DGXVII - July 1990

WORKING DOCUMENT XVII/315/90-EN

INVENTORY

OF

FEATURES OF THE ELECTRICITY SUPPLY SECTOR

IN THE

EUROPEAN COMMUNITY

REVIEW
OF THE PRINCIPAL FEATURES OF THE ELECTRICITY SECTOR IN THE COMMUNITY

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

OVERVIEW

1. Within the Community, there is no common structure of the electricity sector. A variety of ownership patterns exist, both public and private, and the production, transmission and distribution functions are associated, and in some cases integrated, in various ways. One common feature is that of the influences de jure or de facto, of Member State Governments in the functioning of the sector through regulatory or other processes. Concessionary monopolies exist in distribution and in the control and operation of the high voltage transmission systems in most Member States.

2. In some Member States (France, Italy, Portugal, Ireland, Greece and areas of the U.K.) the distribution, transmission and production functions are mainly vertically integrated in one organisation. In Member States with different organisational structures, co-operative arrangements exist between the various organisations.

3. The regulatory and other processes of the exercise of Member State Governments influence on the sector extend, depending on the Member State concerned, to the control of electricity prices, investments and other aspects of the functioning of the sector, reflecting the respective Government's views of the importance of the sector in the implementation of energy and economic policies.

4. As distinct from the "public supply" organisations, industrial auto-producers contribute some 10% of total electricity production in the Community. The ability of such producers to sell surplus electricity to the public system and to purchase from it are subject to conditions varying between Member States.

5. The high voltage transmission systems in the Community (with the exception of those of Ireland and Greece) are interconnected and operate as an integrated system. Whilst there are no restrictions on the interchange of electricity between these systems, there exist monopolies of import/export assigned to some transmission organisations.

B E L G I U M

SECTION 1 - STRUCTURE OF THE ELECTRICTY SECTOR

A. GENERAL DESCRIPTION

The electricity production in Belgium is run basically by private utilities which produce 93% of the total electricity. A public utility presently covers 3% of the production and 4% are produced by auto-producers.

The high voltage transmission network is operated by a joint company CPTE formed by the producing utilities.

Distribution is carried out either by private utilities, or association of private utilities and municipalities.

The government establishes the goals of its energy policy through the Ministry of Economy, which approves investment plans and tariffs. The major instrument in regulating the electricity industry is the Control Committee (Comité de Contrôle du Gaz et de l'électricité) in which trade unions, industries, government, municipalities and utilities are represented. The Control Committee presents recommendations to the industry and to the Government on a wide range of issues and is charged to make sure that the evolution of the sector is oriented in the general economic interest and fits into the overall energy policy.

B. PRODUCTION

1. Number of undertakings, capacity, production.

The electricity production industry in Belgium is now run basically by one private utility Electrabel, which produces 93 % of total electricity. Electrabel was formed in June 1990 from the merger into a single company of the production activities of the three former private utilities, INTERCOM, UNERG and EBES.

Since the Law of August 1980, public production facilities, have been regrouped under the "Société Coopérative de Production d'Electricité" (SPE) which covers 3% of the production. The other 4% are produced by auto-producers.

In 1981, the three private utilities came to an agreement with the Government which allows the public sector to reach 15% of the total national capacity, by the year 1995 (1).

(1) As a result of recent negotiations this deadline would be extended to 2005.

The following table shows the national capacity and production for 1988 :

	Capacity (MW)	(%)	Production (kWh)	(%)
Private companies	12.400	88,4	57.711	93,2
Public company	887	6,3	1.612	2,6
Auto-producers	743	5,3	2.590	4,2
NATIONAL TOTAL	14.030	100,0	61.913	100,0

2. Ownership

The TRACTEBEL group owns directly and indirectly 42 % of Electrabel.

The public company SEP is owned by the National Investment Company SNI, the Municipalities Credit Bank CCB and municipalities.

3. Cooperation among utilities

The generating utilities have joined together in several organisations which allow them to efficiently coordinate their activities :

- Pool des Calories : in charge of fossil fuel purchases for power stations;
- Synatom : in charge of management of the nuclear fuel cycle;
- CPTE : company for coordination of production and transport of electric energy;
- Gecoil : company for management and construction of high voltage grid and power station interconnection;
- Laborelec : common laboratory for applied research.
- Electronucléaire[1)] : holds the Belgian participation in international nuclear projects.

1) without SPE

4. Auto-producers

The auto-production share in 1988 amounts to 4% of the total national electricity consumption.

C. TRANSMISSION

1. Number of undertakings

The daily coordination of production and transmission is run at national level by the "Société pour la coordination de la production et du transport de l'énergie électrique" (CPTE).

The grid is owned by the company GECOLI.

2. Ownership

CPTE and GECOLI are owned by the generating utilities.

3. Interconnections

See annex.

D. DISTRIBUTION

1. Number of undertakings

Electric power distribution is governed by the "Electricity Distribution Act" of March 10, 1925, which establishes the municipality as being responsible for distribution. The municipality may operate a distribution monopoly or grant concessions to the private sector, or it may join, with or without the participation of the private sector, an association of municipalities which may operate as a monopoly or entrust the daily management of the operation to a third party or grant a concession. However, the monopoly that is granted is limited to electric supplies for lighting and domestic uses as well as for power and industrial uses of less than 1.000 kW. For supplies greater than this, the consumer may apply to the producer of his choice.

As a result, 43 distributors are active in the country. In 1988, the approximate number of customers was 5 million.

2. Ownership

As regards ownership, the distributors can be classified in three categories :

- Bulk distribution is operated by the private utility. It represents 41% of the market, supplying mainly industry.

- Distribution organised by the municipalities in association with private utilities (intercommunales mixtes) for residential consumers, public services and small to medium sized companies . It represents 48% of the market.

- Distribution organised by the municipalities on their own (intercommunales pures); it represents 11% of the market.

3. Cooperation

Municipalities participating into intercommunales mixtes have formed an association INTERMIXT represented at the Control Committee.

ANNEX TO SECTION 1 QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	5.500
Thermal monovalent	
- coal	126
- brown coal	-
- oil	98
- by-product gas	60
Thermal polyvalent	
- with coal	3.673
- without coal	2.059
Hydro	
- gravity	93
- pumped storage	1.238
New energies	5
Gas turbines, diesel etc.	898
Not specified	-
TOTAL	13.750

Source : UNIPEDE

(b) Power stations under construction

None.

(c) Total production par type of fuel

origin of production	electricity GWH	%
Hydro (including pumped)	1.162	1,9
Nuclear	40.887	66,0
Thermal		
- coal	12.567	20.3
- brown coal (or peat)	-	-
- oil	1.622	2,6
- natural gas	2.406	3,9
- by product gas	2.710	4,4
- miscellaneous	559	0,9
TOTAL	61.913	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
Belgium-Nederland				
	Gramme	Maasbracht	380	1.320
	Massenhoven	Maasbracht	380	1.320
	Zandvliet	Gertruidenberg	380	1.650
	Zandvliet	Borssele	380	1.650
	Maldegem	Oostburg	150	60
	Total capacity			6.000
Belgium-Luxembourg				
	Aubange	Belval	150/220	350/400
	Total capacity			750
Belgium-France				
	Jamiolle	Chooz	220	400
	Avelgem	Avelin	380	1.320
	Achene	Mazures	380	1.320
	Aubange	Moulaine	220	400
	Total capacity			3.440

Total transmission capacity between Belgium and its neighbouring countries= 10.190

Source : UCPTE

(b) Lines and cables under construction

None.

(c) Electricity exchanges

In 1988 Belgium has imported 5.708 GWh (5.660 GWh in 1987), and exported 7.833 GWh (7.778 GWh in 1987). There was a slight decrease in the export balance in 1988 as compared with the previous year.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	3.023	(1000 TOE)	
Lignite consumption	-	>>	>>
Consumption of petrol. products	389	>>	>>
Natural gas consumption	708	>>	>>
Derived gas consumption	711	>>	>>
Nuclear heat consumption	10.797	>>	>>
Other fuels	254	>>	>>

Source : EUROSTAT

D E N M A R K

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

In Denmark nearly all electricity production (99.7%) is managed by 12 undertakings, the Government takes no part in the operation of electricity undertakings. As a general rule, these undertakings are concerned only with the production and bulk transmission of electricity which they sell to local distributors.

The Great Belt divides the country into two supply areas. Producers in each area are organised within two organisations, ELSAM in the western area, Jutland and Funen, (around 53% of the market), is composed by eight electricity utilities: six Producers and two Producers, Transmitters and Distributors; and ELKRAFT in the eastern area, Zealand and Bornholm, (around 47% of the market), is composed by four electricity utilities: one is a Producer only and the other three are Producers, Transmitters and Distributors. Every operation in the fields of Production or Transmission must be according to authorization and sole rights granted by the Minister of Commerce (Electricity Supply Act 1976, Art. 3, section) and this authorization cannot be granted for a period shorter than 20 years.

B. PRODUCTION

All twelve undertakings are "service" organisations rather than private profit-making enterprises. Ten of these producer undertakings are organised as private companies. The consumers through their representatives in the distribution companies (municipalities/cooperatives) are represented on the Board of Directors. The remaining two undertakings are wholly owned by the Municipalities of Copenhagen and Randers, which distribute electricity directly to consumers.

The following table contains the capacity and production by companies 1988 :

	N° annex. table	Capacity (MW)	(%)	Production (GWh)	(%)
ELSAM					
MIDKRAFT	111	1.287	18,9	3.795	15,7
FYNSVAERKET	511	585	8,6	2.166	9,0
VESTKRAFT	311	516	7,6	1.625	6,7
SH	411	444	6,5	2.373	9,8
NORDKRAFT	011	447	6,6	1.217	5,0
NEFO	012	450	6,6	1.132	4,7
SKAERBAEKVERKET	211	369	5,4	1.331	5,5
RANDERS	152	44	0,6	178	0,7
ELKRAFT					
IFV	711	1.367	20,1	6.763	28,0
COPENHAGEN	611	653	9,6	1.697	7,0
SEAS	811	558	8,2	1.876	7,8
OSTKRAFT	911	70	1,0	1	0,0

The autoproduction share in 1987 was estimated at 1% of the total national electricity consumption.

C. TRANSMISSION

The transmission networks of 30 kV and above are operated by 28 undertakings, including the producers undertakings mentioned above.

There is, for historical reasons no national grid in Denmark. The country is divided in two grids. Jutland and Funen, traditionally from the very beginning, have had an exchange of electricity with Germany, and Zealand with southern Sweden. Later, Jutland was interlinked also with northern Sweden and Norway.

The transmission network is peculiar in the way it interconnects with neighbouring systems. While the eastern part links up with the Swedish AC network, the western part is interconnected synchronously with the continental European power system and via DC links with Norway and Sweden. ELSAM and ELKRAFT are engaged actively within the organisation for nordic electricity cooperation NORDEL, which is developing into an increasingly tighter and more committing cooperation, in respect of both operation and planning.

The transmission grid is owned by the distribution companies.

The international connections are owned by the associations Elsam and Elkraft in their respective areas.

See Fig. 1.

D. DISTRIBUTION

Electricity distribution is highly descentralised with around 120 undertakings being responsible for the distribution service in Denmark. Fifty four of these are owned and operated by municipalities, 54 are cooperatives or partnerships, 10 are private foundations and 2 are joint stock companies.

The distribution undertakings are predominantly owned by their own consumers, either directly as cooperative societies or indirectly, being municipal utilities. Two of the largest Danish distribution undertakings are limited liability companies.

The influence of the central authorities is formally exerted through the administration of existing acts, but in reality also through political compromises which in practice bind the electricity utilities.

The undertakings solely distributing electricity do not come under the above section (1) of the Act.

See table 1 which indicates the number of consumers for each company.

Table 1.

			MWh	Number of consumers
Nordjylland:				
■	011	Nordkraft	0	0
■	012	NEFO	0	0
○	023	Han Herred	98.732	12.000
★	031	ENV	466.933	47.369
★	032	BOE	195.518	25.023
○	042	Nordthy Strømforsyning	173.272	13.792
○	044	HEF	665.927	67.113
■	045	Nr. Sundby Højspænding	3.226	2
○	046	ESV	225.189	32.486
●	051	Frederikshavn	154.343	15.219
●	052	Ålborg	563.444	48.611
●	054	Nr. Sundby	75.719	6.203
●	058	Sæby	38.468	3.854
●	085	Læsø	8.200	1.600
	I alt		**2.668.971**	**273.272**
Midtjylland:				
■	111	Midtkraft	0	0
○	121	Gudenåcentralen	239	11
★	131	MEF	591.874	55.973
○	141	Hammel	43.666	2.100
○	142	Kjellerup	18.486	1.900
■	143	Brabrand	65.299	7.171
○	144	Viby	115.795	11.274
○	145	Galten	208.865	17.617
○	146	Bjerringbro	58.792	1.800
○	147	Arke	399.042	43.091
○	148	SFGHH	255.721	25.500
○	149	ELRO	467.825	41.142
●	151	Århus	548.482	81.000
●	152	Randers	232.207	29.500
●	153	Skive	95.227	9.233
●	154	Viborg	128.459	15.111
●	155	Hobro	83.972	5.912
●	157	Ebeltoft	27.748	2.714
●	158	Grenå	168.375	7.577
●	187	Tunø	494	148
	I alt		**3.510.568**	**358.774**
Sydøstjylland:				
■	211	Skærbækværket	4.830	68
★	231	Odder	37.225	4.461
★	232	Østjysk elf.	327.635	32.660
○	242	Hovedgård og omegn	56.030	5.663
○	243	Boulstrup og omegn	34.714	4.926
○	244	KOH	445.411	27.208
○	245	BHHH	345.604	25.465
○	246	MES	164.733	12.497
○	247	VOH	163.169	15.359
○	248	VOS	44.535	4.693
●	251	Kolding	179.100	21.219
●	252	Horsens	164.260	17.702
●	253	Fredericia	522.483	27.559
●	254	Vejle	245.874	21.330
	I alt		**2.735.603**	**220.810**
Vestjylland:				
■	311	Vestkraft	0	0
★	331	Morsø	140.405	12.314
○	341	Grindsted	68.300	3.900
○	342	Ikast	76.695	6.615
○	343	Thy Højspænding	101.556	13.241
○	344	SAEF	547.035	48.681
○	347	HOE	252.230	12.861
○	348	RAH	200.191	20.157
○	349	LOE	33.964	3.317
●	351	Holstebro	160.613	11.500
●	352	Esbjerg	-409.887	40.877
●	353	Herningegnen	441.309	37.300
●	355	Ringkøbing	24.467	2.888
●	356	Lemvig	39.206	4.411
●	357	Struer	73.636	5.950
●	358	Varde	76.423	6.619
●	359	Skjern	55.500	3.700
○	381	Hurup	16.958	1.548
○	384	Tarm	20.260	1.870
○	385	Videbæk	25.400	1.730
●	387	Harboøre-Thyborøn	33.400	2.650
○	388	Hvide Sande	26.200	1.640
●	391	Vinderup	17.300	1.833
	I alt		**2.840.935**	**245.602**
Sønderjylland og Ærø:				
○	411	Sønderjyllands Højsp.værk	0	0
★	431	Haderslev og omegn	216.580	22.224
○	441	EASV	398.300	26.189
○	442	MSE	273.010	19.142
○	443	Ærø	34.604	4.931
○	445	ESS	660.348	48.294
●	453	Sønderborg	90.263	8.968
●	455	Ribe	29.875	2.712
	I alt		**1.702.980**	**132.460**
Fyn:				
■	511	Fynsværket	0	0
★	531	NEF	138.774	12.610
★	532	Langeland	72.122	10.483
★	533	Sydfyn	222.151	25.698
○	541	Dalum-Hjallese	120.627	7.638
○	543	EFFLA	625.039	65.330
○	546	Vestfyn	110.160	12.514
●	552	Fåborg	118.374	12.748
●	553	Nyborg	89.093	8.600
●	554	Odense	612.682	62.852
●	555	Middelfart	98.600	8.650
	I alt		**2.207.622**	**227.123**
ELSAM-området i alt:			**15.666.679**	**1.458.041**
●	611	**Københavns Belysningsvæsen**	**2.600.717**	**333.162**
Det nordlige Sjælland:				
■	711	Isefjordsværket	0	0
○	741	NESA	5.005.665	456.323
○	742	NVE	1.006.187	99.479
○	743	EFFO	134.904	20.684
●	751	Frederiksberg	321.000	56.200
●	752	Roskilde	144.800	20.000
●	754	Kalundborg	48.626	5.651
●	755	Hillerød	104.600	11.000
●	756	Slagelse	114.693	13.100
●	757	Helsingør	123.507	15.800
●	758	Frederikssund	105.900	5.000
●	759	Nykøbing - Rørvig	29.887	5.613
●	760	Sorø	20.939	3.001
	I alt		**7.160.708**	**711.851**
Det sydlige Sjælland og Lolland-Falster:				
□	811	SEAS	1.651.500	154.475
●	851	Ringsted	83.425	5.910
●	852	Nykøbing F.	98.649	10.500
●	853	Nakskov	71.717	8.540
●	854	Næstved	120.884	14.728
●	855	Maribo	42.324	3.510
●	856	Vordingborg	44.900	4.000
●	857	Sakskøbing	14.900	1.600
●	859	Rødby	42.825	4.210
●	860	Korsør	65.125	9.110
●	861	Køge	77.300	7.063
	I alt		**2.313.549**	**223.646**
Bornholm:				
○	911	Østkraft	221.122	25.996
●	953	Christiansø	337	106
	I alt		**221.459**	**26.102**
ELKRAFT-området i alt:			**12.296.433**	**1.294.761**
TOTAL for hele landet:			**27.963.112**	**2.752.802**

● Kommunale selskaber
○ Andelsselskaber
□ Aktieselskaber
■ Interessentskaber
★ Selvejende institutioner

DENMARK

ANNEX SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

a. Clasification of the existing capacity

Maximum possible capacity (net MW) at the end of 1988.

Nuclear	-
Thermal monovalent	
- coal	101
- brown coal	-
- oil	833
- by product gas	-
Thermal polyvalent	
- with coal	6.431
- without coal	260
Hydro	-
Renewable energies	28
Gas turbines, diesel, etc.	-
Not specified	25
TOTAL	7.678

Source : UNIPEDE

b. Power Stations under construction

Nil

Source : UNIPEDE

c. Total production per type of fuel (1988)

Origin of production	net GWh	%
Hydro (including pumped)	336	1,3
Nuclear	-	-
Conventional thermal		
- coal	24.401	93,2
- brown coal	-	-
- petroleum products	1.192	4,6
- natural gas	247	0,9
- derived gas	-	-
- others	-	-
TOTAL	26.176	100

Source : EUROSTAT

B. EXCHANGES, CAPACITY AND TRADE

a. Existing lines and cables

	Voltage kV	Capacity MVA
Norway - Jutland (HVDC)	250	510
Sweden - Jutland (HVDC)	650	570
Germany - Jutland	220	1.000
Sweden - Zealand	400	700
	132	350
Sweden - Bornholm	60	65

Source : Danske Elvaerkers Forening

b. Lines and cables under construction

c. Electricity exchanges

Total imports in 1988 : 5.859 GWh

Total exports in 1988 : 1.647 GWh (*)

(*) Incl. 1.216 GWh from Preussen Elektra share of the production of Enstdvaerket unit, which are exported to Germany.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCE

The primary fuels used for electricity production are indicated in the following table :

Coal consumption	6.141	(1000 TOE)
Consumption of petroleum products	322	(1000 TOE)
Natural gas consumption	127	(1000 TOE)

Source : EUROSTAT

F R A N C E

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

EDF (Electricite de France) is the main electricity utility in France, responsible for production, transportation, distribution, import and export of electricity. EDF is owned by the state.

Except EDF, which was nationalised in 1946, there exist some minor electricity producers, as well as a number of distribution utilities (the so called "regies"), which belong, in general, to regional authorities.

EDF has the status of "Etablissement Public Industriel et Commerciel (EPIC)"; it has been provided with a financial and managerial autonomy, under tutelage of the State.

EDF employs a staff of approximately 123.000. It plays a major role in the electricity sector in Europe, as one of the leading electricity exporters and users of nuclear power.

It is supervised by the Ministry of Industry and the Ministry of finance. The first considers the efficiency of EDF, its role in energy policy and environmental issues (which are also considered by the Ministry of Environment). The latter looks at the level of tariffs and their impact on inflation, the macroeconomic impact of EDF and the nuclear industry. The formal means of state control on EDF are the appointment of its Administration Conseil and the "Control de Plan" which sets planning targets for EDF.

B. PRODUCTION

1. Number of undertakings, capacity, production

As already mentioned, the main electricity producer in France is EDF, a nationalised, state-owned utility with financial autonomy. There is, however, a small number of other independent producers the most important of which are the "Compagnie Nationale du Rhône" -CNR-the"Charbonages de France"-CDF-and the "Société National des Chemins de fer"-SNCF and a number of private autoproducers.

The following table shows the national maximum net capacity and production for 1988.

	Capacity		Production	
	(MW)	(%)	(GWH)	(%)
EDF	90,404	89,8	342,237	91,7
FRANCE	100,617	100,0	373,318	100,0

The CDF and CNR operate about 3% of the total capacity each and the rest is operated by other minor independent producers and auto-producers.

2. Ownership

EDF is a state-owned public utility with financial autonomy. Autoproducers or independent generators are private companies. CNR is a private company with all of its shares belonging to the public sector (municipal and regional authorities, public companies, etc). CDF and SNCF are public national companies.

In addition, there exist some other producing companies, joint ventures between EDF and other neighbouring countries, which have been created for the better exploitation of the hydro potential. The companies SENA and NERSA of French nationality should also be mentioned. They are joint ventures between France and other countries and they are responsible for the construction and operation of nuclear power stations in France.

3. Cooperation among the utilities

EDF is the main body responsible for the coordination of electricity production in France.

It purchases, through special contracts, all power produced by CDF, CNR and SNCF and despatches it through its own despatching centres. CNR stations are run by EDF as base load plants. All other plants, except those despatched by distribution companies and those run by autogenerators, are despatched by EDF. There is close cooperation between EDF and CDF in building and operating conventional thermal power stations to burn local brown coal. The two companies also have a joint investment in a prototype fluidised bed combustion plant.

4. Autoproduction

Autoproduction represented in 1988 about 4% of total national production (15.000 GWH). The main autoproducing industrial sectors are those of iron and steel, organic chemicals and the paper industry.

C. TRANSMISSION

1. Number of undertakings

One, EDF.

2. Ownership

EDF, a state-owned public company, owns and operates almost all HV lines.

3. Cooperation among the utilities

EDF, being substantially the only company in this field, is responsible for central despatching, with the exception of the electricity controlled by the "Régies".

4. Interconnections

France is interconnected to Spain, the United Kingdom (with a DC submarine cable), Belgium, W. Germany, Switzerland and Italy. It is a member of UCPTE and the biggest electricity exporter in Europe. Its total exchange capacity with neighbouring countries, as regards the lines of interconnection, is of the order of 70 TWh per year.

D. DISTRIBUTION

1. Number of undertakings and customers

Apart from EDF, there are several other distribution utilities (known as "régies"); nevertheless, EDF distributes 96% of all electricity. EDF has 97 distribution centres in 18 regions. Most of the distribution centres are not treated as cost centres. The "régies" can be large companies, such as those of Metz and Strasbourg, which also have their own generation and transmission. Most "régies", however, buy electricity from EDF. At the end of 1988, the number of customers connected to the EDF network amounted to around 26,4 million.

2. Ownership

EDF is a public company. The other distribution utilities, the most important of which are "Electricité de Strasbourg", "La Régie Municipale de Metz" and "la Régie Inter-Communale de Deux-Serres", are non-nationalized, municipal enterprises.

3. Cooperation among the utilities

Most distributors receive electricity from EDF and distribute it in their well specified area, for which they are responsible. Only "Electricité de Strasbourg" and "La Régie Municipale de Metz" are integrated enterprises having their own generation and transmission.

FRANCE

ANNEX TO SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net MW) at the end of 1988.

Nuclear:	52.430
Thermal monovalent	
- coal	5.097
- brown coal	697
- oil	6.080
- by-product gas	234
Thermal polyvalent	
- with coal	10.298
- without coal	250
Hydro	
- gravity	20.264
- pumped storage	4.387
New energies	-
Gas turbines, diesel etc	880
Not specified	-
TOTAL	100.617

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (MW)	Year of Commissioning
Penly 1	Nuclear	1.290	1989
Cattenom 3	"	1.300	1990
Golfech 1	"	1.310	1990
Cattenom 4	"	1.300	1991
Penly 2	"	1.330	1991
Chooz B1	"	1.455	1991
Golfech 2	"	1.310	1993
St. Egrève	Hydro	46	1990
Sampolo	"	39	1991

In total 9.300 MW (nuclear) and 85 MW (hydro) are in construction and expected to be commissioned by the end of 1993.

Source : UNIPEDE

(c) Total production per type of fuel

Origin of production	electricity TWH	%
Hydro (including pumped)	77,846	20,9
Nuclear	260,287	69,7
Thermal		
- coal	22,550	6,0
- brown coal (or peat)	373	0,1
- oil	4,246	1,1
- natural gas	2,150	0,6
- by product gas	4,978	1,3
- miscellaneous	888	0,2
TOTAL	373,318	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

France is interconnected to Spain, the United Kingdom, Belgium, W. Germany, Switzerland and Italy. In particular, there exist the following interconnection lines :

			Voltage (KV)	Transmission Capacity (MVA)
- France - Spain	Cantegrit	Hernani	380	1.150
	Mouguerre	Arkale	220	400
	Pragnères	Biescas	220	150
	Luchon	Benos	150	80
	Baixas	Vich	380	1.250
Total capacity				3.030 MVA
- France - U. K.	Mandarins	Sellindge	270 DC submarine cable	2.000
Total capacity				2.000 MVA
- France - Belgium	Chooz	Famiolle	220	400
	Avelin	Avelgem	380	1.320
	Mazures	Achene	380	1.320
	Moulaine	Aubange	220	440
Total capacity				3.440 MVA
- France-W. Germany	Vigy	Uchtelfangen	380	1.300
	St-Avold	Ensdorf	220	275

	Vogelgrün	Eichstetten	220	500
	Muhlbach	Eichstetten	380	1.700
	Sierentz	Kühmoos	380	1.300
Total capacity				5.075 MVA
-France-Switzerland	Sierentz	Bassecourt	380	1.320
	Sierentz	Laufenburg	380	1.320
	Mambelin	Bassecourt	380	1.320
	Génissiat	Verbois	220	600
	Chancy-Pougny	Verbois	130	60
	Comier	La Bâtiaz	220	300
	Génissiat	Riddes	220	300
	Vallorcine	La Bâtiaz	220	300
Total capacity				5.520 MVA
- France - Italy	Albertville	Rondisonne	380	3.000
	St. Dalmas	Garessio	150	90
	Lingostière	Camporosso	220	340
	Villarodin	Venaus	380	900
	Lucciana	S. Dalmazio Codronglanus (DC line)	200	200
Total capacity				4.530 MVA

Total transmission capacity between France and its neighbouring countries = 23.595 MVA

Source : UCPTE

(b) Lines and cables under construction

None.
The construction, however, of 4 more 400 KV lines has been decided. The new lines will increase the existing interconnection capacity between France and Spain, Belgium, Switzerland and Italy.

Source : UCPTE, EDF

(c) Electricity exchanges

In 1988, France has imported 7.718 GWh (8852 GWh in 1987) and exported 44.720 GWh (38.542 GWh in 1987). In this year, France was a net electricity exporter (the most important in Europe) of 37,002 GWh (29.690 GWh in 1987). The exported electricity represented 10,4 % (8,5 % in 1987) of the gross inland production.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	5.237 (1000 TOE)
Lignite consumption	610 (1000 TOE)
Consumption of petrol. products	1.126 (1000 TOE)
Derived gas consumption	1.078 (1000 TOE)
Nuclear	70.182 (1000 TOE)

Source : EUROSTAT

GERMANY (FR)

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

West Germany has some 1000 electricity utilities operating throughout the country. 710 of them are members of VDEW (Vereinigung deutscher Elektrizitätswerke) and produce 99% of utility-generated power. From those 710 members only 682 are taken into account for the statistics, the production of the remaining utilities being negligible.

The electricity supply is decentralised. Utilities can operate at 3 levels : locally, regionally without a contribution to the national interconnection and regionally with a contribution to the national interconnection.

Concerning transmission, most of the high voltage grid (380 kV & 220 kV) is interconnected to and operated by the eight largest utilities, the "Verbund Utilities". Cooperation among the "Verbund Utilities" is based on harmonization of transmission investments. A small part of the high voltage grid is operated by other smaller utilities.

East "Verbund Utility" remains exclusively responsible for its own part of the transmission grid, the planning of production investment and the sales of electricity in and outside its supply area.

B. PRODUCTION

1. Number of undertakings - Capacity - Production

1. Verbund Utilities

   The 8 largest utilities generate around 69% of the total electricity and operate most of the high voltage grid (380 kV) and 220 kV) - They form the association DVG (Deutsche Verbund Gesellschaft).

2. Regional Electricity Utilities

   57 regional utilities supply different smaller regional areas, mostly sparsely populated areas.

