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ELECTRICITY FOR EUROPE

Power Statistics & Trends 2012

FULL REPORT

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ELECTRICITY FOR EUROPE

The **Union of the Electricity Industry – EURELECTRIC** is the sector association representing the common interests of the electricity industry at pan-European level, plus its affiliates and associates on several other continents.

In line with its mission, EURELECTRIC seeks to contribute to the competitiveness of the electricity industry, to provide effective representation for the industry in public affairs, and to promote the role of electricity both in the advancement of society and in helping provide solutions to the challenges of sustainable development.

EURELECTRIC's formal opinions, policy positions and reports are formulated in Working Groups, composed of experts from the electricity industry, supervised by five Committees. This "structure of expertise" ensures that EURELECTRIC's published documents are based on high-quality input with up-to-date information.

For further information on EURELECTRIC activities, visit our website, which provides general information on the association and on policy issues relevant to the electricity industry; latest news of our activities; EURELECTRIC positions and statements; a publications catalogue listing EURELECTRIC reports; and information on our events and conferences.

EURELECTRIC pursues in all its activities the application of the following sustainable development values:

Economic Development
- Growth, added-value, efficiency

Environmental Leadership
- Commitment, innovation, pro-activeness

Social Responsibility
- Transparency, ethics, accountability

December 2012

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Synopsis

Key Messages 2011-2012

1 Electricity demand on the rollercoaster

After a decade of growth and a partial recovery in 2010 after the economic crisis of 2009, electricity demand fell again in 2011 as the European economy struggled with the prolonged sovereign debt crisis (*Figure 1* and *Table 1*). Amid these changing macro-economic conditions, but also in light of the on-going transition of the energy system at large forecasting electricity demand up to 2020 is proving extremely difficult and, sometimes, erratic. As a consequence, demand forecasts have been revised downwards compared to last year's edition.

2 Low-carbon capacity remains on the rise

The EU's renewables capacity increased yet again in 2011, reaching 34% of total installed capacity (*Figure 7*). About 25 GW – including hydro – were connected to the European electricity grids in both 2010 and 2011. In the context of a shrinking demand, it would appear that these new renewable capacities have been set up as the result of subsidies rather than demand incentives. While the attention of the general public focused on the effects of Fukushima and the subsequent German decision to phase out nuclear power, nuclear capacity in all other member states actually grew by almost 1 GW between 2010 and 2011.

3 Renewables output continues to grow but unfavourable weather reduces hydropower output

Electricity generated from hydropower decreased by 57 TWh or 17% in 2011 compared to 2010 (*Figure 8*). The substantial decrease was driven by adverse hydrological conditions, particularly in southern Europe. However, the drop in hydropower was partially compensated by other renewable plants (+47 TWh or +16%).

4 More than half of power generation will be low-carbon by 2020

Renewables progressively move to the centre of electricity systems and both capacity and generation are expected to be substantially higher in 2020 than today (*Figures 7* and *8*). By 2020 45% of all power plants will be renewable-based, generating some 31% of Europe's electricity. Low-carbon electricity from nuclear and renewables will account for 56% of all electricity generated.

5 Increased variability calls for a holistic, a system approach

The importance of variable renewables like wind and solar (*Tables 2* and *3*) is making a holistic approach to managing the power system increasingly urgent. A portfolio of options is available to back up renewables, from interconnections between power systems – as exemplified by the Nordic region in *Figures 10* and *11* – to (large-scale hydro and pumped) storage, flexible generation and demand-side participation.

What is *Power Statistics*?

The 2012 edition of EURELECTRIC's *Power Statistics* gathers the latest available data from the electricity sector, including forecasts up to 2030.

The data cover the years 1980, 1990, 2000, 2009, 2010, as well as forecasts for 2020 and 2030. The report also includes preliminary data for 2011, which were first published in a leaflet at the occasion of the EURELECTRIC Annual Convention in Malta in June 2012.

The data are provided by EURELECTRIC members from all 27 EU member states, as well as from Switzerland, Norway and Turkey. As from 2011, we also gather data from Energy Community members. We are pleased to present data for Croatia, Bosnia-Herzegovina, Serbia and Ukraine, and intend to include the other states of the region in the next years.

The data cover:

- the structure of the electricity industry;
- trends in general economic indicators;
- peak demand and load management;
- medium and long-term generating prospects;
- sectorial electricity consumption;
- electricity balances;
- fuel consumption in and emissions from the electricity sector.

This synopsis of the full *Power Statistics* report provides an overview of key messages and data. They are primarily based on EURELECTRIC's own statistics, as supplied by EURELECTRIC's Group of Experts on Statistics & Prospects. These statistics reflect the national situation and prospects as perceived by each country. In particular, the forecasts are not necessarily official national forecasts (by governments, electricity associations or transmission system operators), but may be considered as 'best engineering estimates' of the group members, based on an annually updated picture of the respective national planning and forecast situation.

In addition, the report refers to other relevant publications where necessary to identify the main power sector trends for the reporting period. Wherever we use such information, the source is clearly indicated.

Finally, and further to last year's successful experience, this year's edition of *Power Statistics* once again includes a special contribution from EURELECTRIC's partner VGB PowerTech on the availability/unavailability of power plants. We are also pleased to integrate a full section on the Energy Community countries from the Western Balkans, members of EURELECTRIC.

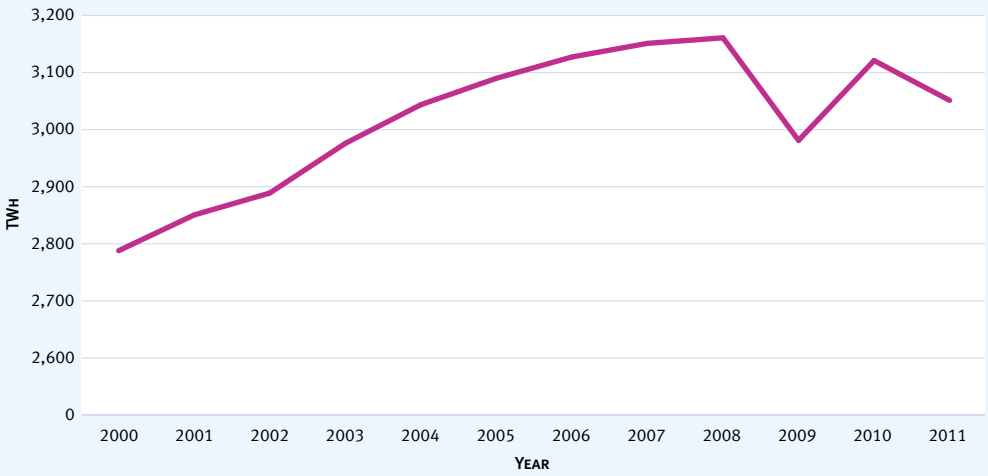
1 The energy transition in times of recession

Where does the European electricity sector stand? What are today's major debates in an overall environment of recession that is putting huge pressure on the promised low-carbon transition towards 2050?

The **continuing economic downturn is placing manifold constraints on the power sector**: uncertain medium- and long-term perspectives, a drop in electricity demand, deteriorating borrowing conditions on the capital markets, volatile regulation, and sudden or retroactive changes to regulatory frameworks and tax regimes are only some of the consequences.[1] The vicious downwards spiral of 'recession' → 'demand drop' → 'lack of investment' is affecting many generation technologies, extending from conventional technologies to even some renewables. According to Bloomberg New Energy Finance, investment in clean energy – renewables but also other technologies like smart grids – was down in 2012 for the first time in eight years, adding to existing doubts about the future growth of such investments.[2]

After the shock triggered by the financial crisis of 2008, the EU economy had recovered somewhat in 2010. However, the prolonged sovereign debt crisis continues to haunt the European capitals, sparking fears of a double-dip recession.

Figure 1: Electricity demand (including network losses) in the EU 27, 2000-2011



Source: EURELECTRIC, Power Statistics (various editions)

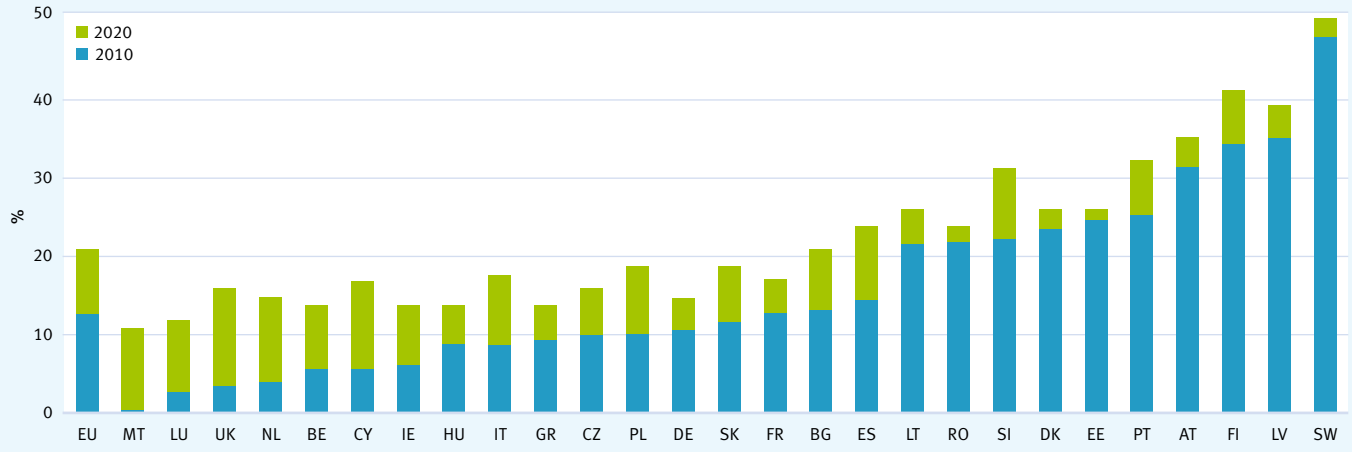
[1] EURELECTRIC, Powering Investments: Challenges for the Liberalised Electricity Sector – Findings and Recommendations, December 2012.

[2] Bloomberg New Energy Finance: World clean energy investment heading for a drop in 2012, after mediocre Q 3, BNEF 2012. The global decline as quoted by Bloomberg is 20%.

Electricity demand has mirrored GDP patterns: after recovering in 2010 it has shrunk again in 2011, although not hitting the low of 2009 (*Figure 1*). While it is true that 2010 was a fairly cold year compared to the milder winter of 2011, preliminary information from the statistical offices of different EU countries suggests a further decrease in demand for 2012 – so the weather might be an element, but the crisis appears to be the main reason for the observed demand drop.

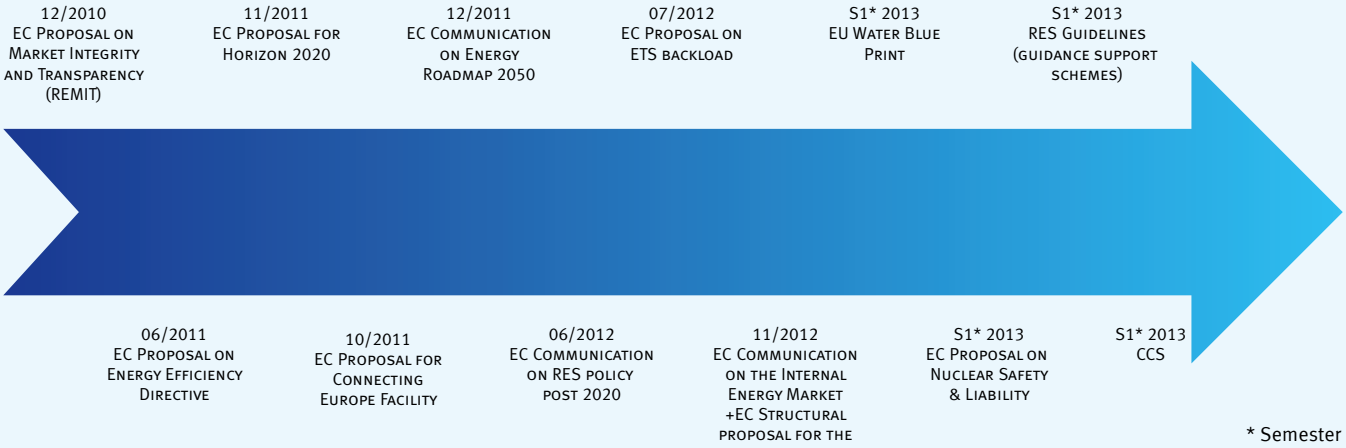
Despite the reduction in electricity demand **RES deployment has continued in 2011**. This is a result of various national support schemes – in particular for solar photovoltaic and wind onshore – but also of constant technological improvement, decreasing prices (in the case of photovoltaic also due to a supply glut) and greater supplier competition, which have all led to successful cost reductions. According to the European Commission, the EU is on track to meet its 2020 renewables target (*Figure 2*). But in 2012 some parties also voiced doubts: the crisis could oblige member states to downsize their renewables policies and thus jeopardise the implementation of the National Renewable Energy Action Plans.

Figure 2: Comparison between EU member states' 2020 renewable target and interim 2010 targets



Source: European Commission

Figure 3: Evolution of European policies in the field of energy 2011-2013



Source: EURELECTRIC 2012

Policy trends

What is on the EU's regulatory and legislative agenda in the reported period? *Figure 3* shows the main legislation on energy for the period 2011-2013.

As a forward-looking exercise and part of a set of three EU roadmaps (on climate, transport and energy), the European Commission's DG Energy presented the **Energy Roadmap 2050** in late 2011. Although its general approach was welcomed by industry, there was a general impression that the roadmap focused predominantly on targets rather than frameworks.

2012 was marked by the release of **two Communications** by the Commission: on **renewables development after 2020** and on the **Internal Energy Market**, to be completed by 2014 according to the European Council. Entering the final stretch of its mandate running until 2014, the current Commission is still considering whether to push for a new policy initiative for the post-2020 period, similar to the 2009 energy and climate package that set the 20-20-20 objectives. Conflicts over the next long-term EU budget, the Multiannual Financial Framework 2014-2020, also touch upon energy: the proposed Connecting Europe Facility would make available €9.1 billion for the completion and improvement of European energy infrastructure, while the so-called Horizon 2020 programme would focus research and development. Meanwhile the question how to empower **the EU Emissions Trading Scheme** (ETS) to deliver low-carbon investment has triggered a proposal from DG Climate Action to 'backload' allowances from the first years of trading phase 3 to the last three years, i.e. 2017-2020.

Energy efficiency remains high on the list of priorities for the EU and its member states going forward. The Energy Efficiency Directive (EED), which details the measures needed to hit the EU's 20% energy efficiency target for 2020, was formally adopted in October 2012. It is still too early to judge the Directive's real contribution, which will strongly depend on how member states transpose and implement it. As a matter of fact, governments have a certain degree of flexibility and could opt for different pathways to reach the agreed targets.

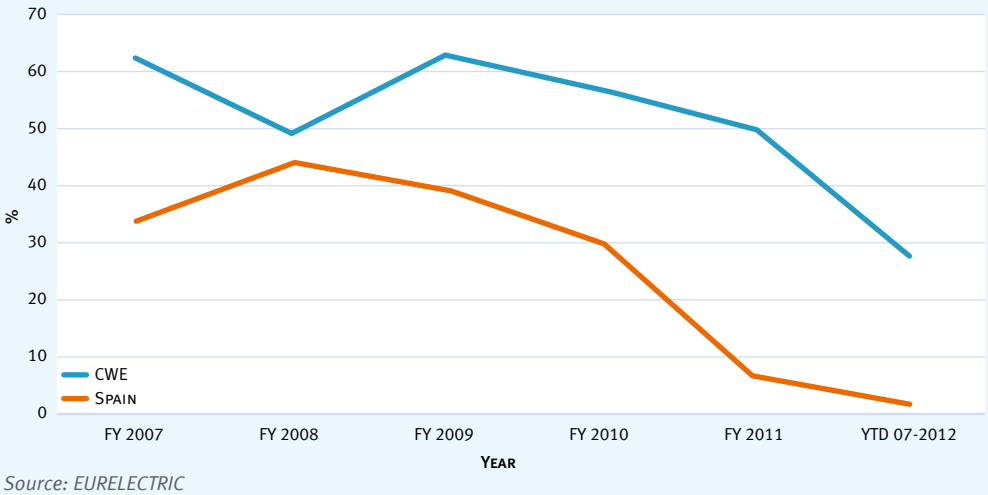
Market design has been one of the buzzwords of the year. Conventional power plants have been running far less than planned – with the extreme case of CCGTs running between zero and 2,000 hours yearly (*Figure 4*). Reasons include *inter alia* the increase of wind and solar photovoltaic and the fact that the latter cuts across peak hours when CCGTs were meant to run, decreasing demand as explained above, and substitution effects between coal and gas depending on commodity and emission allowance prices.

According to UBS Investment Research 22 GW of old thermal capacity in Central Europe is loss-making.[3] The logical response would be to phase out these plants at the next maintenance session. But regulators, TSOs, generators and policymakers agree that they might be needed for balancing and system stability purposes for at least the next two decades, forcing them to nevertheless remain operational.

Multiple questions arise when assessing current market frameworks and mechanisms: how can economically non-viable plants remain in the system to guarantee generation adequacy and system stability? How can this be achieved with the least distortive impact on the market? To date, EU member states present a very fragmented picture (*Figure 5*). It is thus crucial that strategic reserves or other mechanisms, if introduced, at least fulfil some common European criteria that make them compatible with other EU member states and do not undermine the creation of the Internal Energy Market.

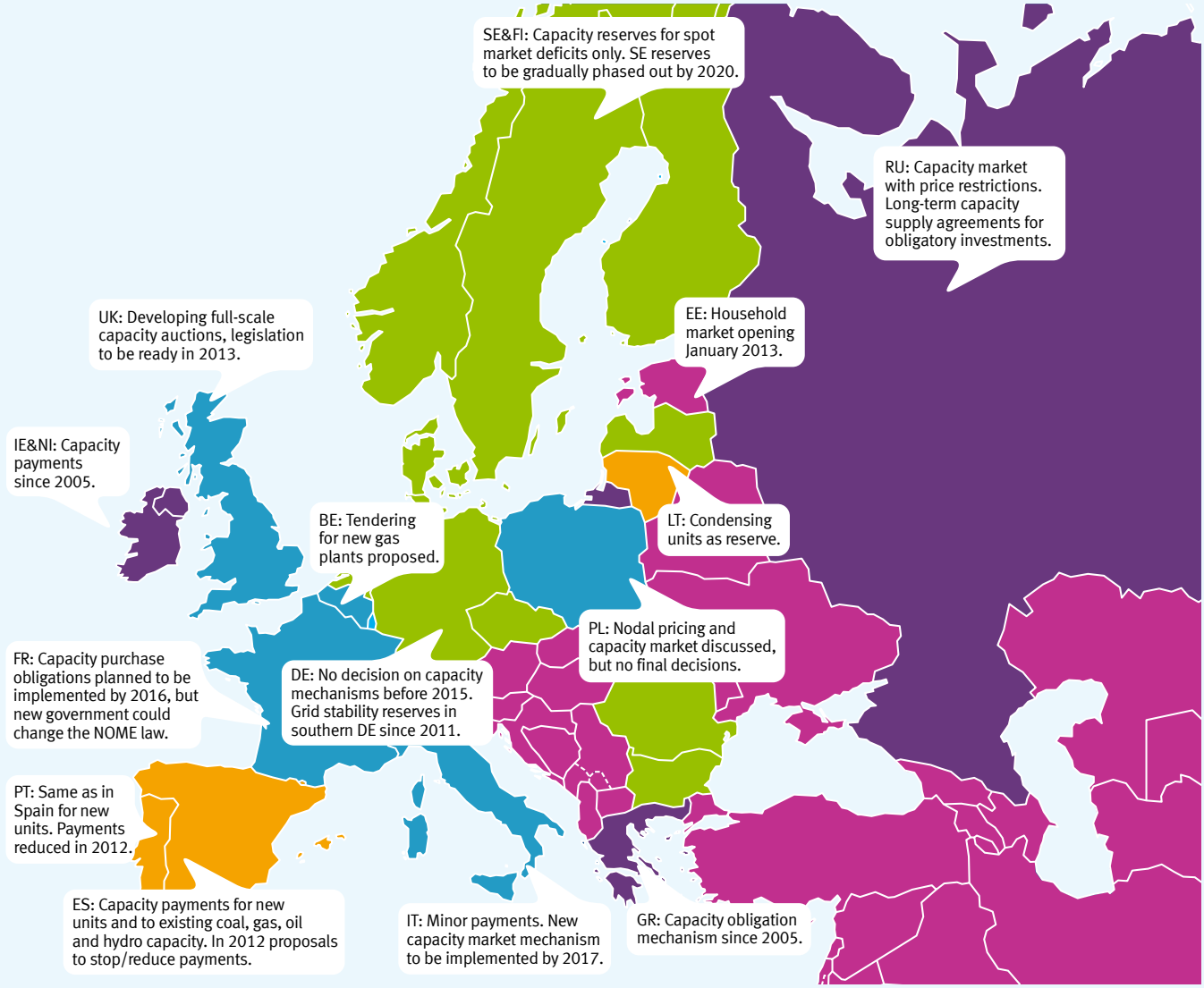
[3] Hummel, Patrick, Intervention to keep prices lower for longer. UBS Investment Research European Utilities. 5.9.2012:3.

Figure 4: Running hours of CCGTs in Spain and Central-Western Europe



Source: EURELECTRIC

Figure 5: Huge variety of market designs across EU member states



* No capacity payments to power plants in the day-ahead and intraday markets, but balancing market reserve capacity is contracted in advance.

Source: EURELECTRIC

2 Demand trends

Table 1 shows the evolution of electricity demand for 2009-2011 and 2020 per member state.

Table 1: Evolution of electricity demand and year-on-year changes in the EU-27 (TWh)

Country	2009	2010	2011	2020	Year-On-Year 2010/2009	Year-On-Year 2011/2010	Annual Growth Rate 2020/2010
Austria	64.0	65.0	66.8	72.8	1.6%	2.8%	1,2%
Belgium	83.6	90.4	86.0	94.3	8.1%	-4.9%	0,4%
Bulgaria	30.4	32.5	31.3	52.7	6.9%	-3.7%	6,2%
Cyprus	4.7	4.8	5.0	6.4	2.8%	4.6%	3,4%
Czech Republic	61.6	63.7	65.2	77.5	3.4%	2.4%	2,2%
Germany	534.8	565.0	565.8	507.0	5.6%	0.1%	-1,0%
Denmark	34.0	34.7	34.7	38.2	2.1%	0.0%	1,0%
Estonia	8.7	8.3	7.8	10.1	-4.9%	-5.8%	2,2%
Spain	274.0	278.0	273.1	340.0	1.5%	-1.8%	2,2%
Finland	81.3	87.7	84.4	99.0	7.9%	-3.8%	1,3%
France	486.7	513.2	478.2	523.1	5.4%	-6.8%	0,2%
United Kingdom	347.0	354.0	342.3	346.0	2.0%	-3.3%	-0,2%
Greece	58.9	59.2	58.6	63.9	0.5%	-1.0%	0,8%
Hungary	38.9	39.8	40.2	47.0	2.3%	1.0%	1,8%
Ireland	25.1	25.4	26.8	31.4	1.2%	5.5%	2,4%
Italy	320.3	330.5	332.3	370.0	3.2%	0.5%	1,2%
Lithuania	10.2	10.3	10.4	13.3	1.0%	1.0%	2,9%
Luxembourg	6.2	6.7	6.6	7.2	7.9%	-1.3%	0,8%
Latvia	7.0	7.3	7.2	8.9	4.3%	-1.4%	2,2%
Malta	2.0	2.0	2.2	2.4	-2.7%	9.1%	2,1%
Netherlands	114.1	117.1	118.1	131.7	2.6%	0.9%	1,2%
Poland	135.9	141.6	145.8	171.8	4.2%	3.0%	2,1%
Portugal	52.6	55.0	53.1	52.0	4.6%	-3.5%	-0,5%
Romania	55.2	50.6	52.3	64.2	-8.3%	3.3%	2,7%
Sweden	137.9	147.0	139.2	146.4	6.6%	-5.3%	-0,04%
Slovenia	12.3	16.1	12.6	14.9	30.9%	-21.7%	-0,7%
Slovakia	25.4	26.6	26.8	35.2	4.7%	0.8%	3,2%
	3,012.8	**3,132.5**	**3,072.8**	**3,327.4**	**4.0%**	**-1.9%**	**0,6%**

Source: EURELECTRIC, Power Statistics (various editions). Data source for 2020 for Italy and Malta is GlobalData's Power E-Track

Electricity demand is forecast to grow throughout the entire observation period in Europe, albeit not in all countries and at lower rates compared to previous estimates. Overall demand in the EU is assumed to grow by 0.6% p.a. until 2020, reaching 3,327 TWh from 3,132 TWh in 2010. It is interesting to note, however, that this year's forecast is considerably lower than the forecast we made in our 2011 edition, where demand in 2020 stood at 3,467 TWh. This shifting of expectations can be explained *inter alia* by the worsening of the economic crisis in 2011 or by the increased role of energy efficiency policies being developed throughout Europe.

Demand is not expected to rise equally everywhere in Europe. Growth will be particularly sustained in Bulgaria, where electricity demand will increase by 6.2% p.a., and in several other countries, including Cyprus (+3.4% p.a.), Slovakia (+3.2% p.a.), Lithuania (+2.9% p.a.) and Romania (+2.7% p.a.). It will achieve double-digit numbers in the majority of member states, whereas it will proceed more slowly in Luxembourg (+0.8% p.a.), Denmark (+1% p.a.), Belgium (+0.4% p.a.) and France (+0.2% p.a.).

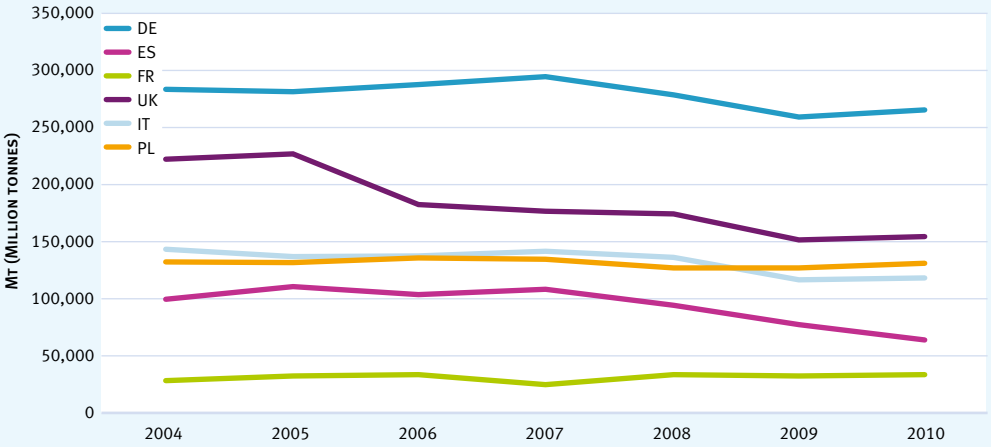
Yet there are exceptions to this trend of growing electricity demand. The most remarkable is without doubt Germany, where in line with the requirements of the *'Energiewende'* (energy transition), total electricity demand is set to decrease by about 1% p.a., from 565 TWh in 2010 to 507 TWh in 2020. Indeed, the trend is set to continue until 2030, when demand is expected to stand at 474 TWh. Other countries with a decreasing electricity demand include Slovenia (-0.7% p.a. until 2020 compared to 2010), Portugal (-0.5% p.a.), and Great Britain (-0.2% p.a.). Growth will be almost nil in Sweden (-0.04% p.a.).

3 Sustainability

The challenge of reducing SO_2 and NO_x emissions has been taken up successfully by the industry during the 1990s and the first decade of the 21st century, with emission reductions of 62% between 1990 and 2007 for SO_2 and 39% for NO_x, despite an increase of electricity generation and heat by 32% in the same period.[4] The deployment of abatement techniques and the switch from coal- and oil-fired generation to gas-fired generation are the main factors behind this trend.

Today, the European emissions concerns have largely shifted from SO_2 and NOx to CO_2, although the necessity of reducing NO_x and SO_2 emissions will continue to prompt the closure of fossil-fired power plants until 2023. The electricity and heating sectors are responsible for nearly 30% of all greenhouse gas emissions in Europe, with CO_2 predominant. But although electricity generation increased by roughly one third, the corresponding increase of CO_2 has been less than 1%. Thus there is a clear decoupling between demand increase and emissions. Due to some missing data, we could not present in this report aggregated EU-27 CO_2 emissions from electricity generation. We thus selected a sample of EU countries (DE, ES, FR, IT, PL, UK), rather representative in terms of variety of energy mixes and generation sizes existing in Europe. Data refer to the period 2004-2010. We observe here the following overall picture: 2004-2007 is characterised by a stabilisation of the level of CO_2 emissions, whereas the period 2007-2010 shows a clear trend of CO_2 reduction despite increased generation (*Figure 6* & *Table 2*). This trend has also been confirmed by the European Environment Agency and is representative for EU at large.

Figure 6: Electricity-related CO_2 emissions for some specific EU countries between 2004 and 2010 (in Mt)



Source: EURELECTRIC, Power Statistics (various editions)

[4] Source: European Environment Agency 2012:www.eea.euroa.eu/data-and-maps/indicators/emissions-co2-so2-nox-from-1/assessment.

4 Trends by technology

In line with the EU's 20-20-20 targets, renewables are being deployed on a massive scale across the EU, as shown in the figures below. Renewable installations grew steadily between 2009 and 2011, with an average of 25 GW – including hydro – being added each year. As a result, renewable energies account for 34% of the total installed capacity at the end of 2011, up from 31% in 2009 and 33% in 2010.

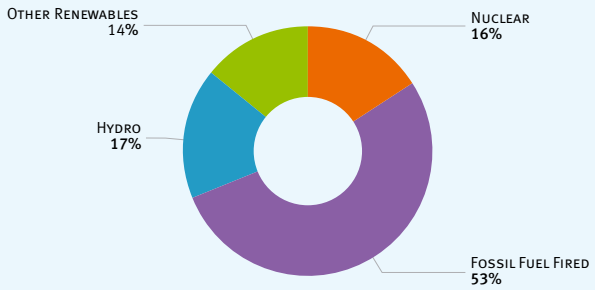
The installed capacity of nuclear power plants changed in 2011 primarily because of the immediate closure of 8.4 GW of German nuclear capacity following the Fukushima accident in March 2011, which prompted the government to pass a phase-out bill that will see the country abandoning nuclear energy by 2022. In all other member states using nuclear power except France and the United Kingdom, the installed capacity actually grew slightly (0.8 GW) between 2010 and 2011, mainly due to repowering. Nuclear power plants now account for 14% of the total installed capacity in the EU.

Although a total of 1 GW of new fossil-fired power plants went on-stream in 2011, their share of the total installed capacity – about 52% – did not change because of the simultaneous addition of new renewables capacity.

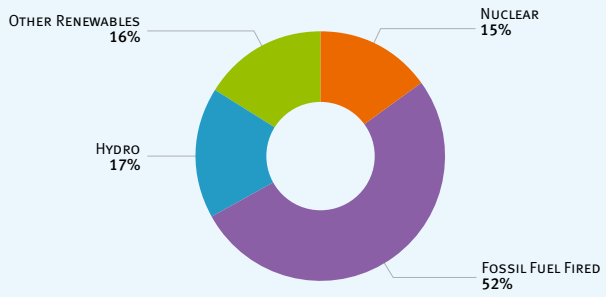
Looking ahead towards the end of the decade, renewables are set to overtake fossil fuel as largest generation technologies, reaching 44% of total installed capacity. Together with nuclear, hydro and other renewables will provide a low-carbon power plant base of 56% of installed capacity by 2020.

Figure 7: Evolution of installed capacity in the EU-27

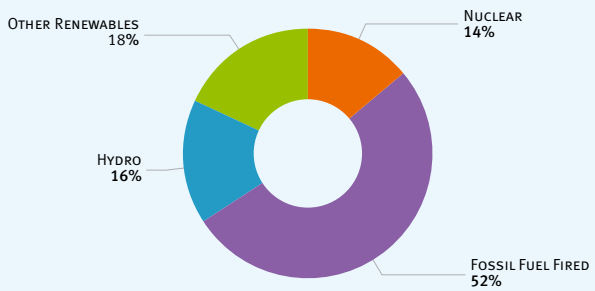
Installed Capacity EU-27 – 2009



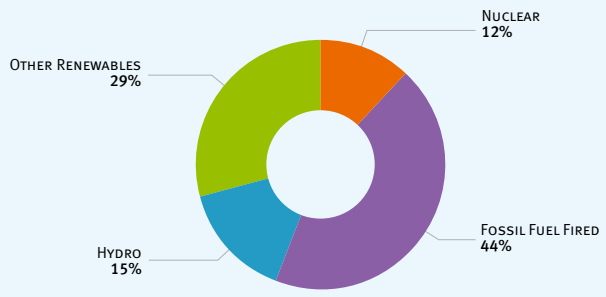
Installed Capacity EU-27 – 2010



Installed Capacity EU-27 – 2011



Installed Capacity EU-27 – 2020



Source: EURELECTRIC, Power Statistics 2012

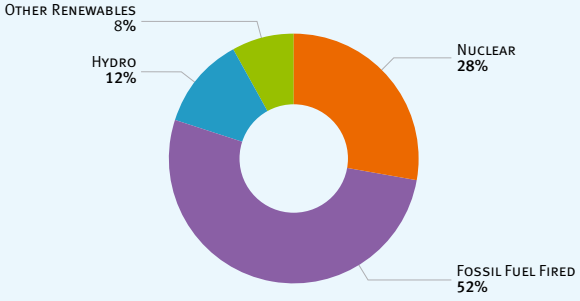
However, this continued trend towards greater renewable penetration is not as straightforward if one looks at actual electricity generation rather than capacity alone. In 2011 renewable electricity (including hydro) represented 22% of total electricity generation – the same as in 2010 although up two points compared to 2009. This is primarily due to the decreasing hydropower generation in 2011, from 390 TWh to 332 TWh (-17%), resulting from unfavourable weather conditions across Europe. Notable national cases of decreased hydro generation include Spain (12.3 TWh less, or -27%), Portugal (4.4 TWh less, or -27%) and Italy (6.7 TWh less, or-12%); these three cases alone account for a third of the reduction (23.4 TWh). The drop in hydro was partially compensated by increased generation from other renewable sources, which now accounts for 11% of total generation (compared to 8% in 2009 and 10% in 2010).

Nuclear generation was down by 1.8% in 2011 compared to 2010. However, due to the reduction in overall generation and the poorer performance of renewables, the share of nuclear in the overall generation mix remained stable year-on-year. Similarly, fossil-fired generation was down by 50 TWh (-3% year-on-year) but its overall contribution to total generation remained stable year-on-year.

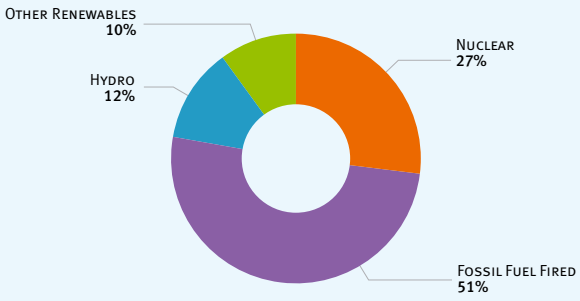
Looking towards 2020, the structure of the sector will change towards increased renewable generation, with renewables other than hydro more than doubling from 340 TWh in 2011 to 708 TWh in 2020. By 2020, the share of total low-carbon electricity generation will be 56%.

Figure 8: Evolution of electricity generation in the EU-27

Electricity Generation EU-27 – 2009



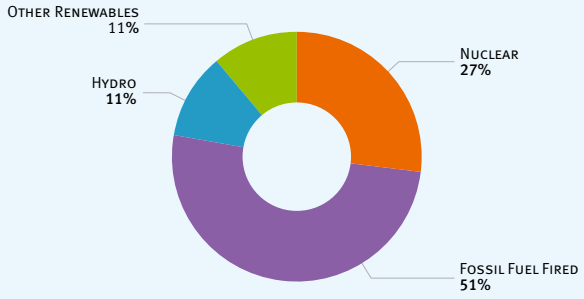
Electricity Generation EU-27 – 2010



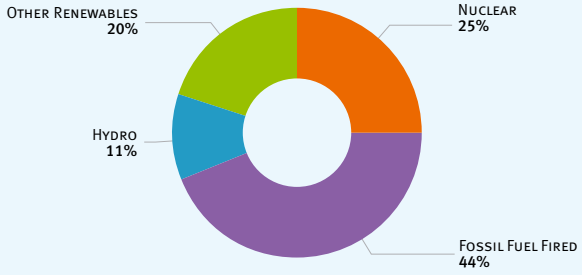
Source: EURELECTRIC, Power Statistics 2012

Compared to last year's forecasts, we see renewables other than hydro contributing to 20% of total electricity generation by 2020 (last year our forecast was 19%), while hydro remains stable at 11%. The changed forecast for non-hydro renewables is complemented by a similar change for nuclear (25% this year against last year's 24%). Such increases take place at the expense of fossil fuel generation, which sees its share fall to 44% compared to the 46% of last year's forecast. It is interesting to note though, that although the nuclear share of total generation changes, absolute nuclear generation in 2020 will be in the same order as in 2011 (about 870 TWh).

Electricity Generation EU-27 – 2011



Electricity Generation EU-27 – 2020



5 Flexibility: Renewables and balancing

The considerable increase of variable renewables (v-RES) in Europe is creating new challenges for the operation of the European power systems. Variable renewables are inherently non-dispatchable, i.e. cannot be controlled by power plant owners/operators. They hence require a holistic approach to ensure they are deployed in a technically sound and cost-effective way.

Germany is a case in point. *Table 2* shows German v-RES data that can help explain the need for flexibility and a system approach.

Table 2: Variable RES indicators in Germany (year-end 2011)

	Wind[5]	Photovoltaic[7]	Wind + PV[7]
Total installed capacity	29,075 MW	24,990 MW	54,065 MW
Maximum generation[6]	22,795 MW (78%)	13,939 MW (56%)	26,479 MW (49%)
Minimum generation[8]	266 MW (0.9%)	0 MW (0%)	402 MW (0.7%)
Average generation[8,7]	5,145 MW (18%)	4,390 MW (18%)	7,374 MW (14%)
Maximum increase within 1 hour	4,348 MW	3,319 MW	4,348 MW
Maximum increase within 5 hours	7,744 MW	12,228 MW	13,907 MW
Maximum decrease within 1 hour	-4,723 MW	-3,299 MW	-4,723 MW
Maximum decrease within 5 hours	-8,507 MW	-11,863 MW	-14,966 MW

Source: BDEW

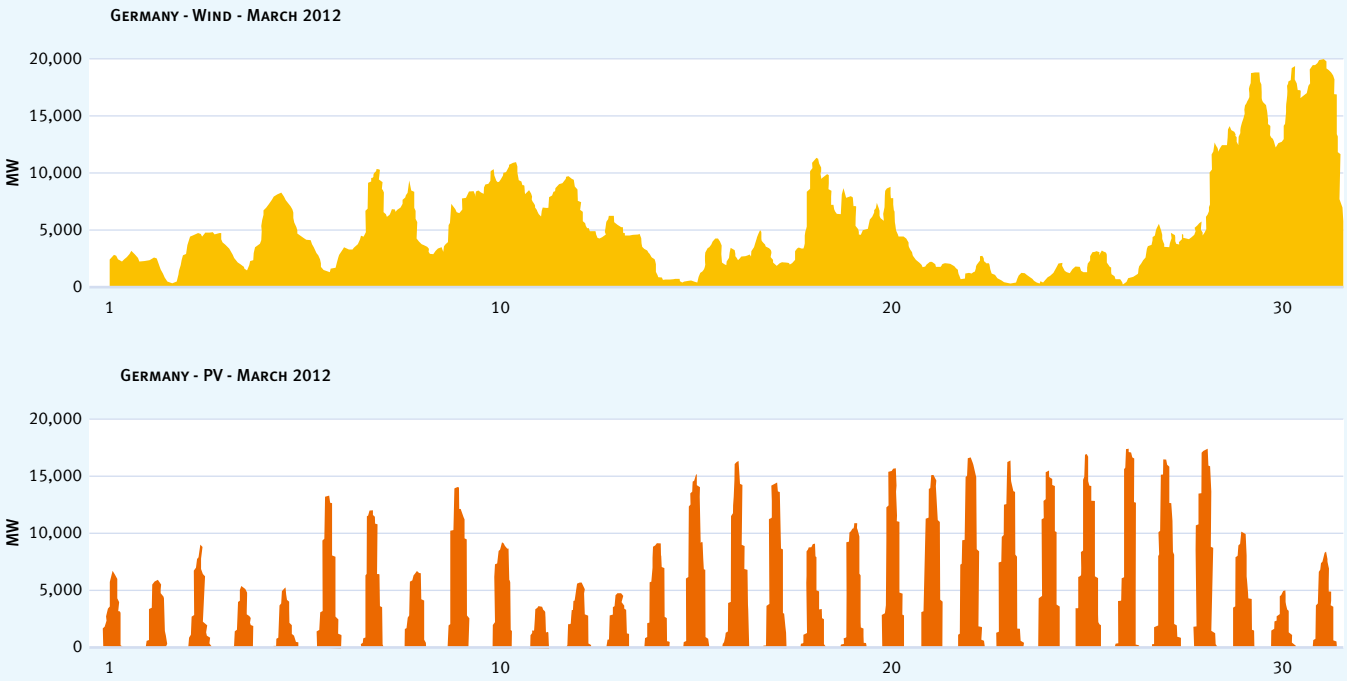
[5] The numbers in parentheses in the second, third and fourth rows show maximum, minimum and average generation as a percentage of the total installed capacity given in the first row.

[6] Maximum generation, minimum generation and average generation do not refer to actual generation (expressed in kWh or its multiples) but to the number of wind farms or photovoltaic installations (or aggregated) that were simultaneously feeding electricity into the grids at a given time (expressed in MW).

[7] Average generation for photovoltaic refers to peak load time, i.e. between 8h00 and 20h00.

[8] The 0% should not mislead the reader; as explained in the preceding footnote, the value does not cover off-peak hours, i.e. the hours between 20h00 and 8h00. In other words, there are days when photovoltaic contribution to the grid during peak hours is nil.

Figure 9: Wind and PV patterns in Germany, March 2012



Source: http://www.theoildrum.com/node/9205, retrieved 5 October 2012

At the end of 2011, 29,075 MW (or 17% of total installed capacity) of wind farms were connected to the German grids. Photovoltaic installations stood at 24,990 MW (or 15% of total installed capacity). In other words, 32% (54,065 MW) of the total installed capacity in Germany was based on v-RES.

The difficulties in predicting when and how much electricity from such sources is actually available are obvious. The maximum and minimum generation values in *Table 3* show the variability of wind power and PV. In 2011, the contribution of v-RES to generation ranged between 1% and 78% of total installed wind capacity and between 0% and 56% of total installed photovoltaic capacity respectively. Another way of interpreting these figures would be to look at the average generation. Out of a total capacity of 29,075 MW for wind and 24,990 MW for photovoltaic, the average capacity generating electricity was 18% for both wind and photovoltaic (and 14% if aggregated). These average generation figures reinforce the idea that v-RES capacity is only partly used most of the time. Other forms of generation continue to be needed to keep the balance between supply and demand of electricity.

Yet even if average generation is still low, v-RES nevertheless introduce challenges to the normal operation of power systems as *Table 2* also shows. In particular, they increase the requirements for flexibility in the system to cope with sudden increases or decreases of v-RES output.

In 2011, the maximum ramp-up of wind farms (i.e. the increase in output) was 4,348 MW within 1 hour and 7,744 MW within 5 hours. Conversely, the maximum decrease was by 4,723 MW and 8,507 MW in 1 hour and 5 hours respectively. Photovoltaic experienced a maximum ramp-up of 3,319 MW within 1 hour and 12,228 MW within 5 hours and a drop of 3,299 MW in 1 hour and 11,863 MW within 5 hours.

Note that the described ramping can either occur simultaneously or peaks in v-RES generation can be unrelated – as shown in *Figure 9* towards the end of March 2012, when wind generation in Germany was sustained and the contribution from photovoltaic was limited compared to the preceding weeks.

Once aggregated, the numbers in *table 2* describing the ramping are even more striking: taken together, photovoltaic and wind ramped up by a maximum of 4,348 MW within 1 hour and 13,907 MW within 5 hours and down by 4,723 MW and 14,966 MW in 1 hour and 5 hours respectively.[9]

These numbers clearly highlight the magnitude of the v-RES challenge: photovoltaic installations and wind farms ramp up and down according to the availability of wind and sun. Such ramping is inherently less predictable and creates pressure on the remainder of the generating fleet to keep the lights on with a decent power quality (e.g. voltage, frequency). This pressure is increased by the fact that v-RES, unlike other generators, are not exposed to market dynamics such as electricity demand, consumer behaviour or balancing requirements.

Flexible and back-up capacity is not the only tool available to compensate for the variability of v-RES. As demonstrated in our report *Flexible generation: backing-up renewables*, interconnectors and (hydro) storage are also key to integrate v-RES, as exemplified by the increased penetration of wind in Denmark.

In Denmark, total installed capacity of wind reached 3,949 MW by the end of 2011, corresponding to 29% of the overall installed capacity (*Table 5*). The maximum contribution from wind stood at 3,520 MW, which corresponded to 89% of total wind capacity, whereas the minimum was a scanty 1 MW (or 0.03%). On average, Danish wind farms were feeding 1,114 MW of electricity into the grid in 2011.

What is specific to the Danish situation is the availability of Norwegian and Swedish hydro storage that can be used in Denmark due to the high interconnectivity between these countries. The following figures are snapshots of wind generation in Denmark and the usage of interconnections with its northern neighbours. They show the shift in cross-border electricity flows between the Scandinavian countries further to changes of wind generation in Denmark.

Table 3: Wind indicators in Denmark (year-end 2011)

	Wind
Total installed capacity	3,949 MW
Maximum generation	3,520 MW (89%)
Minimum generation	1 MW (0.03%)
Average generation	1,114 MW (28%)

Source: EURELECTRIC and Energinet.dk

[9] The aggregated data are not a sum of the previously mentioned (separate) ramps of photovoltaic and wind since those may have occurred separately. It rather represents the combined ramps of photovoltaic and wind in any single moment as registered by the transmission system operators (TSOs).

Figure 10: Wind generation in Denmark and interconnection patterns between Denmark, Norway and Sweden, 25-31 December 2011

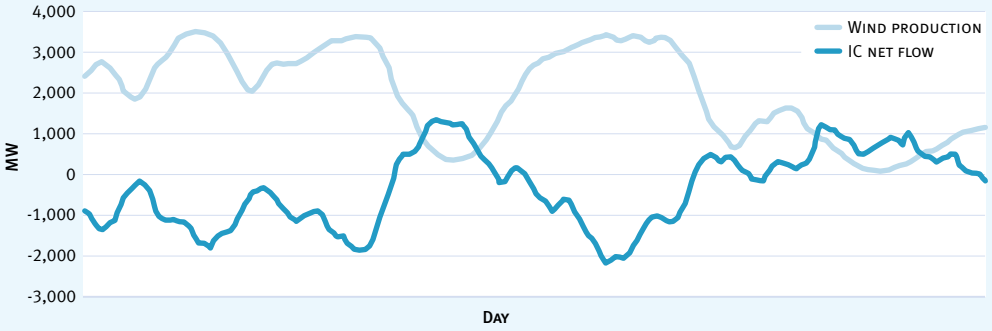
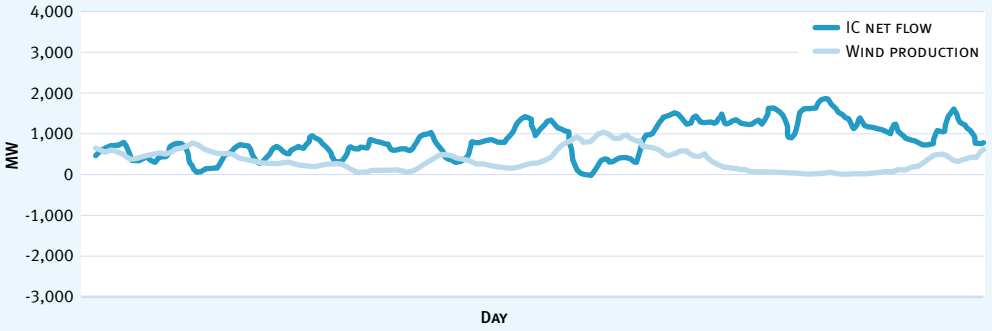
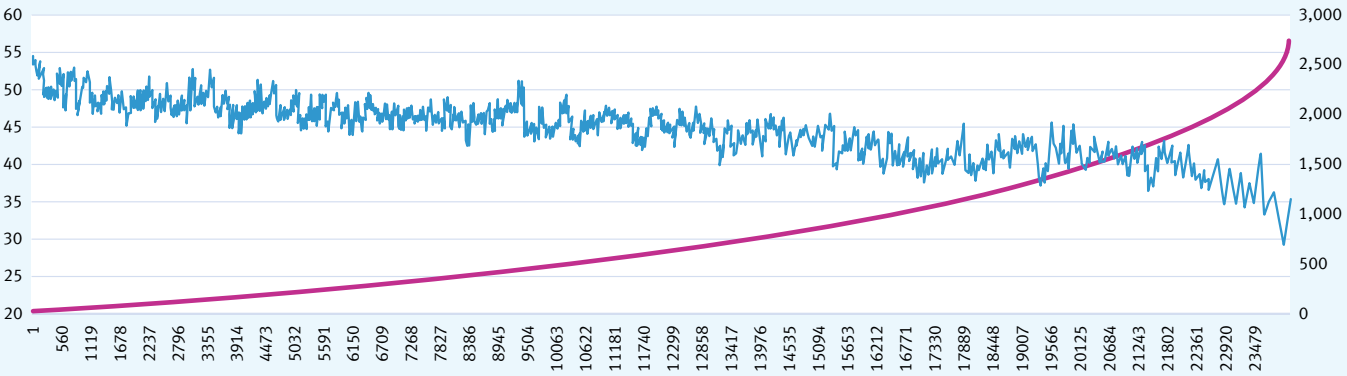


Figure 11: Wind generation in Denmark and interconnection patterns between Denmark, Norway and Sweden, 2-8 June 2011



Source: Energinet.dk

Figure 12: Correlation between wind generation and electricity spot prices in western Denmark between 1 January 2010 and 27 September 2012



Source: Energinet.dk, figure elaborated by Dong Energy

Figure 10 shows that when Denmark experiences sustained wind generation, the country exports power to Sweden and Norway. Conversely, when wind generation drops, the flow in the interconnectors is reversed and Denmark becomes an importing country. *Figure 11* reinforces the preceding conclusion by showing that the flow of electricity in the interconnectors is roughly constant when wind generation is constant too.

Another crucial effect of v-RES on the power system is the downward pressure they exercise on electricity spot prices (*Figure 12*).

The approximately 24,000 data points in *Figure 12* represent wind generation and electricity spot prices in western Denmark between January 2010 and September 2012.[10] The data points are arranged on the x-axis from the hours with the lowest wind generation to the hours with the highest wind generation. The resulting picture is clear: the higher the generation from wind turbines, the lower the electricity spot prices.

However, the figure does not show the effect on the profitability of thermal power plants and their ability to cover their fixed costs as well as investment costs. But taken together with the drop in running hours for CCGTs, as shown earlier in *Figure 4*, it does make clear why conventional generators are experiencing the well-known 'missing money' situation. A cost-effective and technically sound integration of v-RES will need to also resolve this issue.

In conclusion, delivering on renewables will require adapting and developing the entire energy system. Managing increasing shares of v-RES calls for flexible and back-up generation capacity, integrated wholesale markets, storage, smart grids and demand-side participation, as well as adequate transmission and distribution infrastructure.

[10] To extrapolate trends which are easier to analyse, the price is calculated as a rolling average of 100 data points.

6 Trends in the Energy Community, 2008-2011

Six years ago the EU, wishing to create a framework for cooperation in the field of energy with its neighbours, established the Energy Community by signing a treaty with currently nine contracting parties: Albania, Bosnia and Herzegovina, Croatia, the Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Serbia, Ukraine and UNMIK/Kosovo.[11]

The electricity markets in these countries vary widely: the Western Balkans and Moldova have small and fragmented electricity markets, which are mainly dependent on fossil fuels (coal, gas, oil). On the other hand, the Ukrainian electricity market alone is larger than those of the other Energy Community countries combined.

The region also has a fairly diverse set of economies, and while some suffered deep recessions in 2008-2009, others saw slow but positive economic growth.

In the face of large fiscal deficits, government expenditures have been under pressure in many countries of the region and economic growth is generally unpredictable. Pre-crisis regional economic growth averaged 5.5%, but after the recession and a second wave of economic slowdown recovery is expected to be quite slow with an expected average growth of only 0.5-1.5% in 2012.

Although the global economic downturn slowed the growth rate in electricity use during 2009, demand in 2010 returned to 276 TWh. Electricity consumption is still growing, albeit at a slower pace, so that in 2011 consumption amounted to nearly 282 TWh, representing a 2% increase compared to 2010. (source: Energy Community Secretariat, Annual Implementation Report 2012 (http://www.energy-community.org/pls/portal/docs/1770178.PDF).

Table 4: Evolution of Electricity Demand in selected countries, 2008-2011 (TWh)

Country	2008	2009	2010	2011
Bosnia-Herzegovina	12.2	11.6	12.3	12.6
Croatia	18.0	17.7	18.0	17.7
Serbia	33.8	33.3	34.1	34.4
Ukraine	184.6	168.5	183.4	187.0

Source: EURELECTRIC, Power Statistics (various editions) and Energy Community Secretariat, Annual Implementation Report 2012

[11] In line with UNSCR 1244.

According to the forecasts electricity demand for the Energy Community will grow by about 19% between 2010 and 2020, despite energy efficiency policies.

In 2011, the Western Balkans and Moldova had a total capacity of about 22 GW, of which Serbia accounted for about 33%, followed by Bosnia and Herzegovina with 22%, and Croatia with 18%. When adding Ukraine, the total capacity rises to 72 GW. In recent years the (very modest) increase of generation capacity, in addition to gas-fired plants, was primarily a result of rehabilitating existing power plants and commissioning several small-scale renewable projects. The available capacities consist of nearly 59% thermal, 19% nuclear and 22% of hydropower plants.

Regional composition of electricity generation has not changed much in recent years. Fossil fuels are the dominant source of electricity generation in the Western Balkans and Moldova, which rely mostly on coal (64%). Hydro and renewables account for about 36%. The Ukrainian electricity generation mix consists primarily of fossil fuels (48%), followed by nuclear (46%) and hydro and renewables (6%).

In 2010 electricity generation in the Energy Community exceeded 277 TWh (measured as net production injected into the system), mostly due to favourable weather conditions in the areas relying on hydropower plants. In 2011, net output of generation plants decreased to 273 TWh due to adverse hydrological conditions, with imports making up the difference needed to meet demand.

