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COAL DEMAND AND SUPPLY IN THE ECE REGION IN 1998 AND PROSPECTS, WITH PARTICULAR ATTENTION TO THERMAL POWER GENERATION

Note by the secretariat

HIGHLIGHTS 1998

- Coal remained the dominant source of electricity, providing 36% of the world's and 33% of the ECE region's electricity. In Europe, natural gas continued to capture the lion's share of new capacities in this market to the detriment of coal for economic and ecological reasons.

- Progress in modernization and installation of clean energy technologies in coal-fired power plants continued in the ECE region in compliance with national legislation and international commitments and to secure a future for coal in the energy market.

- In an effort to make progress in the implementation of the Kyoto Protocol, several countries, notably EU members, have launched cooperative initiatives, including joint implementation and emissions trading for the development, transfer and financing of climate change abatement technologies, including clean coal technologies. A number of east European countries have participated in such projects.

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- As the liberalization of the energy markets is beginning to show its broader effects, warnings are being expressed in international forums whether fierce competition and free choice will be suitable conditions for ensuring that sustainable development remains the priority which it has been declared by the international community.

List of Tables

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I. COAL IN ENERGY POLICY

1. Despite greater emphasis on the market forces, the future energy supply mix will largely be the result of government policies and strategies, like in the past. The principal goals of energy policies of ECE member countries remained security, competitiveness and ecological soundness of energy supply together with sustainable development. Coal can contribute to the attainment of the policy goals if modern technologies are applied in coal production and coal utilization.

2. More and more ECE member countries are deregulating their energy markets. In the European Union (EU), for instance, the electricity and gas directives underlie Government liberalization policies. Candidates for EU membership and other countries in Europe are following this move. The resulting interfuel competition could benefit coal in the longer term where it is a low-cost and ecologically acceptable source of heat and electricity. As the liberalization is leading to company concentration, vertical integration and privatization in the energy sector, coal utilization could become part of this consolidation strategy, especially for independent power producers.

3. In most European coal mining countries, subsidization of the coal industry, in particular of the underground hard coal mining, is applied as an instrument of policy to offset the difference between coal production costs and achievable sales prices, to help the industry meet its social and environmental obligations and to facilitate the restructuring. The plan is to phase out the subsidies as the coal industry is expected to become self-sustaining through restructuring.

4. As the activities in the energy sector have a significant effect on the environment, a major impact on energy policies in the ECE region is coming from international agreements for environmental protection. The UN/ECE Convention on Long-range Transboundary Air Pollution of 1979 and subsequent protocols are among the early instruments of this kind. They accelerated the development and application of clean coal technologies so that the technical means are now available to reduce to a minimum SO_2, NOx and other harmful emissions from fossil fuel combustion and to comply with the regulations. The call for sustainable development in the Brundtland report of 1987 had another strong impact on energy policies. It gave an impetus to increasing energy efficiency and developing renewable sources of energy. Now, Governments need to develop policies for the implementation of the Kyoto Protocol of 1997 under the United Nations Framework Convention on Climate Change (UNFCCC) which requires signatories to reduce greenhouse gas (GHG) emissions as agreed in the Protocol. Relevant policy instruments already applied include eco taxes to induce the energy industry to invest in the use of climate change mitigation,

including clean and efficient coal technologies, and making further progress in CO_2 abatement and avoidance.

5. The share of coal in the future energy mix will depend on how well, rapidly and widely coal producers and coal users are able to demonstrate that they can meet Government policy aims. In recognition of this, the industry sectors concerned have been making great efforts and will continue to strive towards meeting ever stricter economic and ecological requirements. However Governments, too, will have a role to play in supplementing the market mechanisms and in ensuring an orderly transition to sustainable energy development in their countries and on a regional and global level.

II. COAL IN PRIMARY ENERGY AND ELECTRICITY

6. Coal, with a share of 27%, is the second most important source of primary energy after oil in the world. In the ECE region, coal lost this place to gas in 1996. In 1997, coal had a share of 22% in primary energy supply, while that of gas was 29% and that of oil 37%.