3. Municipalities

   537 local utilities supply different local areas.

4. Small utilities whose production is negligible.

The following table contains the national capacity and production for 1988, showing the 8 largest utilities.

	Capacity (MW)	(%)	Production (GWh)	(%)
Badenwerk AG	4.090	4,9	14.279	4,2
Bayernwerk AG	5.676	6,8	24.279	7,2
Bewag Berlin	2.400	2,9	9.448	2,8
EVS Stuttgart	3.060	3,7	14.648	4,3
HEW Hamburg	3.866	4,7	11.679	3,4
PreussenElektra	11.651	14,0	46.629	13,6
RWE Essen	17.324	20,9	95.940	28,0
NEW Dortmund	4.497	5,4	16.789	4,9
Others	30.522	36,7	108.656	31,6
NATIONAL TOTAL	83.086	100.0	342.799	100.0

2. Ownership

The German utilities can be classified into three different ownership systems :

- Public Co.....with public capital share of at least 95% (Government, State, Town and villages). There are 447 Public Cos.

- Private Co.....with private capital share of at least 75%. There are 123 Private Cos.

- Mixed Co.....with public capital share below 95% and private capital share below 75%. There are 112 Mixed Cos.

The structure in production is :

. Public Co. - 10% Private Co. - 17% - Mixed Co. - 73%

OWNERSHIP OF THE 8 LARGEST ELECTRICITY UTILITIES

/OWNERS / COMPANIES/	(Pub) STATE	(Priv) PRIVATE INVESTORS
BADENWERK AG (P-T-D)	75.0%	25,0%
BAYERNWERK AG (P-T)	61,2%	38,8%
BEWAG Berlin (P-T-D)	50,0%	50,0%
EVS Stuttgart (P-T-D)	100,0%	
HEW Hamburg (P-T-D)	71,4%	28,6%
PREUSSENEKEKTRA (P-T)		100,0%
RWE Essen (P-T-D)	30,6%	69,4%
VEW Dortmund (P-T-D)	55,6%	44,4%

P = Production T = High volt. Transmission
D = Distribution

3. Cooperation among utilities

Electricity utilities in Germany cooperate within the framework of several organisations such as VDLW with 710 members which aims to develop the electricity supply industry at reasonable prices and deals with the technical, economic and organisational aspects of public supply. These utilities supply 99.4% of the total market.

4. Auto-production

More or less 14% of the total energy production derives from auto-production.

There is no federal provision establishing the obligation to admit the surplus of electricity from auto-producers in the public network or to fix a buying price.

C. TRANSMISSION

1. Number of undertakings

The 8 largest "Verbund-Utilities" own most of the transmission system in high voltage grid (380 kv and 220 kv). Each of them is in charge of a specific area.

2. Ownership

The ownership pattern is the same as in B2 above. Structure of transmission Public/private/mix.

3. Interconnections

Interconnections with Austria, Switzerland, France, Luxembourg, Netherlands, Denmark Democratic Republic (see detailed data in Annex 2C).

D. DISTRIBUTION

1.1 The Verbund-Utilities supply +/- 40% of the electricity to other utilities (local and regional) large consumers and six of them also supply small tariff consumers.

The table below shows the distribution configuration for the Verbund-Utilities (%).

VERBUND-UTILITIES	SMALL TARIFF CONSUM.	LARGE CONSUM.	OTHER UTILIT.	TOTAL (%)
. Badenwerk AG (BW)	18,6	26,7	54,7	100,0
. Bayernwerk AG (BAG)	-	4,9	95,0	100,0
. Berliner Kraft und Licht (BEWAG) - AG	250,3	49,7	-	100,0
. Energieversorgung Schwaben AG (EVS)	23,2	24,2	52,6	100,0
. Hamburgische Electricitatswerke (HEW)	34,3	65,4	0,3	100,0
. PreussenElektra AG (PREAG)	-	10,2	89,8	100,0
. Rheinisch-Westfalisches Elektrizitatswerk AG (RWE)	14,8	37,3	47,9	100,0
. Vereinigte Elektrizitatswerke AG (VEW)	23,0	41,0	35,2	100,0

1.2 +/-30% of the electricity is supplied by economical distributors to urban areas and sparsely populated areas suppling directly to consumers or to local utilities. Many regional utilities buy most of their electricity from the Verbund-Utilities or from small producers whose overall production is negligible at national level.

1.3 30% of electricity is distributed at local level by municipal undertakings who are also involved in the distribution of gas and water. They usually receive electricity from other utilities, although the biggest own or are co-owners of power stations. They supply industrial factories, medium sized businesses, local administration and small consumers (household).

2. Ownership

The ownership pattern is the same as in B2 above.

The share of distributed electricity for each type of ownership is following:

- Public Co : 33%

- Private Co: 7%

- Mixed Co : 60%

3. Cooperation among utilities

See B3 above.

ANNEX TO SECTION 1 QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	21.488
Thermal monovalent	
- coal	20.547
- brown coal	11.237
- oil	7.517
- by-product gas	12.095
Thermal polyvalent	
- with coal	11.226
- without coal	
Hydro	
- gravity	2.855
- pumped storage	3.999
New energies	11
Gas turbines, diesel etc.	4.903
Not specified	975
TOTAL	96.850

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (Mw)	Year of comissioning
GK Neckar 2	Nuclear	1.225	1989
Kalkar	>>	218	1990
Einsiedler	Hydro	1	1989
Diebenstein	>>	1	1990
Regensburgn	>>	2	1990
Straubing	>>	20	1994
Ruselkraftwerk	Pumped storage	7	1989
Koepchenwerk	>> >>	18	1989

Source : UNIPEDE

(c) Total production par type of fuel

origin of production	electricity GWH	%
Hydro (including pumped)	20.483	5,1
Nuclear	137.206	34,0
Thermal		
- coal	121.003	30,0
- brown coal (or peat)	73.517	18,2
- oil	11.335	2,8
- natural gas	27.473	6,8
- by product gas	8.173	2,0
- miscellaneous	3.909	1,1
TOTAL	403.099	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
W.Germany-Nederland				
	Diele	Meeden	220	500
	Siersdorf	Maasbracht	380	1.500
	Rommerskirchen	Maasbracht	380	1.500
	Lathen	Musselkanaal	110	120
	Total capacity			3.620
W.Germany-France				
	Uchtelfangen	Vigy	380	1.300
	Ensdorf	St-Avold	220	275
	Eichstetten	Vogelgrun	220	500
	Eichstetten	Muhlbach	380	1.700
	Kuhmoos	Sierentz	380	1.300
	Total capacity			5.075
W.Germany-Switzerland				
	Gurtweil	Laufenburg	220/220	490/ 490
	Kuhmoos	Laufenburg	220	490
	Kuhmoos	Laufenburg	220/380	490/1.700
	Kuhmoos	Laufenburg	380/380	1.700/1.700
	Tiengen	Laufenburg	380	1.100
	Breitenmatt	Laufenburg	110/110	200/ 200
	Tiengen	Beznau	220/380	340/1.160
	Tiengen	Klingnau	110	53
	Kuhmoos	Gosgen	380	
	Engstlatt	Laufenburg	380	1.790
	Total capacity			11.903

			Voltage (KV)	Transmission Capacity (MVA)
W.Germany-Austria				
	Lindau	Rieden	110	180
	Obermooweiler	Burs	220/220	685/ 985
	Herbertingen	Burs	220	330
	Dellmensingen	Burs	220	490
	Rosenheim	Kufstein	110	180
	Neuotting	Braunau	110	200
	Neuotting	Ranshofen	110	180
	Altheim	St.Peter	220	301
	Simbach	St.Peter	220	301
	Ering	St.Peter	110	304
	Egglfing	St.Peter	110	105
	Scharding	St.Peter	220	602
	Pirach	St.Peter	220	518
	Pleinting	St.Peter	220	518
	Passau	Partenstein	110	180
	Leupolz	Westtirol	380	1.590
	Memmingen	Westtirol	220	920
	Habach	Silz	220	1.585
	Total capacity			10.154
W.Germany-Danmark				
	Flensburg	Aabenraa	220	330
	Flensburg	Kasso	220	330
	Audorf	Kasso	380	1.380
	Total capacity			2.040
W.Germany-Luxembourg				
	Niederstedem	Vianden	220	2.480
	Bauler	Flebour	220	490
	Trier	Heisdorf	220	980
	Total capacity			3.950
Total transmission capacity between Germany and its neighbouring countries=				36.742

Source : UCPTE

(b) Lines and cables under construction

None.

(c) Electricity exchanges

In 1988 Germany has imported 22.706 GWh (22.177 GWh in 1987), and exported 22.329 GWh (18.381 GWh in 1987). Thus, the German import surplus fell by 3.948 GWh, reaching a level of 529 GWh.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	30.124	(1000 TOE)
Lignite consumption	18.992	>> >>
Consumption of petrol. products	3.041	>> >>
Natural gas consumption	7.087	>> >>
Derived gas consumption	1.831	>> >>
Nuclear heat consumption	35.638	>> >>
Other fuels	1.005	>> >>

Source : EUROSTAT

G R E E C E

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

Electricity production, transmission, distribution, imports and exports in Greece are exclusively in the hands of one state-owned company, the Public Power Corporation (PPC), except for a very small part of production which comes from a limited number of auto-producers. PPC was created in 1950 as a state-owned public utility, by the gradual amalgamation of 350 private generation companies; it is managed as a private corporation. In 1985, the Greek electricity utility was declared a Socialized Public Utility, belonging to the Greek State and provided to operate under full administrative, legal and economic independence. It is supervised by the Ministry of Industry, Energy and Technology. PPC's top management and the board of directors are, in general, appointed by the government.

PPC also owns and operates the lignite mines which provide it with a large percentage of its fuel inputs for generation.

B. PRODUCTION

1. Number of undertakings, capacity, production

As already mentioned, apart from a limited number of private autoproducers, PPC is the exclusive electricity producer in Greece.

The following table shows the national maximum net capacity and production for 1988.

Capacity (MW)	Production (GWh)
8121	30.600

2. Ownership

PPC is a state-owned company and has the status of an independent corporation with financial, legal and administrative autonomy.

3. Cooperation among the utilities

While the electricity industry is vertically integrated and, essentially, PPC is the exclusive producer, the system is split into four main component parts, not interconnected with each other:

- Mainland
- Cretan system
- Rhodes system
- Scattered generation on the islands.

More than 93% of installed capacity is on the mainland.

4. Autoproduction

Autogeneration accounts for about 2% of capacity and 2,2% of electricity generated. The major auto-generators are petroleum industry, chemicals/fertilisers and the sugar industry.

C. TRANSMISSION

1. Number of undertakings

One, PPC.

2. Ownership

PPC is a state-owned company.

3. Cooperation among the utilities

As with production, PPC owns and operates the whole transmission system, the various parts of which (mainland, Crete, Rhodes, Islands) are not interconnected. Despatching is centralised and there are no regional load despatching centres.

4. Interconnections

Greece is a member of UCPTE and is interconnected to Yugoslavia, Albania and Bulgaria through 400KV and 450KV lines. The main purpose of interconnections is to improve security of supply and enhance regional system stability.

D. DISTRIBUTION

1. Number of undertakings and customers

PPC is the exclusive distribution utility. There are 5 regional distribution control centres responsible for meeting area demand.

The number of customers is 5.504.600 (5,500.000 low voltage, 4.600 medium and high voltage customers).

2. Ownership

PPC, a state-owned company, owns and operates all the distribution network.

3. Cooperation among the utilities

Not applicable

GREECE

ANNEX TO SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of the existing capacity

Maximum possible capacity (net MW) at the end of 1988.

Nuclear	-
Thermal monovalent	
- coal	76
- brown coal	3.889
- oil	1.175
- by product gas	-
Thermal polyvalent	
- with coal	144
- without coal	-
Hydro	
- gravity	1.836
- pumped-storage	315
New energies	3
Gas turbines, diesel, etc	683
Not specified	-
Total	8.121

Source: UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (MW)	Year of commissioning
Stratos 1-2	Hydro	150	1989
Piges 1-2	"	210	1990
Temenos 1-3	"	48	1992
Thisarros 1-3	"	300	1993

In total 708 MW (hydro) are in construction and expected to be commissioned by the end of 1993.

Source : UNIPEDE

(c) Total production per type of fuel

Origin of the production	net GWh	%
Hydro (including pumped)	2.580	8,4
Nuclear	-	-
Conventional thermal		
- coal	65	0,2
- brown coal and peat	22.038	72,0
- petroleum products	5.839	19,1
- natural gas	92	0,3
- derived gas	-	-
- other	-	-
Total net production	30.618	100,0

Source: EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

Transmission

		Voltage (KV)	capacity MVA
- Greece - Albania :	Kardia - Elbasan	380	1.400
	Mourtos - Bistrica	150	138
	- Total capacity		1.538 MVA
- Greece - Yugoslavia:	Thessaloniki - Dubrovo	380	1.300
	Ptolemais-Bitola	150	135
	- Total capacity		1.435 MVA
- Greece - Bulgaria:	Thessaloniki - Blagoevgrad	380	1.400
	- Total capacity		1.400 MVA
Total transmission capacity between Greece and its neighbouring countries			4.373 MVA

Source : UCPTE

(b) Lines and cables under construction

None.

Source : UCPTE, PPC

(c) Electricity exchanges

In 1988, Greece has exported 393 GWh and imported 699 GWh. In that year, the country was an electricity importer of 306 GWh (614 in 1987).

Greece also trades electricity with a number of countries in addition to Yugoslavia, Albania and Bulgaria. It allows wheeling through its system on payment of a transit fee. This takes place between Albania and Yugoslavia.

Imported electricity accounted for 0,9 % (2 % in 1987) of gross inland production.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	21 (1000 TOE)
Lignite consumption	6.207 (1000 TOE)
Consumption of petrol. products	1.465 (1000 TOE)
Natural gas consumption	21 (1000 TOE)

Source : EUROSTAT

I R E L A N D

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

There is only one Company in charge of the production, transmission and distribution of electricity throughout the country, the Electricity Supply Board (E.S.B.). It is owned by the State, being a monopoly established under the Electricity Supply Act of 1927.

B. PRODUCTION

The only existing company, Electricity Supply Board, is owned by the State.
The total net production in 1988 was 12.434 TWh.
The autoproduction share was estimated at 1.5% of the total national electricity production.

C. TRANSMISSION

Concerning transmission, E.S.B. has the responsability for the high and low voltage grid.

Ireland is one of the few countries that does not have interchange of electricity with another country. An interconnection from Northern Ireland (U.K.) has been out of operation for many years.

D. DISTRIBUTION

As with production and transmission, distribution is carried out by the E.S.B. The E.S.B. has the monopoly of the sale and purchase of electricity.

The number of customers in 1988 was 1,2 million.

IRELAND

ANNEX SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

a. Classification of the existing capacity.

Maximum possible capacity (net MW) at the end of 1988.

Nuclear	-
Thermal monovalent	
- coal	14
- brown coal	436
- oil	579
- by product gas	257
Thermal polyvalent	
- with coal	842
- without coal	743
Hydro	
- gravity	219
- pumped storage	289
Gas turbines, diesel, etc.	359
Not specified	-
TOTAL	3.738

Source : UNIPEDE

b. Power station under construction.

There is not any power station under construction in Ireland.

Source : UNIPEDE

c. Total production per type of fuel.

Origin of the production	net GWh	%
Hydro (including pumped)	1.192	9,6
Nuclear	-	-
Conventional thermal		
- coal	4.914	39,5
- brown coal and peat	2.037	16,4
- petroleum products	889	7,2
- natural gas	3.402	27,4
- derived gas	-	-
- others	-	-
TOTAL net production	12.434	100

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

a. Existing lines and cables - Nominal capacity, voltage.

ESB/Northern Ireland Electricity interconnector (capacity 600 MVA) has been out of service for many years due to terrorist actions.

b. Lines and cables under construction.

Nil

c. Electricity exchanges (Import/Export)

There is no exchange of electricity between Ireland and other countries.

C. UTILISATION OF PRIMARY SOURCE

Coal consumption	1.127	(1000 TOE)
Lignite consumption	695	(1000 TOE)
Consumption of petrol products	246	(1000 TOE)
Natural gas consumption	750	(1000 TOE)

Source : EUROSTAT

ITALY

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

The main electricity utility in Italy is ENEL (Ente Nationale Per L'Energia Elettrica), a state-owned corporation, responsible for the production, import and export, transmission, distribution and sale of electricity throughout Italy. The Italian electricity industry was nationalised in 1962 when private regional electricity companies were merged to form ENEL. Several of these companies, especially the most efficient, low cost, hydro-based decided to remain independent. Due to the reluctance of local authorities to grant permission for the construction of new generating capacity, Italy is trying to encourage autoproduction and independent production and relies on electricity imports. ENEL is supervised by the Interministerial Committee for Economic Planning (CIPE) and controlled by the Ministry of Industry. Its top management and the board of directors are appointed by the Ministry of Industry.

Italy is interconnected to the european grid and in 1988 the country was the biggest electricity importer in the EC.

The only indigenous energy resources of Italy are hydro, geothermal and some small quantities of bad quality coal. Almost all electricity production is based on imported coal, oil and natural gas.

B. PRODUCTION

1. Number of undertakings - Capacity - Production

As already mentioned, the main electricity producer in Italy is ENEL. There is in addition, a small number of municipal utilities and autoproducers. ENEL, however, has the monopoly of the operation and ownership of generation capacity over 3MW, with some exceptions.

The following table shows the national capacity and production for 1988.

	Capacity		Production	
	(MW)	(%)	(GWH)	(%)
ENEL	46.710	82,3	161.230	83,5
Municipal Utilities	2.445	4,3	7.118	3,7
Other utilities	278	0,5	991	0,5
Autoproducers	7.311	12.9	23.837	12.3
TOTAL ITALY	56.744	100,0	193,176	100,0

2. OWNERSHIP

ENEL is a state-owned company. The municipal utilities belong to the municipalities, whereas the autoproducers and independent generators are private companies.

3. COOPERATION AMONG THE UTILITIES

ENEL is responsible for the whole coordination of the electricity production in Italy. For the coordination of generation and distribution, ENEL has divided Italy in 8 regional units, everyone of which is responsible for generation and load despatch in its region. Each of the units is also a cost centre. Planning, however, is done centrally.

4. AUTOPRODUCTION

Italy is characterized by its large number of autoproducers. In 1988 they represented 13% of the total installed capacity and produced around 12% of the total electric energy. The share of autogenerating capacity has gone down since the nationalisation of the industry in 1962, when it amounted to about 22%. The chemical and steel industries are the largest autoproducers. Recently the government has provided incentives to autoproducers, trying to encourage them to sell power to the grid.

C. TRANSMISSION

1. NUMBER OF UNDERTAKINGS

The main electricity transmission utility is ENEL. High voltage electricity may be transported only by ENEL and the other concerns authorized to produce HV electricity. The latter may not transport energy for third parties, except on behalf of ENEL or on its instructions.

2. OWNERSHIP

ENEL, a state-owned company owns and operates nearly 90% of the high and medium voltage transmission grid. The remaining 10% belongs to the municipalities and autoproducers.

3. COOPERATION AMONG THE UTILITIES

ENEL is responsible at national level for the transmission of electricity. As for production, the country has been divided into 8 regional units for transmission purposes. Electricity is essentially flowing from the North to the South of the country. The load despatch is done at Rome. The capacity which does not belong to ENEL (18%) is not centrally despatched.

4. INTERCONNECTIONS

Italy is interconnected to France, Switzerland, Austria and Yugoslavia through 380 and 220 KV lines. It is a member of UCPTE (Union for the Coordination of Production and Transmission of electricity) and a net electricity importer. The italian electric system could also be connected to the eastern countries network through Austria, Chechoslovakia etc, or Yugoslavia, Hungary etc. Electricity imports are not so much an attractive commercial operation for ENEL, as mainly a means to overcome its current capacity shortages. Fifty of growth in demand since 1983 has been covered by an increase of imported electricity.

D. DISTRIBUTION

1. NUMBER OF UNDERTAKINGS

The main distribution utility is again ENEL. There is, however, an important number of municipal distributors (150 companies). The relevant percentages at national level are 80% for ENEL and 20% for the municipals.

As far as the number of customers is concerned, in 1988, 26.343.758 (91% of the total) customers were supplied by ENEL and 2.650.000 (9%) by the municipalities.

2. OWNERSHIP

The distribution network belongs mainly to ENEL; around 30 municipals are owners of their distribution networks.

3. COOPERATION AMONG THE UTILITIES

Every distributor is responsible for its well specified area. There are 8 area divisions within ENEL for distribution purposes, the same as those for production and transmission. They are separate operating units and cost centres.

ITALY

ANNEX TO SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of the existing capacity

Maximum possible capacity (net MW) at the end of 1988.

Nuclear :	1.120
Thermal monovalent	
- coal	26
- brown coal	295
- oil	16.565
- by product	399
- gas	
Thermal Polyvalent	
- with coal	6.736
- without coal	11.052
Hydro	
- gravity	12.467
- pumped storage	5.472
New energies	510
Gas turbines, diesel etc	2.102
Not specified	-
Total	56.744

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (MW)	Year of Commissioning
Satriano II	Hydro	36	1990
Carona	"	8	1990
Satriano I	"	19	1992
Palazzo II	"	35	1992
Riva del Garda	"	36	1993
S. Giacomo al Vomano	"	263	1994
Anapo 1	Pumped Storage	125	1989

Presenzano 1	Pumped Storage	250	1989
Anapo 2	"	250	1990
Anapo 3	"	125	1990
Presenzano 2	"	250	1990
Presenzano 3-4	"	500	1992

Total Hydro : 397 MW
Total pumped storage : 1500 MW

A number of small hydro power stations, of a net capacity of some MW each, is also under construction.

No conventional thermal power stations are under construction according to the UNIPEDE's relevant list.

Source : UNIPEDE

(c) Total production per type of fuel

Origin of the production	net GWh	%
Hydro (including pumped)	43.017	22,3
Nuclear	-	-
Conventional thermal		
- coal	27.597	14,3
- brown coal and peat	993	0,5
- petroleum products	84.638	43,8
- natural gas	30.438	15,8
- derived gas	3.005	1,6
- others	644	0,3
TOTAL net production	193.176	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Italy is interconnected to France, Switzerland, Austria and Yugoslavia. In particular :

			Voltage (Kv)	Transmission capacity (MVA)
-Italy - France	Rondissone	Albertville	380	3.000
	Garessio	St-Dalmas	150	90
	Camporosso	Lingostière	220	340
	Venaus	Villarodin	380	900
	S. Dalmazio	Luciana	200(DC)	200
	Cadronglanus (submarine cable)			
	Total capacity			4.530 MVA
-Italy-Switzerland	Ponte	Airolo	220	250
	Mese	Gorduno	220	250
	Bovisio	Soazza	380	900
	Musignano	Lavorgo	380	1.500
	Poschiavino	Campocologno	150	80
	Sondrio	Robbia	220	260
	Avise	Riddes	220	300
	Valpelline	Riddes	220	300
	Pallanzeno	Mörel	220	250
	Total capacity			4.090 MVA
- Italy - Austria	Soverzene	Lientz	220	285
	Total capacity			285 MVA
-Italy -Yugoslavia	Redipulia	Divacca	380	1.625
	Padriciano	Divacca	220	350
	Total capacity			1.975 MVA

Total transmission capacity between Italy and its neighbouring countries : 10.880 MVA

Source : UCPTE

(b) Lines and cables under construction

None.
1 line 380 KV, 2000 MVA is nevertheless planned for the near future between Italy and France. Similarly the interconnection capacity between Italy and Switzerland has been planned to be reinforced in the future with two 380KV lines of 2000+2000 MVA, and that between Italy and Austria also with a 380 KV, 2000 MVA line. In addition to that, a submarine cable interconnecting Italy to Greece (400 KV DC, 1000 MW or 300 KV DC, 600 MW) is in the planning stage.

Source : UCPTE, ENEL

(c) Electricity exchanges

In 1988, Italy imported 31.974 GWh (24.807 GWH in 1987) and exported 719 GWH (1670 GWh in 1987). In that year Italy was the most important single European electricity importer (31.255 GWh, 23.137 GWh in 1987). The net imports account for 13,3 % (10,3 % in 1987) of gross inland consumption.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	6.407 (1000 TOE)
Lignite consumption	275 (1000 TOE)
Consumption of petrol. products	19.141 (1000 TOE)
Natural gas consumption	6.680 (1000 TOE)
Derived gas consumption	734 (1000 TOE)

Source : EUROSTAT

L U X E M B O U R G

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

Luxembourg as a small country is totally dependant on imports for its energy supplies and there is no exception as far as electrical power is concerned.

The electricity industry in Luxembourg is composed of three independant utilities: the SEO company (Société Electrique de l'Our) the CEGEDEL company (Companie Grand Ducale d'Electricité du Luxembourg) and the SOTEL company (Société de Transport d'Energie Electrique du G.D. de Luxembourg).

Only 14% of the total consumption needed is produced in Luxembourg; the largest part of electricity is imported from Belgium and Germany. Native production is based on several small hydro-power stations owned by the state, the SEO company or on auto-production. There is also a pumping station in Vianden which is operated as peak station, in daily cycle, according to the necessities of German R.W.E. (Rheinisch-Westfälisches-Elektrizitätswerk A.G.) grid.

Concerning transmission, the CEGEDEL and SOTEL companies have the responsibility for this in Luxembourg by taking power from both internal and external sources and delivering it to either final customers or to distribution companies.

Distribution in the towns is controlled by the municipalities.

B. PRODUCTION

1. Number of Undertakings - Capacity - Production.

Luxembourg has a small generating capacity. Several stations including auto-producers generate around 14% of the total electricity. 86% of the electricity demand is covered by imports from Belgium, France and Germany.

The following table contains the national capacity and production for 1987 and 1988.

	1987	1988
	GWH	GWH
National Production*	566 (14.3%)	583 (14.28%)
Imports from Belgium	875 (22.2%)	912 (22.3%)
Imports from France	57 (1.4%)	59 (1.4%)
Imports from Germany	2438 (62.0%)	2525 (62.0%)

*Without the production of Vianden Station, which is exported to Germany.

The only major plant, a pumped storage station, run by SEO (capacity 1.1GW) transmits all its power to RWE in West Germany and is not directly connected to either of the Luxembourg grids. SEO also owns and operates run-of-river hydro at Palzem and Grevenmacher on the Moselle.

The electricty production generated by source during 1988 is set out in the table below.

	GWH
Autogenerators	446
Hydro	90
Thermal	74

2. Ownership.

The small hydropower stations that generate the indigenous electricity production are owned by the state and the undertaking SEO. Other power stations are run by auto-producers (mainly iron and steel industry). There is also one power station of refuse incineration owned by an intermunicipal syndicate that produces 1% of the grid demand.

SEO is a private company (Société Anonyme) in which the government has shares. In practical terms, this means that SEO is a joint stock company where 40% of the shares are state owned, another 40% of the shares belong to the German company RWE and the other 20% are owned by private investors. The pumping station in Vianden, pertaining to SEO, is considered as part of the RWE grid.

3. Cooperation among utilities.

Two of the independent utilities (SEO and CEGEDEL) in Luxembourg cooperate between themselves, while the third company participates on electricity supply on the basis of contracts with utilities in Belgium and Germany. SEO is the main generation company which sells to CEGEDEL and the German grid R.W.E. On the other hand, SEO imports electricity from Germany that sells to CEGEDEL under the terms of a contract signed by the Government on behalf of CEGEDEL. The cooperative SOTEL does not cooperate with SEO or CEGEDEL, but imports directly electricity from Belgium and France.

4. Autoproduction.

The autoproduction share in 1987 was produced to a large extent by the iron and steel industries and for less than 1% by other industries (reference to the whole Grand-Duchy's electricity requirements).

On the other hand, autoproducers are the only significant group of generators in Luxembourg. In 1988 they produced 446 GWH, which was generated as follows:

Generation by Autogenerators 1988

	GWL
Blast Furnace Gases	384
Natural Gases	18
Fuel Oil	40
Coal	5

Most of the autoproducers are iron and steel companies who would otherwise have bought power from the distribution companies. Thirty-two per cent of the total electricity required by the iron and steel industry comes from autoproduction.

C. TRANSMISSION

1. Number of undertakings, capacity, production.

There are two companies responisible for electricity transmission in Luxembourg; CEGEDEL and SOTEL. Both of them manage their own networks although the two are interconnected. CEGEDEL controls the flow of electricity from local hydro and imports for public consumption. This company owns a high and low voltage grid and is responsible for the electricty transmission to the public distribution grid and to industry. SOTEL on the other hand owns one different grid destined to interconnect and supply the iron and steel factories exclusively.

The main transmission voltage is 220 kv, the voltage at which energy is imported.

2. Ownership

The ownership structure is different for each transmission system. CEGEDEL is a joint private company, but a large proportion of the shares are held by the government. It is run by a supervisory board of thirteen members, one of them government appointed. The government has a "commissaire" in the board to represent its 41% equity holding. The other 59% of the shares remain in private hands.

The SOTEL company is a co-operative owned and run by the privately owned iron and steel indusries that hold 93% of the shares. The other 7% of the shares belong to the regional authorities.

