20	Berlin/Lichterfelde	Bewag	438	oil
	Berlin/Moabit	Bewag	195	c + oil
	Berlin/Oberhavel	Bewag	194	c + oil
81	Berlin/Reuter	Bewag	416	c
	Berlin/Rudow	Bewag	167	c
82	Berlin/Wilmersdorf	Bewag	276	oil

c : hard coal
L : brown coal
NG : natural gas
FG : furnace gas
CG : coking gas
RG : refinery gas
KG : sewage gas



Conventional thermal power stations - France

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
1	Aramon 1	EDF	685	oil
1	Aramon 2	EDF	685	oil
	Albi	EDF	250	c
2	Ambès	EDF	1234	oil + NG
3	Ansereuilles	EDF	468	c + oil
4	Arjuzanx	EDF	227	L
5	Arrighi	EDF	222	oil + NG
6	Artix	EDF	369	NG
7	Beautor	EDF	351	c
8	Biénod	EDF	980	c
9	Bouchain	EDF	576	c + NG
10	Carling	CDF	330	c
11	Chalon II	EDF	234	c
12	Champagne	EDF	480	c
13	Commines II	EDF	117	c
14	Courrières	CDF	234	c + oil + CG
15	Cordemais	EDF	1955	oil
16	Creil	EDF	468	c
17	Dunkerque	EDF	468	oil + FG + CG
	Emile-Huchet	CDF	746	c + CG
18	Gardanne	CDF	393	L
19	Gennevilliers II	EDF	325	c
20	Grosbliederstroff	CDF	220	c
21	Harnes	CDF	110	c
22	Herserange	CDF	123	c + FG
23	Hornaing	CDF	474	c + oil
	La Maxe	EDF	480	c
24	Le Bec	CDF	170	c
25	Le Havre	EDF	1420	c + oil
26	Loire-sur-Rhône	EDF	1000	c + oil
	Lucy III	CDF	240	c
27	Martigues-Ponteau	EDF	1000	oil
28	Montereau	EDF	734	c + NG + oil
29	Nantes/Cheviré	EDF	801	c + oil + NG
	Pont-de-Claix	Rhône-Progil	166	c
30	Pont-sur-Sambre	EDF	474	c
31	Porcheville A	EDF	468	c
31	Porcheville B	EDF	2340	oil
	Richemont	Mixed	384	FG + CG + c
	Saint-Quen	EDF	480	oil + NG
32	Strasbourg II	EDF	234	c
33	Vaires	EDF	480	c
34	Violaines	CDF	234	c + CG + oil
35	Vitry	EDF	1100	c + oil
36	Yainville	EDF	334	c + oil

EDF : Electricité de France
 CDF : Charbonnages de France
 CNR : Compagnie Nationale du Rhône
 SNCF : Société Nationale Chemins de Fer Français
 SENA : Société d'Énergie Nucléaire Franco-Belge des Ardennes