7. Coal is the dominant source of electricity, providing 36% of the world's and 33% of the ECE region's electricity. However, the share of coal-based electricity differs widely from less than 5% to more than 95% among the ECE member countries (see Tables 14 and 15).

8. In OECD North America as well as in OECD Europe and non-OECD Europe, electricity production increased in 1997 whereas in the Commonwealth of Independent States (CIS) it decreased again. In Europe, natural gas continued to capture the lion's share of new capacities in this market to the detriment of coal for ecological as well as economic reasons. In OECD Europe as a whole, gas use for electricity generation, including combined heat and power production, increased from 6% to 12% between 1990 and 1997, compared with a decline from 38% to 31% for coal use.

III. COAL CONSUMPTION

9. In 1998, world primary energy consumption declined by 0.1%, the first fall since 1982. World coal consumption declined by 2%, mainly because of weaker demand in China and other Asian countries as an effect of the economic crisis. In Europe, coal demand also decreased.

10. In the ECE region, which accounts for roughly 40% of global coal consumption, about 1.5 bln t of hard coal and 0.7 bln t of brown coal were consumed in 1998. In the region as a whole, coal consumption declined by 50 Mt or 2.3%, all of it accounted for by Europe. Many ECE countries are important coal users. The major hard coal users are the United States of America,

Russian Federation, Poland, Germany and United Kingdom. The main brown coal users are Germany, USA, Russian Federation, Poland, Greece, Turkey and the Czech Republic (see Tables 1,2,3 and 4).

11. Nearly all brown coal was consumed by power plants, except in some countries (e.g. Czech Republic, Russian Federation) where considerable volumes were also used by industries and households. Many east European countries rely heavily on domestic low-grade coals as a source of base-load electricity and heat (e.g. Bulgaria, Czech Republic, Poland, Romania). Hard coal, too, was predominantly used for electricity and heat production by the power plant sector. Demand from the other users, i.e. coking plants, industrial factories and the domestic sector has been declining constantly.

12. In several east and west European countries, power plant demand for coal fell again in 1998 mainly owing to increased use of gas, electricity imports, greater fuel efficiency and ecological restructuring of the energy sector. Total brown coal consumption in the EU declined by about 10 Mt, mainly accounted for by Germany, and in eastern Europe and the CIS it fell by about 25 Mt. Hard coal demand from power plants decreased by about 30 Mt in Europe and the CIS, especially accounted for by Denmark, Finland, France, Poland, Russian Federation, UK and Ukraine. In the USA, power plant intake of coal increased again (see Tables 3,4,5,6,7 and 8).

13. Power plant modernization and installation of clean coal technologies leading to improved plant efficiency and ecological performance continued to progress in the ECE region. This progress is necessary to comply with national legislation and international commitments and to secure a future for coal in the energy market.

IV. COAL PRODUCTION

14. In 1998, world hard coal and brown coal production fell to 3.6 bln t and 0.9 bln t respectively. World hard coal output fell by about 3% mainly owing to a considerable production decline in China, which is the world’s largest coal producer and user.

15. Europe accounted for 50% of world brown coal output. Germany with 170 Mt is the world’s largest brown coal producer and user. Brown coal output declined by about 10 Mt, mainly accounted for by Germany but largely offset by increased output in Turkey.

16. Hard coal production in western Europe declined by some 15 Mt, mainly accounted for by Germany and the UK. Hard coal output in eastern Europe and the CIS declined by about 40 Mt, especially in Poland, Russian Federation and Ukraine, an brown coal output fell by about 25 Mt, especially in the Russian

Federation, Czech Republic and Romania. In Canada, hard coal production, which is mainly coking coal for export, fell slightly. In the USA, coal production rose strongly by 15 Mt in response to increased demand from domestic and Canadian power plants (see Tables 3,4,9 and 10).