	OWNERS	
COMPANIES	PUBLIC	PRIVATE
	State	Private investors
CEGEDEL	41%	59%
SOTEL	7% (regional authorities)	93% (iron and steel industry)

3. Interconnections

Luxembourg is connected with Germany and Belgium through the two main transmission companies. SOTEL is connected to the Belgian and French grids and CEGEDEL is connected to the West German grids.

D. DISTRIBUTION

1. Number of undertakings - capacity - production

The public electricity distribution in Luxembourg is assured by the stock company CEGEDEL, either directly or through some 15 redistribution companies, public and private. At the moment the market supplied by CEGEDEL represents around 60% of the total national supply. Another 40% of the public distribution is run by several utilities, the most important ones being these of the cities of Luxembourg and Esch/Alzette. The public distribution companies are supplied in high voltage by CEGEDEL.

The number of directly supplied customers of CEGEDEL is around 100,000 in low voltage and 1500 in high voltage.

SOTEL distributes to industries serving the steel and iron industry via its own service grid and it does not distribute electricity to the public.

The following tables show the split of CEGEDEL sales in 1988 as well as the sources of supply of the two distribution companies in Luxembourg.

CEGEDEL Sales of Electricity Supplied in 1988

	%
Direct sales to high/ medium voltage customers	52.7
Direct sales to domestic customers	21.6
Sales to distribution companies	23.3
Losses	2.4

CEGEDEL Sources of Supply 1988

	GWH
SEO/RWE Contract	2464
State hydro	58
SOTEL	56
SIDOR	37
SEO (Moselle hydro)	26
Private generation	3

SOTEL Sources of Supply 1988

	GWH
UNERG Contract	911
Autogenerators	446
Edf	59
CEGEDEL	14

2. Ownership.

Distribution in Luxembourg is run by CEGEDEL and SOTEL. The ownership pattern is the same as in C.2. above.

3. Co-operation Among Utilities.

See B3 above.

ANNEX TO SECTION 1 QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	-
Thermal monovalent	
- coal	-
- brown coal	-
- oil	-
- by-product gas	-
Thermal polyvalent	
- with coal	178
- without coal	7
Hydro	
- gravity	28
- pumped storage	1.096
New energies	-
Gas turbines, diesel etc.	10
Not specified	-
TOTAL	1.319

Source : UNIPEDE

(b) Power stations under construction

None.

Source : UNIPEDE

(c) Total production par type of fuel

origin of production	electricity GWH	%
Hydro (including pumped)	800	62,3
Nuclear	-	-
Thermal		
- coal	5	0,4
- brown coal (or peat)	-	-
- oil	60	4,7
- natural gas	19	1,5
- by product gas	361	28,1
- miscellaneous	39	3,0
TOTAL	1.284	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
Luxembourg-Belgium				
	Belval	Aubange	150/220	350/400
	Total capacity			750
Luxembourg-W.Germany				
	Vianden	Niederstedem	220	2.480
	Flebour	Bauler	220	490
	Heisdorf	Trier	220	980
	Total capacity			3.950
	Total transmission capacity between Luxembourg and its neighbouring countries=			4.700

Source : UCPTE

(b) Lines and cables under construction

None.

(c) Electricity exchanges

In 1988 Luxembourg has imported 4.508 GWh (4.009 GWh in 1987), and exported 726 GWh (455 GWh in 1987). Thus, the Luxembourg import surplus increased by 228 GWh, reaching a level of 3.782 GWh.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	2	(1000	TOE)
Lignite consumption	-	>>	>>
Consumption of petrol. products	17	>>	>>
Natural gas consumption	6	>>	>>
Derived gas consumption	120	>>	>>
Nuclear heat consumption	-	>>	>>
Other fuels	29	>>	>>

Source : EUROSTAT

NETHERLANDS

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL OVERVIEW

Since the early 1980's the electricity industry in the Netherlands has been going through a process of structural change affecting both the number of companies as well as the range of their activities. In 1986 generation was split from distribution in the previously vertically integrated utilities, and a process of concentration was started to reduce the number of utilities and rationalise the industry. A new electricity law was passed which could potentially lead to increased competition in the industry.

B. PRODUCTION

1. Number of Undertakings - Capacity - Production

Generation is predominantly undertaken by four regional generating companies:

EPON: N.V. Elektriciteits-Produktiemaatschappij Oost- en Noord-Nederland, Zwolle
EPZ : N.V. Elektriciteits-Produktiemaatschappij Zuid-Nederland, Eindhoven
EZH : N.V. Electriciteitsbedrijf Zuid-Holland, Voorburg
UNA: N.V. Energieproduktiebedrijf UNA (Utrecht, Noord-Holland, Amsterdam), Utrecht

Decentralised production is presently about 15% in the Netherlands, and is expected to grow in the future as distribution companies are allowed to promote such schemes and to buy from small scale producers.

The generating capacity and production for the different companies is set out in the table below:

Generating capacity and productions by company, 1988

	MW	GWh
EPON	4,404	18,055
UNA	3,171	8,855
EZH/	2,751	6.970
EPZ/PZEM *	4,698	20,905
Other	396	1,780
TOTAL	15,420	56,565

* EPZ and PZEM have merged recently.

2. Ownership

The Municipal and regional authorities own the generating companies indirectly through the distribution companies. There is no state or private ownership in the Dutch electricity sector.

3. Cooperation among utilities

The generating utilities own the SEP company (Samenwerkende elektriciteits-produktiebedrijven), which has a wide coordination responsability.

- SEP owns and operates the high voltage transmission grid (380 and 220 kV);
- SEP operates centralised load despatch for the whole system;
- SEP operates a cost pooling system, introduced to smooth out cost differences in generation between the different regional generating companies;
- SEP has the monopoly of electricity imports for public supply;
- SEP is responsible for the planning of new capacity;
- SEP purchases all fuel used by the four generating companies, and its own daughter companies.
- SEP also acts as the official representative of the generating industries in industrial, national and international affairs, and vis-a-vis the authorities.

4. Autoproduction

Total production by autogenerators amounted to 10,400 GWh in 1988, which represents approximately 15% of the overall consumption. Electricity supplied by autogenerators to the grid represents approximately 3 percent of the total supplied.

Terms for the sale of electricity are negotiated between VEEN and the organisation of large industrial consumers, SIGE and other organisations representing other groups of auto-producers. They are set on an avoided cost basis.

C. TRANSMISSION

1. Ownership

SEP owns and operates the larger part of the 380/220 KV transmission and interconnection system. A small part of the transmission grid is owned by generating companies and the larger distribution companies. As indicated above, SEP is totally owned by the four large generating companies.

2. Interconnection

The Netherlands are interconnected with Belgium and Germany on 380 kV - level.

D. DISTRIBUTION

1. Number of undertakings - Customers and markets

There are, at present, 53 distribution companies in the Netherlands, among which are 9 larger regional companies who own the lower tension transmission grid (150kV and below). A restructuring process is taking place with the aim of reaching a number of 37 distribution companies.

In 1989 the number of customers supplied in the Netherlands was approximately 6,3 million.

2. Ownership

The distribution companies are owned by the municipal and regional authorities.

3. Cooperation

The distribution companies are organized in a joint association (VEEN) whose main objectives are in the coordination of the contacts with the government, the suppliers and the public and in the development of common policy on tariffs, judicial and technical matters.

ANNEX TO SECTION 1 QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	508
Thermal monovalent	
- coal	-
- brown coal	-
- oil	-
- by-product gas	4.929
Thermal polyvalent	
- with coal	3.880
- without coal	7.554
Hydro	
- gravity	-
- pumped storage	-
New energies	25
Gas turbines, diesel etc.	369
Not specified	120
TOTAL	17.385

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (Mw)	Year of comissioning
Utrecht MK 12	Thermal	200	1989
Purmerend PU 1	>>	64	1989
Geertruidenberg	>>	600	1993
Amsterdam	>>	600	1994

Source : UNIPEDE

(c) Total production par type of fuel

origin of production	electricity GWH	electricity %.
Hydro (including pumped)	18	-
Nuclear	3.468	5,2
Thermal		
- coal	21.520	32,1
- brown coal (or peat)	-	-
- oil	3.446	5,4
- natural gas	35.176	52,3
- by product gas	2.515	3,8
- miscellaneous	801	1,2
TOTAL	67.144	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
Nederland-W.Germany				
	Meeden	Diele	220	500
	Maasbracht	Siersdorf	380	1.500
	Maasbracht	Rommerskirchen	380	1.500
	Musselkanaal	Lathen	110	120
	Total capacity			3.620
Nederland-Belgium				
	Maasbracht	Gramme	380	1.320
	Maasbracht	Massenhoven	380	1.320
	Gertruidenberg	Zandvliet	380	1.650
	Borssele	Zandvliet	380	1.650
	Oostburg	Maldegem	150	60
	Total capacity			6.000

Total transmission capacity between Nederland and its neighbouring countries= 9.620

Source : UCPTE

(b) Lines and cables under construction

None.

Source : UCPTE

(c) Electricity exchanges

In 1988 Nederland has imported 5.846 GWh (3.652 GWh in 1987), and non exported (22 GWh in 19867). Thus, the Nederland import surplus reached by 2.216 GWh.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	4.979	(1000	TOE)
Lignite consumption	-	>>	>>
Consumption of petrol. products	769	>>	>>
Natural gas consumption	7.321	>>	>>
Derived gas consumption	570	>>	>>
Nuclear heat consumption	920	>>	>>
Other fuels	184	>>	>>

Source : EUROSTAT

P O R T U G A L

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

The Portuguese electricity sector is vertically integrated, with single state-owned and operated companies responsible for production, transmission and distribution of electricity in the mainland and the islands of Azores and Madeira.

The electricity industry was nationalized in 1977 by amalgamating the 15 independently owned and operated electricity companies into a single organization, the Electricidade de Portugal (E.D.P.). The E.D.P. company is responsible for production and transmission of the electricity in mainland Portugal. Distribution used to be effected by municipalities themselves or by concessions to E.D.P., but since 1987 the system is changed and E.D.P. has been entrusted with the distribution of electricity at low tension in the 275 municipalities which operated in mainland Portugal.

There are also two other electricity utilities which operate independent of E.D.P. on the islands; the E.D.A. (Electricidade dos Azores) and E.D.M. (Electricidade da Madeira). These two companies manage the whole electricity cycle of production transmission and distribution in the islands.

B. PRODUCTION

1. Number of undertakings - capacity - production

E.D.P. generates over 95% of the electricity consumed in mainland Portugal. The rest of 5% of the electricity demand is covered by imports from Spain. The level of imports varies substantially, and is dependent on the availability of EDP's substantial hydro capacity. The electricity produced by autoproducers is at present relatively low (6% of the total consumption in 1987) but is expected to increase in the future.

Electricity Production 1989

	GWh
E.D.P.	23,943
Imports (net)	1,165

The installed generation capacity is increased by 80% during the decade 1979 - 1989 as it is shown in the following table:

	M.W.
1979	3,252
1989	6,600

(* EPA and EDM, the electricity utilities in the islands generate all the electricity consumed there ??????)

2. Ownership

The electricity industry in Portugal was nationalized in 1977 and now the E.D.P. company is owned by the State who is the only shareholder. So, the electricity production is under central Government administration except for the autoproducers and rural cooperatives. E.D.A. and E.D.M., the two electricity utilities in the islands also belong to the State and they are under the regional government administration.

3. Cooperation among utilities

There is a program of co-operation about technical assistance between E.D.P. and E.D.A.

4. Autoproduction

The autoproduction share in 1987 was estimated at 6% of the total national electricity consumption.

C. Transmission

1. Number of undertakings

Concerning transmission, E.D.P. has the responsibility for the national dispatch in high and low voltage. E.D.A. and E.D.M. are the companies responsible for electricity transmission in the islands.

2. Ownership

E.D.P. is a state-owned company as well as E.D.A. and E.P.M. The State is the only shareholder of the E.D.P. company whilst E.D.A. and E.D.M. depend on the regional authorities. The following table shows the

Owners Companies	Publ. State	Publ. Regional Authorities
E.D.P. (P.-T.-D)	100,00	
E.D.A.(Azores I) (P.-T.-D)		100,00
E.D.M.(Madeira I) (P.-T.-D)		100,00

3. Interconnections

Portugal is interconnected with Spain.

D. DISTRIBUTION

1. Number of undertakings

In mainland Portugal, distribution is carried out by E.D.P., except for the Porto and Covilha municipalities and 10 small rural cooperatives. E.D.P. holds also the obligation to supply, so it is obliged to sell energy to these independent distributors. The E.D.P. distribution grid is divided into (4) regions covering the peninsular territory. Each region is responsible for the planning, construction and operation of the distribution networks and consumer affairs including billing. The operation of network is further subdivided into a total of 31 distribution centres.

On the islands, E.D.A. and E.D.M. are responsible for distribution.

At the end of 1987 there were 3.671.811 consumers of low tension and 12.149 consumers of medium and high tension connected directly to the E.D.P. network.

2. Ownership

In mainland Portugal, E.D.P. is responsible for distribution and is a state-owned company. On the islands, E.D.A. and E.D.M., the companies responsible for the distribution, belong to the regional authorities.

3. Co-operation among utilities

see B.3. above.

ANNEX TO SECTION 1 QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	-
Thermal monovalent	
- coal	849
- brown coal	-
- oil	1.704
- by product gas	-
Thermal polyvalent	
- with coal	136
- without coal	-
Hydro	
- gravity	2.542
- pumped storage	489
New energies	-
Gas turbines, diesel etc.	329
Not specified	120
Gas turbines, diesel etc.	329
TOTAL	6.498

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (Mw)	Year of comissioning
Alto Lindoso	Hydro	634	1992
Caldeirao	>>	32	1992
Touvedo	>>	22	1992
Pracana 2	>>	25	1992
Sines IV	Thermal	283	1989
Pego I	>>	283	1993

Source : UNIPEDE

(c) Total production par type of fuel

origin of production	electricity GWH	electricity %.
Hydro (including pumped)	12.105	55,8
Nuclear	-	-
Thermal		
- coal	5.577	25,8
- brown coal (or peat)	-	-
- oil	3.304	15,2
- natural gas	-	-
- by product gas	42	0,2
- miscellaneous	651	3,0
TOTAL	21.679	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
Portugal-Spain				
	Lindoso	Las conchas	132	100
	Bemposta	Aldeavila	220	400
	Pocinho	Aldeavila	220	400
	Pocinho	Saucellea	220	400
	Total capacity			1.300
Total transmission capacity between Portugal and its neighbouring countries=				1.300

Source : UCPTE

(b) Lines and cables under construction

None.

(c) Electricity exchanges

In 1988 Portugal has imported 3.417 GWh (3.699 GWh in 1987), and exported 1.027 GWh (675 GWh in 1987). Thus, the Portugal import surplus fell by 634 GWh, reaching a level of 2.390 GWh.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	1.317	(1000 TOE)
Lignite consumption	-	>> >>
Consumption of petrol. products	812	>> >>
Natural gas consumption	-	>> >>
Derived gas consumption	19	>> >>
Nuclear heat consumption	-	>> >>
Other fuels	143	>> >>

Source : EUROSTAT

S P A I N

SECTION 1 - STRUCTURE OF THE UTILITIES IN THE ELECTRICITY SECTOR

A. GENERAL OVERVIEW

A great number of private and public producers generate electricity in Spain.

RED ELECTRICA DE ESPANA S.A. (REDESA) owns and is the only operator of the high voltage grid of 380kV and partly of 220kV whilst the electricity utilities own and manage the low voltage grids. REDESA does not operate on the islands, where GESA (Balearic Isles) and UNELCO (Canary Islands) own and operate the transmission systems. REDESA is also entitled to decide which power plant has to be connected to the national grid.

In Spain, production utilities are also distributors. Therefore, the largest operating companies are also the largest distributors. The only exception to this is the public utility ENDESA which only operates as distributor in the Spanish territories of Ceuta and Melilla, and sells the most of its production to the other utilities.

B. PRODUCTION

1. Number of undertakings - Capacity - Production.

171 companies generating electricity operate in Spain. Of these 171, one is only a producer and the other 170 are vertical utilities (both producers and distributors). 21 companies produce 98% of the electricity.
The following table contains the national capacity and production for 1987 (88 data to be obtained), showing the ten largest producers.

TABLE I

	CAPACITY (MW)	(%)	PRODUCTION (GWH)	%
Hidroelectrica Espanola	7.593	18,1	18.740	14,1
Endesa	6.547	15,6	33.517	25,2
Iberduero	6.489	15,4	15.875	11,9
U.E. Fenosa	4.907	11,7	16.150	12,1
Fecsa	4.387	10,4	9.991	7,5
Sevillana	4.275	10,1	12.900	9,7
Enher(*)	1.845	4,4	3.379	2,5
Hidrocantabrico	1.471	3,5	5.057	3,8
Viesgo	1.076	2,6	2.812	2,1
Hecsa(**)	986	2,4	2.496	1,9
Others	2.434	5,8	12.260	9,2
National total	41.992	100,0	133.168	100,0

SOURCE : UNESA

2. Ownership

The ownership structure of the sector is shown in Table II.

(*) affiliated company of ENDESA.
(**) affiliated company of Hidroelectrica Espanola.

TABLE II - Ownership

ELECTRICITY COMPANIES	(Pub) STATE I.N.I.*	(Priv) PRIVATE INVESTORS	(Pub) ENDESA	(Priv) ELECTRICITY UTILITIES	(Priv) HIDROELECT. ESPANOLA	(Pub) ENHER
ENDESA (P-D)	75,6%	24,4%				
HIDROELECT.ESPA. (P-D)		100,0%				
IBERDUERO (P-D)		100,0%				
U.E. -FENOSA (P-D)		94,4%	5,6%			
SEVILLANA (P-D)		90,2%	9,8%			
FECSA (P-D)		65,4%	12%	22,6%		
H. CANTABRICO (P-D)		100,0%				
ENHER (P-D)		8,5%	91,5%			
VIESGO (P-D)		100,0%				
HECSA (P-D)					95.4%	
GESA (Balearic I.) (P-T-D)		44,7%	55,3%			
UNELCO (Canary I.) (P-T-D)		0,4%	99,6%			
ERZ (P-D)		37,3%	62,7%			
RED ELECT. DE ESPANA (T)	1,0%		49,0%	45,0%	5,0%	

P = Production
T = High Voltage Transmission
D = Distribution

SOURCE : UNESA

(*) I.N.I. stands for National Institute of Industry.

C. TRANSMISSION

1. Ownership

Redesa is 51% public and 49% owned by private utilities (see Table II).

2. Interconnection

Spain is interconnected with France and Portugal and Andorra. REDESA is in charge of managing the international exchanges of electricity.
(see data in annex).

D. DISTRIBUTION

1. Customers and markets in 1988

The number of customers of the twelve largest distributors is shown in the following table :

TABLE III

HIDROELECTRICA ESPANOLA	3,711.958
IBERDUERO	3,196.627
SEVILLANA	2,110.312
U.E. FENOSA	2,364.958
FECSA	1,598.285
ENHER	810.194
UNELCO	621.738
E.R.Z.	566.125
GESA	460.253
VIESGO	401.728
HIDROCANTABRICO	310.550
FUERZAS HIDROELECTRICAS DEL SEGRE	158.015

SOURCE : UNESA

Each one of the distributing companies supplies its energy to a specific geographic area.

2. Ownership

The percentage of the distribution sector owned by the State is not as high as it is in the production sector due to the special situation of ENDESA. In spite of ENDESA's affiliated companies - ENHER, E.R.Z, GESA and UNELCO - operating individually as distributors. The majority of the distribution sector is private-owned.

3. Cooperation

There is no cooperation mechanism specific to distribution. The 20 largest distribution companies are represented in UNESA (see point B.3 above).

QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of existing capacity

Maximum possible capacity (net Mw) at the end of 1988.

Nuclear	7.446
Thermal monovalent	
- coal	8.100
- brown coal	1.794
- oil	5.769
- by-product gas	-
Thermal polyvalent	
- with coal	-
- without coal	1.899
Hydro	
- gravity	11.114
- pumped storage	4.216
New energies	1
Gas turbines, diesel etc.	-
Not specified	-
TOTAL	40.339

Source : UNIPEDE

(b) Power stations under construction

Name	Type	Net capacity (Mw)	Year of comissioning
Valdecaballeros 1	Nuclear	926	1996
Valdecaballeros 2	>>	926	1996
Escatron	Thermal	71	1992
Centrales diversas	Hydro	18	1989
Sela-San Jorge	>>	157	1992
La Muela 1-3	Pumped storage	620	1989

Source : UNIPEDE

(c) Total production par type of fuel

origin of production	electricity GWH	%
Hydro (including pumped)	35.720	27,0
Nuclear	48.262	36,5
Thermal		
- coal	31.608	23,9
- brown coal (or peat)	7.987	6,0
- oil	6.460	4,9
- natural gas	999	0,8
- by product gas	842	0,6
- miscellaneous	470	0,4
TOTAL	132.348	100,0

Source : EUROSTAT

B. EXCHANGES - CAPACITY AND TRADE

(a) Existing lines and cables

			Voltage (KV)	Transmission Capacity (MVA)
Spain-Portugal				
	Las conchas .	Lindoso	132	100
	Aldeavila	Bemposta	220	400
	Aldeavila	Pocinho	220	400
	Saucellea	Pocinho	220	400
	Total capacity			1.300
Spain-France				
	Cantegrit	Hernani	380	1.150
	Mouguerre	Arkale	220	400
	Pragnères	Biescas	220	150
	Luchon	Benos	150	80
	Baixas	Vich	380	1.250
	Total capacity			3.030

Total transmission capacity between Spain and its neighbouring countries= 4.330

Source : UCPTE

(b) Lines and cables under construction

None.

Source : UCPTE

(c) Electricity exchanges

In 1988 Spain has imported 3.482 GWh (3.171 GWh in 1987), and exported 4.803 GWh (4.704 GWh in 1987). Thus, the Spain export surplus was 1.321 GWh in 1988.

Source : EUROSTAT

C. UTILISATION OF PRIMARY SOURCES

Coal consumption	7.852	(1000 TOE)
Lignite consumption	2.435	>> >>
Consumption of petrol. products	1.867	>> >>
Natural gas consumption	225	>> >>
Derived gas consumption	202	>> >>
Nuclear heat consumption	13.023	>> >>
Other fuels	132	>> >>

Source : EUROSTAT

U N I T E D K I N G D O M

SECTION 1 - STRUCTURE OF THE ELECTRICITY SECTOR

A. GENERAL DESCRIPTION

All public generation, transmission and distribution of electricity in Great Britain was nationalised on April 1948 under the Electricity Act, 1947, and the structure created was subsequently amended, in the case of Scotland in 1954, and in England and Wales in 1957. Electricity supply in Northern Ireland was placed under the control of a non-departmental public body on 1 April 1973 under the Electricity Supply (Northern Ireland) Order 1972.

The Energy Act 1983 had removed the statutory restrictions on the private generation of electricity. From 1st June 1983, providing the terms and conditions were reasonable, a public Electricity Board had to allow the private generators to use it's transmission and distribution system and purchase electricity generated by the private generators.

On 25 February 1988 the Government announced the proposal for privatisation of the Electricity Supply Industry in England and Wales. The 12 Area Boards will be privatised as 12 distribution companies, each with the obligation to supply in its area, the Central Electricity Generation Board will disappear and its obligation to provide bulk supplies of electricity end.

The Electricity Act 1989 gave the Government powers to carry out the re-organisation of the electricity supply industry.

From the 1st of April 1990 the electricity industry in the United Kingdom has the following structure:-

Northern Ireland is supplied by Northern Ireland Electricity, and Scotland, the Northern part, by Scottish Hydro Electric and the South by Scottish Power. These three organisations are vertically integrated utilities with generation, transmission and distribution.

Also in Scotland, Scottish Nuclear (SNL), owns the three existing nuclear power stations (1 Magnox and 2 Advanced gas cooled reactors).

In England and Wales generation, transmission and distribution are separate tasks under different responsibilities.

Generation is provided by three production companies, National Power and PowerGen, who own the conventional stations previously under the responsibility of the Central Electricity Generation Board (CEGB), and Nuclear Electric, which has inherited all its nuclear power plants in England and Wales.

A new trade association has been created for the electricity supply industry in the United Kingdom, known as the Electricity Association. It will be financed by all the newly-created electricity companies, both private and public. As well as providing a forum for discussion of matters of common interest, it will provide a collective voice for the industry, nationally and internationally and make available specialist research and professional services for member companies.

Within the United Kingdom nearly 90% of public electricity supply is in England and Wales.

B. PRODUCTION

In England and Wales, National Power has about 60% of the coal and oil generating capacity (30 GW), with PowerGen holding the remainder (19 GW).

Nuclear Electric, holds all the nuclear power plants, which represent about 8,8% of the generating capacity in England and Wales.

The generating facilities in Scotland, with the exception of the nuclear stations, are owned by Scottish Hydro Electric and Scottish Power. Scottish Nuclear will remain state-owned.

In Northern Ireland the generating stations, with about 2,1 GW of installed capacity, are owned by Northern Ireland Electricity.

After the privatisation the generating companies in England and Wales will be able to supply directly to their own big customers, with the limitations described under D. during the first eight years.

The following table gives the capacities of present generating companies:

Company	Net Capacity : (MW)
England and Wales :	
National Power	29.687
PowerGen	18.450
Nuclear Electric	4.898
National Grid	2.088
Scotland :	
Scottish Hydro E.	3.265
Scottish Power	3.831
Scottish Nuclear	2.700
Northern Ireland :	
Northern Ireland E.	2.100

The following table contains the national capacity and production with the old company structure, for 1988. (Year ending March 1989)

	Capacity (MW)	(%)	Production (Gwh)	(%)
CEGB	58.470		231.909	
North Ireland El.....	2.100		5.956	
North Scotland H.....	2.577		7.073	
South Scotland E.....	6.531		22.321	
Others.....	-		19.593	

The autoproduction share in 1988 amounts to 6% of total national electricity consumption.

C. TRANSMISSION

In England and Wales the high voltage transmission grid is operated by the National Grid Company (NGC), which owns the 275 kV and 400 kV transmission system. It is owned by a holding company representing the 12 area distribution companies of England Wales.

National Grid operates the high voltage transmission grid in England and Wales, by taking the energy from the different stations in a preference order of increasing prices, in accordance with the demand in each moment and calculating the energy price every half hour.

In Northern Ireland and Scotland, the high voltage transmission system are owned and operated respectively by Northern Ireland Electricity and by Scottish Hydro Electric and Scottish Power.

There is a submarine interconnection between France and southern Britain.

An interconnection from Northern Ireland to the Republic of Ireland has been out of operation for many years due to terrorist activity.

D. DISTRIBUTION

The distribution is carried out in Northern Ireland by the Northern Ireland Electricity and in Scotland by the Scottish Hydro Electric and the Scottish Power, all of them vertically integrated utilities.

In England and Wales the distribution systems are owned and operated by 12 Distribution Companies in their respective areas. These Distribution Companies have an obligation to supply in their respective areas, but will be open to competition from outside suppliers.

However, to protect the distributing companies in the early years of privatisation, the Government agreed to restrict competition in the first eight years after privatisation, guaranteeing the distributors a monopoly of all customers in their areas, using less than 1 MW during the first four years and below 100 kW during the next four years.

There will be also some limitations on direct sales by generating companies to customers in the early years, to smooth the transition, in the first four years they will be able to supply directly to premises taking more than 1 MW., provided that National Power and PowerGen together, do not supply more than 15% of the demand in any distribution company's area.

In the next four years, the generating companies will be able to supply directly to customers taking more than 100 kW. subject to a ceiling of 25% of the demand in any distribution company's area.

After these eight years there will be no restrictions on direct sales either in total or for size of customer.

	Field	Ownership at 1/4/90[1]
ENGLAND AND WALES		
National Power	P	February 1991
PowerGen	P	February 1991
Nuclear Electric	P	Public
National Grid	T	November 1990
(London)	D	November 1990
(South Eastern)	D	"
(Southern)	D	"
(South Western)	D	"
(Eastern)	D	"
(East Midlands)	D	"
(Midlands)	D	"
(South Wales)	D	"
(Merseyside and North Wales)	D	"
(Yorkshire)	D	"
(North Eastern)	D	"
(North Western)	D	"
SCOTLAND		
Scottish Hydro Electric	P,T & D	August 1990
Scottish Power	P,T & D	"
Scottish Nuclear	P	Public
NORTHERN IRELAND		
Northern Ireland Electricity	P,T & D	---

(Field: P = Production T = Transmission D = Distribution)

(1) All the electricity utilities are at present owned by the public sector, the date written under title "Ownership" reflects the foreseen date to carry out the privatisation of each company.

In 1988 the number of customers supplied in the United Kingdom was approximately 24.8 million, distributed by companies as follows:

12 Area Boards	.....	21,911.405
Northern Ireland Electricity	.....	589.993
South of Scotland Electricity B.	.....	1,700.120
North of Scotland Hydro Electric B	.....	596.960

UNITED KINGDOM

ANNEX TO SECTION 1 - QUANTITATIVE BALANCE 1988

A. CAPACITY AND PRODUCTION

(a) Classification of the Existing Capacity

Maximum possible capacity (net MW) at the end of 1988.