The region's market reforms remain incomplete and at different levels among the Contracting Parties of the Energy Community. "The local markets are largely foreclosed by dominating incumbent companies and regulated generation and supply segments."[12] As a result, the internal and regional electricity markets are not functioning properly and are not liquid enough to attract investors.

In view of the main Energy Community objectives, thinking beyond national borders must become the norm in this region as well. The Energy Community is preparing a Regional Energy Strategy with the aim of facilitating investments, promoting energy security and exploiting the regional cooperation potential.

The simultaneous need to meet the increasing level of energy demand and reduce the region's carbon footprint requires new technological solutions, energy sector modernisation and further dialogue with neighbours.

Currently relatively low energy consumption per capita, high energy intensity in industry and large regional energy efficiency potential indicate that the region has a good growth potential.

The region's strengths include inter alia: the large and diverse renewable energy potential; its position at the crossroads of Central Europe, South East Europe and the Middle East; comparatively low labour costs; low land or raw material prices; and rapid growth potential. All these factors demonstrate the region's comparative advantage in electricity generation.

The major incumbent power utilities are still publicly owned in most of the countries, while decisions to invest are constrained by low returns, given the existing low prices and high cost of borrowed capital. As public borrowing capacity is limited, public-private partnerships could be one of the possible ways forward. This concept is already being promoted in some of the Contracting Parties.

[12] Energy Community Secretariat: Annual Implementation Report 2012.

7 VGB Analysis on availability and unavailability of power plants (2002-2011)

Because the performance indicators are important for analysing the behaviour of a power station, EURELECTRIC and VGB PowerTech decided some years ago to merge their data collection on the availability and unavailability of power plants into one single database.[13]

The creation of peer groups ensures that all data coming from different power plants can be evaluated according to similar technical characteristics, capacity ranges, fuels, etc.

To date, for all technologies, the database manages a power plant capacity of 256 GW representing 638 units in 13 European countries (AT, BE, CH, CZ, DE, ES, FI, FR, IE, IT, NL, PL, PT).

However, the partial data collection for each country and each technology by primary energy source does not allow reporting of performance indicators like the supply data in Chapter 3 on a country-by-country basis.

The presentation below covers global availability/unavailability results and analysis for fossil-fired power plants and nuclear power plant. This presentation is an abstract of two VGB technical-scientific reports: Availability of Thermal Power Plants 2002-2011 and *Analysis of Unavailability of Thermal Power Plants 2002-2011*.

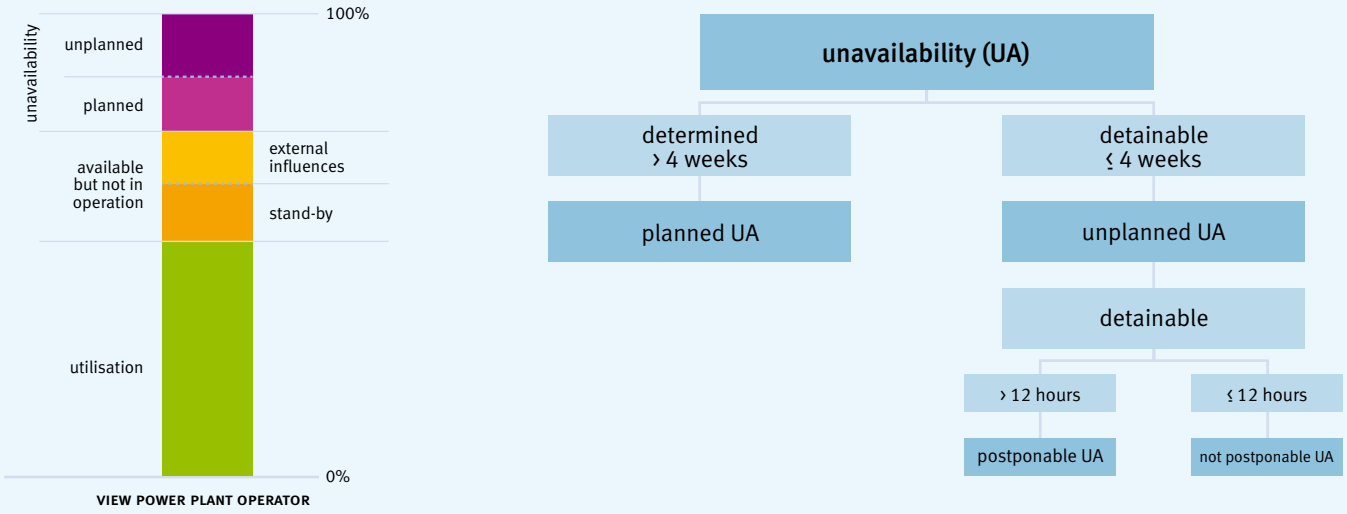
[13] According to standardised uniform definitions and recording procedure (1), the data are collected in a database with the help of an adapted software tool called KISSY (Kraftwerk InformationS System, which translates into Power Plant Information System). KISSY also includes data on South Africa, which are not shown here.

Evaluation of the availability and the unavailability of power plants

Availability and Utilisation of fossil-fired units

Figure 13 shows the concept of availability and utilisation for an electricity producer and also explains the unavailability of a plant.[14] Availability and utilisation are perhaps the most important factors for explaining the behaviour of a plant as well as the operation mode within a plant or a fleet.

Figure 13: Definitions of availability and utilisation of power plants

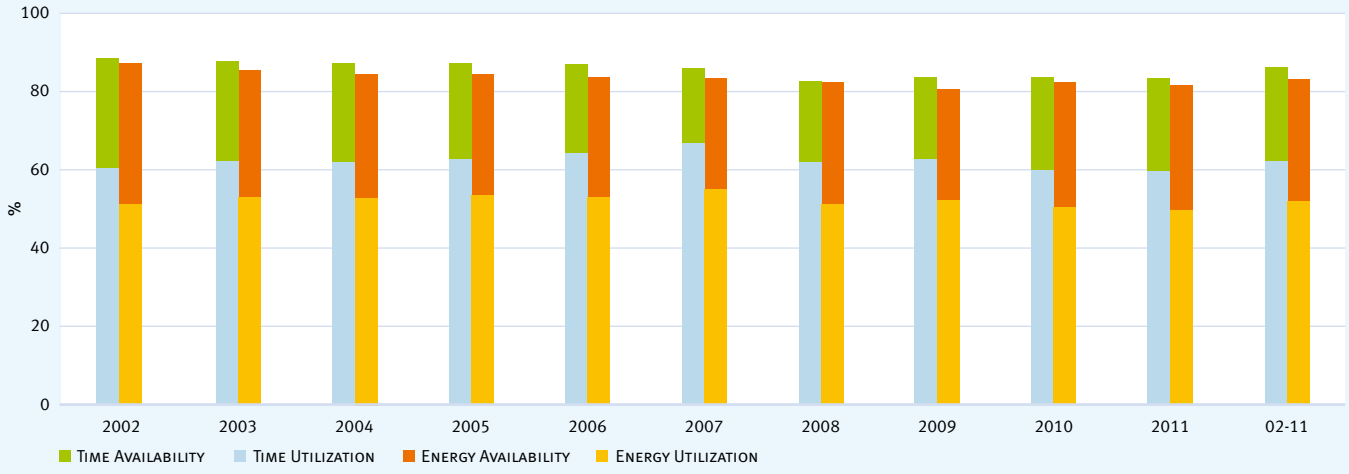


Source: VGB PowerTech

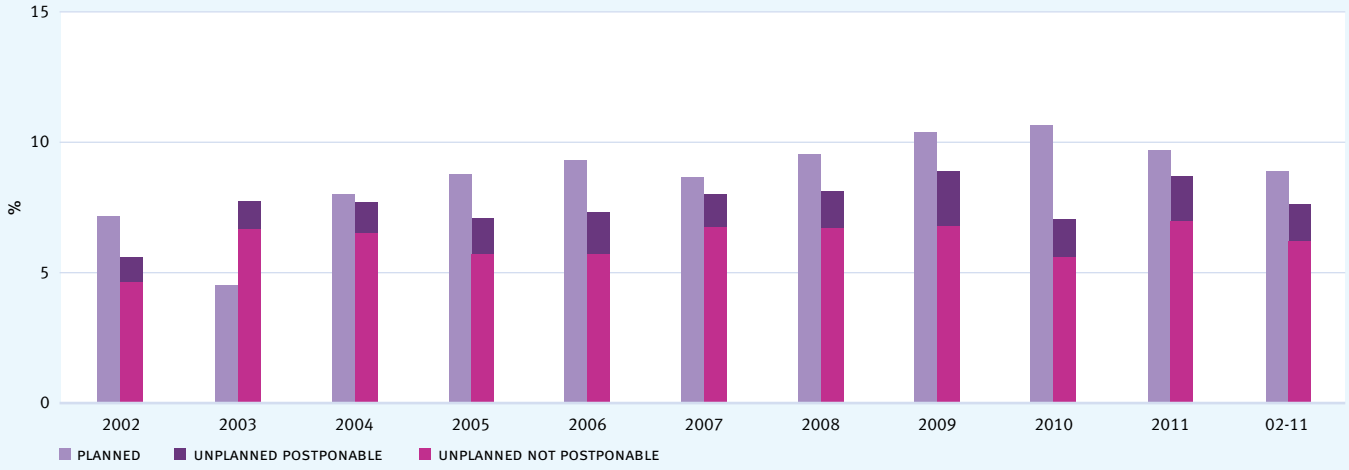
[14] The exact definitions of availability and utilisation are explained in the document referenced (1).

The typical outcome of the standardised availability analysis is illustrated in *Figure 14*, which shows the yearly evolution, between 2002 and 2011, of different availability and utilisation indicators as well as the global values. The precise figures are reported in the table below. The sample of units taken into account represents a global capacity of 788.8 GW in AT, CZ, DE, FR, IT, NL, PL, PT.

Figure 14: Availability and unavailability indicators (EU countries AT, CZ, DE, FR, IT, NL, PL, PT)



Energy unavailability



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	02-11
Number/Unit Years	237	239	247	249	249	252	250	239	244	248	2,454
Capacity (gross) (MW)	73,585	75,543	80,122	80,942	79,538	80,672	80,368	75,882	80,015	82,104	788,770
Time Availability (%)	83.3	87.7	87.0	86.8	86.8	85.9	84.2	83.3	83.5	83.4	85.7
Time Utilisation (%)	60.3	61.9	61.7	62.4	63.7	66.7	61.7	62.4	59.5	59.2	62.0
Energy Availability (%)	87.2	85.4	84.3	84.2	83.4	83.3	82.4	80.7	82.3	81.7	83.5
Energy Unavailability (%)	12.8	14.6	15.7	15.8	16.6	16.7	17.6	19.3	17.7	18.3	16.5
planned part (%)	7.2	6.9	8.0	8.7	9.3	8.7	9.5	10.4	10.6	9.7	8.9
unplanned part (%)	5.6	7.7	7.7	7.1	7.3	8.0	8.1	8.9	7.0	8.6	7.6
postponable (%)	1.0	1.1	1.2	1.4	1.6	1.3	1.4	2.1	1.5	1.7	1.4
not postponable (%)	4.6	6.7	6.57	5.7	5.7	6.7	6.7	6.8	5.6	7.0	6.2
Energy Utilisation (%)	51.0	53.1	52.7	53.2	52.9	55.2	51.0	51.8	50.3	49.4	52.1

Source: VGB PowerTech database

Unavailability analysis of thermal power plants

If we consider the availability of the fossil-fired power plants over the last three years (2009-2011), we note a small variation of the time and the energy availability at around 84% and 83% respectively.

On the other hand, the utilisation is lower than the availability (around 57% of energy utilisation over three years). The analysis of these figures over ten years shows the impact on the supply system of the increase of renewables and the required priority dispatch of renewables: utilisation of conventional plants has fallen. The decrease of annual operating hours for conventional plants leads to severe difficulties in covering the cost of generation and removes any incentive for the building of new thermal power capacities.

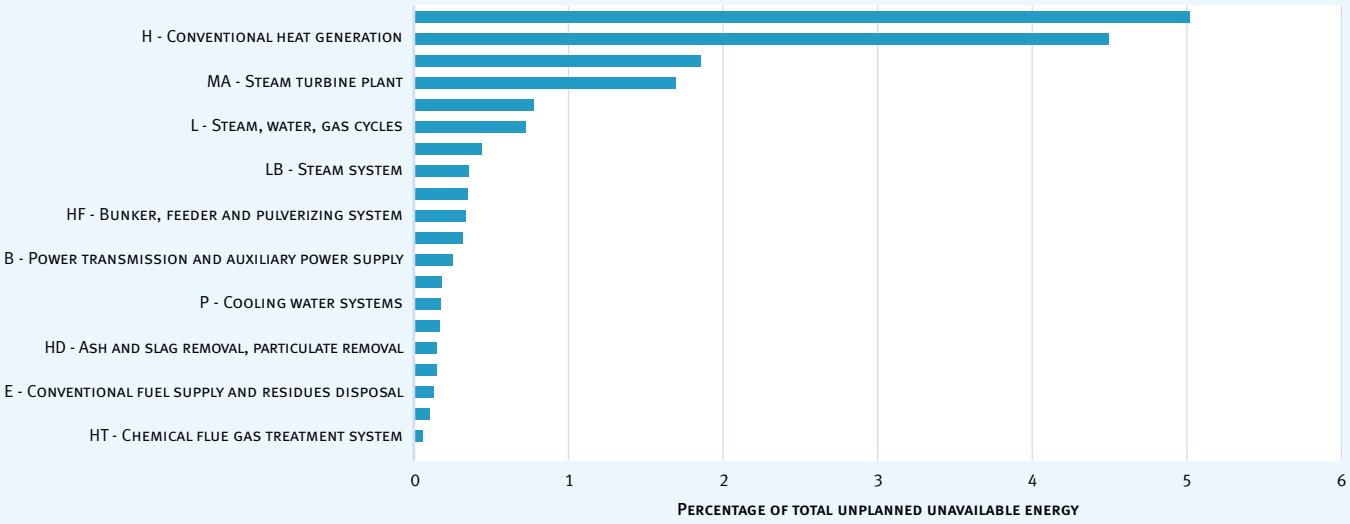
The planned and unplanned outages are excellent indicators of the technical status of each installation. The duration of a planned outage is determined by the level of repair work on damaged or aged components as well as the retro-fit measures taken to upgrade the plant performance. Unplanned outages, which can be further divided into postponable and not-postponable outages, illustrate the real operation of the plant and/or its components. The ratio of planned to unplanned outages indicates the quality of the maintenance work undertaken to avoid any damage during plant operation. Furthermore, the possibility to postpone an unplanned unavailability in times of ever increasing v-RES generation is an indicator of the stability of the system.

Events which caused unavailability are analysed in the annual VGB report *Analysis of Unavailability of Thermal Power Plants*. The relevant data are collected online by member companies on an annual basis. Because not all member companies participate in this complex recording, using the KKS and EMS codifications for describing and evaluating the event characteristics, the unavailability analysis is based on different plant collectives. In the latest reporting period (2002-2011), a total of 97,867 events from 259 generation units were evaluated.

Information on the main components and systems affected by the unplanned unavailability is important in order to adapt any maintenance programme to the most efficient operation policy.

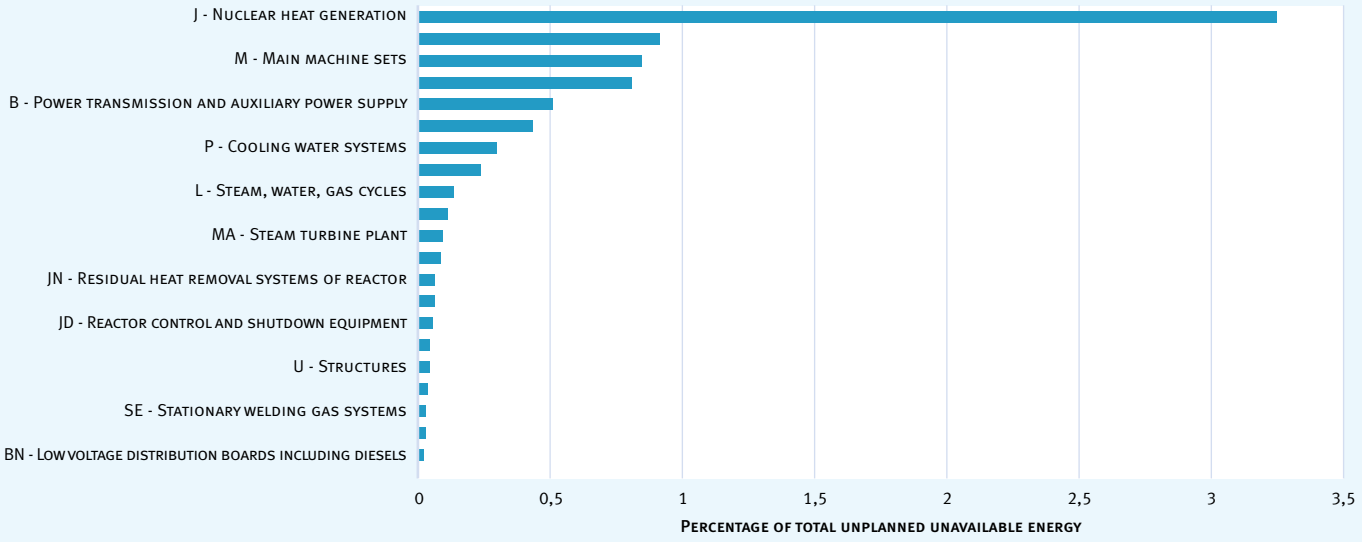
Figures 15 and *16* show the main components causing the most unplanned unavailability for fossil-fired power plants (170 units in AT, DE, IT, NL, PT) and nuclear power plants (23 units in DE, CH) respectively, between 2002 and 2011. They show that most of the unplanned unavailability is caused by the heat generation itself. It can also be due to suspicion of failure on a reactor safety component, which prompts the immediate shutdown of the nuclear unit. The generator itself causes around 1% of the total unplanned unavailability for all thermal power stations.

Figure 15: Components causing unplanned unavailability of fossil fired units (2002 - 2011)



Source: VGB PowerTech database

Figure 16: Components causing unplanned unavailability of nuclear units (2002 - 2011)



Source: VGB PowerTech database

Power Statistics & Trends 2012

FULL REPORT

1. General Information

Introduction

This is the 40th edition of "Power Statistics & Trends". Our 2012 report contains referenced data for the years 1980, 1990, 2000, 2009, 2010, preliminary data for 2011 as well as forecasts for 2020 and 2030, concerning:

- The structure of the electricity industry;
- Trends in general economic indicators;
- Peak demand and load management;
- Medium and long term generating prospects;
- Electricity consumption by sector;
- Energy balance for electricity;
- Fuel consumption in and emissions from the electricity sector.

The data contained in this report has been supplied by EURELECTRIC Group of Experts on Statistics & Prospects (members are listed in the inside page of the back cover). The covered area includes all EURELECTRIC members, stretching beyond the EU-27: candidate countries are among them as much as the European Economic Space, like Norway or Switzerland, but also for the second year the Energy community countries Serbia, Ukraine, and many others. The report presents the situation and prospects as perceived by each country. Furthermore, the figures are not necessarily official national forecasts (by governments or electricity associations), but may be considered as "best engineering estimates" of the group members, based on an annually updated picture of the planning and forecast situation in each country. Thus, even the 2020 or 2030 forecasts are interestingly changing from year to year, as a result of changed key factors such as economic growth or regulatory changes impacting on the development of technologies.

This report should indeed not be regarded as the definitive position of the background and prospects against which the individual country companies helping with its compilation base their business planning. While EURELECTRIC has taken reasonable care in the preparation of this report no representation, expressed or implied, is made as to the accuracy or completeness of the information contained in this report.

It is important to ensure that good-quality data are gathered on time. While gathering statistics from a multitude of stakeholders continues to be challenging, it remains of prime importance to us to have our own data at our disposal.

We would like to express our gratitude to all our committed members for the timely submission of the data.

1.1 Trends in General Economic Indicators

TABLE 1.1.1

Breakdown of Gross Domestic Product (GDP) (Billion EUR at the 2000 price level and exchange rate)
The tables below display the breakdown of Gross Domestic Product (in billion euro at the 2000 price level and exchange rate) from 1980 to 2010 for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community member states. Forecasts for 2020 and 2030 are also included.

"Services" also includes transport. This applies to all tables below.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	6.2	5.3	3.8	3.6	3.6	3.6	3.8
Industry	41.8	46.2	57.4	64.2	65.5	81.4	101.7
Services	68.3	92.2	125.4	147.0	150.1	184.8	223.2
Total Value Added	116.2	143.7	186.6	214.8	219.4	269.8	328.8
Gross Domestic Product	130.6	161.7	207.5	237.0	241.9	297.7	362.8
Private Final Consumption Expenditure	72.6	89.0	110.9	127.8	130.5	152.7	186.1
Gross Fixed Capital Formation	36.0	40.5	50.8	49.7	50.7	65.5	79.8

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	2.6	3.1	2.9	2.8	2.7	3.2	3.8
Industry	42.7	51.6	103.8	100.3	104.2	123.3	146.0
Services	81.9	98.9	121.7	152.9	154.0	182.3	215.7
Total Value Added	127.2	153.6	224.7	253.3	258.3	308.8	365.5
Gross Domestic Product	154.4	190.9	252.0	283.6	290.0	343.2	406.2
Private Final Consumption Expenditure	86.0	103.0	123.4	213.1	216.8	256.6	303.7
Gross Fixed Capital Formation	27.0	32.0	53.4	60.5	60.0	71.0	84.0

Note: Data are based on the 2005 price level.

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			1.7		1.3	2.4	4.1
Industry			3.6		5.7	9.6	15.0
Services			6.8		11.4	19.9	31.6
Total Value Added		15.6	12.1		18.4	31.9	50.7
Gross Domestic Product		16.3	13.7		20.9	37.4	58.1
Private Final Consumption Expenditure		10.5	20.7			23.4	30.0
Gross Fixed Capital Formation		2.6	4.2			6.2	6.5

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			0.4	0.3	0.3		
Industry			1.1	1.3	1.3		
Services			0.8	0.7	0.7		
Total Value Added			9.3	13.4	13.2		
Gross Domestic Product			10.1	14.9	15.1		
Private Final Consumption Expenditure			6.5	10.0	9.6		
Gross Fixed Capital Formation			1.7	3.1	2.8		

Note: Data are based on the 2005 price level.

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			3.3	5.2	5.1	4.0	6.4
Industry			25.3	37.5	41.8	42.8	69.0
Services			33.6	44.3	42.0	74.2	101.9
Total Value Added			62.3	87.0	88.9	121.2	157.4
Gross Domestic Product			69.3	97.1	99.2	135.4	196.6
Private Final Consumption Expenditure			36.4	52.2	54.0	73.2	102.0
Gross Fixed Capital Formation			21.1	30.6	33.2	44.0	63.0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	18.6	22.7	13.6	21.1	25.4	27.0	29.0
Industry	442.7	511.0	576.2	535.0	580.6	690.0	720.0
Services	727.4	964.6	1,332.1	1,513.5	1,546.9	1,630.0	1,840.0
Total Value Added	1,188.7	1,498.3	1,921.7	2,066.4	2,151.2	2,347.0	2,589.0
Gross Domestic Product	1,275.0	1,592.4	2,159.2	2,284.5	2,368.8	2,570.0	2,840.0
Private Final Consumption Expenditure	458.7	726.6	1,287.2	1,330.9	1,339.0	1,475.0	1,620.0
Gross Fixed Capital Formation	185.5	278.3	426.3	392.5	414.1	495.0	550.0

Note: Reference year 2005, data before 1991 reference year 1991 level.

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	2.0	2.7	3.9	2.8	4.0	3.8	4.6
Industry	20.9	23.9	31.6	26.1	27.4	35.7	44.0
Services	78.7	91.9	113.6	109.3	109.3	155.1	188.3
Total Value Added	101.6	118.5	149.0	138.2	140.7	194.5	237.0
Gross Domestic Product	120.5	138.8	173.6	177.2	179.4	227.1	273.0
Private Final Consumption Expenditure	66.1	71.9	82.7	86.9	94.5	119.9	147.6
Gross Fixed Capital Formation	21.9	25.7	35.3	34.1	36.0	48.7	62.2

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			0.3	0.2			
Industry			1.5	2.0			
Services			0.8	5.3			
Total Value Added			5.4	7.6			
Gross Domestic Product			6.1	8.7			
Private Final Consumption Expenditure			3.4				
Gross Fixed Capital Formation			1.6				

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	28.0	27.0	25.0	25.0	21.3	21.0	19.0
Industry	108.0	131.0	167.0	176.0	186.3	237.0	295.0
Services	218.0	287.0	379.0	500.0	480.6	617.0	776.0
Total Value Added	355.0	446.0	571.0	701.0	688.3	875.0	1,089.0
Gross Domestic Product	365.0	487.0	630.0	775.0	764.3	980.0	1,231.0
Private Final Consumption Expenditure	235.0	296.0	376.0	459.0	460.3	594.0	751.0
Gross Fixed Capital Formation	82.0	124.0	163.0	189.0	214.9	265.0	320.0

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	4.2	4.1	4.0	4.8	4.7		
Industry	22.3	29.6	39.9	47.3	47.9		
Services	42.5	60.8	71.2	79.5	83.0		
Total Value Added	68.5	92.2	115.1	131.6	135.6		
Gross Domestic Product	79.7	107.8	132.1	153.2	157.8	183.0	213.0
Private Final Consumption Expenditure	41.1	58.0	65.3	82.7	84.8		
Gross Fixed Capital Formation	17.8	26.4	26.5	28.2	29.3		

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Agriculture					46.6		
Industry					400.8		
Services					1,148.5		
Total Value Added					1,595.9		
Gross Domestic Product	497.6	980.1	1,441.4	1,907.2	1,729.0		
Private Final Consumption Expenditure	275.2	549.5	783.9	1,084.6	976.6		
Gross Fixed Capital Formation	113.8	210.5	280.7	392.1	343.3		

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	9.8	12.3	12.4	12.2	12.0	11.7	12.6
Industry	252.4	298.6	481.2	416.7	433.4	460.2	559.9
Services	731.3	987.9	991.7	1,507.4	1,531.5	1,869.9	2,441.3
Total Value Added	993.4	1,298.8	1,485.3	1,936.3	1,976.6	2,341.8	3,013.7
Gross Domestic Product	1,103.8	1,443.2	1,646.5	2,166.6	2,212.0	2,630.0	3,385.5
Private Final Consumption Expenditure	626.2	890.8	1,036.4	1,392.8	1,410.1	1,662.6	2,101.6
Gross Fixed Capital Formation	147.7	227.5	253.9	330.3	340.7	508.8	709.8

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			7.9	6.2	6.1		
Industry			16.8	19.5	18.5		
Services			95.7	131.1	127.4		
Total Value Added			120.4	156.7	152.0		
Gross Domestic Product			136.3	176.5	170.3	167.7	
Private Final Consumption Expenditure			98.6	136.6	131.6		
Gross Fixed Capital Formation			29.5	36.1	30.7		

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	3.8	3.8	2.4	3.5	3.0	4.0	5.0
Industry	3.8	5.0	14.4	15.5	16.6	21.0	27.0
Services	25.1	27.6	27.7	32.7	32.4	39.0	46.0
Total Value Added	32.6	36.3	44.5	51.7	52.0	64.0	78.0
Gross Domestic Product	37.6	42.6	52.0	60.4	61.1	80.0	100.0
Private Final Consumption Expenditure	18.8	20.0	26.4	35.1	32.1	45.0	55.0
Gross Fixed Capital Formation	15.0	16.3	11.9	15.3	12.8	18.0	23.0

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			3.2	3.2	3.1		
Industry			39.5	49.6	47.7		
Services			50.9	107.2	103.2		
Total Value Added			93.6	160.0	154.0		
Gross Domestic Product			104.6	160.0	154.0		
Private Final Consumption Expenditure			50.1	83.0	84.0		
Gross Fixed Capital Formation		11.3	24.5	26.2	18.7		

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	20.0	23.0	30.0	28.0	29.0		
Industry	226.0	274.0	302.0	265.0	272.0		
Services	467.0	617.0	732.0	782.0	790.0		
Total Value Added	719.0	914.0	1,064.0	1,076.0	1,092.0		
Gross Domestic Product	802.0	1,018.0	1,191.0	1,206.0	1,221.0		
Private Final Consumption Expenditure	465.0	602.0	710.0	734.0	741.0		
Gross Fixed Capital Formation	172.0	213.0	242.0	233.0	239.0		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	1.9	4.0	0.7	0.8	0.7	1.3	2.3
Industry	6.8	10.3	3.3	5.1	5.2	8.2	14.4
Services	1.2	1.7	7.0	10.6	10.8	16.8	29.6
Total Value Added	9.9	16.0	11.0	16.6	16.8	26.3	46.3
Gross Domestic Product	11.2	18.0	12.4	18.7	19.0	29.7	52.2
Private Final Consumption Expenditure		4.4	8.2	12.8	12.3	19.3	33.9
Gross Fixed Capital Formation		2.8	3.0	3.2	4.2	6.7	11.9

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			0.1	0.1	0.1		
Industry			2.6	2.0	2.0		
Services			38.2	53.4	55.1		
Total Value Added			22.6	29.1	29.9		
Gross Domestic Product			25.4	32.3	33.2		
Private Final Consumption Expenditure			9.6	11.4	11.6		
Gross Fixed Capital Formation			4.8	6.8	7.0		

Note: Data are based on the 2005 price level.

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	0.6	1.1	0.3	0.4	0.4	0.5	0.6
Industry	4.0	6.0	1.4	1.8	1.8	2.3	2.6
Services	2.2	3.3	4.3	6.8	6.7	7.0	7.8
Total Value Added	6.8	10.4	6.0	9.0	8.9	9.8	11.0
Gross Domestic Product	7.9	11.9	6.8	9.7	9.6	10.2	11.4
Private Final Consumption Expenditure	2.6	4.0	4.2	6.4	6.4	7.2	8.0
Gross Fixed Capital Formation	1.1	1.7	1.6	2.0	1.9	2.3	2.5

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product			4.0	4.6	4.7		
Private Final Consumption Expenditure			2.6	3.1	3.0		
Gross Fixed Capital Formation			0.9	0.6	0.7		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Agriculture		8.1	9.9	9.6	9.5	10.7	12.5
Industry		117.1	152.7	111.3	114.6	128.9	149.6
Services		152.9	210.8	364.4	370.6	416.7	483.6
Total Value Added		278.1	373.4	485.3	494.8	556.4	645.7
Gross Domestic Product		306.0	418.0	541.7	550.9	619.5	718.9
Private Final Consumption Expenditure		230.5	302.7	399.3	401.8	451.8	524.4
Gross Fixed Capital Formation		60.9	91.7	103.2	98.7	111.0	128.8

Note: Data as from 2009 are based on the 2005 price level.

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			9.7	9.9	10.9	16.5	16.8
Industry			62.1	90.0	91.5	140.7	195.7
Services			124.1	176.2	184.4	314.9	549.1
Total Value Added			195.8	276.1	286.8	472.1	761.6
Gross Domestic Product	162.3	157.3	220.1	312.3	324.2	539.2	890.8
Private Final Consumption Expenditure		75.4	141.1	199.7	207.3	344.7	569.4
Gross Fixed Capital Formation		33.0	52.2	62.2	64.6	107.4	177.4

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	3.1	4.5	4.0	3.8	3.7	4.3	5.3
Industry	19.1	24.6	31.8	28.4	28.5	31.0	38.0
Services	40.2	55.4	75.8	87.7	89.2	100.2	122.8
Total Value Added	62.5	84.5	111.5	119.8	121.4	135.5	166.1
Gross Domestic Product	71.2	95.3	127.3	133.8	135.6	150.8	184.6
Private Final Consumption Expenditure	43.0	57.7	78.7	86.4	88.3	82.6	100.5
Gross Fixed Capital Formation	16.4	21.5	35.2	29.3	28.1	26.2	32.0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Agriculture		10.2	4.5		4.0	6.5	10.2
Industry		21.4	13.0		19.8	34.9	55.2
Services		11.3	18.2		32.1	51.6	83.9
Total Value Added		42.8	35.7		55.9	93.0	149.3
Gross Domestic Product	45.0	47.8	40.3		62.7	104.4	167.6
Private Final Consumption Expenditure		34.0	31.8		43.9	62.6	100.5
Gross Fixed Capital Formation		7.1	7.6		19.4	31.3	50.3

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	4.0	5.1	4.7	4.3	4.8	6.5	7.6
Industry	33.4	41.8	67.1	66.8	76.4	107.5	138.3
Services	106.9	140.3	163.7	200.5	207.2	263.7	323.5
Total Value Added	144.3	187.2	235.5	271.6	288.4	377.6	469.4
Gross Domestic Product	174.4	216.8	268.2	311.3	330.4	431.1	535.9
Private Final Consumption Expenditure	94.8	112.6	131.9	156.3	162.1	227.6	288.5
Gross Fixed Capital Formation	33.1	45.6	50.0	52.4	63.4	88.7	119.3

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Agriculture		0.6	0.6				
Industry		6.1	6.5				
Services		8.6	11.3				
Total Value Added		15.7	18.4				
Gross Domestic Product		17.4	21.1				
Private Final Consumption Expenditure		9.3	12.0				
Gross Fixed Capital Formation		3.0	5.5				

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			0.9				
Industry			7.1				
Services			11.6				
Total Value Added			19.6				
Gross Domestic Product			22.0				
Private Final Consumption Expenditure			12.4				
Gross Fixed Capital Formation			5.7				

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Agriculture		3.2	3.2	3.0	2.9		
Industry		70.1	71.3	82.0	86.1		
Services		174.1	198.9	229.8	235.5		
Total Value Added		247.7	273.4	314.8	324.6		
Gross Domestic Product		259.9	289.7	333.6	343.8		
Private Final Consumption Expenditure		146.3	168.6	191.0	194.0		
Gross Fixed Capital Formation		59.6	65.3	68.1	71.4		

Note: Data are based on the 2005 price level.

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	3.8	3.5	3.4	3.4	3.8	4.0	4.0
Industry	31.2	30.2	61.6	68.5	66.8	70.0	75.0
Services	61.0	72.7	97.8	133.2	135.1	157.0	182.0
Total Value Added	96.0	106.4	162.8	205.1	205.7	231.0	261.0
Gross Domestic Product	103.2	116.0	185.1	232.2	233.7	258.0	285.0
Private Final Consumption Expenditure	46.5	54.7	76.7	107.8	111.7	136.0	166.0
Gross Fixed Capital Formation	27.7	24.3	34.1	48.8	46.3	59.0	76.0

TABLE 1.1.1 BREAKDOWN OF GROSS DOMESTIC PRODUCT (GDP) (Billion EUR at the 2000 price level and exchange rate)

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Agriculture	24.2	27.1	29.2	32.3	33.0		
Industry	22.6	43.6	66.7	88.5	99.9		
Services	54.3	86.2	175.1	254.0	275.7		
Total Value Added	96.4	154.4	271.0	372.2	405.9		
Gross Domestic Product	91.8	152.5	289.4	387.6	423.1		
Private Final Consumption Expenditure			204.1	283.2	302.0		
Gross Fixed Capital Formation		31.5	59.0	72.3	94.4		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product		10.6	6.0	12.7		21.9	
Private Final Consumption Expenditure							
Gross Fixed Capital Formation							

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product			25.7	45.7			
Private Final Consumption Expenditure							
Gross Fixed Capital Formation							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Agriculture			4.6	5.6	5.6		
Industry			7.1	7.8	7.7		
Services			12.0	18.4	18.8		
Total Value Added			23.7	31.8	32.1		
Gross Domestic Product			25.5	36.3	36.6		
Private Final Consumption Expenditure			19.4				
Gross Fixed Capital For mation			3.2				

TABLE 1.1.2

POPULATION (THOUSANDS) AT YEAR-END

The table below shows the evolution of the number of inhabitants in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community member states between 1980 and 2010. Estimates for 2020 and 2030 are also displayed.

COUNTRY	1980	1990	2000	2009	2010	2020	2030
AT	7,549	7,729	8,110	8,360	8,400	8,788	9,191
BE	9,855	9,948	10,239	-	10,807	11,538	11,982
BG	8,728	8,487	8,131	7,564	7,505	6,914	6,452
CY	-	-	-	-	-	-	-
CZ	10,327	10,363	10,273	10,490	10,533	10,284	10,102
DE	78,275	79,365	82,260	81,802	81,752	80,176	78,188
DK	5,124	5,146	5,349	5,535	5,561	5,697	5,880
EE	1,477	1,571	1,372	1,340	1,284	1,221	1,202
ES	37,386	38,836	40,050	45,827	46,256	47,037	47,560
FI	4,788	4,998	5,181	5,351	5,375	5,636	5,850
FR	55,113	56,577	58,825	62,799	62,302	66,000	68,500
UK	56,329	57,288	58,886	61,791	62,262	67,173	71,392
GR	9,643	10,161	10,931	11,305	11,310	11,526	11,578
HU	10,709	10,375	10,222	10,031	10,014	9,901	9,704
IE	3,401	3,506	3,790	4,458	4,481	5,449	5,901
IT	56,479	56,744	56,961	60,340	60,626	62,632	63,545
LT	3,420	3,698	3,487	3,329	3,200	3,074	2,981
LU	365	384	439	494	512	560	612
LV	2,515	2,658	2,380	2,180	2,150	2,050	2,030
MT	-	352	389	413	418	-	-
NL	14,100	14,947	15,922	16,486	16,575	17,200	17,700
PL	35,735	38,183	38,254	38,168	38,200	37,830	36,796
PT	9,819	9,873	10,257	10,638	10,637	10,703	10,760
RO	22,201	23,207	22,435	-	21,414	20,990	20,368
SE	8,318	8,591	8,883	9,341	9,416	10,200	10,660
SI	1,901	1,998	1,988	-	1,961	1,849	2,003
SK	4,996	5,298	5,403	-	5,388	5,251	5,186
CH	6,335	6,751	7,164	7,786	7,788	8,356	8,714
NO	4,079	4,233	4,478	4,799	4,858	5,511	6,037
TR	44,990	55,561	64,693	72,561 *	73,723 *	82,168	-
BA	4,092	4,347	3,830	3,842	-	-	-
HR	4,601	4,784	4,437	4,429	-	-	-
RS	9,262	9,885	7,516	7,321	7,276	7,066	6,950
UA	-	51,838	49,429	46,143	45,963	40,481	-

* TR Result of Address Based Population Registration System, 31 December 2008/2010.
Others are estimated based on Address Based Population Registration System.

1.2 General Presentation of the Electricity Sector in 2010

TABLE 1.2.1

Number and Market Shares of Companies in the Electricity Sector

The table below shows the number and the market share of generation, transmission, distribution and supply companies in the European electricity sector in 2010, including some Energy Community members.

Country	Generation*		Transmission	Distribution	Supply*	
	Number	Market Share	Number	Number	Number	Market Share
AT	6	-	3	138	6	-
BE	-	-	-	-	-	-
BG	7	-	1	8	-	-
CY	1	-	1	1	1	-
CZ	1	-	1	3	3	-
DE	4	70%	4	880	3	37%
DK	2	-	1	73	26	-
EE	-	-	-	-	-	-
ES	-	-	-	-	-	-
FI	-	-	1	85	-	-
FR	-	-	1	-	-	-
UK	7	78%	4	15	6	100%
GR	1	77%	1	1	1	95,82%
HU	3	67%	1	6	5	71,8%
IE	4	81%	1	1	5	98%
IT	5	60%	1	144	3	55%
LT	6	86%	1	2	3	96%
LU	7	95%	1	6	21	100%
LV	1	78%	1	11	2	95%
MT	1	100%	0	1	1	100%
NL	4	-	1	11	4	
PL	8	76,08%	1	33	5	100%
PT	2	61,7%	1	3	3	93%
RO	-	-	-	-	-	-
SE	3	80%	1	173	-	-
SI	-	-	-	-	-	-
SK	1	-	1	3	-	-
CH	-	-	1	730	-	
NO	5	-	1	155	4	
TR	3	53%	1	21	3	53%
BA	-	-	1	-	-	-
RS	1	99%	1	5	1	99%

Notes:

- Figures are the best estimates
- **Generation:** includes entities which have a share equal or greater to 5% of production
- **Transmission:** TSOs – Transmission System Operators
- **Distribution:** distribution companies
- **Supply:** companies selling electricity to end-users (includes entities which have a share equal or greater to 5% of supply)

The remainder is met by other generation or supply companies. Any assessment of the market situation must also take net imports into consideration *(see tables under point 4.3)*.

TABLE 1.2.2

NUMBER OF EMPLOYEES, ANNUAL INVESTMENTS AND TURNOVER

The table below shows the number of employees, the annual investments and turnover in million of euros in 2010 of the electricity sector in each EU 27 Member States plus Switzerland, Norway, Turkey and of some Energy Community members.

	EMPLOYEES (NUMBER)	ANNUAL INVESTMENTS (MILLION OF EUR)	TURNOVER (MILLION OF EUR)
AT	-	-	-
BE	-	-	-
BG	-	-	-
CY	2,200	181	595
CZ	17,000	800	3,000
DE	-	-	-
DK	-	-	-
EE	-	-	-
ES	-	-	-
FI	10,200	2,000	14,100
FR	-	-	-
UK	-	-	-
GR	21,845	963	5,811
HU	22,000	-	2,750
IE	-	-	-
IT	-	-	-
LT	6,715	179	1,200
LU	-	-	-
LV	-	-	-
MT	1,041	154	339
NL	-	-	-
PL	72,883	1,909	11,500
PT	-	-	-
RO	-	-	-
SE	-	-	-
SI	-	-	-
SK	-	-	-
CH	-	-	-
NO	11,500	940	6,772
TR	-	-	-
BA	-	-	-
RS	29,350	-	-

Note: Data for Greece represent only data from PPC SA.

Note: The EU-27 exists since the last enlargement in 2007 so that mentioning EU-27 for 1980 is indeed incorrect. What is referred to here as 1980 EU-27 data is indeed the historical data for the respective countries, becoming EU members in 2004 and 2007.

2. Demand

2.1 Annual Electricity and Peak Demand

TABLE 2.1.1

Annual Electricity and Peak Demand

The tables below present the evolution of the annual total (in TWh) and peak (in MW) demands for both connected and total systems in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community member states, between 1980 and 2010. Forecasts for 2020 and 2030 are also displayed. Where available, the date of the peak demand, i.e. the month during which the demand in the energy system occurs, is shown.

Please note that isolated systems, such as islands which are not connected to the mainland, are included in the category 'total system' and excluded from the category 'connected system'.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Total System							
Peak Demand (MW)	5,700	7,400	8,800				
Total Demand (TWh)	36	47	57	64	65	73	79
Date of Peak Demand (month of the year)				1	1		
Connected System (*)							
Peak Demand (MW)	5,700	7,400	8,800	9,700	9,748		
Total Demand (TWh)	36	47	57	64	65	73	79
Date of Peak Demand (month of the year)							
Use factor of Connected Peak Demand (h/a)	6,368	6,338	6,466				
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Total System							
Peak Demand (MW)	7,900	10,428	12,653	13,838	14,391	15,145	
Total Demand (TWh)	47,643	62,608	82,851	83,806	90,427	94,30	101,90
Date of Peak Demand (month of the year)	12	12	1	1	12		
Connected System (*)							
Peak Demand (MW)	-	10,428	12,653	13,838	14,391		
Total Demand (TWh)	47,643	62,608	82,851	83,806	90,427		
Date of Peak Demand (month of the year)	12	12	1	1	12		
Use factor of Connected Peak Demand (h/a)	6,038	6,004	6,543	-	-		
Peak Demand (connected system), 3rd Wednesday, 18:00h CET	-	-	12,244	12,340	13,766		

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	6,900	8,100	7,100		7,270	10,500	13,340
Total Demand (TWh)	35	41	32	30	33	53	67
Date of Peak Demand (month of the year)	12	12	1		1	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	6,900	8,100	7,100		7,270	10,500	13,340
Total Demand (TWh)	35	41	32		33	53	67
Date of Peak Demand (month of the year)	12	12	1		1	12	12
Use factor of Connected Peak Demand (h/a)	5,049	5,079	4,485		6	5,019	5,052
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	200	372	688	1,098	1,148	1,525	2,150
Total Demand (TWh)	1	2	3	5	5	6	12
Date of Peak Demand (month of the year)	7	7	7	7	8	7	7
CONNECTED SYSTEM (*)							
Peak Demand (MW)	200	372	688		1,191	1,650	2,150
Total Demand (TWh)	1	2	3		5	7	12
Date of Peak Demand (month of the year)	7	7	7		7	7	7
Use factor of Connected Peak Demand (h/a)	0	0	0		0	0	0
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)		9,000	9,000	11,159	11,204	14,000	14,500
Total Demand (TWh)	47	57	57	62	64	78	83
Date of Peak Demand (month of the year)		2	1	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)		9,000	9,000	11,159	11,204	14,000	14,500
Total Demand (TWh)		57	57	62	64	78	83
Date of Peak Demand (month of the year)		2	1	1	1	1	1
Use factor of Connected Peak Demand (h/a)		6,333	6,333	5,520	5,712	6,458	6,640
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	52,200	63,100	76,800	73,000	79,300	74,000	73,000
Total Demand (TWh)	351	415	536	535	565	507	474
Date of Peak Demand (month of the year)			11	12	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	52,200	63,100	76,800	73,000	79,300	74,000	73,000
Total Demand (TWh)	351	415	536	536	565	507	474
Date of Peak Demand (month of the year)			11	12	12	12	12
Use factor of Connected Peak Demand (h/a)			6,973	7,337	7,125	6,851	6,493
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	4,700	5,900	6,200	6,300	6,300	6,900	8,000
Total Demand (TWh)	24	31	35	34	35	38	44
Date of Peak Demand (month of the year)	2	2	2	1	2	2	2
CONNECTED SYSTEM (*)							
Peak Demand (MW)	4,700	5,900	6,200	6,300	6,800	6,900	8,000
Total Demand (TWh)	24	31	35	34	35	41	45
Date of Peak Demand (month of the year)	2	2	2	1	2	2	2
Use factor of Connected Peak Demand (h/a)	5,085	5,220	5,600	5,400	5,600	5,600	5,600
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)			1,262	1,513	1,590	1,767	
Total Demand (TWh)	6	8	7	9	8	10	
Date of Peak Demand (month of the year)			12	12	2	1	
CONNECTED SYSTEM (*)							
Peak Demand (MW)			1,262	1,513	1,590	1,767	
Total Demand (TWh)				9		10	
Date of Peak Demand (month of the year)				12		1	
Use factor of Connected Peak Demand (h/a)							
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	19,151	26,292	35,275	47,397	45,317	55,554	66,374
Total Demand (TWh)	102	146	215	274	278	340	411
Date of Peak Demand (month of the year)							
CONNECTED SYSTEM (*)							
Peak Demand (MW)	18,572	25,160	33,236	44,440	42,346	51,634	61,338
Total Demand (TWh)	96	135	204	261	250	319	384
Date of Peak Demand (month of the year)	1	1	1	1	1	1	1
Use factor of Connected Peak Demand (h/a)	6,464	6,464	6,464	5,879	5,903	6,178	6,268
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	6,600	10,450	12,400	13,300	14,600	16,500	18,100
Total Demand (TWh)	40	62	79	81	88	99	109
Date of Peak Demand (month of the year)	2	1	1	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	6,600	10,450	12,400	13,300	14,600	16,500	18,100
Total Demand (TWh)	40	62	79	81	88	99	109
Date of Peak Demand (month of the year)	2	1	1	1	1	1	1
Use factor of Connected Peak Demand (h/a)	6,049	5,965	6,384	6,113	6,007	6,000	6,022
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	44,100	63,400	72,400	92,400	96,710	107,300	113,200
Total Demand (TWh)	249	350	441	487	513	523	554
Date of Peak Demand (month of the year)	12	12	1	1	12	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	44,100	63,400	72,400	92,400	96,710	107,300	113,200
Total Demand (TWh)	249	350	441	487	513	523	554
Date of Peak Demand (month of the year)	12	12	1	1	12	1	1
Use factor of Connected Peak Demand (h/a)	5,639	6	6,086	5,270	5,310		
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	52,100	57,300	64,100	66,613	62,029	59,601	65,037
Total Demand (TWh)	265	309	372	347	354	346	377
Date of Peak Demand (month of the year)	1	12	12	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	52,100	57,300	64,100	66,613	62,029	59,601	65,037
Total Demand (TWh)	265	309	372	358	354	346	377
Date of Peak Demand (month of the year)	1	12	12	1	1	1	1
Use factor of Connected Peak Demand (h/a)	5,080	5,400	5,800	5,378	5,700	5,800	5,800
Peak Demand (connected system), 3rd Wednesday, 18:00h CET	49,495	54,435	60,895	63,282	58,927	56,621	61,785

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,554	4,924	8,531	9,762	9,794	10,906	
Total Demand (TWh)	22	33	50	59	59	64	
Date of Peak Demand (month of the year)	12	12	7	7	7	7	
CONNECTED SYSTEM (*)							
Peak Demand (MW)**	3,554	4,924	8,531	9,762	9,794	10,906	
Total Demand (TWh)	21	30	45	53	54	59	
Date of Peak Demand (month of the year)	12	12	7	7	7	7	
Use factor of Connected Peak Demand (h/a)	5,880	6,240	5,320	5,460	5,463	5,401	
Peak Demand (connected system), 3rd Wednesday, 18:00h CET				7,343	7,852	8,647	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	5,127	6,554	5,800	5,997	6,064	7,065	8,200
Total Demand (TWh)	31	40	39	39	40	47	54
Date of Peak Demand (month of the year)	12	12	12	1	12	7	7
CONNECTED SYSTEM (*)							
Peak Demand (MW)	5,107	6,534	5,742	5,997	6,064	7,065	8,200
Total Demand (TWh)	31	39	38	39	40	47	54
Date of Peak Demand (month of the year)	12	12	12	1	12	7	7
Use factor of Connected Peak Demand (h/a)	6,070	5,969	6,618	6,487	6,565	6,653	6,610
Peak Demand (connected system), 3rd Wednesday, 18:00h CET				5,691	5,866	6,700	7,770

(*) Without isolated system

(**) Peak demand in 2020 includes additional loads due to the interconnection of Cyclades and Crete to the Mainland

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1,800	2,500	3,800	4,987	5,026	5,243	6,085
Total Demand (TWh)	10	14	23	25	25	31	35
Date of Peak Demand (month of the year)	1	12	12	1	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	1,800	2,500	3,800	4,637	5,026	5,224	6,085
Total Demand (TWh)	10	13	22	25	25	30	35
Date of Peak Demand (month of the year)	1	12	12	1	12	12	12
Use factor of Connected Peak Demand (h/a)	5,123	5,344	5,700	4,987	5,026	5,243	6,085
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	31,400	40,500	49,019	51,873	56,425		
Total Demand (TWh)	180	235	299	320	331		
Date of Peak Demand (month of the year)	12	12	12	7	7		
CONNECTED SYSTEM (*)							
Peak Demand (MW)	31,400	40,500	49,019	56,425	56,425		
Total Demand (TWh)	180	235	299	320	330		
Date of Peak Demand (month of the year)	12	12	12	7	7		
Use factor of Connected Peak Demand (h/a)	5,742	5,804	6,089	6,174	5,856		
Peak Demand (connected system), 3rd Wednesday, 18:00h CET	0	0	48,313	50,963	54,925		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	2,200	2,800	1,500	1,824	1,817	2,280	3,140
Total Demand (TWh)	11	14	8	10	10	13	19
Date of Peak Demand (month of the year)			12	12	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	2,200	2,800	1,500	1,824	1,817	2,280	3,140
Total Demand (TWh)	11	14	8	10	10	13	19
Date of Peak Demand (month of the year)			12	12	12	12	12
Use factor of Connected Peak Demand (h/a)	4,955	5,105	5,500	5,580	5,658	5,850	6,006
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	500	600	900	1,037	1,080	1,300	1,500
Total Demand (TWh)	4	4	6	6	7	7	8
Date of Peak Demand (month of the year)				12	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	500	600	900	1,037	1,080	1,300	1,500
Total Demand (TWh)	4	4	6	6	7	7	8
Date of Peak Demand (month of the year)				12	12	12	12
Use factor of Connected Peak Demand (h/a)	7,200	7,000	6,333	5,979	6,181	5,538	5,000
Peak Demand (connected system), 3rd Wednesday, 18:00h CET					1,050	1,180	1,320

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1,700	1,900	1,200	1,340	1,320	1,650	1,970
Total Demand (TWh)	8	10	6	7	7	9	11
Date of Peak Demand (month of the year)	12	12	1	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	1,700	1,900	1,200	1,340	1,320	1,650	1,970
Total Demand (TWh)	8	10	6	7	7	9	11
Date of Peak Demand (month of the year)	12	12	1	1	1	1	1
Use factor of Connected Peak Demand (h/a)	4,710	5,210	4,750	5,223	5,503	5,390	5,480
Peak Demand (connected system), 3rd Wednesday, 18:00h CET				1,270			

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	102	230	354	403	400		
Total Demand (TWh)	0	1	2	2	2		
Date of Peak Demand (month of the year)	12	12	1	8	7		
CONNECTED SYSTEM (*)							
Peak Demand (MW)	0	0	0	0	0		
Total Demand (TWh)	0	0	0	0	0		
Date of Peak Demand (month of the year)	0	0	0	0	0		
Use factor of Connected Peak Demand (h/a)	0	0	0	0	0		
Peak Demand (connected system), 3rd Wednesday, 18:00h CET	0	0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	11,000	13,000	15,180	17,685	18,151	20,410	23,690
Total Demand (TWh)	60	76	105	114	117	132	153
Date of Peak Demand (month of the year)	12	12	12	12	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	11,000	13,000	15,180	17,685	18,151	20,410	23,690
Total Demand (TWh)	60	76	105	114	117	132	153
Date of Peak Demand (month of the year)	12	12	12	12	12	12	12
Use factor of Connected Peak Demand (h/a)	5,400	6,000	6,897	6,450	6,450	6,450	6,450
Peak Demand (connected system), 3rd Wednesday, 18:00h CET			12,255	17,840	17,187	20,300	23,500

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	19,133	21,476	20,471	22,552	23,543	28,764	37,554
Total Demand (TWh)	112	119	124	136	142	172	222
Date of Peak Demand (month of the year)	1	1	1	12	1	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	19,133	21,476	20,471	22,552	23,543	28,764	37,554
Total Demand (TWh)	112	119	124	136	142	172	222
Date of Peak Demand (month of the year)	1	1	1	12	1	12	12
Use factor of Connected Peak Demand (h/a)	5,843	5,560	6,057	6,026	6,015	5,973	5,914
Peak Demand (connected system), 3rd Wednesday, 18:00h CET		19,986	19,716	22,191	22,597	26,752	34,927

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,055	4,969	7,585	9,641	9,836	9,108	10,677
Total Demand (TWh)	17	27	43	53	55	52	61
Date of Peak Demand (month of the year)	1	12	1	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	3,000	4,861	6,909	9,217	9,403	8,800	10,315
Total Demand (TWh)	16	27	38	50	52	50	59
Date of Peak Demand (month of the year)	1	12	1	1	1	1	1
Use factor of Connected Peak Demand (h/a)	5,389	5,456	5,490	5,412	5,551	5,692	5,698
Peak Demand (connected system), 3rd Wednesday, 18:00h CET	0	0	5,752	8,019	7,245	0	0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	9,100	9,600	7,370		7,890	10,525	13,769
Total Demand (TWh)	62	66	46	55	51	64	81
Date of Peak Demand (month of the year)	12	4	1		12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	9,100	9,600	7,370		7,890	10,525	13,769
Total Demand (TWh)	62	66	46		51	64	81
Date of Peak Demand (month of the year)	12	4	1		12	12	12
Use factor of Connected Peak Demand (h/a)	6,808	6,890	6,296		6,419	6,100	5,880
Peak Demand (connected system), 3rd Wednesday, 18:00h CET					6,375	9.,528	11,810

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	17,700	23,300	26,000	24,800	26,300	24,400	24,200
Total Demand (TWh)	94	140	147	138	147	146	148
Date of Peak Demand (month of the year)	2	11	1	1	12	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	17,700	23,300	26,000	24,800	26,300	24,400	24,200
Total Demand (TWh)	94	140	147	138	147	146	148
Date of Peak Demand (month of the year)	2	11	1	1	12	1	1
Use factor of Connected Peak Demand (h/a)	5,309	6,006	5,637	5,560	5,589	6,000	6,100
Peak Demand (connected system), 3rd Wednesday, 18:00h CET			23,800	22,240	24,127		

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1,400	1,700	1,700		2,241	2,476	
Total Demand (TWh)	6	9	12	12	16	15	
Date of Peak Demand (month of the year)	12	12	12		12	12	
CONNECTED SYSTEM (*)							
Peak Demand (MW)	1,400	1,700	1,700		2,241	2,476	
Total Demand (TWh)	6	9	12		16	18	
Date of Peak Demand (month of the year)	12	12	12		12	12	
Use factor of Connected Peak Demand (h/a)	4,900	5,100	5,300		5,400	5,500	
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,300	4,100	4,050		4,800	5,600	6,200
Total Demand (TWh)	22	27	26	25	27	35	40
Date of Peak Demand (month of the year)			1		12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	3,300	4,100	4,050		4,800	5,600	6,200
Total Demand (TWh)	22	27	26		31	35	40
Date of Peak Demand (month of the year)			1		12	12	12
Use factor of Connected Peak Demand (h/a)			6,425		6,458	6,286	6,370
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	6,700	8,500	9,000	10,249	10,749		
Total Demand (TWh)	39	50	56	62	64	69	72
Date of Peak Demand (month of the year)	1	12	1	12	12		
CONNECTED SYSTEM (*)							
Peak Demand (MW)	6,700	8,500	9,000	10,249	10,749		
Total Demand (TWh)	39	50	56	62	64	69	72
Date of Peak Demand (month of the year)	1	12	1	12	1		
Use factor of Connected Peak Demand (h/a)							
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	14,098	17,047	20,216	21,984	23,994	24,500	25,500
Total Demand (TWh)	82	105	122	123	132	136	140
Date of Peak Demand (month of the year)	2	11	12	1	1	1	1
CONNECTED SYSTEM (*)							
Peak Demand (MW)	14,098	17,047	20,216	21,984	23,994	24,500	25,500
Total Demand (TWh)	82	105	122	123	132	136	140
Date of Peak Demand (month of the year)	2	11	12	1	1	1	1
Use factor of Connected Peak Demand (h/a)	5,833	6,131	6,030	5,586	5,501	5,551	5,490
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,947	9,180	19,524	29,870	33,392		
Total Demand (TWh)	23	54	122	186	202		
Date of Peak Demand (month of the year)	11	12	11	8	8		
CONNECTED SYSTEM (*)							
Peak Demand (MW)	3,947	9,180	19,524	29,870	33,392		
Total Demand (TWh)	23	54	122	186	202		
Date of Peak Demand (month of the year)	11	12	11	8	8		
Use factor of Connected Peak Demand (h/a)	5,878	5,828	6,254	6,224	6,058		
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

(*) Without isolated system

TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1	2	2	2		3	
Total Demand (TWh)	7	12	9	12	12	18	
Date of Peak Demand (month of the year)	12	1	12	1			
CONNECTED SYSTEM (*)							
Peak Demand (MW)	1	2	2	2		3	
Total Demand (TWh)	7	12	9	12		18	
Date of Peak Demand (month of the year)	12	1	12	1			
Use factor of Connected Peak Demand (h/a)	5,993	5,882	5,719	5,704		6,780	
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)				3		4	5
Total Demand (TWh)	12	15	14	18	18	24	32
Date of Peak Demand (month of the year)							
CONNECTED SYSTEM (*)							
Peak Demand (MW)							
Total Demand (TWh)							
Date of Peak Demand (month of the year)							
Use factor of Connected Peak Demand (h/a)							
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,806	5,053	6,593	6,383	6,579	7,030	7,750
Total Demand (TWh)	19	28	30	33	34	39	43
Date of Peak Demand (month of the year)	12	1	1	1	12	12	12
CONNECTED SYSTEM (*)							
Peak Demand (MW)	3,806	5,053	6,593	6,383	6,579	7,030	7,750
Total Demand (TWh)	19	28	30	33	34	39	43
Date of Peak Demand (month of the year)	12	1	1	1	12	12	12
Use factor of Connected Peak Demand (h/a)	5	5	4	5	5	6	6
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)							
Total Demand (TWh)			167	168	183	237	309
Date of Peak Demand (month of the year)							
CONNECTED SYSTEM (*)							
Peak Demand (MW)							
Total Demand (TWh)							
Date of Peak Demand (month of the year)							
Use factor of Connected Peak Demand (h/a)							
Peak Demand (connected system), 3rd Wednesday, 18:00h CET							

(*) Without isolated system

2.2 Sectoral Breakdown

TABLE 2.2.1

Breakdown of Total Demand (TWh)

The tables below display the breakdown of total demand (in TWh) between 1980 and 2010 in each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community member states. Forecasts for 2020 and 2030 are also presented.