17. In contrast to hard coal, which is plagued by high production costs, brown coal mining is no longer receiving subsidies in most ECE countries. Opencast mining and use in nearby power plants, which often own the mines, make brown coal a viable fuel for base load electricity and heat generation.

18. During 1998, restructuring and adjustments to market conditions continued in the European coal industry, resulting in mine closures, job losses and reduced coal output in nearly all European and CIS coal mining countries. Arrears in payments, lack of funds and insufficient institutional and administrative support for technical modernization and social security measures continued to delay progress in economic and ecological restructuring of the coal industry in most east European and CIS countries.

19. The opening of the energy markets, company concentrations and integration of coal and power producers, which are taking place on a rapid scale, are considered beneficial for attracting investments and promoting privatization in the coal and thermal power sectors, which will be needed for a future without subsidies.

20. Comprehensive information about the restructuring of the coal industry and central/eastern Europe and the CIS since 1990 and the effects on output, employment and productivity in the coal mining industry is available from separate studies prepared by the ECE secretariat (ENERGY/1998/15 and 16; ENERGY/1999/6).

V. INTERNATIONAL COAL TRADE

21. The volume of coal traded internationally represents about 10% of global hard coal production. World coal trade continued to grow in 1998 and reached about 520 Mt, which was about 3.5% more than in 1997. Australia supplying 167 Mt remained the top coal exporting country.

22. The ECE region contributed 185 Mt or 35% to world coal exports, with 80 Mt coming from the USA, 34 Mt from Canada and the remainder from Poland, Russian Federation, Kazakhstan and the Czech Republic. While Poland and the Russian Federation exported steam and coking coals to a range of recipient countries in eastern and western Europe, nearly all of Kazakhstan’s coal exports were steam coals traditionally supplied to power plants in the Russian Federation. The Czech Republic exported coal mainly to the neighbouring countries of Austria, Germany, Hungary, Poland and Slovakia, with two thirds

of total exports being coking coals. United States coal exports continued to decline partly because of low prices and greater competition in the international coal market. The coal export volumes of the other ECE countries remained the same as in the previous year (see Tables 11,12 and 13).

23. In 1998, Canada imported 17Mt of USA steam and coking coals for geographic proximity, 3 Mt more than in 1997. The USA imported 8 Mt, 2 Mt more than the year before, mainly from Canada, Colombia and Venezuela also for geographic advantages.

24. Virtually all internationally traded coal is hard coal. However, there is some cross-border brown coal trade, including in Europe, where the major exporters are the Czech Republic and Russian Federation.

25. In 1998, coal imports into western Europe amounted to 170 Mt. Coal import demand in western Europe increased by about 5 Mt or 3% and represented 60% of total hard coal demand in that region. Coal imports into eastern Europe and the CIS amounted to about 50 Mt, the same as in the previous year. This volume does not truly reflect east European and CIS coal import demand since these countries could not always meet their requirements due to lack of finance and other difficulties.

26. World market prices for steam coal fell again, particularly in Europe, in some instances by as much as 15%, accentuated by low maritime freight rates. Coal supplies were amply and readily available on the international market. Therefore, in western Europe the trend to buy coal on a spot basis instead of long-term contracts has been increasing and dependence on coal from the world market is not considered a risk to supply security.

VI. COAL AND THE ENVIRONMENT AND CLIMATE

27. The principle of sustainable development as defined in the 1987 Brundtland report is now widely accepted as the overriding aim for all economic activities. National and international efforts for environmental and climate protection constitute a major component in this context. Nowadays, in virtually all ECE member countries there exist national laws and international commitments which regulate environmental and climate protection according to the required standards and targets. As a result of international agreements such as the UN/ECE Convention on Long-Range Transboundary Air Pollution of 1979 and its subsequent protocols, substantial improvements in environmental performance have been accomplished in many ECE member countries, notably in the energy sector.