Nuclear		10.956
Thermal monovalent		
- coal	-	34.695
- brown coal		-
- oil	-	12.216
- by product gas		-
Thermal polyvalent		
- with coal		4.870
- without coal		-
Hydro		
- gravity	-	1.408
- pumped storage	-	2.788
Gas turbines, diesel, etc	-	3.145
Renewable energies		4
TOTAL		70.082

Source : UNIPEDE

(b) Power Station Under Construction

Year	Name	Year Started	Capacity (MW)	Type
1995	Sizewell B	1987	1175	Nuclear PWR

(c) Total Production Per Type of Fuel

Origin of the production	net GWh	%
Hydro (including pumped)	6.854	2,4
Nuclear	55.642	19,3
Conventional thermal		
- coal	194.493	67,6
- brown coal and peat	-	-
- petroleum products	27.623	9,6
- natural gas	1.813	0,6
- derived gas	1.517	0,5
- others	-	-
TOTAL net production	287.942	100,0

Source : EUROSTAT

B. EXCHANGES, CAPACITY AND TRADE

(a) Existing Lines and Cables
There is a submarine interconnection with France consisting in two direct current circuits at +- 270 kV and a capacity of 2000 MVA.

(b) Lines and Cables under Construction

(c) Electricity Exchanges
The imported electricity from France in 1988 was 12.844 GWh and the exported electricity amounted to 13 GWh.

C. UTILISATION OF PRIMARY SOURCE

Nuclear	16.337 (1000 TOE)
Coal consumption	46.782 (1000 TOE)
Consumption of petrol products	6.086 (1000 TOE)
Natural gas consumption	363 (1000 TOE)
Derived gas	583 (1000 TOE)

Source : EUROSTAT

OVERVIEW

SECTION 2 - ELECTRICITY SECTOR - LEGAL PROVISIONS AND REGULATIONS

Section 2 deals with the main legal provisions and regulations which concern overall planning, authorisation of investments, production, import, export, transmission and distribution.

1. Overall planning regulations

In a number of countries, national energy plans exist which are set up regularly either by the government in agreement with the electricity industry (E, F, It, NL), or by the industry itself (B, Gr). If the industry is responsible for these plans, the approval of the energy minister is required. This means that in practice all long term planning is strongly influenced by the state.

2. Planning and authorisation of investment

Most Member States have complicated systems and long procedures for the authorisation of investment projects in production and transmission. No such authorisations are required in L. In D only a declaration has to be made and the public authorities have the power to refuse.

3. Production

In a number of Member States (Gr, F, Ir, It, Po), electricity production is in the hands of public utilities which have exclusive rights and operate essentially under monopolistic conditions. In other Member States, there is no need for specific authorisation for production (B, L). The remaining Member States have a system of public authorisation granted by the Minister of Energy (Dk, NL, E, UK) or have an obligation of notification to the public authorities (D).

4. Transmission

Transmission rules are similar to the production rules. In F, Gr, Ir, It, NI and Po almost exclusive rights or monopolies apply for transmission. In Dk and E, a public authorisation for transmission is needed. In L and the UK, the transmission right may be conceded. In D there is again the need for declaration with the possibility of refusal by the public authorities. In B generally no specific authorisation is needed, but in practice transmission is controlled by the electricity industry association.

5. Import/Export

In principle, in all countries with a public electricity industry, the electricity utilities have the monopoly or exclusive rights for electricity import and export (Gr, E, F, Ir, It). Moreover, in almost all of these countries, imports have to be approved by the Minister of Energy (E, F, Gr, Ir, It) and the National Bank (Gr).

Particular authorisations for import and export of electricity are foreseen in Dk and Po. This means in practice that only the national supplier gets authorisations.

No limitations to import and export exist in B, D, L and the UK. In B however, the imports and exports are controlled by the industry association.

6. Distribution

The systems of electricity distribution are more difficult to summarise. In Gr and Ir, the internal public supplier has also the exclusive right to distribution. This means that the electricity industry is totally integrated from production to distribution. In F and It, distribution is assured mainly by the public electricity utilities, but relatively small parts of distribution are under the responsibility of regional authorities. In Po, the municipalities have the exclusive right of distribution, while in other countries (L, NL, UK and It) distribution rights are given by concessions. In E distribution is assured by a number of small private enterprises which need public authorisation for distribution.

7. Autoproduction

For autoproduction, distinction should be made between the right to transport autoproduced electricity through the grid between different plants of the autoproducer, and the obligation for the grid company to purchase auto-produced electricity from the auto-producer.

a) Transport

Such rules exist in Gr, F, It, Lux and NL. In D the transport has only to be assured by the grid company if it would otherwise abuse a dominant position.

b) Purchase

The obligation to purchase autoproduced electricity at a fixed price exists only in Gr, E, F, It, NL and Po. In the other countries, where no such legal obligation applies, special agreements between autoproducers and electricity utilities for the purchase of autoproduced electricity have been concluded.

BELGIUM

SECTION 2 - ELECTRICITY SECTOR. LEGAL PROVISIONS AND REGULATIONS

A. GENERAL OVERVIEW

The Belgian electricity system balances private and public interests in a cooperative manner. It rests on the following principles :

- Principle of free enterprise in production, bulk distribution transmission, import and export.
- Principle of monopoly to municipalities (communes) for local distribution; in practice, municipalities associate with utilities in "Intercommunale mixte" and enter into long term renewable supply contracts.
- Principle of public regulation through :
  - Comité de Contrôle (Convention between the parties and Royal Decree 147 published on 19.1.1983).
  - Law of 8.8.1980 (M.B. 15.8.1980): approval of the investment plan by Ministry of Economic Affairs.
  - Right to a share of 15% in production for a public entity.
  - Right to nominate an administrator in a number of boards and bodies.

B. OVERALL PLANNING REGULATIONS

Since the law of 8 August 1980 (art. 173) concerning the budgetary proposals for 1979 and 1980, the national equipment plan for production and transmission of electricity has to be approved by the Ministry of Economic Affairs.

The part of the plan concerning production equipment is established by the CGEE (Comité de gestion des entreprises d'électricité). It includes an analysis of the expected demand and a review of investment projects under consideration by the auto-producers. The part of the plan concerning the transmission of electricity (above 150 KV) is established by GECOLI.

The approval is based on the following criteria : (to be included)

C. AUTHORISATION OF INVESTMENT

No specific rule applies to the authorisation of specific investment in the electricity sector. The authorisation procedures which apply are the same as for the other industrial activities. They are :

a) the authorisation to build : decision by the municipality and the region in the case of a power plant;

b) the authorisation to create a potentially dangerous installation applicable to transformers, turbo-generators, etc: decision by the municipality, the province or the region;

c) the authorisation to build an installation classified under the regulation for the protection against ionizing radiations, applicable to nuclear power plants : joint decision by the Minister of Employment and the Minister of Economic Affairs;

d) the authorisation for water intake and discharge: decision by the Region.

The right to use public ground to erect installations necessary for the transport and distribution of electricity is established by the law of 10 March 1925 and organised by two procedures:

a) the public ground use agreement (accord de voirie, A.R. of 26 November 1973, M.B. 27.2.1974) in the case of use by the State, regions, provinces or municipalities of public ground outside their geographical jurisdiction : decision by agreement with the public entity having jurisdiction, or decision by the region or the King;

b) the public ground use permission (permission de voirie, A.R. of 26 November 1973, M.B. 27.2.74) in the case of individuals of private companies: decision by the Commune or the province with approval by the region and the King, in the case of lines that do not extend beyond the limits of a commune or province; decision by the region or the King in the case of lines extending beyond the limits of a province or region.

The right to use privately-owned grounds to erect electric lines for distributors or transporters of electricity is also established by the law of 10 March 1925, provided the region or the King declares that it is in the public interest (déclaration d'utilité publique).

D. PRODUCTION

The overall production management is entrusted to the CPTE which calls on plants according to a merit order based on the minimization of short-term marginal cost and taking into account the technical constraints of the transmission network.

The auto-producers can enter into private contracts with the utilities, to sell their surplus electricity. There is no legal obligation to do so. The price of purchase has been standardized by note 2901 of the CGEE and is based on the avoided cost to the utility. The price of supplies to the auto-producer reflects the irregularity of such supplies.

E. IMPORT/EXPORT OF ELECTRICITY

The principle of free enterprise applies to the import and export of electricity.
Practically, imports and exports are regulated through the transmission network by the CPTE taking into account import or export contracts by the utilities, the contracts resulting from the multinational ownership of power plants in Belgium or in other countries and the so-called short-term coordination exchanges within the framework of the UCPTE (european coordination).

F. TRANSMISSION

Transmission of electricity regulated by the CPTE.

G. DISTRIBUTING

The law of 25 March 1925 entrusts to municipalities the monopoly to supply electricity to domestic consumers (supply for lighting and power less than 1000 KW).

Several types of entities are possible under the law of 25 March 1925:

- public service established by the municipality (regie communale);
- concession by the municipality to the private sector;
- association of the municipality with the private sector;
- association of municipalities, with or without the private sector (intercommunale pure ou mixte).

Other consumers (above 1000 KW in power) can in principle decide the supplier's choice.

In practice, only the largest consumers are supplied directly by the producing utilities and the transmission network. All the other consumers are supplied by the area distributors, in the same way as the domestic consumers.

DENMARK

SECTION 2: ELECTRICITY SECTOR. LEGAL PROVISION AND REGULATION

1. OVERALL PLANNING REGULATION

Every electricity supply company with a production capacity bigger than 25 MW needs the approval of the Minister of Energy. (Law of Electricity distribution 1976 art.3)

2. PLANIFICATION AND AUTHORISATION OF INVESTMENT

The production companies must submit the annual investment plans to the government authorities.

3. AUTO-PRODUCTION

There is no legal regulation covering the obligation to buy the surplus electricity of autoproducers.

4. IMPORT/EXPORT

The electricity import and export need government authorisation if they are made through installations of voltage above 100 kV. The authorisation has been given to Elsam and Elkraft.

5. TRANSMISSION

The grid owner has the monopoly of its utilisation. There is no obligation to provide access to third parties.

6. DISTRIBUTON

FRANCE

SECTION 2 : LEGAL PROVISIONS AND REGULATIONS

1. OVERALL PLANNING REGULATIONS

The government interferes directly in EDF planning through the "Contrat de Plan" with which planning targets are set for EDF. The latest "Contrat de Plan" refers to the period 1989-1992 and has set the following targets for EDF:

- real reduction of tariffs by 1,5% by 1992
- reduction of debt by 20 billion FF
- 21,5 billion FF investment in grid
- a number of performance indicators to be met.

Prior to the latest "Contrat de Plan", investment plans were reviewed by inter-ministerial FDES, which is now really concerned with the general effect rather than with individual projects.

In general terms, planning was and continues to be the responsibility of EDF, who is, however, influenced and controlled by the government (through for example appointment of its Administration Conseil, the "Contrat de Plan" etc).

2. PLANIFICATION AND AUTHORISATION OF INVESTMENTS

The authorisation procedure differs depending on the type of the plant.

(a) Thermoelectric plants

The various steps and the required approvals are indicated in the following table.

Name of the procedure	Type of the decision and competent authority	Object of the procedure
. Declaration of public interest	Decree of the "Conseil d'Etat"	Site acquisition - expropriation
. Authorisation for creation (for the nuclear power stations)	Decree of the Counsil of Ministers	Technical control
. Authorisation to use petroleum products in thermoelectric power stations	Decision of the General Energy Director on the Minister's authority	Directive EEC of 1975
. Authorisation for classified installations regarding environmental protection :		
- for thermoelectric power stations	Local authority byelaw	Environmental protection
- for nuclear power stations	Local authority byelaw included in the decree concerning the authorisation for creation	
. Authorisation to take water	Local authority byelaw	Protection of water courses
. Authorisation for water rejection	Local authority byelaw	Aquifer
. Authorisation to reject radioactive liquid or gaseous effluents	Ministerial order	Limits of effluents rejection

The authorisations for conventional thermal power plants are granted at regional level.

(b) Hydroelectric plants

The various procedures and the necessary authorisations are indicated in the following table.

Name of the procedure	Type of the decision and competent authority	Object of the procedure
For the installations of more than 4.500 KW		
. concession (and specifications)	Decree of the "Conseil d'Etat"	Granting of the right to use water
. declaration of public utility	Decree of the "Conseil d'Etat"	Leaways and expropriation
. instructions for the exploitation	Administration	Conditions of exploitation
For the installations of less than 4.500 KW		
. authorisation decision	Local authority byelaw	water right, leaways, exploitation conditions
. Exploitation regulation (eventually)	Administration	

The authorisations for hydroelectric plants of an installed capacity of less than 4.500 KW are granted at regional level.

(c) Electric lines

All necessary procedures and authorisation are described in the following table.

Name of the procedure	Type of the decision and competent authority	Object of the procedure
Contract for the concession of the right to transport electricity	Decree of the Counsil of Ministers Convention and specifications signed by the State and the utility Local situation : local authority byelaw and opinion of the Minister convention and specifications signed by the State and the utility	Concession of the right to transport electricity
Declaration of the public interest of the installations	Ministerial decision	Application of leaways (lines) or expropriation (pylons)
Execution authorisation	Local authority byelaw	Construction standards of the installation
Building permit	Local authority byelaw	Conformity with the town planning standards

3. PRODUCTION

- Public supply

EDF was created in 1946 under the Nationalisation Act 46-628 of 8 April 1946, with which not only the production but also the transport, the distribution as well as the import and export of electricity were nationalised. EDF was formed by the amalgamation of the many hundreds of companies involved in electricity generation and distribution. Although a nationalised company, EDF is financially, technically and commercially autonomous and run as an independent enterprise. It has the expropriation right. EDF today owns all the power stations transferred to it with the nationalisation and all the installations built thereafter :

The following production installations have been excluded from the nationalisation :

- the power stations of which the mean annual production in the years 1942 and 1943 was less than 12 GWh,
- the autoproducing installations,
- the private generators with an installed capacity of not more than 8 MVA (law 2.8.49),
- the power installations belonging to the municipals and producing power from urban waste or producing heat and power.

In particular, the following electricity production companies have been excluded from the nationalisation :

- SNCF and CDF, which are public nationalised companies. SNCF owns a number of hydro electric plants totalling 568 MW and CDF operates some coal-fired stations and sells both power and coal to EDF,
- the production installations belonging to municipals or to mixed companies with the majority of shares held by public bodies,
- CNR, which was set up as a public company on 27 May 1933. Today CNR has the particular status of a public utility company (société d'intérêt général). All shares are held by public bodies such as EDF, SNCF and regional authorities.

All production utilities belonging to one of the above categories have the expropriation right.

In order to use the hydro power of some international rivers more rationally, France has concluded special agreements with neighbouring countries regarding the joint exploitation of hydropower for electricity production. This is the case for DOUBS (Chatelot, Goule, Refrain) RHIN, RHONE (Chancy-Pougny) and in the ALPES (development of Emosson).

A law of 27.11.1958 permits the creation of limited companies (sociétés anonymes), governed by French law, with the participation of foreign capitals, for the establishment of nuclear power stations in the French territory. It is the case for SENA (Société

d'Energie Nucléaire franco-belge des Ardennes), which has built the power station of CHOOZ, and NERSA (Société Centrale Nucléaire à neutrons rapides S.A.), which has constructed the power station of CREYS - MALVILLE. Other relevant legislation includes the law of 2.8.49 about private generators, the law of 20.5.55 concerning the obligation of EDF to purchase energy produced by private generators etc.

- Autoproduction

The EDF nationalisation law of 8.4.1946 (article 8, §4) is the basic law governing the electricity autoproduction. The relations between autoproducers and EDF in the technical and commercial field are defined in the decree of 23.1.1950. The decree of 20.5.1955, obliges EDF to buy the electricity produced by the autoproducers with an MVA ceiling and only as long as the producers sell all production to EDF and defines the principles for the estimation of the price at which EDF purchases this electricity.

The tariffs paid are based on sales tariffs minus EDF's transmission and distribution costs.

Large firms have lobbied to have the ceiling increased, but EDF is completely opposed to it. Autoproducers have the right of common carriage to a maximum of three other sites owned by them and situated in the French territory. Few, however, have taken advantage of this.

4. IMPORT-EXPORT

Electricity may be imported or exported only be EDF (nationalisation law 46.628 of 8.4.1946). The same law provides that a consumer does not have the right to use EDF's lines in order to import electricity from another country. The obligation to transport electricity for third parties is not foreseen. The electricity exchanges are governed by the decree of 29.1.1985. Today, EDF is the sole responsible body for electricity exchanges and a pre-authorisation is not needed.

5. TRANSMISSION

EDF owns and operates almost all high voltage transmission lines and organises central despatching, according to the nationalisation law 46-628 of 8.4.1946. As high voltage transmission lines are considered all 400 KV, 225 KV, 90 KV and 63 KV electric lines. There are, however, some 90 KV and 63 KV lines supplying the electrified railway lines of SNCF, a network project of 225 KV exploited by Régie de Metz, and a number of 90 KV lines of Régie de la Vienne which are not of a general supply character; these lines have been excluded from the nationalisation of the transmission network.

EDF has the obligation under some conditions to transport the electricity produced by the independent producers, which existed before nationalisation (1946).

6. DISTRIBUTION

Distribution was also nationalised with law 46-628 of 8.4.1946, and EDF distributes today 95% of all electricity. However, all

distribution companies in which public bodies and municipalities hold the majority of shares, the "régies", and some other companies of similar character have been excluded from the nationalisation (art. 23). The distribution utilities which do not belong to EDF are today more than 200.

GERMANY

SECTION 2 - ELECTRICITY SECTOR - LEGAL PROVISIONS AND REGULATIONS

1. OVERVIEW

In principle, the rule of freedom of business activities applies also for the electricity undertakings responsible for production, transmission and distribution.

However, the electricity sector is subject to national policies and to State surveillance and functions with closed supply areas.

The State surveillance stipulated in the "Energiewirtschaftsgesetz" (EnWG) covers the field from construction of an energy plant to a tariff system applied to consumer. Investment to be notified, and the national administration has the possibility to veto investments which are not in line with public law.

Electricity utilities have an obligation of connection and supply, and they are subject to a tariff system.

The general electricity policy concerns mainly the following fields:

- coal policy

- nuclear power policy and

- environmental and energy savings policies.

The legal instrument for this policy is the "3. Verstromingsgesetz" (1) which assures the use of certain quantities of coal for electricity production.

There is strong political pressure for banning nuclear power production. High standards for SO_x emissions and encouragement for the increased use of renewable energies complete this policy.

Electricity utilities are subject to the general control of market power. The competition law (Gesetz gegen Wettbewerbsbeschränkunger - GWB) allows elimination of any abuse of such power.

In practice the electricity industry functions with closed supply areas which are created by demarcation and concession contracts. In practice, this leads to little or no competition in the field of electricity production, transmission and distribution.

(1) Bundesgesetzblatt (BG BL), 1, page 2137; last change in 1987 BGBL, 1, page 1617.

2. PRODUCTION

Paragraph 5 (1) of the "Energiewirtschaftsgesetz" (EnWG) foresees an authorisation by the competent authorities of the "Land" to supply electricity to third parties. (Exceptions : the companies which supplied electricity before the coming into effect of the 1935 law, which is the case of most of the companies at present, as well as the installations whose power does not exceed 1MW.)

This authorisation does not establish an exclusive right; it can be limited to a specific area or buyer. Its purpose is to avoid a dispersion of supplying areas and double investment.

The construction of new installations must be notified to the State supervisory authorities (§ 4 EnWG) (exceptions : power stations for public supply < 1MW power stations of auto-producers < 10MW). The authorities have the right to veto for reasons of public policy.

The electricity supply companies benefit from a right of expropriation necessary for the public supply of energy (Art 11 EnWG).

3. Import/Export

There are no exclusive or special import or export rights.

4. Distributions

The same authorisations as for production.

5. Transmission

The types of authorisation for transmission are the same as for production.

Exclusive rights can be granted by "concession" contracts or "demarcation" contracts to guarantee that no other company will undertake public supply of electricity in a well-defined area.

These contracts are permitted as long as they do not bind the contractual parties for more than 20 years (Art 103 GWB).

GREECE

SECTION 2 - LEGAL PROVISIONS AND REGULATIONS

1. OVERALL PLANNING REGULATIONS

PPC, being a monopole in the electricity sector, has all the responsibility for planning and operation. However, the government influences PPC in decision making in various ways. PPC prepares five and ten year energy plans which are approved by the Ministry of Industry Energy and Technology.

2. PLANIFICATION AND AUTHORISATION OF INVESTMENTS

Planification of investments is the responsibility of PPC. Authorisation, however, for any particular investment has to be asked by the Ministry of Industry, Energy and Technology. The procedure differs depending on the type of the plant or the installation. The criteria for an authorisation are closely related to the purposes for which PPC was created and given the exclusive rights for production, transmission, distribution and import and export of electricity (satisfaction of demand, exploitation of indigenous resources, security of supply, supply of electricity at the least possible cost, protection of the environment etc). The authorisation procedures depend on the type of the electric installations and they are generaly long.

(a) Thermo electric plants

A lot of authorisations are required. The relevant applicable laws are N 1235/3.3.82, (art. 6), N 1559/85 (art. 10, 11 and 12), Presidential Decree (PD) of 24.5.86 (art. 7), N 487/70 and P.D., of 3.9.1983. The intervening Ministries are those for Industry, Energy and Technology, Public Works Town Planning and Environment, Agriculture (Forests), Antiquities and Culture and National Economy. The authorisation of the regional authorities is also needed. Regarding new power plants on islands, the procedure is different and some more authorisations are required, among which those of the Ministry of National Defence and the Tourist Organisation.

(b) Hydroelectric plants

The following legislation applies :

N 1335/83, N 1650/86, N 191/71, N 337/85, N 998/79, N 1488/84, N 1065/80, N 1266/82, PD 76/85, N 1559/85, N 1739/87, N 998/79, N 1065/80.

(c) Electric lines

Similar complicated procedures are required for the granting of an authorisation for the construction of electric lines or submarine cables.

(d) Aeolian and photovoltaic plants

The relevant applicable laws are : N 1559/85, 2689/87, 2708/87, 2798/87, 2689/87, N 475/1984 (geothermal plants) etc.

(e) Autoproduction plants

The procedure to be followed for the necessary authorisation is described in the law 1559/85.

Precondition for the construction of any work (power plant or electric line) is its inclusion in the PPC's plan, which is approved by the Ministry of Industry, Energy and Technology. The final decision is made at national level.

3. PRODUCTION

- Public supply

PPC was created in 1950 and given the status of an independent utility with all shares owned by the state. PPC has the exclusive right of electricity production in Greece (with the exception of autoproducers). The relevant legal base is the laws 1468 of 1950 and 1559 of 1985.

- Autoproduction

The relationship between PPC and new autogenerators is covered by the law 1559 of 1985. The autoproducers are not allowed to use PPC's lines to sell to third parties electricity produced in their installations. The electric energy, which is not used by the autoproducers for their own needs, is sold exclusively to PPC, which is obliged, under certain circumstances to buy it.

The conditions for the connection of an autoproducer's production installation to its consumption centre are defined in the ministerial decision 2769 of 16.5.1988. The definition of the relevant selling prices are governed by the ministerial decision 2752 of 15.2.88.

4. IMPORT/EXPORT

PPC has the exclusive right of import and export of electricity. Any import is done for PPC's own needs and no one else has the right to import or export electricity. For the import of electricity, the authorisation of the Bank of Greece is required (for the necessary exchange), which is granted after the suggestion of PPC's supervising Minister for Industry, Energy and Technology. Criteria for all electricity exchanges are the covering of internal demand and the best utilisation of the electric system. PPC has so far concluded long term arrangements with the interconnected countries as well as specific contracts and spot exchanges to cover emergencies.

5. TRANSMISSION

PPC owns and operates exclusively the transmission lines (law 1468 of 1950). It has no obligation to transport electricity for third parties. Concerning autoproducers, the Greek utility has the obligation to "rent" its lines for the transport of the autoproduced electricity to the consumption centres of the autoproducer (law 1559/85).

6. DISTRIBUTION

PPC is the exclusive distribution utility in Greece (law 1468 of 1950) and it does not have the obligation to distribute energy for third parties.

IRELAND

SECTION 2 - ELECTRICITY SECTOR, LEGAL PROVISIONS AND REGULATIONS

1. OVERALL PLANNING REGULATIONS

In addition to the duties and obligations imposed on Electricity Supply Board by the Electricity Acts, the company is also subject to the Planning Laws in force.

2. PLANIFICATION AND AUTHORISATION OF INVESTMENT

All investment proposals are formulated within ESB's overall planning framework. As part of the Public Capital Programme, the company's investment plans are submitted to Government annually for approval, while major investment projects require specific Government authorisation. The Company's borrowings also require Government sanction. Finally, the level of ESB's aggregate capital expenditure is fixed by Government Statute.

3. AUTO-PRODUCTION

Whilst a person or company may generate electricity for their own use, it cannot be distributed to the public without a permit from ESB. ESB can and does purchase the surplus energy of autoproducers, but it is not legally obliged to do so.

4. IMPORT/EXPORT

The Electricity Supply Act 1945 has given the exclusive right of import and export of electricity to the Electricity Supply Board. Ireland does not interchange electricity with other countries.

5. TRANSMISSION

The Electricity Supply Act 1945 has given the exclusive right of electricity transmission and distribution to the electricity Supply Board.

6. DISTRIBUTION

See title above.

ITALY

SECTION 2 : LEGAL PROVISIONS AND REGULATIONS

1. OVERALL PLANNING REGULATIONS

The Ministry of Industry draws up the National Energy Plan, whenever it considers it necessary; there are not fixed or regulated time limits for that. ENEL and other energy bodies contribute to the composition of the National Energy Plan, the last one of which was edited three years ago. The National Energy plan is submitted to the Italian Parliament for approval.

2. PLANIFICATION AND AUTHORISATION OF INVESTMENT

ENEL is the sole responsible body for investments planification. Its plans have to be approved by the Ministry of Industry and the interministerial committee for economic planning, CIPE.

The authorisation procedures for investments in the electricity sector differ depending on the type of plant. In general they are long. ENEL is facing serious problems (public opposition) in getting permission for any extension of the country's electric system.

(a) Thermo-electric plants

The current regulations were introduced by Decree of the President of the Council of Ministers of 27 December 1988. These regulations set out the procedural regulations for the power plant siting, construction and operation phase and for environmental impact evaluation as well as emission control regulations.

Authorization for the siting, construction and operation of a power plant is issued by the Ministry for Industry, Trade and Crafts following a complex procedure, involving various central and local authorities (including the Ministry for the Environment, the Health Ministry and the Region concerned).

The regulations set out in this Decree are in line with EEC directives on the subject of environmental impact valuations and emission control.

No provision is made for a site location phase in the construction of plants by parties other than ENEL, but:

- In the case of plants of below 3 MW making use of renewable resources, notice must be given to the Ministry for Industry, ENEL and the "Ufficio Tecnico per le Imposte di Fabbricazione" (UTIF - the production tax office);

- In the case of energy recovery plants in excess of 3 MW within industrial plants, the authorization of the Ministry for Industry is required;

- in the case of co-generation plants run by Municipalities or Provinces or consortia thereof, companies and consortia of companies and consortia set up by public and private concerns, notice must be given to the Ministry for Industry;

- all other plants continue to be covered by the regulations laid down by the Consolidated Text of laws on water and electricity plants (Royal Decree 1775 of 11.12.1933), following an environmental impact valuation procedure.

(b) Hydro-electric plants

Authorization for the construction of a hydro-electric plant associated with the use of a major public waterway diversion (in excess of 3 MW) must be obtained through an authorizing procedure, the main phases of which are:

- Submission of application

  The application, together with the project description, is submitted to the Ministry for Public Works.

  Notice of submission of the application is published in the Gazzetta Ufficiale della Repubblica and Foglio degli Annunzi Legali in the Province concerned. Any competing applications may be submitted within a specified period from the date of publication.

- Order by the Provveditorato alle Opere Pubbliche (Office of the Superintendant of Public Works).

  The Order states that the application or applications (the original and any competing applications) and the projects must be made available to the public for a given period.

  The Order also prescribes a period for the forwarding of observations, objections or requests, as well as the date and meeting point for an inspection of the sites from which the water will be taken. This Order is sent directly to all public agencies concerned.

- Public inspection

  Any interested party may join the inspection of the sites from which water will be taken.

  On this occasion, all objections, observations and requests that have been received are read out, and may be clarified and supplemented by the parties concerned.

  The party applying for the concession may set out the counter-arguments at that hearing or, within a given period from the date of the examination, forward them in writing.

- An ad hoc minute is made of the events at the inspection.

- Main documents required in considering the application

  . approval by the Ministry of Defence and the applicant's signature of the set of military regulations;

  . opinion from the Region concerned (which in theory is not binding);

  . report by the Ufficio Idrografico confirming the hydrographic data used as a basis for the project.

- Ministry of Public Works report and set of regulations

  The Provveditorato alle Opere Pubbliche (Office of the Superintendant of public works), having ascertained the counter-arguments from the applicant (if there are competing applications), draws up a detailed report on the whole investigation for the Ministry of Public Works, concluding with its own opinion on the concession to be granted.