Network losses are expressed both in TWh and as a percentage (%) of the total electricity demand of each country.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	33.7	43.9	53.7	60.5	61.5	69.1	74.7
of which Agriculture	1.1	1.3	1.3	0.8	0.8	0.8	0.8
Industry	19.2	24.7	21.6	26.7	27.2	29.7	31.2
Transport	2.3	2.7	3.6	3.5	3.5	5.9	9.3
Services	2.3	4.0	12.4	12.3	12.5	14.1	14.2
Households	8.8	11.2	14.8	17.2	17.4	18.6	19.2
Network Losses - in TWh	2.6	3.0	3.2	3.5	3.5	3.7	3.8
Network Losses - in %	7.2	6.4	5.6	5.5	5.4	5.1	4.8
Total Electricity Demand	36.3	46.9	56.9	64.0	65.0	72.8	78.5

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	45.0	59.0	79.9	79.6	85.6	90.0	98.0
of which Agriculture		0	0.3	1.0	0.8	0.8	0.9
Industry		31.6	41.4	35.0	40.7	42.1	44.2
Transport		1.2	1.4	1.8	1.7	3.3	3.3
Services		7.8	12.2	21.4	22.2	22.0	23.3
Households		18.4	23.7	20.2	20.2	22.3	26.3
Network Losses - in TWh	2.7	3.6	3.7	4.0	4.2	4.3	3.9
Network Losses - in %	5.7	5.8	4.5	4.8	4.6	4.6	3.8
Total Electricity Demand	47.7	62.6	82.8	83.8	90.4	94.3	101.9

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	31.5	36.9	25.4	32.6	27.1	46.6	61.2
of which Agriculture	1.1	1.0	0.2		0.2	0.2	0.3
Industry	18.5	20.3	13.0		7.8	29.6	36.8
Transport	0.9	1.3	0.4		0.4	1.1	1.5
Services	4.2	3.8	2.0		8.1	5.0	9.7
Households	6.8	10.5	9.8		10.6	10.7	12.9
Network Losses - in TWh	3.5	4.3	6.3	4.6	4.5	6.1	6.2
Network Losses - in %	10.0	10.4	19.9	15.1	13.8	11.6	9.2
Total Electricity Demand	34.9	41.2	31.7	30.4	32.5	52.7	67.4

TABLE 2.2.1 Breakdown of Total Demand (TWh)

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	0.7	1.5	3.1	4.7	4.8	6.4	
of which Agriculture	0	0.1	0.1	0.1	0.2	0.2	
Industry	0.3	0.4	0.6	0.8	0.8	1.0	
Transport	0	0	0	2.0	2.1	2.8	
Services	0.2	0.5	1.3	1.7	1.7	2.5	
Households	0.2	0.5	1.1	0.2	0.2		
Network Losses - in TWh	0.1	0.1	0.2	3.9	2.9		
Network Losses - in %	12.5	5.3	6.3	83.9	61.5		
Total Electricity Demand	0.8	1.9	3.2	4.7	4.8	6.4	11.5

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	43.1	53.0	52.3	57.1	59.3	71.3	76.6
of which Agriculture	1.8	2.1	1.2	1.1	1.1	1.2	1.3
Industry	23.9	28.2	24.5	29.2	31.1	35.6	37.7
Transport	2.7	3.1	2.7	2.3	2.3	3.7	4.2
Services	8.5	10.0	10.1	10.3	10.6	14.1	15.8
Households	6.2	9.6	13.8	14.2	14.2	16.9	17.7
Network Losses - in TWh	3.6	4.0	4.7	4.5	4.5	6.1	6.4
Network Losses - in %	7.7	7.0	8.2	7.3	7.1	7.9	7.7
Total Electricity Demand	46.7	57.0	57.0	61.6	63.7	77.5	83.0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	337.0	398.2	501.4	509.8	541.1	483.0	453.0
of which Agriculture	7.0	7.2	7.5	8.6	9.0	8.0	8.0
Industry	175.0	199.0	239.1	226.6	250.2	210.0	195.0
Transport	11.0	11.0	15.9	15.9	16.7	20.0	25.0
Services	58.0	81.0	108.4	119.5	123.5	115.0	105.0
Households	86.0	100.0	130.5	139.2	141.7	130.0	120.0
Network Losses - in TWh	14.0	17.0	34.1	25.0	23.9	24.0	21.0
Network Losses - in %	4.0	4.1	6.4	4.7	4.2	4.7	4.4
Total Electricity Demand	351.0	415.2	535.5	534.8	565.0	507.0	474.0

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	21.8	28.6	32.4	32.2	32.8	35.8	41.1
of which Agriculture	1.9	2.4	2.6	2.5	2.5	2.8	2.8
Industry	5.5	8.4	9.6	8.3	8.5	10.2	11.9
Transport	0.1	0.2	0.5	0.6	0.6	0.5	0.5
Services	6.9	8.6	10.2	11.4	11.5	12.2	14.2
Households	7.4	9.0	9.5	9.5	9.8	10.1	11.7
Network Losses - in TWh	2.1	2.2	2.3	1.8	1.8	2.4	2.7
Network Losses - in %	8.8	7.1	6.6	5.3	5.2	6.3	6.2
Total Electricity Demand	23.9	30.8	34.7	34.0	34.7	38.2	43.8

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	5.5	7.3	5.4	7.8	7.2	9.3	
of which Agriculture	1.2	2.0	0.2	0.1		0.8	
Industry	3.0	3.5	2.2	3.3		5.4	
Transport	0.7	0.8	1.5	0.1		0.1	
Services	0.1	0.2	0.1	2.4		1.7	
Households	0.5	0.9	1.5	1.9		1.3	
Network Losses - in TWh	1.0	1.1	1.2	0.9	1.1	0.8	
Network Losses - in %	14.9	13.6	18.6	10.3	13.1	7.6	
Total Electricity Demand	6.5	8.4	6.7	8.7	8.3	10.1	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	92.0	131.0	198.0	253.0	252.8	315.0	383.0
of which Agriculture	2.0	4.0	5.0	5.0	5.3	6.0	6.0
Industry	57.0	68.0	86.0	95.0	97.0	116.0	134.0
Transport	2.0	4.0	4.0	7.0	4.3	7.0	10.0
Services	12.0	25.0	53.0	78.0	75.7	96.0	119.0
Households	20.0	31.0	50.0	68.0	70.4	91.0	115.0
Network Losses - in TWh	10.0	15.0	17.0	21.0	20.9	25.0	28.0
Network Losses - in %	9.8	10.3	7.9	7.7	7.5	7.4	6.8
Total Electricity Demand	102.0	146.0	215.0	274.0	278.0	340.0	411.0

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	37.6	59.5	76.5	78.5	84.9	96.0	106.0
of which Agriculture	0.5	1.0	0.8	0.9	0.9	1.0	1.0
Industry	23.2	33.0	43.7	37.3	41.5	51.0	56.0
Transport	0.2	0.4	0.5	0.7	0.7	1.0	3.0
Services	5.5	10.4	13.3	17.6	18.2	20.0	22.0
Households	8.2	14.6	18.1	22.0	23.6	23.0	24.0
Network Losses - in TWh	2.3	2.9	2.6	2.8	2.8	3.0	3.0
Network Losses - in %	5.8	4.7	3.3	3.4	3.2	3.0	2.8
Total Electricity Demand	39.9	62.3	79.2	81.3	87.7	99.0	109.0

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	231.5	322.9	410.7	453.1	476.1	487.0	515.9
of which Agriculture	1.5	2.1	2.7	3.4	3.4	39.0	4.2
Industry	117.9	141.2	167.6	146.5	151.7	144.4	146.9
Transport	6.9	6.7	8.9	8.8	8.8	17.9	32.3
Services	43.6	76.0	102.8	139.1	145.0	149.1	156.0
Households	61.5	96.9	128.7	155.2	167.1	171.7	176.5
Network Losses - in TWh	17.2	26.6	29.9	33.6	37.1	36.1	38.4
Network Losses - in %	6.9	7.6	6.8	6.9	7.2	6.9	6.9
Total Electricity Demand	248.7	349.6	440.6	486.7	513.2	523.1	554.3

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	243.2	284.4	340.3	330.0	337.0	330.0	360.0
of which Agriculture	4.0	3.8	4.4	4.0	4.0	5.0	5.0
Industry	98.7	110.6	125.0	108.0	113.0	122.0	130.0
Transport	3.0	5.3	8.6	4.0	4.0	5.0	5.0
Services	51.4	70.9	90.5	96.0	97.0	101.0	109.0
Households	86.1	93.8	111.8	119.0	119.0	95.0	111.0
Network Losses - in TWh	21.6	25.0	31.2	17.0	16.0	16.0	18.0
Network Losses - in %	8.2	8.1	8.4	4.9	4.5	4.6	4.8
Total Electricity Demand	264.8	309.4	371.5	347.0	354.0	346.0	377.0

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	20.3	29.6	45.4	54.1	54.4	58.8	
of which Agriculture	0.4	1.5	2.9	2.5	2.5	2.7	
Industry	10.9	13.3	15.9	13.7	13.7	15.3	
Transport	0.1	0.1	0.1	0.1	0.1	0.1	
Services	3.3	5.6	12.3	19.7	20.2	21.5	
Households	5.6	9.1	14.2	18.1	17.9	19.2	
Network Losses - in TWh	1.6	2.9	4.5	4.8	4.8	5.1	
Network Losses - in %	7.3	8.9	9.0	8.1	8.1	8.0	
Total Electricity Demand	21.9	32.5	49.9	58.9	59.2	63.9	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	28.2	35.5	33.9	35.3	36.0	42.7	49.2
of which Agriculture	1.5	1.6	1.0	0.7	0.6	0.9	1.0
Industry	19.2	18.4	15.5	12.0	13.2	16.0	18.0
Transport	0.6	1.4	1.8	1.9	2.0	3.0	5.0
Services	2.5	5.4	5.8	9.5	9.2	9.8	11.2
Households	4.4	8.7	9.8	11.2	11.0	13.0	14.0
Network Losses - in TWh	3.1	4.1	4.7	3.6	3.8	4.3	5.0
Network Losses - in %	9.9	10.4	12.2	9.3	9.5	9.1	9.2
Total Electricity Demand	31.3	39.6	38.6	38.9	39.8	47.0	54.2

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	8.4	11.8	20.3		28.9	32.6	37.8
of which Agriculture					0.6	0.6	0.7
Industry	3.1	4.4	7.8		9.6	9.0	10.5
Transport					0.1	0.1	0.1
Services	1.8	2.8	5.5		9.3	10.8	12.5
Households	3.5	4.6	7.0		10.0	2.5	2.8
Network Losses - in TWh	1.1	1.2	2.0		3.0		
Network Losses - in %	11.0	8.9	8.8		11.8		
Total Electricity Demand	10.0	13.5	22.7	25.1	25.4	31.4	35.3

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	163.6	218.7	279.3	299.9	309.9		
of which Agriculture	2.6	4.2	4.9	5.7	5.6		
Industry	100.0	119.5	148.2	130.5	138.4		
Transport	48.0	6.3	8.5	10.5	10.7		
Services	18.4	36.0	56.6	84.3	85.6		
Households	37.8	52.7	61.1	68.9	69.6		
Network Losses - in TWh	16.6	16.4	19.2	20.4	20.6		
Network Losses - in %	9.2	7.0	6.4	6.4	6.2		
Total Electricity Demand	180.3	235.1	298.5	320.3	330.5		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	9.5	12.8	7.0	9.2	9.2	12.0	17.2
of which Agriculture	1.8	2.7	0.2	0.2	0.2	0.2	0.3
Industry	5.0	6.2	3.3	2.7	3.1	3.9	5.6
Transport	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Services	1.4	1.9	1.6	3.5	3.3	4.5	6.4
Households	1.1	1.8	1.8	2.8	2.6	3.3	4.7
Network Losses - in TWh	1.4	1.5	1.3	1.0	1.1	1.4	1.7
Network Losses - in %	12.8	10.5	15.7	9.8	10.7	10.5	9.0
Total Electricity Demand	10.9	14.3	8.3	10.2	10.3	13.3	18.9

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	3.5	4.1	5.6	6.2	6.8	7.2	7.5
of which Agriculture				0.1	0.1	0.1	0.1
Industry				3.9	4.5	4.6	4.7
Transport				0.1	0.1	0.2	0.3
Services				1.0	1.1	1.2	1.2
Households				0.9	1.0	1.0	1.1
Network Losses - in TWh				0.1	0.1	0.1	0.1
Network Losses - in %				1.6	1.5	1.4	1.3
Total Electricity Demand	3.6	4.2	5.8	6.2	6.7	7.2	7.5

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	6.7	8.7	4.7	6.2	6.3	7.8	9.5
of which Agriculture	1.2	1.6	0.1	0.1	0.1	0.2	0.3
Industry	3.3	3.9	1.6	1.5	1.5	2.3	3.1
Transport	0.2	0.2	0.2	0.1	0.1	0.2	0.3
Services	1.2	1.7	1.7	2.5	2.5	2.9	3.3
Households	0.8	1.3	1.1	2.0	2.1	2.2	2.5
Network Losses - in TWh	1.3	1.2	1.0	0.8	0.7	1.1	1.3
Network Losses - in %	16.3	12.0	17.5	11.4	9.6	12.4	12.0
Total Electricity Demand	8.0	9.9	5.7	7.0	7.3	8.9	10.8

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption			1.5	1.8	1.8		
of which Agriculture							
Industry							
Transport							
Services							
Households							
Network Losses - in TWh			0.3	0.2	0.2		
Network Losses - in %			17.3	9.9	8.0		
Total Electricity Demand	0.5	1.1	1.8	2.0	2.0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	57.2	72.4	100.6	109.7	112.7	126.7	147.1
of which Agriculture	2.0	1.9	11.9	8.2	6.3	7.1	8.3
Industry	31.0	32.0	38.0	41.2	45.0	50.7	58.8
Transport	1.3	1.3	1.8	2.2	2.3	2.5	2.9
Services	7.9	20.7	24.2	27.4	26.8	30.2	35.0
Households	15.3	16.5	24.6	30.7	32.3	36.3	42.1
Network Losses - in TWh	2.5	3.1	4.0	4.4	4.5	5.0	5.8
Network Losses - in %	4.2	4.1	3.8	3.9	3.8	3.8	3.8
Total Electricity Demand	59.7	75.5	104.7	114.1	117.1	131.7	152.9

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	99.6	108.0	109.8	123.4	129.7	154.3	199.3
of which Agriculture	5.8	8.1	4.8	0.5	0.5	2.8	2.8
Industry	66.8	54.7	53.3	54.8	53.3	67.2	73.7
Transport	4.8	6.0	5.8	4.2	4.8	5.6	6.8
Services	11.5	18.6	24.9	33.7	40.4	43.9	67.7
Households	10.7	20.6	21.0	30.2	30.7	34.8	48.3
Network Losses - in TWh	12.2	11.4	14.2	12.5	11.9	17.5	22.8
Network Losses - in %	10.9	9.5	11.5	9.2	8.4	10.2	10.3
Total Electricity Demand	111.9	119.4	124.0	135.9	141.6	171.8	222.1

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	14.6	23.8	38.9	48.8	50.5	47.8	56.1
of which Agriculture	0.1	0.3	0.7	1.0	1.0	0.9	1.1
Industry	8.4	11.5	15.8	16.4	17.5	16.1	18.6
Transport	0.3	0.3	0.5	0.7	0.7	0.8	1.1
Services	2.5	5.7	11.8	16.5	16.8	16.4	19.5
Households	3.3	5.9	10.0	14.2	14.5	13.6	15.9
Network Losses - in TWh	1.9	3.4	3.7	3.8	4.4	4.1	4.9
Network Losses - in %	11.5	12.5	8.7	7.2	8.0	7.9	8.0
Total Electricity Demand	16.5	27.1	42.5	52.6	55.0	52.0	61.0

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	57.9	60.3	39.8		44.7	56.9	72.5
of which Agriculture	2.8	3.2	0.6		0.5	0.8	1.1
Industry	45.2	46.0	26.5		26.0	33.3	42.0
Transport	1.9	2.6	1.9		1.6	2.0	2.5
Services	3.1	3.2	3.2		6.0	7.8	10.3
Households	4.9	5.3	7.6		10.6	13.1	16.6
Network Losses - in TWh	4.0	5.9	6.6		5.9	7.3	8.5
Network Losses - in %	6.5	8.9	14.2		11.7	11.3	10.4
Total Electricity Demand	62.0	66.1	46.4	55.2	50.6	64.2	81.0

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	85.8	130.7	135.5	128.3	136.3	135.3	136.3
of which Agriculture	2.5	3.2	3.0	3.0	3.2	2.8	2.8
Industry	42.1	65.1	65.3	56.2	60.3	59.1	57.0
Transport	2.3	2.5	3.2	2.4	2.4	4.1	8.5
Services	13.9	23.2	24.3	26.7	26.9	28.9	29.7
Households	25.1	36.7	39.7	39.9	43.5	40.5	38.4
Network Losses - in TWh	8.2	9.3	11.1	9.6	10.7	11.1	11.2
Network Losses - in %	8.7	6.6	7.6	7.0	7.3	7.6	7.6
Total Electricity Demand	94.0	139.9	146.6	137.9	147.0	146.4	147.5

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	5.1	8.6	10.7		15.3	14.0	
of which Agriculture	0.1	0.3			0.7		
Industry	1.7	2.6	5.7		4.7	6.8	
Transport	1.9	3.2	0.3		5.5	0.4	
Services	0.1	0.3	2.1		0.7	3.2	
Households	1.3	2.2	2.6		3.7	3.6	
Network Losses - in TWh	0.5	0.6	0.8		0.8	0.9	
Network Losses - in %	8.9	6.5	7.0		5.0	6.0	
Total Electricity Demand	5.6	9.2	11.5	12.3	16.1	14.9	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	20.5	25.1	23.7	24.3	28.5	32.3	36.5
of which Agriculture	1.2	1.3	0.9	0.3	1.1	1.3	1.4
Industry	13.6	15.2	11.5	12.0	13.0	14.1	15.7
Transport	0.8	1.1	1.0	0.5	1.3	1.4	1.5
Services	2.6	3.7	4.5	7.1	6.0	7.3	8.8
Households	2.3	3.8	5.8	4.4	7.1	8.2	9.1
Network Losses - in TWh	1.7	1.8	2.0	0.8	2.5	2.9	3.0
Network Losses - in %	7.7	6.7	7.8	3.1	9.4	8.2	7.6
Total Electricity Demand	22.2	26.9	25.7	25.4	26.6	35.2	39.5

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	35.3	46.6	52.4	57.5	59.8	64.6	67.1
of which Agriculture	0.4	0.9	1.0	1.0	1.0		
Industry	11.9	17.2	18.1	18.2	19.3		
Transport	2.1	4.0	4.2	4.7	4.9		
Services	10.8	11.3	13.4	15.7	16.0		
Households	10.1	13.2	15.7	17.9	18.6		
Network Losses - in TWh	3.2	3.7	3.9	4.3	4.5	4.8	5.0
Network Losses - in %	8.3	7.4	6.9	7.0	7.0	6.9	6.9
Total Electricity Demand	38.5	50.3	56.3	61.8	64.3	69.4	72.1

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	75.1	97.6	111.1	112.8	121.7	125.0	129.0
of which Agriculture			1.8	1.8	2.2	2.0	2.0
Industry	39.3	45.9	51.1	48.0	51.2	54.0	54.0
Transport	0.7	0.6	0.7	1.6	1.7	2.0	2.0
Services	11.5	19.9	23.2	25.3	26.8	28.0	30.0
Households	23.6	31.2	34.2	36.1	39.8	39.0	41.0
Network Losses - in TWh	7.1	6.9	10.8	10.0	10.3	11.0	11.0
Network Losses - in %	8.6	6.6	8.9	8.1	7.8	8.1	7.9
Total Electricity Demand	82.2	104.5	121.9	122.8	132.0	136.0	140.0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	20.4	46.8	98.3	156.9	172.1	434.5	
of which Agriculture	0.2	0.5	3.1	4.9	5.6	7.4	
Industry	12.2	27.3	48.8	70.5	79.3	227.8	
Transport	0.1	0.4	0.4	0.7	0.6	4.0	
Services	4.4	9.5	22.1	41.8	45.1	105.1	
Households	3.5	9.1	23.9	39.1	41.4	90.2	
Network Losses - in TWh	2.8	6.7	23.8	29.0	30.2	65.0	
Network Losses - in %	12.1	12.5	19.5	15.6	14.9		
Total Electricity Demand	23.2	53.5	122.1	185.9	202.3		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	6.6	10.2	7.7	10.0			
of which Agriculture	0.1	0.1	0.0	0.0			
Industry	3.6	5.8	3.1	3.9			
Transport	0.1	0.2	0.1	0.1			
Services	0.7	1.0	1.1	1.6			
Households	2.2	3.2	3.5	4.4			
Network Losses - in TWh	0.8	1.3	1.7	1.6			
Network Losses - in %	10.6	11.3	17.8	13.9			
Total Electricity Demand	7.4	11.5	9.4	11.6	12.3	17.9	

TABLE 2.2.1 BREAKDOWN OF TOTAL DEMAND (TWH)

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	12.0	15.7	14.7	18.5			
of which Agriculture	0.3	0.5	0.3	0.3			
Industry	5.2	5.9	2.8	3.3			
Transport	0.4	0.4	0.3	0.3			
Services	1.4	2.0	2.7	5.1			
Households	2.9	4.5	5.7	6.5			
Network Losses - in TWh	1.2	1.6	2.1	2.0			
Network Losses - in %	10.3	10.7	15.0	11.3			
Total Electricity Demand	11.7	15.0	14.0	17.7	18.0	24.0	32.0

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption	16.3	24.9	24.5	27.3	28.1	34.1	37.5
of which Agriculture	0.1	0.2	0.2	0.3	0.3		
Industry	9.1	13.2	5.8	7.0	7.7		
Transport	0.3	0.4	0.4	0.5	0.5		
Services	0.6	1.1	4.1	5.1	4.9		
Households	6.1	10.1	14.0	14.4	14.6		
Network Losses - in TWh	2.5	3.0	5.1	6.0	6.0	5.2	5.6
Network Losses - in %	12.9	10.7	17.2	17.9	17.6	13.3	12.9
Total Electricity Demand	19.4	27.7	29.6	33.3	34.1	39.4	43.1

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Final Consumption			122.9	134.3	147.2	189.6	247.5
of which Agriculture			16.8	18.4	20.0	25.9	33.9
Industry			62.5	63.8	71.3	96.4	125.8
Transport							
Services			43.6	52.1	56.0	67.3	87.8
Households							
Network Losses - in TWh			44.0	34.2	36.1	47.4	61.9
Network Losses - in %			26.4	20.3	19.7	20.0	20.0
Total Electricity Demand			166.9	168.5	183.4	237.0	309.4

3. Supply

3.1 Generation Equipment – Capacity

TABLE 3.1.1.1

Generation Equipment – Capacity by Primary Energy (MW)

The tables below display the generating capacity by primary energy in the 27 EU Member States plus installed capacity in Switzerland, Norway, Turkey and some Energy Community member states, between 1980 and 2010. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

EU-27

	1980	1990	2000	2009	2010	2020	2030
Nuclear	42,376	125,380	136,847	132,960	131,696	123,761	120,577
Fossil Fuel Fired	301,755	325,467	381,298	443,333	449,860	472,094	352,500
of which multifuel	35,323	42,673	59,625	49,417	51,193	8,101	7,098
Hard Coal	120,257	134,154	122,170	109,772	111,745	94,688	70,065
Brown Coal	37,350	47,914	55,994	46,613	53,955	47,404	29,366
Oil	69,995	55,964	51,334	45,888	46,237	16,218	14,063
Natural Gas	34,885	40,161	90,089	142,337	157,789	191,900	197,711
Derived Gas	1,913	2,599	7,884	6,850	7,259	4,075	3,945
Hydro	99,166	124,071	135,669	142,934	143,927	161,803	137,900
Conventional Hydro	65,286	89,015	96,732	90,716	100,684	69,295	66,375
of which Run of River	16,315	21,017	26,388	27,749	28,165	16,846	17,310
Pumped and Mixed	18,054	35,057	38,897	40,467	43,530	42,722	45,173
Other Renewables	1,613	3,670	21,344	113,957	138,265	312,050	376,774
Solar	0	2	82	15,643	30,575	79,858	83,246
Geothermal	432	502	604	729	772	1,476	504
Wind	4	502	12,805	74,582	83,192	196,909	255,286
of which Wind Onshore	4	458	9,863	43,571	48,095	89,859	97,452
of which Wind Offshore	0	0	44	1,177	1,810	34,421	63,565
Biogas	0	230	954	3,132	3,724	6,146	6,561
Biomass	932	1,369	3,277	12,834	13,922	22,890	23,973
Waste	5	746	2,401	6,950	7,392	4,359	4,419
Other (Wave/Tidal etc)	240	240	241	2	22	33	1,103
Not Specified	8,252	7,716	2,073	2,126	1,729	1,475	2,587
Total	453,019	585,887	684,075	843,961	874,419	1,068,814	987,377

Note: It must be noted that whereas the EU-27 aggregated figures for type of primary energy used are fairly complete, the breakdown into sub-types might not always take into account all EU-27 countries.

Table 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

Austria (AT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	4,150	5,060	6,121	6,273	6,326	7,058	7,989
of which multifuel							
Hard Coal	140	1,080	1,460	1,226	1,226	750	750
Brown Coal	440	760	421	0	0	0	0
Oil	1,170	950	870	481	359	39	0
Natural Gas	2,180	2,050	3,090	4,600	4,298	5,778	6,878
Derived Gas	220	220	280	257	443	491	561
Hydro	8,210	10,870	11,730	12,665	12,919	15,919	17,919
Conventional Hydro	3,520	4,670	5,400	5,460	5,396	6,016	6,616
of which Run of River	3,520	4,670	5,400	5,460	5,396	6,016	6,616
Pumped and Mixed	4,690	6,200	6,330	7,205	7,523	9,903	11,303
Other Renewables			857	1,419	1,495	4,147	8,847
Solar			5	20	35	500	4,000
Geothermal				1	1	1	1
Wind			77	972	1,013	3,000	4,000
of which Wind Onshore			77	972	1,013	3,000	4,000
of which Wind Offshore			0	0	0	0	0
Biogas			6	75	79	179	279
Biomass			769	330	334	434	534
Waste				21	21	21	21
Other (Wave/Tidal etc)				0	12	12	12
Not Specified	160	150	140	728	660	559	473
Total	12,620	16,190	18,048	21,085	21,400	27,683	35,228

Belgium (BE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,666	5,500	5,713	5,902	5,927	4,037	0
Fossil Fuel Fired	8,210	7,154	8,051	7,812	7,816	9,880	15,255
of which multifuel							
Hard Coal			1,959	1,156	1,156	1,153	3,828
Brown Coal			0				
Oil			494	741	741	996	656
Natural Gas			5,097	5,440	5,444	7,731	10,771
Derived Gas			501	475	475		
Hydro	1,128	1,401	1,413	1,417	1,425	1,401	1,401
Conventional Hydro	72	94	103	110	118	94	94
of which Run of River							
Pumped and Mixed	1,056	1,307	1,310	1,307	1,307	1,307	1,307
Other Renewables	0	84	12	1,676	2,793	7,201	8,527
Solar		0	0	386	904	1,340	1,587
Geothermal	0	0	0	0	0		
Wind	0	5	12	608	912	4,181	4,951
of which Wind Onshore				570	722	2,063	2,443
of which Wind Offshore				38	88	2,118	2,508
Biogas							
Biomass				682	977	1,680	1,989
Waste					45		
Other (Wave/Tidal etc)							
Not Specified			496	689	361		
Total	11,004	14,139	15,189	17,496	18,322	20,609	23,789

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,300	2,700	3,500	1,900	1,900	3,800	5,700
Fossil Fuel Fired	4,830	5,655	4,934	5,115	5,269	5,820	5,830
of which multifuel	0	0	0		0	0	0
Hard Coal	1,966	2,021	1,394		1,151	1,636	450
Brown Coal	1,924	2,814	2,960		3,064	2,994	3,100
Oil	450	420	220		275	220	220
Natural Gas	490	400	360		789	970	2,060
Derived Gas	0	0	0		0	0	0
Hydro	1,700	1,800	1,950	1,800	2,724	2,250	2,460
Conventional Hydro	1,550	1,650	1,380		1,929	1,620	1,620
of which Run of River	40	40	40		143	50	50
Pumped and Mixed	150	150	570		938	630	840
Other Renewables	0	0	0	340	513	2,400	3,400
Solar	0	0	0		25	0	0
Geothermal	0	0	0			0	0
Wind	0	0	0	340	488	2,400	3,400
of which Wind Onshore	0	0	0		800	2,400	3,400
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	
Biomass	0	0	0		0	0	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	0
Total	7,830	10,155	10,384	9,155	10,406	14,270	17,390

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	264	462	988	1,388	1,438	2,198	2,678
of which multifuel	0	0	0			0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0			0	0
Oil	264	462	988	1,388	1,438	428	188
Natural Gas	0	0	0			1,770	2,490
Derived Gas	0	0	0			0	0
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0				
of which Run of River	0	0	0				
Pumped and Mixed	0	0	0				
Other Renewables	0	0	0	6	95		
Solar	0	0	0	3	6		
Geothermal	0	0	0				
Wind	0	0	0	0	82		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0	0	82		
Biogas	0	0	0				
Biomass	0	0	0	4	7		
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				
Not Specified	0	0	0			0	0
Total	264	462	988	1,394	1,533	2,198	2,678

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	1,651	1,651	3,830	3,900	3,830	6,000
Fossil Fuel Fired	9,060	10,634	10,491	11,632	11,770	10,295	8,878
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1,447	1,373	1,776	1,776	1,776	2,659	2,659
Brown Coal	7,442	9,090	7,976	8,912	8,971	6,445	5,000
Oil	0	0	123	123	123	123	0
Natural Gas	106	106	197	374	453	649	800
Derived Gas	65	65	419	447	447	419	419
Hydro	1,300	1,342	2,089	2,183	2,203	2,121	2,121
Conventional Hydro	810	852	949	1,036	1,056	981	981
of which Run of River	182	224	221	276	276	252	252
Pumped and Mixed	490	490	1,140	1,147	1,147	1,140	1,140
Other Renewables	0	8	1	681	2,200	2,378	2,750
Solar	0	0	0	465	1,959	1,820	1,850
Geothermal	0	0	0	0	0	0	0
Wind	0	0	1	193	218	550	900
of which Wind Onshore	0	0	1	193	218	550	900
of which Wind Offshore	0	0	0	0	0	*0*	*0*
Biogas	0	0	0	7	7	0	0
Biomass	0	8	0	16	0	0	0
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	139	125	0	0	0	0	0
Total	10,499	13,760	14,232	18,326	20,073	18,544	19,749

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	8,607	22,406	22,396	20,480	20,477	8,107	0
Fossil Fuel Fired	63,536	63,761	81,997	83,200	83,726	70,700	58,300
of which multifuel	10,128	8,723	9,521	8,700	8,700		
Hard Coal	26,893	31,090	30,123	27,867	27,890	20,800	16,800
Brown Coal	12,997	11,298	20,050	20,358	20,377	19,700	10,800
Oil	12,035	7,229	7,218	6,074	5,788	600	400
Natural Gas	11,611	14,144	20,127	24,355	24,902	28,000	28,400
Derived Gas			4,479	4,546	4,769	1,600	1,900
Hydro	6,451	6,851	9,392	11,027	11,137	13,500	14,000
Conventional Hydro	2,666	2,834	4,738	5,317	5,427	5,500	5,500
of which Run of River			3,404	3,810	3,920	3,900	3,900
Pumped and Mixed	3,785	4,017	4,654	5,710	5,710	8,000	8,500
Other Renewables	3	800	7,186	41,200	51,059	84,500	96,800
Solar	0	2	62	9,631	17,488	33,300	37,500
Geothermal	0	0	0	10	10	300	400
Wind	3	48	6,094	25,777	27,204	43,200	50,200
of which Wind Onshore	3	48	6,094	25,717	27,154	33,200	33,600
of which Wind Offshore	0	0	0	60	60	10,000	16,600
Biogas	0	140	250	2,150	2,500	2,500	3,000
Biomass	0	50	260	2,342	2,457	3,500	4,000
Waste	0	560	520	1,290	1,400	1,700	1,700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	78,597	93,818	120,971	155,907	166,329	176,807	169,100

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	6,609	7,762	9,746	9,159	8,893	8,900	8,100
of which multifuel	0	0	0			0	0
Hard Coal	4,444	6,878	6,770	4,899	4,899	3,500	2,500
Brown Coal	0	0	0	0	0	0	0
Oil	2,165	839	800	1,071	1,077	600	600
Natural Gas	0	45	2,176	3,189	2,917	4,800	5,000
Derived Gas	0	0	0	0	0	0	0
Hydro	9	9	9	9	9	9	9
Conventional Hydro	9	9	9	9	9	9	9
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	1	438	2,662	4,195	4,517	5,600	7,300
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0			0	0
Wind	1	343	2,417	3,482	3,802	5,600	7,300
of which Wind Onshore	1	343	2,377	2,821	2,934	3,474	3,974
of which Wind Offshore	0	0	40	661	868	2,126	3,326
Biogas	0	0	0	76	78	0	0
Biomass	0	95	245	258	258	0	0
Waste	0	0	0	379	379	0	0
Other (Wave/Tidal etc)	0	0	0			0	0
Not Specified	0	0	0			0	0
Total	6,619	8,209	12,417	13,363	13,420	14,509	15,409

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear			0	0	0	0	
Fossil Fuel Fired			3,211	2,228	2,228	2,873	
of which multifuel			0	176	176	176	
Hard Coal			0	0	0	0	
Brown Coal			2,976	2,000	2,000	1,973	
Oil			10	0	0	0	
Natural Gas			207	184	184	400	
Derived Gas			18	44	44	500	
Hydro			2	4	4	5	
Conventional Hydro			2	4	4	5	
of which Run of River			2	4	4	5	
Pumped and Mixed			0	0	0	0	
Other Renewables			0	209	209	1,177	
Solar			0	0	0	0	
Geothermal			0	0	0	0	
Wind			0	142	149	900	
of which Wind Onshore	0	0	0	142	149	400	
of which Wind Offshore			0	0	0	500	
Biogas			2	2	2	10	
Biomass			0	74	74	250	
Waste			0	0	0	17	
Other (Wave/Tidal etc)			0	0	0	0	
Not Specified							
Total			3,213	2,441	2,441	4,055	

Note: In the case of Estonia, brown coal includes oil shale.

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,065	7,000	7,486	7,419	7,483	7,483	9,916
Fossil Fuel Fired	15,088	19,382	25,748	46,583	47,748	48,418	46,887
of which multifuel	1,000	1,045	3,116	1,785	1,815	0	0
Hard Coal	4,358	8,621	9,494	11,098	11,153	8,856	2,984
Brown Coal	1,800	1,800	1,930				
Oil	8,930	8,510	10,697	8,706	8,332	6,159	7,277
Natural Gas	0	451	3,626	26,779	28,702	33,403	36,626
Derived Gas							
Hydro	13,175	16,561	17,667	18,798	18,816	21,251	22,266
Conventional Hydro	10,554	11,661	12,767	13,898	14,027	14,194	14,715
of which Run of River	850	940	1,080	1,160	1,160	1,160	1,160
Pumped and Mixed	2,621	4,900	4,900	4,900	5,823	7,057	7,551
Other Renewables	0	35	2,628	23,090	24,790	44,696	64,270
Solar	0	0	1	3,562	5,331	8,138	11,321
Geothermal							
Wind	0	35	2,243	18,483	19,783	34,957	50,899
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	28	169	164	282	382
Biomass	0	0	97	414	393	743	1,043
Waste	0	0	259	461	481	576	626
Other (Wave/Tidal etc)							
Not Specified							
Total	29,328	42,978	53,529	95,890	98,837	121,848	143,338

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	2,210	2,310	2,640	2,700	2,730	4,604	7,395
Fossil Fuel Fired	5,562	7,043	9,202	8,121	8,331	7,710	6,606
of which multifuel	0	0	0	0	0		
Hard Coal	2,601	3,506	3,760	2,699	2,699		
Brown Coal	185	986	1,354	1,231	1,441		
Oil	2,224	1,140	1,395	1,349	1,349		
Natural Gas	552	1,411	2,693	2,842	2,842		
Derived Gas							
Hydro	2,318	2,621	2,882	3,074	3,084	3,330	3,400
Conventional Hydro	2,318	2,621	2,882	3,074	3,084	3,330	3,400
of which Run of River							
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	932	1,196	1,480	2,477	2,595	4,948	6,385
Solar							
Geothermal	0	0	0	0			
Wind	0	0	38	147	197	2,565	3,870
of which Wind Onshore	0	0	38	147	197		
of which Wind Offshore	0	0	0				
Biogas							
Biomass	932	1,196	1,442	2,172	2,240	2,342	2,474
Waste				158	158	41	41
Other (Wave/Tidal etc)	0	0	0	0	0		
Not Specified	0	0	54			221	219
Total	11,022	13,170	16,258	16,372	16,740	20,813	24,005

Note: In the case of Finland, brown coal includes peat.

TABLE 3.1.1.1 GENERATION EQUIPMENT – CAPACITY BY PRIMARY ENERGY (MW)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	14,394	55,750	63,183	63,130	63,130	65,000	56,000
FOSSIL FUEL FIRED	29,032	22,673	26,799	26,154	27,399	16,600	29,100
of which multifuel	0	0	0		0		
Hard Coal	12,800	11,900	10,300	7,942	7,942		
Brown Coal	227	100	0				
Oil	15,254	10,073	11,080	10,001	10,447		
Natural Gas	550	0	4,141	8,159	8,963		
Derived Gas	201	600	800				
HYDRO	19,285	24,987	25,356	25,357	25,390	25,200	25,200
Conventional Hydro	17,671	20,694	21,054	21,093	21,127		
of which Run of River	7,743	7,453	7,505	7,562	7,612		
Pumped and Mixed	1,614	4,293	4,302	4,263	4,263		
OTHER RENEWABLES	240	240	718	5,793	7,864	26,300	52,600
Solar	0	0	6	189	878	8,000	18,000
Geothermal	0	0	0	0	0	0	0
Wind	0	0	38	4,573	5,764	17,000	32,000
of which Wind Onshore	0	0					
of which Wind Offshore	0	0					
Biogas	0	0	34	137	214	1,300	2,600
Biomass	0	0	20	182	272		
Waste	0	0	380	711	737		
Other (Wave/Tidal etc)	240	240	240				
NOT SPECIFIED	0	0	0	0	0	0	0
TOTAL	62,711	103,410	115,338	120,434	123,783	133,100	158,100

Note: This table includes autoproducers.

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	5,767	11,353	12,486	10,881	10,846	9,456	13,910
FOSSIL FUEL FIRED	60,689	57,850	60,728	66,421	68,860	60,569	57,797
of which multifuel	4,510	5,030	7,092	301	301	301	301
Hard Coal	43,668	40,739	30,529	27,889	27,892	18,329	10,102
Brown Coal	0	0	0	0	0	0	0
Oil	16,241	15,862	5,474	5,267	5,181	1,371	907
Natural Gas	80	549	24,025	33,266	35,786	40,869	46,788
Derived Gas	700	700	700		0	0	0
HYDRO	2,344	4,197	4,273	4,357	4,355	5,088	5,208
Conventional Hydro	1,285	1,410	1,485	1,613	1,611	2,344	2,464
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	1,059	2,787	2,788	2,744	2,744	2,744	2,744
OTHER RENEWABLES	0	130	1,335	8,136	9,085	38,296	69,225
Solar	0	0	2	9	42	2,500	5,801
Geothermal	0	0	0	0	0	0	0
Wind	0	9	412	4,214	4,795	30,957	56,053
of which Wind Onshore	0	9	408	4,024	4,311	14,265	19,647
of which Wind Offshore	0	0	4	190	484	16,692	36,406
Biogas	0	90	425	0	0	0	0
Biomass	0	0	157	1,933	2,098	4,819	6,290
Waste	0	31	338	1,979	2,140		
Other (Wave/Tidal etc)	0	0	1	2	10	20	1,081
NOT SPECIFIED	0	0	0		0	0	0
TOTAL	68,800	73,530	78,822	89,795	93,146	113,409	146,139

Table 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

Greece (GR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired	3,909	6,097	7,558	10,005	11,229	10,281	
of which multifuel	0	0	0		0	0	
Hard Coal	0	0	0	0	0	0	
Brown Coal	1,863	3,889	4,461	4,746	4,682	2,871	
Oil	2,046	2,192	1,967	2,393	2,432	1,852	
Natural Gas	0	16	1,129	2,866	4,115	5,558	
Derived Gas	0	0	0	0	0	0	
Hydro	1,416	2,408	3,072	3,201	3,215	4,502	
Conventional Hydro	1,416	2,094	2,373	2,502	2,516	2,922	
of which Run of River	0	0	0	183	197	255	
Pumped and Mixed	0	315	699	699	699	1,580	
Other Renewables	0	3	261	1,263	1,530	9,330	
Solar	0	0	0	48	191	2,450	
Geothermal	0	2	0	0	0	120	
Wind	0	1	205	1,172	1,298	6,510	
of which Wind Onshore	0	1	205	1,172	1,298	6,300	
of which Wind Offshore	0	0	0	0	0	210	
Biogas	0	0	21	43	41	210	
Biomass	0	0	0	0	0	40	
Waste	0	0	36	0	0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	5,324	8,508	10,891	14,469	15,974	24,113	

Hungary (HU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	1,654	1,752	1,822	1,892	1,880	2,810
Fossil Fuel Fired	4,796	4,881	5,725	6,154	6,181	7,154	6,980
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	163	106	106	0	0
Brown Coal	1,728	1,900	1,736	1,073	1,073	680	500
Oil	306	481	1,229	410	410	410	1,000
Natural Gas	2,763	2,500	2,597	4,565	4,592	6,064	5,480
Derived Gas	0	0	0	0	0	0	0
Hydro	46	48	47	50	50	66	1,270
Conventional Hydro	46	48	47	50	50	66	70
of which Run of River	46	48	47	50	50	66	70
Pumped and Mixed	0	0	0	0	0	0	1,200
Other Renewables	0	0	18	549	630	1,500	2,140
Solar	0	0	0	0	0	63	150
Geothermal	0	0	0	0	0	57	60
Wind	0	0	0	169	240	750	1,000
of which Wind Onshore	0	0	0	169	240	750	1,000
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	11	21	100	180
Biomass	0	0	0	348	348	500	710
Waste	0	0	18	21	21	30	40
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	19	63	0	0	0	0
Total	4,842	6,602	7,605	8,575	8,753	10,600	13,200

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	1,848	3,256	3,921	4,877	5,277	6,006	6,171
of which multifuel	0	844	865	3,500	3,900	4,311	4,313
Hard Coal	14	870	855	847	847	847	847
Brown Coal	355	437	386	0	0	0	0
Oil	1,307	1,011	1,255	1,130	1,130	567	324
Natural Gas	172	938	1,425	2,900	3,300	4,592	5,000
Derived Gas	0	0	0	0	0	0	0
Hydro	512	512	526	539	539	539	539
Conventional Hydro	220	220	234	247	247	247	247
of which Run of River	8	8	19	32	32	32	32
Pumped and Mixed	292	292	292	292	292	292	292
Other Renewables	0	0	133	1,200	1,400	4,241	4,460
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	118	1,200	1,400	3,918	4,137
of which Wind Onshore	0	0	118	1,200	1,400	3,593	3,812
of which Wind Offshore	0	0	0	0	0	325	325
Biogas	0	0	15	0	0	0	0
Biomass	0	0	0	0	0	231	231
Waste	0	0	0	0	0	92	92
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	128	346	346	346	346
Total	2,360	3,768	4,708	6,953	7,553	11,123	11,507

Note: In the case of Ireland, brown coal includes peat.