29. Through the installation of flue gas desulphurization, NO_x removal and other measures since the 1980s, significant reductions in the emissions of

power plant pollutants have been achieved in western Europe. Land recultivation has been carried out on a planned and systematic scale to repair the damage especially from opencast mining. These improvements have helped in maintaining a market share for coal in electric power and heat generation. In eastern Europe and the CIS the installation of environmental control equipment only started in the past few years and, with the exception of some countries, has been slow due to the economic difficulties. However, the liberalization and globalization in the energy sectors has been stimulating investments and several countries in eastern Europe and the CIS (e.g. Bulgaria, Czech Republic, Kazakhstan, Poland, Russian Federation) are already participating in international IPPs and other joint venture projects aimed at restructuring and modernizing coal production and utilization, including ecological improvements.

30. With expanding application of conventional as well as more advanced clean and efficient energy technologies such as fluidized bed combustion and combined cycle systems, it is possible to minimize harmful pollutants from coal use and to reduce CO_2 emissions. For example, increasing coal combustion efficiency from 20% to 30% reduces CO_2 emissions by 33% and combined heat and power generation offers a CO_2 reduction potential of 50% and more. For coal producers and coal users the technologies are now available to comply with required protection standards, albeit at a cost which not all countries can readily afford.

31. Now that the traditional environmental pollution in the energy sector can be minimized, the greatest challenge for coal use comes from the 1997 Kyoto Protocol in which the industrialized countries committed themselves to quantified reductions of six GHG, including CO_2, in the years 2008-2012 to avert climate change. The EU as a whole, for instance, is committed to a 8% cut in GHG emissions compared with 1990 levels and the USA to 7%. Energy-related GHG emissions are said to represent 80% of the total. An intergovernmental negotiation process is carried out, particularly through the annual Conferences of the Parties to the UNFCCC (COPs), to solve political, financial and other problems related to the implementation of the Protocol. The Buenos Aires Plan of Action emanating from COP-4 in November 1998 established a two-year deadline for this process.

32. Part of the unresolved problems is how to apply the flexible mechanisms, i.e. clean development, joint implementation and emissions trading, which have been introduced into the Protocol to facilitate its implementation. COP-5 is scheduled to be held in November 1999 and COP-6 in 2000 to resolve, among other things, the controversies over the three flexible mechanisms. Although at present only nine countries have formally ratified the Kyoto Protocol, a number of countries, notably EU members, have been taking steps to implement their commitments. In an effort to make progress and to induce industry to

invest in climate change mitigation, several countries are already applying energy-related carbon taxes and carrying out cooperative programmes, including joint implementation and emissions trading for the development, transfer and financing of GHG abatement technologies, including clean coal technologies. A number of east European and CIS countries have already participated in such projects. The energy sector of the central/east European and CIS subregion with its large and urgent needs for technological and ecological modernization presents a formidable source of “credits” for use in cooperative projects under the flexible mechanisms.

33. The transition to sustainable energy development will require huge investments, both public and private, throughout the ECE region and the world. Policy-makers, the business community and international organizations have recognized that they will have to work together to make the best use of the available resources.

VII. OUTLOOK

34. Given the large and widespread reserves, ample supplies from diversified sources and competitive prices, coal will continue to be a major source of energy, especially electricity, in many countries of the ECE region and worldwide for a long time yet . However, coal producers and coal users will be required to fulfil ever increasing obligations of environmental and climate protection and at the same time they will have to remain competitive with other energy supply options.

35. Strong growth in coal demand is forecast for the Asia-Pacific region and continuing increase in the USA driven by strong growth in electricity demand, while in western Europe as a whole, coal use is expected to decrease in the short term mainly because of greater use of gas for power generation and greater energy efficiency in response to economic and ecological pressures. In eastern Europe and the CIS, coal consumption, especially hard coal, will continue to fall as a result of the adaptation of the coal and thermal power industries to market economy conditions. Gas use will continue to expand for ecological reasons. However, according to forecasts up to the year 2020, coal will remain the dominant electricity fuel in most European ECE countries as well as in the USA.