  The report is accompanied by an outline set of regulations governing the concession, setting out the particulars, content and limits of that concession. The set of regulations specifies the annual rent to be paid by the concessionaire for the public property.

  The applicant for the concession may ask for the set of regulations to be amended.

- Opinion of the Consiglio Superiore dei Lavori Pubblici (Higher Council of Public Works)

  The Ministry of Public Works - Direzione Generale delle Acque e degli Impianti Elettrici (Directorate Generale for Water and Electricity Plants) - asks the Council for its opinion on the report and the outline regulations.

- Signature of regulations

  If the opinion given by the Higher Council is favourable, the Superintendant asks the applicant for the concession to sign the set of regulations.

- Concession decree

  Having gone through the procedural channels described above, the Ministry of Public Works and the Finance Ministry issue the concession decree. This decree has the effect of a "declaration of public utility".

If a case is recognized as being urgent, the Provveditorato alle Opere Pubbliche draws up a summary report and the Minister, after consulting the Higher Council, issues an ad hoc decree giving provisional authorization for construction work to commence.

The only document required for the examination is the opinion of the Region concerned (which in theory is not binding).

This decree has the effect of a declaration to the effect that project work is urgent and cannot be deferred, so that land can be temporarily occupied pending its expropriation.

Once construction work has begun, the normal procedure for obtaining a final decree of concession continues. In this case, the applicant for the concession assumes the risk of carrying out work which may have to be modified as a result of subsequent regulations.

For small diversions (up to 3 MW), if there are no competing applications from two or more parties, a simplified procedure is applied for which individual Regions or Autonomous Provinces are responsible.

Pending the decree granting a water concession, a provisional authorization for the commencement of works is issued. A building permit from the mayor of the Commune concerned is required.

(c) Electric lines

The construction and operation of electricity lines are authorized by a decree of the Minister for Public Works following a structured procedure whose aim is to secure the opinions of the Ministry for Posts and Telecommunications, the military authorities responsible for the geographical area and the authority responsible for the protection of cultural and environmental assets, as well as the consent of the Ministry for Industry.

There is provision for the issue of provisional authorization for the commencement of works, which also authorizes operation. Where transmission lines are constructed by undertakings producing electricity on their own account, the authorization is issued by the Minister for Industry.

In planning terms, it is not regarded as necessary for specific building permits to be issued by the mayors of Communes affected by the installation, but special authorization is required from the competent Region in terms of the landscape and environment.

It is also pointed out that transmission lines cannot normally be moved from the area in which they are constructed.

Agencies and undertakings other than ENEL must comply with instructions given by ENEL, which has the power to coordinate their electricity-related activity.

3. PRODUCTION

- Public supply

Law no 1643 of 6 December 1962 led to the creation of ENEL. ENEL is a legal entity subject to public law, and operates under the surveillance of the Ministry of Industry. It exercises its activity in accordance with directives from CIPE, the interministerial committee for economic planning. It is also subject to the statutes of common law governing the private companies. Nonetheless, to the producing monopoly of ENEL there are some exceptions. The whole situation in the electricity producing situation could be described as follows :

(a) For an installed capacity of more than 3 MW, the right to produce electricity has been exclusively attributed to ENEL, according to article 1 of law 1643, 6 December 1962, which was enacted in implementation of article 43 of the Italian Constitution. ENEL has the expropriation right.

(b) The following categories of producers are not covered by the reserve of point a, and are, therefore, permitted to produce electricity even if their capacity exceeds the 3 MW limit.

- Autoproducers
- "Small producers", which are undertakings whose production is less than 25.000 MWh/y (40.000 MWh/y in the case that 15.000 Mwh/y come from renewable sources).

The above undertakings derive their right from article 4, paragraphs 5,6 and 8 of law 1643/62.

(c) Any party may produce electricity in plants not exceeding 3 Mw of installed capacity, provided that it uses renewable energy sources or combined heat and electricity installations. The limit of 3 MW may also be exceeded in the case of plants operated by municipal authorities. This right derives from article 4 of law 308 of 29 May 1982. The increase of the above specified limit of 3MW to 25 MW is being considered by the competent authorities.

- Autoproduction

Electricity autoproduction is not only permitted but also encouraged in Italy (article 4 of Law 1643/62). Autoproducers are not entitled to use third party lines for the transmission of the energy they produce (article 20, Presidential Decree 342/65). However, Law 308/29.5.1982 places an obligation on ENEL to transport energy produced by renewable energy sources to the producers' consumption points. ENEL, though not obliged, is willing to transport the electricity produced for own use, to the producer's establishments at his request. A party producing its own electricity may not sell its production surpluses to bodies other than ENEL. ENEL receives these surpluses in compliance with the Interministerial Committee for Economic Planning - CIPE (art; 10, Presidential Decree 342/65, as amended by article 1 of presidential Decree 554/67). ENEL is also under the obligation to purchase the surplus energy produced by renewable sources. ENEL purchases electricity from other small producers, which assign their whole output to ENEL, and producers/distributors which assign their surplus output to ENEL.

The further extension of the opportunities for the placement of self-generated electricity with other user companies is under consideration.

Italy has introduced and is going to introduce more incentives (limited access to the grid, inclusion of a capacity charge in the tariff which an autoproducer receives for electricity sold to the grid, unlike many other countries where autoproducers are paid only avoided cost etc) to encourage autoproduction; the reasons for this policy are ENEL's difficulties in building additional capacity and the relatively considerable power of autoproducers.

4. IMPORT - EXPORT

Italy is a member of UCPTE and by far the biggest single electricity importer in Europe. Electricity energy may be imported and exported only by ENEL. Article 1 of law 1643/62 and article 30 of Presidential Decree 342/62 prohibit bodies other than ENEL from importing or exporting electricity. There is no obligation of ENEL to import or export on behalf of third parties.

Import and export authorizations are regulated by law 606/19.7.1959 and by articles 133 et seq. of Consolidated Legislation 1755/11.12.1933, amended by Law 127/26.1.1942. The relevant authorization is given by a decree of the Minister of Public Works, which cooperates for this purpose with the Ministers for Foreign Affairs, Finance, Industry, Foreign Trade, Transport and Postal and Telecommunication Services. There is a number of considerations in the light of which an import/export authorization may be granted. ENEL has authorizations for energy movements in both directions with France, Switzerland, Austria, Yugoslavia and Greece. Ninety percent of the total imported electricity is governed by annual or multi-annual contracts, and the remaining 10% by seasonal or ad hoc agreements. There are no longterm export contracts. All exports are concluded on an ad hoc basis.

5. TRANSMISSION

High voltage electricity may be transported only by ENEL and the other concerns authorized to produce HV electricity. The latter may not, however, transmit energy for third parties, except on behalf of ENEL or on its instructions.

The right to transport electricity is granted, in ENEL's case, by Article 1, law 1543/62, and by article 20 of Presidential Decree 342/65 in the case of other producers.

As far as ENEL is concerned, it is not obliged to transport energy produced by others, over its own long-distance lines. Nevertheless, ENEL is willing to transport third party electricity via its own grid from the production points to the producers' own user points. Producers other than ENEL must transmit electrical energy on their own account and on ENEL's instructions over their own lines. The financial terms for this transmission are agreed between the interested parties. Failing agreement, the terms are laid down by the Minister for Industry (article 20, Presidential Decree 342/1965).

6. DISTRIBUTION

The distribution of low and medium voltage electrical energy is the sole responsibility of ENEL, some local authorities and the small producers/distributors. As far as small producers are concerned, they may distribute the electricity they produce in the quantities laid down by law, and only occasionally the electricity they acquire from ENEL. Local authority concerns, on the other hand, distribute the energy they produce themselves plus any energy acquired from ENEL, to meet the needs of the consumers they serve.

As far as ENEL is concerned, the right to distribute energy derives from article 1 of Law 1643/6.12.1962. Local authorities and small producers/distributors derive their right from articles 4.5 and 4.8 of the same law.

As with transmission lines, ENEL is not under an obligation to transfer energy for third parties via its distribution network, but is prepared to make such transfers. It does, however, have an obligation to transmit the energy produced by the plants covered by article 1 of Law 308/29.5.1982. Small producers/distributors may transport energy only on behalf of ENEL, and are obliged to do so by article 20 of Presidential Decree 342/65.

LUXEMBOURG

SECTION 2: ELECTRICITY SECTOR, LEGAL PROVISIONS AND REGULATIONS

1. Overview.

Inspite of the fact that Luxembourg is a small country and imports the greater part of electricity, the rules of freedom of business activities seem to apply for the electricity sector. The undertaking companies responsible for production, transmission and distribution, belong to private investors but a certain percentage of their shares are government owned. From this point of view the electricity sector is under a state of surveillance. Electricity utilities have an obligation of connection and supply, and they are subject to a legal reference system.

The Luxembourg electricity supply is also based on a series of contracts, however these contracts are between the utilities in Luxembourg and utilities in Belgium and Germany.

As the indigenus production is based on some hydro power stations and auto-production, no need of harmonizing environmental policies with the electricity production policy seems to have appeared.

The general electricity policy concerns mainly the fields of transmission and distribution. The legal instrument for this policy is a "contrat de concesion", the convention of 11.11.1927 approved under the law of 4.1.1928. In practise this leads to little or no competition in the field of electricty transmission and distribution.

2. Production.

Up to the 1950's production of electricity by the iron and steel industry provided all the electricity which Luxembourg required; however changes in the steel making process reduced the generating capacity and in 1963 the Luxembourg government signed a contract with SEO for the supply of energy to the main transmission company.

In practise, the undertaking (SEO) buys electricity form the German company RWE and then sells the power to the transmission company CEGEDEL. The contract between the Luxembourg government and the undertaking SEO was renewed in 1975 and it is the means by which RWE sells electricity to CEGEDEL.

This contract does not establish directly an exclusive right because there are no enterprises in Luxembourg with exclusive rights as far as the production of electricity is concerned. The small number of hydropower stations that produce a low percentage of electricity and belong to auto-producers follow the rules of the free market. The

government regulates private generation only in the way of licencing; anyone may build a station in Luxembourg as long as they meet licence requirements, most important of which is an environmental licence, which covers general environmental matters (not directly linked to electricity production).

3. Transmission.

CEGEDEL, the main transmission company, is a limited company operating a state-granted franchise. The exclusive right granted to CEGEDEL under the Act of 2.2.1924 and the franchise contract, revised and executed with the convention of 11.11.1927, approved under the law of 4.1.1928. CEGEDEL, has the exclusive right to employ state and communal lands in order to install its network. The agreement specifies certain restrictions on this monopoly.

The government has a contract with SEO/RWE which is signed on behalf of CEGEDEL. The supplier (the German company RWE) agrees to supply all needs and the purchaser (CEGEDEL) agrees to buy all energy required from them, with the exception of energy produced in Luxembourg. There are no fixed limits on the amount of energy which can be bought.

The steel and iron industry is supplied by the SOTEL company, a co-operative solely concerned with the supply of electricity to its members. SOTEL imports electricity from the Belgian utility UNERG and also a small amount from EDF in France. The SOTEL/UNERG contract which lasts until 2000 has no limitation on the amount of supply to be taken. Energy is made available and paid for according to the load factor for supplies each month. The terms of the contract are confidential, but the tariffs charged to customers are essentially based on those which UNERG charges in Belgium.

4. Import - export

There are no companies in Luxembourg with exclusive or special import or export rights. On the other hand, this issue has to be seen in relation to the contract signed between the Government (on behalf of CEGEDEL) and the SEO/RWE. Under this contract, the German company supplies the main part of power to the Grand Duchy.

5. Distribution

The types of authorisation for production are the same as for transmission. As far as tariffs are concerned, there are standards for tariff calculation in the Act of 1924 and the Convention of 1927. In practice the level of tariffs set in Luxembourg is agreed between CEGEDEL and the government. The last accord was signed in 1982.

THE NETHERLANDS

SECTION 2 - ELECTRICITY SECTOR LEGAL PROVISIONS AND REGULATIONS

The Electricity Act of 7th December 1989 establishes the new framework for the electricity supply industry in the Netherlands.

The prime objectives of the Electricity Act was to increase competition, to separate generation from distribution, to maintain national coordination and optimization of electricity production, to reduce the number of companies in order to benefit from the economies of scale and to provide for elements of Government control over the industry.

According to the new law, the generating companies and the SEP company are responsible for ensuring the reliable and efficient supply of electricity nationwide at the lowest possible costs and in a socially responsible fashion. The distribution companies are associated with the task.

Government exerts control over the industry through the following means :

- it provides licences to the generating companies, and it appoints Sep as the national body;
- it approves the electricity plans prepared by SEP;
- it approves the tariffs proposed by VEEN, and SEP; and
- it arbitrates on issues of conflict in the industry.

A. OVERALL PLANNING REGULATIONS

The Government establishes in consultation with SEP the Electricity Supply Structural Scheme (Struktuurschema Electriciteitsvoorziening) in the context of regional planning. This scheme relates in particular to the possible sites for power stations and the possible routes for high-voltage transmission lines.

SEP is responsible for drawing up, after consultation with the distribution companies, a two-yearly electricity plan which sets out the development of the electricity supply in the Netherlands. This plan has to be approved by the Minister of Economic Affairs.

The plan should estimate how much and what type of new capacity is required, which company will be responsible for the building and operation of the newly required capacity and what quantity of electricity will be imported or exported. The plan also sets out the policy pursued with regard to the utilization of the various fuels for the generation of electricity and describes the investment needed in the high-voltage transmission network.

The plan should also propose a policy with regard to the use of decentralized generation plants based on combined heat and power (CHP) and renewables. The contribution of this type of production would be deducted from the total capacity requirement. Only then could the construction of new public capacity be considered.

B. AUTHORISATION OF INVESTMENT

Plant siting and environmental controls regarding new electricity plant in the Netherlands depend on a complicated licensing system.
This system comprises about 15 different procedures. The most important ones are permits in the field of :

- construction (given by the municipal authorities);
- emission standards (given by the province);
- solid wastes (given by the municipal authorities and the Ministry of Environment);
- effluents (given by the Ministry of Transportation and Waterways).

C. PUBLIC SUPPLY AND AUTOPRODUCTION

1. The building or operation of a power plant for the public supply of electricity is permitted only to holders of a licence granted by the Minister of Economic Affairs. This license is only granted to companies which operates power plants in the Netherlands with a total capacity of 2500 MW or more.

   This licence is not required for a power plant if the capacity of that plant plus the capacity of other power plants at the same site does not exceed 5 MW. It is also not required for CHP plants and plants using renewable energies.

   The holders of a generation licence must sell all the generated electricity to SEP and must sell to distributors all the electricity bought back from SEP. They may not supply any electricity to consumers.

2. The distributors may build and operate generation plants based on CHP and renewables. If the total capacity on one site exceeds 25 MW, the approval of SEP has to be sought. This approval has to take into account the guidelines mentioned in the electricity plan, for the development of decentralised power generation.

3. Obstacles to Electricity generation by customers have been removed. Provinces and towns are not authorised to regulate the generation of electricity and distribution companies are obliged to buy electricity from third parties provided that it is generated from CHP or renewable plants on sites which are not at the same time importing electricity. A standard arrangement on the conditions of such sales has to be established by VEEN, SEP and organisations representing generators. The conditions are harmonised throughout the country in such a way that the compensation to the electricity suppliers amounts to the costs savings calculated for all distribution companies and averaged out between them.

D. IMPORTS AND EXPORTS

1. Electricity destined for public supply may only be imported by SEP, after the approval of the Minister of Economic Affairs as far as it concerns contracts with guaranteed capacity. Distributors are not allowed to import electricity.

2. End consumers can meet their own electricity requirements through imports. Grid operators, either at the transmission or at the distribution level, are required to transport this electricity as indicated in sections E and F below. The resale of imported electricity is forbidden.

3. There are no rules applying to exports, except that they should be described and taken into account in the electricity plan. There is no obligation on grid operators to transport electricity destined to exports.

E. TRANSMISSION

1. SEP has the monopoly to build high voltage transmission lines of 220 kV and above.

2. SEP is obliged to offer the transmission of electricity on the high voltage network to any person requesting it provided that :

   a) the electricity is destined for public supply;
   b) the electricity is destined for large individual consumers (with a consumption higher than 20 GWh and operation time larger than 4000 hours);
   c) the electricity is imported.

   This transmission should be carried out under reasonable conditions, including reasonable compensation for the costs incurred.

   This requirement does not apply when there is reasonably no capacity available for the requested transmission.

3. This provision will only apply to distribution companies after 1.1.1992. From then on, it will allow distribution companies to purchase power from a production undertaking other than the one in their particular region.

4. In case of disagreement on the transmission conditions, the case is referred to the Minister of Economic Affairs.

F. DISTRIBUTION

1. Most of the provincial distribution companies have obtained from the Provinces a Royal Concession to distribute electricity. Other distribution companies have obtained an Authorization from the provinces on the basis of the Provinces Law.

2. The building of high voltage distribution lines has to be authorized by the Minister of Economic Affairs.

3. Since the Electricity law, generation companies and the distribution companies are subject to the same obligation as SEP, to offer the use of their network as described in para E.2 to E.4 above.

4. This provision together with the provision under E.2 above allows large industrial consumers to "shop around" at distributors other than their local undertaking. It does not allow large consumers to transmit electricity directly from a licensed production site in the Netherlands to a consumption site.

PORTUGAL

SECTION 2. ELECTRICITY SECTOR. LEGAL PROVISIONS AND REGULATIONS

1. General Overview

The electricity sector in Portugal was nationalized in 1976 and it is still a part of the public sector. E.D.P., the Portuguese electricity company is a state monopoly established by Decree-Law Nr. 502/76 of 30.6.1976 and 427/82.

The state is directly involved in the running of the industry(1). Thus E.D.P. requires central government approval for:

(a) the setting of annual and long-term financial and activity plans.
(b) capital expenditure
(c) asset valuation and
(d) the setting of tariffs

2. Production

Public production is mainly assured by E.D.P. There is also an obligation for E.D.P. to transport electricity between different plaints of an autoproducer.

The autoproduction share in 1987 was estimated at 6% of the total national electricity consumption, referred only to the public electricity distribution. The autoproducers are regulated by Decree-Law 189/88, this D.L. promotes the increase of the autoproducers number for the future.

3. Imports - Exports

Imports and exports of electricity are under the state authority. Nobody can import or export electricity without an authorization by the Minister of Industry and Energy and the Minister of Finance.

In practical terms this means that this kind of authorization is granted only to E.D.P.

4. Transmission

E.D.P. has responsibility for the national dispatch. This is carried out by another operational section which is also responsible for construction and operation of the country's high voltage transmission system. Portugal's high voltage grid has grown considerably in the last 10 years to accomodate increased trade with Spain and the new installed generation capacity.

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(1) Government appoints 8 members representing 6 Ministries to EDP's Board of Directors with the remaining 18 Board members nominated by EDP's management and workforce. The municipalities served directly by EDP are also presented in EDP's regional distribution boards.

There is no third party access except for autoproducers between their own plants.

5. Distribution

There is no concession system in Portugal. Electricity is mainly distributed directly by E.D.P. E.D.P. also assumes responsibility for the services run by a large number of municipalities, thus bringing the entire sector under state administration.

SPAIN

SECTION 2 - ELECTRICITY SECTOR. LEGAL PROVISIONS AND REGULATIONS

A) Overall planning regulations

1. The energy sector planning framework for the period 1983-1992 is contained in the Plan Energetico Nacional (National Energy Plan - NEP) of 1983. Its main objectives are : the reduction of the vulnerability of the Spanish energy supplies, the improvement of the energy efficiency and the optimal use of resources to satisfy the demand.

2. Concerning the electricity sector, the NEP has opted for an institutional operation and organisation of the electricity sector based on the following elements : presence of public sector and private companies with financial capacity to generate sufficient funds to finance the necessary investments to meet electricity demand, medium and long term coordination of the development of the electricity sector by corresponding energy plans, and short term coordination of companies in the sector through joint programmes of operation of installed capacities. These elements have led to two important institutional reforms : the nationalisation of the high voltage grid as an instrument for the unified exploitation of the electricity system stated in Law 49/1984 of 26 December, and the establishment of the Marco Legal Estable (legal and stable frame) for the determination of the tariffs and the income system for the utilities through Decree 1538/1987 of 11 December.

3. The 1983 NEP imposed a moratorium on five nuclear projects under construction. This moratorium was due to a relative overcapacity in nuclear generation and to associated financial problems.

B) Production

1. The authorisations for the construction of a power plant are :

   - administrative authorisation for the plant's electromechanical elements and approval of the execution project given by the Directorate General for Energy of the Spanish Ministry of Industry or the corresponding authority in the regional Community, depending on whether the installation is part or not of the national electricity system;

   - in the case of a hydro unit water concessions given by the Ministry of Public Works or the regional Community, depending on the region.

   The authorisations are given following the guidelines of the NEP and taking into account, among others, electricity and environmental regulations. Provisions concerning expropriation for electricity installations are in Law 10/1966 of 18 March.

2. Any private utility can own production units but the working of those units depends on the decisions of the public owned transmission company, Red Electrica de España S.A. (Redesa). Redesa takes its decisions in order to optimise the electricity system, within the general PEN guidelines. These special rights are established by Law 49/1984 of 26 December.

3. The electricity surplus of auto-producers is sold to local distributors which are obliged to buy it at a price fixed by the State.

4. The most relevant acts concerning production are the following:

   - Decree 12-3-54 on electricity verifications and regularity of supply (also for distribution and transmission)

   - Decree 2.617/1966 on the authorization of electricity installations (also for distribution and transmission)

   - Law 10/1966 on expropriations for electricity installations (also for distribution and transmission).

   - Decree 1.217/1981 on supporting small hydro units.

   - Decree 907/1982 on supporting autoproduction.

   - Decree 1.544/1982 on supporting the construction of hydro units.

   - Decree 3.275/1982 on technical and safety conditions for electricity plants and transformation units (also for distribution).

   - Law 49/84 on unified exploitation of the national electricity system (also for distribution and transmission).

C) **Import/Export**

1. Red Electrica de Espana S.A. (Redesa) has exclusive rights for the importation and exportation of electricity as stated in Law 49/1984 of 26 December and Decree 91/1985 of 23 January.

2. The agreements must be approved by the Ministry of Industry and Energy which bases its decision on security of supply at the best cost and on reasons of national interest.

3. There is no obligation to import and export for third parties.

D) **Transmission**

1. The installation of lines needs the following authorisations :

   - administrative authorisation for electricity installations, public utility declaration and approval of the execution project given by the Ministry of Industry and Energy;

   - an operating licence given by the Provincial Delegations of Industry. Distortions concerning expropriations for electricity installations are in Law 10/1966 of 18 March.

2. Red Electrica de Espana S.A. (Redesa) owns the high voltage grid. It has the functions of transmission and interconnection and is responsible for the management and optimalisation of the system.

3. There is no obligation to transport for third parties, including auto-producers.

4. The most important legal acts concerning transmission, besides those already mentioned, are the following :

   - Decree 3151/1968 regulating high tension grid.

   - Decree 2413/1973 regulating low tension grid.

E) **Distribution**

1. The types of authorisations for distribution installations are the same as the ones for transmission. They are generally given by the Regional Communities.

2. There are no exclusive rights for distribution. The majority of the distribution enterprises are privately owned.

   REDESA provides a transmission service for the electricity companies amounting currently to 2,29% of the electricity gross sales. This rate is fixed by the Ministry of Industry and Energy (Act 23-1-89).

3. Legal Frame

   The most important legal acts concerning transmission, besides those already mentioned, are the following:

   - Decree 3151/1968 regulating high tension grid.

   - Decree 2413/1973 regulating low tension grid.

UNITED KINGDOM

SECTION 2. ELECTRICITY SECTOR - LEGAL PROVISIONS AND REGULATIONS

1. Overall planning regulations

None

2. Planification and Authorisation of Investment

No authorisation is required. Planning consents required only for the use of the sites.

3. Autoproduction

There is no obligation to buy the electricity from autoproducers.

4. Import/Export

No restrictions.

5. Transmission

NGC will hold a Transmission Licence which will govern the way in which it operates. The Licence will contain anti-discrimation clauses to prevent NGC taking advantage of their monopoly.

6. Distribution

The distribution companies in England and Wales will also have to abide by the terms of their Licence.

OVERVIEW

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

In all Member States, primary fuel diversification is considered as an important factor for the security of supply, and it is seriously taken into account in electricity production planning.

France, among all Member States, is the most heavily dependent country on nuclear power (about 70%) and the only one which has officially decided to continue its nuclear programme for reasons of security of supply, energy independence etc. Belgium, which comes immediately after France, regarding the percentage of nuclear to the total of electricity production (about 60%), has decided not to go further with its nuclear development plan.

Most countries try to exploit to the maximum their indigenous resources, maintaining, at the same time, a relative equilibrium among the various indigenous and imported primary fuels.

For most of the Member States, solid fossil fuels (peat, lignite, or coal) continue to be the main primary fuel; DK, with 94% of its electricity production based on coal, is situated at the extreme scale of these countries. However, in almost all countries a high percentage of the coal-fired power plants are multi-fired, which constitutes a great advantage in relation to security of supply. In the meantime, many countries undertake convertion programmes of single-fired to multi-fired power stations;

There is a general tendency for the minimisation of the utilization of petroleum products for electricity production, whereas many Member States are examining the extention of the use of natural gas for electricity production.

B. PRIMARY FUEL STOCKS

In almost all Member States, the Council Directive 75/339/EEC obliging them to maintain minimum stocks of fossil fuels at thermal power stations applies.

Apart from the above-mentioned Counsil Directive, no other supplementary national measures have been reported.

C. OBLIGATION TO SUPPLY

Essentially, in all Member States there exists a de facto obligation of the electricity utilities to supply. The independent distributors, wherever they exist, conclude special contracts with the producers for the purchase of the electricity they distribute; in these cases, the obligation to supply falls on the distributors.

B E L G I U M

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

In Belgium, 60% electricity production is based on nuclear energy, 5% on fuels like blast furnace gas, oil distillates and refuse, and the rest on fossil fuels. All conventional thermal units with 125 MW and more can be fired with 2 or 3 different fuels and are, therefore, very flexible in adapting to the fuel markets.

As indicated in section 2.B above, the national equipment plan for production and transmission of electricity has to be approved by the Minister of Economic Affairs.

The approval of the Minister of Economic Affairs takes into account economic aspects and energy policy considerations such as primary fuel diversification.

In December 1988, the Belgian Government made known its decision about the equipment plan of the electricity utilities for the period 1988-1998. The Government indicated that it was not opportune to develop further the nuclear option beyond the Belgian participation in the French nuclear power plants in Chooz and recommended a development of units burning natural gas.

Two combined steam gas plants have now been decided by the electricity utilities while the cost of deferring new nuclear plants is being monitored.

A small decrease is, therefore, expected on the part of nuclear energy, whereas the proportion of fossil fuels will increase.

The Government has also the right to designate a representative on the Boards of the electricity utilities. This representative may suspend Board's decisions when they are deemed to be contrary to the general economic interest and more particularly to the energy policy pursued by the Government.

B. PRIMARY FUEL STOCKS

Concerning minimum stocks of fossil fuel at thermal power stations, Council Directive 339 of 20 May 1975 is complied with.

C. OBLIGATIONS TO SUPPLY

In Belgium, the general conditions applicable to the supply of electricity which are approved by the Control Committee include the obligation on the supplier to take all necessary measures to ensure the availability of power to the consumers.

This obligation is contractual in the case of the supply to industrial consumers and statutory in the case of the supply to an intercommunale. For domestic consumers covered by the distribution monopoly of the communes, the obligation becomes regulatory by virtue of a "commune" regulation which renders the general conditions of supply obligatory.

DENMARK

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUELS AND DIVERSIFICATION

Coal is the predominant fuel in Danish power stations. In 1988, coal covered 94% of the power production. However, several types of fuel can be used in the Danish power stations. Thus, 88% of the production capacity can be fuelled by more than one type of fuel.

In addition to the big conventional power stations, the Danish electricity companies are building small local CHP-stations fuelled by natural gas or other indigenous fuels. Also 100 MW of wind-turbines are being built. All these projects are part of a political decision on new types of generating plants.

B. PRIMARY FUEL STOCKS

The Council Directive 75/339/EEC applies.

C. OBLIGATION TO SUPPLY

FRANCE

SECTION 3 : SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

In the 1970's and after the two oil crisis, the French government and EDF decided to diminish the country's heavy oil dependence for electricity production by developing nuclear power. About 70% of France's electricity is produced, today, by nuclear power. The close links between EDF and the nuclear construction company Framatome have helped reduce costs through standardisation rather than competition. When the supply surplus became apparent, EDF tried to encourage electricity consumption, especially in home heating. The rapid increase in domestic consumption exacerbated the problem of meeting peak demand. The French government has decided to continue its nuclear programme and no significant policy change is envisaged for the future. Concerning the nuclear fuel input into the PWR, two important decisions were made in 1985 and 1986 :

- The supply of a reactor at refuelling with 16 assemblies of plutonium on one side and with 8 assemblies of enriched uranium from reprocessing on the other side.