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,424	0	0	0	0		
Fossil Fuel Fired	29,146	37,232	53,384	71,108	72,397		
of which multifuel	12,608	19,523	34,006	32,595	31,254		
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro	15,826	18,770	20,346	21,371	21,521		
Conventional Hydro		12,582	13,389	13,827	13,977		
of which Run of River		3,109	3,453	4,633	4,765		
Pumped and Mixed		6,188	6,957	7,544	7,544		
Other Renewables	428	496	1,610	8,650	12,254		
Solar	0	0	6	1,142	3,470		
Geothermal	428	496	590	695	728		
Wind	0	0	363	4,879	5,794		
of which Wind Onshore							
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	171	361	486		
Biomass	0	0	207	823	1,007		
Waste	0	0	273	749	768		
Other (Wave/Tidal etc)	0	0	0	0	0		
Not Specified	0	50	164	319	318		0
Total	46,824	56,548	75,504	101,447	106,489		

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	2,367	2,367	1,183	0	1,303	1,303
Fossil Fuel Fired	2,171	2,452	2,477	2,539	2,525	2,426	2,426
of which multifuel	2,023	2,304	2,329	2,358	2,344	1,825	1,825
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	2,105	1,130	746	148	148	148	148
Natural Gas	66	1,322	1,731	2,391	2,377	2,278	2,278
Derived Gas	0	0	0	0	0	0	0
Hydro	106	105	873	876	875	1,091	1,105
Conventional Hydro	106	105	113	116	115	131	145
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	760	760	760	960	960
Other Renewables	0	0	0	126	205	850	1,498
Solar	0	0	0	0	0	10	30
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	89	161	500	1,100
of which Wind Onshore	0	0	0	89	161	500	500
of which Wind Offshore	0	0	0	0	0	0	600
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	37	44	340	351
Waste	0	0	0	0	0	17	17
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	2,277	4,924	5,717	4,724	3,606	5,670	6,332

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	85	80	51	498	505	530	550
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	498	505	530	550
Derived Gas	85	80	51	0	0	0	0
Hydro	1,124	1,124	1,128	1,128	1,128	1,328	1,328
Conventional Hydro	28	28	32	32	32	32	32
of which Run of River	11	11	15	15	15	15	15
Pumped and Mixed	1,096	1,096	1,096	1,096	1,096	1,296	1,296
Other Renewables	5	5	20	80	95	133	153
Solar	0	0	0	23	25	35	45
Geothermal	0	0	0	0	0	0	0
Wind	0	0	15	43	50	60	70
of which Wind Onshore	0	0	15	43	50	60	70
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	1	9	15	20	20
Biomass	0	0	0	0	0	0	0
Waste	5	5	5	5	5	18	18
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	4	4	0	0	0	0	0
Total	1,218	1,213	1,199	1,706	1,728	1,991	2,031

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired	562	587	595	870	930	1,080	1,180
of which multifuel				0	0		
Hard Coal	0	0	0	0	0	200	300
Brown Coal	0	0	0	0	0	0	0
Oil	190	67	75	30	30	30	30
Natural Gas	372	520	520	840	900	850	850
Derived Gas	0	0	0	0	0		
Hydro	1,487	1,487	1,530	1,536	1,550	1,560	1,560
Conventional Hydro	1,487	1,487	1,530	1,536	1,550	1,560	1,560
of which Run of River	1,487	1,487	1,530	1,536	1,550	1,560	1,560
Pumped and Mixed	0	0	0	0	0	0	
Other Renewables	0	0	2	50	54	390	635
Solar	0	0	0	0	0	0	2
Geothermal	0	0	0	0	0	0	3
Wind	0	0	2	30	31	300	500
of which Wind Onshore	0	0	2	30	31	150	200
of which Wind Offshore	0	0	0	0	0	150	300
Biogas	0	0	0	9	12	25	30
Biomass	0	0	0	4	4	50	80
Waste	0	0	0	7	7	15	20
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	2,049	2,074	2,127	2,456	2,534	3,030	3,375

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear		0	0	0	0		
Fossil Fuel Fired		289	571	571	571		
of which multifuel			0	0			
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			571	571	571		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		
Hydro		0	0	0	0		
Conventional Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
Pumped and Mixed		0	0	0	0		
Other Renewables		0	0	2	2		
Solar		0	0	2	2		
Geothermal		0	0		0		
Wind		0	0	0	0		
of which Wind Onshore		0	0	0	0		
of which Wind Offshore		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	0	0	0		
Other (Wave/Tidal etc)		0	0	0	0		
Not Specified		0	0	0	0		
Total							

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	498	449	449	485	485	485	2,985
Fossil Fuel Fired	14,370	15,334	18,305	21,747	22,959	32,615	27,875
of which multifuel							
Hard Coal	1,936	3,839	4,176	4,161	4,161	8,352	7,302
Brown Coal	0	0	0	0	0	0	0
Oil	742	37	37	0	0	0	0
Natural Gas	11,050	10,524	13,629	16,641	17,853	23,318	19,628
Derived Gas	642	934	500	945	945	945	945
Hydro	0	37	37	38	38	40	40
Conventional Hydro	0	37	37	38	38	40	40
of which Run of River	0	37	37	38	38	40	40
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables		227	778	3,044	3,154	7,290	9,600
Solar		0	0	68	88	140	200
Geothermal				0		0	0
Wind		57	435	2,216	2,241	5,900	8,000
of which Wind Onshore		57	435	1,988	2,013	3,600	4,500
of which Wind Offshore		0	0	228	228	2,300	3,500
Biogas							
Biomass		20	53	240	290	550	700
Waste		150	290	520	535	700	700
Other (Wave/Tidal etc)		0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	14,868	16,047	19,569	25,314	26,636	40,430	40,500

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	3,070
Fossil Fuel Fired	21,624	26,433	28,457	30,293	29,282	42,649	37,068
of which multifuel	0	0	0	0	0	0	0
Hard Coal	16,844	17,812	20,525	21,101	20,169	24,650	18,817
Brown Coal	4,395	8,236	7,759	8,293	8,092	8,625	7,715
Oil	385	385	0	0	0	0	0
Natural Gas	0	0	174	999	1,022	9,374	10,536
Derived Gas	0	0	0	0	0	0	0
Hydro	1,287	1,960	2,134	2,315	2,325	2,346	2,346
Conventional Hydro	642	765	512	550	553	570	570
of which Run of River	204	204	365	409	412	412	412
Pumped and Mixed	645	1,195	1,622	1,765	1,776	1,776	1,776
Other Renewables	0	0	13	804	1,225	7,495	8,789
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	4	702	1,096	6,638	7,840
of which Wind Onshore	0	0	4	702	1,096	6,638	7,840
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	62	75	0	0
Biomass	0	0	9	40	54	857	949
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	1	1
Total	22,910	28,394	30,604	33,512	32,832	52,491	51,274

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	2,026	4,122	5,979	8,226	9,092	8,246	7,958
of which multifuel	0	0	0	2	3	0	0
Hard Coal	135	1,316	1,776	1,756	1,756	576	0
Brown Coal	0	0	0	0	0	0	0
Oil	1,891	2,806	3,035	2,844	2,835	420	345
Natural Gas	0	0	1,168	3,626	4,501	7,250	7,613
Derived Gas	0	0	0	0	0	0	0
Hydro	2,467	3,327	4,469	5,037	5,051	9,100	10,330
Conventional Hydro	2,399	2,723	3,865	4,001	4,016	5,149	5,279
of which Run of River	1,561	2,007	2,402	2,581	2,595	3,083	3,203
Pumped and Mixed	68	604	604	1,035	1,035	3,951	5,051
Other Renewables	4	4	395	4,192	4,610	6,713	8,124
Solar	0	0	0	95	131	560	760
Geothermal	4	4	14	23	23	40	40
Wind	0	0	89	3,575	3,907	5,420	6,570
of which Wind Onshore	0	0	89	3,575	3,907	5,420	6,570
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	1	21	30	60	70
Biomass	0	0	9	111	117	200	230
Waste	0	0	282	367	402	432	444
Other (Wave/Tidal etc)	0	0	0	0	0	1	10
Not Specified	0	0	44	44	44	48	48
Total	4,496	7,454	10,887	17,499	18,797	24,107	26,460

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	655	1,400	1,300	2,630	4,130
Fossil Fuel Fired	10,710	13,470	8,040	11,964	8,844	10,169	9,764
of which multifuel	5,054	5,204	2,696		2,700	1,488	659
Hard Coal	1,366	1,366	1,234		1,193	1,924	2,726
Brown Coal	3,310	5,920	3,366		3,891	3,777	2,251
Oil	2,077	2,129	1,184		675	372	165
Natural Gas	3,957	4,055	2,256		3,084	4,096	4,622
Derived Gas	0	0	0		0	0	0
Hydro	2,990	4,930	5,170	6,400	5,908	7,595	7,646
Conventional Hydro	2,990	4,930	5,170		5,908	6,382	6,433
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	0	0	0		0	1,213	1,213
Other Renewables	0	0	0	20	408	3,535	5,189
Solar	0	0	0		0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	12	401	3,496	4,996
of which Wind Onshore	0	0	0	12	401	3,496	4,996
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		8	38	192
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0
Not Specified	0	0	0		0	0	0
Total	13,700	18,400	13,865	19,784	16,460	23,929	26,728

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4,625	9,970	9,439	9,342	9,150	10,030	7,030
Fossil Fuel Fired	0	0	3,760	5,502	5,035	2,920	2,920
of which multifuel							
Hard Coal	0	0	913	130	130	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	2,421	4,231	3,764	1,800	1,800
Natural Gas	0	0	290	1,005	1,005	1,000	1,000
Derived Gas	0	0	136	136	136	120	120
Hydro	14,500	16,330	16,229	16,203	16,200	16,400	16,600
Conventional Hydro	14,150	15,980	16,229	16,203	16,200	16,400	16,600
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	350	350	0	0	0	0	0
Other Renewables	0	4	1,225	4,666	5,316	10,500	14,400
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	4	241	1,560	2,163	5,700	9,500
of which Wind Onshore	0						
of which Wind Offshore	0						
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	2,824	2,860	4,100	4,200
Waste	0	0	0	282	293	700	700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	7,949	7,368	984	0	0	0	0
Total	27,074	33,672	30,894	35,713	35,701	39,850	40,950

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	630	670	666	656	656	328
Fossil Fuel Fired	1,015	1,093	1,341	1,285	1,482	1,711	2,188
of which multifuel	0	0	0		0	0	
Hard Coal	872	950	970				
Brown Coal	0	0	0				
Oil	143	143	143		123	3	3
Natural Gas	0	0	228		381	381	341
Derived Gas	0	0	0		0	0	0
Hydro	663	779	868	1,071	984	1,087	1,152
Conventional Hydro	663	779	868				
of which Run of River	663	779	868				
Pumped and Mixed	0	0	0		0	0	
Other Renewables	0	0	0	28	24	118	182
Solar	0	0	0		0	0	
Geothermal	0	0	0		0	0	
Wind	0	0	0		0	0	
of which Wind Onshore	0	0	0		0	0	
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	
Biomass	0	0	0		30	30	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	1,678	2,502	2,879	3,050	3,146	3,502	3,795

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	820	1,640	2,460	1,820	1,820	2,460	
Fossil Fuel Fired	2,463	2,705	2,834	2,742	2,614	3,114	
of which multifuel	0	0	0		0	0	
Hard Coal	773	793	747		481	456	
Brown Coal	684	684	619		365	339	
Oil	70	98	98		85	80	
Natural Gas	936	1,130	1,370		1,783	2,239	
Derived Gas	0	0	0		0	0	
Hydro	822	1,615	2,437	2,478	2,478	2,576	
Conventional Hydro	684	742	1,564		1,694	1,703	
of which Run of River							
Pumped and Mixed	138	873	873		873	873	
Other Renewables	0	0	10	61	143	160	
Solar	0	0	0		0	0	
Geothermal	0	0	0		10	10	
Wind	0	0	1	5	3	60	
of which Wind Onshore	0	0	0	5	0	0	0
of which Wind Offshore	0	0	0	0	0	0	
Biogas	0	0	0		0	0	
Biomass	0	0	9		50	90	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	4,105	5,960	7,741	7,101	7,780	8,310	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,940	2,950	3,162	3,240	3,250	2,900	2,100
Fossil Fuel Fired		700	649	693	630	400	800
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro	11,410	11,582	13,229	13,480	13,520	16,100	16,400
Conventional Hydro					12,120	12,100	12,400
of which Run of River					3,770	3,800	3,900
Pumped and Mixed					1,400	4,000	4,000
Other Renewables		78	158	277	363	980	2,000
Solar	0	2	15	71	100	300	800
Geothermal	0	0	0	0	0		
Wind	0	0	3	18	42	200	500
of which Wind Onshore	0	0	3	18	42	200	500
of which Wind Offshore	0	0	0	0	0	0	0
Biogas							
Biomass							
Waste		75	137	170	179	180	180
Other (Wave/Tidal etc)		0	0	0	0	0	0
Not Specified							
Total		15,332	17,182	17,672	17,730	20,380	22,800

Table 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

Norway (NO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	35	35	63	900	915	1,200	1,200
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	35	35	63	900	915	1,200	1,200
Derived Gas	0	0	0	0	0	0	0
Hydro	19,598	26,375	27,262	29,636	29,945	31,500	33,000
Conventional Hydro	19,004	25,147	25,994	28,366	27,806	29,700	31,000
of which Run of River							
Pumped and Mixed	594	1,228	1,269	1,270	1,269	1,800	2,000
Other Renewables	0	0	13	430	430	2,700	4,500
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	13	430	430	2,700	4,500
of which Wind Onshore	0	0	13	430		2,500	4,000
of which Wind Offshore	0	0	0	0		200	500
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0
Waste			22	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	203	228	218	0	168	0	0
Total	19,836	26,637	27,578	30,966	31,290	35,400	38,700

Turkey (TR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Fossil Fuel Fired	2,975	9,536	16,029	29,252	32,172		
of which multifuel	184	372	1,358	5,138	5,326		
Hard Coal	323	332	480	2,391	3,751		
Brown Coal	1,047	4,874	6,509	8,215	8,228		
Oil	1,605	2,120	1,996	2,099	1,773		
Natural Gas		2,210	7,044	16,547	18,420		
Derived Gas							
Hydro	2,131	6,764	11,175	14,553	15,831		
Conventional Hydro	2,131	6,764	11,175	14,553	15,831		
of which Run of River							
Pumped and Mixed							
Other Renewables	12	18	60	956	1,521		
Solar							
Geothermal		18	18	77	94		
Wind			19	792	1,320		
of which Wind Onshore			19	792			
of which Wind Offshore							
Biogas			4	55	70		
Biomass							
Waste	12		19	32	37		
Other (Wave/Tidal etc)							
Not Specified							
Total	5,118	16,318	27,264	44,761	49,524		

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Fossil Fuel Fired	1,370	1,962	1,778	1,778	1,778		
of which multifuel				53			
Hard Coal	1,317	1,909	1,725	1,725			
Brown Coal							
Oil	53	53	53	53			
Natural Gas	0	0	0	0			
Derived Gas	0	0	0	0			
Hydro	1,210	2,034	1,976	2,056	2,056		
Conventional Hydro	770	1,594	1,536	1,616			
of which Run of River	5	7	10	29			
Pumped and Mixed	440	440	440	440			
Other Renewables	0	0	0	0	0		
Solar	0	0	0	0			
Geothermal	0	0	0	0			
Wind	0	0	0	0	0		
of which Wind Onshore	0	0	0	0			
of which Wind Offshore	0	0	0	0			
Biogas	0	0	0	0			
Biomass	0	0	0	0			
Waste	0	0	0	0			
Other (Wave/Tidal etc)	0	0	0	0			
Not Specified	0	0	0	0			
Total	2,579	3,995	3,754	3,834	3,834		

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired		1,498	1,519	1,683	1,683	2,028	
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro		2,080	2,076	2,133	2,133	2,179	
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables	0	0	0	6			
Solar							
Geothermal							
Wind	0	0	0	70			
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
Not Specified							
Total						4,207	

TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (MW)

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	3,412	5,734	4,346	4,322	4,322	5,460	5,470
of which multifuel	450	450	136	27	27		
Hard Coal	0	0	0	0	0	0	0
Brown Coal	2,753	4,851	3,936	3,936	3,936	5,010	5,020
Oil	450	450	52	27	27	0	0
Natural Gas	209	433	358	359	359	450	450
Derived Gas	0	0	0	0	0	0	0
Hydro	1,855	2,803	2,804	2,863	2,863	3,210	3,646
Conventional Hydro	1,855	2,189	2,190	2,249	2,249	2,596	2,596
of which Run of River	1,578	1,787	1,822	1,852	1,852	2,225	2,225
Pumped and Mixed	0	614	614	614	614	614	1,050
Other Renewables	0	0	0	0	0	250	250
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0	0	250	250
of which Wind Onshore	0	0	0	0	0		
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	0	0	0		
Biomass	0	0	0	0	0		
Waste	0	0	0	0	0		
Other (Wave/Tidal etc)							
Not Specified	0	0	0	0	0		
Total	5,267	8,537	7,150	7,185	7,185	8,920	9,366

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear				13,835	13,835	17,600	24,300
Fossil Fuel Fired				33,625	33,774	30,356	38,221
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro				5,414	5,458	7,750	8,649
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables							
Solar				0	8	646	865
Geothermal							
Wind				84	86	646	865
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
Not Specified							
Total				52,958	53,162	56,998	72,900

TABLE 3.1.1.2 Generation Equipment – Nuclear Capacity by Country (MW)

The tables below display the nuclear generating nuclear capacity in the 27 EU Member States plus installed nuclear capacity in Switzerland, Norway, Turkey and some Energy Community member states, between 1980 and 2010. Forecasts for 2020 and 2030 have also been included. The nuclear capacity is expressed in MW.

Country	1980	1990	2000	2009	2010	2020	2030
AT	0	0	0	0	0	0	0
BE	1,666	5,500	5,713	5,825	5,801	5,825	5,825
BG	1,300	2,700	3,500	1,900	1,900	3,800	5,700
CY	0	0	0	0	0	0	0
CZ	0	1,651	1,651	3,830	3,900	3,830	6,000
DE	8,607	22,406	22,396	20,480	20,477	8,107	0
DK	0	0	0	0	0	0	0
EE	-	-	0	0	0	0	-
ES	1,065	7,000	7,486	7,419	7,483	7,483	9,916
FI	2,210	2,310	2,640	2,700	2,730	4,604	7,395
FR	14,394	55,750	63,183	63,130	63,130	65,000	65,000
UK	5,767	11,353	12,486	10,881	10,846	9,456	13,910
GR	0	0	0	0	0	0	-
HU	0	1,654	1,752	1,822	1,892	1,880	2,810
IE	0	0	0	0	0	0	0
IT	1,424	0	0	0	0	-	-
LT	0	2,367	2,367	1,183	0	1,303	1,303
LU	0	0	0	0	0	0	0
LV	0	0	0	0	0	0	-
MT	-	0	0	0	0	-	-
NL	498	449	449	485	485	485	2,985
PL	0	0	0	0	0	0	3,070
PT	0	0	0	0	0	0	0
RO	0	0	655	1,400	1,300	2,630	4,130
SE	4,625	9,970	9,439	9,342	9,150	10,030	7,030
SI	0	630	670	666	656	656	327
SK	820	1,640	2,460	1,820	1,820	2,460	
CH	1,940	2,950	3,162	3,240	3,250	2,900	2,100
NO	0	0	0	0	0	0	0
TR	0	0	0	0	0	-	-
BA	0	0	0	0	0	-	-
HR	0	0	0	0	0	0	-
RS	0	0	0	0	0	0	0
UA	-	-	-	13,835	13,835	17,600	24,300

TABLE 3.1.1.3

GENERATION EQUIPMENT – FOSSIL FUEL FIRED CAPACITY BY COUNTRY (MW)

The tables below display the fossil fuel fired generating capacity in the 27 EU Member States plus installed capacity in Switzerland, Norway, Turkey and some Energy Community member states between 1980 and 2010. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUEL FIRED	4,150	5,060	6,121	6,273	6,326	7,058	7,989
of which multifuel							
Hard Coal	140	1,080	1,460	1,226	1,226	750	750
Brown Coal	440	760	421	0	0	0	0
Oil	1,170	950	870	481	359	39	0
Natural Gas	2,180	2,050	3,090	4,600	4,298	5,778	6,878
Derived Gas	220	220	280	257	443	491	561

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUEL FIRED	8,210	7,154	8,051	7,812	7,816	9,880	15,255
of which multifuel							
Hard Coal			1,959	1,156	1,156	1,153	3,828
Brown Coal			0				
Oil			494	741	741	996	656
Natural Gas			5,097	5,440	5,444	7,731	10,771
Derived Gas			501	475	475		

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUEL FIRED	4,830	5,655	4,934	5,115	5,269	5,820	5,830
of which multifuel	0	0	0		0	0	0
Hard Coal	1,966	2,021	1,394		1,151	1,636	450
Brown Coal	1,924	2,814	2,960		3,064	2,994	3,100
Oil	450	420	220		275	220	220
Natural Gas	490	400	360		789	970	2,060
Derived Gas	0	0	0		0	0	0

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUEL FIRED	264	462	988	1,388	1,438	2,198	2,678
of which multifuel	0	0	0			0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0			0	0
Oil	264	462	988	1,388	1,438	428	188
Natural Gas	0	0	0			1,770	2,490
Derived Gas	0	0	0			0	0

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUEL FIRED	9,060	10,634	10,491	11,632	11,770	10,295	8,878
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1,447	1,373	1,776	1,776	1,776	2,659	2,659
Brown Coal	7,442	9,090	7,976	8,912	8,971	6,445	5,000
Oil	0	0	123	123	123	123	0
Natural Gas	106	106	197	374	453	649	800
Derived Gas	65	65	419	447	447	419	419

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	63,536	63,761	81,997	83,200	83,726	70,700	58,300
of which multifuel	10,128	8,723	9,521	8,700	8,700		
Hard Coal	26,893	31,090	30,123	27,867	27,890	20,800	16,800
Brown Coal	12,997	11,298	20,050	20,358	20,377	19,700	10,800
Oil	12,035	7,229	7,218	6,074	5,788	600	400
Natural Gas	11,611	14,144	20,127	24,355	24,902	28,000	28,400
Derived Gas			4,479	4,546	4,769	1,600	1,900

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	6,609	7,762	9,746	9,159	8,893	8,900	8,100
of which multifuel	0	0	0			0	0
Hard Coal	4,444	6,878	6,770	4,899	4,899	3,500	2,500
Brown Coal	0	0	0	0	0	0	0
Oil	2,165	839	800	1,071	1,077	600	600
Natural Gas	0	45	2,176	3,189	2,917	4,800	5,000
Derived Gas	0	0	0	0	0	0	0

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired			3,211	2,228	2,228	2,873	
of which multifuel			0	176	176	176	
Hard Coal			0	0	0	0	
Brown Coal			2,976	2,000	2,000	1,973	
Oil			10	0	0	0	
Natural Gas			207	184	184	400	
Derived Gas			18	44	44	500	

Note: In the case of Estonia, brown coal includes oil shale.

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	15,088	19,382	25,748	46,583	47,748	48,418	46,887
of which multifuel	1,000	1,045	3,116	1,785	1,815	0	0
Hard Coal	4,358	8,621	9,494	11,098	11,153	8,856	2,984
Brown Coal	1,800	1,800	1,930				
Oil	8,930	8,510	10,697	8,706	8,332	6,159	7,277
Natural Gas	0	451	3,626	26,779	28,702	33,403	36,626
Derived Gas							

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	5,562	7,043	9,202	8,121	8,331	7,710	6,606
of which multifuel	0	0	0	0	0		
Hard Coal	2,601	3,506	3,760	2,699	2,699		
Brown Coal	185	986	1,354	1,231	1,441		
Oil	2,224	1,140	1,395	1,349	1,349		
Natural Gas	552	1,411	2,693	2,842	2,842		
Derived Gas							

Note: In the case of Finland, brown coal includes peat.

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	29,032	22,673	26,799	26,154	27,399	16,600	15,300
of which multifuel	0	0	0		0		
Hard Coal	12,800	11,900	10,300	7,942	7,942		
Brown Coal	227	100	0				
Oil	15,254	10,073	11,080	10,001	10,447		
Natural Gas	550	0	4,141	8,159	8,963		
Derived Gas	201	600	800				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	60,689	57,850	60,728	66,421	68,860	60,569	57,797
of which multifuel	4,510	5,030	7,092	301	301	301	301
Hard Coal	43,668	40,739	30,529	27,889	27,892	18,329	10,102
Brown Coal	0	0	0	0	0	0	0
Oil	16,241	15,862	5,474	5,267	5,181	1,371	907
Natural Gas	80	549	24,025	33,266	35,786	40,869	46,788
Derived Gas	700	700	700		0	0	0

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	3,909	6,097	7,558	10,005	11,229	10,281	
of which multifuel	0	0	0		0	0	
Hard Coal	0	0	0	0	0	0	
Brown Coal	1,863	3,889	4,461	4,746	4,682	2,871	
Oil	2,046	2,192	1,967	2,393	2,432	1,852	
Natural Gas	0	16	1,129	2,866	4,115	5,558	
Derived Gas	0	0	0	0	0	0	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	4,796	4,881	5,725	6,154	6,181	7,154	6,980
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	163	106	106	0	0
Brown Coal	1,728	1,900	1,736	1,073	1,073	680	500
Oil	306	481	1,229	410	410	410	1,000
Natural Gas	2,763	2,500	2,597	4,565	4,592	6,064	5,480
Derived Gas	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	1,848	3,256	3,921	4,877	5,277	6,006	6,171
of which multifuel	0	844	865	3,500	3,900	4,311	4,313
Hard Coal	14	870	855	847	847	847	847
Brown Coal	355	437	386	0	0	0	0
Oil	1,307	1,011	1,255	1,130	1,130	567	324
Natural Gas	172	938	1,425	2,900	3,300	4,592	5,000
Derived Gas	0	0	0	0	0	0	0

Note: In the case of Ireland, brown coal includes peat.

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	29,146	37,232	53,384	71,108	72,397		
of which multifuel	12,608	19,523	34,006	32,595	31,254		
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	2,171	2,452	2,477	2,539	2,525	2,426	2,426
of which multifuel	2,023	2,304	2,329	2,358	2,344	1,825	1,825
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	2,105	1,130	746	148	148	148	148
Natural Gas	66	1,322	1,731	2,391	2,377	2,278	2,278
Derived Gas	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	85	80	51	498	505	530	550
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	498	505	530	550
Derived Gas	85	80	51	0	0	0	0

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	562	587	595	870	930	1,080	1,180
of which multifuel				0	0		
Hard Coal	0	0	0	0	0	200	300
Brown Coal	0	0	0	0	0	0	0
Oil	190	67	75	30	30	30	30
Natural Gas	372	520	520	840	900	850	850
Derived Gas	0	0	0	0	0		

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired		289	571	571	571		
of which multifuel			0	0			
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			571	571	571		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	14,370	15,334	18,305	21,747	22,959	32,615	27,875
of which multifuel							
Hard Coal	1,936	3,839	4,176	4,161	4,161	8,352	7,302
Brown Coal	0	0	0	0	0	0	0
Oil	742	37	37	0	0	0	0
Natural Gas	11,050	10,524	13,629	16,641	17,853	23,318	19,628
Derived Gas	642	934	500	945	945	945	945

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	21,624	26,433	28,457	30,293	29,282	42,649	37,068
of which multifuel	0	0	0	0	0	0	0
Hard Coal	16,844	17,812	20,525	21,101	20,169	24,650	18,817
Brown Coal	4,395	8,236	7,759	8,293	8,092	8,625	7,715
Oil	385	385	0	0	0	0	0
Natural Gas	0	0	174	999	1,022	9,374	10,536
Derived Gas	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	2,026	4,122	5,979	8,226	9,092	8,246	7,958
of which multifuel	0	0	0	2	3	0	0
Hard Coal	135	1,316	1,776	1,756	1,756	576	0
Brown Coal	0	0	0	0	0	0	0
Oil	1,891	2,806	3,035	2,844	2,835	420	345
Natural Gas	0	0	1,168	3,626	4,501	7,250	7,613
Derived Gas	0	0	0	0	0	0	0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	10,710	13,470	8,040	11,964	8,844	10,169	9,764
of which multifuel	5,054	5,204	2,696		2,700	1,488	659
Hard Coal	1,366	1,366	1,234		1,193	1,924	2,726
Brown Coal	3,310	5,920	3,366		3,891	3,777	2,251
Oil	2,077	2,129	1,184		675	372	165
Natural Gas	3,957	4,055	2,256		3,084	4,096	4,622
Derived Gas	0	0	0		0	0	0

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	0	0	3,760	5,502	5,035	2,920	2,920
of which multifuel							
Hard Coal	0	0	913	130	130	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	2,421	4,231	3,764	1,800	1,800
Natural Gas	0	0	290	1,005	1,005	1,000	1,000
Derived Gas	0	0	136	136	136	120	120

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	1,015	1,093	1,341	1,285	1,482	1,711	2,188
of which multifuel	0	0	0		0	0	
Hard Coal	872	950	970				
Brown Coal	0	0	0				
Oil	143	143	143		123	3	3
Natural Gas	0	0	228		381	381	341
Derived Gas	0	0	0		0	0	0

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	2,463	2,705	2,834	2,742	2,614	3,114	
of which multifuel	0	0	0		0	0	
Hard Coal	773	793	747		481	456	
Brown Coal	684	684	619		365	339	
Oil	70	98	98		85	80	
Natural Gas	936	1,130	1,370		1,783	2,239	
Derived Gas	0	0	0		0	0	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired		700	649	693	630	400	800
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	35	35	63	900	915	1,200	1,200
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	35	35	63	900	915	1,200	1,200
Derived Gas	0	0	0	0	0	0	0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	2,975	9,536	16,029	29,252	32,172		
of which multifuel	184	372	1,358	5,138	5,326		
Hard Coal	323	332	480	2,391	3,751		
Brown Coal	1,047	4,874	6,509	8,215	8,228		
Oil	1,605	2,120	1,996	2,099	1,773		
Natural Gas		2,210	7,044	16,547	18,420		
Derived Gas							

TABLE 3.1.1.3 Generation Equipment – Fossil Fuel Fired Generating Capacity by Country (MW)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	1,370	1,962	1,778	1,778	1,778		
of which multifuel				53			
Hard Coal	1,317	1,909	1,725	1,725			
Brown Coal							
Oil	53	53	53	53			
Natural Gas	0	0	0	0			
Derived Gas	0	0	0	0			

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired		1,498	1,519	1,683	1,683	2,028	
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired	3,412	5,734	4,346	4,322	4,322	5,460	5,470
of which multifuel	450	450	136	27	27		
Hard Coal	0	0	0	0	0	0	0
Brown Coal	2,753	4,851	3,936	3,936	3,936	5,010	5,020
Oil	450	450	52	27	27	0	0
Natural Gas	209	433	358	359	359	450	450
Derived Gas	0	0	0	0	0	0	0

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Fossil Fuel Fired				33,625	33,774	30,356	38,221
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

The tables below display the renewables generating capacity in the 27 EU Member States plus installed capacity in Switzerland, Norway, Turkey and some Energy Community member states, between 1980 and 2010. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	8,210	10,870	11,730	12,665	12,919	15,919	17,919
Conventional Hydro	3,520	4,670	5,400	5,460	5,396	6,016	6,616
of which Run of River	3,520	4,670	5,400	5,460	5,396	6,016	6,616
Pumped and Mixed	4,690	6,200	6,330	7,205	7,523	9,903	11,303
Other Renewables			857	1,419	1,495	4,147	8,847
Solar			5	20	35	500	4,000
Geothermal				1	1	1	1
Wind			77	972	1,013	3,000	4,000
of which Wind Onshore			77	972	1,013	3,000	4,000
of which Wind Offshore			0	0	0	0	0
Biogas			6	75	79	179	279
Biomass			769	330	334	434	534
Waste				21	21	21	21
Other (Wave/Tidal etc)				0	12	12	12

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	6,324	4,272	1,417	1,425	0	0
Conventional Hydro	72	94	103	110	118	94	94
of which Run of River							
Pumped and Mixed	1,056	1,307	1,310	1,307	1,307	1,307	1,307
Other Renewables	0	84	12	1,676	2,649	7,201	8,527
Solar		0	0	386	904	1,340	1,587
Geothermal		0	0	0	0		
Wind		5	12	608	912	4,181	4,951
of which Wind Onshore				570	722	2,063	2,443
of which Wind Offshore				38	190	2,118	2,508
Biogas							
Biomass				682	833	1,680	1,989
Waste					45		
Other (Wave/Tidal etc)							

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,700	1,800	1,950	1,800	2,724	2,250	2,460
Conventional Hydro	1,550	1,650	1,380		1,929	1,620	1,620
of which Run of River	40	40	40		143	50	50
Pumped and Mixed	150	150	570		938	630	840
Other Renewables	0	0	0	340	513	2,400	3,400
Solar	0	0	0		25	0	0
Geothermal	0	0	0			0	0
Wind	0	0	0	340	488	2,400	3,400
of which Wind Onshore	0	0	0		800	2,400	3,400
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	
Biomass	0	0	0		0	0	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0				
of which Run of River	0	0	0				
Pumped and Mixed	0	0	0				
Other Renewables	0	0	0	6	95		
Solar	0	0	0	3	6		
Geothermal	0	0	0				
Wind	0	0	0	0	82		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0	0	82		
Biogas	0	0	0				
Biomass	0	0	0	4	7		
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,300	1,342	2,089	2,183	2,203	2,121	2,121
Conventional Hydro	810	852	949	1,036	1,056	981	981
of which Run of River	182	224	221	276	276	252	252
Pumped and Mixed	490	490	1,140	1,147	1,147	1,140	1,140
Other Renewables	0	8	1	681	2,200	2,378	2,750
Solar	0	0	0	465	1,959	1,820	1,850
Geothermal	0	0	0	0	0	0	0
Wind	0	0	1	193	218	550	900
of which Wind Onshore	0	0	1	193	218	550	900
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	7	7	0	0
Biomass	0	8	0	16	0	0	0
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	6,451	6,851	9,392	11,027	11,137	13,500	14,000
Conventional Hydro	2,666	2,834	4,738	5,317	5,427	5,500	5,500
of which Run of River			3,404	3,810	3,920	3,900	3,900
Pumped and Mixed	3,785	4,017	4,654	5,710	5,710	8,000	8,500
Other Renewables	3	800	7,186	41,200	51,059	84,500	96,800
Solar	0	2	62	9,631	17,488	33,300	37,500
Geothermal	0	0	0	10	10	300	400
Wind	3	48	6,094	25,777	27,204	43,200	50,200
of which Wind Onshore	3	48	6,094	25,717	27,154	33,200	33,600
of which Wind Offshore	0	0	0	60	60	10,000	16,600
Biogas	0	140	250	2,150	2,500	2,500	3,000
Biomass	0	50	260	2,342	2,457	3,500	4,000
Waste	0	560	520	1,290	1,400	1,700	1,700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Hydro	9	9	9	9	9	9	9
Conventional Hydro	9	9	9	9	9	9	9
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	1	438	2,662	4,195	4,517	5,600	7,300
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0			0	0
Wind	1	343	2,417	3,482	3,802	5,600	7,300
of which Wind Onshore	1	343	2,377	2,821	2,934	3,474	3,974
of which Wind Offshore	0	0	40	661	868	2,126	3,326
Biogas	0	0	0	76	78	0	0
Biomass	0	95	245	258	258	0	0
Waste	0	0	0	379	379	0	0
Other (Wave/Tidal etc)	0	0	0			0	0

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Hydro			2	4	4	5	
Conventional Hydro			2	4	4	5	
of which Run of River			2	4	4	5	
Pumped and Mixed			0	0	0	0	
Other Renewables			0	209	209	1,177	
Solar			0	0	0	0	
Geothermal			0	0	0	0	
Wind			0	142	149	900	
of which Wind Onshore	0	0	0	142	149	400	
of which Wind Offshore			0	0	0	500	
Biogas			2	2	2	10	
Biomass			0	74	74	250	
Waste			0	0	0	17	
Other (Wave/Tidal etc)			0	0	0	0	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Hydro	13,175	16,561	17,667	18,798	18,816	21,251	22,266
Conventional Hydro	10,554	11,661	12,767	13,898	14,027	14,194	14,715
of which Run of River	850	940	1,080	1,160	1,160	1,160	1,160
Pumped and Mixed	2,621	4,900	4,900	4,900	5,823	7,057	7,551
Other Renewables	0	35	2,628	23,090	24,790	44,696	64,270
Solar	0	0	1	3,562	5,331	8,138	11,321
Geothermal							
Wind	0	35	2,243	18,483	19,783	34,957	50,899
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	28	169	164	282	382
Biomass	0	0	97	414	393	743	1,043
Waste	0	0	259	461	481	576	626
Other (Wave/Tidal etc)							

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Hydro	2,318	2,621	2,882	3,074	3,084	3,330	3,400
Conventional Hydro	2,318	2,621	2,882	3,074	3,084	3,330	3,400
of which Run of River							
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	932	1,196	1,480	2,477	2,595	4,948	6,385
Solar							
Geothermal	0	0	0	0			
Wind	0	0	38	147	197	2,565	3,870
of which Wind Onshore	0	0	38	147	197		
of which Wind Offshore	0	0	0				
Biogas							
Biomass	932	1,196	1,442	2,172	2,240	2,342	2,474
Waste				158	158	41	41
Other (Wave/Tidal etc)	0	0	0	0	0		

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	19,285	24,987	25,356	25,357	25,390	25,200	25,200
Conventional Hydro	17,671	20,694	21,054	21,093	21,127		
of which Run of River	7,743	7,453	7,505	7,562	7,612		
Pumped and Mixed	1,614	4,293	4,302	4,263	4,263		
Other Renewables	240	240	718	5,793	7,864	26,300	52,600
Solar	0	0	6	189	878	8,000	18,000
Geothermal	0	0	0	0	0	0	0
Wind	0	0	38	4,573	5,764	17,000	32,000
of which Wind Onshore	0	0					
of which Wind Offshore	0	0					
Biogas	0	0	34	137	214	1,300	2,600
Biomass	0	0	20	182	272		
Waste	0	0	380	711	737		
Other (Wave/Tidal etc)	240	240	240				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Hydro	2,344	4,197	4,273	4,357	4,355	5,088	5,208
Conventional Hydro	1,285	1,410	1,485	1,613	1,611	2,344	2,464
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	1,059	2,787	2,788	2,744	2,744	2,744	2,744
Other Renewables	0	130	1,335	8,136	9,085	38,296	69,225
Solar	0	0	2	9	42	2,500	5,801
Geothermal	0	0	0	0	0	0	0
Wind	0	9	412	4,214	4,795	30,957	56,053
of which Wind Onshore	0	9	408	4,024	4,311	14,265	19,647
of which Wind Offshore	0	0	4	190	484	16,692	36,406
Biogas	0	90	425	0	0	0	0
Biomass	0	0	157	1,933	2,098	4,819	6,290
Waste	0	31	338	1,979	2,140		
Other (Wave/Tidal etc)	0	0	1	2	10	20	1,081

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,416	2,408	3,072	3,201	3,215	4,502	
Conventional Hydro	1,416	2,094	2,373	2,502	2,516	2,922	
of which Run of River	0	0	0	183	197	255	
Pumped and Mixed	0	315	699	699	699	1,580	
Other Renewables	0	3	261	1,263	1,530	9,330	
Solar	0	0	0	48	191	2,450	
Geothermal	0	2	0	0	0	120	
Wind	0	1	205	1,172	1,298	6,510	
of which Wind Onshore	0	1	205	1,172	1,298	6,300	
of which Wind Offshore	0	0	0	0	0	210	
Biogas	0	0	21	43	41	210	
Biomass	0	0	0	0	0	40	
Waste	0	0	36	0	0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Hydro	46	48	47	50	50	66	1,270
Conventional Hydro	46	48	47	50	50	66	70
of which Run of River	46	48	47	50	50	66	70
Pumped and Mixed	0	0	0	0	0	0	1,200
Other Renewables	0	0	18	549	630	1,500	2,140
Solar	0	0	0	0	0	63	150
Geothermal	0	0	0	0	0	57	60
Wind	0	0	0	169	240	750	1,000
of which Wind Onshore	0	0	0	169	240	750	1,000
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	11	21	100	180
Biomass	0	0	0	348	348	500	710
Waste	0	0	18	21	21	30	40
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	512	512	526	539	539	539	539
Conventional Hydro	220	220	234	247	247	247	247
of which Run of River	8	8	19	32	32	32	32
Pumped and Mixed	292	292	292	292	292	292	292
Other Renewables	0	0	133	1,200	1,400	4,241	4,460
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	118	1,200	1,400	3,918	4,137
of which Wind Onshore	0	0	118	1,200	1,400	3,593	3,812
of which Wind Offshore	0	0	0	0	0	325	325
Biogas	0	0	15	0	0	0	0
Biomass	0	0	0	0	0	231	231
Waste	0	0	0	0	0	92	92
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	15,826	18,770	20,346	21,371	21,521		
Conventional Hydro		12,582	13,389	13,827	13,977		
of which Run of River		3,109	3,453	4,633	4,765		
Pumped and Mixed		6,188	6,957	7,544	7,544		
Other Renewables	428	496	1,610	8,650	12,254		
Solar	0	0	6	1,142	3,470		
Geothermal	428	496	590	695	728		
Wind	0	0	363	4,879	5,794		
of which Wind Onshore							
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	171	361	486		
Biomass	0	0	207	823	1,007		
Waste	0	0	273	749	768		
Other (Wave/Tidal etc)	0	0	0	0	0		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	106	105	873	876	875	1,091	1,105
Conventional Hydro	106	105	113	116	115	131	145
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	760	760	760	960	960
Other Renewables	0	0	0	126	205	850	1,498
Solar	0	0	0	0	0	10	30
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	89	161	500	1,100
of which Wind Onshore	0	0	0	89	161	500	500
of which Wind Offshore	0	0	0	0	0	0	600
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	37	44	340	351
Waste	0	0	0	0	0	17	17
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,124	1,124	1,128	1,128	1,128	1,328	1,328
Conventional Hydro	28	28	32	32	32	32	32
of which Run of River	11	11	15	15	15	15	15
Pumped and Mixed	1,096	1,096	1,096	1,096	1,096	1,296	1,296
Other Renewables	5	5	20	80	95	133	153
Solar	0	0	0	23	25	35	45
Geothermal	0	0	0	0	0	0	0
Wind	0	0	15	43	50	60	70
of which Wind Onshore	0	0	15	43	50	60	70
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	1	9	15	20	20
Biomass	0	0	0	0	0	0	0
Waste	5	5	5	5	5	18	18
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,487	1,487	1,530	1,536	1,550	1,560	1,560
Conventional Hydro	1,487	1,487	1,530	1,536	1,550	1,560	1,560
of which Run of River	1,487	1,487	1,530	1,536	1,550	1,560	1,560
Pumped and Mixed	0	0	0	0	0	0	
Other Renewables	0	0	2	50	54	390	635
Solar	0	0	0	0	0	0	2
Geothermal	0	0	0	0	0	0	3
Wind	0	0	2	30	31	300	500
of which Wind Onshore	0	0	2	30	31	150	200
of which Wind Offshore	0	0	0	0	0	150	300
Biogas	0	0	0	9	12	25	30
Biomass	0	0	0	4	4	50	80
Waste	0	0	0	7	7	15	20
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Hydro		0	0	0	0		
Conventional Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
Pumped and Mixed		0	0	0	0		
Other Renewables		0	0	2	2		
Solar		0	0	2	2		
Geothermal		0	0		0		
Wind		0	0	0	0		
of which Wind Onshore		0	0	0	0		
of which Wind Offshore		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	0	0	0		
Other (Wave/Tidal etc)		0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	37	37	38	38	40	40
Conventional Hydro	0	37	37	38	38	40	40
of which Run of River	0	37	37	38	38	40	40
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables		227	778	3,044	3,154	7,290	9,600
Solar		0	0	68	88	140	200
Geothermal				0		0	0
Wind		57	435	2,216	2,241	5,900	8,000
of which Wind Onshore		57	435	1,988	2,013	3,600	4,500
of which Wind Offshore		0	0	228	228	2,300	3,500
Biogas							
Biomass		20	53	240	290	550	700
Waste		150	290	520	535	700	700
Other (Wave/Tidal etc)		0	0	0	0	0	0

TABLE 3.1.1.4 GENERATION EQUIPMENT – RENEWABLE CAPACITY BY COUNTRY (MW)

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	1,287	1,960	2,134	2,315	2,325	2,346	2,346
Conventional Hydro	642	765	512	550	553	570	570
of which Run of River	204	204	365	409	412	412	412
Pumped and Mixed	645	1,195	1,622	1,765	1,776	1,776	1,776
OTHER RENEWABLES	0	0	13	804	1,225	7,495	8,789
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	4	702	1,096	6,638	7,840
of which Wind Onshore	0	0	4	702	1,096	6,638	7,840
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	62	75	0	0
Biomass	0	0	9	40	54	857	949
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	2,467	3,327	4,469	5,037	5,051	9,100	10,330
Conventional Hydro	2,399	2,723	3,865	4,001	4,016	5,149	5,279
of which Run of River	1,561	2,007	2,402	2,581	2,595	3,083	3,203
Pumped and Mixed	68	604	604	1,035	1,035	3,951	5,051
OTHER RENEWABLES	4	4	395	4,192	4,610	6,713	8,124
Solar	0	0	0	95	131	560	760
Geothermal	4	4	14	23	23	40	40
Wind	0	0	89	3,575	3,907	5,420	6,570
of which Wind Onshore	0	0	89	3,575	3,907	5,420	6,570
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	1	21	30	60	70
Biomass	0	0	9	111	117	200	230
Waste	0	0	282	367	402	432	444
Other (Wave/Tidal etc)	0	0	0	0	0	1	10

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	2,990	4,930	5,170	6,400	5,908	7,595	7,646
Conventional Hydro	2,990	4,930	5,170		5,908	6,382	6,433
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	0	0	0		0	1,213	1,213
OTHER RENEWABLES	0	0	0	20	408	3,535	5,189
Solar	0	0	0		0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	12	401	3,496	4,996
of which Wind Onshore	0	0	0	12	401	3,496	4,996
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		8	38	192
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	14,500	16,330	16,229	16,203	16,200	16,400	16,600
Conventional Hydro	14,150	15,980	16,229	16,203	16,200	16,400	16,600
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	350	350	0	0	0	0	0
Other Renewables	0	4	1,225	4,666	5,316	10,500	14,400
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	4	241	1,560	2,163	5,700	9,500
of which Wind Onshore	0						
of which Wind Offshore	0						
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	2,824	2,860	4,100	4,200
Waste	0	0	0	282	293	700	700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Hydro	663	779	868	1,071	984	1,087	1,152
Conventional Hydro	663	779	868				
of which Run of River	663	779	868				
Pumped and Mixed	0	0	0		0	0	
Other Renewables	0	0	0	28	24	118	182
Solar	0	0	0		0	0	
Geothermal	0	0	0		0	0	
Wind	0	0	0		0	0	
of which Wind Onshore	0	0	0		0	0	
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	
Biomass	0	0	0		30	30	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Hydro	822	1,615	2,437	2,478	2,478	2,576	
Conventional Hydro	684	742	1,564		1,694	1,703	
of which Run of River							
Pumped and Mixed	138	873	873		873	873	
Other Renewables	0	0	10	61	143	160	
Solar	0	0	0		0	0	
Geothermal	0	0	0		10	10	
Wind	0	0	1	5	3	60	
of which Wind Onshore	0	0	0	5	0	0	0
of which Wind Offshore	0	0	0	0	0	0	
Biogas	0	0	0		0	0	
Biomass	0	0	9		50	90	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Hydro	11,410	11,582	13,229	13,480	13,520	16,100	16,400
Conventional Hydro					12,120	12,100	12,400
of which Run of River					3,770	3,800	3,900
Pumped and Mixed					1,400	4,000	4,000
Other Renewables		78	158	277	363	980	2,000
Solar	0	2	15	71	100	300	800
Geothermal	0	0	0	0	0		
Wind	0	0	3	18	42	200	500
of which Wind Onshore	0	0	3	18	42	200	500
of which Wind Offshore	0	0	0	0	0	0	0
Biogas							
Biomass							
Waste		75	137	170	179	180	180
Other (Wave/Tidal etc)		0	0	0	0	0	0

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Hydro	19,598	26,375	27,262	29,636	29,945	31,500	33,000
Conventional Hydro	19,004	25,147	25,994	28,366	27,806	29,700	31,000
of which Run of River							
Pumped and Mixed	594	1,228	1,269	1,270	1,269	1,800	2,000
Other Renewables	0	0	13	430	430	2,700	4,500
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	13	430	430	2,700	4,500
of which Wind Onshore	0	0	13	430		2,500	4,000
of which Wind Offshore	0	0	0	0		200	500
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0
Waste			22	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	2,131	6,764	11,175	14,553	15,831		
Conventional Hydro	2,131	6,764	11,175	14,553	15,831		
of which Run of River							
Pumped and Mixed							
Other Renewables	12	18	60	956	1,521		
Solar							
Geothermal		18	18	77	94		
Wind			19	792	1,320		
of which Wind Onshore			19	792			
of which Wind Offshore							
Biogas			4	55	70		
Biomass							
Waste	12		19	32	37		
Other (Wave/Tidal etc)							

TABLE 3.1.1.4 Generation Equipment – Renewable Capacity by Country (MW)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,210	2,034	1,976	2,056	2,056		
Conventional Hydro	770	1,594	1,536	1,616			
of which Run of River	5	7	10	29			
Pumped and Mixed	440	440	440	440			
Other Renewables	0	0	0	0	0		
Solar	0	0	0	0			
Geothermal	0	0	0	0			
Wind	0	0	0	0	0		
of which Wind Onshore	0	0	0	0			
of which Wind Offshore	0	0	0	0			
Biogas	0	0	0	0			
Biomass	0	0	0	0			
Waste	0	0	0	0			
Other (Wave/Tidal etc)	0	0	0	0			

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Hydro		2,080	2,076	2,133	2,133	2,179	
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables	0	0	0	6			
Solar							
Geothermal							
Wind	0	0	0	70			
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Hydro	1,855	2,803	2,804	2,863	2,863	3,210	3,646
Conventional Hydro	1,855	2,189	2,190	2,249	2,249	2,596	2,596
of which Run of River	1,578	1,787	1,822	1,852	1,852	2,225	2,225
Pumped and Mixed	0	614	614	614	614	614	1,050
Other Renewables	0	0	0	0	0	250	250
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0	0	250	250
of which Wind Onshore	0	0	0	0	0		
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	0	0	0		
Biomass	0	0	0	0	0		
Waste	0	0	0	0	0		
Other (Wave/Tidal etc)							

TABLE 3.1.2

Generation Equipment – Capacity by Technology (MW)

The tables below present the generating capacity from a different perspective, i.e. by technology. Data shown are in MW and include both historical data and forecasts for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community members.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	8,210	10,870	11,730	12,665	12,919	15,919	17,919
Non-fuel Renewables	100	110	170	1,043	1,495	4,147	8,847
New Technologies (e.g. Fuel Cells)							
Not Specified	1,944	2,619	3,870	678	660	559	473
Total	12,620	16,190	18,040	21,085	21,400	27,683	35,228

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,666	5,500	5,713	5,902	5,927	4,037	0
Steam Thermal Units	-	6,324	4,272	3,436	3,149	-	-
Gas Turbine Units	-	276	1281	1746	1723	-	-
Combined Cycle Units	-	186	2792	3462	3878	-	-
Internal Combustion Units	-	169	200	424	288	-	-
Hydro	1,128	1,401	1,413	1,417	1,425	1,041	1,401
Non-fuel Renewables	0	5	14	994	1,816	5,521	6,538
New Technologies (e.g. Fuel Cells)	-						
Not Specified	8,210	280	0	115	116	10,010	15,850
Total	11,004	14,141	15,685	17,496	18,322	20,609	23,789

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,300	2,700	3,500	1,900	1,900	3,800	5,700
Steam Thermal Units	4,830	5,655	4,934		5,269	5,520	4,330
Gas Turbine Units	0	0	0		0	0	0
Combined Cycle Units	0	0	0		0	300	1,500
Internal Combustion Units	0	0	0		0	0	0
Hydro	1,700	1,800	1,950	1,800	2,724	2,250	2,460
Non-fuel Renewables	0	0	0		513	2,400	3,400
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	0
Total	7,830	10,155	10,384		10,406	14,270	17,390

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	264	462	800	930	930	630	390
Gas Turbine Units	0	0	188	188	188	188	188
Combined Cycle Units	0	0	0	220	220	1,380	2,100
Internal Combustion Units	0	0	0	50	100	0	0
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	0	0	6	95		
New Technologies (e.g. Fuel Cells)	0	0	0		0		
Not Specified	0	0	0		0	0	0
Total	264	462	988	1,394	1,533	2,198	2,678

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	1,651	1,651	3,830	3,900	3,830	6,000
Steam Thermal Units	8,889	10,463	10,009	10,734	10,770	9,144	7,368
Gas Turbine Units	171	171	63	328	433	489	800
Combined Cycle Units	0	0	419	570	590	579	700
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	1,300	1,342	2,089	2,183	2,203	2,121	2,121
Non-fuel Renewables	0	8	1	658	2,177	2,370	2,750
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	1	10
Not Specified	139	125	0	0	0	0	0
Total	10,499	13,760	14,232	18,326	20,073	18,544	19,749

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	8,607	22,406	22,396	20,480	20,477	8,107	0
Steam Thermal Units			64,500	63,927	64,093	49,300	37,100
Gas Turbine Units	3,450	3,900	4,157	5,930	5,900	6,000	6,200
Combined Cycle Units			14,000	18,425	18,970	22,000	22,200
Internal Combustion Units			290	700	1,050	1,100	1,500
Hydro	6,451	6,851	9,392	11,027	11,137	13,500	14,000
Non-fuel Renewables			6,156	35,418	44,702	76,800	88,100
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	80	0	0	0	0
Total	78,597	93,818	120,971	155,907	166,329	176,807	169,100

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	6,609	7,762	9,746		7,212	8,900	8,100
Gas Turbine Units	0	0	0		813	0	0
Combined Cycle Units	0	0	0		552	0	0
Internal Combustion Units	0	0	0		1,044	0	0
Hydro	9	9	9	9	9	9	9
Non-fuel Renewables	1	438	2,662		3,809	5,600	7,300
New Technologies (e.g. Fuel Cells)	0	0	0		0	0	0
Not Specified	0	0	0		0	0	0
Total	6,619	8,209	12,417		13,439	14,509	15,409

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear			0	0	0	0	
Steam Thermal Units			1,429	2,302		1,973	
Gas Turbine Units				0		900	
Combined Cycle Units			0	0		0	
Internal Combustion Units			10	2		0	
Hydro			2	4	4	5	
Non-fuel Renewables			0	133		900	
New Technologies (e.g. Fuel Cells)			0	0		0	
Not Specified			0	0		277	
Total			2,441	2,441	2,630	3,350	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,065	7,000	7,486	7,419	7,483	7,483	9,916
Steam Thermal Units	14,088	17,677	23,114	20,566	21,054	16,554	11,546
Gas Turbine Units	0	0	304	301	304	304	1,552
Combined Cycle Units	0	0	0	21,448	23,286	26,962	28,187
Internal Combustion Units	1,000	1,705	2,329	4,268	3,543	4,598	5,601
Hydro	13,175	16,561	17,667	18,798	18,816	21,251	22,266
Non-fuel Renewables	0	35	2,628	23,090	25,617	44,696	64,270
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	29,328	42,978	53,529	95,890	101,072	121,848	143,338

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	2,210	2,310	2,640	2,700	2,730	4,604	7,395
Steam Thermal Units	5,679	6,882	7,215				
Gas Turbine Units	815	1,357	1,847				
Combined Cycle Units		0	1,586				
Internal Combustion Units		0	50				
Hydro	2,318	2,621	2,882	3,074	3,084	3,330	3,400
Non-fuel Renewables	0	0	38	147	197	2,565	3,870
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	0
Total	11,022	13,170	16,258	16,372	16,740	20,813	24,005

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	14,394	55,750	63,183	63,130	63,130	65,000	65,000
Steam Thermal Units	29,032	22,673	26,799	26,154	27,399	16,600	15,300
Gas Turbine Units	0	0	0				
Combined Cycle Units	0	0	0				
Internal Combustion Units	0	0	0				
Hydro	19,285	24,987	25,356	25,357	25,390	25,200	25,200
Non-fuel Renewables	240	240	718	5,793	7,864	26,300	52,600
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	62,711	103,410	115,338	120,434	123,783	133,100	158,100

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	5,767	11,353	12,486	10,881	10,846	9,456	13,910
Steam Thermal Units	57,051	54,522	38,874	36,805	37,204	23,648	16,892
Gas Turbine Units	3,638	3,130	1,291	1,499	1,501	1,133	1,339
Combined Cycle Units	0	229	21,058	32,028	34,393	40,607	45,856
Internal Combustion Units	0	90	425	0	0	0	0
Hydro	2,344	4,197	4,273	4,357	4,355	5,088	5,208
Non-fuel Renewables	0	9	415	4,225	4,848	33,477	62,935
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	68,800	73,530	78,822	89,795	93,146	113,409	146,139

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	3,508	5,495	5,676	6,172	6,106	3,372	
Gas Turbine Units	255	294	343	599	603	942	
Combined Cycle Units	0	16	920	2,485	3,734	5,216	
Internal Combustion Units	146	292	676	793	828	1,002	
Hydro	1,416	2,408	3,072	3,201	3,215	4,502	
Non-fuel Renewables	0	3	205	1,220	1,489	9,080	
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	
Not Specified	0	0	0	0	0	0	
Total	5,324	8,508	10,891	14,470	15,975	24,114	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	1,654	1,752	1,822	1,892	1,880	2,810
Steam Thermal Units	4,594	4,678	4,392	3,623	3,623	1,800	1,500
Gas Turbine Units	202	202	408	555	555	670	1,000
Combined Cycle Units	0	0	988	1,445	1,445	4,204	4,100
Internal Combustion Units	0	0	0	531	558	480	380
Hydro	46	48	47	50	50	66	1,270
Non-fuel Renewables	0	0	0	549	630	1,500	2,140
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	20	18	0	0	0	0
Total	4,842	6,602	7,605	8,575	8,753	10,600	13,200

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	1,733	2,640	2,807	1,094	1,094	1,094	1,500
Gas Turbine Units	0	358	379	2,100	2,400	2,844	3,686
Combined Cycle Units	115	258	735	0	0	0	0
Internal Combustion Units	0	0	15	529	529	529	224
Hydro	512	512	526	2,210	2,210	1,883	898
Non-fuel Renewables	0	0	118	1,000	1,200	3,694	4,892
New Technologies (e.g. Fuel Cells)				0	0	0	130
Not Specified	0	0	128	0	0	0	287
Total	2,360	3,768	4,708	6,933	7,433	10,044	11,617

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,424	0	0	0	0		
Steam Thermal Units	27,492	34,761	40,048	23,067	22,845		
Gas Turbine Units	1,465	2,120	5,314	3,353	3,369		
Combined Cycle Units	0	115	7,840	44,843	46,217		
Internal Combustion Units	189	236	833	1,778	2,227		
Hydro	15,826	18,770	20,346	21,371	21,521		
Non-fuel Renewables	428	496	960	6,717	9,992		
New Technologies (e.g. Fuel Cells)							
Not Specified	0	50	164	319	318		
Total	46,824	56,548	75,504	101,406	106,489		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	2,367	2,367	1,183	0	1,303	1,303
Steam Thermal Units	2,171	2,452	2,477	2,542	2,536	2,313	2,341
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	33	33	453	453
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	106	105	913	876	875	1,091	1,105
Non-fuel Renewables	0	0	0	89	161	510	1,130
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	2,277	4,924	5,757	4,723	3,606	5,670	6,332

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	0	0	0	0
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	4	4	51	498	505	530	550
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	1,124	1,124	1,128	1,128	1,128	1,328	1,328
Non-fuel Renewables	5	5	20	80	95	133	153
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	81	76	0	0	0	0	0
Total	1,214	1,209	1,199	1,706	1,728	1,991	2,031

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	562	587	581	230	230	410	510
Gas Turbine Units	0	0	0	0	0	20	20
Combined Cycle Units	0	0	0	600	643	620	650
Internal Combustion Units	0	0	14	53	60	125	130
Hydro	1,487	1,487	1,530	1,536	1,550	1,560	1,560
Non-fuel Renewables	0	0	2	30	31	315	525
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	
Not Specified	0	0	0	0	0	0	
Total	2,049	2,074	2,127	2,456	2,534	3,030	3,375