36. World coal production will grow in response to growing demand. Again, Asia and the USA are forecast to be the growth areas. In western Europe, the coal industry restructuring will lead to further reductions in coal production, in particular in the underground hard coal, which is expensive to mine in Europe even with modern technology. In Germany, for example, hard coal production is expected to fall from 45 Mt to 30 Mt in the 1998-2005 period. In

France, where 6 Mt of coal were mined in 1998, coal production is foreseen to end by 2005.

37. In most of the east European and CIS coal producing countries, the economic downturn and inability of the Governments to provide sufficient financial support for the restructuring are expected to continue to hamper progress in the transition of the coal industry to economic viability. Further cutbacks in coal output and employment will be unavoidable. In Poland, for instance, hard coal output is planned to be cut from 137 Mt to 110 Mt in the 1997-2002 period to turn the loss-making coal industry into a profitable economic activity. Privatization is expected to proceed in parallel with restructuring and to support the process.

38. Further growth in international coal trade is forecast mostly in steam coal and the total could reach 530 Mt in 1999. Steam coal prices might continue to ease as competition in supply is expected to remain strong. Coal imports into western Europe are forecast to decline in 1999 on account of weaker demand from power plants and coal imports into eastern Europe are likely to remain constrained on financial grounds.

39. Ever more stringent environmental and climate protection requirements will lead to increasingly strict regulations. The implementation of energy-related eco taxes in a growing number of countries and the proposed amendment of the EU directive for large power plants (50 MW and more) are among the signs of increasing ecological stringency.

40. In response, technological research and development resulting in further energy efficiency gains and constant ecological improvements along the coal to energy chain will continue, since clean and efficient energy technologies offer the best safeguard for maintaining coal’s position as a secure, competitive and ecologically sound energy source for future generations.

41. As the liberalization of the energy markets is beginning to show its broader effects, warnings are being expressed in international forums whether fierce competition and free choice will be suitable conditions for ensuring that sustainable development remains the priority which it has been declared by the international community.

Table 1: Hard Coal Consumption Western Europe and North America (Mt)

Main countries	Actual 1997	Provisional 1998	Forecast 1999
Belgium	12	11	11
Denmark	14	11	9
Finland	7	4	5
France	22	15	14
Germany	69	72	71
Italy	17	16	16
Netherlands	14	14	14
Portugal	6	5	5
Spain	28	30	31
United Kingdom	69	63	53
European Union	268	252	247
Israel	9	9	9
Turkey	12	12	12
Western Europe	289	273	268
Canada	20	20	20
USA	840	870	890
North America	860	890	910

Source: UN/ECE and European Commission

Table 2: Hard Coal Consumption Central/Eastern Europe and CIS (Mt)

Main Countries	Actual 1997	Provisional 1998	Estimates and Forecast 1999
Czech Republic	12	11	11
Poland	110	92	96
Romania	9	8	7
Kazakhstan	45	45	46
Russian Federation	153	148	140
Slovakia	5	4	4
Ukraine	75	63	64
Total Central/East EUR/CIS	409	371	369

Source: UN/ECE

Table 3: Brown Coal production/consumption
Western Europe and North America */ (Mt)

Main Countries	Actual 1997	Provisional 1998	Forecast 1999
Austria	1	1	1
France	1	1	1
Germany	177	169	169
Greece	60	58	65
Spain	9	9	9
European Union	250	239	246
Slovenia	5	5	5
The former Yugoslav Republic of Macedonia	7	7	7
Turkey	57	65	65
Western Europe	319	316	323
Canada	37	37	37
USA	80	80	80
North America	117	117	117

*/ 90% and more for use in thermal power plants
Source : UN/ECE and European Commission

Table 4: Brown Coal production/Consumption
Central/Eastern Europe and CIS (Mt)