- The developing change from a fuel handling "third of core" to one of "fourth of core" promises in the long term economic advantages.

Another 21% of electricity production is hydro, which is very sensitive to climatic conditions; problems have been encountered in the last years because of the drought.

B. PRIMARY FUEL STOCKS

The Council Directive 75/339/EEC obliging the Member States to maintain minimum stocks of fossil fuels at thermal power stations is of application. However, given that more than 90% of electricity production is based on nuclear and hydro and a number of conventional thermal power stations of EDF and CDF are situated close to coal mines, the importance of fossil fuel stocks for electricity production is rather limited.

C. OBLIGATION TO SUPPLY

EDF is obliged to satisfy all demands for electricity supply. It is, moreover, obliged to supply all independent distribution utilities (régies), which have also an obligation to supply in their territory.

GERMANY

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUELS AND DIVERSIFICATION

The use of Community coal is encouraged by the 3rd law on electricity generation (3. Verstromungsgesetz) of 13.12.1974.

§ 1 of the law sets quantities of Community coal which should be used by German electricity generators.

§ 2 creates a special fund which finances particularly the difference between the price of Community coal and heavy fuel oil. This fund is renumerated by the "Kohlpfennig" (at present 8.5% addition to electricity prices) paid by all consumers.

§ 12 of the same law foresees a special authorisation for new generation plants on the basis of heavy fuel oil and/or natural gas.

In Germany, as a consequence of the energy policy adopted and the equipment programme for the electricity sector, electricity generation in the future will rely almost exclusively on coal and nuclear energy. The share of electricity generated from lignite, coal and nuclear energy will rise from 82% in 1988 to 84% in 1994. The nuclear contribution will rise from 34% to 36%. That of coal and lignite will stay stable at 30% and 18%.

B. PRIMARY FUEL STOCKS

The reglementation on stock-keeping of power stations (Kraftwerkbevorratungs-Verordnung of 11.2.1981) foresees the obligation to keep a 30 day fuel stock for power stations based on the use of fossil fuels. The stock is to be kept on the premises of the power stations. This rule does not apply to power stations of autoproducers with less than 100 MW capacity.

C. OBLIGATION TO SUPPLY

According to the Energiewirtschaftsgesetz, there is an obligation of connection and supply for electricity utilities.

GREECE

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

Government fuel policy currently dictates that lignite must be used above other fuels, given the fact that it is the only important indigenous energy source. More than 70% of electricity is produced by lignite. The share of heavy fuel oil and diesel was greatly reduced after the two oil crisis. Lignite is supplied mainly by PPC's own mines. PPC also buys some small quantities of privately produced lignite. Heavy fuel oil and diesel are purchased from the Public Oil Corporation which refines the quantities demanded to public refineries.

In the future, a decline of PPC's heavy dependance on lignite is expected, because of a most probable rise of production costs and the decrease of the lignite's calorific value. Imported gas and coal will most likely substitute lignite in electricity production.

Lignite is used for base load electricity followed by oil. Hydro and diesel are used for the peaks. Natural gas is going to be used for electricity production for environmental reasons, as soon as the natural gas supply installation will be available.

B. PRIMARY FUEL STOCKS

For the most part, electricity is produced in power plants situated in the coalmines' neighbourhood. For all other cases, the Council Directive 75/339/EEC obliging Member States to maintain minimum stocks of fossil fuel at thermal power stations applies.

C. OBLIGATION TO SUPPLY

PPC, being a monopoly in the electricity sector, has an obligation to satisfy all demands for supply.

IRELAND

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

The percentage of installed capacity analysed by fuels is as follows:

Oil	16%
Peat	12%
Hydro	13%
Coal	24%
Gas	35% *

* Of the plant classified as Gas, 81% can also burn oil.

For reasons of national socio-economic policy concerning the use of indigenous fuels, ESB has to burn agreed quantities of peat.

For Ireland, energy policy for the longer term continues to aim at optimum utilization of existing plant using imported coal and indigenous energy resources, thus keeping oil dependence under control.

B. PRIMARY FUEL STOCKS

ESB complies with the national/EC legal requirements in relation to the minimum amount of fuel stocks which it is obliged to hold, e.g. Coal 30 days and Oil 55 days.

C. OBLIGATION TO SUPPLY

Despite a High Court judgement in 1984 which stated that the ESB had no specific obligation to supply, the de facto position remains that the company is obliged to supply electricity to anyone who applies.

ITALY

SECTION 3 : SECURITY OF SUPPLY

A. PRIMARY FUELS AND DIVERSIFICATION

Italy has little indigenous primary sources. Some small quantities of low quality brown coal, and some geothermal resources. On the other hand, the country is heavily dependent on oil (about 45% of electricity generation in 1988). Italy's main objectives in this field are :

- the reinforcement of the role played by ENEL in the coordination of all the electricity resources existing in the national territory;

- the reduction of the degree of dependence on foreign sources and supplies, through the exploitation of the residual national hydro-geothermal resources and other renewable sources;

- the further reduction, in particular, of its heavy oil dependence for electricity generation, through the conversion of oil-fired power stations to "multi-fuel" type, or the construction of new such power stations, thus increasing the security of fuel procurement.

ENEL's fuel use policy for the new polyvalent units is to burn coal for base load, for economic and strategic reasons. Only with the return to coal could the use of hydrocarbons be kept at the present abnormally high level or further reduced.

Italy's diversification policy concerns not only the differenciation of the fuels, but of their origins as well.

The nuclear moratorium led to the closure of the three operational nuclear power stations with a combined net generating capacity of 1,270 MW. Coal is still regarded by ENEL as the most secure fuel because of world reserves and the large number of potential suppliers. In the last Energy Plan, 1988, it was forecast that coal's share in the fuel mix would rise to 31 percent by the year 2000. Given local opposition to new coal-fired stations this seems unlikely. All coal is purchased by ENEL on the international market and together with the two Danish utilities, Elsam and Elkraft, it is among the largest European purchasers of internationally traded coal. For the supply of gas ENEL has historically been dependent on SNAM, the Italian gas utility. Last year, however, ENEL signed a short term contract with the Russians for the supply of 1 bcm/a for 2 years.

B. PRIMARY FUEL STOCKS

The only existing legislative measure in this field is the Council Directive 75/339/EEC for the maintenance of minimum stocks of fossil fuels at thermal power stations.

C. OBLIGATION TO SUPPLY

ENEL is obliged to satisfy any demand for supply. It is also obliged to supply all independent distribution utilities, which have also the obligation to supply in their territory.

LUXEMBOURG

SECTION 3: SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

Luxembourg satisfies most of its electricity needs with imports from Germany and Belgium. There is only a limited local production from hydro-energy and autoproducers (basically the steel industry).

B. PRIMARY FUEL STOCKS

The Council Directive 75/330/EEC has been introduced in national legislation.

C. OBLIGATION TO SUPPLY

CEGEDEL has an obligation of connection and supply to distribution companies, industrial consumers (except auto-producers), and to private consumers.

SOTEL as a cooperative of auto-producers has a contractual obligation to supply the cooperative members.

THE NETHERLANDS

SECTION 3 - SECURITY OF SUPPLY

A. PRIMARY FUEL USE AND DIVERSIFICATION

According to the new Electricity Law, the generating companies and SEP are responsible for ensuring the reliable and efficient supply of electricity.

The Electricity Plan (see section 2.A above) indicates how the companies intend to guarantee electricity generation and this includes a formulation of the policy pursued with regard to the utilization of the various fuels and fissile materials for the generation of electricity.

The present outstanding feature of the fuel mix in the Netherlands is the large percentage of gas (just under 50%). Imported Coal is the other major fuel with 40%. The Netherlands' aim is to decrease the electricity generation part which has a price relationship with the price of gas.

B. PRIMARY FUEL STOCKS

Concerning mimimum stocks of fossil fuel at thermal power stations, Council Directive 339 of 20 May 1975 is complied with.

C. OBLIGATION TO SUPPLY

According to the Electricity Law, anybody is entitled to the supply of electricity and the provision of capacity in respect of the distributors who supply electricity to consumers as part of the public supply.

Distributors have the right, vis-a-vis the generating companies, to supplies of electricity and the provision of capacity. The generating companies establish with SEP, for each part of the Netherlands, which of them is responsible for supplying electricity to distributors active in those areas and which wish to be supplied.

PORTUGAL

SECTION 3: SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

Portugal's electricity production is essentially based on hydro, coal and oil. Hydro-power is very sensitive to climatic conditions. EDP is examining the possibility to use natural gas in combined cycle turbines. The latter decision is connected with the realisation of the natural gas programme (infrastructure works) which has just been approved.

B. PRIMARY FUEL STOCKS

There are no rules on the use of primary fuels or on stock keeping.

C. OBLIGATION TO SUPPLY

EDP has an obligation for connection and supply to industry and to domestic consumers (except for the Porto and Covilha regions which remain independent, here the local suppliers have the above-mentioned obligation).

SPAIN

SECTION 3 SECURITY OF SUPPLY

A PRIMARY FUEL AND DIVERSIFICATION

Primary fuel use and diversification have to be considered in the framework of the unified exploitation of the electricity system through the industrial grid established in law 49/1984. According to its article 2.1.a, the exploitation of the production and transmission installations should be optimized in order to achieve a minimum cost of electricity. The optimisation in the short term is based on marginal cost, while in the long term it is guided by the policy orientations of the Plan Energetico Nacional (National Energy Plan). For short term optimisation the public transmission company - Redesa - plays an instrumental role by establishing a monthly and daily schedule for production and dispatch.

The 1983 PEN recommended a reduction of the use of fuel oil by electricity utilities.

Law 49/1984 gives Redesa the function of control and definition of the use of hydroelectric reserves. Their correct exploitation is very important to achieve optimisation and has to be carefully studied and forecasted. Decrees 1217/1981 and 1544/1982 support the construction of hydro units.

As regards domestic coal, an important agreement was signed in December 1986 between the electricity utilities' organisation (Unesa) and the National Federation of Coal Producers (Carbunion). Its aim is to make the domestic sector more competitive by providing a stable framework under which long-term contracts can be concluded at prices fixed freely between the contracting parties (free reference prices) and not according to authorised prices as was the case under the previous arrangements. Coal supplied to utilities by the public coal producer Hunosa is not included in the agreement.

Concerning imports of coal, quantitative restrictions exist.

The plan Energetico Nacional (National Energy Plan) proposed a moratorium on the nuclear programme. The Spanish government decided in March 1984 to scale it down by stopping work on five units under construction and in project.

Any new investment in electricity production would be decided by the Spanish government. It is expected that interested utilities would be selected through a bidding system based on the commitment to build to time and cost.

Taking unto account the present limitations on additional domestic coal reserves and possible development of new hydro projects, there are only two basic alternatives for making Spain able in the long term to supply substantial additional amounts of electricity : either imported coal or nuclear energy (or a combination of both)

B PRIMARY FUEL STOCKS

Concerning minimum stocks of fossil fuel at thermal power stations, Council Directive 339 of 20 May 1975 is complied in Decree 3691/72 of 23 December for oil and Ministerial Order of 23 July 1987 for coal.

C OBLIGATION TO SUPPLY

According to Decree of 12 March 1954, which approves the regulation of electricity verifications and regularity of energy supply, electricity distributors are obliged to supply any final consumer. Distributors can only stop their service temporarily in case of circumstances outside their control or repairs, maintenance and improvement of the grid and in case of non-payment by the consumer after the authorisation by the local delegation of the Ministry of Industry.

UNITED KINGDOM

SECTION 3 SECURITY OF SUPPLY

A. PRIMARY FUEL AND DIVERSIFICATION

On the mainland of Britain the main fuel used for electricity generation is coal, supported by nuclear energy with oil used for low-load-factor operation only. It is expected that the use of gas for electricity generation will increase significantly.

To reduce dependance of oil in Northern Ireland, the plant at Kilroot is being converted from oil firing to mixed coal and oil firing. Further coal/oil fired sets are planned for Kilroot.

In England and Wales some plants have been converted to fire both oil or gas.

The generating companies have the obligation to maintain a certain level of burn of indigenous coal. In addition, the distribution companies will be obliged to purchase a proportion of their supplies from non fossil sources.

B. PRIMARY FUEL STOCKS

C. OBLIGATION TO SUPPLY

The distribution companies have the obligation to supply in their areas.

OVERVIEW

SECTION 4 - PRICE REGIMES

1. There is still considerable diversity in tariff structures between Member States, although there appear to be moves towards more homogeneous structures within Member States, and greater conformity to the principles set out in the 1981 Council Recommendation on electricity tariffs[1].

2. Perhaps the greatest distortion with respect to the internal market is the variation in the relative prices to (more captive) domestic consumers compared to (more competing) industrial consumers, as suggested in the attached table, (though it should be interpreted with caution). This is not so much a question of tariff structures as the rates actually charged, including under non-tariff supplies. There is relatively little information on the proportion of non-tariff supplies, and on the rates charged under them, although the price transparency Directive should give some new data. Further internal analyses, however, seem warranted for this important aspect, including the question of particularly favourable terms sometimes granted to certain large users. One can tentatively conclude, however, that for BE, FR and ES there seems to be cross-subsidisation in favour of the industrial consumer, and in PO, HE and IT, in favour of the domestic consumer, (in DK the effect is off-set by very high taxes).

3. There is generally good conformity with the following tariff features given in the Council Recommendation, (Member States with at least some non-conforming tariffs are indicated in brackets) :

   i) two-part tariffs, (more accurately reflecting costs) (BE,LX,HE)
   ii) no socially motivated tariffs (BE,LX?,HE,IT,PO)
   iii) differential unit rates (off-peak, etc.) (IT,HE)
   iv) no discriminatory tariffs by use, (BE,HE,IR, previously UK)
   v) no block tariffs (discriminatory and promotional) (DE,IT,NL,UK)[2]

4. All Member State governments, including the UK at least initially for the small consumer, influence tariff decisions. This can introduce distortions to the competitive positions of industry in the different Member States, firstly to the extent that the utilities are required to be economically healthy, and secondly to the extent that there is a loading of costs on the domestic or on the industrial sector. Countries where the utilities generally appear to have to earn a significant return are BE,DK,DE,LX,NL,UK. The second distortion, concerning the favouring of one sector at the expense of another, is considered in paragraph 2 above.

5. Several Member States operate a fuel compensation system as follows : DE and ES for indigenous coal, IT for oil, and the UK for nuclear. One can argue that the compensation systems in IT and the UK arise from different fuels being in different ownership, (if the supplier was completely integrated, cost variations would simply be

(1) 81/924/EEC OJ L337/12 of 24.11.81.

(2) HE, very unusually, has progressive block rate tariffs.

accommodated in the overall cost of generation). Furthermore, future use of oil in IT and nuclear in the UK should depend on the fuel's merits. The support for coal in DE and ES, however, is a continuing and distorting policy, though there may be a degree of justification on security of supply grounds.

6. The fuel mixes used for generation, which greatly affect costs and thus prices, vary considerably between Member States. The choice often results from deliberate policy, usually heavily influenced by government. This can be a negative constraint, (eg. the non-nuclear countries), or a positive constraint, (eg. peat and lignite in IR and HE respectively, coal in DE and ES, nuclear in FR, and gas in DK).

7. Operational structures also vary widely between Member States, and any resulting consequences on efficiency clearly affect costs and prices. Some have more or less regional competition, (BE,DK,DE,ES,NL) and this generally seems to coincide with an efficient industry. The UK has the most competitive structure, although the results have yet to be seen. Prices are likely to be competitive for large consumers, but there may be some other less desirable consequences, (eg. increased domestic prices, less use of "long term" fuels). The vertically integrated monopoly electricity suppliers have tended to be less efficient, though EdF has achieved considerable economies of scale with its successful nuclear construction programme. Autoproducers can also act as a competitive stimulus in these circumstances and are particularly active in DE, IT and LX, and are being encouraged in PO and, in limited circumstances, in HE.

Comparison of the ratios of electricity prices in the industrial and domestic sectors (without tax) by Member State

	Avg. Ind. Price,1988 (ECU/kWh)	Ind. Tax Rate (1988)	Avg.I.Price without Tax (ECU/kWh)	Avg. Dom. Price,1988 (ECU/kWh)	Domestic Tax Rate (1988)	Avg.D.Price without Tax	Avg. Dom. as % of avg. Ind.(exc.Tax)
BE	0.046	0.0%	0.046	0.125	14.5%	0.107	233%
FR	0.041	0.5%	0.041	0.111	20.7%	0.088	215%
ES	0.072	12.0%	0.063	0.145	10.2%	0.130	206%
IR	0.055	0.0%	0.055	0.104	0.0%	0.104	189%
NL	0.042*	0.0%*	0.042	0.092	16.7%	0.077	183%
LX	0.055	0.0%	0.055	0.099	5.7%	0.093	169%
DE	0.071	6.7%	0.066	0.127	18.2%	0.104	158%
UK	0.056	0.0%	0.056	0.082	0.0%	0.082	146%
IT	0.059	9.3%	0.054	0.091	19.2%	0.074	137%
HE	0.061*	15.3%*	0.052	0.082*	14.8%	0.070	135%
DK	0.042	0.0%	0.042	0.118	52.6%	0.056	133%
PO	0.080	7.4%	0.074	0.103	14.3%	0.088	119%

* 1987 figure used as 1988 figure not available.

BELGIUM

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

For very small consumptions, a one-part tariff (kWh only) is available; moreover, there is a special rate for a few categories of needy consumers. More generally, a choice of two two-part tariffs is available, the first with a standing charge and single kWh rate, the second with a differential day/night (24.00-09.00 hours) rate. In addition, supplies on a separate circuit, night only tariff may be taken. A variant of this separate supply includes supplies during daytime hours, though with the possibility of shut-down in peak demand periods.

The same structure of tariffs is available for small commercial and industrial consumers, though the standing charge is related to maximum demand. For large, high voltage consumers, a nationwide two-part tariff system is available, with monthly demand charges based on maximum quarter-hour demands, and unit rates based on differential time of day and off-peak/peak periods. In some cases, demand charges may differ for lighting and motive power loads; it would need to be checked whether these variations reflect genuine consumption characteristics.

PRICE SETTING AND CONTROLS

Proposals for electricity price changes are presented by the Comité de Gestion des Entreprises d'Electricité (the CGEE - the committee representing the electricity supply industry), to the Comité de Controle de l'Electricité et du Gaz, (the CCEG). This latter committee, which includes government and local authority representatives as well as representatives of the electricity suppliers, then passes its views to the Minister for Energy, who is responsible for the final decisions.

There is a generally held agreement that each utility should cover its costs and make a fair return for its shareholders. Any income above this level, however, has to be passed back to the electricity consumer. All customers within the same consumer band pay the same tariff, whilst special contracts signed by utilities with "intercommunale" distributors, or with high voltage customers, are vetted by the CCEG. Generally speaking, Belgium's use of nuclear energy, (about 66%) and of imported coal, gives a good cost base, although the industrial consumer seems to benefit more from this than the domestic consumer, prices being relatively high for the latter.

DENMARK

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

Domestic consumers are mostly supplied under a two-part tariff, with either a single unit rate, or a two rate (time-of-day) unit charge. A similar structure applies to small commercial and industrial consumers, although three-part tariffs with standing charge, maximum demand charge, and various unit rate charges, are available for larger consumers in this category. The three-part tariff structure applies to most of the large commercial and industrial consumers and there are variations depending on whether supplies are at medium or high voltage.

PRICE SETTING AND CONTROLS

Dispatching of electricity is controlled by the two separate regional grid companies, Elsam and Elkraft. They are supplied by eleven main generating companies, as well as from trade with their Scandinavian neighbours via the NORDEL grid and, for Elsam, with the Federal Republic. The regional companies call on supplies in the most economic way with reimbursement on the basis of the costs incurred. The total costs are then distributed among the different companies according to the demand in their area. The system thus pools costs, and therefore to a large extent prices, although the country has a diversified distribution network comprising about 120 companies. The system, which makes very good use of imported coal and of exchanges with neighbouring countries, is generally recognised to be very efficiently run. Prices are therefore low in Denmark, apart from the very high taxes on sales to the domestic sector. As to regulation of pricing, a special pricing committee within the Ministry of Industry must approve changes in the prices of electricity for final consumers.

FRANCE

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

EdF, the main supplier, offers a range of two-part tariffs (blue tariffs) for the domestic, agricultural and small commercial user, with the standing charge fixed for domestic users and based on demand for the larger users. Also for the larger users under this tariff, day/night or mobile peak/off-peak differential rates are available. (The mobile peak period covers the period 07.00 hours to 01.00 hours for 22 days chosen by EdF). For commercial and small industrial users, the "yellow tariff" two-part, two rate, (seasonal/time of day) system applies. Two alternatives are available, the first with the standing charge related to subscribed demand with rebates for demand in off-peak periods and the second with the demand charge related to set-up demand in mobile peak periods. Again seasonal/time of day rate differentials apply to the demand charges in both cases.

The "green tariff" for the large commercial and industrial consumer offers a more complicated range of two-part tariffs with up to eight differential time of day/seasonal kWh rates, and the standing charge based on differential subscribed demands. For very large users, specially negotiated contracts are available.

PRICE SETTING AND CONTROLS

EdF produces and distributes most of the electricity supplied in France. The sources of electricity are predominantly nuclear, (about 70%) and hydropower (about 20%). Both of these are potentially cheap sources, particularly with the economies of scale achieved under the nuclear construction programme. However the programme, carried out over a relatively short period, incurred considerable financial expenditure and has given rise to a relatively high level of endebtedness. Under the "Contrat de Plan", which the government sets on EdF, prices overall are to fall in real terms by about 1% per year, although reductions in endebtedness are expected at the same time. Since capital expenditure is now declining, apart from expenditure on the transmission system, it is hoped that both targets can be met. Since inflation is currently running at about 4% per year, this means price increases in nominal terms of about 3% per year. French electricity is indeed relatively cheap for the industrial consumer; the domestic consumer, however, pays rather more than the Community average.

GERMANY

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

Although there is no national tariff system, two-part tariffs, with the possibility of differential day/night rates, are the norm for domestic consumers. The standing charge is based on various parameters, although there are moves towards more sophisticated metering based on electricity parameters only, (such as demand levels). For commercial consumers, only two-part tariffs are available, again with differential day/night rates. In periods of relatively high demand, the standing charge may be based on demand, over quarter-hour periods. For industrial consumers, two-part tariffs are the norm, with the standing charge generally based on demand set-up, (over quarter-hour periods) and perhaps partly also on subscribed demand. Differential time of day rates are usually available, and some supplies still use block tariffs. With the highly diverse structure of the supply industry in the Federal Republic and the unregulated economic environment, negotiated, non-tariff contracts are common for large consumers.

PRICE SETTING AND CONTROL

The structure of the industry is very diverse with various mixtures of ownership, size of utility, and degree of vertical integration. This allows for a certain degree of competition in procuring bulk supplies and in comparative competition, though there is nevertheless monopoly of supply in the areas supplied by distributers. This is achieved through demarcation and concession contracts granted by municipalities to suppliers, though a recent law limits these to 20 years, with all contracts signed before 1980 automatically expiring in 1995. On the impact of the fuel mix, almost half of the electricity is generated from coal, and about a third from nuclear, although the proportions vary widely by region. The coal component, in particular, adds significantly to costs, since there is long term agreement by the electricity supply industry to take domestic coal, (the Jahrhundertvertrag) with a levy on electricity prices (the Kohlpfennig) to pay for the extra cost above world coal prices.

Another item which added considerably to the cost of electricity in the Federal Republic was the cost of equipment to meet the very strict environmental conditions. Expenditure on this, however, is now beginning to decline, and several supply utilities have found themselves with substantial profits, leading to a spate of acquisitions in other sectors.

Regulation on prices is carried out by the Länder administrations, which can ask for financial data from the supply company when examining a tariff change proposal. The Länder also regulate new constructions very closely, and the Federal Government also has the power of veto for new investments.

GREECE

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

The domestic consumer has a choice of two tariffs, each with a standing charge. The first tariff has four progressive unit rate blocks, and the second a block progressive unit rate for day-time consumption, and a single unit rate for night-time consumption. The use of progressive blocks is thought to be unique in the Community.

Tariffs for small commercial and industrial consumers are divided according to the voltage. Low voltage consumers may have any one of three tariffs, the first a two-part tariff with standing charge and a single unit rate, the second with the addition of demand charges, and the third with differential day/night rates. Two-part tariffs are also available to medium voltage consumers, each with a demand charge, but one with a single unit rate and the other with two block unit rates related to demand. For agricultural use, a very simple one-part tariff with a single unit rate is available, as is a one-part, two block tariff for traction.

High voltage, large industrial users, have a two-part tariff, with a demand rate and three unit rate, seasonal tariffs, (peak, intermediate, low-load). For the demand rate, a subscribed demand for each rate period is required.

PRICE SETTING AND CONTROLS

Because of government policy, electricity generation by the Public Power Corporation, (which is the monopoly supplier), is very dependent on lignite, (about 70%). Most of the remaining electricity is provided by oil and hydropower. The lignite mines are owned by PPC, and although this is currently an economic source of electricity, costs will rise in the future as the limited reserves diminish and the less good reserves are worked. Furthermore, there is a new policy of reinstating mined areas which will significantly add to costs. For these reasons, Greece is looking to imported gas and coal to meet future needs, so that the cost structure of generation will change over the coming years.

On regulation, the legislation creating the PPC set a number of obligations affecting prices, namely that:

- the PPC should be financially self-sufficient;
- profits should be used to improve the system and to reduce electricity prices;
- residential and agricultural customers should be supplied at lowest possible commercial price.

Ensuring conforming with these obligations is the duty of the Ministry of Industry, Energy and Technology. Furthermore, whilst tariff levels and other matters such as procurement, fuel choice, etc., are not formally regulated, the government exercises a very strong influence on these questions. In addition to the supervising ministry, financial decisions in general, including on tariff levels, have to be endorsed by the Ministry of National Economy. This can sometimes give rise to considerable conflict, particularly since the PPC is often seen as a possible instrument of public policy.

IRELAND

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

Domestic consumers have the choice of two two-part tariffs, the first having a single unit rate and the second with differential day/night rates. (As something of an anomoly, it has been reported that the standing charge in rural areas depends on floor area.) A similar structure applies to small commercial and industrial consumers. A further alternative tariff for this sector, which is now being phased out, had separate metering for different types of load (e.g. lighting/motive power, space heating, cooking, etc), and with different kWh rates.

Large commercial and industrial consumers have maximum demand tariffs based on quarter-hour periods and a day/night unit rate. High voltage supplies (10kV, 38kV or 110 kV) sometimes have seasonal variations in charges and a service capacity charge.

PRICE SETTING AND CONTROLS

The Electricity Supply Board (ESB) is the monopoly supplier of electricity in Ireland and mainly relies on largely imported coal and oil, and on indigenous gas and peat, for generation. The imported coal (from Columbia) is very economic and the indigenous gas is thought to be cheap. However, the indigenous peat is relatively expensive, the ESB being obliged to buy it in order to maintain the peat mining industry in a region with little alternative employment. Moreover, there are two other factors tending to offset the cheap coal and gas supplies for electricity. Firstly, the ESB has considerable spare capacity; partly because growth in electricity did not meet forecast levels, but also because a large reserve is needed in a small, isolated system with a few large units (e.g. the coal fired Moneypoint station). The second factor tending to increase prices is the relatively sparsely distributed population, which means high distribution costs.

On regulation, there is an obligation for tariffs to cover costs, and to contribute to provisions to smooth out capital expenditures and reduce debt. The ESB is not, however, obliged to made a profit. Previously tariff changes were subject to approval by the National Prices Commission, but this role has been taken over by the Department of Energy. There is nevertheless still a tendancy to use tariffs as an instrument of anti-inflation policy.

ITALY

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

Italy has a system of national tariffs, with a compensation pool operated to average out the low-cost hydro supplies, (often owned by municipal suppliers), and the more costly, mainly thermal based electricity supplied by ENEL. A "thermal surcharge" (introduced in 1974 following the oil crisis) is levied on all kWh's and the funds used to compensate the higher cost electricity. The rate is fixed each year by the Interministerial Committee on Prices (the CIP), with an adjustment every four months to take account of the actual evolution in fuel costs. The surcharge is thought to form a substantial proportion of the kWh rate charged.

As to the structure of the tariffs, a two-part tariff is available for the domestic consumer, with the standing charge based on subscribed demand. For very small domestic consumers, (up to 3 kW) reductions are given both on the standing charge and on monthly consumptions up to 150 kWh. For small commercial and industrial users, a range of two-part tariff variants are available with the standing charge based on either subscribed or set-up demand, and with a cut-out switch sometimes used in the former case. In some cases, the demand charge may be based on degressive blocks. Utilisation factors, (hours of maximum demand per year equivalent) are also used in some tariffs.

Differential (seasonal/time-of-day) rates only appear to be available for large commercial and industrial users. Demand charges, which may be either subscribed or set-up, also vary by period. Again tariff variants related to utilisation factors, and to voltage, are also available.