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear		0	0	0	0		
Steam Thermal Units			350	350	350		
Gas Turbine Units			111	111	111		
Combined Cycle Units			110	110	110		
Internal Combustion Units			0	0	0		
Hydro		0	0	0	0		
Non-fuel Renewables			0	2	2		
New Technologies (e.g. Fuel Cells)			0	0	0		
Not Specified					0		
Total							

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	498	449	449	485	485	485	2,985
Steam Thermal Units	0	6,100	7,009	8,901	8,858	11,100	9,000
Gas Turbine Units	522	314	1,131	1,272	1,317	1,100	1,000
Combined Cycle Units	3,815	8,800	8,485	8,656	9,943	17,685	15,375
Internal Combustion Units	0	139	1,582	3,618	3,606	3,880	3,800
Hydro	0	37	37	38	38	40	40
Non-fuel Renewables	0	208	876	2,284	2,329	6,040	8,200
New Technologies (e.g. Fuel Cells)				60	60	100	100
Not Specified	10,033	0	0	0	0	0	0
Total	14,868	16,047	19,569	25,314	26,636	40,430	40,500

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	3,070
Steam Thermal Units	21,624	26,433	28,039	29,394	28,260	33,275	26,532
Gas Turbine Units	0	0	0	0	0	0	493
Combined Cycle Units	0	0	174	9,989	10,219	9,374	10,043
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	1,287	1,960	2,134	2,315	2,325	2,346	2,346
Non-fuel Renewables	0	0	4	712	2,176	6,638	7,840
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	1	1
Not Specified	0	0	9	103	129	857	949
Total	22,910	28,394	30,604	33,512	32,832	52,491	51,274

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	1,537	3,262	4,236	4,513	4,515	1,972	1,569
Gas Turbine Units	165	329	329	330	335	226	267
Combined Cycle Units	0	0	990	2,992	3,829	5,670	5,745
Internal Combustion Units	323	531	759	934	1,006	1,118	1,170
Hydro	2,467	3,327	4,469	5,037	5,051	9,100	10,330
Non-fuel Renewables	4	4	103	3,693	4,061	6,021	7,380
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	4,496	7,454	10,887	17,499	18,797	24,107	26,460

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	655	1,400	1,300	2,630	4,130
Steam Thermal Units	10,710	13,470	8,040		8,545	7,708	5,829
Gas Turbine Units	0	0	0		101	140	140
Combined Cycle Units	0	0	0		197	2,359	3,987
Internal Combustion Units	0	0	0		0	0	0
Hydro	2,990	4,930	5,170	6,400	5,908	7,595	7,646
Non-fuel Renewables	0	0	0		408	3,496	4,996
New Technologies (e.g. Fuel Cells)					0	0	0
Not Specified	0	0	0		0	0	0
Total	13,700	18,400	13,865		16,460	23,929	26,728

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4,625	9,970	9,439	9,342	9,150	10,030	7,030
Steam Thermal Units	6,180	5,661	3,644	7,001	6,620	6,120	6,220
Gas Turbine Units	1,695	1,687	1,341	1,607	1,607	1,600	1,600
Combined Cycle Units	0	0	0	0	0	0	0
Internal Combustion Units	74	20	0	0	0	0	0
Hydro	14,500	16,330	16,229	16,203	16,200	16,400	16,600
Non-fuel Renewables	0	4	241	1,560	2,163	5,700	9,500
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified							
Total	27,074	33,672	30,894	35,713	35,701	39,850	40,950

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	630	670	666	656	656	328
Steam Thermal Units	1,015	1,093	1,026				
Gas Turbine Units	0	0	228				
Combined Cycle Units	0	0	84				
Internal Combustion Units	0	0	0				
Hydro	663	779	868	1,071	984	1,087	1,152
Non-fuel Renewables	0	0	0				
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	3		0	0	
Total	1,678	2,502	2,879		3,133	3,502	3,795

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	820	1,640	2,460	1,820	1,820	2,460	
Steam Thermal Units	2,463	2,705	2,622				
Gas Turbine Units	0	0	0				
Combined Cycle Units	0	0	212				
Internal Combustion Units	0	0	0		0	0	
Hydro	822	1,615	2,437	2,478	2,478	2,576	
Non-fuel Renewables	0	0	10		104	160	
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	
Total	4,105	5,960	7,741		7,845	8,310	

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	1,940	2,950	3,162	3,240	3,250	2,900	2,100
Steam Thermal Units			0		0		
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	11,410	11,582	13,229	13,480	13,520	16,100	16,400
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	22	0	0	0	0
Gas Turbine Units	35	35	63	250	250	250	250
Combined Cycle Units	0	0	0	650	665	950	950
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	19,598	26,375	27,262	29,636	29,945	31,500	33,000
Non-fuel Renewables	0	0	0	430	430	2,700	4,500
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	203	228	218	0	0	0	0
Total	19,836	26,637	27,578	30,966	31,290	35,400	38,700

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units		0	8,509	10,996	12,437		
Gas Turbine Units		0	449	2,077	2,085		
Combined Cycle Units		0	6,854	14,739	16,075		
Internal Combustion Units		0	241	1,442	1,578		
Hydro	2,131	6,764	11,175	14,553	15,831		
Non-fuel Renewables		18	36	869	1,414		
New Technologies (e.g. Fuel Cells)							
Not Specified	2,987	9,536	0	85	104		
Total	5,118	16,318	27,264	44,761	49,524		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units	1,317	1,909	1,725	1,725			
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units	53	53	53	53			
Hydro	1,210	2,034	1,976	2,056	2,056		
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro		2,080	2,076	2,133	2,133	2,179	
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total		3,578	3,688		3,893	4,207	

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	2,090	4,188	3,273	3,273	3,273	4,347	5,020
Gas Turbine Units	0	0	0	0	0	450	450
Combined Cycle Units	872	1,096	1,021	1,022	1,022	663	0
Internal Combustion Units	450	450	52	27	27	0	0
Hydro	1,855	2,803	2,804	2,863	2,863	3,210	3,646
Non-fuel Renewables	0	0	0	0	0	250	250
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	0	0	0	0		
Total	5,267	8,537	7,150	7,185	7,185	8,920	9,366

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear				13,835	13,835	17,600	24,300
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro				5,414	5,458	7,750	8,649
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

The tables below show the capacity of cogeneration plants in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community member states. Capacity is expressed in MW, and differentiated by primary energy. The tables present both historical data (between 1980 and 2010) and estimates for 2020 and 2030.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0				
Hard Coal	277	935	910				
Oil	406	262	270				
Natural Gas	627	791	2,030				
Renewables	0	0	0				
Other Non-Renewables	474	481	520				
Total	1,784	2,469	3,730		5,642		

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels		310	158	444	609	943	
Hard Coal							
Oil							
Natural Gas		59	1,160	1,853	1,715	2,658	
Renewables		19	39	62	82	126	
Other Non-Renewables		151	154	176	175	272	
Total		540	1,464	2,430	2,577	4,000	

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	0
Hard Coal	148	120	110		120	110	110
Oil	460	390	270		290	270	270
Natural Gas	426	404	294		305	374	374
Renewables	0	0	0		0	0	0
Other Non-Renewables	0	0	0		0	0	0
Total	1,034	914	674		715	754	754

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0		
Hard Coal	0	0	0		0		
Oil	0	0	0		0		
Natural Gas	0	0	0		0		
Renewables	0	0	0		0		
Other Non-Renewables	0	0	0		0		
Total	0	0	0		0		

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	335	335	338	338	500	600
Hard Coal	0	1,824	3,390	3,320	3,320	3,450	3,500
Oil	0	0	130	130	130	130	130
Natural Gas	0	106	333	400	400	720	800
Renewables	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	0	2,265	4,188	4,188	4,188	4,800	5,030

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels				4,000	4,000		
Hard Coal				7,200	7,280		
Oil				860	860		
Natural Gas				12,300	12,720		
Renewables				1,920	2,140		
Other Non-Renewables				1,120	1,200		
Total	6,819	8,996	18,500	27,400	28,200		

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	
Hard Coal	3,591	7,741	6,745		4,373	4,059	
Oil	0	0	0		563	0	
Natural Gas	0	140	2,421		2,447	4,833	
Renewables	0	0	0		1,069	0	
Other Non-Renewables	0	0	0		298	0	
Total	3,591	7,881	9,166		8,750	8,892	

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			190	176		176	
Hard Coal			0	0		0	
Oil			0	0		0	
Natural Gas			17	156		100	
Renewables			9	50		277	
Other Non-Renewables			289	24		0	
Total			505	406		553	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal	0	0	81	42	42	42	42
Oil	525	900	1,448	1,155	1,446	1,561	1,676
Natural Gas	0	451	3,322	5,031	5,112	6,137	6,887
Renewables							
Other Non-Renewables							
Total	525	1,351	4,851	6,227	6,600	7,740	8,604

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0	0	0	0	0
Hard Coal			1,468	958	958	417	437
Oil			158	290	290	170	158
Natural Gas			1,797	2,442	2,442	2,864	2,518
Renewables			1,442	2,056	2,109	2,253	2,385
Other Non-Renewables			1,038	1,099	1,249	1,569	1,429
Total	2,839	4,000	5,903	6,845	7,048	7,273	6,927

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0				
Hard Coal			211				
Oil			211				
Natural Gas			2,530				
Renewables			843				
Other Non-Renewables			422				
Total			4,217				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0		
Hard Coal	877	527	160	184	176	131	78
Oil	1,077	884	266	97	87	58	60
Natural Gas	43	315	3,168	4,244	4,613	4,655	4,861
Renewables	0	0	110	240	260	689	1,318
Other Non-Renewables	527	400	774	807	917	0	0
Total	2,524	2,126	4,478	5,573	6,053	5,533	6,316

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	33	33	33	33	33	33	
Hard Coal	0	0	21	46	62	65	
Oil	132	154	153	141	125	125	
Natural Gas	0	16	28	235	219	219	
Renewables	0	0	0		0	40	
Other Non-Renewables	0	0	0		0	0	
Total	165	203	234	455	439	482	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	222	0	0	0	0
Hard Coal	182	176	150	30	30	10	0
Oil	0	0	0	0	0	0	0
Natural Gas	589	637	391	1,880	1,893	1,500	1,500
Renewables	0	0	0	80	85	500	500
Other Non-Renewables	0	0	81	0	0	0	0
Total	770	813	844	1,990	2,008	2,010	2,000

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0	0	0	0	
Hard Coal			0	0	0	0	
Oil			0	0	0	0	
Natural Gas			100	150	150	200	
Renewables			0	0	0	0	
Other Non-Renewables			18	18	18	18	
Total			118	168	168	289	307

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total	5,249	4,540	11,892	23,717	23,671		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	314	594	619	626	612	667	667
Hard Coal	0	0	0	0	0	0	0
Oil	148	148	148	148	148	148	148
Natural Gas	0	0	0	33	33	33	33
Renewables	0	0	0	37	44	224	270
Other Non-Renewables	0	0	0	0	0	0	0
Total	462	742	767	844	837	1,072	1,118

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	4	4	51	498	501	530	550
Renewables	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	4	4	51	498	501	530	550

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	
Hard Coal	0	0	0	0	0	0	
Oil	42	67	75	3	3		
Natural Gas	520	520	520	856	970	1,000	1,000
Renewables	0	0	0	13	20	75	110
Other Non-Renewables	0	0	0	0	0		
Total	562	587	595	872	993	1,075	1,110

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0		
Hard Coal	0	0	0	0	0		
Oil	0	0	0	0	0		
Natural Gas	0	0	0	0	0		
Renewables	0	0	0	0	0		
Other Non-Renewables	0	0	0	0	0		
Total	0	0	0	0	0		

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal	1,163	1,163	930	1,480	1,480	1,480	625
Oil							
Natural Gas	2,652	4,131	5,925	11,057	10,328	11,840	11,145
Renewables	0	0	0	303	396	550	600
Other Non-Renewables	0	0	145	130	130	130	130
Total	3,815	5,294	7,000	12,970	12,334	14,000	12,500

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	7,063	7,914	6,724	6,310	6,044	3,940	3,362
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	174	955	943	2,446	3,014
Renewables	0	0	0	29	37	197	43
Other Non-Renewables	0	0	0	0	0	0	0
Total	7,063	7,914	6,897	7,293	7,024	6,583	6,419

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	430	589	690	574	518	0	0
Natural Gas	0	0	178	634	672	1,580	1,868
Renewables	0	0	238	308	343	371	383
Other Non-Renewables	0	0	0	0	0	0	0
Total	430	589	1,106	1,515	1,533	1,950	2,250

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal	1,390	1,560	1,257		1,245	1,254	1,103
Oil	754	1,725	875		502	290	177
Natural Gas	1,436	3,285	1,668		1,753	2,938	3,470
Renewables	0	0	0		0	39	192
Other Non-Renewables	0	0	0		0	0	0
Total	3,580	6,570	3,800		3,500	4,520	4,942

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels						0	0
Hard Coal						0	0
Oil						90	90
Natural Gas						1,000	1,000
Renewables				2,824	2,680	4,800	4,900
Other Non-Renewables					100	120	120
Total	3,179	3,280	3,196	4,730	4,779	6,010	6,110

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	
Hard Coal	58	103	103		103	103	
Oil	0	0	0		0	0	
Natural Gas	0	0	0		0	0	
Renewables	0	0	0		0	0	
Other Non-Renewables	0	0	0		0	0	
Total	58	103	103		103	103	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	
Hard Coal	491	574	454		513	462	
Oil	70	98	98		85	80	
Natural Gas	336	467	707		1,053	1,543	
Renewables	0	0	0		0	0	
Other Non-Renewables	0	0	0		0	0	
Total	897	1,139	1,259		1,651	2,085	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	0
Hard Coal	0	0	0		0	0	0
Oil	0	0	0		0	0	0
Natural Gas	0	0	0	650	615	950	950
Renewables			22				
Other Non-Renewables	203	228	217				
Total	203	228	239	650	615	950	950

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			1,173	2,064	2,462		
Hard Coal			133	159	159		
Oil			540	194	253		
Natural Gas			616	2,217	2,443		
Renewables			0				
Other Non-Renewables			12		56		
Total			2,474	4,634	5,373		

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	53	53	53	53			
Hard Coal	1,317	1,909	1,725	1,725			
Oil							
Natural Gas							
Renewables	1,210	2,034	1,976	2,056			
Other Non-Renewables				0			
Total	2,579	3,995	3,754	3,834			

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	129	353	353	353	353	0	0
Hard Coal	663	663	663	663	663	382	0
Oil	0	84	84	0	0	0	0
Natural Gas	80	80	5	6	6	450	450
Renewables	0	0	0	0	0		
Other Non-Renewables	0	0	0	0	0		
Total	872	1,180	1,105	1,022	1,022	832	450

TABLE 3.1.3.2

CHP CAPACITY BY COMPANY TYPE (MW)

Cogeneration plays an important role in those industry sectors which require a significant amount of steam or process heat. Indeed, a number of factories are equipped with their own cogeneration units in order to obtain an integrated production of electricity and heat.

The tables below break down the CHP capacity given in the previous table by company type, thus distinguishing between generating companies and autoproducers. Capacity is indicated for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries, and is presented both for past years (between 1980 and 2010) and as forecasts for the years 2020 and 2030.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	953	1,619	2,670				
Autoproducers	831	850	1,060				
Total	1,784	2,469	3,730		5,642		

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels				1,657	1,758		
Other Non-Renewables				773	820		
Total		540	1,464	2,430	2,577	4,000	

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	194	274	360		440	440	440
Autoproducers	840	640	314		314	314	314
Total	1,034	914	674		715	754	754

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	0		0		
Autoproducers	0	0	0		0		
Total	0	0	0		0		

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies				2,094	2,094	2,800	2,800
Autoproducers				2,094	2,094	2,000	2,230
Total	0	2,265	4,188	4,188	4,188	4,800	5,030

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	6,819	8,996	10,000	18,550	19,300		
Autoproducers	0	0	8,500	8,850	8,900		
Total	6,819	8,996	18,500	27,400	28,200		

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	3,591	7,786	7,833		8,750	7,392	
Autoproducers	0	95	1,333		0	1,500	
Total	3,591	7,881	9,166		8,750	8,892	

TABLE 3.1.3.2 CHP CAPACITY BY COMPANY TYPE (MW)

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies			449	378			
Autoproducers			56	28			
Total			505	406		553	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies							
Autoproducers	525	1,351	4,851	6,227	6,600	7,740	8,604
Total	525	1,351	4,851	6,227	6,600	7,740	8,604

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies							
Autoproducers							
Total	2,839	4,000	5,903	6,845	7,048	7,273	6,927

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies							
Autoproducers							
Total			4,217				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	600	2,234	2,270	1,554	1,554
Autoproducers	2,524	2,126	3,878	3,339	3,783	3,979	4,762
Total	2,524	2,126	4,478	5,573	6,053	5,533	6,316

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	21	46	62	65	
Autoproducers	165	203	214	409	377	417	
Total	165	203	234	455	439	482	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	615	615	517	1,678	1,686	600	600
Autoproducers	155	198	327	312	322	1,410	1,400
Total	770	813	844	1,990	2,008	2,010	2,000

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies			60	0	100	166	166
Autoproducers			58	0	68	123	141
Total			118	168	168	289	307

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	29	209	7,698	18,303	18,216		
Autoproducers	5,220	4,331	4,194	5,414	5,455		
Total	5,249	4,540	11,892	23,717	23,671		

TABLE 3.1.3.2 CHP Capacity by Company Type (MW)

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	411	691	691	737	744	896	942
Autoproducers	51	51	76	107	93	176	176
Total	462	742	767	844	837	1,072	1,118

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	0	385	385	385	385
Autoproducers	4	4	51	113	110	145	165
Total	4	4	51	498	501	530	550

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	520	520	520	806	853	810	810
Autoproducers	42	67	75	66	140	265	300
Total	562	587	595	872	993	1,075	1,110

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	0	0	0		
Autoproducers	0	0	0	0	0		
Total	0	0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	3,553	4,534	6,000	5,400	5,500	8,000	6,500
Autoproducers	262	760	1,000	7,570	6,834	6,000	6,000
Total	3,815	5,294	7,000	12,970	12,334	14,000	12,500

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	4,280	5,132	5,002	5,869	5,463	4,603	4,179
Autoproducers	2,783	2,783	1,896	1,424	1,561	1,980	2,240
Total	7,063	7,914	6,897	7,293	7,024	6,583	6,419

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	56	56	56	1,279	1,297	1,950	2,250
Autoproducers	374	533	1,050	236	236	0	0
Total	430	589	1,106	1,515	1,533	1,950	2,250

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	2,930	5,910	3,363		3,079	3,220	3,642
Autoproducers	650	660	437		421	1,300	1,300
Total	3,580	6,570	3,800		3,500	4,520	4,942

TABLE 3.1.3.2 CHP Capacity by Company Type (MW)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	2,171	2,524	2,264	3,531	3,560	4,510	4,580
Autoproducers	1,008	756	932	1,199	1,219	1,500	1,530
Total	3,179	3,280	3,196	4,730	4,779	6,010	6,110

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	58	103	103		103	103	
Autoproducers	0	0	0		0	0	
Total	58	103	103		103	103	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	317	361	360		561	661	
Autoproducers	580	778	899		1,090	1,424	
Total	897	1,139	1,259		1,651	2,085	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies							
Autoproducers							
Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	0	0	0	650	665	950	950
Autoproducers	203	228	239		0	0	0
Total	203	228	239	650	615	950	950

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies			189	2,970	2,227		
Autoproducers			2,285	1,664	3,146		
Total			2,474	4,634	5,373		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	2,527	3,943	3,701	3,761			
Autoproducers	53	53	53	73			
Total	2,579	3,995	3,754	3,834			

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Electricity Generating Companies	792	1,100	1,100	1,016	1,016	832	450
Autoproducers	80	80	5	6	6		
Total	872	1,180	1,105	1,022	1,022	832	450

3.2 Electricity Generation

TABLE 3.2.1.1

Annual Electricity Generation by Primary Energy (TWh)

The tables below present the annual electricity generation by primary energy in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community members between 1980 and 2010. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

Note: In the table below, "*multifuel*" refers to the ability of a generating unit of using more than one single fuel in producing electricity (and heat). The same applies to the tables below.

EU-27

	1980	1990	2000	2009	2010	2020	2030
Nuclear	196.0	747.2	898.6	852.0	872.4	867.5	827.5
Fossil Fuel Fired	1,293.2	1,256.4	1,532.3	1,599.1	1,625.9	1,521.2	1,115.4
of which multifuel	98.2	92.9	84.9	41.2	47.5	7.1	5.8
Hard Coal	571.7	641.6	558.5	452.1	468.2	305.0	272.6
Brown Coal	205.4	238.9	320.9	287.1	310.6	275.1	196.9
Oil	342.9	187.6	173.3	83.3	76.6	31.9	34.0
Natural Gas	150.4	171.9	450.3	707.2	747.9	596.8	547.9
Derived Gas	18.9	14.4	28.0	20.0	27.8	16.9	16.5
Hydro	318.3	312.5	395.1	354.0	390.3	392.1	350.8
Conventional Hydro	233.3	199.3	259.9	217.4	267.9	165.4	159.6
of which Run of River	109.6	96.9	115.9	91.7	98.0	47.6	49.5
Hydro Pumped and Mixed	21.0	31.3	41.8	41.7	44.9	45.3	51.6
Other Renewables	7.0	12.5	58.4	258.2	299.7	708.2	888.0
Solar	0	0	0	14.0	24.1	65.1	92.4
Geothermal	2.5	3.1	4.5	5.2	5.3	3.3	3.5
Wind	0	0.1	22.7	131.4	145.7	403.7	602.2
of which Wind Onshore	0	0	11.8	79.8	102.6	178.3	205.0
of which Wind Offshore	0	0	0	2.4	3.7	94.6	190.3
Biogas	0	0.6	3.9	23.2	25.9	32.8	43.7
Biomass	3.6	5.4	12.9	56.2	65.5	95.0	120.2
Waste	0.3	1.9	13.7	28.0	29.9	21.9	22.0
Other (Wave/Tidal etc)	0.6	0.6	1.1	0	0.0	0.7	4.6
Not Specified	13.5	13.0	7.9	4.5	4.7	9.6	1.7
Total	1,844.8	2,356.8	2,889.9	3,075.2	3,205.8	3,481.6	3,121.4

Note: It must be noted that whereas the the EU-27 aggregated figures for type of primary energy used are fairly complete, the breakdown into subtypes might not always take into account all EU-27 countries.

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	11.2	15.2	17.3	20.0	21.0	16.3	16.2
of which multifuel							
Hard Coal	0	3.7	5.9	4.1	4.6	2.4	2.1
Brown Coal	2.4	2.3	1.8	0	0	0	0
Oil	4.9	1.7	1.3	1.2	1.2	0.1	0
Natural Gas	3.6	6.8	7.0	12.9	13.5	12.8	13.0
Derived Gas	0.3	0.7	1.3	1.8	1.7	1.1	1.1
Hydro	28.9	32.3	42.8	42.4	41.0	51.0	56.2
Conventional Hydro	20.5	23.3	29.7	29.8	27.6	33.2	35.9
of which Run of River	20.5	23.3	29.7	29.8	27.6	33.2	35.9
Hydro Pumped and Mixed	8.4	9.0	13.1	13.0	13.4	17.8	20.3
Other Renewables				4.4	4.8	10.5	17.0
Solar				0.0	0.0	0.5	3.8
Geothermal				0.0	0.0	0.0	0.0
Wind				2.0	2.2	6.4	8.7
of which Wind Onshore				2.0	2.2	6.4	8.7
of which Wind Offshore				0	0	0	0
Biogas				0.5	0.5	1.0	1.5
Biomass				1.9	2.0	2.5	2.9
Waste				0	0.1	0.1	0.1
Other (Wave/Tidal etc)				0	0.0	0.0	0.0
Not Specified	0.6	1.3	0.1	0.4	0.5	0.7	0.9
Total	40.7	48.8	60.2	67.2	67.3	78.5	90.3

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	11.90	42.72	48.15	47.22	47.94	31.8	0
Fossil Fuel Fired	38.00	26.51	32.60	35.69	37.70	44.25	71.37
of which multifuel							
Hard Coal	12.20	19.80	16.00	6.10	5.90	8.90	28.40
Brown Coal							
Oil	17.30	1.31	0.70	0.28	0.40	2.20	2.67
Natural Gas	5.60	5.40	15.90	29.31	31.40	30.60	37.10
Derived Gas	2.90					2.55	3.20
Hydro	0.80	0.90	1.69	1.75	1.66	1.66	1.66
Conventional Hydro	0.10	0.27	0.46	0.32	0.31	0.31	0.31
of which Run of River							
Pumped and Mixed	0.70	0.63	1.23	1.43	1.35	1.35	1.35
Other Renewables	0.00	0.73	1.35	6.05	7.22	21.00	28.23
Solar		0.00	0.00	0.16	0.56	0.70	0.80
Geothermal							
Wind		0.01	0.02	0.99	1.29	11.10	15.60
of which Wind Onshore							
of which Wind Offshore							
Biogas		0.01	0.10	0.47	0.58		
Biomass		0.14	0.16	2.66	2.90	10.20	12.90
Waste		0.58	1.07	1.78	1.89		
Other (Wave/Tidal etc)							
Not Specified	0.30						
Total	51.00	70.86	83.79	90.71	94.52	98.71	101.26

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Bulgaria (BG)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	5.7	13.5	16.8	14.2	14.4	28.4	43.0
Fossil Fuel Fired	21.8	22.2	17.1	20.4	21.8	30.0	35.7
of which multifuel	0	0	0		0	0	0
Hard Coal	7.4	6.8	2.0		4.7	4.5	0.4
Brown Coal	9.4	11.2	12.3	18.3	15.2	19.4	24.8
Oil	2.5	2.1	1.2	0.4	0.2	0.5	0.5
Natural Gas	2.5	2.0	1.6	1.7	1.7	5.6	10.0
Derived Gas	0	0	0		0	0	0
Hydro	3.7	1.8	2.9	3.0	5.5	3.2	3.2
Conventional Hydro	3.7	1.7	2.6		4.6	2.6	2.6
of which Run of River	0.2	0.1	0.1		0.3	0.3	0.3
Pumped and Mixed	0	0.1	0.3		0.9	0.6	0.6
Other Renewables	0	0	0	0.3	0.5	4.9	6.8
Solar	0	0	0	0	0.0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	0.3	0.3	4.9	6.8
of which Wind Onshore	0	0	0		1.6	4.9	6.8
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		0.2	0	0
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0
Not Specified	0	0	0		0	0	0
Total	31.2	37.5	36.8	37.9	46.7	66.5	88.7

Cyprus (CY)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	1.0	2.0	3.4	5.1	5.1	8.6	11.5
of which multifuel	0	0	0			0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0			0	0
Oil	1.0	2.0	3.4			0.5	0.7
Natural Gas	0	0	0			8.1	10.8
Derived Gas	0	0	0			0	0
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0			0	0
of which Run of River	0	0	0			0	0
Pumped and Mixed	0	0	0			0	0
Other Renewables	0	0	0	0	0.1	0	0
Solar	0	0	0				
Geothermal	0	0	0				
Wind	0	0	0		0.1		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				
Not Specified	0	0	0	0	0	0	0
Total	1.0	2.0	3.4	5.1	5.2	8.6	11.5

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Czech Republic (CZ)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	11.8	12.7	27.2	28.0	25.9	35.0
Fossil Fuel Fired	46.3	44.9	52.7	50.3	51.9	50.4	50.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	6.8	5.6	6.6	6.0	5.5	7.7	7.0
Brown Coal	37.3	38.0	42.6	41.1	42.8	39.2	40.0
Oil	1.1	0.4	0.3	0	0	0	0
Natural Gas	0.2	0.2	1.7	3.2	3.6	2.0	2.0
Derived Gas	0.9	0.7	1.5	0	0	1.5	1.0
Hydro	2.4	1.4	2.3	3.0	3.0	2.2	2.0
Conventional Hydro	1.9	1.0	1.7			1.6	1.5
of which Run of River	1.4	0.6	1.1			1.0	1.1
Pumped and Mixed	0.5	0.4	0.6			0.6	0.5
Other Renewables	0	0	0	1.8	2.6	3.5	4.0
Solar	0	0	0	0.1	0.6	0.5	0.5
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.3	0.3	1.5	4.0
of which Wind Onshore	0	0	0	0.3	0.3	*1.5*	*4.0*
of which Wind Offshore	0	0	0	0	0	*0*	*0*
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1.4	1.4	1.5	1.5
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	7.9	0
Total	48.7	58.1	67.7	82.3	85.9	89.9	93.0

Germany (DE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	41.0	139.0	160.7	127.7	133.0	59.0	0
Fossil Fuel Fired	276.0	247.0	328.6	328.1	347.5	277.6	190.4
of which multifuel	42.8	35.9	39.2	35.5	34.0		
Hard Coal	105.0	129.0	131.2	98.8	107.4	75.0	54.0
Brown Coal	87.0	75.0	136.1	133.6	134.2	118.0	56.0
Oil	25.0	9.0	5.4	8.7	7.5	0.6	0.4
Natural Gas	59.0	34.0	47.0	76.2	84.1	78.0	74.0
Derived Gas			8.9	10.8	14.3	6.0	6.0
Hydro	18.0	21.0	29.0	24.2	27.0	30.5	32.5
Conventional Hydro	16.0	18.0	25.2	18.7	20.7	21.0	21.5
of which Run of River	16.0	18.0	21.3				
Pumped and Mixed	2.0	3.0	3.8	5.5	6.3	9.5	11.0
Other Renewables	0	0	14.3	76.8	83.9	166.0	203.8
Solar	0	0	0	6.6	11.7	33.0	37.0
Geothermal	0	0	0	0.0	0.0	2.0	2.8
Wind	0	0	9.5	38.6	37.8	90.0	116.0
of which Wind Onshore	0	0	9.5	38.6	37.8	60.0	64.0
of which Wind Offshore	0	0	0	0	0.0	30.0	52.0
Biogas	0	0	0.5	11.9	13.8	15.5	19.0
Biomass	0	0	0.6	12.9	13.0	17.5	21.0
Waste	0	0	3.7	6.8	7.7	8.0	8.0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	12.0	11.0	5.9	0	0	0	0
Total	347.0	418.0	538.5	556.8	591.4	533.1	426.7

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Denmark (DK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	23.9	30.4	29.9	25.5	25.6	26.9	24.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	20.8	29.4	16.7	17.7	17.0	9.9	7.0
Brown Coal	0	0	0	0	0	0	0
Oil	3.1	0.8	4.4	1.2	0.8	1.0	1.0
Natural Gas	0	0.2	8.8	6.7	7.9	14.0	14.0
Derived Gas	0	0	0	0	0	0	0
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0	0	0	0	0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	0	0	6.1	10.8	13.1	16.5	23.2
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	4.2	6.7	7.8	16.5	23.2
of which Wind Onshore	0	0				8.1	9.3
of which Wind Offshore	0	0				8.4	13.9
Biogas	0	0	0.2	0.4	0.4	0	0
Biomass	0	0	1.1	3.0	4.2	0	0
Waste	0	0	0.6	0.8	0.7	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	23.9	30.8	36.0	36.4	38.8	38.2	43.8

Estonia (EE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear			0	0	0	0	
Fossil Fuel Fired			8.5	8.0	11.7	10.1	
of which multifuel			0			1.2	
Hard Coal			0	0	0	0	
Brown Coal			7.8	7.6	11.0	9.0	
Oil			0.1	0	0	0	
Natural Gas			0.5	0.1	0.3	0.6	
Derived Gas			0.1	0.3	0.4	0.5	
Hydro			0	0.1	0.1	0.1	
Conventional Hydro			0	0.1	0.1	0.1	
of which Run of River			0	0.1	0.1	0.1	
Pumped and Mixed			0	0	0	0	
Other Renewables			0.1	0.5	1.0	3.8	
Solar			0	0	0	0	
Geothermal			0	0	0	0	
Wind			0	0.2	0.3	2.3	
of which Wind Onshore			0	0.2	0.3	1.3	
of which Wind Offshore			0	0	0	1.0	
Biogas			0	0	0	0.1	
Biomass			0	0.3	0.7	1.3	
Waste			0	0	0	0.1	
Other (Wave/Tidal etc)			0	0	0	0	
Not Specified					0.2	0.2	
Total	17.2	15.4	8.6	8.6	13.0	14.2	

Note: In the case of Estonia, brown coal includes oil shale.

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	5.0	52.0	60.0	51.0	58.9	58.0	77.0
Fossil Fuel Fired	73.0	69.0	118.0	158.0	128.9	159.0	155.0
of which multifuel	3.0	3.0	4.0	0	0.5	0	0
Hard Coal	22.0	46.0	62.0	35.0	29.2	26.0	15.0
Brown Coal	7.0	11.0	14.0	0	0	0	0
Oil	37.0	8.0	23.0	18.0	17.7	21.0	25.0
Natural Gas	3.0	4.0	20.0	105.0	87.1	112.0	114.0
Derived Gas	0	0	0	0	0	0	0
Hydro	30.0	26.0	31.0	29.0	44.9	41.0	42.0
Conventional Hydro	28.0	21.0	28.0	26.0	34.2	36.0	37.0
of which Run of River	1.0	0	0	0	0	0	0
Pumped and Mixed	3.0	5.0	3.0	3.0	4.4	5.0	5.0
Other Renewables	0	0	6.0	49.0	57.9	97.0	142.0
Solar	0	0	0	6.0	8.1	14.0	20.0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	5.0	37.0	41.9	76.0	112.0
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	0
Biogas	0	0	0	1.0	0.7	1.0	2.0
Biomass	0	0	0	2.0	1.7	3.0	4.0
Waste	0	0	1.0	3.0	2.7	3.0	3.0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0		0	0
Total	108.0	147.0	215.0	287.0	290.7	355.0	355.0

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	6.6	18.1	21.6	22.6	21.9	36.3	58.3
Fossil Fuel Fired	18.0	17.8	21.4	24.5	30.9	21.4	18.1
of which multifuel							
Hard Coal	11.4	9.0	8.2	10.4	13.6	5.4	4.4
Brown Coal	0.7	2.8	3.5	4.1	5.9	5.2	3.0
Oil	4.2	1.6	1.3	0.5	0.4	0.6	0.6
Natural Gas	1.7	4.4	8.4	9.5	11.0	10.2	10.1
Derived Gas							
Hydro	10.1	10.8	14.5	12.6	12.7	14.7	15.2
Conventional Hydro	10.1	10.8	14.5	12.6	12.7	14.7	15.2
of which Run of River							
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	3.4	4.4	8.2	8.6	10.7	19.7	22.9
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.1	0.3	0.3	5.9	8.9
of which Wind Onshore	0	0	0.1	0.3	0.3	5.9	8.9
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	0	0.1	0.1	0.3	0.4
Biomass	3.4	4.4	8.0	7.9	10.0	13.0	13.1
Waste			0.1	0.3	0.3	0.5	0.5
Other (Wave/Tidal etc)			0	0	0	0	0
Not Specified	0.6	0.5	1.0	0.9	1.0		
Total	38.7	51.6	67.3	69.2	77.2	92.1	114.5

Note: In the case of Finland, brown coal includes peat.

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	57.9	297.9	395.2	390.0	407.9	420.1	375.2
Fossil Fuel Fired	118.8	45.1	49.9	54.9	59.5	48.7	44.8
of which multifuel	0	0	0		0		
Hard Coal	59.6	29.3	25.8	20.7	19.1		
Brown Coal	0.6	0.4	0				
Oil	45.2	7.2	7.9	7.7	8.0		
Natural Gas	5.9	2.8	10.9	24.1	29.9		
Derived Gas	7.6	4.6	3.4				
Hydro	69.8	57.2	71.6	61.9	67.6	69.4	69.4
Conventional Hydro	68.7	53.3	66.8	56.1	61.1		
of which Run of River	42.1	31.8	37.1	30.7	33.4		
Pumped and Mixed	1.1	4.0	4.8	5.8	5.6		
Other Renewables	0.6	0.6	3.1	12.3	15.3	50.6	100.0
Solar	0	0	0	0.1	0.6	8.8	22.0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.1	7.9	9.7	31.0	58.2
of which Wind Onshore	0	0		7.9	9.7		
of which Wind Offshore	0	0		0	0		
Biogas	0	0	0	0.7	1.1	10.1	15.5
Biomass	0	0	0	0.7	0.8		
Waste	0	0	1.9	2.9	3.0		
Other (Wave/Tidal etc)	0.6	0.6	1.1	0	0	0.7	4.3
Not Specified	0	0	0	0	0	0	0
Total	246.6	400.2	516.7	519.1	550.2	588.8	589.4

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	32.3	58.7	78.3	62.8	56.4	60.5	74.3
Fossil Fuel Fired	228.9	233.6	269.8	266.6	279.0	156.3	88.1
of which multifuel	20.0	22.0	30.0	1.3	1.3	0.8	0.7
Hard Coal	203.9	209.1	114.7	97.8	102.3	41.6	34.7
Brown Coal	0	0	0	0	0	0	0
Oil	22.7	20.5	5.9	5.4	4.3	0.1	0
Natural Gas	0.3	2.0	145.0	163.5	172.5	114.6	53.4
Derived Gas	2.0	2.0	4.2			0	0
Hydro	5.1	7.1	7.7	8.9	6.8	10.8	9.6
Conventional Hydro	4.0	5.2	5.1	5.2	3.6	7.8	6.7
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	1.1	1.9	2.6	3.7	3.1	3.0	3.0
Other Renewables	0	0.7	5.0	20.0	22.2	101.5	202.7
Solar	0	0	0	0.0	0.0	2.7	6.3
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.9	9.3	10.2	81.9	163.3
of which Wind Onshore	0	0		8.3	8.9	34.4	51.6
of which Wind Offshore	0	0	0	1.7	3.0	47.5	111.6
Biogas	0	0.5	2.3	5.0	5.0		
Biomass	0	0	0.5	3.6	4.7	16.9	33.1
Waste	0	0.2	1.2	2.1	2.3		
Not Specified	0	0	0	0	0	0	0.2
Not Specified	0	0	0	0	0		
Total	266.3	300.1	360.8	359.0	366.2	329.0	374.7

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Greece (GR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired	17.9	30.0	45.2	46.6	42.9	35.4	
of which multifuel							
Hard Coal	0	0	0		0	0	
Brown Coal	9.0	23.0	30.9	30.5	27.4	17.0	
Oil	8.9	7.1	8.7	6.6	5.0	1.7	
Natural Gas			5.6	9.6	10.5	16.7	
Derived Gas	0	0	0		0	0	
Hydro	3.4	2.0	4.1	5.7	7.5	6.1	
Conventional Hydro	3.4	1.7	3.3	5.4	7.5	5.2	
of which Run of River	0	0	0	0.7	0.8	1.0	
Pumped and Mixed	0	0.3	0.8	0.3	0.0	0.9	
Other Renewables	0	0.2	0.6	2.8	3.1	20.3	
Solar	0	0	0	0.1	0.2	3.6	
Geothermal	0	0	0		0	0.7	
Wind	0	0	0.4	2.5	2.7	14.7	
of which Wind Onshore	0	0	0.4	2.5	2.7	14.1	
of which Wind Offshore	0	0	0	0	0	0.6	
Biogas	0	0	0.1	0.2	0.2	0.9	
Biomass						0.4	
Waste	0	0.2	0.2		0		
Other (Wave/Tidal etc)							
Not Specified	0	0	0		0	0	
Total	21.3	32.1	49.9	55.1	53.5	61.8	

Hungary (HU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	13.7	14.1	14.6	14.8	14.2	21.0
Fossil Fuel Fired	23.8	14.6	20.8	16.6	17.3	24.0	20.6
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	1.0	0.8	0.4	0.8	0	0
Brown Coal	12.0	7.8	8.4	5.3	4.7	3.3	2.0
Oil	5.9	1.0	4.5	0.5	0.4	0.5	0.8
Natural Gas	5.9	4.8	7.1	10.4	11.4	20.2	17.8
Derived Gas	0	0	0	0	0	0	0
Hydro	0.1	0.2	0.2	0.2	0.2	0.3	3.3
Conventional Hydro	0.1	0.2	0.2	0.2	0.2	0.3	0.3
of which Run of River	0.1	0.2	0.2	0.2	0.2	0.3	0.3
Pumped and Mixed	0	0	0	0	0	0	3.0
Other Renewables	0	0	0.1	2.0	2.3	5.3	7.7
Solar	0	0	0	0	0	0.1	0.2
Geothermal	0	0	0	0	0	0.2	0.4
Wind	0	0	0	0.3	0.5	1.6	2.1
of which Wind Onshore	0	0	0	0.3	0.5	1.6	2.1
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0.6	1.0
Biomass	0	0	0	1.6	1.7	2.7	3.8
Waste	0	0	0.1	0.1	0.1	0.1	0.2
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	23.9	28.5	35.2	33.4	34.6	43.8	52.6

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	8.9	12.5	21.3	19.8	20.9	19.8	23.3
of which multifuel	0	1.8	2.6				
Hard Coal	0.1	5.5	6.4	3.4	3.5	2.3	2.0
Brown Coal	1.5	2.0	1.6	0	0	0	0
Oil	5.3	1.5	4.4	0.7	0.3	0	0
Natural Gas	2.0	3.5	8.9	15.8	17.1	17.5	21.3
Derived Gas	0	0	0	0	0	0	0
Hydro	8.1	11.6	16.6	7.8	6.6	2.7	2.5
Conventional Hydro	0.7	0.7	0.8	0.8	0.5	0.9	0.9
of which Run of River				0	0	0	0
Pumped and Mixed	0.4	0.3	0.3	0.4	0	0.4	0.4
Other Renewables			0.3	2.4	2.3	6.3	7.3
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind			0.2	2.3	2.2	5.5	6.3
of which Wind Onshore			0.2	0	0	5.5	6.3
of which Wind Offshore				0	0	0	0
Biogas	0	0	0.1	0.1	0.1	0.9	0.9
Biomass	0	0	0	0	0	0	0
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	2.4	2.1	0.5	0.5
Total	17	24.1	38.2	32.4	31.9	29.3	33.6

Note: In the case of Ireland. brown coal includes peat.

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	2.1	0	0	0	0	0	
Fossil Fuel Fired	125.5	167.3	205.9	208.3	211.2		
of which multifuel							
Hard Coal	13.6	29.8	23.8	35.9	35.9		
Brown Coal	0	0	0	0	0		
Oil	100.5	97.4	84.3	25.6	22.3		
Natural Gas	8.7	36.8	93.4	143.1	148.3		
Derived Gas	2.7	3.3	4.3	3.7	4.7		
Hydro	47.2	34.6	50.2	52.8	54.4		
Conventional Hydro	45.0	31.2	43.6	48.6	51.1		
of which Run of River	18.4	11.5	15.6	20.5	21.5		
Pumped and Mixed	2.3	3.4	6.6	4.3	3.3		
Other Renewables	2.5	3.2	6.4	19.4	25.0		
Solar	0	0	0	0.7	1.9		
Geothermal	2.5	3.1	4.4	5.0	5.0		
Wind	0	0	0.6	6.5	9.0		
of which Wind Onshore	0	0	0.6	6.5	9.0		
of which Wind Offshore	0	0	0	0	0		
Biogas		0	0.5	1.6	2.0		
Biomass		0.1	0.5	4.1	5.1		
Waste		0	0.4	1.5	2.0		
Other (Wave/Tidal etc)	0	0	0	0	0		
Not Specified	0	0.2	0.7	0.6	0.7		
Total	177.4	205.3	263.3	281.1	290.7		

TABLE 3.2.1.1 ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	0	15.7	7.4	10.0	0	9.8	9.8
FOSSIL FUEL FIRED	10.6	10.2	2.0	2.7	3.6	9.5	9.5
of which multifuel	10.4	9.7	1.7	2.4	3.3	4.2	4.2
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	10.3	4.7	0.6	0.2	0.1	0.3	0.3
Natural Gas	0.3	5.5	1.4	2.5	3.5	9.3	9.3
Derived Gas	0	0	0	0	0	0	0
HYDRO	0.4	0.4	0.6	1.1	1.3	1.4	1.6
Conventional Hydro	0.4	0.4	0.3	0.4	0.6	0.7	0.8
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0.3	0.7	0.8	0.8	0.8
OTHER RENEWABLES	0	0	0	0.3	0.4	2.4	5.5
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.2	0.2	1.0	4.0
of which Wind Onshore	0	0	0	0.2	0.2	1.0	2.2
of which Wind Offshore	0	0	0	0	0	0	1.8
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0.1	0.2	1.4	1.4
Waste	0	0	0	0	0	0	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
NOT SPECIFIED	0	0	0	0	0	0	0
TOTAL	11.0	26.3	10.0	14.1	5.3	23.1	26.3

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	0.7	0.5	0.4	2.8	2.9	3.0	3.1
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0.2	0	0.4	2.8	2.9	3.0	3.1
Derived Gas	0.5	0.5	0	0	0	0	0
HYDRO	0.3	0.8	0.8	0.8	1.4	1.5	1.6
Conventional Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0.3	0.7	0.7	0.7	1.3	1.4	1.4
OTHER RENEWABLES	0	0	0.1	0.2	0.2	0.3	0.3
Solar	0	0	0	0.0	0.0	0.0	0.0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.1	0.1	0.1	0.1
of which Wind Onshore	0	0	0	0.1	0.1	0.1	0.1
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.0	0.0	0.1	0.1
Biomass	0	0	0	0	0	0	0
Waste	0	0	0	0.0	0.0	0.1	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
NOT SPECIFIED	0	0	0	0	0	0	0
TOTAL	1.0	1.3	1.3	3.8	4.1	4.2	4.4

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired	1.6	1.9	1.2	1.8	2.8	3.0	3.4
of which multifuel							
Hard Coal	0	0	0	0	0	0.9	1.1
Brown Coal	0	0	0	0	0		
Oil	0.9	0.3	0.2	0	0		
Natural Gas	0.7	1.6	1.0	1.8	2.8	2.1	2.3
Derived Gas	0	0	0	0	0	0	
Hydro	3.0	4.5	2.8	3.4	3.4	2.9	2.9
Conventional Hydro	3.0	4.5	2.8	3.4	3.4	2.9	2.9
of which Run of River	3.0	4.5	2.8	3.4	3.4	2.9	2.9
Pumped and Mixed	0	0	0	0	0	0	
Other Renewables	0	0	0	0.2	0.2	0.9	1.5
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0		
Wind	0	0	0	0.2	0.2	0.7	1.1
of which Wind Onshore	0	0	0	0.2	0.2	0.4	0.5
of which Wind Offshore	0	0	0	0	0	0.3	0.6
Biogas	0	0	0	0.0	0	0.1	0.1
Biomass	0	0	0	0.1	0	0.1	0.2
Waste	0	0	0	0.0	0	0.1	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	4.6	6.4	4.0	5.4	6.4	6.8	7.8

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear		0	0	0	0		
Fossil Fuel Fired		1.2	1.9	2.2	2.1		
of which multifuel			0	0			
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			1.9	2.2	2.1		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		
Hydro		0	0	0	0		
Conventional Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
Pumped and Mixed		0	0	0	0		
Other Renewables		0	0	0	0		
Solar		0	0	0	0		
Geothermal		0	0	0	0		
Wind		0	0	0	0		
of which Wind Onshore		0	0	0	0		
of which Wind Offshore		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	0	0	0		
Other (Wave/Tidal etc)		0	0	0	0		
Not Specified		0	0	0	0		
Total		1.2	1.9	2.2	2.1		

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4.0	3.3	3.7	4.2	4.0	4.0	25.3
Fossil Fuel Fired	55.7	64.4	80.7	94.8	100.0	104.5	98.7
of which multifuel							
Hard Coal	7.0	25.1	29.2	23.4	21.9	42.6	40.0
Brown Coal	0	0	0	0	0	0	0
Oil	23.0	0.2	0.1	0.1	0.1	0	0
Natural Gas	23.7	37.2	48.0	68.6	74.9	58.1	54.9
Derived Gas	2.0	1.9	3.2	2.7	3.1	3.8	3.8
Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
Conventional Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
of which Run of River	0	0.1	0.1	0.1	0.1	0.1	0.1
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables		1.0	1.3	10.0	10.3	21.1	27.9
Solar			0	0.1	0.1	0.1	0.1
Geothermal							
Wind			0.8	4.6	4.0	12.8	17.8
of which Wind Onshore			0.8	3.8	3.3	5.9	7.4
of which Wind Offshore			0	0.7	0.7	6.8	10.4
Biogas			0.1	0.8	0.9	2.0	3.0
Biomass			0.2	3.4	4.0	4.5	5.2
Waste			0.4	1.2	1.3	1.8	1.8
Other (Wave/Tidal etc)			0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	59.7	68.8	85.8	109.2	114.4	129.7	151.9

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	19.6
Fossil Fuel Fired	110.1	119.8	129.2	130.5	133.7	151.7	180.2
of which multifuel	0	0	0	0	0	0	0
Hard Coal	86.1	71.2	82.9	79.9	84.5	68.3	70.3
Brown Coal	21.9	48.2	45.9	46.1	44.7	44.0	52.8
Oil	2.1	0.4	0	0	0	0	0
Natural Gas	0	0	0.4	4.5	4.5	39.4	57.1
Derived Gas	0	0	0	0	0	0	0
Hydro	3.2	3.3	4.0	3.0	3.1	2.8	2.8
Conventional Hydro	2.3	1.4	1.8	2.1	2.2	1.8	1.8
of which Run of River	1.0	0.6	0.9	0.8	0.8	0.8	0.8
Pumped and Mixed	0.9	1.9	2.2	1.5	1.7	1.1	1.1
Other Renewables	0	0	0.0	5.5	7.0	18.4	20.6
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.0	1.1	1.6	10.2	12.0
of which Wind Onshore	0	0	0.0	1.1	16.0	10.1	12.0
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.3	0.4	0	0
Biomass	0	0	0.0	4.2	5.0	8.2	8.6
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	113.3	123.1	133.2	139.0	143.8	161.7	223.2

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	6.9	18.2	29.5	29.3	23.8	24.8	28.5
of which multifuel	0	0	0	2.0	3.0	0	0
Hard Coal	0.6	8.7	13.7	11.9	6.6	4.3	0
Brown Coal	0	0	0	0	0	0	0
Oil	6.3	9.5	9.2	2.7	2.4	1.4	0.9
Natural Gas	0	0	6.6	14.6	14.9	19.2	27.6
Derived Gas	0	0	0	0	0	0	0
Hydro	7.9	9.1	11.6	8.9	16.4	14.0	14.3
Conventional Hydro	7.8	8.6	10.3	7.5	14.0	11.6	11.5
of which Run of River	5.9	6.2	7.0	5.4	9.8	7.9	8.1
Pumped and Mixed	0.1	0.5	1.2	1.4	2.4	2.4	2.8
Other Renewables	0	0	0.9	10.3	12.4	16.2	18.7
Solar	0	0	0	0.2	0.2	1.1	1.6
Geothermal	0	0	0.1	0.2	0.2	0.3	0.3
Wind	0	0	0.2	7.6	9.1	11.3	13.0
of which Wind Onshore	0	0	0.2	7.6	9.1	11.3	13.0
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.1	0.1	0.2	0.3
Biomass	0	0	0.0	0.3	0.6	1.1	1.3
Waste	0	0	0.7	2.0	2.2	2.1	2.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0.0
Not Specified	0	0	0.2	0.2	0.2	0.3	0.3
Total	14.8	27.3	42.2	48.7	52.9	55.3	61.8

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	5.1	11.8	10.1	22.2	33
Fossil Fuel Fired	49.2	46	27.4	30	26.2	23.5	26.5
of which multifuel	22	20.5	7.4		5.4	0.9	0.9
Hard Coal	7.1	4.1	4.1		2.1	2.4	5.7
Brown Coal	13.1	14.6	13.8		18	12.4	7.8
Oil	5.8	9	2.5		1.4	0.2	0.2
Natural Gas	23.2	18.3	7		4.8	8.5	12.7
Derived Gas	0	0	0		0	0	0
Hydro	12.3	10.7	14.6	15.7	16.0	16.8	16.9
Conventional Hydro	12.3	10.7	14.6		16.0	16.7	16.6
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	0	0	0		0	0.1	0.3
Other Renewables	0	0	0	0	0.5	5.9	9.1
Solar	0	0	0		0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	0	0.5	5.7	8.1
of which Wind Onshore	0	0	0		0.5	5.7	8.1
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		0.0	0.2	1
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0
Not Specified	0	0	0		0	0	0
Total	61.5	56.7	47.1	57.5	52.8	68.4	85.5

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	25.3	65.2	54.8	50.0	55.6	75.4	52.9
Fossil Fuel Fired	9.5	3.3	4.5	4.4	6.5	4.8	4.8
of which multifuel							
Hard Coal	0.2	1.0	1.5	0.6	0.8	0	0
Brown Coal	0	0.1	0	0.5	0.6	0	0
Oil	9.3	1.2	1.4	1.3	1.7	0.8	0.8
Natural Gas	0	0.3	0.4	1.3	2.2	2.6	2.6
Derived Gas	0	0.7	1.1	0.7	1.2	1.4	1.4
Hydro	58.1	71.4	77.8	64.9	66.7	67.8	68.8
Conventional Hydro	0	0	0	0	0	0	0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	0.5	1.7	4.5	13.9	16.0	28.5	37.3
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.5	2.5	3.5	12.5	21.0
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	0	0	0	0	0
Biomass	0.2	0.8	1.8	6	6.9	10.0	10.3
Waste	0.3	0.9	2.3	5.4	5.6	6	6
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Not Specified							
Total	93.4	141.7	141.7	133.2	144.9	176.5	163.8

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	4.4	4.8	5.7	5.9	6.1	3.1
Fossil Fuel Fired	3.8	4.0	4.6	5.9	5.8	8.0	11.6
of which multifuel			0				
Hard Coal	3.7	3.9	4.4		0.5	0.5	0.5
Brown Coal	0	0	0		4.4	6.0	10.4
Oil	0.1	0.1	0.1		0.0	0.0	0.0
Natural Gas	0	0	0.1		0.7	1.3	0.7
Derived Gas	0	0	0		0	0	0
Hydro	3.2	2.8	3.2	4.7	3.4	3.9	4.2
Conventional Hydro	3.2	2.8	3.2		3.3	3.7	3.9
of which Run of River	0	0	0				
Pumped and Mixed	0	0	0				
Other Renewables	0	0	0	0.2	0.2	1.0	1.6
Solar	0	0	0		0	0	
Geothermal	0	0	0		0	0	
Wind	0	0	0		0	0	0
of which Wind Onshore	0	0	0		0	0	
of which Wind Offshore	0	0	0		0	0	
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	7.0	11.2	12.6	16.5	15.2	19.0	21.7