Main countries	Actual 1997	Provisional 1998	Estimates and Forecast 1999
Bulgaria	30	30	26
Czech Republic	58	51	47
Hungary	14	14	14
Kazakhstan	2	2	2
Poland	63	63	63
Romania	29	23	22
Russian Federation	89	77	83
Slovakia	4	5	6
Ukraine	1	1	1
Uzbekistan	3	3	3
Total Central/East.EUR/CIS	293	269	267

Source: UN/ECE

Table 5: Comparison of the main features of the Solid Fuel Market - EUR 15 (Mt)

	1997 Provisional	1998 Forecast	1997/96 (%)**	1998/97 (%)**
HARD COAL				
Resources				
- Production and Imports	271	253	+0.1	-6.7
Deliveries				
- To coking plants	53	51	-1.7	-3.5
- To power stations*	183	162	-1.3	-11.5
% of total deliveries	68%	66%	—	—
- To others	32	30	-0.1	-5.4
- Exports to 3rd countries	0.5	0.5	+41.6	+9.4
Total	269	244	-1.1	-9.2
LIGNITE				
Resources				
- Production and imports	250	244	-4.4	-2.2
Deliveries				
- To briquetting plants	23	19	-16.0	-19.5
- To power stations	223	223	-2.6	-0.1
% of total deliveries	90%	91%	—	—
- Others (inc. Exports to 3rd countries)	3	3	-20.3	-13.5
Total	249	244	-4.3	-2.1

(!) The sums may not add up due to rounding
(*) Including industrial and pithead power stations
(**) The variations are calculated in kt.

Source: European Commission

Table 6: Deliveries of hard coal to power plants
Western Europe and North America (Mt)

Main Countries	Actual 1997	% of total hard coal consumption	Provisional 1998	Forecast 1999
Belgium	5	40	5	5
Denmark	13	95	10	9
Germany	45	65	43	43
Spain	24	85	24	26
France	4	20	1	0.5
Greece	-	-	-	-
Ireland	2	65	2	2
Italy	8	50	7	7
Luxembourg	-	-	-	-
Netherlands	9	65	9	9
Austria	1	30	1	1
Portugal	5	85	4	4
Finland	5	70	3	3
Sweden	1	30	1	1
United Kingdom	50	75	47	38
European Union	**173**	**65**	**157**	**148**
Israel	9	100	9	9
Turkey	2	15	2	2
Canada	14	70	14	14
USA	770	90	790	800

Source: European Commission; UN/ECE

Table 7: Deliveries of hard coal to power plants
Central/Eastern Europe and CIS (Mt)

Main Countries	Actual 1997	% of total hard coal consumption	Provisional 1998	Estimates & Forecast 1999
Czech Republic	2	20	2	2
Hungary	1	80	1	1
Poland	55	50	50	50
Romania	4	45	3	3
Kazakhstan	40	80	34	33
Russian Federation	96	60	100	100
Ukraine	30	40	30	30
Central/Eastern Europe/CIS	233	57	220	219

Source: UN/ECE

Table 8: Deliveries of brown coal to power plants
Central/Eastern Europe and CIS (Mt)

Main Countries	Actual 1997	% of total brown coal consumption	Provisional 1998	Estimates & Forecast 1999
Bulgaria	27	90	27	24
Czech Republic	31	60	31	31
Hungary	14	95	14	14
Poland	63	98	63	63
Romania	28	95	22	22
Kazakhstan	-	-	-	-
Russian Federation	45	55	50	54
Slovakia	3	60	3	3
Ukraine	0.5	50	0.5	0.5
Central/Eastern Europe/CIS	211.5	72	210.5	211.5

Source: UN/ECE

Table 9: Hard coal production Western Europe and North America (Mt)