c : hard coal
 L : Brown coal
 NG: natural gas
 FG: furnace gas
 CG: coking gas

Conventional thermal power stations - Great Britain

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
1	Aberthaw A	CEGB	704	c + oil
1	Aberthaw B	CEGB	1083	c
	Acton Lane	CEGB	148	c
2	Agecroft	CEGB	336	c
3	Ballylumford	NIES	912	oil
	Bankside	CEGB	226	oil
4	Barking B	CEGB	144	c
4	Barking C	CEGB	245	oil
5	Battersea A	CEGB	228	c + oil
5	Battersea B	CEGB	245	c
6	Belfast	NIES	360	c + oil
7	Belvedere	CEGB	460	oil
	Blackburn	CEGB	143	c
	Blackburn Meadows	CEGB	151	c
8	Blyth A	CEGB	448	c
8	Blyth B	CEGB	1100	c
9	Bold A	CEGB	120	c
9	Bold B	CEGB	166	c
	Braehead	SSEB	253	oil
10	Brighton B	CEGB	320	c
	Bromborough	CEGB	197	oil
11	Brunswick Wharf	CEGB	330	oil
12	Carmarthen Bay	CEGB	342	c
	Carolina Port	NSHB	307	oil
13	Carrington	CEGB	240	c
14	Castle Donington	CEGB	591	c
	Chadderton B	CEGB	236	c
15	Clarence Dock	DEGB	156	oil
16	Cliff Quay	CEGB	258	c
17	Cockenzie	SSEB	1152	c
	Connah's Quay	CEGB	180	c
18	Coolkeeragh/Londonderry	NIES	447	oil
19	Cottam	CEGB	1780	c
20	Croydon B	CEGB	338	c
	Dalmarnock	SSEB	202	oil
	Deptford East	CEGB	158	c
21	Didcot	CEGB	1440	c
22	Doncaster	CEGB	122	c
23	Drakelow A	CEGB	228	c
23	Drakelow B	CEGB	448	c
23	Drakelow C	CEGB	1155	c
24	Drax	CEGB	1880	oil + c
25	Dunston B	CEGB	225	c
	Earley	CEGB	225	c
	East Yelland	CEGB	194	c
26	Eggborough	CEGB	1908	c
	Elland	CEGB	168	c
27	Fawley	CEGB	2000	oil
28	Ferrybridge A	CEGB	125	c

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cont.

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
28	Ferrybridge B	CEGB	282	c
28	Ferrybridge C	CEGB	2000	c
29	Fiddler's Ferry	CEGB	1974	c
30	Fulham	CEGB	336	oil
	Goldington	CEGB	168	c
31	Hams Hall A	CEGB	166	c
31	Hams Hall B	CEGB	306	c
31	Hams Hall C	CEGB	366	c + NG
	Hartshead	CEGB	125	c + oil
	Hastings	CEGB	110	oil
32	High Marnham	CEGB	930	c
	Huncoat	CEGB	150	c
33	Ince	CEGB	240	oil
34	Inverkip 1	SSEB	660	oil
35	Ironbridge A	CEGB	200	c + oil
35	Ironbridge B	CEGB	954	c
36	Keadby	CEGB	336	c
37	Kearsley	CEGB	250	c + oil
38	Kincardine	SSEB	714	c
39	Kingsnorth	CEGB	2003	c + oil
	Kingston	CEGB	117	c
	Kirkstall	CEGB	190	oil
	Lister Drive	CEGB	110	oil
	Little Barford A	CEGB	120	c
	Little Barford B	CEGB	118	c
68	Littlebrook B	CEGB	113	oil
68	Littlebrook C	CEGB	231	oil
	Llynfi	CEGB	113	c
40	Longannet	SSEB	2304	c
41	Marchwood	CEGB	466	oil
	Meaford A	CEGB	112	c
	Meaford B	CEGB	224	c
	Mexborough	CEGB	113	c
	Neepsand	CEGB	151	c
	Nechells B	CEGB	212	c
42	Northfleet	CEGB	684	oil
43	North Tees C	CEGB	236	c
	Norwich	CEGB	140	c
44	Nottingham	CEGB	288	c
	Ocker Hill	CEGB	120	c
	Padiham B	CEGB	224	c
45	Pembroke	CEGB	1920	oil
46	Plymouth B	CEGB	209	oil
47	Poole	CEGB	325	oil
48	Portishead B	CEGB	373	oil
	Porthmouth	CEGB	112	oil
49	Ratcliffe-on-Soar	CEGB	2000	c
	Ribble B	CEGB	120	c
50	Richborough	CEGB	342	oil
	Rogerstone	CEGB	120	c
	Roosecote	CEGB	120	c
	Rotherham	CEGB	150	c
51	Rugeley A	CEGB	560	c

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cont.