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Slovakia (SK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4.2	11.2	15.2	13.1	13.6	15.8	
Fossil Fuel Fired	12.1	8.8	8.5	6.3	5.6	14.7	
of which multifuel	0	0	0		0	0	
Hard Coal	4.2	3.6	2.6		2.3	2.3	
Brown Coal	3.5	2.5	2.2		1.7	1.6	
Oil	0.5	0.6	0.5		0.3	0.3	
Natural Gas	3.9	2.1	3.2		6.4	10.5	
Derived Gas	0	0	0		0	0	
Hydro	2.3	2.5	5.0	4.7	5.5	4.4	
Conventional Hydro	2.1	2.3	4.7		4.1	4.1	
of which Run of River							
Pumped and Mixed	0.2	0.2	0.3		0.3	0.3	
Other Renewables	0	0	0	0.4	0.5	0.7	
Solar	0	0	0		0	0	
Geothermal	0	0	0		0.1	0.1	
Wind	0	0	0	0	0	0.1	
of which Wind Onshore	0	0	0		0	0.1	
of which Wind Offshore	0	0	0		0	0	
Biogas	0	0	0		0	0	
Biomass	0	0	0		0.4	0.5	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	18.6	22.5	28.7	24.4	26.1	35.6	

Switzerland (CH)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	13.7	22.3	24.9	26.1	25.2	21.5	16.0
Fossil Fuel Fired	0.8	0.7	1.7	1.9	2.2	2.4	9.0
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro	33.5	30.7	37.9	37.1	37.5	41.2	42.0
Conventional Hydro						35.4	36.0
of which Run of River		13.6	17.6	16.1	16.0	16.6	17.0
Pumped and Mixed						5.8	6.0
Other Renewables	0.2	0.4	0.8	1.2	1.4	3.1	6.2
Solar		0	0	0.1	0.1	0.2	0.9
Geothermal		0	0	0	0	0.2	0.7
Wind		0	0	0	0	0.3	0.8
of which Wind Onshore		0	0	0	0	0.3	0.8
of which Wind Offshore		0	0	0	0	0	0
Biogas		0.1	0.1	0.2	0.2	0.6	1.2
Biomass		0	0	0.1	0.1	0.6	1.2
Waste		0.3	0.7	0.9	1.0	1.2	1.3
Other (Wave/Tidal etc)		0	0	0	0	0	0
Not Specified		0	0	0		0	0
Total	48.2	54.1	65.3	66.5	66.3	68.2	73.2

TABLE 3.2.1.1 ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	0	0	0	4.7	5.1	2.0	2.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	4.7	5.1	2.0	2.0
Derived Gas	0	0	0	0	0	0	0
HYDRO	83.1	120.3	141.1	126.1	118.4	134.0	135.0
Conventional Hydro	82.4	118.8	139.6	126.1	118.4	134.0	135.0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0.7	1.5	1.5	0	0	0	0
OTHER RENEWABLES	0	0	0.1	1.0	0.9	7.0	8.0
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.0	1.0	0.9	7.0	8.0
of which Wind Onshore	0	0	0.0	1.0	0.9	6.5	7.0
of which Wind Offshore	0	0	0	0	0	0.5	1.0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0
Waste	0	0	0.1	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
NOT SPECIFIED	0.1	0.4	0.6	0	0	0	0
TOTAL	83.2	120.8	141.8	131.8	124.4	143.0	145.0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
NUCLEAR	0	0	0	0	0		
FOSSIL FUEL FIRED	11.8	34.3	93.8	156.6	155.4		
of which multifuel		2.2	16.1	21.3	20.7		
Hard Coal	0.9	0.6	3.1	15.1	17.5		
Brown Coal	5.0	19.6	34.4	39.1	35.9		
Oil	5.9	3.9	9.3	4.8	2.2		
Natural Gas		10.2	46.2	96.1	98.1		
Derived Gas			0.8	1.5	1.7		
HYDRO	11.4	23.1	30.9	36.0	51.8		
Conventional Hydro	11.4	23.1	30.9	36.0	51.8		
of which Run of River							
Pumped and Mixed							
OTHER RENEWABLES	0.1	0.1	0.2	2.2	4.0		
Solar							
Geothermal		0.1	0.1	0.4	0.7		
Wind	0	0	0	1.5	2.9		
of which Wind Onshore							
of which Wind Offshore							
Biogas			0	0.2	0.3		
Biomass							
Waste	0.1		0.1	0.1	0.1		
Other (Wave/Tidal etc)							
NOT SPECIFIED							
TOTAL	23.3	57.5	124.9	194.8	211.2		

Table 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

Bosnia Herzegovina (BA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Fossil Fuel Fired	5.5	9.7	5.6	8.2	7.9		
of which multifuel	0	0	0	0			
Hard Coal	5.5	9.7	5.6	8.2			
Brown Coal							
Oil	0	0	0	0			
Natural Gas							
Derived Gas							
Hydro	4.2	3.4	4.8	6.3	8.2		
Conventional Hydro	4.2	3.4	4.8	6.3			
of which Run of River	0.1	0.1	0.1	0.2			
Pumped and Mixed							
Other Renewables	0	0	0	0	0		
Solar							
Geothermal							
Wind	0	0	0	0	0		
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
Not Specified							
Total	9.7	13.1	10.4	14.6	16.1		

Croatia (HR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Fossil Fuel Fired	2.6	4.3	4.0	5.5	4.8		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro	6.2	3.8	5.8	6.8	8.3	5.8	
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables	0	0	0	0	0	0	
Solar							
Geothermal							
Wind	0	0	0	0.1	0.1		
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
Not Specified							
Total	8.8	8.1	11.1	12.3	13.2	19.6	

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Fossil Fuel Fired	14.5	28.2	19.4	25.1	23.4	30.7	34.1
of which multifuel	0.9	0.7	0.0	0.0	0.0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	13.6	25.9	19.1	24.9	23.2	28.1	31.6
Oil	0.9	0.7	0.0	0.0	0.0		
Natural Gas	0.1	1.6	0.3	0.2	0.2	2.6	2.6
Derived Gas	0	0	0	0	0		
Hydro	10.9	8.3	10.3	11.1	12.5	12.1	12.6
Conventional Hydro	10.9	7.6	9.8	10.5	11.8	11.6	11.6
of which Run of River	9.9	6.9	8.8	8.0	10.5	10.1	10.1
Pumped and Mixed	0	0.8	0.5	0.6	0.7	0.5	1.0
Other Renewables	0	0	0	0	0	1.0	1.0
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0		
Wind	0	0	0	0	0	1.0	1.0
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	0	0	0		
Biomass	0	0	0	0	0		
Waste	0	0	0	0	0		
Other (Wave/Tidal etc)	0	0	0	0	0		
Not Specified	0	0	0	0	0		
Total	25.4	36.5	29.7	36.2	35.9	43.7	47.7

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear				82.9	89.2	131.2	180.8
Fossil Fuel Fired				78.4	85.9	107.3	149.0
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Hydro				11.8	13.0	13.7	15.4
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables							
Solar				0	0.0	0.7	0.9
Geothermal							
Wind				0.0	0.1	0.7	0.9
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
Not Specified							
Total				173.1	188.1	253.5	346.9

TABLE 3.2.1.2 Annual Nuclear Electricity Generation by Country (TWh)

The tables below present the annual nuclear electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community members between 1980 and 2010. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

Country	1980	1990	2000	2009	2010	2020	2030
AT	0	0	0	0	0	0	0
BE	11.9	42.7	48.2	44.9	44.9	45.6	0
BG	5.7	13.5	16.8	14.2	14.4	28.4	43
CY	0	0	0	0	0	0	0
CZ	0	11.8	12.7	27.2	28	25.9	35
DE	41	139	160.7	127.7	133	59	0
DK	0	0	0	0	0	0	0
EE	-	-	0	0	0	0	-
ES	5	52	60	51	58.9	58	77
FI	6.6	18.1	21.6	22.6	21.9	36.3	58.3
FR	57.9	297.9	395.2	390	407.9	430.2	425.7
UK	32.3	58.7	78.3	62.8	56.4	60.5	74.3
GR	0	0	0	0	0	0	-
HU	0	13.7	14.1	14.6	14.8	14.2	21
IE	0	0	0	0	0	0	0
IT	2.1	0	0	0	0	-	-
LT	0	15.7	7.4	10	0	9.8	9.8
LU	0	0	0	0	0	0	0
LV	0	0	0	0	0	0	-
MT	-	0	0	0	0	-	-
NL	4	3.3	3.7	4.2	4	4	25.3
PL	0	0	0	0	0	0	19.6
PT	0	0	0	0	0	0	0
RO	0	0	5.1	11.8	10.1	22.2	33
SE	25.3	65.2	54.8	50	55.6	75.4	52.9
SI	0	4.4	4.8	5.7	5.9	6.1	3.1
SK	4.2	11.2	15.2	13.1	13.6	15.8	
CH	13.7	22.3	24.9	26.1	25.2	21.5	16
NO	0	0	0	0	0	0	0
TR	0	0	0	0	0	-	-
BA	0	0	0	0	0	-	-
HR	0	0	0	0	0	0	-
RS	0	0	0	0	0	0	0
UA	-	-	-	82.9	89.2	131.2	180.8

TABLE 3.2.1.3 ANNUAL FOSSIL FUEL FIRED ELECTRICITY GENERATION BY COUNTRY (TWH)

The tables below present the annual fossil fuel fired electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community members between 1980 and 2010. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUELED	11.2	15.2	17.3	20.0	21.0	16.3	16.2
of which multifuel							
Hard Coal	0	3.7	5.9	4.1	4.6	2.4	2.1
Brown Coal	2.4	2.3	1.8	0	0	0	0
Oil	4.9	1.7	1.3	1.2	1.2	0.1	0
Natural Gas	3.6	6.8	7.0	12.9	13.5	12.8	13.0
Derived Gas	0.3	0.7	1.3	1.8	1.7	1.1	1.1

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUELED	38.0	26.5	32.7	35.7	37.7	44.2	71.4
of which multifuel							
Hard Coal	12.2	19.8	16.0	6.1	5.9	8.9	28.4
Brown Coal							
Oil	17.3	1.3	0.7	0.3	0.4	2.2	2.7
Natural Gas	5.6	5.4	15.9	29.3	31.4	30.6	37.1
Derived Gas	2.9					2.5	3.2

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUELED	21.8	22.2	17.1	20.4	21.8	30.0	35.7
of which multifuel	0	0	0		0	0	0
Hard Coal	7.4	6.8	2.0		4.7	4.5	0.4
Brown Coal	9.4	11.2	12.3	18.3	15.2	19.4	24.8
Oil	2.5	2.1	1.2	0.4	0.2	0.5	0.5
Natural Gas	2.5	2.0	1.6	1.7	1.7	5.6	10.0
Derived Gas	0	0	0		0	0	0

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUELED	1.0	2.0	3.4	5.1	5.1	8.6	11.5
of which multifuel	0	0	0			0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0			0	0
Oil	1.0	2.0	3.4			0.5	0.7
Natural Gas	0	0	0			8.1	10.8
Derived Gas	0	0	0			0	0

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
FOSSIL FUELED	46.3	44.9	52.7	50.3	51.9	50.4	50.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	6.8	5.6	6.6	6.0	5.5	7.7	7.0
Brown Coal	37.3	38.0	42.6	41.1	42.8	39.2	40.0
Oil	1.1	0.4	0.3	0	0	0	0
Natural Gas	0.2	0.2	1.7	3.2	3.6	2.0	2.0
Derived Gas	0.9	0.7	1.5	0	0	1.5	1.0

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	276.0	247.0	328.6	328.1	347.5	277.6	190.4
of which multifuel	42.8	35.9	39.2	35.5	34.0		
Hard Coal	105.0	129.0	131.2	98.8	107.4	75.0	54.0
Brown Coal	87.0	75.0	136.1	133.6	134.2	118.0	56.0
Oil	25.0	9.0	5.4	8.7	7.5	0.6	0.4
Natural Gas	59.0	34.0	47.0	76.2	84.1	78.0	74.0
Derived Gas			8.9	10.8	14.3	6.0	6.0

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	23.9	30.4	29.9	25.5	25.6	26.9	24.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	20.8	29.4	16.7	17.7	17.0	9.9	7.0
Brown Coal	0	0	0	0	0	0	0
Oil	3.1	0.8	4.4	1.2	0.8	1.0	1.0
Natural Gas	0	0.2	8.8	6.7	7.9	14.0	14.0
Derived Gas	0	0	0	0	0	0	0

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled			8.5	8.0	11.7	10.1	
of which multifuel			0			1.2	
Hard Coal			0	0	0	0	
Brown Coal			7.8	7.6	11.0	9.0	
Oil			0.1	0	0	0	
Natural Gas			0.5	0.1	0.3	0.6	
Derived Gas			0.1	0.3	0.4	0.5	

Note: In the case of Estonia, brown coal includes oil shale.

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	73.0	69.0	118.0	158.0	128.9	159.0	155.0
of which multifuel	3.0	3.0	4.0	0	0.5	0	0
Hard Coal	22.0	46.0	62.0	35.0	29.2	26.0	15.0
Brown Coal	7.0	11.0	14.0	0	0	0	0
Oil	37.0	8.0	23.0	18.0	17.7	21.0	25.0
Natural Gas	3.0	4.0	20.0	105.0	87.1	112.0	114.0
Derived Gas	0	0	0	0	0	0	0

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	18.0	17.8	21.4	24.5	30.9	21.4	18.1
of which multifuel							
Hard Coal	11.4	9.0	8.2	10.4	13.6	5.4	4.4
Brown Coal	0.7	2.8	3.5	4.1	5.9	5.2	3.0
Oil	4.2	1.6	1.3	0.5	0.4	0.6	0.6
Natural Gas	1.7	4.4	8.4	9.5	11.0	10.2	10.1
Derived Gas							

Note: In the case of Finland, brown coal includes peat.

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	118.8	45.1	49.9	54.9	59.5	48.7	44.8
of which multifuel	0	0	0		0		
Hard Coal	59.6	29.3	25.8	20.7	19.1		
Brown Coal	0.6	0.4	0		0		
Oil	45.2	7.2	7.9	7.7	8.0		
Natural Gas	5.9	2.8	10.9	24.1	29.9		
Derived Gas	7.6	4.6	3.4		2.4		

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	228.9	233.6	269.8	266.6	279.0	156.3	88.1
of which multifuel	20.0	22.0	30.0	1.3	1.3	0.8	0.7
Hard Coal	203.9	209.1	114.7	97.8	102.3	41.6	34.7
Brown Coal	0	0	0	0	0	0	0
Oil	22.7	20.5	5.9	5.4	4.3	0.1	0
Natural Gas	0.3	2.0	145.0	163.5	172.5	114.6	53.4
Derived Gas	2.0	2.0	4.2			0	0

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	17.9	30.0	45.2	46.6	42.9	35.4	
of which multifuel							
Hard Coal	0	0	0		0	0	
Brown Coal	9.0	23.0	30.9	30.5	27.4	17.0	
Oil	8.9	7.1	8.7	6.6	5.0	1.7	
Natural Gas			5.6	9.6	10.5	16.7	
Derived Gas	0	0	0		0	0	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	23.8	14.6	20.8	16.6	17.3	24.0	20.6
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	1.0	0.8	0.4	0.8	0	0
Brown Coal	12.0	7.8	8.4	5.3	4.7	3.3	2.0
Oil	5.9	1.0	4.5	0.5	0.4	0.5	0.8
Natural Gas	5.9	4.8	7.1	10.4	11.4	20.2	17.8
Derived Gas	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	8.9	12.5	21.3	19.8	20.9	19.8	23.3
of which multifuel	0	1.8	2.6				
Hard Coal	0.1	5.5	6.4	3.4	3.5	2.3	2.0
Brown Coal	1.5	2.0	1.6	0	0	0	0
Oil	5.3	1.5	4.4	0.7	0.3	0	0
Natural Gas	2.0	3.5	8.9	15.8	17.1	17.5	21.3
Derived Gas	0	0	0	0	0	0	0

Note: In the case of Ireland, brown coal includes peat.

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	125.5	167.3	205.9	208.3	211.2		
of which multifuel							
Hard Coal	13.6	29.8	23.8	35.9	35.9		
Brown Coal	0	0	0	0	0		
Oil	100.5	97.4	84.3	25.6	22.3		
Natural Gas	8.7	36.8	93.4	143.1	148.3		
Derived Gas	2.7	3.3	4.3	3.7	4.7		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	10.6	10.2	2.0	2.7	3.6	9.5	9.5
of which multifuel	10.4	9.7	1.7	2.4	3.3	4.2	4.2
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	10.3	4.7	0.6	0.2	0.1	0.3	0.3
Natural Gas	0.3	5.5	1.4	2.5	3.5	9.3	9.3
Derived Gas	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	0.7	0.5	0.4	2.8	2.9	3.0	3.1
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0.2	0	0.4	2.8	2.9	3.0	3.1
Derived Gas	0.5	0.5	0	0	0	0	0

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	1.6	1.9	1.2	1.8	2.8	3.0	3.4
of which multifuel							
Hard Coal	0	0	0	0	0	0.9	1.1
Brown Coal	0	0	0	0	0		
Oil	0.9	0.3	0.2	0	0		
Natural Gas	0.7	1.6	1.0	1.8	2.8	2.1	2.3
Derived Gas	0	0	0	0	0	0	

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled		1.2	1.9	2.2	2.1		
of which multifuel			0	0			
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			1.9	2.2	2.1		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	55.7	64.4	80.7	94.8	100.0	104.5	98.7
of which multifuel							
Hard Coal	7.0	25.1	29.2	23.4	21.9	42.6	40.0
Brown Coal	0	0	0	0	0	0	0
Oil	23.0	0.2	0.1	0.1	0.1	0	0
Natural Gas	23.7	37.2	48.0	68.6	74.9	58.1	54.9
Derived Gas	2.0	1.9	3.2	2.7	3.1	3.8	3.8

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	110.1	119.8	129.2	130.5	133.7	151.7	180.2
of which multifuel	0	0	0	0	0	0	0
Hard Coal	86.1	71.2	82.9	79.9	84.5	68.3	70.3
Brown Coal	21.9	48.2	45.9	46.1	44.7	44.0	52.8
Oil	2.1	0.4	0	0	0	0	0
Natural Gas	0	0	0.4	4.5	4.5	39.4	57.1
Derived Gas	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	6.9	18.2	29.5	29.3	23.8	24.8	28.5
of which multifuel	0	0	0	2.0	3.0	0	0
Hard Coal	0.6	8.7	13.7	11.9	6.6	4.3	0
Brown Coal	0	0	0	0	0	0	0
Oil	6.3	9.5	9.2	2.7	2.4	1.4	0.9
Natural Gas	0	0	6.6	14.6	14.9	19.2	27.6
Derived Gas	0	0	0	0	0	0	0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	49.2	46.0	27.4	30.0	26.2	23.5	26.5
of which multifuel	22.0	20.5	7.4		5.4	0.9	0.9
Hard Coal	7.1	4.1	4.1		2.1	2.4	5.7
Brown Coal	13.1	14.6	13.8		18.0	12.4	7.8
Oil	5.8	9.0	2.5		1.4	0.2	0.2
Natural Gas	23.2	18.3	7.0		4.8	8.5	12.7
Derived Gas	0	0	0		0	0	0

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	9.5	3.3	4.5	4.4	6.5	4.8	4.8
of which multifuel							
Hard Coal	0.2	1.0	1.5	0.6	0.8	0	0
Brown Coal	0	0.1	0	0.5	0.6	0	0
Oil	9.3	1.2	1.4	1.3	1.7	0.8	0.8
Natural Gas	0	0.3	0.4	1.3	2.2	2.6	2.6
Derived Gas	0	0.7	1.1	0.7	1.2	1.4	1.4

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	3.8	4.0	4.6	5.9	5.8	8.0	11.6
of which multifuel			0				
Hard Coal	3.7	3.9	4.4		0.5	0.5	0.5
Brown Coal	0	0	0		4.4	6.0	10.4
Oil	0.1	0.1	0.1		0.0	0.0	0.0
Natural Gas	0	0	0.1		0.7	1.3	0.7
Derived Gas	0	0	0		0	0	0

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	12.1	8.8	8.5	6.3	5.6	14.7	
of which multifuel	0	0	0		0	0	
Hard Coal	4.2	3.6	2.6		2.3	2.3	
Brown Coal	3.5	2.5	2.2		1.7	1.6	
Oil	0.5	0.6	0.5		0.3	0.3	
Natural Gas	3.9	2.1	3.2		6.4	10.5	
Derived Gas	0	0	0		0	0	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	0.8	0.7	1.7	1.9	2.2	2.4	9.0
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	0	0	0	4.7	5.1	2.0	2.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	4.7	5.1	2.0	2.0
Derived Gas	0	0	0	0	0	0	0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	11.8	34.3	93.8	156.6	155.4		
of which multifuel		2.2	16.1	21.3	20.7		
Hard Coal	0.9	0.6	3.1	15.1	17.5		
Brown Coal	5.0	19.6	34.4	39.1	35.9		
Oil	5.9	3.9	9.3	4.8	2.2		
Natural Gas		10.2	46.2	96.1	98.1		
Derived Gas			0.8	1.5	1.7		

TABLE 3.2.1.3 Annual Fossil Fuel Fired Electricity Generation by Country (TWh)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	5.5	9.7	5.6	8.2	7.9		
of which multifuel	0.0	0.0	0.0	0.0			
Hard Coal	5.5	9.7	5.6	8.2			
Brown Coal							
Oil	0.0	0.0	0.0	0.0			
Natural Gas							
Derived Gas							

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	2.6	4.3	4.0	5.5	4.8		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled	14.5	28.2	19.4	25.1	23.4	30.7	34.1
of which multifuel	0.9	0.7	0.0	0.0	0.0	0	0
Hard Coal	0	0	0	0	0	0	0
Brown Coal	13.6	25.9	19.1	24.9	23.2	28.1	31.6
Oil	0.9	0.7	0.0	0.0	0.0		
Natural Gas	0.1	1.6	0.3	0.2	0.2	2.6	2.6
Derived Gas	0	0	0	0	0		

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Fossil fueled				78.4	85.9	107.3	149.0
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

Table 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

The tables below present the annual renewables electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community members between 1980 and 2010. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	28.9	32.3	42.8	42.4	41.0	51.0	56.2
Conventional Hydro	20.5	23.3	29.7	29.8	27.6	33.2	35.9
of which Run of River	20.5	23.3	29.7	29.8	27.6	33.2	35.9
Pumped and Mixed	8.4	9.0	13.1	13.0	13.4	17.8	20.3
Other Renewables				4.4	4.8	10.5	17.0
Solar				0.0	0.0	0.5	3.8
Geothermal				0.0	0.0	0.0	0.0
Wind				2.0	2.2	6.4	8.7
of which Wind Onshore				2.0	2.2	6.4	8.7
of which Wind Offshore				0	0	0	0
Biogas				0.5	0.5	1.0	1.5
Biomass				1.9	2.0	2.5	2.9
Waste				0	0.1	0.1	0.1
Other (Wave/Tidal etc)				0	0.0	0.0	0.0

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0.80	0.90	1.69	1.75	1.66	1.66	1.66
Conventional Hydro	0.10	0.27	0.46	0.32	0.31	0.31	0.31
of which Run of River							
Pumped and Mixed	0.70	0.63	1.23	1.43	1.35	1.35	1.35
Other Renewables	0.00	0.73	1.35	6.05	7.22	21.00	28.23
Solar		0.00	0.00	0.16	0.56	0.70	0.80
Geothermal							
Wind		0.01	0.02	0.99	1.29	11.10	15.60
of which Wind Onshore							
of which Wind Offshore							
Biogas		0.01	0.10	0.47	0.58		
Biomass		0.14	0.16	2.66	2.90	10.20	12.90
Waste		0.58	1.07	1.78	1.89		
Other (Wave/Tidal etc)							

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Hydro	3.7	1.8	2.9	3.0	5.5	3.2	3.2
Conventional Hydro	3.7	1.7	2.6		4.6	2.6	2.6
of which Run of River	0.2	0.1	0.1		0.3	0.3	0.3
Pumped and Mixed	0	0.1	0.3		0.9	0.6	0.6
Other Renewables	0	0	0	0.3	0.5	4.9	6.8
Solar	0	0	0	0	0.0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	0.3	0.3	4.9	6.8
of which Wind Onshore	0	0	0		1.6	4.9	6.8
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		0.2	0	0
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0			0	0
of which Run of River	0	0	0			0	0
Pumped and Mixed	0	0	0			0	0
Other Renewables	0	0	0	0	0.1	0	0
Solar	0	0	0				
Geothermal	0	0	0				
Wind	0	0	0		0.1		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Hydro	2.4	1.4	2.3	3.0	3.0	2.2	2.0
Conventional Hydro	1.9	1.0	1.7			1.6	1.5
of which Run of River	1.4	0.6	1.1			1.0	1.1
Pumped and Mixed	0.5	0.4	0.6			0.6	0.5
Other Renewables	0	0	0	1.8	2.6	3.5	4.0
Solar	0	0	0	0.1	0.6	0.5	0.5
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.3	0.3	1.5	4.0
of which Wind Onshore	0	0	0	0.3	0.3	1.5	4.0
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1.4	1.4	1.5	1.5
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	18.0	21.0	29.0	24.2	27.0	30.5	32.5
Conventional Hydro	16.0	18.0	25.2	18.7	20.7	21.0	21.5
of which Run of River	16.0	18.0	21.3				
Pumped and Mixed	2.0	3.0	3.8	5.5	6.3	9.5	11.0
Other Renewables	0	0	14.3	76.8	83.9	166.0	203.8
Solar	0	0	0	6.6	11.7	33.0	37.0
Geothermal	0	0	0	0.0	0.0	2.0	2.8
Wind	0	0	9.5	38.6	37.8	90.0	116.0
of which Wind Onshore	0	0	9.5	38.6	37.8	60.0	64.0
of which Wind Offshore	0	0	0	0	0.0	30.0	52.0
Biogas	0	0	0.5	11.9	13.8	15.5	19.0
Biomass	0	0	0.6	12.9	13.0	17.5	21.0
Waste	0	0	3.7	6.8	7.7	8.0	8.0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

Table 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

Denmark (DK)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	0	0	0	0	0	0
Conventional Hydro	0	0	0	0	0	0	0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	0	0	6.1	10.8	13.1	16.5	23.2
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	4.2	6.7	7.8	16.5	23.2
of which Wind Onshore	0	0				8.1	9.3
of which Wind Offshore	0	0				8.4	13.9
Biogas	0	0	0.2	0.4	0.4	0	0
Biomass	0	0	1.1	3.0	4.2	0	0
Waste	0	0	0.6	0.8	0.7	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

Estonia (EE)

	1980	1990	2000	2009	2010	2020	2030
Hydro			0	0.1	0.1	0.1	
Conventional Hydro			0	0.1	0.1	0.1	
of which Run of River			0	0.1	0.1	0.1	
Pumped and Mixed			0	0	0	0	
Other Renewables			0.1	0.5	1.0	3.8	
Solar			0	0	0	0	
Geothermal			0	0	0	0	
Wind			0	0.2	0.3	2.3	
of which Wind Onshore			0	0.2	0.3	1.3	
of which Wind Offshore			0	0	0	1.0	
Biogas			0	0	0	0.1	
Biomass			0	0.3	0.7	1.3	
Waste			0	0	0	0.1	
Other (Wave/Tidal etc)			0	0	0	0	

Spain (ES)

	1980	1990	2000	2009	2010	2020	2030
Hydro	30.0	26.0	31.0	29.0	44.9	41.0	42.0
Conventional Hydro	28.0	21.0	28.0	26.0	34.2	36.0	37.0
of which Run of River	1.0	0	0	0	0	0	0
Pumped and Mixed	3.0	5.0	3.0	3.0	4.4	5.0	5.0
Other Renewables	0	0	6.0	49.0	57.9	97.0	142.0
Solar	0	0	0	6.0	8.1	14.0	20.0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	5.0	37.0	41.9	76.0	112.0
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	0
Biogas	0	0	0	1.0	0.7	1.0	2.0
Biomass	0	0	0	2.0	1.7	3.0	4.0
Waste	0	0	1.0	3.0	2.7	3.0	3.0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.2.1.4 ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	10.1	10.8	14.5	12.6	12.7	14.7	15.2
Conventional Hydro	10.1	10.8	14.5	12.6	12.7	14.7	15.2
of which Run of River							
Pumped and Mixed	0	0	0	0	0	0	0
OTHER RENEWABLES	3.4	4.4	8.2	8.6	10.7	19.7	22.9
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.1	0.3	0.3	5.9	8.9
of which Wind Onshore	0	0	0.1	0.3	0.3	5.9	8.9
of which Wind Offshore	0	0	0	0	0		
Biogas	0	0	0	0.1	0.1	0.3	0.4
Biomass	3.4	4.4	8.0	7.9	10.0	13.0	13.1
Waste			0.1	0.3	0.3	0.5	0.5
Other (Wave/Tidal etc)			0	0	0	0	0

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	69.8	57.2	71.6	61.9	67.6	69.4	69.4
Conventional Hydro	68.7	53.3	66.8	56.1	61.1		
of which Run of River	42.1	31.8	37.1	30.7	33.4		
Pumped and Mixed	1.1	4.0	4.8	5.8	5.6		
OTHER RENEWABLES	0.6	0.6	3.1	12.3	15.3	52.7	100.8
Solar	0	0	0	0.1	0.6	8.4	18.8
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.1	7.9	9.7	35.8	67.4
of which Wind Onshore	0	0		7.9	9.7		
of which Wind Offshore	0	0		0	0		
Biogas	0	0	0	0.7	1.1	8.5	14.6
Biomass	0	0	0	0.7	0.8		
Waste	0	0	1.9	2.9	3.0		
Other (Wave/Tidal etc)	0.6	0.6	1.1	0	0	0	0

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	5.1	7.1	7.7	8.9	6.8	10.8	9.6
Conventional Hydro	4.0	5.2	5.1	5.2	3.6	7.8	6.7
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	1.1	1.9	2.6	3.7	3.1	3.0	3.0
OTHER RENEWABLES	0	0.7	5.0	20.0	22.2	101.5	202.7
Solar	0	0	0	0.0	0.0	2.7	6.3
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.9	9.3	10.2	81.9	163.3
of which Wind Onshore	0	0		8.3	8.9	34.4	51.6
of which Wind Offshore	0	0	0	1.7	3.0	47.5	111.6
Biogas	0	0.5	2.3	5.0	5.0		
Biomass	0	0	0.5	3.6	4.7	16.9	33.1
Waste	0	0.2	1.2	2.1	2.3		
Other (Wave/Tidal etc)	0	0	0	0	0	0	0.2

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	3.4	2.0	4.1	5.7	7.5	6.1	
Conventional Hydro	3.4	1.7	3.3	5.4	7.5	5.2	
of which Run of River	0	0	0	0.7	0.8	1.0	
Pumped and Mixed	0	0.3	0.8	0.3	0.0	0.9	
Other Renewables	0	0.2	0.6	2.8	3.1	20.3	
Solar	0	0	0	0.1	0.2	3.6	
Geothermal	0	0	0		0	0.7	
Wind	0	0	0.4	2.5	2.7	14.7	
of which Wind Onshore	0	0	0.4	2.5	2.7	14.1	
of which Wind Offshore	0	0	0	0	0	0.6	
Biogas	0	0	0.1	0.2	0.2	0.9	
Biomass						0.4	
Waste	0	0.2	0.2		0		
Other (Wave/Tidal etc)							

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0.1	0.2	0.2	0.2	0.2	0.3	3.3
Conventional Hydro	0.1	0.2	0.2	0.2	0.2	0.3	0.3
of which Run of River	0.1	0.2	0.2	0.2	0.2	0.3	0.3
Pumped and Mixed	0	0	0	0	0	0	3.0
Other Renewables	0	0	0.1	2.0	2.3	5.3	7.7
Solar	0	0	0	0	0	0.1	0.2
Geothermal	0	0	0	0	0	0.2	0.4
Wind	0	0	0	0.3	0.5	1.6	2.1
of which Wind Onshore	0	0	0	0.3	0.5	1.6	2.1
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0.6	1.0
Biomass	0	0	0	1.6	1.7	2.7	3.8
Waste	0	0	0.1	0.1	0.1	0.1	0.2
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	8.1	11.6	16.6	7.8	6.6	2.7	2.5
Conventional Hydro	0.7	0.7	0.8	0.8	0.5	0.9	0.9
of which Run of River				0	0	0	0
Pumped and Mixed	0.4	0.3	0.3	0.4	0	0.4	0.4
Other Renewables			0.3	2.4	2.3	6.3	7.3
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind			0.2	2.3	2.2	5.5	6.3
of which Wind Onshore			0.2	0	0	5.5	6.3
of which Wind Offshore				0	0	0	0
Biogas	0	0	0.1	0.1	0.1	0.9	0.9
Biomass	0	0	0	0	0	0	0
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	47.2	34.6	50.2	52.8	53.8		
Conventional Hydro	45.0	31.2	43.6	48.6	50.5		
of which Run of River	18.4	11.5	15.6	20.5	21.5		
Pumped and Mixed	2.3	3.4	6.6	4.3	3.3		
Other Renewables	2.5	3.2	6.4	19.4	25.0		
Solar	0	0	0	0.7	1.9		
Geothermal	2.5	3.1	4.4	5.0	5.0		
Wind	0	0	0.6	6.5	9.0		
of which Wind Onshore	0	0	0.6	6.5	9.0		
of which Wind Offshore	0	0	0	0	0		
Biogas		0	0.5	1.6	2.0		
Biomass		0.1	0.5	4.1	5.1		
Waste		0	0.4	1.5	2.0		
Other (Wave/Tidal etc)	0	0	0	0	0		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0.4	0.4	0.6	1.1	1.3	1.4	1.6
Conventional Hydro	0.4	0.4	0.3	0.4	0.6	0.7	0.8
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0.3	0.7	0.8	0.8	0.8
Other Renewables	0	0	0	0.3	0.4	2.4	5.5
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.2	0.2	1.0	4.0
of which Wind Onshore	0	0	0	0.2	0.2	1.0	2.2
of which Wind Offshore	0	0	0	0	0	0	1.8
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0.1	0.2	1.4	1.4
Waste	0	0	0	0	0	0	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0.3	0.8	0.8	0.8	1.4	1.5	1.6
Conventional Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0.3	0.7	0.7	0.7	1.3	1.4	1.4
Other Renewables	0	0	0.1	0.2	0.2	0.3	0.3
Solar	0	0	0	0.0	0.0	0.0	0.0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0	0.1	0.1	0.1	0.1
of which Wind Onshore	0	0	0	0.1	0.1	0.1	0.1
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.0	0.0	0.1	0.1
Biomass	0	0	0	0	0	0	0
Waste	0	0	0	0.0	0.0	0.1	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Hydro	3.0	4.5	2.8	3.4	3.4	2.9	2.9
Conventional Hydro	3.0	4.5	2.8	3.4	3.4	2.9	2.9
of which Run of River	3.0	4.5	2.8	3.4	3.4	2.9	2.9
Pumped and Mixed	0	0	0	0	0	0	
Other Renewables	0	0	0	0.2	0.2	0.9	1.5
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0		
Wind	0	0	0	0.2	0.2	0.7	1.1
of which Wind Onshore	0	0	0	0.2	0.2	0.4	0.5
of which Wind Offshore	0	0	0	0	0	0.3	0.6
Biogas	0	0	0	0.0	0	0.1	0.1
Biomass	0	0	0	0.1	0	0.1	0.2
Waste	0	0	0	0.0	0	0.1	0.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Hydro		0	0	0	0		
Conventional Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
Pumped and Mixed		0	0	0	0		
Other Renewables		0	0	0	0		
Solar		0	0	0	0		
Geothermal		0	0	0	0		
Wind		0	0	0	0		
of which Wind Onshore		0	0	0	0		
of which Wind Offshore		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	0	0	0		
Other (Wave/Tidal etc)		0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
Conventional Hydro	0	0.1	0.1	0.1	0.1	0.1	0.1
of which Run of River	0	0.1	0.1	0.1	0.1	0.1	0.1
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables		1.0	1.3	10.0	10.3	21.1	27.9
Solar			0	0.1	0.1	0.1	0.1
Geothermal							
Wind			0.8	4.6	4.0	12.8	17.8
of which Wind Onshore			0.8	3.8	3.3	5.9	7.4
of which Wind Offshore			0	0.7	0.7	6.8	10.4
Biogas			0.1	0.8	0.9	2.0	3.0
Biomass			0.2	3.4	4.0	4.5	5.2
Waste			0.4	1.2	1.3	1.8	1.8
Other (Wave/Tidal etc)			0	0	0	0	0

TABLE 3.2.1.4 ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	3.2	3.3	4.0	3.0	3.1	2.8	2.8
Conventional Hydro	2.3	1.4	1.8	2.1	2.2	1.8	1.8
of which Run of River	1.0	0.6	0.9	0.8	0.8	0.8	0.8
Pumped and Mixed	0.9	1.9	2.2	1.5	1.7	1.1	1.1
OTHER RENEWABLES	0	0	0.0	5.5	7.0	18.4	20.6
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.0	1.1	1.6	10.2	12.0
of which Wind Onshore	0	0	0.0	1.1	16.0	10.1	12.0
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.3	0.4	0	0
Biomass	0	0	0.0	4.2	5.0	8.2	8.6
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	7.9	9.1	11.6	8.9	16.4	14.0	14.3
Conventional Hydro	7.8	8.6	10.3	7.5	14.0	11.6	11.5
of which Run of River	5.9	6.2	7.0	5.4	9.8	7.9	8.1
Pumped and Mixed	0.1	0.5	1.2	1.4	2.4	2.4	2.8
OTHER RENEWABLES	0	0	0.9	10.3	12.4	16.2	18.7
Solar	0	0	0	0.2	0.2	1.1	1.6
Geothermal	0	0	0.1	0.2	0.2	0.3	0.3
Wind	0	0	0.2	7.6	9.1	11.3	13.0
of which Wind Onshore	0	0	0.2	7.6	9.1	11.3	13.0
of which Wind Offshore	0	0	0	0	0	0	0
Biogas	0	0	0	0.1	0.1	0.2	0.3
Biomass	0	0	0.0	0.3	0.6	1.1	1.3
Waste	0	0	0.7	2.0	2.2	2.1	2.1
Other (Wave/Tidal etc)	0	0	0	0	0	0	0.0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
HYDRO	12.3	10.7	14.6	15.7	16.0	16.8	16.9
Conventional Hydro	12.3	10.7	14.6		16.0	16.7	16.6
of which Run of River	0	0	0		0	0	0
Pumped and Mixed	0	0	0		0	0.1	0.3
OTHER RENEWABLES	0	0	0	0	0.5	5.9	9.1
Solar	0	0	0		0	0	0
Geothermal	0	0	0		0	0	0
Wind	0	0	0	0	0.5	5.7	8.1
of which Wind Onshore	0	0	0		0.5	5.7	8.1
of which Wind Offshore	0	0	0		0	0	0
Biogas	0	0	0		0	0	0
Biomass	0	0	0		0.0	0.2	1.0
Waste	0	0	0		0	0	0
Other (Wave/Tidal etc)	0	0	0		0	0	0

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Hydro	58.1	71.4	77.8	64.9	66.7	67.8	68.8
Conventional Hydro	0	0	0	0	0	0	0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0	0	0	0	0	0	0
Other Renewables	0.5	1.7	4.5	13.9	16.0	28.5	37.3
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.5	2.5	3.5	12.5	21.0
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	0	0	0	0	0
Biomass	0.2	0.8	1.8	6.0	6.9	10.0	10.3
Waste	0.3	0.9	2.3	5.4	5.6	6.0	6.0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Hydro	3.2	2.8	3.2	4.7	3.4	3.9	4.2
Conventional Hydro	3.2	2.8	3.2		3.3	3.7	3.9
of which Run of River	0	0	0				
Pumped and Mixed	0	0	0				
Other Renewables	0	0	0	0.2	0.2	1.0	1.6
Solar	0	0	0		0	0	
Geothermal	0	0	0		0	0	
Wind	0	0	0		0.0	0.0	0.0
of which Wind Onshore	0	0	0		0	0	
of which Wind Offshore	0	0	0		0	0	
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0		0	0	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Hydro	2.3	2.5	5.0	4.7	5.5	4.4	
Conventional Hydro	2.1	2.3	4.7		4.1	4.1	
of which Run of River							
Pumped and Mixed	0.2	0.2	0.3		0.3	0.3	
Other Renewables	0	0	0	0.4	0.5	0.7	
Solar	0	0	0		0	0	
Geothermal	0	0	0		0.1	0.1	
Wind	0	0	0	0	0	0.1	
of which Wind Onshore	0	0	0		0	0.1	
of which Wind Offshore	0	0	0		0	0	
Biogas	0	0	0		0	0	
Biomass	0	0	0		0.4	0.5	
Waste	0	0	0		0	0	
Other (Wave/Tidal etc)	0	0	0		0	0	

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Hydro	33.5	30.7	37.9	37.1	37.5	41.2	42.0
Conventional Hydro						35.4	36.0
of which Run of River		13.6	17.6	16.1	16.0	16.6	17.0
Pumped and Mixed						5.8	6.0
Other Renewables	0.2	0.4	0.8	1.2	1.4	3.1	6.2
Solar		0	0	0.1	0.1	0.2	0.9
Geothermal		0	0	0	0	0.2	0.7
Wind		0	0	0	0	0.3	0.8
of which Wind Onshore		0	0	0	0	0.3	0.8
of which Wind Offshore		0	0	0	0	0	0
Biogas		0.1	0.1	0.2	0.2	0.6	1.2
Biomass		0	0	0.1	0.1	0.6	1.2
Waste		0.3	0.7	0.9	1.0	1.2	1.3
Other (Wave/Tidal etc)		0	0	0	0	0	0

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Hydro	83.1	120.3	141.1	126.1	118.4	134.0	135.0
Conventional Hydro	82.4	118.8	139.6	126.1	118.4	134.0	135.0
of which Run of River	0	0	0	0	0	0	0
Pumped and Mixed	0.7	1.5	1.5	0	0	0	0
Other Renewables	0	0	0.1	1.0	0.9	7.0	8.0
Solar	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Wind	0	0	0.0	1.0	0.9	7.0	8.0
of which Wind Onshore	0	0	0.0	1.0	0.9	6.5	7.0
of which Wind Offshore	0	0	0	0	0	0.5	1.0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	0
Waste	0	0	0.1	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	11.4	23.1	30.9	36.0	51.8		
Conventional Hydro	11.4	23.1	30.9	36.0	51.8		
of which Run of River							
Pumped and Mixed							
Other Renewables	0.1	0.1	0.2	2.2	4.0		
Solar							
Geothermal		0.1	0.1	0.4	0.7		
Wind	0	0	0	1.5	2.9		
of which Wind Onshore							
of which Wind Offshore							
Biogas			0	0.2	0.3		
Biomass							
Waste	0.1		0.1	0.1	0.1		
Other (Wave/Tidal etc)							

Table 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

Bosnia Herzegovina (BA)

	1980	1990	2000	2009	2010	2020	2030
Hydro	4.2	3.4	4.8	6.3	8.2		
Conventional Hydro	4.2	3.4	4.8	6.3			
of which Run of River	0.1	0.1	0.1	0.2			
Pumped and Mixed							
Other Renewables	0	0	0	0	0		
Solar							
Geothermal							
Wind	0	0	0	0	0		
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

Croatia (HR)

	1980	1990	2000	2009	2010	2020	2030
Hydro	6.2	3.8	5.8	6.8	8.3	5.8	
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables	0	0	0	0	0	0	
Solar							
Geothermal							
Wind	0	0	0	0.1	0.1		
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

Serbia (RS)

	1980	1990	2000	2009	2010	2020	2030
Hydro	10.9	8.3	10.3	11.1	12.5	12.1	12.6
Conventional Hydro	10.9	7.6	9.8	10.5	11.8	11.6	11.6
of which Run of River	9.9	6.9	8.8	8.0	10.5	10.1	10.1
Pumped and Mixed	0	0.8	0.5	0.6	0.7	0.5	1.0
Other Renewables	0	0	0	0	0	1.0	1.0
Solar	0	0	0	0	0		
Geothermal	0	0	0	0	0		
Wind	0	0	0	0	0	1.0	1.0
of which Wind Onshore							
of which Wind Offshore							
Biogas	0	0	0	0	0		
Biomass	0	0	0	0	0		
Waste	0	0	0	0	0		
Other (Wave/Tidal etc)	0	0	0	0	0		

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWh)

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Hydro				11.8	13.0	13.7	15.4
Conventional Hydro							
of which Run of River							
Pumped and Mixed							
Other Renewables							
Solar				0	0.0	0.7	0.9
Geothermal							
Wind				0.0	0.1	0.7	0.9
of which Wind Onshore							
of which Wind Offshore							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

The tables below show the annual electricity generation from a different perspective, i.e. by technology. Data are shown in TWh and include both historical data and forecasts for each of the EU 27 Member States plus Switzerland, Norway and Turkey and some Energy Community countries.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	29	32	43	42	41	51	56
Non-fuel Renewables	0	0	0	4	5	11	17
New Technologies (e.g. Fuel Cells)	0	0	0				
Not Specified	12	17	17				
Total	41	49	60	67	67	79	90

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	12	43	48	45	45	46	
Steam Thermal Units			18		17	17	
Gas Turbine Units			1		1	2	
Combined Cycle Units			13		22	35	
Internal Combustion Units			1		1	1	
Hydro	1	1	2	2	1	2	
Non-fuel Renewables	0	0	0		1	2	
New Technologies (e.g. Fuel Cells)							
Not Specified	38	25	0		0	0	
Total	51	67	80		88	89	

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	6	14	17	14	14	28	43
Steam Thermal Units	22	22	17		20	29	30
Gas Turbine Units	0	0	0		2	0	0
Combined Cycle Units	0	0	0		0	1	6
Internal Combustion Units	0	0	0		0	0	0
Hydro	4	2	3	3	6	3	3
Non-fuel Renewables	0	0	0		1	5	7
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	0
Total	31	38	37		42	67	89

TABLE 3.2.2 ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	1	2	3		5	1	2
Gas Turbine Units	0	0	0		0	0	0
Combined Cycle Units	0	0	0		0	7	10
Internal Combustion Units	0	0	0		0	0	0
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	0	0		0		
New Technologies (e.g. Fuel Cells)					0	0	0
Not Specified	0	0	0		0	0	0
Total	1	2	3		5	9	12

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	12	13	27	28	26	35
Steam Thermal Units	44	44	50	49	50	51	40
Gas Turbine Units	0	0	0	1	2	3	3
Combined Cycle Units	0	0	0	2	2	3	3
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	2	1	2	3	3	2	2
Non-fuel Renewables	0	0	0	0	1	2	5
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	1	1
Not Specified	2	1	3	0	0	4	6
Total	49	58	68	82	86	90	93

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	41	139	161	128	133	59	0
Steam Thermal Units			293	283	298	241	164
Gas Turbine Units			6	9	9	10	15
Combined Cycle Units			37	67	74	67	57
Internal Combustion Units			0	1	1	1	2
Hydro	18	21	29	24	27	31	33
Non-fuel Renewables			10	45	49	125	156
New Technologies (e.g. Fuel Cells)				0	0	0	0
Not Specified			3	0	0	0	0
Total	347	418	539	557	591	533	427

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear							
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro							
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear			0	0	0	0	
Steam Thermal Units			8	8		9	
Gas Turbine Units			0	0		1	
Combined Cycle Units			0	0		0	
Internal Combustion Units			0	0		0	
Hydro			0	0	0	0	
Non-fuel Renewables			0	0		2	
New Technologies (e.g. Fuel Cells)			0	0		0	
Not Specified			0	0		2	
Total			8	9		14	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	5	52	60	51	59	58	77
Steam Thermal Units	66	61	109	69	66	69	63
Gas Turbine Units	3	3	1	1	1	1	2
Combined Cycle Units	0	0	0	76	56	75	73
Internal Combustion Units	1	5	7	11	10	14	18
Hydro	30	26	31	29	45	41	42
Non-fuel Renewables	0	0	6	48	55	97	142
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	105	147	215	286	285	355	416

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	7	18	22	23	22	36	58
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	10	11	15	13	13	15	15
Non-fuel Renewables	0	0	0	0	0	6	9
New Technologies (e.g. Fuel Cells)	0	0	0				
Not Specified	22	23	31	34	42	35	32
Total	39	52	67	69	77	92	115

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	58	298	395	390	408	430	426
Steam Thermal Units	119	45	50	55	60	43	31
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	70	57	72	62	68	69	69
Non-fuel Renewables				12	15	53	101
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	247	400	517	519	550	595	627

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	32	59	78	63	56	60	74
Steam Thermal Units	229	234	145	112	117	59	68
Gas Turbine Units	0	0	0	2	1	0	0
Combined Cycle Units	0	0	126	163	172	115	53
Internal Combustion Units	0	1	2	0	0		
Hydro	5	7	8	9	7	11	10
Non-fuel Renewables	0	0	1	10	12	85	170
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	266	300	361	359	366	329	375

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	17	29	39	35	30	19	
Gas Turbine Units	1	1	1	1	0	0	
Combined Cycle Units	0	0	4	9	10	17	
Internal Combustion Units	1	1	2	3	3	1	
Hydro	3	2	4	6	8	6	
Non-fuel Renewables	0	0	0	3	3	19	
New Technologies (e.g. Fuel Cells)	0	0	0		0	0	
Not Specified	0	0	0		0	0	
Total	21	32	50	55	54	62	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	14	14	15	15	14	21
Steam Thermal Units	24	15	17	9	12	8	6
Gas Turbine Units	0	0	1	0	1	1	1
Combined Cycle Units	0	0	3	4	6	14	12
Internal Combustion Units	0	0	0	3	2	2	2
Hydro	0	0	0	0	0	0	3
Non-fuel Renewables	0	0	0	2	1	5	8
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	24	29	35	33	36	44	53

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	2	2	5	8
Gas Turbine Units	1	1	4	13	15	11	12
Combined Cycle Units	0	0	0	0	0	0	0
Internal Combustion Units	1	1	1	1	0	1	1
Hydro	8	12	17	8	7	3	3
Non-fuel Renewables	0	0	0	2	2	6	7
New Technologies (e.g. Fuel Cells)				0	0	0	0
Not Specified	0	0	0	0	0	1	1
Total	10	14	23	25	26	27	31

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	2	0	0	0	0		
Steam Thermal Units	125	164	146	58	54		
Gas Turbine Units	1	2	17	4	4		
Combined Cycle Units	0	1	43	148	154		
Internal Combustion Units	0	1	2	6	8		
Hydro	47	35	50	53	54		
Non-fuel Renewables	3	3	6	12	16		
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	0	0	1	1		
Total	177	205	263	281	291		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	16	7	10	0	10	10
Steam Thermal Units	11	10	2	3	4	6	6
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	0	0	5	5
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	0	0	1	1	1	1	2
Non-fuel Renewables	0	0	0	0	0	1	4
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	11	26	10	14	5	23	26

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	0	0	0	0
Gas Turbine Units	1	1	0	0	0	0	0
Combined Cycle Units	0	0	0	3	3	3	3
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	0	1	1	1	1	2	2
Non-fuel Renewables	0	0	0	0	0	0	0
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	1	1	1	4	4	4	4

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	0	0	0	0	0	1	1
Gas Turbine Units	0	0	0	0	0		
Combined Cycle Units	2	2	1	2	3	2	2
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	3	5	3	3	3	3	3
Non-fuel Renewables	0	0	0	0	0	1	1
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	0	0	0	0		
Total	5	6	4	5	6	7	8

TABLE 3.2.2 ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear		0	0	0	0		
Steam Thermal Units			2	2	2		
Gas Turbine Units			0	0	0		
Combined Cycle Units			0	0	0		
Internal Combustion Units			0	0	0		
Hydro		0	0	0	0		
Non-fuel Renewables			0	0	0		
New Technologies (e.g. Fuel Cells)			0	0	0		
Not Specified			0	0	0		
Total			2	2	2		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4	3	4	4	4	4	25
Steam Thermal Units	38	19	33	36	31	42	56
Gas Turbine Units	1	1	6	5	6	6	5
Combined Cycle Units	17	44	36	41	51	44	29
Internal Combustion Units	0	0	5	12	13	13	9
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	1	2	10	10	21	28
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0	0	0	0	0
Total	60	69	86	109	114	130	152

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	20
Steam Thermal Units	110	120	129	126	129	112	123
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	5	5	39	57
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	3	3	4	3	3	3	3
Non-fuel Renewables	0	0	0	1	2	10	12
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	4	5	8	9
Total	113	123	133	139	144	173	223

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	6	17	21	17	12	11	7
Gas Turbine Units	0	0	0	1	1	1	1
Combined Cycle Units	0	0	6	12	11	13	20
Internal Combustion Units	1	1	3	3	4	4	4
Hydro	8	9	12	9	16	14	14
Non-fuel Renewables	0	0	0	8	10	13	15
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	15	27	42	49	53	55	62

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	5	12	10	22	33
Steam Thermal Units	49	46	27		26	18	16
Gas Turbine Units	0	0	0		0	0	0
Combined Cycle Units	0	0	0		0	5	11
Internal Combustion Units	0	0	0		0	0	0
Hydro	12	11	15	16	16	17	17
Non-fuel Renewables	0	0	0		0	6	8
New Technologies (e.g. Fuel Cells)	0	0	0		0	0	0
Not Specified	0	0	0		0	0	0
Total	62	57	47		53	68	85

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	25	65	55	50	56	75	53
Steam Thermal Units	10	5	9	16	19	21	21
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	0	0	0	0
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	58	71	78	65	67	68	69
Non-fuel Renewables	0	0	0	3	4	13	21
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	93	142	142	133	145	177	164

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	4	5	6	6	6	3
Steam Thermal Units	4	4	5				
Gas Turbine Units	0	0	0				
Combined Cycle Units	0	0	0				
Internal Combustion Units	0	0	0				
Hydro	3	3	3	5	3	4	4
Non-fuel Renewables	0	0	0				
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	
Total	7	11	13		15	19	22

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	4	11	15	13	14	16	
Steam Thermal Units	12	9	7		7	6	
Gas Turbine Units	0	0	0		0	0	
Combined Cycle Units	0	0	1		4	8	
Internal Combustion Units	0	0	0		0	0	
Hydro	2	3	5	5	6	4	
Non-fuel Renewables	0	0	0		1	1	
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0		0	0	
Total	19	23	29		31	36	

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	14	22	25	26	25	22	16
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	34	31	38	37	38	41	42
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	0	0	0	0
Gas Turbine Units	0	0	0	1	2	1	1
Combined Cycle Units	0	0	0	4	3	1	1
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	83	120	141	126	118	134	135
Non-fuel Renewables	0	0	0	1	1	7	8
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	1	0	0	0	0
Total	83	121	142	132	124	143	145

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units			45	49	48		
Gas Turbine Units			2	8	9		
Combined Cycle Units			46	95	93		
Internal Combustion Units			1	5	5		
Hydro	11	23	31	36	52		
Non-fuel Renewables		0	0	2	4		
New Technologies (e.g. Fuel Cells)							
Not Specified	12	34		0	1		
Total	23	58	125	195	211		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units	0	0	0	0			
Internal Combustion Units	4	3	5	6			
Hydro	4	3	5	6	8		
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	10	13	10	15			

TABLE 3.2.2 Annual Electricity Generation by Technology (TWh)

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	6	4	6	7	8	6	
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total			11		16	20	

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	11	24	18	22	21	26	32
Gas Turbine Units	0	0	0	0	0	3	3
Combined Cycle Units	2	3	1	3	3	2	
Internal Combustion Units	1	1	0	0	0		
Hydro	11	8	10	11	12	12	13
Non-fuel Renewables	0	0	0	0	0	0	0
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	1	1
Not Specified	0	0	0	0	0	0	0
Total	25	37	30	36	36	44	48