Main Countries	Actual 1997	Provisional 1998	Forecast 1999
France	6	5	4
Germany	52	45	46
Spain	17	18	17
United Kingdom	48	39	33
European Union	123	107	100
Turkey	2	2	3
Western Europe	125	109	103
Canada	40	38	38
USA	910	925	930
North America	950	963	968

Source : UN/ECE and European Commission

Table 10: Hard Coal production Central/Eastern Europe and CIS (Mt)

Main Countries	Actual 1997	Provisional 1998	Forecast 1999
Czech Republic	16	16	15
Hungary	1	1	1
Poland	137	116	115
Romania	4	3	3
Kazakhstan	70	68	66
Russian Federation	150	148	140
Ukraine	70	57	57
Total Central/East.EUR/CIS	448	409	397

Source: UN/ECE

Table 11: Hard coal exports UN/ECE countries - Major coal exporting countries (Mt)

Main Countries	Actual 1997	Provisional 1998	Forecast 1999
Canada	36	34	34
USA	75	70	60
North America	111	104	94
Czech Republic	6	7	5
Kazakhstan	25	24	20
Poland	29	28	23
Russian Federation	22	22	22
Central/East.EUR/CIS	82	81	70
Total UN/ECE Region	193	185	164

Source: UN/ECE

Table 12: Hard coal imports Western Europe - Major coal importing countries (Mt)

Main Countries	Actual 1997	Steam coal %	Provisional 1998	Forecast 1999
Belgium	12	33	12	11
Denmark	13	100	10	9
France	14	20	18	14
Germany	18	70	23	24
Italy	16	40	16	16
Netherlands	17	80	20	20
Spain	9	70	14	14
United Kingdom	22	40	20	17
*** European Union**	147	55	152	146
Israel	9	100	9	9
Turkey	9	30	9	10

*/ includes about 2Mt intra-EU imports
Source : European Commission and UN/ECE

Table 13: Hard Coal imports Central/Eastern Europe and CIS - Major coal importing countries (Mt)

Main Countries	Actual 1997	Steam coal %	Provisional 1998	Estimates & Forecast 1998
Bulgaria	1	100	1	1
Czech Republic	2	90	2	1
Republic of Moldova	2	n.a.	2	2
Poland	2	60	4	4
Romania	5	90	4	4
Russian Federation*/	25	95	22	22
Slovakia	5	50	4	4
Ukraine	10	50	8	10
Total Central/East.EUR/CIS	52	n.a.	47	48

*/ all from Kazakhstan
Source: UN/ECE and IEA/OECD

Table 14: Fuel shares in electricity production, 1996 (%)

	Coal	Gas	Oil	Nuclear	Hydro
OECD EUROPE	33	10	7	31	16
EU 15	30	12	8	35	12
Canada	16	3	1.6	16	62
USA	53	13	2.5	20	10
Non-OECD EUROPE	38	12	8	17	25
CIS	n.a.	n.a.	n.a.	n.a.	n.a.
Russian Federation	20	40	9	13	18
Ukraine	30	18	3	44	5

Source: IEA/OECD

Table 15: Gross electricity production 1996 and coal share UN/ECE Selected Countries

	TWh	Coal share %
OECD Europe	2890	33
EU-15	2390	30
Non-OECD Europe	240	38
CIS	1230	25
UN/ECE	**8600**	**33**
Canada	570	16
United States of America	3650	53
Austria	53	10
Denmark	54	74
France	508	6
Germany	550	55
Greece	42	70
Italy	239	10
Netherlands	85	32
Spain	173	32
United Kingdom	346	42
Belarus	24	0
Bulgaria	40	43
Czech Republic	64	73
Hungary	35	28
Poland	141	97
Republic of Moldova	6	22
Romania	61	33
Russian Federation	846	20
Kazakhstan	58	72
Slovakia	25	23
Slovenia	13	33
Turkey	95	32
The former Yugoslav Republic of Macedonia	6	86
Ukraine	182	30
Uzbekistan	45	4
WORLD	**13650**	**36**

Source: IEA/OECD