PRICE SETTING AND CONTROLS

The heavy dependence of ENEL electricity on mostly imported hydrocarbons means that costs are currently low, although vulnerable to possible increases in oil prices. The significant hydro input (around 20%), much retained in municipal ownership, is also a cheap source of electricity. (As described above, the different cost structures, though in different ownership, are pooled through the compensation system). Apart from the vulnerability, the main problem in the supply industry is a shortage of new capacity, due to the nuclear moratorium and difficulties with local planning authorisations. The price mechanism has been cited as a part solution to this problem, by depressing demand, and there have indeed been significant increases in prices recently. Another solution is the encouragement of autoproduction, which now accounts for about 12% of electricity generation. In practice, policy measures include limited access to use ENEL's grid, and payment for electricity bought from autoproducers which includes a capacity cost element. The relatively high price of electricity to industry is also likely to encourage autoproduction. Another solution to current supply difficulties is represented by significant electricity imports, mainly from France.

With respect to the control of prices, the role of the Interministerial Committee for Prices and the compensation pool is described above. More generally, the old policy of using electricity prices as an element of social policy was superseded by a cost plus approach dating from the mid-70's. However,the rebates for low electricity consumers, the relatively low cost of domestic electricity, and the relatively high prices for industry, suggest that an element of the earlier policy survives.

LUXEMBOURG

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

For domestic and small commercial and industrial consumers a variety of one-part or two-part tariffs are available, with either a single kWh rate or a day/night rate in each case. A seasonal element for the unit rate, and a subscribed demand charge, is also introduced for larger consumers in this category.

For large commercial and industrial consumers, two-part tariffs apply, with a two rate time-of-day unit charge and demand charges based on the maximum half hourly demand. There are no published tariffs for supplies above 20kV.

PRICE CONTROL AND CONTROLS

The rather unusual characteristics of Luxembourg's electricity supply industry, namely a heavy reliance on imported electricity, on electricity from the iron and steel industry, and use of indigenous hydropower, largely determine the industry's cost structure. This means imported electricity at relatively good rates, (though without the Kohlpfennig which applies to RWE's sales in Germany), and generally cheap hydropower. As for the iron and steel industry, this is supplied by its own production, plus imports of electricity from UNERG through its company SOTEL. Whilst the supply sources are relatively cheap, the electricity companies in Luxembourg are privately owned and largely uncontrolled, which means that they will aim to earn a normal return on their assets. For CEGEDEL, the dominant public supplier, tariffs are set in agreement with the government, though this allows the company to pay dividends from its profits and there is little other government control.

THE NETHERLANDS

SECTION 4 - PRICE REGIMES

B. PRICE CONTROLS

As a general rule, tariffs are set by the electricity industry but need approval by the Ministry of Economic Affairs.

The tariffs for the sale of electricity by SEP to the generating companies are set by the former. They are based on the standardized costs from the pooling system and on SEP's own costs for transmission and general overheads. SEP has to consult with the organisation of distribution companies (VEEN) on the level and structure of the tariffs. SEP does not require final permission from VEEN, but does need approval by the Ministry of Economic Affairs.

The maximum tariffs which the generating companies charge the distribution companies are negotiated between VEEN and the generating companies. The outcome of these negotiations is a maximum RBT (Regional Bulk Tariff) which the generating companies can aim to undercut. In this tariff, generating companies include their costs which were not included in the pooling system and for the costs they have not had compensated by Sep.

Maximum final consumer tariffs are set by VEEN. Large industrial consumers can negotiate separate contracts with their distribution company. If very substantial quantities are involved and it is so required by the industrial consumer, SEP and the regional generating companies will be included in the negotiations as well. Tariffs must be based on the costs for each submarket so that "political pricing" should be avoided.

Terms for use of the grid will be set by SEP. The Ministry has not provided any particular guidelines on how the tariffs are to be set. If SEP and a third party user cannot come to an agreement within three months, they will need to find an independent arbitrator who will be given three months to reach a verdict. In the event that this solution is still not satisfactory to either party, the Ministry will make a decision.

PORTUGAL

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

A national system of tariffs has recently been introduced. For the domestic and small commercial consumer, this offers a range of two-part tariffs with the first part based on subscribed demand and the second part based on a selection of one, two or three unit rates. In fact two two-part tariffs, each with three unit rates, are available, depending on whether there is a medium or high utilization factor. Domestic consumers with consumption levels below 240 kWh/year are given a 75% rebate on the demand charge.

Large commercial and industrial consumers are offered two-part, three rate time-of-day tariffs. Various options are available depending on the voltage and the utilization factor. For this category of user, as for the larger domestic/small commercial user, the demand charge is a weighted average of the subscribed demand and the monthly maximum demand over a quarter-hour.

PRICE SETTING AND CONTROLS

Despite over half of the country's electricity coming from hydropower, generally a relatively economic source, and the use of imported coal, again potentially an economic supply, Portugal's electricity prices are high. The explanation seems to be a large amount of relatively old and inefficient plant, and perhaps more general inefficiency within EdP, the dominant supplier. To overcome this, the government is introducing competition in electricity supply, in particular through the encouragement of autoproduction, as well as encouraging the construction of efficient new plant such as the Sines complex, which will use imported coal. These developments will help to meet the rapid growth in demand that Portugal is currently experiencing, as will the use of imported electricity, notionally from France, though involving swaps with Spain. In time, it is hope that these initiatives should lead to a fall in the relative position of Portugal's electricity prices in the Community.

Government regulation of prices is tending to move from a policy largely influenced by social considerations to a more economically based policy. The first step has been the introduction of a national system of tariffs more closely reflecting costs, and a get tough policy with some areas where a proportion of bills were not collected at all. The domestic consumer nevertheless remains well favoured compared to his industrial counterpart. In formal terms, it is the Directorate General for Prices and Competition which agrees EdP's tariffs, though the Directorate General for Energy is consulted. The Energy Directorate, however, is responsible for most other policy aspects concerning EdP.

SPAIN

SECTION 4 - PRICE REGIMES

TARIFF SYSTEM

For domestic consumers with a subscribed demand up to 15 kW, a two-part tariff is available with a demand charge based on the subscribed demand, and either a uniform, or a day/night, unit rate. For consumers above 15 kW, subscribed demand, two-part tariffs are available, with variants depending on whether there is a medium or high utilisation factor. These have either two or three unit time-of-day rates. A similar tariff structure is available for small commercial and industrial consumers.

Large commercial and industrial consumers are supplied under two-part tariffs, with the demand charge a function of monthly maximum quarter-hourly demands and subscribed demands. The unit rate varies by peak, medium, or off-peak period and there is also a seasonal variation. Further variations are made corresponding to the voltage at which supplies are taken.

PRICE SETTING AND CONTROLS

The electricity supply industry has seen several significant structural changes over the last few years. The current structure, consisting essentially of ten principal regional generating and supply companies linking into a centrally controlled grid operated by the 51% government owned REDESA, and the nature of their generating sources, largely determines the cost of electricity in Spain. With respect to the fuel mix, about 37% of supplies are nuclear, with contributions of about 27% and 24% from hydro and coal respectively. This is potentially an economic and well-balanced mix, yet the obligation to use indigenous and expensive coal no doubt partly explains the relatively high electricity prices. The REDESA pool allows these differences in regional costs to be spread across the country, although, like the Dutch system, regional contributions to a pool can also be used to introduce a degree of competition.

The Government exercises considerable control over the electricity supply industry both directly and through REDESA. This includes planning new capacity and operation, both factors having a strong influence on costs, as well as control of tariffs. These are set each year on the basis of forecast demand and the standard costs used in the pool system, with any differences resulting from the actual evolution of events being carried over to the following year.

UNITED KINGDOM

SECTION 4 - PRICE REGIMES

TARIFF SYSTEMS

Although the industry has been restructured since 1.4.1990, open competition between suppliers has initially only been introduced for consumers with demands above 1 MW. After four years, open competition is introduced for consumers above 100 kW, and finally, after four more years, to all consumers. Supplies to domestic consumers, therefore, remain unaffected initially, and indeed are subject to control, allowing maximum increases related to the rate of inflation. The pre-restructuring tariffs thus remain in force except for very large consumers where negotiated competitive contracts may apply.

For the domestic consumer, this means a choice of two two-part tariffs one, the standard tariff, with a single kWh rate, the other with day/night rates. Some customers are still supplied under a separate circuit, restricted hour tariff in combination with the standard tariff, though this option is no longer available to new customers. Small commercial and industrial consumers have a choice of tariffs with a fixed standing charge and a unit rate, or with various day/night/evening/weekend rates. There seem to be some use of blocks for unit rates for given periods, presumably with a degressive element.

Large commercial and industrial consumers are generally supplied on three part tariffs with a (kVA) availability charge, a monthly maximum demand charge, (varying by month) and a single kWh rate or a day/night rate. An additional standing charge may also be applied. More sophisticated tariffs have up to six kWh rate periods, defined by time-of-day, day of week, and by season.

PRICE SETTING AND CONTROLS

The new structure in the UK progressively introduces competition in electricity supply, beginning first with large consumers and ultimately, in theory at least, to all consumers. This has already had some effect on prices for large consumers, who have been able to shop around for the best terms. Developments in the fuels used for generation are also likely to affect costs and thus prices in the longer term. Two main trends can be identified in this respect; the first is the ending, at the expiry of the recently concluded three year contract, of the obligation to take indigenous coal, and the second is the compensating increase in the attractiveness of generation from natural gas. Certainly a large proportion of existing coal supplies will remain economic, and the coal burning plant is often conveniently located for this, with relatively little coal import infrastructure. Nevertheless, the pressure is undoubtedly on the coal industry to ensure competitivity. As regards new plant, natural gas is easier to handle, is cleaner, and can give high efficiences in combined cycle plant, so that this tends to be the preferred fuel for new plant. Prices are therefore likely

to be contained in the future, except for two countervailing influences. The first is the need for the new privatised industry to earn a satisfactory return on its assets for its new shareholders. The second element is the fossil fuel levy, to be levied on all fossil fuel supplies, and to pay for the higher cost nuclear electricity, (which has been retained in public ownership).

As to government control, this is greatly reduced under the new competitive structure. Indeed intervention will be by the Regulator, (the Director General of Electricity Supply) and his Office of Electricity Regulation, (OFFER), whose main function is to ensure conformity with the new legislation, and to carry out their duties under this legislation, such as the granting of licences for generation or supply.

OVERVIEW

SECTION 5 - FINANCIAL ASPECTS

1. This Section reviews the salient financial aspects of the electricity supply industry. The information is given on a Member State basis and thus does not reflect, in every case, the situation of individual enterprises.

2. In the majority of Member States, the electricity enterprises have no advantages over other industries in their access to the financial markets. In some Member States (F, GR, IT and PT) the enterprises may benefit from relatively lower interest rates when borrowing from State funds and may also have the advantage of State guarantees on such loans and on loans on the international market.

3. Discount rates applied to the economic assessment of major investments are in most cases determined by the enterprises, based on their perception of future market rate trends. In some cases, the Member State Governments see fit to advise the enterprises as to which rate should be used (in 1988, F, NL, PT and UK).

4. Although the actual rates of return on capital employed are not available for every Member State, only in PT is a specific rate fixed by a Member State Government.

5. The Performance Ratios for 1988 indicate a wide variations in the financial situations of the enterprises. These show:-

   a) Investments/turnover - a Community average of 24,2%, decreasing slightly in recent years, varying from 44,3% to 9,3%;
   b) Self-financing of capital requirements in a Community average of 86,5%, varying from 182% to 17,8%;
   c) Indebtedness/turnover - a Community average of 138,1%, varying from 433% to 14,1%;
   d) Financial charges and reimbursement of loans/turnover - a Community average of 34,8%, varying from 117% to 3,8%.

6. In some Member States (D, IT, NL, ES and in UK after 1989) systems of Revenue Allocation exist. These are designed to support certain sources of production or specific fuel sources.

B E L G I U M

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The companies have normal access to national and international capital markets to finance their investments. The companies receive no preferential treatment over comparable firms in other branches of the industry. No state guarantees are given.

Risks involving exchange rates on loans in foreign currencies are covered by an annual reserve in the company's accounts which is calculated when the loan is concluded.

B. DISCOUNT RATES (on major investments)

8.6% based on market rates.

C. RATE OF RETURN

There are no external guidelines on the desirable rate of return of these companies. When the private utilities (now merged) associate themselves with municipalities as regards distribution, capital shares are assigned to associates for their material or financial contributions. The rate of return on the capital share is the same for private and public associates.

D. PERFORMANCE RATIOS (1988)

a) Investments/turnover : 14,7%

b) Structure of financing :

. self financing :	74,3%
. capital contributions	0,9%
. loans	23,3%
. others	1,5%

c) Indebtedness/turnover : 81,3%

d) Financial charges and reimbursement of loans/turnover : 20,7%

E. SYSTEM OF REVENUE ALLOCATION

Not applicable

DENMARK

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The electricity supply industry has access to the national and international capital markets on the same conditions as other industrial branches. The structure with cooperatives and municipalities as owners of the ESI gives a better credit rating than other industrial branches.

B. DISCOUNT RATES (on major investments)

5 %. Based on market rates.

Source : OECD

C. RATE OF RETURN

Not available.

D. PERFORMANCE RATIOS (1988)

a. Investments / turnover - 36,3%

b. Structure of financing

- self financing	74,6 %
- cap. contributions	- %
- loans	25,4
- others	-

c. Indebtedness/turnover - 69,2%

d. Financial charges and reimbursements of loans/turnover - 14,4%

E. SYSTEM OF REVENUE ALLOCATION

Not applicable

FRANCE

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

EDF has obtained attractive conditions on both the national and international financial markets, which recognize its qualities. The latter are founded on the breadth of EDF's transactions (liquidity), their successful outcome (correct appreciation of market prices), but also and above all on the nature of the Company's activity, which provides bondholders with a long-term guarantee against the risk of insolvency.

With regard to foreign currencies, the state guarantee clearly constitutes an additional favourable factor.

(a) National Market

Until 1984, EDF received loans from the state through the intermediary of the F.D.E.S. (Fund for Economic and Social Development). These loans were long-term and made at relatively advantageous rates compared to prevailing market rates. EDF's French franc liabilities no longer include any loans of that type. They are composed essentially of bond issues.

Generally speaking, the conditions obtained by EDF on the French bond market are similar to those obtained by other public borrowers. It is worth mentioning, and constitutes one of the specificities of the market, that they are only slightly higher (0.1 to 0.2%) than those obtained by the state itself. On the other hand, they are better than the conditions a private firm could expect (as much as 0.5% less).

(b) International Market

EDF has voluntarily readjusted its debt balance in favour of European currencies where interest rates are lower (SF, DM), to the detriment of such currencies as the Yen and the US$.

The rating attributed to firms by financial intermediaries is a measure of the risk of default (minimum risk is rated AAA).

French public enterprises issue in their own name but with the state's guarantee; they all have the same AAA rating. Theoretically, their conditions for access to the market are identical, but temporary differences may exist due to :

. the borrower's reputation

. the frequency of the loans

. the success of each loan: good timing, good price.

Few private French firms issue on the international markets. Only two of them have a rating, Elf (AA) and Thomson (A).

Since it was founded, EDF has received 36.6 billion Francs of capital financing from the state. Since 1982, no new financing has been made. At the end of 1988, this funding corresponded to 15.7% of the debt.

Starting in 1989 (see new Planning Agreement with the state), the loans were repaid in the form of an annual interest set at a rate of 5% and dividends corresponding to the company's profits. In 1988, a 7.2% interest was paid out.

B. DISCOUNT RATES (on major investments)

8% according to government advice.

C. RATE OF RETURN

Not available

D. PERFORMANCE RATIOS (1988)

(a) Investments/Turnover = 30,9% (practically constant since 1984)

(b) Structure of financing

. Self financing	66,2% (increasing since 1984)
. Capital contributions	-
. Loans	22,9% (decreasing since 1984)
. Other	10,9% (practically stable since 1984)

(c) Indebtedness = 166,9% (practically stable since 1984)
Turnover

(d) Financial charges & reimbursements of loans = 30%

(practically stable since 1984)

Source : UNIPEDE

E. SYSTEM OF REVENUE ALLOCATION

Such a system does not exist in France. EDF purchases electricity from independent generators and sells power to independent distributors at tariffs and conditions defined according to ministerial decisions and special contracts. On the other hand, prices are the same throughout the country for any particular category of consumers, and independent of the origin of production.

GERMANY

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The electricity supply undertakings have open access to the financial market and are financed in the same way as other industry. They have to take loans at market rates.

No state guarantees are given for these loans, but the undertakings have to supply normal securities for the loans like other industry (for example on their real estate property). No exchange rate guarantees are given by the state.

The capital of the undertakings has to be supplied by the public or private owners.

B. DISCOUNT RATES (on major investments)

C. RATE OF RETURN

The electricity undertakings are organized according to company law. They usually make profits, these are used to pay return rates on the capital. There is no such rate imposed by the state.

D. PERFORMANCE RATIOS (1988)

a) Investments/turnover - 2,5%

b) Structure of Financing - 81,7%

.Capital Contributions - 0

.Loans - 14,1%

.Others (especially contributions of customers) - 4,2%

c) Indebtedness/turnover - 34,3%

d) Financial charges + reimbursements of loans/turnover - 4,8%

E. SYSTEM OF REVENUE ALLOCATION

There is an 8,5% addition to the electricity price which is used to finance fuel costs for coal-fired power stations (Kohlepfeinng). The difference of the world market price and the production price of German coal is partly compensated by this payment.

GREECE

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

PPC, being a public enterprise, borrows from domestic financial market with an interest rate determined by the Bank of Greece and which, actually, amounts to 18,5%. Private enterprises borrow at higher interest rates.

PPC, as other public enterprises, can also borrow on the international financial market, after getting Bank of Greece's approval. International PPC loans enjoy State guarantees, which, however, are remunerated. The guarantee fees paid to the Greek State vary. As far as risk cover is concerned, it is expressed by differences in the spread margin over LIBOR or in the percentage of the fixed rate loans. Private enterprises do not have the right to borrow in foreign currencies.

PPC, as a state-owned public utility, has no shares placed on the stock exchange market.

B. DISCOUNT RATES (on major investments)

The employed real discount rate is 10% and is dictated by the general economic policy of the government and the conditions of the capital market.

C. RATE OF RETURN

The rate of return on capital employed was 8,69%.

D. PERFORMANCE RATIOS (1988)

(a) Investments/Turnover = 28,7% (decreasing since 1984)

(b) Structure of financing -

. self financing	41,9%	(increased substantially since 1984; remained stable from 1987)
. capital contributions	-0	
. loans	45,8%	(decreasing with time)
. other	12,3%	(not significantly changed)

(c) Indebtness/Turnover = 263,8% (decreasing since 1984)

(d) Financial charges & reimbursements of loans/Turnover = 55,7%

(practically stable since 1984).

SOURCE : UNIPEDE

E. SYSTEM OF REVENUE ALLOCATION

Given the fact that PPC is a vertically integrated company, managed as a single enterprise without even separate cost centres, the question of revenue allocation is not applicable.

IRELAND

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The Electricity Supply Board receives no preferential treatment as regards financing conditions compared with other industrial branches. Where different financing conditions/interest rates exist, these are in line with normal commercial banking practice.

B. DISCOUNT RATES (on major investments)

Based on market rates.

C. RATE OF RETURN

Not available.

D. PERFORMANCE RATIOS (1988)

a. Investments / turnover - 12.4%

b. Structure of financing

- self financing	41,8%
- cap. contributions	0%
- loans	55,0%
- others	3,2%

c. Indebtedness/turnover - 162,9%

d. Financial charges and reimbursements of loans/turnover - 57,5%.

E. SYSTEM OF REVENUE ALLOCATION, IF ANY

Not applicable.

ITALY

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

(a) National Market

ENEL's conditions of access to the national capital markets are those set by law for all firms.

The only significant difference lies in the fact that bonds issued by ENEL are government secured, as stipulated in Article 10 of the ENEL Act of incorporation.

Taxation and interest rates are the same as for government issues.

ENEL bonds have quotation privileges on the stock market; the Central Bank grants bank advances on them and the State can accept them as collateral.

(b) International Market

ENEL's conditions of access to the international market are the same as for any other private or public Italian enterprise.

Bonds issued by ENEL on the international market are government secured, as stipulated by Article 10 of the ENEL Act of incorporation.

The State guarantees the loans concluded by ENEL in the national or international financial market, according to article N° 10 of the establishment law of the electricity utility.

B. DISCOUNT RATES (on major investments)

5% based on real market rates.

C. RATE OF RETURN

The rate of return on capital employed is calculated on the basis of the results of each annual use. The government does not impose any percentage (it controls, however, the prices). The rate of return in 1988 was 5%.

D. PERFORMANCE RATIOS (1988)

(a) Investments/Turnover = 31.1% (no significant change since 1984)

(b) Structure of financing

. Self financing	62,7% (increasing since 1984)
. Capital Contributions	- 0
. Loans	26,8% (decreasing since 1984)
. Other	10,5% (rather stable since 1984)

(c) Indebtedness/Turnover = 131% (no significant change since 1984)

(d) Financial charges & reimbursements of loans/Turnover = 31.6%
(decreasing since 1984)

Source : UNIPEDE

E. SYSTEM OF REVENUE ALLOCATION

Since 1974 there is a system according to which consumers pay a thermal supplement in addition to the basic tariff. Each utility collects the revenue from this supplement and hands it over to the "equalisation fund for the electricity sector". The revenue from the fund is distributed among the utilities according to their projected fuel consumption. The system was introduced to accomodate the increase in fuel prices, without increasing the profits of those companies who have an above average share of hydro capacity.

LUXEMBOURG

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The electricity supply undertakings have open access to the financial market and financed in the same way as other industry. They have to take loans for market rates.

No state guarantees are given for these loans but the undertakings have to supply normal securities for the loans like other industries (for example on their real estate property). No exchange rate guarantees are given by the state.

B. DISCOUNT RATES (on major investments)

Not available. No special rates are imposed by the State.

C. RATE OF RETURN

In Luxembourg, the State owns 41% of the capital of CEGEDEL. This participation is renumerated in the same was a private shareholding (59% of the capital). The shares are quoted on the Luxembourg and Brussels stock exchanges.

There is also a dividend limited by law up to 12% of social capital. In practical terms, this legal provision means that there is a dividend of 207 FLux for every 2000 FLux which equals to 10,4%.

D. PERFORMANCE RATIOS - 1988

a) Investments/turnover - 9,3%

b) Structure of financing

Self-financing - 74,9%

Loans - 24,9%

Others - 0,2%

c) Indebtedness/turnover - 36,6%

d) Financial charges and reimbursements of loans/turnover - 3,8%

E. COMPENSATORY SYSTEM

Not applicable.

THE NETHERLANDS

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL ASPECTS

Electricity utilities have access to the national financial market. Having regard to the low risk profile of the utilities, they can compete or even do better than the industrial branches with the highest credit rating. Financing on international market is quite uncommon for Dutch utilities.

B. DISCOUNT RATES (on major investments)

5%, based on Government advice.

C. RATE OF RETURN

Not available.

D. PERFORMANCE RATIOS (1988)

The restructuring of the electricity industry in the Netherlands make it difficult to obtain representative consolidated ratios. The indicated figures should be interpreted with caution.

a)	Investment/Turnover	: Not available
b)	Structure of financing	
	. self-financing	: 21%
	. capital contribution	: 0
	. loans	: 67,9%
	. others	: 10,4%
c)	Indebtedness/turnover	: 222%

d) Financial charges and reimbursement of loans/turnover : 45,6%

E. COMPENSATORY SYSTEM

SEP operates a cost pooling system. This system is, in effect, a framework in which transactions take place between SEP and the generating companies with the aim of averaging out differences in generating costs between the different regions. The generating companies sell all the electricity they generate to SEP. SEP reimburses the companies for the costs incurred. A large share of the costs are reimbursed on the basis of standard costs, ie costs which can be expected to be incurred given the characteristics of the plant, and the amount of electricity required. The basis for compensation and the level of the standard costs are agreed between the generating companies and SEP in the so-called agreement of cooperation (overeenkomst van samenwerking). At present, all direct costs and 60 percent of indirect costs are being pooled.

For new investment, SEP will allocate the responsibility for construction to one of the generating companies and will sign a contract with the company which will include technical specifications, cost and time deadlines, and establish penalties for breach of contract. The construction finance will have to be provided by the company itself. The company will then be refunded through the compensation scheme.

PORTUGAL

SECTION 5 - FINANCIAL ASPECTS

A. ACCESS TO FINANCIAL MARKETS

The national and international financial markets have constituted the main source to match E.D.P.'s financial needs.

The state guarantee to E.D.P. is obtained in the case of loans negotiated with the World Bank, E.I.B. and Kredietanstadt fur Wiederaufbau. In those cases, a commission is paid of 1/2% per year. At the end of 1988 this commission raised to 1% per year.

B. DISCOUNT RATES (on major investments)

A reference rate of 10% is used, based on the latest national energy plan.

C. RATE OF RETURN

The renumeration of the E.D.P. statutory capital is legally fixed at 4% per year, though it has not been collected.

D. PERFORMANCE RATIOS - 1988

a) Investments/turnover - 44,3%

b) Structure of financing

Self financing - 17,8%

Capital contributions - 0

Loans - 76,5%

Others - 76,5%

c) Indebtedness/turnover - 443%

d) Financial charges and reimbursements of loans/turnover - 117%

E. COMPENSATORY SYSTEM

Not applicable

SPAIN

SECTION 5 - FINANCIAL ASPECTS

A) ACCESS TO FINANCIAL MARKETS

With regard to external loans, whether in national or foreign currencies, conditions of access for companies in the electricity industry are at present the same as those for other branches of industry, namely those determined by the market itself and, above all, by the borrower's credit rating.

As regards capital increases in the electricity industry, the situation was less favourable than for other branches of industry. Electricity rates maintained in many cases below actual operating costs, made it impossible to remunerate equity capital under market conditions. This led to difficulty in obtaining new capital.

There is no State guarantee for loans and no state guarantee for exchange rates.

B) DISCOUNT RATES - (on major investments)

A discount rate of 5% is used, based on estimation of future market interest rates.

C) RATE OF RETURN

In 1988, consolidated profits before taxation represented 14% of the turnover.

Rate of return on capital 15.8% for the sector in general.
22% for Endera.

D) PERFORMANCE RATIOS (1988)

a) Investments/turnover 29,8%

b) Structure of financing :

. self financing	40,1%
. capital contributions	6,1%
. loans	51,7%
. other	2,1%

c) Indebtedness/turnover 303,3%

d) Financial charges + reimbursements of loans/turnover 77,6%

Source UNIPEDE

E) COMPENSATORY SYSTEM

The companies revenues are their income from their sales to final users plus or minus compensations. These compensations are a result of the different structure of costs and markets of the companies and the existence of a single tariff for the whole country. The rules for compensations are established by the stable legal framework (see section 4.B). The compensation system is not applied to Endesa, which is controlled by the public sector and whose revenues are calculated by applying the same variable costs as the other companies and by determining its fixed costs in an appropriate way.

OVERVIEW

SECTION 6 - FISCAL ASPECTS(1)

1. The types of tax on companies operating in the electricity supply industry, the rates of these taxes, and the various exemptions and allowances, are extremely diverse within the Community.

2. The estimated tax burden on companies as a proportion of turnover, (and thus of electricity bills), is summarised in the attached table. This shows considerable variation, from the very low tax burdens for the electricity supply industry in a number of countries up to about 8% or 9% for some other Member States.

3. The variation in social security contributions(2), (which many consider as equivalent to a tax), by the industry in the different Member States is also shown in the table. These range from virtually no contributions in Denmark to contributions representing about 9% of turnover in France. These figures need to be interpreted with caution, however; Denmark, for example, maintaining that general taxes on personnel are very high, and that these taxes help to fund government social security costs.

4. As to taxes on electricity, the main component here is VAT, the rates for which are shown in the table. These again vary widely, from an effective rate close to 0% in the UK to 22% in Denmark. Other taxes are also levied in several Member States, namely DK,DE,ES,FR,HE,IT and PO. Usually VAT is recoverable by industry; nevertheless, partly because of the other taxes, the tax content of electricity prices for industry varies widely. Figures on this, (taken from an IEA report), are given in the table. In particular, industry in ES,HE,IT,PO and to a lesser extent DE seems to be disadvantaged in this respect.

5. Taxes on both companies, (including social security liabilities) and on electricity sales often apply to other types of company or commodity respectively, which indicates that any attempts at harmonisation must be dealt with in a very broad context. There nevertheless seem to be a number of areas in which moves towards harmonisation would have less or no impact on other areas, and which merit examination. These tend to relate more to the special taxes on electricity, for example in Italy and France. Furthermore, these particular taxes often give rather arbitrary variations in prices by area, by size of consumer, and by type of consumer. Any tax system, however, which inevitably generates revenues for certain parties, will be difficult to change. But one new area in which the Commission should try to encourage a harmonized approach from the start is on "environmental" taxes, which are currently only present in NL.

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(1) Most data relates to 1988.

(2) the structures for these are broadly similar, and have not been considered in the individual Member State sections.

BELGIUM

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

In considering taxes on electricity supply bodies in Belgium, a distinction needs to be made between generation and distribution, and between publically and privately owned bodies. On generation there are three privately owned companies (whose merger was recently announced), and who account for about 93% of generation. The fourth generator, (SEP), is an intercommunal partnership of publicallly owned companies. Its current role is small, (about 3% of generation) though planned to grow under government policy. Below 1 MW, distribution is carried out by communal electricity boards, or "pure" or "mixed" intercommunal bodies, the "mixed" bodies having the association of a private company.