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Nuclear				83	89	131	181
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro				12	13	14	15
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total							

TABLE 3.2.3

CHP Generation (TWh)

The tables below give information on the electricity produced in cogeneration plants in the 27 EU Member States, plus Switzerland, Norway, Turkey and Serbia. Production is expressed in TWh, and differentiated by primary energy. The tables present both historical data (between 1980 and 2010) and estimates for 2020 and 2030.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total	3.4	6.1	14.5		22.0		

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal		6.6	0.1	0.2	0.3		
Oil		0.5	0.4	0.1	0.3		
Natural Gas		0.2	4.7	11.1	12.0		
Renewables		0.0	0.5	1.8	1.8	5.5	
Other Non-Renewables		0.0	0.0	0.0	0.0		
Total		7.3	5.7	13.2	14.4	22.2	

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	0
Hard Coal	0.8	0.7	0.6		3.0	0.2	0.2
Oil	2.5	2.1	1.2		0.6	0.5	0.5
Natural Gas	2.5	2.0	1.6		1.7	3.0	3.0
Renewables	0	0	0		0	0	0
Other Non-Renewables	0	0	0		0	0	0
Total	5.8	4.8	3.4		5.3	3.7	3.7

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0		
Hard Coal	0	0	0		0		
Oil	0	0	0		0		
Natural Gas	0	0	0		0		
Renewables	0	0	0		0		
Other Non-Renewables	0	0	0		0		
Total	0	0	0		0		

TABLE 3.2.3 CHP Generation (TWh)

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	11.0	15.0	17.0	7.5	7.6	17.0	17.0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	1.1	1.1	3.0	3.0
Renewables	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	11.0	15.0	17.0	8.6	8.7	20.0	20.0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal				18.2	20.8		
Oil				2.4	2.2		
Natural Gas				52.3	55.7		
Renewables				10.2	11.7		
Other Non-Renewables				2.3	2.7		
Total	38.0	60.0	64.5	85.4	93.1	115.0	125.0

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0		0	0	
Hard Coal			11.7		10.0	8.0	
Oil			4.0		4.0	4.0	
Natural Gas			10.3		12.0	14.0	
Renewables			0		0	0	
Other Non-Renewables			0		0	0	
Total	11.6	14.2	26.0		26.0	26.0	

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0.4	0.4		0.3	
Hard Coal			0	0		0	
Oil			0	0		0	
Natural Gas			0.2	0.1		0.2	
Renewables			0.0	0.4		1.5	
Other Non-Renewables			0.5	0		0	
Total			1.2	0.9		2.0	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	1.0	0	0.3	0	0
Oil	0	2.0	7.0	6.0	6.7	7.0	8.0
Natural Gas	1.0	1.0	18.0	28.0	29.6	36.0	40.0
Renewables	0	0	0	0		0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	1.0	4.0	26.0	34.0	36.5	43.0	48.0

TABLE 3.2.3 CHP Generation (TWh)

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0	0	0	0	0
Hard Coal			4.0	4.3	4.3	3.5	3.0
Oil			1.2	0.3	0.3	0.4	0.4
Natural Gas			8.0	9.4	10.8	9.7	10.0
Renewables			8.8	7.4	8.8	10.0	10.6
Other Non-Renewables			2.5	3.4	3.9	3.3	2.8
Total	10.8	16.1	24.5	24.8	28.1	26.9	26.8

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0				
Hard Coal			0.7				
Oil			0.7				
Natural Gas			8.6				
Renewables			2.9				
Other Non-Renewables			1.4				
Total			14.3				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	2.9	2.3	0.6	0.6	0.6	0.4	0.3
Oil	4.1	3.9	1.5	0.4	0.3	0.2	0.2
Natural Gas	0.2	1.3	19.0	20.1	20.3	21.0	21.9
Renewables	0	0	0.5	1.1	1.3	3.3	6.2
Other Non-Renewables	1.8	2.8	3.7	4.2	4.3		
Total	9.0	10.3	25.3	26.4	26.8	24.9	28.6

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0.1	0.1	0.1	
Hard Coal	0	0	0.1	0.1	0.1	0.1	
Oil	0.6	0.7	0.7	0.7	0.7	0.7	
Natural Gas	0	0.1	0.1	0.9	1.2	1.2	
Renewables	0	0	0	0	0	0.2	
Other Non-Renewables	0	0	0	0	0	0	
Total	0.6	0.8	1.0	1.8	2.1	2.3	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0.6	0	0	0	0
Hard Coal			0.8	0.2	0.1	0	0
Oil			0	0	0	0	0
Natural Gas			1.0	5.5	6.0	4.0	4.0
Renewables			0	0.1	0.4	1.5	1.5
Other Non-Renewables			0.1	0	0.1	0	0
Total	2.3	2.0	2.5	5.8	6.6	5.5	5.5

TABLE 3.2.3 CHP Generation (TWh)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0		0	0	
Hard Coal			0		0	0	
Oil			0		0	0	
Natural Gas			0.4		2.0	2.3	
Renewables			0		0	0	
Other Non-Renewables			0.1		0.1	0.1	
Total			0.5		2.1	2.4	

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total	19.7	15.8	57.9	97.6	108.3		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	1.1	2.5	1.1	1.5	1.5	3.6	3.6
Hard Coal	0	0	0	0	0	0	0
Oil	0.2	0.5	0.3	0.2	0.1	0.3	0.3
Natural Gas	0	0	0	0.2	0.2	0.3	0.3
Renewables	0	0	0	0.1	0.2	1.4	1.4
Other Non-Renewables	0	0	0	0	0	0	0
Total	1.3	3.0	1.4	2.0	2.0	5.5	5.5

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0.4	2.8	3.0	3.0	3.1
Renewables	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	0	0	0.4	2.8	3.0	3.0	3.1

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0		
Hard Coal	0	0	0	0	0	0	
Oil	0.5	0.3	0.2	0	0		
Natural Gas	1.1	1.6	1.0	1.8	2.8	2.1	2.3
Renewables	0	0	0	0	0	0.2	0.4
Other Non-Renewables	0	0	0	0	0		
Total	1.6	1.9	1.2	1.8	2.8	2.3	2.7

TABLE 3.2.3 CHP Generation (TWh)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			0	0	0		
Hard Coal			0	0	0		
Oil			0	0	0		
Natural Gas			0	0	0		
Renewables			0	0	0		
Other Non-Renewables			0	0	0		
Total			0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal		4.8	6.5	8.3	5.2	8.0	3.4
Oil				0	0	0	0
Natural Gas		19.3	41.5	53.2	54.2	59.0	55.9
Renewables		0	0	1.3	1.7	2.4	2.6
Other Non-Renewables		0	1.0	0.6	0.6	0.6	0.6
Total	16.0	24.1	49.0	63.4	61.6	69.9	62.4

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	26.9	26.0	28.1	24.2	24.8	11.7	13.4
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0.4	5.0	5.0	14.1	11.6
Renewables	0	0	0	0.2	0.2	1.6	0.2
Other Non-Renewables	0	0	0	0	0	0	0
Total	26.9	26.0	28.5	29.4	30.0	27.4	25.2

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	1.2	1.6	3.7	1.2	1.0	0.6	0.4
Natural Gas	0	0	0.7	3.2	4.2	6.2	7.9
Renewables	0	0	0.4	1.8	2.0	1.8	1.8
Other Non-Renewables	0	0	0	0	0	0	0
Total	1.2	1.6	4.9	6.1	7.1	8.6	10.0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal	1.5	5.3	2.8		4.4	4.4	3.9
Oil	1.7	4.7	1.8		0.6	0.3	0.2
Natural Gas	6.8	9.5	5.1		4.0	7.1	8.8
Renewables	0	0	0		0	0.2	1.0
Other Non-Renewables	0	0	0		0	0	0
Total	10.0	19.5	9.7		9.0	11.9	13.9

TABLE 3.2.3 CHP Generation (TWh)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0.2	1.1	1.5	0.6	0.8	0	0
Oil	8.3	1.1	1.4	0.9	1.2	0.6	0.6
Natural Gas	0	0.3	0.4	1.3	2.2	2.6	2.6
Renewables	0.6	1.7	3.8	10.8	11.5	16.0	16.3
Other Non-Renewables	0.0	0.6	1.4	1.3	2.3	1.4	1.4
Total	9.1	4.8	8.5	14.8	17.9	20.6	20.9

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	
Hard Coal	0.2	0.3	0.4		0.4	0.4	
Oil	0	0	0		0	0	
Natural Gas	0	0	0		0	0	
Renewables	0	0	0		0	0	
Other Non-Renewables	0	0	0		0	0	
Total	0.2	0.3	0.4		0.4	0.4	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0		0	0	
Hard Coal	1.8	1.9	1.8		2.2	2.2	
Oil	0.5	0.6	0.5		0.3	0.3	
Natural Gas	0.9	1.3	2.7		6.4	7.6	
Renewables	0	0	0		0	0	
Other Non-Renewables	0	0	0		0	0	
Total	3.2	3.8	5.0		8.9	10.1	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0	4.7	5.1	2.0	2.0
Renewables	0	0	0.1	0	0	0	0
Other Non-Renewables	0.1	0.4	0.6	0	0	0	0
Total	0.1	0.4	0.7	4.7	5.1	2.0	2.0

TABLE 3.2.3 CHP Generation (TWh)

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Multifuels			2.1	2.9	3.4		
Hard Coal			0.4	0.3	0.3		
Oil			0.9	0.4	0.1		
Natural Gas			1.6	3.8	4.1		
Renewables			0				
Other Non-Renewables			0				
Total	0	0	5.0	7.4	7.9		

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	2.4	1.9	1.2	2.4	2.4	2.1	0
Oil	0	0	0	0	0	0	0
Natural Gas	0.1	1.6	0.3	0.2	0.2	2.6	2.6
Renewables	0	0	0	0			
Other Non-Renewables	0	0	0	0			
Total	2.5	3.5	1.4	2.6	2.6	4.7	2.6

4. Balances

4.1 Total Energy Use

TABLE 4.1.1

Total Energy Use (Mtoe)

The tables below present the evolution of the total energy use in any given EU Member State plus Switzerland, Norway, Turkey and some Energy Community countries. Gathered data show both historical information (between 1980 and 2010) and forecasts (for 2020 and 2030).

The tables present the primary energy for energy uses as well as consumption and losses in the energy sector, i.e. the final energy consumption of the energy sector as a whole (also broken down by sector). As far as the power sector is concerned, the tables show the primary energy used in power generation (with the breakdown for primary electricity and thermal power).

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	23.7	25.1	29.2	32.3	32.9	35.0	34.3
2. Non Energy Uses and Bunkers	2.2	2.2	2.6	2.5	2.6	2.7	2.6
3. Primary Energy for Energy Uses	21.4	22.9	26.6	29.9	30.2	32.3	31.7
4. Primary Energy Used for Electricity Generation	5.5	6.8	7.7	8.8	8.9	7.3	6.7
of which 4.a Primary Electricity							
4.b Thermal Power Generation							
5. Consumption and Losses in the Energy Sector	4.7	4.6	4.0	4.6	4.6	5.0	4.9
6. Final Energy Consumption	16.8	18.3	22.6	25.3	25.6	27.4	26.8
of which 6.a Agriculture	0.7	0.6	0.6	0.5	0.6	0.5	0.5
6.b Industry	5.4	5.2	6.1	7.3	7.3	8.1	8.1
6.c Transport	4.0	5.0	7.1	8.5	8.6	9.2	9.1
6.d Services	1.8	1.8	2.3	2.6	2.7	2.8	2.8
6.e Households	5.0	5.8	6.5	6.2	6.4	6.8	6.6

TABLE 4.1.1 Total Energy Use (Mtoe)

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements		48.7	59.2	58.1	61.5	57.9	52.3
2. Non Energy Uses and Bunkers		3.1	6.7	7.2	7.5	7.0	6.0
3. Primary Energy for Energy Uses		45.6	52.5	50.9	54.0	50.9	46.3
4. Primary Energy Used for Electricity Generation		11.4	14.9	13.2	14.6	13.7	12.5
of which 4.a Primary Electricity		2.3	8.7				
4.b Thermal Power Generation		9.1	6.2				
5. Consumption and Losses in the Energy Sector		2.3	2.3	2.3	3.2	2.8	2.5
6. Final Energy Consumption		34.2	44.4	42.1	44.3	38.9	36.2
of which 6.a Agriculture		0.4	0.6	0.8	0.8	0.4	0.3
6.b Industry		15.1	21.4	17.4	19.3	13.6	12.9
6.c Transport		7.7	9.6	11.1	10.3	9.8	9.1
6.d Services		2.8	3.4	4.5	5.0	5.3	5.0
6.e Households		8.2	9.4	8.3	8.9	10.1	9.2

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	20.7	28.5	16.0		17.8	22.9	24.7
2. Non Energy Uses and Bunkers	1.2	1.8	0.9		0.5	1.4	1.5
3. Primary Energy for Energy Uses	19.5	26.7	15.1		17.3	21.5	23.2
4. Primary Energy Used for Electricity Generation	11.8	6.7	6.0		12.2	9.7	10.4
of which 4.a Primary Electricity	0.8	1.3	1.7		0.8	2.8	3.3
4.b Thermal Power Generation	11.0	5.4	4.3		11.4	5.8	4.7
5. Consumption and Losses in the Energy Sector	5.2	6.7	4.6		8.6	8.9	9.1
6. Final Energy Consumption	14.3	20.0	10.5		8.7	12.6	14.1
of which 6.a Agriculture		1.2	0.4		0.2	0.5	0.6
6.b Industry		11.8	4.8		2.5	3.8	3.9
6.c Transport		1.7	2.5		2.7	4.1	4.2
6.d Services		1.9	0.3		1.0	1.2	1.4
6.e Households		3.5	2.5		2.3	3.0	4.0

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements		1.6	2.4	5.1	5.2		
2. Non Energy Uses and Bunkers		0.1	0.3	0.3	0.3		
3. Primary Energy for Energy Uses		1.5	2.1	4.9	4.9		
4. Primary Energy Used for Electricity Generation		0.6	1.0		1.2		
of which 4.a Primary Electricity		0	0		0		
4.b Thermal Power Generation		0.6	1.0		1.3		
5. Consumption and Losses in the Energy Sector		0.4	0.4		1.2		
6. Final Energy Consumption		1.1	1.7		2.4		
of which 6.a Agriculture		0	0		0		
6.b Industry		0.2	0.3		0.4		
6.c Transport		0.5	0.8		0.8		
6.d Services		0.2	0.3		0.7		
6.e Households		0.2	0.3		0.5		

TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	50.5	49.7	40.2	46.2	45.5	44.5	45.0
2. NON ENERGY USES AND BUNKERS	0	0	0.5	0.6	0.6	0.5	0.5
3. PRIMARY ENERGY FOR ENERGY USES	50.5	49.7	39.7	45.6	44.9	44.0	44.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	13.8	15.2	17.0	20.3	16.9	17.9	18.5
of which 4.a Primary Electricity	0.5	3.1	3.5	6.2	6.1	6.7	6.8
4.b Thermal Power Generation	13.3	12.1	13.5	14.1	14.0	11.2	11.7
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	18.6	18.4	15.3	17.0	16.9	15.0	15.2
6. FINAL ENERGY CONSUMPTION	31.9	31.3	24.4	28.6	28.8	29.0	29.3
of which 6.a Agriculture	1.8	1.9	1.0	0.7	0.7	0.6	0.6
6.b Industry	16.6	15.4	11.6	12.7	12.9	13.1	13.0
6.c Transport	1.5	1.4	3.6	4.9	4.9	5.1	5.3
6.d Services	5.0	4.7	2.6	3.8	3.8	4.1	4.3
6.e Households	7.0	7.9	5.6	6.5	6.5	6.1	6.3

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	274.5	350.0	344.0	320.7		287.0	235.0
2. NON ENERGY USES AND BUNKERS	19.2	22.5	27.7	25.1		23.0	19.0
3. PRIMARY ENERGY FOR ENERGY USES	255.3	327.5	316.3	295.6		264.0	216.0
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	89.2	138.7	127.4	124.3		110.0	80.0
of which 4.a Primary Electricity	19.7	40.8	47.7	48.3		47.0	40.0
4.b Thermal Power Generation	69.5	97.9	79.7	76.0		63.0	40.0
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	74.6	104.9	95.8	88.0		72.0	49.0
6. FINAL ENERGY CONSUMPTION	180.7	222.6	220.5	207.6		192.0	167.0
of which 6.a Agriculture	3.0	3.2	3.0	3.0		3.0	2.0
6.b Industry	61.9	69.9	57.8	55.1		54.0	48.0
6.c Transport	40.0	55.8	65.7	60.6		58.0	51.0
6.d Services	27.4	37.9	32.3	29.8		24.0	20.0
6.e Households	48.4	55.8	61.7	59.1		53.0	46.0

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	19.8	18.0	19.5	19.3	20.2	21.0	21.0
2. NON ENERGY USES AND BUNKERS	0.4	0.3	0.3	0.3	0.3		
3. PRIMARY ENERGY FOR ENERGY USES	19.4	17.7	19.2	19.1	19.9		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	6.2	5.4	6.6	6.5	6.8		
of which 4.a Primary Electricity	0	0.1	0.4	0.6	0.7		
4.b Thermal Power Generation	6.2	5.4	6.2	5.9	6.1		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	5.0	4.1	4.4	4.3	4.5		
6. FINAL ENERGY CONSUMPTION	14.3	13.5	14.8	14.7	15.5		
of which 6.a Agriculture	0.9	1.0	1.0	0.9	0.9		
6.b Industry	3.1	2.7	3.0	2.4	2.4		
6.c Transport	3.4	4.1	4.8	5.0	5.0		
6.d Services	1.9	1.7	1.8	2.0	2.1		
6.e Households	5.0	4.0	4.2	4.6	5.1		

TABLE 4.1.1 Total Energy Use (Mtoe)

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements			4.6	4.1			
2. Non Energy Uses and Bunkers			1.5	1.2			
3. Primary Energy for Energy Uses			3.2	2.9			
4. Primary Energy Used for Electricity Generation			2.1	2.0			
of which 4.a Primary Electricity							
4.b Thermal Power Generation							
5. Consumption and Losses in the Energy Sector			0.9	0.4			
6. Final Energy Consumption			2.3	2.5			
of which 6.a Agriculture			0.1	0.1			
6.b Industry			0.5	0.5			
6.c Transport			0.2	0.4			
6.d Services			0.3	0.4			
6.e Households			1.2	1.2			

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	73.0	92.0	130.0	145.0	144.2	165.0	183.0
2. Non Energy Uses and Bunkers	4.0	6.0	10.0	19.0	18.3	21.0	23.0
3. Primary Energy for Energy Uses	70.0	85.0	120.0	127.0	125.9	143.0	160.0
4. Primary Energy Used for Electricity Generation	25.0	34.0	47.0	56.0	56.4	69.0	81.0
of which 4.a Primary Electricity	8.0	17.0	22.0	28.0	33.1	43.0	57.0
4.b Thermal Power Generation	18.0	17.0	25.0	28.0	23.2	26.0	24.0
5. Consumption and Losses in the Energy Sector	21.0	28.0	35.0	38.0	37.8	41.0	44.0
6. Final Energy Consumption	49.0	58.0	85.0	88.0	88.1	102.0	116.0
of which 6.a Agriculture	2.0	2.0	3.0	3.0	2.6	2.0	2.0
6.b Industry	23.0	22.0	30.0	24.0	24.4	29.0	34.0
6.c Transport	16.0	23.0	34.0	36.0	36.3	43.0	51.0
6.d Services	2.0	3.0	7.0	10.0	9.9	11.0	11.0
6.e Households	5.0	7.0	12.0	15.0	14.7	17.0	19.0

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	23.1	27.8	33.4		37.6	37.0	
2. Non Energy Uses and Bunkers	0.9	1.1	1.3		1.7		
3. Primary Energy for Energy Uses	22.2	26.7	32.2		35.9		
4. Primary Energy Used for Electricity Generation	6.7	9.0	11.3	11.6	13.0		
of which 4.a Primary Electricity	2.6	5.6	6.9	7.0	6.8		
4.b Thermal Power Generation	4.1	3.4	4.4	4.6	6.2		
5. Consumption and Losses in the Energy Sector	4.4	5.5	7.4		8.7		
6. Final Energy Consumption	17.7	21.2	24.8		27.2	26.7	24.5
of which 6.a Agriculture	0.8	0.9	0.8		0.9		
6.b Industry	8.2	9.6	12.5		12.3		
6.c Transport	2.8	4.0	4.3		4.9		
6.d Services	1.6	2.4	2.7		3.1		
6.e Households	4.3	4.3	4.5		6.0		

TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	190.0	229.8	268.7		300.3	322.1	339.4
2. NON ENERGY USES AND BUNKERS	11.8	12.4	17.4		18.3	18.5	19.1
3. PRIMARY ENERGY FOR ENERGY USES	178.2	217.4	251.3		282.0	303.6	320.3
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	69.5	93.8	118.5				
of which 4.a Primary Electricity	40.2	83.8	107.2				
4.b Thermal Power Generation	29.3	10.0	11.3				
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	44.0	74.8	93.4		104.2	108.8	111.2
6. FINAL ENERGY CONSUMPTION	134.2	142.6	157.9		177.8	194.8	209.1
of which 6.a Agriculture	3.2	3.1	3.1		3.1	3.1	3.1
6.b Industry	44.9	38.5	38.7		44.1	48.7	52.7
6.c Transport	32.1	41.7	49.4		56.3	62.2	68.3
6.d Services	24.0	26.4	29.7		22.5	24.7	27.4
6.e Households	29.9	32.9	37.0		51.9	56.1	57.5

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	214.5	227.6	247.1	219.9	227.0	206.7	219.2
2. NON ENERGY USES AND BUNKERS	10.0	13.9	14.5	8.9	9.0	9.0	9.0
3. PRIMARY ENERGY FOR ENERGY USES	204.5	213.7	232.6	211.0	218.0	197.7	210.2
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	68.4	78.2	84.6	70.8	71.2	51.9	49.2
of which 4.a Primary Electricity	9.2	18.6	23.7	15.7	14.5	21.2	31.2
4.b Thermal Power Generation	59.2	59.6	61.1	55.1	56.8	30.7	18.0
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	62.1	66.4	73.4	67.6	68.4	58.1	62.9
6. FINAL ENERGY CONSUMPTION	142.4	147.3	159.2	143.4	149.6	139.7	147.3
of which 6.a Agriculture	1.4	1.3	1.2	0.9	1.0	1.0	1.0
6.b Industry	48.3	38.7	35.3	26.6	27.7	28.7	27.9
6.c Transport	35.6	48.6	55.5	56.1	55.2	57.5	59.9
6.d Services	17.3	17.9	20.3	16.8	17.3	16.5	18.1
6.e Households	39.8	40.8	46.9	43.0	48.5	36.0	40.4

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	16.5	24.9	31.7	33.3	31.6		
2. NON ENERGY USES AND BUNKERS	1.3	3.9	5.0	3.5	3.8		
3. PRIMARY ENERGY FOR ENERGY USES	15.2	21.0	26.7	29.8	27.8		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	5.1	8.8	12.1	12.3	11.9		
of which 4.a Primary Electricity	0.3	0.2	0.5	0.7	0.9		
4.b Thermal Power Generation	4.8	8.6	11.6	11.6	11.0		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	4.0	6.5	8.1	9.3	8.8		
6. FINAL ENERGY CONSUMPTION	11.2	14.5	18.6	20.5	19.0		
of which 6.a Agriculture	0.8	1.0	1.1	0.9	0.8		
6.b Industry	4.0	3.9	4.5	3.5	3.5		
6.c Transport	4.0	5.8	7.2	9.2	8.2		
6.d Services	0.4	0.7	1.3	2.1	1.9		
6.e Households	2.0	3.1	4.5	4.8	4.6		

TABLE 4.1.1 Total Energy Use (Mtoe)

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	30.1	29.1	24.8	25.3	26.0	29.0	31.0
2. Non Energy Uses and Bunkers			1.7	1.9	2.0	2.0	2.0
3. Primary Energy for Energy Uses			23.1	23.4	24.0	27.0	29.0
4. Primary Energy Used for Electricity Generation	10.0	11.5	9.5	9.1	9.7	11.1	12.2
of which 4.a Primary Electricity	2.3	6.1	4.0	4.0	4.2	4.6	6.9
4.b Thermal Power Generation	7.7	5.4	5.5	5.1	5.5	6.5	5.3
5. Consumption and Losses in the Energy Sector			7.2	7.0	7.3	8.5	9.0
6. Final Energy Consumption	21.0	20.5	15.9	16.4	16.7	18.5	20.0
of which 6.a Agriculture	0.6	0.6	0.6	0.4	0.4	0.6	0.6
6.b Industry	9.2	7.1	3.7	2.7	2.9	3.5	4.0
6.c Transport	3.0	3.0	3.0	4.8	4.5	5.0	5.5
6.d Services	2.9	2.8	3.4	3.0	3.2	3.5	4.0
6.e Households	5.3	7.0	5.2	5.5	5.7	5.9	5.9

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	8.1	9.5	14.0		17.6	20.0	
2. Non Energy Uses and Bunkers	0.3	0.4	0.4		0.4	0.4	
3. Primary Energy for Energy Uses	7.8	9.1	13.6		17.2	19.6	
4. Primary Energy Used for Electricity Generation	2.4	3.1	5.0		5.7	6.8	
of which 4.a Primary Electricity	0.1	0.1	0.1		0.4	0.5	
4.b Thermal Power Generation	2.3	3.0	4.9		5.3	6.3	
5. Consumption and Losses in the Energy Sector	1.6	1.9	3.0		3.0	3.1	
6. Final Energy Consumption	6.2	7.2	10.6		14.2	16.5	
of which 6.a Agriculture	0.1	0.2	0.3		0.3	0.3	
6.b Industry	1.9	1.7	2.3		2.6	3.1	
6.c Transport	1.7	2.0	3.9		5.5	6.5	
6.d Services	0.6	1.0	1.6		2.5	2.9	
6.e Households	1.8	2.2	2.6		3.2	3.8	

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	0	156.5	177.3	172.5	178.8		
2. Non Energy Uses and Bunkers	0	13.0	10.1	10.8	12.5		
3. Primary Energy for Energy Uses	0	143.5	167.2	161.7	166.3		
4. Primary Energy Used for Electricity Generation	0	46.2	57.2	60.7	63.1		
of which 4.a Primary Electricity	0	6.0	8.2	9.0	9.4		
4.b Thermal Power Generation	0	40.3	49.0	51.7	53.7		
5. Consumption and Losses in the Energy Sector	0	35.6	41.9	40.3	42.6		
6. Final Energy Consumption	0	107.9	125.3	121.4	123.7		
of which 6.a Agriculture	0	2.9	3.0	3.1	3.0		
6.b Industry	0	35.8	39.7	29.8	31.1		
6.c Transport	0	34.2	42.5	42.3	42.0		
6.d Services	0	8.9	12.6	17.6	16.3		
6.e Households	0	26.1	27.5	28.7	31.4		

TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	12.2	17.2	7.5	8.7	7.0	9.3	11.7
2. NON ENERGY USES AND BUNKERS	0.9	0.9	0.6	0.9	0.9	1.3	1.4
3. PRIMARY ENERGY FOR ENERGY USES	11.3	16.3	6.9	7.8	6.2	8.0	10.3
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	2.3	6.2	2.3	3.4	0.8	2.0	4.6
of which 4.a Primary Electricity	0	4.1	1.9	2.9	0.1	0.2	3.1
4.b Thermal Power Generation	2.3	2.1	0.4	0.5	0.7	1.8	1.5
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	2.5	7.2	3.1	3.3	1.4	2.1	3.5
6. FINAL ENERGY CONSUMPTION	8.8	9.1	3.8	4.6	4.8	5.9	6.8
of which 6.a Agriculture	0.8	0.9	0.1	0.1	0.1	0.1	0.2
6.b Industry	3.4	3.1	0.8	0.8	0.9	1.3	1.5
6.c Transport	1.7	1.7	1.0	1.5	1.6	2.0	2.4
6.d Services	1.4	1.5	0.5	0.6	0.6	0.8	0.9
6.e Households	1.5	1.9	1.4	1.6	1.6	1.7	1.8

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		3.6	3.6	4.5	4.5		
2. NON ENERGY USES AND BUNKERS		0	0	0	0		
3. PRIMARY ENERGY FOR ENERGY USES		3.6	3.6	4.5	4.5		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION		0	0.1	0.6	0.6		
of which 4.a Primary Electricity		0	0.0	0.0	0		
4.b Thermal Power Generation		0	0.1	0.6	0.6		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR		0.2	0.2	0.4	0.4		
6. FINAL ENERGY CONSUMPTION		3.4	3.5	4.1	4.1		
of which 6.a Agriculture		0	0.0	0.0	0		
6.b Industry		1.9	0.7	0.6	0.6		
6.c Transport		0.9	1.9	2.5	2.5		
6.d Services		0	0.4	0.4	0.4		
6.e Households		0.5	0.5	0.5	0.5		

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	8.0	8.7	4.0	4.7	4.8	6.0	6.8
2. NON ENERGY USES AND BUNKERS	0.1	0.5	0.1	0.2	0.3	0.2	0.2
3. PRIMARY ENERGY FOR ENERGY USES	7.9	8.2	3.9	4.5	4.5	5.8	6.6
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	1.0	1.4	1.3	1.1	0.8	1.3	1.7
of which 4.a Primary Electricity	0.5	0.7	0.6	0.4	0.3	0.5	0.9
4.b Thermal Power Generation	0.5	0.7	0.7	0.7	0.7	0.8	0.8
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	1.2	1.7	0.6	0.3	0.2	0.5	0.6
6. FINAL ENERGY CONSUMPTION	6.7	6.5	3.3	4.2	4.3	5.3	6.0
of which 6.a Agriculture	0.6	0.6	0.1	0.1	0.1	0.2	0.2
6.b Industry	2.0	2.1	0.6	0.8	0.9	1.2	1.5
6.c Transport	1.4	1.1	0.8	1.2	1.2	1.4	1.4
6.d Services	1.1	1.1	0.5	0.6	0.6	0.8	1.0
6.e Households	1.6	1.6	1.3	1.5	1.5	1.7	1.9

TABLE 4.1.1 Total Energy Use (Mtoe)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements			0.9				
2. Non Energy Uses and Bunkers			0				
3. Primary Energy for Energy Uses			0.9				
4. Primary Energy Used for Electricity Generation			0.5	0.6	0.6		
of which 4.a Primary Electricity			0.5	0.6	0.6		
4.b Thermal Power Generation			0	0	0		
5. Consumption and Losses in the Energy Sector			0.2				
6. Final Energy Consumption			0.7				
of which 6.a Agriculture			0				
6.b Industry			0.2				
6.c Transport			0.3				
6.d Services			0.1				
6.e Households			0.1				

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	74.2	78.0	87.3	98.2	101.0	113.6	131.8
2. Non Energy Uses and Bunkers	10.6	13.9	14.5	20.3	17.6	19.8	22.9
3. Primary Energy for Energy Uses	63.6	64.1	72.8	78.0	83.4	93.8	108.9
4. Primary Energy Used for Electricity Generation	12.4	16.8	22.2	24.6	25.7	27.2	31.2
of which 4.a Primary Electricity	0.9	3.0	2.7	1.4	1.2	1.4	1.6
4.b Thermal Power Generation	11.5	13.8	19.5	23.3	24.5	25.8	29.6
5. Consumption and Losses in the Energy Sector	11.7	12.6	14.6	14.3	15.2	16.3	19.0
6. Final Energy Consumption	51.9	51.5	58.2	63.7	68.9	77.5	89.9
of which 6.a Agriculture	3.7	3.7	4.2	4.9	5.5	6.2	7.2
6.b Industry	22.3	21.8	25.0	27.9	30.5	34.2	39.7
6.c Transport	7.8	8.4	11.0	11.7	12.3	13.9	16.2
6.d Services	5.6	7.0	7.7	9.1	9.3	10.5	12.2
6.e Households	12.5	10.4	10.3	10.3	11.4	12.9	14.9

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	124.6	100.7	90.3	95.4	101.9	101.7	118.5
2. Non Energy Uses and Bunkers	0.1	0.1	2.0	4.7	5.5	4.4	5.6
3. Primary Energy for Energy Uses	124.5	100.6	88.3	90.7	96.4	97.3	112.9
4. Primary Energy Used for Electricity Generation	30.6	32.4	31.7	32.4	33.6	34.1	39.5
of which 4.a Primary Electricity	0.7	0.7	0.9	0.9	1.1	2.9	3.3
4.b Thermal Power Generation	29.9	31.7	30.8	31.5	32.5	31.2	36.2
5. Consumption and Losses in the Energy Sector	36.5	33.6	29.8	33.2	25.4	24.5	28.5
6. Final Energy Consumption	88.0	67.0	58.5	57.4	60.2	72.8	84.4
of which 6.a Agriculture	3.0	2.9	5.3	3.6	3.8	5.0	4.2
6.b Industry	48.0	27.1	21.6	14.2	14.7	20.9	24.0
6.c Transport	10.0	9.9	9.5	16.5	16.9	18.7	23.3
6.d Services	2.0	2.1	4.7	4.4	3.8	8.8	12.8
6.e Households	25.0	25.0	17.4	18.7	21.0	19.4	20.1

TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	11.6	18.3	26.2	25.2	24.2	26.0	27.1
2. NON ENERGY USES AND BUNKERS	1.1	2.8	3.2	2.5	3.1	2.7	2.7
3. PRIMARY ENERGY FOR ENERGY USES	10.5	15.5	23.0	22.7	21.2	23.3	24.4
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	3.9	4.9	7.4	7.9	7.2	6.0	6.5
of which 4.a Primary Electricity	2.2	0.8	1.1	1.9	2.5	1.9	2.3
4.b Thermal Power Generation	1.7	4.1	6.2	6.1	4.7	4.1	4.1
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	3.1	3.9	5.5	5.1	3.9	4.2	4.4
6. FINAL ENERGY CONSUMPTION	7.4	11.6	17.5	17.6	17.3	19.1	20.0
of which 6.a Agriculture	0.4	0.6	0.5	0.4	0.5	0.5	0.5
6.b Industry	3.2	4.3	5.7	5.0	5.4	6.0	6.3
6.c Transport	2.1	3.6	6.6	6.7	6.5	7.1	7.5
6.d Services	0.4	0.8	1.8	2.2	2.0	2.2	2.3
6.e Households	1.1	2.4	2.9	3.2	2.9	3.2	3.4

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS			41.8		46.3	48.1	52.5
2. NON ENERGY USES AND BUNKERS			5.3		12.0	12.0	12.0
3. PRIMARY ENERGY FOR ENERGY USES			36.5		34.3	36.1	40.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION			11.6		12.7	15.1	18.1
of which 4.a Primary Electricity			4.4		6.7	10.1	12.9
4.b Thermal Power Generation			7.2		6.0	5.0	5.2
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR			14.4		12.4	12.6	13.0
6. FINAL ENERGY CONSUMPTION			22.1		21.9	23.5	27.5
of which 6.a Agriculture			0.4		0.2	0.2	0.3
6.b Industry			9.0		8.6	10.5	12.7
6.c Transport			3.5		4.1	4.4	5.6
6.d Services			0.8		1.9	2.1	2.6
6.e Households			8.4		7.2	6.3	6.5

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	50.1	59.8	62.0	59.6	63.8	65.0	64.5
2. NON ENERGY USES AND BUNKERS	1.7	2.7	3.3	4.7	4.7	5.7	6.0
3. PRIMARY ENERGY FOR ENERGY USES	48.4	57.1	58.7	54.9	59.0	59.4	58.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	21.1	33.6	34.1	30.6	32.8	33.3	32.6
of which 4.a Primary Electricity	19.7	33.0	33.0	28.9	30.6	31.0	30.3
4.b Thermal Power Generation	1.4	0.6	1.1	1.7	2.2	2.3	2.3
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	16.6	25.0	25.1	22.5	24.3	25.0	24.2
6. FINAL ENERGY CONSUMPTION	31.8	32.1	33.6	32.4	34.7	34.4	34.3
of which 6.a Agriculture	1.1	0.7	0.7	0.9	0.9	0.8	0.8
6.b Industry	13.0	12.3	13.7	11.8	13.1	14.2	14.6
6.c Transport	5.9	7.2	7.5	8.4	8.5	8.1	7.7
6.d Services	3.4	4.0	4.0	3.9	4.2	4.5	4.6
6.e Households	8.5	7.9	7.8	7.4	7.9	6.9	6.7

TABLE 4.1.1 Total Energy Use (Mtoe)

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements			6.3				
2. Non Energy Uses and Bunkers			0				
3. Primary Energy for Energy Uses			6.3				
4. Primary Energy Used for Electricity Generation			1.6				
of which 4.a Primary Electricity			1.1				
4.b Thermal Power Generation			0.5				
5. Consumption and Losses in the Energy Sector			1.9				
6. Final Energy Consumption	3.3	3.4	4.4		5.0	5.9	
of which 6.a Agriculture							
6.b Industry			1.3				
6.c Transport							
6.d Services			1.4				
6.e Households			1.7				0

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements		22.2	16.2		21.8	29.6	
2. Non Energy Uses and Bunkers							
3. Primary Energy for Energy Uses							
4. Primary Energy Used for Electricity Generation		5.4	4.7		6.6	9.3	
of which 4.a Primary Electricity		2.3	2.2		2.7	3.3	
4.b Thermal Power Generation		3.1	2.5		3.9	6.0	
5. Consumption and Losses in the Energy Sector							
6. Final Energy Consumption	14.5	15.5	10.9	24.3	14.6	19.8	
of which 6.a Agriculture				0.3			
6.b Industry				12.0			
6.c Transport				0.5			
6.d Services				7.1			
6.e Households				4.4			

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements	17.5	19.5	20.2	27.6	28.4		
2. Non Energy Uses and Bunkers	0.4	0.2	-1.0	0.5	0.5		
3. Primary Energy for Energy Uses	17.1	19.3	21.2	27.1	27.9		
4. Primary Energy Used for Electricity Generation	7.2	9.4	11.4	10.3	10.2		
of which 4.a Primary Electricity	6.7	8.8	10.7				
4.b Thermal Power Generation	0.5	0.6	0.7				
5. Consumption and Losses in the Energy Sector	0.7	0.6	0.8	6.2	6.1		
6. Final Energy Consumption	16.4	18.7	20.4	20.9	21.8		
of which 6.a Agriculture	0.4	0.6	0.3	0.3	0.3		
6.b Industry	3.3	3.5	4.0	3.9	4.1		
6.c Transport	4.5	6.1	7.2	7.3	7.3		
6.d Services	2.9	3.1	3.3	3.3	3.6		
6.e Households	5.3	5.4	5.5	6.0	6.5		

TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	30.2	36.1	49.1		51.0	55.8	59.0
2. NON ENERGY USES AND BUNKERS	1.4	1.6	2.1		2.3	2.3	2.3
3. PRIMARY ENERGY FOR ENERGY USES	28.8	34.5	47.0		48.7	53.5	56.7
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	18.7	23.7	27.8		30.1	32.2	34.6
of which 4.a Primary Electricity	18.7	23.7	27.7		28.6	29.1	29.7
4.b Thermal Power Generation	0	0	0.2		1.5	3.2	4.9
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	14.2	17.9	28.0		27.1	30.2	31.5
6. FINAL ENERGY CONSUMPTION	14.6	16.6	19.0		21.6	23.3	25.2
of which 6.a Agriculture			0.7		0.8	0.8	0.8
6.b Industry	5.9	6.1	7.7		7.7	8.1	8.8
6.c Transport	2.9	3.6	4.4		5.7	6.3	7.0
6.d Services			2.5		3.0	3.3	3.5
6.e Households			3.7		4.4	4.8	5.1

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	32.0	53.0	80.5	106.1	109.3		
2. NON ENERGY USES AND BUNKERS	0.6	1.0	2.4	4.8	3.8		
3. PRIMARY ENERGY FOR ENERGY USES	31.4	52.0	78.1	101.3	105.4		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	4.3	10.7	24.8	37.4	39.1		
of which 4.a Primary Electricity	1.0	2.1	2.7	3.6	5.3		
4.b Thermal Power Generation	3.3	8.6	22.1	33.8	33.8		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	4.4	11.3	18.5	25.6	25.5		
6. FINAL ENERGY CONSUMPTION	27.0	40.7	59.7	75.8	79.9		
of which 6.a Agriculture	1.0	2.0	3.1	5.1	5.1		
6.b Industry	8.0	14.6	24.5	25.7	30.7		
6.c Transport	5.2	8.7	12.0	16.0	15.2		
6.d Services							
6.e Households	12.8	15.4	20.0	29.0	28.9		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		7.0		5.8			
2. NON ENERGY USES AND BUNKERS		0.1		0.1			
3. PRIMARY ENERGY FOR ENERGY USES		7.0		5.7			
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION		2.4		2.9			
of which 4.a Primary Electricity		0.3		0.5			
4.b Thermal Power Generation		2.1		2.4			
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR		2.4		1.8			
6. FINAL ENERGY CONSUMPTION		4.6		3.9			
of which 6.a Agriculture		0.2		0.2			
6.b Industry		2.7		1.3			
6.c Transport		0.8		0.9			
6.d Services		0.1		0.2			
6.e Households		0.9		1.4			

TABLE 4.1.1 Total Energy Use (Mtoe)

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
1. Total Primary Energy Requirements				14.7	15.1		
2. Non Energy Uses and Bunkers				0.9	1.3		
3. Primary Energy for Energy Uses				13.8	13.9		
4. Primary Energy Used for Electricity Generation				7.9	6.7		
of which 4.a Primary Electricity				1.0	0.4		
4.b Thermal Power Generation				6.9	6.3		
5. Consumption and Losses in the Energy Sector				6.1	5.6		
6. Final Energy Consumption				7.7	8.3		
of which 6.a Agriculture				0.1	0.1		
6.b Industry				2.1	2.5		
6.c Transport				2.3	2.2		
6.d Services				0.9	1.0		
6.e Households				2.3	2.4		

4.2 Capacity Balances

TABLE 4.2.1

Capacity Balances only for Interconnected Part (MW)

The tables below present the capacity balances for any given system. They are shown for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries, both on an historical basis (between 1980 and 2010) and as forecasts (for 2020 and 2030).

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	12,600	16,200	18,227				
Foreseeable not Available Capacity	3,200	4,100	3,000				
Connected Peak Demand	5,700	7,400	8,800	9,700	9,748		
Reserve Capacity	1,400	1,800	800				
Country Balance	2,300	2,900	5,371				
Net Transfer Capacity	1,500	2,000	4,000				

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity		14,887	15,472		18,127	25,343	
Foreseeable not Available Capacity			2,017		2,970	8,740	
Connected Peak Demand	7,900	10,400	12,653		15,311	16,221	
Reserve Capacity			1,200		960	960	
Country Balance			398		393	-578	
Net Transfer Capacity			2,200		3,378	3,588	

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	7,830	10,155	10,384		9,636	14,270	17,390
Foreseeable not Available Capacity							
Connected Peak Demand	6,900	8,100	7,100		7,270	10,500	13,340
Reserve Capacity	1,384	2,028	1,767		1,927	2,100	2,670
Country Balance	-454	27	1,517		439	1,670	1,380
Net Transfer Capacity	3,050	3,050	3,050			3,850	3,850

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	264	462	988		1,338	2,198	2,678
Foreseeable not Available Capacity	0	0	0		0		
Connected Peak Demand	200	372	688		1,191	1,650	2,150
Reserve Capacity	40	72	138		268	440	536
Country Balance	26	30	162		-80	108	-8
Net Transfer Capacity	0	0	0		0	0	0

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity		13,800	14,200	18,326	16,400	21,000	21,500
Foreseeable not Available Capacity		2,100	2,100	2,000	2,000	2,000	2,000
Connected Peak Demand		9,000	9,000	11,159	11,204	14,000	14,500
Reserve Capacity		1,800	2,000	1,800	1,500	2,000	2,000
Country Balance		900	1,100	3,367	1,700	3,000	3,000
Net Transfer Capacity		2,500	2,500	2,800	3,000	3,000	3,000

TABLE 4.2.1 Capacity Balances only for Interconnected Part (MW)

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	78,600	93,800	106,500	139,200	145,400	176,200	179,000
Foreseeable not Available Capacity	6,900	8,200	10,400	32,600	36,700	78,900	85,000
Connected Peak Demand	52,200	63,100	76,800	73,000	79,300	74,000	73,000
Reserve Capacity	17,600	21,300	13,000	13,800	13,900	14,100	13,500
Country Balance	1,900	1,200	6,300	19,800	15,500	9,200	7,500
Net Transfer Capacity				17,060	19,800	22,400	22,400

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	6,619	8,109	11,225		12,909	14,509	15,409
Foreseeable not Available Capacity	300	500	2,900		4,200	6,200	8,000
Connected Peak Demand	4,700	5,900	6,200		6,800	6,900	8,000
Reserve Capacity	900	1,200	1,200		1,400	1,400	1,600
Country Balance	719	509	925		509	0	-2,200
Net Transfer Capacity		3,000	4,500		5,800	8,000	8,000

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity			2,441	2,441	2,630	4,055	
Foreseeable not Available Capacity							
Connected Peak Demand			1,262	1,513	1,590	1,767	
Reserve Capacity				0		250	
Country Balance			1,179	928	1,040	2,038	
Net Transfer Capacity				1,250		1,900	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	27,910	40,808	50,528	90,754	95,945	115,005	134,590
Foreseeable not Available Capacity	5,402	6,616	9,357	26,739	29,101	45,280	61,736
Connected Peak Demand	18,572	25,160	33,236	44,440	42,346	51,634	61,338
Reserve Capacity	2,568	3,745	5,152	7,095	7,045	7,824	8,854
Country Balance	1,368	5,288	2,783	12,480	17,453	10,267	2,662
Net Transfer Capacity		1,200	2,080	2,800	4,240	5,680	5,680

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	11,022	13,170	16,258	16,372	16,740	20,813	24,005
Foreseeable not Available Capacity	1,032	850	2,537	3,072	3,640	4,900	5,900
Connected Peak Demand	6,600	10,450	12,400	13,300	14,600	16,500	18,100
Reserve Capacity	924	1,463	1,047	1,420	1,420		
Country Balance	2,466	407	274	-1,420	-2,920		
Net Transfer Capacity		2,510	3,100	3,850	3,850	5,300	

TABLE 4.2.1 Capacity Balances only for Interconnected Part (MW)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	62,711	53,235	115,338	120,434	123,783	133,100	158,000
Foreseeable not Available Capacity				23,174	26,495	35,500	
Connected Peak Demand	44,100	63,400	72,400	92,400	96,710	107,300	113,200
Reserve Capacity				1,333	3,826	3,000	
Country Balance				3,527	-3,248	-12,700	
Net Transfer Capacity				8,765	10,895	11,700	

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	68,800	73,500	78,800	89,795	93,146	113,409	146,139
Foreseeable not Available Capacity	0	0	300	3,073	3,468	22,878	42,231
Connected Peak Demand	52,100	57,300	64,100	67,614	66,287	59,601	65,037
Reserve Capacity	10,400	11,500	12,800	13,523	13,257	11,920	13,007
Country Balance	6,300	4,700	1,600	5,586	10,133	19,010	25,864
Net Transfer Capacity	0	2,000	2,000	1,988	3,188	6,088	8,088

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	4,514	7,274	9,692	12,414	13,942	20,731	
Foreseeable not Available Capacity	0	0	150	1,406	1,563	6,160	
Connected Peak Demand	3,554	4,924	8,531	9,762	9,794	10,906	
Reserve Capacity	890	1,230	1,454	1,464	1,469	1,636	
Country Balance	70	1,120	-443	-218	1,116	2,029	
Net Transfer Capacity				1,200	1,200	1,200	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity			7,855	8,575	8,753	10,600	13,200
Foreseeable not Available Capacity			360	1,430	1,617	2,500	2,500
Connected Peak Demand	5,107	6,534	5,742	5,997	6,064	7,065	8,200
Reserve Capacity	800	1,000	600	810	810	950	1,100
Country Balance	100	800	1,153	338	262	85	1,400
Net Transfer Capacity			340	1,000	1,000	1,500	1,500

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	2,400	3,800	4,700	8,056	7,500	11,787	
Foreseeable not Available Capacity	100	100	100	100	100	100	
Connected Peak Demand	1,800	2,500	3,800	4,637	5,026	5,224	6,085
Reserve Capacity	600	800	950	1,300	1,800	1,750	
Country Balance	100	400	-150	2,019	0	4,713	
Net Transfer Capacity	0	0	300	300	600	800	800

TABLE 4.2.1 CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	46,824	56,548	75,504	106,489			
Foreseeable not Available Capacity			22,104	37,189			
Connected Peak Demand	31,400	40,500	49,019	56,425	56,425		
Reserve Capacity			4,381	12,875			
Country Balance			0	0			
Net Transfer Capacity			5,400	8,040			

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	2,277	4,924	5,756	4,724	3,606	5,670	6,332
Foreseeable not Available Capacity	10	10	50	810	810	1,182	1,179
Connected Peak Demand	2,200	2,800	1,500	1,824	1,817	2,280	3,140
Reserve Capacity	300	600	600	350	350	1,480	1,480
Country Balance	-233	1,514	3,606	1,740	629	728	533
Net Transfer Capacity	2,000	3,000	3,000	3,000	3,000	4,700	4,700

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	1,214	1,209	1,199	1,706	1,728	1,991	2,031
Foreseeable not Available Capacity	100	100	100	100	100	100	100
Connected Peak Demand	500	600	900	1,037	1,080	1,300	1,500
Reserve Capacity	100	100	100	100	100	100	100
Country Balance	514	409	99	469	428	491	331
Net Transfer Capacity	0	0	0	0	0	0	0

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	2,049	2,074	2,127	2,456	2,530	3,030	3,375
Foreseeable not Available Capacity	750	750	752	780	850	950	1,050
Connected Peak Demand	1,700	1,900	1,200	1,340	1,320	1,650	1,970
Reserve Capacity	120	120	120	200	200	450	450
Country Balance	-521	-696	55	136	180	-20	-95
Net Transfer Capacity	600	700	630	1,500	1,500	2,000	2,200

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	0	0	0	0			
Foreseeable not Available Capacity	0	0	0	0			
Connected Peak Demand	0	0	0	0			
Reserve Capacity	0	0	0	0			
Country Balance	0	0	0	0			
Net Transfer Capacity	0	0	0	0			

TABLE 4.2.1 CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	14,868	16,049	19,569	25,314	26,636	40,430	40,500
Foreseeable not Available Capacity	1,100	1,100	1,100	1,452	1,332	2,022	2,025
Connected Peak Demand	11,000	13,000	15,180	17,685	18,151	20,410	23,690
Reserve Capacity	3,300	3,700	3,000	3,495	3,267	3,674	4,264
Country Balance	-532	-1,751	289	2,682	3,886	14,324	10,523
Net Transfer Capacity	3,200	3,200	3,600	4,550	4,550	7,750	7,750

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	22,910	28,394	30,604	33,552	32,832	52,481	51,273
Foreseeable not Available Capacity	0	0	11	549	846	5,042	5,972
Connected Peak Demand	19,133	21,476	20,471	22,552	23,543	28,764	37,554
Reserve Capacity	3,827	5,047	4,913	4,510	4,709	5,753	7,511
Country Balance	3,225	5,979	5,209	5,901	3,735	12,922	238
Net Transfer Capacity				820	820	1,320	1,320

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	3,974	6,660	9,662	15,620	17,475	23,198	24,423
Foreseeable not Available Capacity	247	506	254	3,504	4,426	6,916	8,360
Connected Peak Demand	3,000	4,861	6,909	9,217	9,403	8,800	10,315
Reserve Capacity	774	1,013	2,112	3,244	3,274	4,303	4,724
Country Balance	-47	281	387	-345	372	3,178	1,024
Net Transfer Capacity	550	550	850	1,500	1,600	3,200	3,200

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	13,700	18,400	13,865		16,460	23,929	26,728
Foreseeable not Available Capacity	1,500	5,500	1,650		2,724	5,700	7,070
Connected Peak Demand	9,100	9,600	7,370		7,890	10,525	13,769
Reserve Capacity	3,630	3,850	2,950		3,553	4,637	5,049
Country Balance	-530	-550	1,895		2,294	3,067	841
Net Transfer Capacity	1,800	2,600	950		1,400	1,950	2,200

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	27,074	33,672	30,894	35,713	35,701	39,850	40,950
Foreseeable not Available Capacity	2,600	2,603	2,781	3,770	4,220	6,875	9,725
Connected Peak Demand	17,700	23,300	26,000	24,800	26,300	24,400	24,200
Reserve Capacity	1,200	1,200	1,200	1,200	1,200	1,200	1,200
Country Balance	5,574	6,569	913	5,943	3,981	7,374	5,825
Net Transfer Capacity	2,905	4,975	8,455	8,570	8,570	11,220	13,020

TABLE 4.2.1 Capacity Balances only for Interconnected Part (MW)

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	1,678	2,502	2,879		3,073	2,973	
Foreseeable not Available Capacity	150	200	250		250	250	
Connected Peak Demand	1,400	1,700	1,700		2,241	2,476	
Reserve Capacity	294	320	670		335	335	
Country Balance	-510	242	121		247	-88	
Net Transfer Capacity	700	800	800		800	800	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	4,105	5,960	7,741		7,845	8,310	
Foreseeable not Available Capacity	800	1,400	1,900		1,900	1,950	
Connected Peak Demand	3,300	4,100	4,050		4,800	5,600	6,200
Reserve Capacity	600	900	1,100		1,250	1,350	
Country Balance	-595	-440	691		-105	-590	
Net Transfer Capacity	1,400	1,800	3,000		3,000	3,600	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	14,107	15,441	17,333	17,700	17,900		
Foreseeable not Available Capacity	3,800	4,100	4,400	4,750	4,900		
Connected Peak Demand	6,700	8,500	9,000	10,249	10,749		
Reserve Capacity	1,000	1,000	1,000	1,000	1,000		
Country Balance	2,607	1,841	2,933	1,701	1,251		
Net Transfer Capacity			6,000	6,000	6,000		

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	19,836	26,637	27,577	30,966	31,290	35,400	38,700
Foreseeable not Available Capacity	2,817	3,784	3,930	4,700	5,013	5,500	6,500
Connected Peak Demand	14,098	17,047	20,216	21,984	23,994	24,500	25,500
Reserve Capacity	800	1,000	1,200	1,200	1,200	1,200	1,200
Country Balance	2,121	4,806	2,231	3,082	1,083	4,200	5,500
Net Transfer Capacity			3,650		5,400		

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity			26,173	42,879	47,610		
Foreseeable not Available Capacity			3,809	8,851	11,610		
Connected Peak Demand	3,947	9,180	19,524	29,870	33,392		
Reserve Capacity			1,657	1,930	1,576		
Country Balance			1,183	2,228	1,032		
Net Transfer Capacity			638				

TABLE 4.2.1 Capacity Balances only for Interconnected Part (MW)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	2,579	3,995	3,754	3,834			
Foreseeable not Available Capacity	300	300	300	200			
Connected Peak Demand	1	2	2	2		3	
Reserve Capacity	440	440	440	700			
Country Balance	609	1,294	1,374	901			
Net Transfer Capacity							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Total Internal Net Generating Capacity	4,737	8,091	7,177	7,185	7,185	8,920	9,366
Foreseeable not Available Capacity						355	1,018
Connected Peak Demand	3,806	5,053	6,593	6,383	6,579	7,030	7,750
Reserve Capacity				600	600	700	700
Country Balance	931	3,038	584	202	6	835	-102
Net Transfer Capacity				2,500	2,500		

4.3 Electricity Balances

TABLE 4.3.1

Electricity Balances (TWh)

The tables below give the electricity balances for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries between 1980 and 2010. Forecasts for 2020 and 2030 are also presented.