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{eI}	Fuel
51	Rugeley B	CEGB	970	c
52	Rye House	CEGB	260	c
53	Skelton Grange A	CEGB	336	c
53	Skelton Grange B	CEGB	448	c
54	South Denes	CEGB	248	oil
	Spondon	CEGB	151	c
55	Staythorpe A	CEGB	336	c
55	Staythorpe B	CEGB	336	c
56	Stella North	CEGB	236	c
56	Stella South	CEGB	300	c
57	Stourport A	CEGB	119	c
57	Stourport B	CEGB	112	c
	Thornhill	CEGB	157	c
58	Thorpe Marsh	CEGB	1057	c
59	Tilbury A	CEGB	348	oil
59	Tilbury B	CEGB	1268	c
60	Uksmouth A	CEGB	342	c
60	Uksmouth B	CEGB	336	c
61	Wakefield	CEGB	234	c
	Walsail	CEGB	191	c
62	West Burton A	CEGB	1908	c
	West Ham	CEGB	114	c
63	West Thurrock	CEGB	1240	c + NG
	Westwood	CEGB	120	c
64	Willington A	CEGB	392	c
64	Willington B	CEGB	376	c
	Woolwich	CEGB	156	c
65	Grain 1 & 2	CEGB	2 x 660	oil
34	Inverkip 2	SSEB	660	oil
65	Grain 3 & 4	CEGB	2 x 660	oil
66	Peterhead 1	NSHB	660	oil + NG
1	Aberthaw B 9	CEGB	483	c
33	Ince B 1 & 2	CEGB	2 x 500	oil
34	Inverkip 3	SSEB	660	oil
65	Grain 5	CEGB	660	oil under construction
67	Kilroot 1	NIES	300	oil "
68	Littlebrook D 1	CEGB	660	oil "
66	Peterhead 2	NSHB	660	oil + NG "
67	Kilroot 2	NIES	300	oil "
68	Littlebrook D 2	CEGB	660	oil "
67	Kilroot 3	NIES	300	oil "
68	Littlebrook D 3	CEGB	660	oil "

CEGB : Central Electricity Generating Board
NIES : Northern Ireland Electricity Service
SSEB : South of Scotland Electricity Board
NSHB : North of Scotland Hydro-Electric Board

c : hard coal
NG : natural gas



Conventional thermal power stations - Italy

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
	Augusta	ENEL	140	oil + NG
	Bari	ENEL	205	c + oil + NG
	Bastardo	ENEL	150	oil
1	Brindisi	ENEL	905	oil
	Camerata Picena	ENEL	104	oil + NG
2	Chivasso	ENEL	563	oil + c + NG
3	Civitavecchia	ENEL	426	c
	Codrongianos	ENEL	102	oil
4	Fusina	ENEL	485	c + oil
5	Genova	ENEL	281	c + oil
6	La Casella	ENEL	1200	oil
	Larderello	ENEL	189	geothermie
7	La Spezia	ENEL	1821	c + oil
	Maddaloni	ENEL	180	oil
8	Marghera	ENEL	390	c + oil
9	Marghera Levante	Monte Edison Chim.	305	oil + NG
10	Marzocco	ENEL	296	oil
	Mercure	ENEL	150	oil
11	Milazzo	ENEL	608	oil
12	Milazzo Levante	ENEL	320	oil
13	Monfalcone	ENEL	320	c + oil
14	Napoli Levante	ENEL	412	c + oil + NG
15	Ostiglia	ENEL	1220	oil
	Ottana	Chimica e Fibro del Tirzo	135	oil
	Palermo	ENEL	180	c + oil
16	Piacenza Levante	ENEL	653	oil + NG
	Piacenza Emilia	ENEL	140	oil
17	Piombino	ENEL	320	oil
18	Porto Corsini	ENEL	434	oil
	Porto Empedocle	ENEL	150	NG + oil
19	Priolo Melilli/Sicilia	Sincat Chim.	265	oil + RG
	Porto Marchera	Alsar	160	c + oil
20	Sulcis/Sardegna	ENEL	490	c + oil
21	Portoscuso/Sardegna	Alsar	245	c + oil
22	Puglia/Taranto	Italsider	455	CG + FG
	Ravenna	Anic	125	oil
23	Rossano	ENEL	640	oil
24	Santa Barbara	ENEL	260	L + oil
25	Tavazzano	ENEL	387	oil + NG
26	Termini Imerese/Sicilia	ENEL	345	oil + NG
27	Torre Valdaliga	ENEL	1116	oil
	Turbigo	ENEL	145	oil
28	Turbigo Levante	ENEL	1146	oil
29	Vado Ligure	ENEL	1200	c + oil
17	Piombino 1 & 2	ENEL	2 x 300	oil
1	Brindisi 4	ENEL	300	oil + c
4	Fusina 4	ENEL	300	oil + c
23	Rossano 3 & 4	ENEL	2 x 300	oil
26	Termini Imerese Ponente 1 & 2	ENEL	2 x 300	oil

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cont.