The publically owned participants (including SEP) are exempt from taxation. The three privately owned generators are liable in principle to normal corporation tax at 43%, but in practice they benefit from special allowances related to dividend payments, so that actual payments are negligible. Again various exemptions apply to a general withholding tax levied at source on payments for dividends and interest, and the three private generators pay relatively small sums. More significant are the various property taxes they pay, though again supply companies with a public ownership element are exempt. These property taxes represent about 1/2% of total turnover.

By far the biggest tax element, (apart from social security contributions which are of the same magnitude, though dealt with separately in this analysis), are the effective attribution of profits to the communes, in particular in the "mixed" intercommunales. These funds are used to finance the communes' other public service functions and amount to a tax of about 5% on average electricity prices. They may be considered as a concession payment by the private sector participant to have the right of supply in the communes' areas.

There are numerous other miscellaneous taxes, some of a regional or local nature, although their impact is relatively very small. Taking all taxes together, the total tax burden is about 5.8%.

TAXES ON ELECTRICITY

A VAT rate, reclaimable by industry, of 17% applies.

DENMARK

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

Taxes on companies in the electricity sector, as opposed to electricity sales, are relatively unimportant in Denmark (about 0.9% of turnover). Corporation tax, for example, is only applicable to two joint-stock companies out of the 116 bodies in the sector, and even these companies have reduced their liability to very modest amounts. Property taxes are liable on assessed values, with roughly similar rates for an equivalent tax for municipally owned installations. The amounts collected are however relatively very small, adding less than 1/2% to electricity prices. More significant is the impact of taxes on the companies' personnel, which are very high in Denmark, though social security payments by both employer and employee are very low.

TAXES ON ELECTRICITY

The VAT rate on electricity, which is deductible by industry, is 22%. In addition, a special governmental tax on electricity, also deductible by industry, was introduced in 1977 and now amounts to 0.325 DKr per KWh.

FRANCE

SECTION 6 - FISCAL SPECTS

TAXES ON ELECTRICITY COMPANIES

The main taxes on electricity supply companies in France, which represent in total about 7% of turnover, are the business licence tax, (about 2.9%), returns on capital allocations, (about 2%), contributions to FACE* (just under 1%) and land taxes (0.8%). Whilst EdF, the dominant supplier, is liable to corporation tax levied at 42%, a system of allowances based on the replacement cost of investments means that the liability is negligible. In addition, the regional, departmental and municipal electricity supply bodies also active in the sector are exempt from corporation tax.

TAXES ON ELECTRICITY

The VAT rate, which is deductible by industry, is 18.6%. In addition there are certain municipal and departmental taxes levied in a number of areas, as follows (1988) :

	Municipal Tax	Departmental Tax	Total
Lille	8 %	2%	10 %
Lyon	8 %	4%	12 %
Marseille	8 %	4%	12 %
Paris	13.2%	-	13.2%
Strasbourg	-	4%	4 %
Toulouse	8 %	4%	12 %

These rates are applied to 80% of the tax exclusive price for domestic and very small industrial consumers, (i.e. consumers with up to 32.4 kW subscribed demand), 30% of the tax exclusive price for medium size industrial consumers, (i.e. 32.4 kW - 225 kW), and nothing for consumers with subscribed demands above 225 kW.

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* Fonds d'Amortissement des Charges d'Electrification Rurale.

GERMANY

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

Notwithstanding the wide variety of ownership and structural role of companies in the electricity supply chain, all are subject to the normal tax system. The system is complicated, however, and with the diversity of companies to which it applies, it is difficult to assess the impact of the many different taxes. The following is a brief description of the main taxes and estimates of their impact.

A profit tax of 56% (50% as from 1990) is levied on non-distributed profits, and 36% on distributed profits, (with a further tax of 25% levied on dividends received). This profit tax is divided between State and the Länder. There are a variety of taxes on assets : a tax at the rate of 0.6% on net worth (to the Länder), a tax of 0.8% on working capital and a tax of about 1% on landed property, (the last two taxes for the municipal authorities). In total, taxes are estimated to add on average around 3.7% to electricity bills.

Additional concession payments to municipalities by supply companies for the exclusive right to supply in their area vary, but are generally about 1% of turnover for industrial consumers and about 8% for tariff based consumers. In total, they average about 4.7% of turnover.

TAXES ON ELECTRICITY

In addition to the (deductible) VAT rate of 14% in the Federal Republic, the Kohlpfennig is also levied on all electricity sold, to fund the compensation pool for the higher cost of indigenously produced coal. Currently the Kohlpfennig adds 8.5% to the cost of electricity, a figure which has more than doubled over the last few years.

GREECE

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

Whilst the information available is incomplete, it seems that the publically owned Public Power Corporation is exempt from tax payments, at least for all significant tax liabilities.

TAXES ON ELECTRICITY

The VAT rate in Greece is 16%. Furthermore, from data available, it appears that there is an effective tax rate of the same order of magnitude on industrial electricity, suggesting that VAT is not deductible.

IRELAND

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

The major tax burden paid by the Electricity Supply Board (ESB), which accounts for virtually all electricity supply in Ireland, is the payment of local authority rates. This is a property based tax and amounts to about 4% of final turnover. The various other tax liabilities are negligible, apart from a small contribution from excise duties on oil. In particular, whilst the ESB would be liable to corporation tax at the manufacturing rate of 10%, it makes no profit, partly through the use of accelerated capital allowances. Indeed the ESB is not required to necessarily make a profit under its statutory obligations.

TAXES ON ELECTRICITY

VAT has recently been introduced in Ireland at a rate of 10% and is deductible for industry.

ITALY

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

ENEL, the nationalised corporation established in 1962, is the dominant supplier, although there is a significant contribution to supplies from undertakings retained in municipal ownership. The information available for Italy suggests that most of the tax burden on companies is made up of taxes paid on fuel oils, licence fees, stamp duties, taxes for the occupation of public space (and in particular by power lines), and registration fees. As to corporation tax, ENEL is liable at the normal rate of 36%, but since it makes no profits, (and previous losses can be offset for up to five years), no payments are made. Taxes on motor vehicles and local taxes, including those on geothermal stations, however, make a further small contribution to the total burden, estimated at about 9% of turnover. It appears, however, that this includes a substantial "parafiscal" charge for water and other items.

TAXES ON ELECTRICITY

The VAT rate in Italy is 9% and is deductible by industry. In addition there is a very complicated system of local, provincial and other state taxes, sometimes with different rates for the south of the country and exemptions for certain types of user, (eg. electro-chemical, electro-metallurgical, etc.). The state tax is levied at 1.1 LIT/kWh for domestic and small industrial consumers and 0.65 LIT/kWh for larger consumers. The rates are halved in the south. Furthermore there is a local tax of 6.5 LIT/kWh and a provincial tax of 11.5 LIT/kWh for the smaller class of users, representing about 5% and 8% respectively of electricity prices.

LUXEMBOURG

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

The main tax item on public electricity supply companies in Luxembourg is income tax, which represents about 3.4% out of the total tax component of turnover of about 7.7%. The next largest component (about 2.7%) is a special fee paid by the main public supply company, CEGEDEL, relating to its supply contracts with the German RWE and the state owned indigeneous generating company, SEO. The last major item (about 1%) is a municipal tax on trade and profits generated by electricity supply companies, (except those companies themselves in municipal ownership).

TAXES ON ELECTRICITY

VAT, which is deductible for industry, is levied at 6% in Luxembourg.

THE NETHERLANDS

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

The total tax burden on the publically owned electricity supply industry in the Netherlands is only about 1.5%. Just under half of this is accounted for by taxes levied by municipalities on property. An almost equal sum is paid under an environmental tax levied by central government. The tax amounts to 5.75 NLF per 1000 Kg of oil or coal burnt, with refunds of 2.25 NLF if sulphur emissions are reduced by 85%. The rate is 0.0022 NFL per m^3 natural gas. Relatively little oil is used for generation and the tax on (the less polluting) gas is low, so that most of the environmental tax paid results from the use of coal. As with some other countries, there is a municipal tax for land use, though it is negligible in terms of total turnover. As for corporation tax, the public supply utilities are exempt provided their shares continue to be directly or indirectly controlled by statutory bodies and they supply only utility commodities, (i.e. electricity, water, gas, heat).

TAXES ON ELECTRICITY

The VAT rate stood at 20% in 1988 and is deductible for industry.

PORTUGAL

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

The overall tax burden on EdP, which accounts for virtually all public supply in Portugal, is only about 1.7%. About 3/4 of this represents concession payments to municipalities for the right to operate a low-voltage distribution system in their areas. Most of the rest is accounted for by fees payable on generation plant to municipalities.

TAXES ON ELECTRICITY

The VAT rate in Portugal was 8% in 1988. In addition there is an "inspection tax" for both households and industry, though this is a fixed amount per month. In any event there appears to be a tax liability on industry of slightly less than the VAT rate, suggesting that VAT may often not be deductible.

SPAIN

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

Of the many taxes which apply to electricity supply companies in Spain, (and they are treated no differently to other companies), the main ones are : corporation tax (about 1.8% of turnover), a special municipal tax for the use of subsoil, ground and highways, (about 1% of turnover), and a fiscal licence for economic activity (about 0.3%). Corporation tax is levied at 35%, although after the application of various allowances such as for investment expenditures and job creation, the effective take is only about 40% of the nominal amount. The municipal tax for the occupation of ground, subsoil and aerial space by distribution networks varies by municipality, but may not exceed 1.5% of the total electricity revenue in the area. These three taxes, plus the many other smaller ones, give a total tax burden estimated at about 3.7% of turnover.

TAXES ON ELECTRICITY

In 1986 the various municipal and provincial taxes were replaced by VAT which was at 12% in 1988. It is not clear whether this is tax deductible for industry, since various sources show a tax component for industrial electricity prices of this amount.

UNITED KINGDOM

SECTION 6 - FISCAL ASPECTS

TAXES ON ELECTRICITY COMPANIES

The only significant burden under the old structure of the electricity supply industry was from local authority rates, a property tax amounting to about 4% of electricity sales revenue. Various other taxes such as duty on fuel oil, other excise duties, capital gains tax, etc. are negligible compared to turnover. Because of capital expenditures and exceptional costs during the miners' strike, the industry was not liable for corporation tax up to 1990. The new privatised electricity supply industry, however, will be liable to corporation tax as for any other industrial enterprise.

TAXES ON ELECTRICITY

VAT was introduced in the United Kingdom for non-domestic consumers at 15% on 1.7.1990. It is recoverable by industry, (but not by non-VAT registered bodies such as financial institutions).

OVERVIEW

SECTION 7 - ENVIRONMENT

Community Member States have in the past developed different strategies and policies for the abatement of air pollution from stationary sources. The main methods have been air quality standards, fuel quality and use regulations as well as emission standards. In 1988 the Community adopted a Directive on the limitation of emissions of certain pollutants into the air from large combustion plants, which will have the effect of bringing standards for new facilities among Member States to a minimum level of uniformity. This Directive entered into force on 30 June 1990.

The Directive is made up of two parts and is based on the use of best available technologies not entailing excessive costs. The first part applies to new combustion plants exceeding 50 MW th. Under the Directive, all new large combustion plants will be subject to a licensing procedure to ensure that they meet the specified SO_2, NO_x and dust emission limits. The second part applies to existing combustion installations and specifies national reduction targets for SO_2 and NO_x on the basis of 1980 levels.

However, more far reaching national legislation (see the following country fiches) will continue to exist in line with Article 130 of the EC Treaty. These additional stricter requirements relate to emission standards for existing combustion facilities (B, D, I, NL), where there is the greatest potential to reduce emissions in the shorter term and where costs are very substantial. Furthermore, fuel quality standards for large combustion plants exist in some countries and DK has fixed a limit for the maximum yearly amount of SO_2 emissions.

As regards small combustion plants below 50 MW th, Community legislation is under preparation. Only in a few Member States (D, NL) small plants are subject to strict standards.

Transboundary air pollution and the acid rain discussion has also led to the conclusion of international agreements, such as the 1979 UNECE Convention on Long Range Transboundary Air Pollution and the Helsinki Protocol aiming at a 30% overall SO_2 reduction by the year 1993 (base 1980 levels). This Protocol has been ratified by DK, F, D, NL, B and I. Furthermore, in 1989 the Sofia Protocol on the limitation of NO_x emissions was agreed upon; this Protocol has been ratified by a number of Member States.

As regards the reduction of SO_2 emissions directive EEC (85/776) on the sulphur contents of gasoils is of importance. It reduces the maximum content of gasoil to 0.3% and allows Member States to set a stricter limit of 0.2% because of environmental needs. So far B, DK, L, NL and D have applied the 0.2% standard.

There are no rules on CO_2 emissions.

B E L G I U M

SECTION 7 - ENVIRONMENT

1. SO_2 and NO_x control

The environmental legislation in Belgium has been developed in two major steps.

A first set of recommendations, signed into law under Royal order of August 8, 1976 deals with the control of emissions, dust and sulphur dioxides by industrial boilers. Emission levels compatible with the regulation are mainly guaranteed through mandatory requirements on the sulphur content of liquid fuels. The fuel requirements are given hereafter.

fuel	max. S content %	max. SO2 em. factor (g/Nm3)
gasoil	0.3	
light fuel-oil	0.5	0.85
intermediate fuel-oil	1.3	
heavy fuel-oil	1.9	3.2
extra heavy fuel-oil	2.2 to 2.8	3.7 to 4.7

The Royal order on the abatement of atmospheric pollution from large scale combustion plants was signed into law on August 18, 1986. It completes the preceeding legislation and introduces emission standards for SO2 and NO_x emissions for new power stations. They differ as a function of the size of the plant, the fuel used and the date of commissioning as indicated on the table below. They are equal to the levels of the directive 88/609/EEC for the period until 1995 and they are more stringent afterwards.

fuel	power MWth	SO2		NO_x	
		before 1995	after 1995	before 1995	after 1995
solid	50-100	2000	2000	800	400
	100-300	1200	1200	800	200
	>300	400	250	650	200
liquid	50-100	1700	1700	450	150
	100-300	1700	1700	450	150
	>300	400	250	450	150
gas :	>50				
coke gas		100	100	350	100
natural gas		35	35	350	100

Belgian National Regulation on SO2 and NO_x emissions (mg/Nm3) (AR 18/8/86)

Belgium is also a signatory of the UNECE '30% Club' protocol pledging to reduce total overall SO2 emissions by 30% compared to 1980 levels by 1993.

For existing large combustion plants, Belgium has to draw up according to 88/609/EEC directive a programme with the objective of reducing SO_2 emissions by 40%, 60% and 70% on 1993, 1998 and 2003 respectively. NO_x emissions should be reduced by 20 and 40% on 1993 and 1998. All reduction targets have 1980 emissions as a reference level.

2. Particulates control

The Royal Order of 18/8/86 introduces also dust emission standards for new power stations.

DENMARK

SECTION 7 - ENVIRONMENT

A. SO2

a) Gaseous emission

The Danish regulations for reduction of SO2 emissions are based on different principles for the power generation sector and for the rest of the energy system.

The Danish act of limitation of sulphur dioxide pollution from power plants is based on the principle that the Minister for the Environment shall lay down a limit for the maximum yearly amount of sulphur dioxide which can be emitted from Danish power plants.

The Minister has stated that the total yearly emission from the power plants will be regulated in such a way that it must be reduced to 125.000 t/a in 1995. It is accordingly left to the two power companies to decide among themselves the most economic way to achieve this goal, but it has been agreed that in the coming years all new and some old Danish power plants will be equipped with flue gas desulphurisation. These power plants will be used as base load plants in order to utilize the investment in abatement facilities to the limit.

This policy is an alternative to emission standards for individual power plants.

In the industry and terciary sectors, emission reduction regulations are not based on emission measurements but on reductions of the sulphur content in the fuel.

b) NOx

The National Agency of Environmental Protection has, in the approval of the four projects concerning the construction or the modification of power plants to be put into operation in the period 1986-1991, required that a low NOx technique is applied, and that the emission of nitrogen oxides does not exceed 400 mg NOx/MJ as a yearly average.

The use of SCR technique (Selective Catalytic Reduction) in power plants has so far not been required in Denmark, but it will be necessary for obtaining in 2005 a 50% reduction compared to the 1980 emission as decided by the Parliament in 1987.

c) Particulates:

FRANCE

SECTION 7 - ENVIRONMENT

National emission standards have been set for particulates and for SO2 but only in 'specially protected areas' while licences for individual plants may set limits stricter than national standards. Licensing of classified installations is governed by the Law of 19 July, 1976 on installations classified for the protection of the environment.

SO2 control

France is a signatory of the UNECE "30% Club" protocol, and has a policy of reducing total SO2 emissions by 65% compared with 1980 levels by 1995. No national emission standards for SO2 have been set (except in specially protected areas), although these are currently under discussion.

NOx control

An aim of reducing global NOx emissions by 20-30% compared with 1979 levels by the year 2000 has been indicated. So far, however, no emission standards for NOx have been introduced.

The Directive 88/609/EEC will become national law by 30.6.1990 and will be the main legislative instrument in France in this field.

GERMANY

SECTION 7 - ENVIRONMENT

A. GASEOUS EMISSIONS

In the Federal Republic of Germany several different administrative air pollution control regulations have been enforced to limit ecological damages.

1. Power and heating plants

In 1983 the Statutory Ordinance on large scale Firing Installations (GFAVO) and in 1986 the Technical Guideline for Air Quality Control (TA Luft) for smaller installations have passed law. These regulations are based on plant specific emission standards expressed in mg/NM^3 and which are summarised (for new installations) in the following table for stationary firing installations of more than 50 MWth.

fuel	power	SO_2	NO_x
coal	50–100	2000	400
	100–300	2000	400
	>300	400	200
oil	50–100	1700	300
	100–300	1700	300
	>300	400	150
natural gas	<300	35	200
	>300	35	100

Already existing plants have to be either converted, retrofitted or shut down within a specified transition period. Moverover, State governments have the possibility to impose more stringent standards.

industry/industrial process	SO_2	NO_x
refineries		
- catalytic crackers	1700	700
cokefaction	800	500
cement industry		
- grate preheater		
- cyclonic preheater with heat recovering system	400	1500
iron and steel industry		
- sintering plants	500	400
- rolling mill		500-1300

Moreover, several product specifications are valid for liquid fuels. One example is the legislation on the maximum sulphur content of gasoil which was set from the previous level of 0,3 to 0,2 weight percentage. This law was passed on 1 March, 1988.

GREECE

SECTION 7 - ENVIRONMENT

Environmental laws in Greece were still under development in 1988. Initial efforts have concentrated on large urban areas where a large portion of the industrial and commercial activity is located (e.g. Athens). The main strategy for reducing pollution is to limit the sulphur content of fuel. According to the EEC Directive on fuel quality standards adopted in 1987, gasoil should contain a maximum 0.3% sulphur from 1 January 1989 onwards. Since 1982, the sulphur content of gasoil was already restricted to 0.3% in the Greater Athens area and the sulphur content of heavy fuel oil to 0.7%. Lignite use in Northern Greece is not considered to be a problem as its sulphur content is only 0,4%. Efforts are under way in Southern Greece at the Megalopolis power station to reduce the high sulphur content in lignite of 1,5%. There are no plans for using FGD or denitrification devices and coping with the EC directive on large combustion plants will require special efforts in Greece. The EEC Directive 80/779 regulating the sulphur dioxide and particulates emissions became internal law in Greece. Concerning the NOx emissions, the relevant procedure is at a final stage for adopting the EEC Directive 85/203.

IRELAND

SECTION 7 - ENVIRONMENT

A. GASEOUS EMISSION

a) SO2: The EC target SO2 figures for Ireland imply that ESB will have to have a certain proportion of low sulphur heavy fuel oil in its mix in the 1990's. This proportion will be highly contingent on the availability of gas for electricity generation coupled with the growth in electricity demand.

b) NOx: The Sofia Protocol to the Geneva Convention imposes conditions more stringent than those of the large Combustion Plant Directive and requires ESB to maintain emission of NOx at the 1987 level from 1994 onwards. Planning is already well advanced to convert Moneypoint Coal Station from high NOx to low NOx performance before 1994.

ITALY

SECTION 7 - ENVIRONMENT

GASEOUS EMISSIONS

The first real emission reduction regulation was introduced in Italy by the Law 615/1966 Act (the so-called anti-smog law); this regulation Act is related to only three types of pollutant sources : power plants, industrial plants and car traffic (other moving sources such as aircraft, ships, self-moving means for road and agricultural works have been neglected).

Italy is also a member of the so-called 30% Club, agreeing to reduce by 1993 the global SO2 emissions by 30% compared to the 1980 emission level. To achieve this goal, it has been decided to convert oil-fired units to coal (in 1985, there were 3200 MW oil-fired units under conversion to coal).

Emission standards for SO2 and NOx

In response to growing concern about acid rain and to the National Energy Plan's requirement for the construction of new coal-fired plants, the national government has issued emission standards for SO2, NOx and particulates emitted by thermoelectric power plants fed by liquid or solid fuels.

The relevant existing legislation in this field is:

- decree 105 of 10.3.1987 concerning limits of gaseous emissions (SO_2, NO_x and particulates) to the atmosphere from existing or new thermoelectric power plants fed by liquid or solid fuels,

- decree of 8.3.1989 concerning gaseous emissions to the atmosphere from big combustion plants, with which the directive 88/609/CEE was introduced in the Italian legislation.

These national emission standards actually apply only to power stations operated by ENEL. In this new legislation, distinction is made between new and existing power plants, the emission standard being less severe for the latter. They imply use of FGD and combustion control techniques for new (existing) plants of 100 MWth (400 MWth) and more.

The Decree n°105 foresees that each operator, dealing with groups of plants that put more than 300 kt of SO2 into the atmosphere during 1980, has to reduce the emissions by 30% to 1990. Practically only ENEL is involved in this limitation.

To cope with the EC regulations, optimisation and flexible use of different fuels is also important i.e. natural gas, coal with less than 1% sulphur and low-sulphur oil.

Fuel quality standards

Limits on the sulphur content of fuels used in combustion processes which already existed prior to this recent regulation remain of application. The sulphur content of coal is limited to 1% by weight, while levels of 3.0% and 0.3% have been set for the heavy fuel oil and the gasoil respectively.

L U X E M B O U R G

Section 7: Environment

The national electricity production is mainly based on hydro-power stations and auto-production. The auto-production uses mainly blast furnace gas (iron and steel industry) and only to a small extent fuel oil and coal. Therefore no need has been seen to create a specific legislation concerning the environmental protection.

THE NETHERLANDS

SECTION 7 - THE ENVIRONMENT

The basic regulation concerning air pollution is the Air Pollution Act adopted in 1972 (Wet inzake de luchtverontreiniging). This sets down the procedure for licensing industrial installations in relation to their impact on air pollution.

1. SO_2 and NO_x control

In 1987, the Dutch Government set strict environmental emission standards for SO2 and NO_x through a general administrative order. These standards apply to both new and existing combustion plants and depend on the fuel. They are summarized hereafter in mg/Nm3.

fuel	power MWth	SO2 new	SO2 existing	NO_x new (1)	NO_x existing
coal	>300	400	400	800/400	1000
	<300	700	0.8% max S.	800/500	-
fuel-oil	>300	400	400	450/300	700
	<300	1700	1700	450/300	700
gas :				350/200	500
refinery gas		35	35		
natural gas		-	-		
blf gas		200	200		
coke gas		800	800		

(1) For new plants, NO_x standards are twofold depending on whether the building licence has been signed before or after the 1st August 1988.

An additional target for reduction of total SO2 emissions from industry and power plants by 70% compared with 1980 levels by 2000 has been set. Since 1989, all existing power plants that will still be operating after 1995 are required to use FGD.

A target for reduction of total NO_x emissions by 45% (industrial and power plant emissions by 15%) from 1980 levels by 2000 has also been set. The existing plants must meet the new emission limits by 1989 unless they are planned to cease operation within specified periods. Coal transported in the Netherlands may not have a sulphur content higher than 1%.

2. Particulates control

Emission limit values for dust will have to be introduced in order to meet the requirements of the Council directive on the limitation of emissions from large combustion plants 88/609/EEC.

PORTUGAL

Section 7. ENVIRONMENT

Air pollution constitutes a significant and growing environmental problem in Portugal. The Government is in the process of establishing emission limits for stationary combustion sources (Air Quality Base Law). The legal framework sectors to be included and the level of standards are still to be approved, although guidelines for air quality limits on SO_2, NO_x and particulates have already been set. The new legislation is designed to be compatible with future EC legislation on emission limits for large combustion plants.

The following table shows the foreseeable Portuguese emission standards for SO_2 and NO_x.

Fuel	Power MWth	SO 2 (mg/Nm3	Power MWth	NOx (mg/Nm3)
Solid fuel	50 - 100 100 - 500 > 500	2000 2000-400 400	< 300 > 300	800 650
Liquid fuel	50 - 300 300 - 500 > 500	1700 1700-400 400	any power	450
gaseous fuel	any power	35	any power	300

Fuel quality standards

There is a limit of 3.5% on the sulphur content of fuel oil that may be burned in the power generation sector and in the industry. Moreover, limits on the sulphur content of coal are set which can however depend on the site of the power plant: at the Sines coal power plant, the maximum sulphur content of coal is 1.5% while a limit of 1.3% sulphur content has been set for the coal to be used in the Pego coal-fired power plant.

SPAIN

SECTION 7 - ENVIRONMENT

A. GASEOUS EMISSIONS

Emission standards are issued at national level, but local authorities may impose more stringent standards or other measures in the so-called "polluted areas". The basis for air pollution control regulation are the law (1972) and the Decree (1975) for the protection of the atmospheric environment.

a. **SO_2 control.** Emission standards for SO_2 and particulates have been specified in the Royal Decree 1613/1985 and do not require emission control technologies. They are given in the following table:

Sector & fuel type	SO_2 (mg/NM3)
hard coal	2.400
brown coal	9.000
fuel-oil	3.000

Spain has been allowed a derogation from 88/609/EEC Directive and may before 2000 authorise a certain number of new power plants with an individual rated thermal power greater than 500 MWth complying with a SO_2 emission standard of 800 mg/Nm^3 in the case of imported solid fuels or achieving a rate of 60% desulphurisation in the case of indigenous solid fuels. The normal criteria that would otherwise apply are 400mg SO_2/Nm^3 or a 90% desulphurisation rate.

For existing large combustion plants, Spain has to draw up according to 88/609/EEC directive a programme with the objective of reducing SO_2 emissions by 0% in 1993, 24% in 1998 and 37% in 2003. No_x emissions should be reduced by 24% by 1998. All reduction targets have 1980 emissions as a reference level.

Fuel quality standards, applicable to all industrial sectors including power generation, were set in 1986 for oil but not for heavy fuel oil.

Royal decree 1933/1975 places restrictions on the sulphur content of coal that may be used in certain zones under well-defined emergency conditions (occurrence of high pollution levels). The tightest limit is 1% sulphur, and this could restrict the use of some Spanish coals in very special circumstances. Coal washing is being encouraged especially for indigenous high sulphur coals (4-7% sulphur content) by a change in the price formula for domestic coal since 1986.

b and c NO_x and particulates control

There are no NO_x or particulates emission standards, other than those that will have to be introduced to comply with the 88/609/EEC directive.

For particulates from power stations with a capacity > 200 MW, Royal Decree 833/1975 established the following levels of emissions:

Type of fuel:	Coal	Fuel-oil
Particulates (mg/Nm^3)	350 (old) 200 (new)	A5 (old) 150 (new)

The are some special levels for installations burning low quality fuel (content of ashes > 20%).

UNITED KINGDOM

SECTION 7 ENVIRONMENT

A. GASEOUS EMISSION

Legislation on air pollution control in the United Kingdom has developed in a fragmentary fashion since the 1950's. The first steps were taken with the Clean Air Acts of 1950 and 1968. These dealt primarily with smoke emissions. Other important pieces of legislation are the Control of Pollution Act (1974) regulating the sulphur content of fuel oil, and the Control of Public Health Acts (1961, 1974)

(a) The United Kingdom has not signed the ECE-Helsinki Protocol on SO2 (the so called 30% CLub), limiting the sulphur dioxide emissions by 1993 at least 30% compared to the 1980. However, over the last years, several decisions have been taken to reduce SO2 emissions from power plants in future. Guidance notes for new large boilers (> 7000 MWth) have been adopted which will require at least 90% SO2 removal. The Central Electricity Generating Board has planned to retrofit some 6000 MW of existing coal-fired plants with flue gas desulphurisation equipment between 1988 and 1997. The Government will also require any future coal-fired power station to be fitted with FGD equipment. New guidelines for smaller boilers are now proposed, requiring SO2 removal from 30-90% depending on size.

(b) NOx -
Concerning NOx emissions, the British Government has endorsed plans of the CEGB to begin a major action programme to install low-NOx burners at the twelve largest power stations between 1988 and 1997. It will also require all future coal-fired power stations to be equipped with low-NOx burners.

(c) Particulates :

(d) CO2