Number in geographical map	Location or name	Undertaking	Max. output capacity MW _{el}	Fuel
49	Melilli 1 & 2	ENEL	2 x 300	oil
30	Morto Toile 1	ENEL	640	oil + c
25	Tavazzano 1	ENEL	300	oil
31	Sermide 1	ENEL	300	oil under construction or planned
30	Porto Tolle 2	ENEL	640	oil "
25	Tavazzano 2	ENEL	300	oil "
31	Sermide 2 & 3	ENEL	2 x 300	oil "
13	Monfalcone 3 & 4	ENEL	2 x 300	oil "
30	Porto Tolle 3 & 4	ENEL	2 x 640	oil "
27	Torvaldaliga Nord 1 & 2	ENEL	2 x 640	oil "

ENEL : Ente Nazionale per l'Energia Elettrica

c : hard coal
L : brown coal
NG : natural gas
FG : furnace gas
CG : coking gas

ANNEX

During the preparation of this report a very interesting resolution on the medium and long-term perspectives for coal in the Community has been adopted by the European Coal and Steel Community Consultative Committee. Table 8 summarizes the Community's energy requirements in 1977-2000(4).

4) Official Journal of the European Communities
No. C 161/10 of 28.6.1979.

Meeting the Community's energy requirements in 1977, 1985, 1990 and 2000

(million tce) (*)					
	1977 (†)	1985 (‡)	1990 (‡)	2000	2000
Real economic growth 1977/2000				3.8 % p.a.	2.6 % p.a.
Energy coefficient 1977/2000				0.73	0.78
Growth in energy requirements 1977/2000				2.8 % p.a.	2.0 % p.a.
Coal					
indigenous	208	226	236	250-300	250-300
imported	<u>38</u>	<u>59</u>	<u>79</u>	<u>350-300</u>	<u>200-150</u>
	246	285	315	600	450
Brown coal					
indigenous	38	40	40	40	40
Oil					
indigenous	64	164-236	124-210	150-180	150-160
imported	<u>686</u>	<u>755-669</u>	<u>829-722</u>	<u>750</u>	<u>680</u>
	750	919-905	953-932	900-930	830-840
Natural gas					
indigenous	200	199-213	166-187	100-140	100-110
imported	<u>25</u>	<u>119</u>	<u>174</u>	<u>300</u>	<u>270</u>
	225	318-332	340-361	400-440	370-380
Nuclear					
indigenous	37	162	297	450	350
Renewable energies and hydro-power					
indigenous	51	50	56	150-80	100-80
imported	<u>5</u>	<u>4</u>	<u>6</u>	<u>10</u>	<u>10</u>
	56	54	62	160-90	110-90
Total					
indigenous	598	841-927	919-1 026	1 140-1 190	990-1 040
imported	<u>754</u>	<u>937-851</u>	<u>1 088- 981</u>	<u>1 410-1 360</u>	<u>1 160-1 110</u>
	1 352	1 778	2 007	2 550	2 150

(*) Conversion factor: 1 toe = 1.43 tce for 1977, 1985, 1990.

(†) Gross energy consumption minus net imports =: consumption of indigenous energy.

(‡) Member States' estimates: COM (78) 613 (final) of 16 November 1978.

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EUR 6998 – Mobilization of heavy metals from fossil-fuelled power plants, potential ecological and biochemical implications

I – Electricity demand, installed capacity and geographical location of the fossil-fuelled power stations in the territory of the European Community

by L. Goetz, E. Sabbioni and A. Springer

Joint Research Centre, Ispra Establishment (Italy)

Luxembourg : Office for Official Publications of the European Communities

1981 – III, 42 pp., 7 tab. and 4 fig. – 21.0 x 29.7 cm

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