In particular, the tables display the electricity used for pumping purposes in pumped hydro-schemes. They also give the trade balance, i.e. the difference between imports and exports in a certain system. The tables thus present the electricity demand in a given system (including network losses) calculated as electricity production minus electricity used for pumping purposes and minus the trade balance.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	40.7	48.8	60.2	67.2	67.3	78.5	90.3
Pumping	-0.5	-1.4	-2.0	-3.9	-4.5	-9.2	-11.8
Imports	3.2	6.8	13.8	19.5	19.9	24.8	29.8
Exports	7.1	7.3	15.1	18.8	17.6	21.3	29.8
Trade Balance	-3.9	-0.5	-1.3	0.7	2.3	3.5	0.0
Demand (Including losses)	36.3	46.9	56.9	64.0	65.0	72.8	78.5

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	51.0	70.9	83.8	90.7	94.5	98.7	101.3
Pumping		8.0	16.0	18.0	17.0	17.0	17.0
Imports		47.0	116.0	94.0	123.0	136.0	156.0
Exports		85.0	73.0	113.0	118.0	2.0	2.0
Trade Balance		-38.0	43.0	-19.0	5.0	116.0	136.0
Demand (Including losses)	47.7	62.6	82.8	83.8	90.4	94.3	101.9

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	31.2	37.5	36.8	37.9	46.7	66.5	88.7
Pumping	-0.1	-0.1	-0.5	0.9	0.9	-0.8	-0.8
Imports	4.7	5.4	1.0	2.6	1.2	0.0	0.0
Exports	0.9	1.6	5.6	7.7	9.6	13.0	20.5
Trade Balance	3.8	3.8	-4.6		8.4	-13.0	-20.5
Demand (Including losses)	34.9	41.2	31.7	30.4	32.5	52.7	67.4

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	1.0	2.0	3.4	5.1	5.2	8.6	11.5
Pumping	0.0	0.0	0.0		0.0	0.0	0.0
Imports	0.0	0.0	0.0		0.0	0.0	0.0
Exports	0.0	0.0	0.0		0.0	0.0	0.0
Trade Balance	0.0	0.0	0.0		0.0	0.0	0.0
Demand (Including losses)	0.8	1.9	3.2	4.7	4.8	6.4	11.5

TABLE 4.3.1 Electricity Balances (TWh)

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	48.7	58.1	67.7	82.3	85.9	89.9	93.0
Pumping	-0.5	-0.4	-0.7	-0.7	-0.8	-0.5	-0.5
Imports	0.0	0.0	2.4	8.6	6.6	10.5	12.0
Exports	1.5	0.7	12.4	22.2	21.6	12.5	16.0
Trade Balance	-1.5	-0.7	-10.0	-13.6	-15.0	-2.0	-4.0
Demand (Including losses)	46.7	57.0	57.0	61.6	63.7	77.5	83.0

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	347.0	418.0	538.5	556.8	591.4	533.1	426.7
Pumping	-2.0	-2.0	-6.0	-7.6	-8.6	-125.0	-14.5
Imports	16.2	25.1	45.1	40.6	42.2		
Exports	10.2	26.0	42.1	54.9	59.9		
Trade Balance	6.0	-0.9	3.0	-14.3	-17.7	-13.6	61.8
Demand (Including losses)	351.0	415.2	535.5	534.8	565.0	507.0	474.0

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	23.9	30.8	35.2	34.8	37.2	38.2	43.8
Pumping	0.0	0.0	0.0		0.0	0.0	0.0
Imports	2.0	12.0	8.3	11.2	10.6	0.0	0.0
Exports	1.6	4.9	7.7	10.9	11.7	0.0	0.0
Trade Balance	0.4	7.1	0.6		0.0	0.0	0.0
Demand (Including losses)	23.9	30.8	34.7	35.1	36.0	38.2	43.8

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	17.2	15.4	8.6	8.6	13.0	14.2	
Pumping			0.0	0.0			
Imports	0.4	1.5	0.4	3.0			
Exports	11.1	8.5	1.3	2.9			
Trade Balance	-10.7	-7.0	-0.9	0.1			
Demand (Including losses)	6.5	8.4	6.7	8.7	8.3	10.1	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	108.0	147.0	215.0	287.0	290.7	355.0	355.0
Pumping	-2.0	-1.0	-5.0	-4.0	-4.4	-7.0	-8.0
Imports	2.0	3.0	12.0	7.0	5.2	14.0	23.0
Exports	4.0	4.0	8.0	15.0	13.5	18.0	15.0
Trade Balance	-1.0	0.0	4.0	-8.0	-4.7	-3.0	8.0
Demand (Including losses)	102.0	146.0	215.0	274.0	278.0	340.0	411.0

TABLE 4.3.1 Electricity Balances (TWh)

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	38.7	51.6	67.3	69.2	77.2	92.1	114.5
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	2.4	11.1	12.2	15.5	15.7		
Exports	1.2	0.4	0.3	3.4	5.2		
Trade Balance	1.2	10.7	11.9	12.1	10.5	6.9	-5.5
Demand (Including losses)	39.9	62.3	79.2	81.3	87.7	99.0	109.0

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	246.6	400.2	516.7	519.1	550.2	595.2	627.4
Pumping	-1.0	-4.9	-6.6	-6.7	-6.5	-7.3	-7.3
Imports	15.6	6.7	3.7	19.4	20.3		
Exports	12.5	52.4	73.2	45.1	50.8		
Trade Balance	3.1	-45.8	-69.5	-25.7	30.5	-64.7	-65.9
Demand (Including losses)	248.7	349.6	440.6	486.7	513.2	523.1	554.3

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	266.3	300.1	360.8	359.0	366.2	329.0	374.7
Pumping	-1.5	-2.6	-3.5	2.7	2.7	2.7	2.7
Imports	0.0	11.9	14.3	6.6	7.1	13.2	13.5
Exports	0.0	0.0	0.1	3.7	4.5	10.5	31.5
Trade Balance	0.0	11.9	14.2	2.9	2.7	2.7	-18.0
Demand (Including losses)	264.8	309.4	371.5	369.1	366.4	345.7	377.2

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	21.3	32.1	49.9	55.1	53.5	61.8	
Pumping	0.0	-0.3	-0.6	-0.4	0.0	-1.2	
Imports	0.7	1.3	1.7	6.8	8.5	6.1	
Exports	0.1	0.6	1.7	2.6	2.8	2.8	
Trade Balance	0.6	0.7	0.0	4.2	5.7	3.3	
Demand (Including losses)	21.9	32.5	49.9	58.9	59.2	63.9	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	23.9	28.5	35.2	33.4	34.6	43.8	52.6
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.9
Imports	10.2	13.3	6.2	11.0	9.9	11.2	10.5
Exports	2.8	2.2	2.8	5.5	4.7	8.0	8.0
Trade Balance	7.4	11.1	3.4	5.5	5.2	3.2	2.5
Demand (Including losses)	31.3	39.6	38.6	38.9	39.8	47.0	54.2

TABLE 4.3.1 ELECTRICITY BALANCES (TWH)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	-0.5	-0.5	-0.4	-0.2	-0.1	-0.1	-0.1
Pumping		0.0	0.2			1.5	6.5
Imports		0.0	0.1			1.0	1.8
Exports		0.0	0.1			0.6	4.8
Trade Balance	9.5	13.0	22.3	26.8	27.0	30.1	32.5
Demand (Including losses)	10.0	13.5	22.7	25.1	25.4	31.4	35.3

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	177.4	205.3	263.3	281.1	290.7		
Pumping	-3.2	-4.8	-9.1	-5.8	-4.5		
Imports	8.1	35.6	44.8	47.1	46.0		
Exports	2.0	0.9	0.5	2.1	1.8		
Trade Balance	6.1	34.7	44.3	45.0	44.2		
Demand (Including losses)	180.3	235.1	298.5	320.3	330.5		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	11.0	26.3	10.0	14.1	5.3	23.1	26.3
Pumping	0.0	0.0	-0.4	-1.0	-1.0	-1.1	-1.1
Imports	0.0	0.0	0.2	0.7	7.1	0.4	0.4
Exports	0.1	12.0	1.5	3.6	1.1	9.1	6.8
Trade Balance	-0.1	-12.0	-1.3	-2.9	6.0	-8.7	-6.4
Demand (Including losses)	10.9	14.3	8.3	10.2	10.3	13.3	18.9

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	1.0	1.3	1.3	3.8	4.1	4.2	4.4
Pumping	-0.2	-1.0	-1.2	-1.0	-1.1	-1.2	-1.2
Imports	3.0	4.7	6.4	6.0	6.8	7.6	7.7
Exports	0.2	0.8	0.7	2.6	3.0	3.4	3.4
Trade Balance	2.8	3.9	5.7	3.4	3.8	4.2	4.3
Demand (Including losses)	3.6	4.2	5.8	6.2	6.7	7.2	7.5

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	4.6	6.4	4.0	5.4	6.4	6.8	7.8
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	5.4	6.5	4.7	4.3	4.0	4.5	5.0
Exports	2.0	3.0	3.0	2.6	3.1	2.5	2.0
Trade Balance	3.4	3.5	1.7	1.7	0.9	2.0	3.0
Demand (Including losses)	8.0	9.9	5.7	7.0	7.3	8.9	10.8

TABLE 4.3.1 Electricity Balances (TWh)

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production		1.2	1.9	2.2	2.1		
Pumping		0.0	0.0	0.0	0.0		
Imports		0.0	0.0	0.0	0.0		
Exports		0.0	0.0	0.0	0.0		
Trade Balance		0.0	0.0	0.0	0.0		
Demand (Including losses)	0.5	1.1	1.8	2.0	2.0		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	59.7	68.8	85.8	109.2	114.4	129.7	151.9
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	0.0	9.9	22.9	15.5	15.6	17.0	17.0
Exports	0.0	0.4	4.0	10.6	12.8	15.0	16.0
Trade Balance	0.0	9.5	18.9	4.9	2.8	2.0	1.0
Demand (Including losses)	59.7	75.5	104.7	114.1	117.1	131.7	152.9

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	113.3	123.1	133.2	139.0	143.8	161.7	223.2
Pumping	-1.2	-2.6	-2.8	-0.9	-0.8	-1.1	-1.1
Imports	4.2	10.4	3.3	7.4	6.3	0.0	0.0
Exports	4.4	11.5	9.7	9.6	7.7	0.0	0.0
Trade Balance	-0.2	-1.1	-6.4	-2.2	-1.4	0.0	0.0
Demand (Including losses)	111.9	119.4	124.0	135.9	141.6	171.8	222.1

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	14.8	27.3	42.2	48.7	52.9	55.3	61.8
Pumping	-0.1	-0.2	-0.6	-0.9	-0.5	-0.4	-0.5
Imports		0.2	4.7	7.6	5.8	0.0	0.0
Exports		0.1	3.8	2.8	3.2	0.0	0.0
Trade Balance	1.8	0.0	0.9	4.8	2.6	-2.9	-0.4
Demand (Including losses)	16.5	27.1	42.5	52.6	55.0	52.0	61.0

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	61.5	56.7	47.1	57.5	52.8	68.4	85.5
Pumping	0.0	0.0	0.0		-0.1	-0.2	-0.5
Imports	0.5	9.5	0.8		1.0	1.5	1.5
Exports	0.1	0.0	1.5		3.0	5.5	5.5
Trade Balance	0.4	9.5	-0.7		-2.0	-4.0	-4.0
Demand (Including losses)	62.0	66.1	46.4	55.2	50.6	64.2	81.0

TABLE 4.3.1 Electricity Balances (TWh)

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	93.4	141.7	141.7	133.2	144.9	176.5	163.8
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	3.4	12.9	18.3	13.8	14.9		
Exports	2.8	14.7	13.6	9.1	12.9		
Trade Balance	0.5	-1.8	4.7	4.7	2.1	-30.1	-16.3
Demand (Including losses)	94.0	139.9	146.6	137.9	147.0	146.4	147.5

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	7.0	11.2	12.6	16.5	15.2	19.0	21.7
Pumping	0.0	0.0	0.0		0.0	0.0	
Imports	0.9	0.6	0.5		0.7	0.9	
Exports	0.3	1.2	2.4		0.6	0.4	
Trade Balance	0.6	-0.6	-1.9		0.1	0.5	
Demand (Including losses)	5.6	9.2	11.5	12.3	16.1	14.9	

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	18.6	22.5	28.7	24.4	26.1	35.6	
Pumping	-0.2	-0.8	-0.3	-0.3	-0.5	-0.4	
Imports		6.0	6.3	8.9	7.3	0.0	
Exports		0.8	9.0	7.7	6.3	0.0	
Trade Balance	3.4	5.2	-2.7	1.3	0.0	0.0	
Demand (Including losses)	22.2	26.9	25.7	25.4	26.6	35.2	39.5

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	48.2	54.1	65.3	66.5	66.3	68.2	73.2
Pumping	-1.5	-1.7	-2.0	-2.5	-2.5	-7.2	-7.5
Imports	9.9	22.8	39.9	30.6	66.8		
Exports	18.1	24.9	47.0	31.8	66.3		
Trade Balance	-8.2	-2.1	-7.1	-1.2	0.5	10.0	15.5
Demand (Including losses)	38.5	50.3	56.3	61.8	64.3	69.4	72.1

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	83.2	120.8	141.8	131.8	124.4	143.0	145.0
Pumping	-0.5	-0.3	-0.9	-0.6	0.5	0.0	0.0
Imports	1.8	0.3	1.5	6.2	14.7	5.0	5.0
Exports	2.3	16.2	20.5	14.6	7.1	12.0	10.0
Trade Balance	-0.5	-15.9	-19.1	-8.4	7.6	-7.0	-5.0
Demand (Including losses)	82.2	104.5	121.9	122.8	132.0	136.0	140.0

TABLE 4.3.1 Electricity Balances (TWh)

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	23.3	57.5	124.9	194.8	211.2		
Pumping	0.0	0.0	0.0	0.0	0.0		
Imports	1.3	0.2	3.8	0.8	1.1		
Exports	0.0	0.9	0.4	1.5	1.9		
Trade Balance	1.3	-0.7	3.4	-0.7	-0.8		
Demand (Including losses)	23.2	53.5	122.1	185.9	202.3		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	9.7	13.1	10.4	14.6	16.1		
Pumping							
Imports				0.9	1.1		
Exports	2.4	1.6	1.0	3.9	4.9		
Trade Balance	7.4	11.5	9.4	11.6			
Demand (Including losses)	7.4	11.5	9.4	11.6	12.3	17.9	

CROATIA (HR)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	8.8	8.1	11.1	12.3	13.2	19.6	
Pumping	0.0	0.1	0.1	0.1	0.2		
Imports	3.3	7.5	3.5	7.6	6.8	2.8	
Exports	0.4	0.5	0.5	1.0	1.9	0.5	
Trade Balance							
Demand (Including losses)	11.7	15.0	14.0	17.7	18.0	24.0	32.0

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production	25.4	36.5	29.7	36.2	35.9	43.7	47.7
Pumping	0.1	1.2	0.7	0.9	1.0	1.1	1.1
Imports	0.2	0.4	2.7	5.2	5.6		
Exports	1.3	2.4	1.3	6.6	5.9		
Trade Balance	-1.1	-2.0	1.4	-1.4	-0.3		
Demand (Including losses)	19.4	27.7	29.6	33.3	34.1	39.4	43.1

UKRAINE (UA)

	1980	1990	2000	2009	2010	2020	2030
Electricity Production				173.1	188.1	253.5	346.9
Pumping							
Imports							
Exports							
Trade Balance							
Demand (Including losses)			166.9	168.5	183.4	237.0	309.4

5. Environment

5.1 Fuel Consumption for Electricity Generation

TABLE 5.1.1

Fuel Consumption for Electricity Generation (PJ)

The tables below present information on fuel consumption (expressed in petajoule or PJ) for electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries, between 1980 and 2010. Forecasts for 2020 and 2030 are also displayed below. The total inputs as well as the breakdown by fossil fuel are shown.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.3	27.0	32.4		44.0	22.3	19.8
Brown Coal	13.4	13.0	11.3		0.0	0.0	0.0
Oil	20.7	1.1	7.0		11.5	0.7	0.0
Natural Gas	20.2	37.7	37.4		101.3	92.2	90.3
Derived Gas	0.0	0.0	8.3		12.8	7.8	7.4
Biomass							
Other Fuels	0.0	0.0	0.0				
Thermal Total	54.7	78.9	96.4		169.5	123.1	117.5

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0	1,622	1,097	505	399		
Brown Coal	0						
Oil	0	132	61	25	37		
Natural Gas	0	613	1,457	2,316	2,462		
Derived Gas	0	289	286	139	200		
Biomass	0	104	133	252	260		
Other Fuels	0	53	67	364	420		
Thermal Total	0	2,813	3,101	3,600	3,778		

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	77.5	65.4	19.1		51.1	43.3	18.2
Brown Coal	106.7	128.5	140.0		213.1	165.2	156.7
Oil	259.1	17.2	10.0		5.5	5.2	4.2
Natural Gas	16.3	13.2	10.7		14.7	30.2	40.1
Derived Gas	0.0	0.0	0.0		0.0	0.0	0.0
Biomass							
Other Fuels	0.0	0.0	0.0		0.0	0.0	0.0
Thermal Total	459.7	224.3	179.8		284.4	243.9	219.2

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	0.0	0.0		0.0	0.0	0.0
Brown Coal	0.0	0.0	0.0		0.0	0.0	0.0
Oil	12.9	22.5	38.3		42.0	4.6	3.3
Natural Gas	0.0	0.0	0.0		0.0	58.0	77.8
Derived Gas	0.0	0.0	0.0		0.0	0.0	0.0
Biomass							
Other Fuels	0.0	0.0	0.0		0.0	0.0	0.0
Thermal Total	12.9	22.5	38.3		42.0	62.7	81.0

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	82.0	63.0	76.1	63.0	64.0	76.4	76.4
Brown Coal	448.0	426.0	445.0	513.8	510.0	359.1	350.0
Oil	11.0	5.0	5.6	3.1	3.0	2.4	2.4
Natural Gas	2.0	2.0	9.4	7.7	9.0	7.8	10.0
Derived Gas	9.0	7.0	20.1	21.5	21.5	21.4	15.4
Biomass							
Other Fuels	2.0	2.0	4.3	0.9	0.5	1.0	1.0
Thermal Total	554.0	505.0	560.5	610.0	608.0	468.1	455.2

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	1,046.0	1,270.0	1,268.0	923.0	982.0	701.0	504.0
Brown Coal	962.0	1,731.0	1,420.0	1,369.0	1,367.0	1,208.0	573.0
Oil	209.0	108.0	71.0	77.0	66.0	5.0	4.0
Natural Gas	551.0	336.0	396.0	548.0	580.0	561.0	532.0
Derived Gas	0.0	98.0	85.0	65.0	87.0	34.0	34.0
Biomass	0.0	64.0	96.0	201.0	214.0	261.0	305.0
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	2,768.0	3,607.0	3,336.0	3,184.0	3,306.0	2,509.0	1,648.0

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	214.0	207.0	134.0	146.0	139.0	100.0	70.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	48.0	9.0	40.0	11.0	8.0	20.0	20.0
Natural Gas	0.0	6.0	69.0	49.0	57.0	160.0	170.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass	0.0	1.0	11.0	30.0	41.0		
Other Fuels	0.0	1.0	29.0	0.0	0.0	0.0	0.0
Thermal Total	262.0	224.0	283.0	236.0	245.0	280.0	260.0

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal			0.0	0.0		0.0	
Brown Coal			0.0	0.0		0.0	
Oil			0.4	0.0		0.0	
Natural Gas			3.0	0.4		0.4	
Derived Gas			0.0				
Biomass				1.2		4.7	
Other Fuels			85.5	78.6		92.7	
Thermal Total			88.9				

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	233.0	467.0	601.0	345.0	237.0	248.0	118.0
Brown Coal	93.0	130.0	137.0	0.0	46.0	0.0	0.0
Oil	362.0	55.0	177.0	151.0	147.0	175.0	211.0
Natural Gas	46.0	52.0	129.0	665.0	542.0	666.0	679.0
Derived Gas							
Biomass							
Other Fuels							
Thermal Total	734.0	704.0	1,044.0	1,161.0	972.0	1,089.0	1,008.0

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	102.7	61.3	55.4	74.3	103.2	32.0	24.0
Brown Coal	4.0	17.2	21.5	24.5	38.5	32.0	14.0
Oil	26.8	9.7	3.3	3.3	2.8	4.0	3.0
Natural Gas	12.6	24.8	43.2	40.9	46.9	47.0	43.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass	25.2	29.1	41.6	41.9	55.8	80.0	76.0
Other Fuels			8.7	9.0	10.3		
Thermal Total	171.3	142.1	173.7	193.9	257.5	195.0	160.0

Note: Biomass data for 1980 and 1990 include other fossil fuels. The total sum for data between 2000 and 2010 include hydrogen, electricity used in electric boilers and heat pumps or industrial reaction and secondary heat.

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	605.0	303.5	328.9				
Brown Coal	8.0	4.9	5.3				
Oil	473.0	70.4	76.3				
Natural Gas	62.0	18.3	19.8				
Derived Gas	80.0	48.2	52.2				
Biomass							
Other Fuels	0.0	9.7	10.5				
Thermal Total	1,228.0	455.0	493.0				

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	2,176	2,077	1,200	1,033	1,070	436	364
Brown Coal	0	0	0	0	0	0	0
Oil	392	350	65	63	49	1	0
Natural Gas	48	23	1,169	1,294	1,345	894	416
Derived Gas	20	20	0	0	0	0	0
Biomass			8	25	27	97	190
Other Fuels	5	15	57	42	34	54	48
Thermal Total	2,641	2,485	2,490	2,456	2,525	1,481	1,018

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	0.0	0.0	2.0	4.4	0.0	
Brown Coal	105.7	258.8	340.1	343.7	312.4	181.8	
Oil	93.8	78.3	90.1	68.7	52.5	12.7	
Natural Gas	0.0	0.0	58.5	76.1	86.3	119.0	
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	
Biomass							
Other Fuels							
Thermal Total	199.5	337.1	488.6	490.5	455.6	313.5	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	16.0	11.0	5.0	6.8	0.0	0.0
Brown Coal	160.0	108.0	104.0	66.1	63.7	40.0	24.0
Oil	44.0	19.0	43.0	7.4	4.6	6.0	9.0
Natural Gas	109.0	74.0	77.0	105.7	115.6	205.0	175.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass					26.9	17.0	12.0
Other Fuels	0.0	0.0	1.0	36.4	3.1	3.0	3.0
Thermal Total	313.0	217.0	236.0	220.6	220.7	271.0	223.0

TABLE 5.1.1 FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	51.0	61.0		64.0	55.8	41.4
Brown Coal	19.0	24.0	21.0		25.0	11.6	0.0
Oil	51.0	14.0	44.0		10.0	0.0	0.2
Natural Gas	18.0	34.0	76.0		124.0	107.0	113.3
Derived Gas	0.0	0.0	0.0		0.0	0.0	0.0
Biomass						0.0	0.0
Other Fuels	0.0	0.0	0.0		0.0	0.0	0.0
Thermal Total	88.0	123.0	202.0		223.0	174.5	154.9

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	124.2	285.1	253.3	385.1	376.9		
Brown Coal	13.0	11.0	0.0	0.0	0.0		
Oil	959.5	916.7	818.8	264.4	227.9		
Natural Gas	81.9	338.4	787.9	994.7	1,030.3		
Derived Gas	32.3	38.8	40.5	32.7	42.8		
Biomass		1.3	12.2	71.8	93.6		
Other Fuels		7.0	1.7	1.5	0.7		
Thermal Total	1,210.8	1,597.2	1,914.4	1,750.3	1,772.1		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	98.3	41.7	5.0	2.6	3.3	3.2	3.2
Natural Gas	3.1	48.8	11.6	25.2	33.7	70.7	70.7
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Other Fuels	0.0	0.0	0.0	1.1	1.8	14.0	14.4
Thermal Total	101.4	90.5	16.6	29.0	38.8	87.9	88.3

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal			0.0	0.0			
Brown Coal			0.0	0.0			
Oil			0.0	0.0			
Natural Gas			0.1	0.5			
Derived Gas			0.0	0.0			
Biomass							
Other Fuels			0.0	0.0			
Thermal Total			0.1	0.5			

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	0.0	0.0	0.0	0.0	7.2	8.8
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	
Oil	4.6	1.5	1.0	0.0	0.0		
Natural Gas	3.6	8.2	5.1	7.3	10.9	10.9	11.9
Derived Gas	0.0	0.0	0.0	0.0	0.0		
Biomass							
Other Fuels	0.0	0.0	0.0	0.0	0.0		
Thermal Total	8.2	9.7	6.1	9.3	10.9	18.1	20.7

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal			0.0	0.0	0.0		
Brown Coal			0.0	0.0	0.0		
Oil			22.2	24.7	24.4		
Natural Gas			0.0	0.0	0.0		
Derived Gas			0.0	0.0	0.0		
Biomass	0.0	0.0	0.0	0.0	0.0		
Other Fuels			0.0	0.0	0.0		
Thermal Total			22.2	24.7	24.4		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	61.0	234.0	219.0	208.0	195.0	380.0	357.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	214.0	2.0	1.0	1.0	1.0	0.0	0.0
Natural Gas	214.0	317.0	360.0	621.0	664.0	515.0	487.0
Derived Gas	16.0	18.0	24.0				
Biomass				73.0	82.0	108.0	136.0
Other Fuels	0.0	0.0	6.0	45.0	52.0	63.0	63.0
Thermal Total	505.0	571.0	610.0	991.0	1,038.0	1,101.0	1,162.0

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	955.0	754.0	773.3	739.3	783.3	546.6	568.6
Brown Coal	260.0	549.0	495.3	487.7	470.3	402.6	488.3
Oil	29.0	17.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	16.1	35.6	38.0	240.4	352.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass			0.2	50.8	62.8	112.1	98.0
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	1,244.0	1,320.0	1,284.7	1,313.4	1,354.3	1,301.7	1,506.9

TABLE 5.1.1 FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	3.6	84.5	133.6	118.1	66.6	42.2	0.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	61.5	84.6	65.1	23.9	21.1	6.2	4.0
Natural Gas	0.0	0.0	48.0	87.7	87.4	100.1	144.8
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Other Fuels	4.1	3.2	13.5	23.5	20.4	22.0	22.9
Thermal Total	69.3	172.2	260.2	253.2	195.5	170.5	171.7

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	72.0	45.0	45.0		19.3	20.9	47.5
Brown Coal	129.0	161.0	149.0		179.8	119.3	72.3
Oil	67.0	117.0	26.0		10.3	1.8	1.8
Natural Gas	255.0	249.0	81.0		40.0	67.3	96.0
Derived Gas	0.0	0.0	0.0		0.0	0.0	0.0
Biomass							
Other Fuels	0.0	0.0	0.0		0.0	0.0	0.0
Thermal Total	523.0	572.0	301.0		249.3	209.3	217.6

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	1.0	5.3	7.9	2.7	3.6	0.0	0.0
Brown Coal	0.0	0.3	0.3	2.4	3.0	0.0	0.0
Oil	54.6	6.0	7.7	5.5	8.9	3.1	3.1
Natural Gas	0.0	1.7	2.1	5.9	10.4	12.1	12.1
Derived Gas	0.2	3.9	5.5	3.1	6.4	6.5	6.5
Biomass	3.6	8.6	19.1	53.4	64.2	73.8	75.2
Other Fuels							
Thermal Total	59.3	25.7	42.5	73.1	96.5	95.5	96.9

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	44.0	46.0	47.0		50.0	49.0	
Brown Coal	0.0	0.0	0.0		0.0	0.0	
Oil	1.0	1.0	1.0		1.0	1.0	
Natural Gas	0.0	0.0	1.0		2.0	3.0	
Derived Gas	0.0	0.0	0.0		0.0	0.0	
Biomass							
Other Fuels	0.0	0.0	0.0		0.0	0.0	
Thermal Total	45.0	47.0	49.0		53.0	53.0	

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal							
Brown Coal							
Oil	23.2	10.3					
Natural Gas							
Derived Gas							
Biomass							
Other Fuels							
Thermal Total	139.0	97.0	122.0		143.0	157.0	

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal							
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas							
Derived Gas							
Biomass							
Other Fuels							
Thermal Total							

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural Gas	0.0	0.0	0.0	29.6	33.8	12.0	12.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Other Fuels	1.6	5.6	7.4	0.0	0.0	0.0	0.0
Thermal Total	1.6	5.6	7.4	29.6	33.8	12.0	12.0

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	20.0	9.0	33.0	147.0	165.6		
Brown Coal	50.0	208.0	385.0	408.8	404.2		
Oil	70.0	47.0	149.0	71.4	37.2		
Natural Gas		97.0	357.0	776.2	814.3		
Derived Gas							
Biomass							
Other Fuels				2.4	4.9		
Thermal Total	140.0	361.0	924.0	1,405.8	1,426.2		

TABLE 5.1.1 FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal		77.3	38.4	57.8			
Brown Coal		42.4	25.1	40.8			
Oil		1.0					
Natural Gas							
Derived Gas							
Biomass							
Other Fuels							
Thermal Total							

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Hard Coal	0.0	2.4	0.0	0.2	0.2	0.0	0.0
Brown Coal	171.6	297.7	209.1	288.7	269.0	375.3	375.3
Oil				0.7	0.7		
Natural Gas				4.9	7.0		
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	171.6	300.2	209.1	294.5	276.8	375.3	375.3

5.2 Emissions from Electricity Generation

TABLE 5.2.1

Emissions from Electricity Generation (kilotons)

The tables below show the evolution of carbon dioxide and air pollutant emissions related to electricity production in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries. Data are gathered on an historical basis (from 1980 to 2010) and as forecasts (2020 and 2030).

Burning of fossil fuels (and solid waste) in power-generating units releases carbon dioxide (CO_2) into the atmosphere. As one of the main anthropogenic greenhouse gases (GHG), CO_2 contributes to global warming and to climate change.

The main air pollutants released during power generation are sulphur dioxide (SO_2) and nitrogen oxides (NO_x): acidifying gases which cause acid rain and have harmful effects on ecosystems and human health.

AUSTRIA (AT)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	109.9	15.1	3.1	2.6			
Nitrogen Oxides NO_x	26.5	14.5	7.7	9.6			
Carbon Dioxide CO_2	11,550	12,400	9,700	9,326	10,552	7,720	7,296

BELGIUM (BE)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	352	95.2	35.1		8		
Nitrogen Oxides NO_x	87	60.6	42.5		16		
Carbon Dioxide CO_2	31,604	23,504	23,086		22,540	33,365	27,000

BULGARIA (BG)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	975	1068	881		516.6	443.1	391.8
Nitrogen Oxides NO_x	62.1	69.1	53.5		44.4	38.1	31.1
Carbon Dioxide CO_2	23,244	25,910	21,066		28,278	24,251	19,806

CYPRUS (CY)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	16	29	30.6	15.9	20.3	2	3
Nitrogen Oxides NO_x	2.6	4.1	4.6	7.3	6.3	2.3	2.8
Carbon Dioxide CO_2	964	1,667	2,836	3,992	3,867	2,821	3,381

CZECH REPUBLIC (CZ)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		400	62	56.1	54	53	43
Nitrogen Oxides NO_x		58	63	59	50	52.8	41.35
Carbon Dioxide CO_2		42,000	55,750	49,800	40,000	40,500	40,000

GERMANY (DE)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	3,660	2,040	163	121	120	90	
Nitrogen Oxides NO_x	990	385	182	180	187	156	
Carbon Dioxide CO_2	327,000	289,100	279,000	261,000	267,000	215,000	

Note: Data cover only the public supply sector.

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

DENMARK (DK)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	207	119	144	49	39	7.6	7
Nitrogen Oxides NO_x	121	90	467	214	211	16.1	16
Carbon Dioxide CO_2	22,868	27,337	21,099	18,537	16,715	18,000	18,000

ESTONIA (EE)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		175.9	74.4	49		2	
Nitrogen Oxides NO_x		16.3	10.3	13		9.6	
Carbon Dioxide CO_2		20,158	10,866	10,280		8,550	

SPAIN (ES)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	1,835	1,442	1,063	233	217	112	100
Nitrogen Oxides NO_x	225	210	281	154	132	51	36
Carbon Dioxide CO_2	59,187	64,957	88,886	78,236	65,599	70,929	61,527

FINLAND (FI)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	112	52	13.9	11.3	15.7		
Nitrogen Oxides NO_x	54	38	19.4	19.8	26.5		
Carbon Dioxide CO_2	13,000	10,000	11,700	13,100	17,800	12,100	8,600

FRANCE (FR)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	978	293.4	117.3				
Nitrogen Oxides NO_x	316	94.5	91.9				
Carbon Dioxide CO_2	82,000	37,700	31,300	33,085	34,206	22,800	15,700

UNITED KINGDOM (UK)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	3,013.5	2,731.8	826.1	161.4	136	67.9	
Nitrogen Oxides NO_x	861.6	777.7	349.2	266.5	260.8	146.3	
Carbon Dioxide CO_2	220,080	203,196	158,408	150,756.1	156,195.6	79,166	51,381

GREECE (GR)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		272	343	296	165	25	
Nitrogen Oxides NO_x		61	99	124	110	43	
Carbon Dioxide CO_2		40,580	51,450	50,250	46,483	31,278	

HUNGARY (HU)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	654	439	356	11	8.7	8	5
Nitrogen Oxides NO_x		30	30	13.2	12.9	13	15
Carbon Dioxide CO_2			20,595	14,847	13,040	12,455	12,000

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

IRELAND (IE)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	93	103	79		18	10	6
Nitrogen Oxides NO_x	21	46	40		20	11	10
Carbon Dioxide CO_2	7,800	11,000	15,100		16,250	10,083	8,818

ITALY (IT)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	1,510	855	438	62	42		
Nitrogen Oxides NO_x	405	490	255	79	65		
Carbon Dioxide CO_2	96,300	123,400	134,000	118,000	118,000		

LITHUANIA (LT)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	96.4	40.9	4.9	2.6	3.3	3.4	3.4
Nitrogen Oxides NO_x	15.3	13.6	2.5	4.8	6.4	13.6	13.7
Carbon Dioxide CO_2	7,880	6,054	1,053	1,764	2,374	5,790	5,840

LUXEMBOURG (LU)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		0.1	0.0	0.0	0.0	0.0	0.0
Nitrogen Oxides NO_x		0.3	0.4	0.7	0.6	0.7	0.7
Carbon Dioxide CO_2		840	1,040	1,019	1,056	1,019	1,019

LATVIA (LV)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	0.4	0.2	0.2	0.1	0.1	0.5	0.6
Nitrogen Oxides NO_x	1.9	2.3	1.4	2.2	2.5	3.6	4.1
Carbon Dioxide CO_2	840	900	570	810	750	1,300	1,500

MALTA (MT)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2			25.1	7.8	8.1		
Nitrogen Oxides NO_x			4.7	5.3	5.1		
Carbon Dioxide CO_2			1,682	1,897	1,878.3		

NETHERLANDS (NL)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	196	45	16	10	10	12	11
Nitrogen Oxides NO_x	84	73	43	32	32	32	31
Carbon Dioxide CO_2	35,400	38,600	42,509	54,600	59,500	85,000	90,000

POLAND (PL)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	1770	1450	739.4	299.7	336.5	202.9	193.3
Nitrogen Oxides NO_x		362	221	206.3	212.4	140.7	141.3
Carbon Dioxide CO_2		138,300	127,271.9	128,149.7	132,153.9	109,404.5	110,371.7

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

PORTUGAL (PT)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	92	184	149.3	23.1	16.4	10.9	5.8
Nitrogen Oxides NO_x	20	63	72.7	49.2	39.4	24.7	19.5
Carbon Dioxide CO_2	5,080	15,000	20,097.4	19,005.3	14,248.3	13,068.8	12,093.6

ROMANIA (RO)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	530	607	486		198.9	34.1	27.5
Nitrogen Oxides NO_x	126	134	79		48.5	26.0	28.2
Carbon Dioxide CO_2	39,255	43,701	25,803		22,497	17,547	16,989

SWEDEN (SE)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	66.0	9.5	2.8	3.5	4.8	3.5	3.6
Nitrogen Oxides NO_x	9.8	3.5	3.0	5.0	6.4	6.3	6.4
Carbon Dioxide CO_2	4,270.7	1,458.1	2,006.2	1,837.3	2,886	1,860.3	1,860.3

SLOVENIA (SI)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		154	84.3		40	34	
Nitrogen Oxides NO_x		17.1	15.2		8	8	
Carbon Dioxide CO_2		5,989	5,565		4,320	5,365	3,994

SLOVAKIA (SK)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		459	46		40	12	13
Nitrogen Oxides NO_x	40.2	147	25		8	14	18
Carbon Dioxide CO_2	13,388	14,818	9,144		4,320	10,971	15,018

SWITZERLAND (CH)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2							
Nitrogen Oxides NO_x							
Carbon Dioxide CO_2				1,200	1,200		

NORWAY (NO)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	0.1	0.2	0.3	1.1	1.4	0.5	0.5
Nitrogen Oxides NO_x	0.3	0.4	0.6	1.7	3	1.2	1.2
Carbon Dioxide CO_2	264	340	546	1,812	2,345	900	900

TURKEY (TR)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2	239	790	1399	1399	413.8		
Nitrogen Oxides NO_x	35	89	209	209	316.1		
Carbon Dioxide CO_2	11,896	30,325	72,089	96,286.3	106,824		

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		375.9	82.3			57.0	
Nitrogen Oxides NO_x		48.1	18.2			5.7	
Carbon Dioxide CO_2		15,254.1	4,054				

SERBIA (RS)

	1980	1990	2000	2009	2010	2020	2030
Sulphur Dioxide SO_2		296.2		319	326		
Nitrogen Oxides NO_x		86.8		55.8	43		
Carbon Dioxide CO_2		36,202			27,190		

6. Early Power Statistics - 2011

6.1 Installed Capacity

TABLE 6.1.1

Total Installed Capacity

The tables below display the generating capacity by primary energy in the 27 EU Member States, plus installed capacity in Switzerland, Norway, Turkey and some Energy Community countries in 2009, 2010 and 2011. The capacity is expressed in MW.

AUSTRIA (AT)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	6,273	6,326	7,274
Hydro Power	MW	12,665	12,919	13,187
Total Other Renewables	MW	1,419	1,495	1,558
of which Wind	MW	972	1,013	1,032
Total Capacity	MW	21,085	21,400	22,019

BELGIUM (BE)

		2009	2010	2011
Nuclear	MW	5,902	5,927	5,926
Conventional Thermal	MW	7,812	7,816	8,502
Hydro Power	MW	1,417	1,425	1,419
Total Other Renewables	MW	1,676	2,793	2,437
of which Wind	MW	608	912	912
Total Capacity	MW	17,496	18,322	18,284

BULGARIA (BG)

		2009	2010	2011
Nuclear	MW	1,900	1,900	2,000
Conventional Thermal	MW	5,115	5,269	6,403
Hydro Power	MW	1,800	2,724	3,151
Total Other Renewables	MW	340	513	674
of which Wind	MW	340	488	516
Total Capacity	MW	9,155	10,406	12,228

TABLE 6.1.1 Total Installed Capacity

CYPRUS (CY)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	1,388	1,438	1,553
Hydro Power	MW	0	0	0
Total Other Renewables	MW	6	95	136
of which Wind	MW	0	82	116
Total Capacity	MW	1,394	1,533	1,689

CZECH REPUBLIC (CZ)

		2009	2010	2011
Nuclear	MW	3,830	3,900	3,970
Conventional Thermal	MW	11,632	11,770	11,889
Hydro Power	MW	2,183	2,203	2,201
Total Other Renewables	MW	681	2,200	2,190
of which Wind	MW	193	218	219
Total Capacity	MW	18,326	20,073	20,250

GERMANY (DE)

		2009	2010	2011
Nuclear	MW	20,480	20,477	12,068
Conventional Thermal	MW	83,200	83,726	85,077
Hydro Power	MW	11,027	11,137	11,255
Total Other Renewables	MW	41,200	51,059	59,420
of which Wind	MW	25,777	27,204	29,075
Total Capacity	MW	155,907	166,329	167,820

DENMARK (DK)

		2009	2010	2011
Nuclear	MW	0	0	
Conventional Thermal	MW	9,159	8,893	8,914
Hydro Power	MW	9	9	9
Total Other Renewables	MW	4,195	4,517	4,616
of which Wind	MW	3,482	3,802	3,949
Total Capacity	MW	13,363	13,420	13,540

ESTONIA (EE)

		2009	2010	2011
Nuclear	MW	0	0	
Conventional Thermal	MW	2,228	2,228	
Hydro Power	MW	4	4	
Total Other Renewables	MW	209	209	
of which Wind	MW	142	149	
Total Capacity	MW	2,441	2,441	

SPAIN (ES)

		2009	2010	2011
Nuclear	MW	7,419	7,483	7,535
Conventional Thermal	MW	46,583	47,748	48,432
Hydro Power	MW	18,798	18,816	18,817
Total Other Renewables	MW	23,090	24,790	26,829
of which Wind	MW	18,483	19,783	20,776
Total Capacity	MW	95,890	98,837	101,613

TABLE 6.1.1 Total Installed Capacity

FINLAND (FI)

		2009	2010	2011
Nuclear	MW	2,700	2,730	2,750
Conventional Thermal	MW	8,121	8,331	8,331
Hydro Power	MW	3,074	3,084	3,108
Total Other Renewables	MW	2,477	2,595	2,624
of which Wind	MW	147	197	226
Total Capacity	MW	16,372	16,740	16,813

FRANCE (FR)

		2009	2010	2011
Nuclear	MW	63,130	63,130	63,130
Conventional Thermal	MW	26,154	27,399	27,789
Hydro Power	MW	25,357	25,390	25,405
Total Other Renewables	MW	5,793	7,864	10,138
of which Wind	MW	4,573	5,764	6,639
Total Capacity	MW	120,434	123,783	126,462

UNITED KINGDOM (UK)

		2009	2010	2011
Nuclear	MW	10,881	10,846	10,561
Conventional Thermal	MW	66,421	68,860	70,328
Hydro Power	MW	4,357	4,355	4,369
Total Other Renewables	MW	6,316	7,067	6,226
of which Wind	MW	2,396	2,787	5,842
Total Capacity	MW	87,795	93,146	97,326

GREECE (GR)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	10,005	11,229	12,139
Hydro Power	MW	3,201	3,215	3,223
Total Other Renewables	MW	1,263	1,530	2,297
of which Wind	MW	1,172	1,298	1,640
Total Capacity	MW	14,469	15,974	17,659

HUNGARY (HU)

		2009	2010	2011
Nuclear	MW	1,822	1,892	1,892
Conventional Thermal	MW	6,154	6,181	6,860
Hydro Power	MW	50	50	50
Total Other Renewables	MW	549	630	695
of which Wind	MW	169	240	325
Total Capacity	MW	8,575	8,753	9,497

TABLE 6.1.1 Total Installed Capacity

IRELAND (IE)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	4,877	5,277	6,325
Hydro Power	MW	539	539	530
Total Other Renewables	MW	1,200	1,400	1,763
of which Wind	MW	1,200	1,400	1,557
Total Capacity	MW	6,953	7,553	8,618

ITALY (IT)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	71,108	72,397	72,813
Hydro Power	MW	21,371	21,521	21,593
Total Other Renewables	MW	8,650	12,254	23,084
of which Wind	MW	4,879	5,794	6,831
Total Capacity	MW	101,447	106,489	117,490

LITHUANIA (LT)

		2009	2010	2011
Nuclear	MW	1,183	0	0
Conventional Thermal	MW	2,539	2,525	2,574
Hydro Power	MW	876	875	876
Total Other Renewables	MW	126	205	231
of which Wind	MW	89	161	185
Total Capacity	MW	4,724	3,606	3,681

LUXEMBOURG (LU)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	498	505	505
Hydro Power	MW	1,128	1,128	1,128
Total Other Renewables	MW	80	95	95
of which Wind	MW	43	50	50
Total Capacity	MW	1,706	1,728	1,728

LATVIA (LV)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	870	930	930
Hydro Power	MW	1,536	1,550	1,575
Total Other Renewables	MW	50	54	71
of which Wind	MW	30	31	36
Total Capacity	MW	2,456	2,534	2,576

TABLE 6.1.1 Total Installed Capacity

MALTA (MT)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	571	571	571
Hydro Power	MW	0	0	0
Total Other Renewables	MW	2	2	2
of which Wind	MW	0	0	0
Total Capacity	MW			573

NETHERLANDS (NL)

		2009	2010	2011
Nuclear	MW	485	485	485
Conventional Thermal	MW	21,722	22,934	23,010
Hydro Power	MW	38	38	38
Total Other Renewables	MW	3,044	3,154	3,200
of which Wind	MW	2,216	2,241	2,230
Total Capacity	MW	25,314	26,636	26,733

POLAND (PL)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	30,293	29,282	30,117
Hydro Power	MW	2,315	2,325	2,341
Total Other Renewables	MW	804	1,225	2,210
of which Wind	MW	702	1,096	2,059
Total Capacity	MW	33,512	32,832	34,668

PORTUGAL (PT)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	8,226	9,092	9,216
Hydro Power	MW	5,037	5,051	5,453
Total Other Renewables	MW	4,192	4,610	5,052
of which Wind	MW	3,575	3,907	4,359
Total Capacity	MW	17,499	18,797	19,819

ROMANIA (RO)

		2009	2010	2011
Nuclear	MW	1,400	1,300	1,412
Conventional Thermal	MW	11,964	8,844	5,996
Hydro Power	MW	6,400	5,908	6,438
Total Other Renewables	MW	20	408	
of which Wind	MW	12	401	980
Total Capacity	MW	19,784	16,460	16,460

TABLE 6.1.1 Total Installed Capacity

SWEDEN (SE)

		2009	2010	2011
Nuclear	MW	9,342	9,150	9,363
Conventional Thermal	MW	5,502	5,035	2,660
Hydro Power	MW	16,203	16,200	16,197
Total Other Renewables	MW	4,666	5,316	5,310
of which Wind	MW	1,560	2,163	2,899
Total Capacity	MW	35,713	35,701	36,429

SLOVENIA (SI)

		2009	2010	2011
Nuclear	MW	666	656	
Conventional Thermal	MW	1,285	1,482	
Hydro Power	MW	1,071	984	
Total Other Renewables	MW	28	24	
of which Wind	MW		0	
Total Capacity	MW	3,050	3,146	

SLOVAKIA (SK)

		2009	2010	2011
Nuclear	MW	1,820	1,820	1,940
Conventional Thermal	MW	2,742	2,614	2,896
Hydro Power	MW	2,478	2,478	2,478
Total Other Renewables	MW	61	143	753
of which Wind	MW	5	3	3
Total Capacity	MW	7,101	7,780	8,152

SWITZERLAND (CH)

		2009	2010	2011
Nuclear	MW	3,240	3,250	
Conventional Thermal	MW	693	630	
Hydro Power	MW	13,480	13,520	
Total Other Renewables	MW	277	363	
of which Wind	MW	18	42	
Total Capacity	MW	17,672	17,730	

NORWAY (NO)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	900	915	915
Hydro Power	MW	29,636	29,945	30,380
Total Other Renewables	MW	430	430	515
of which Wind	MW	430	430	515
Total Capacity	MW	30,966	31,290	31,810

TABLE 6.1.1 Total Installed Capacity

TURKEY (TR)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	29,252	32,172	33,931
Hydro Power	MW	14,553	15,831	17,137
Total Other Renewables	MW	956	1,521	1,843
of which Wind	MW	792	1,320	1,729
Total Capacity	MW	44,761	49,524	52,911

BOSNIA HERZEGOVINA (BA)

		2009	2010	2011
Nuclear	MW	0	0	
Conventional Thermal	MW	1,778	1,778	
Hydro Power	MW	2,056	2,056	
Total Other Renewables	MW	0	0	
of which Wind	MW	0	0	
Total Capacity	MW	3,834	3,834	

CROATIA (HR)

		2009	2010	2011
Nuclear	MW	0	0	
Conventional Thermal	MW	1,683	1,683	
Hydro Power	MW	2,133	2,133	
Total Other Renewables	MW	6		
of which Wind	MW	70		
Total Capacity	MW			

SERBIA (RS)

		2009	2010	2011
Nuclear	MW	0	0	0
Conventional Thermal	MW	4,322	4,322	4,322
Hydro Power	MW	2,863	2,863	2,863
Total Other Renewables	MW	0	0	0
of which Wind	MW	0	0	0
Total Capacity	MW	7,185	7,185	7,185

UKRAINE (UA)

		2009	2010	2011
Nuclear	MW	13,835	13,835	
Conventional Thermal	MW	33,625	33,774	
Hydro Power	MW	5,414	5,458	
Total Other Renewables	MW			
of which Wind	MW	84	86	
Total Capacity	MW	52,958	53,162	

6.2 Electricity Generation

TABLE 6.2.1

Electricity Generation

The tables below present the annual electricity generation by primary energy in the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries in 2011. Electricity generation is expressed in TWh.

AUSTRIA (AT)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	20.0	21.0	21.1
Hydro Power	TWh	42.4	41.0	37.2
Total Other Renewables	TWh	4.4	4.8	5.4
of which Wind	TWh	2.0	2.2	1.9
Total Generation	TWh	67.2	67.3	63.6

BELGIUM (BE)

		2009	2010	2011
Nuclear	TWh	47.2	47.9	45.9
Conventional Thermal	TWh	35.7	37.7	34.0
Hydro Power	TWh	1.8	1.7	1.4
Total Other Renewables	TWh	6.1	7.2	3.8
of which Wind	TWh	1.0	1.3	2.3
Total Generation	TWh	90.7	94.5	87.4

BULGARIA (BG)

		2009	2010	2011
Nuclear	TWh	14.2	14.4	16.3
Conventional Thermal	TWh	20.4	21.8	29.8
Hydro Power	TWh	3.0	5.5	3.7
Total Other Renewables	TWh	0.3	0.5	1.0
of which Wind	TWh	0.3	0.3	0.8
Total Generation	TWh	37.9	46.7	50.7

CYPRUS (CY)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	5.1	5.1	4.7
Hydro Power	TWh	0	0	0
Total Other Renewables	TWh	0	0.1	0.3
of which Wind	TWh		0.1	0.2
Total Generation	TWh	5.1	5.2	5.0

CZECH REPUBLIC (CZ)

		2009	2010	2011
Nuclear	TWh	27.2	28.0	28.3
Conventional Thermal	TWh	50.3	51.9	53.9
Hydro Power	TWh	3.0	3.0	2.8
Total Other Renewables	TWh	1.8	2.6	2.5
of which Wind	TWh	0.3	0.3	0.4
Total Generation	TWh	82.3	85.9	87.6

TABLE 6.2.1 Electricity Generation

GERMANY (DE)

		2009	2010	2011
Nuclear	TWh	127.7	133.0	102.2
Conventional Thermal	TWh	328.1	347.5	347.7
Hydro Power	TWh	24.2	27.0	24.8
Total Other Renewables	TWh	76.8	83.9	104.6
of which Wind	TWh	38.6	37.8	46.5
Total Generation	TWh	556.8	591.4	579.3

DENMARK (DK)

		2009	2010	2011
Nuclear	TWh	0	0	
Conventional Thermal	TWh	24.2	24.3	19.5
Hydro Power	TWh	0	0	0
Total Other Renewables	TWh	10.6	12.8	13.8
of which Wind	TWh	6.7	7.8	9.8
Total Generation	TWh	34.8	37.2	33.4

ESTONIA (EE)

		2009	2010	2011
Nuclear	TWh	0	0	
Conventional Thermal	TWh	8.0	11.7	
Hydro Power	TWh	0.1	0.1	
Total Other Renewables	TWh	0.5	1.0	
of which Wind	TWh	0.2	0.3	
Total Generation	TWh	8.6	13.0	

SPAIN (ES)

		2009	2010	2011
Nuclear	TWh	51.0	58.9	54.8
Conventional Thermal	TWh	158.0	128.9	136.8
Hydro Power	TWh	29.0	44.9	32.6
Total Other Renewables	TWh	49.0	57.9	58.3
of which Wind	TWh	37.0	41.9	42.5
Total Generation	TWh	287.0	290.7	282.5

FINLAND (FI)

		2009	2010	2011
Nuclear	TWh	22.6	21.9	22.3
Conventional Thermal	TWh	24.5	30.9	24.5
Hydro Power	TWh	12.6	12.7	12.3
Total Other Renewables	TWh	8.6	10.7	10.5
of which Wind	TWh	0.3	0.3	0.5
Total Generation	TWh	69.2	77.2	70.6

TABLE 6.2.1 Electricity Generation

FRANCE (FR)

		2009	2010	2011
Nuclear	TWh	390.0	407.9	421.1
Conventional Thermal	TWh	54.9	59.5	51.2
Hydro Power	TWh	61.9	67.6	50.3
Total Other Renewables	TWh	12.3	15.3	19.3
of which Wind	TWh	7.9	9.7	11.9
Total Generation	TWh	519.1	550.2	541.9

UNITED KINGDOM (UK)

		2009	2010	2011
Nuclear	TWh	62.8	56.4	62.7
Conventional Thermal	TWh	266.6	279.0	252.9
Hydro Power	TWh	8.9	6.8	5.7
Total Other Renewables	TWh	20.0	22.2	30.2
of which Wind	TWh	9.3	10.2	15.8
Total Generation	TWh	358.3	364.4	367.1

GREECE (GR)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	46.6	42.9	47.2
Hydro Power	TWh	5.7	7.5	4.3
Total Other Renewables	TWh	2.8	3.1	4.2
of which Wind	TWh	2.5	2.7	3.3
Total Generation	TWh	55.1	53.5	55.7

HUNGARY (HU)

		2009	2010	2011
Nuclear	TWh	14.6	14.8	14.7
Conventional Thermal	TWh	16.6	17.3	16.8
Hydro Power	TWh	0.2	0.2	0.2
Total Other Renewables	TWh	2.0	2.3	1.8
of which Wind	TWh	0.3	0.5	0.6
Total Generation	TWh	33.4	34.6	33.5

IRELAND (IE)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	19.8	20.9	20.5
Hydro Power	TWh	1.2	0.7	0.7
Total Other Renewables	TWh	2.4	2.3	3.3
of which Wind	TWh	2.3	2.2	3.2
Total Generation	TWh	32.4	31.9	24.4

TABLE 6.2.1 Electricity Generation

ITALY (IT)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	208.3	211.2	206.5
Hydro Power	TWh	52.8	54.4	47.7
Total Other Renewables	TWh	19.4	25.0	35.0
of which Wind	TWh	6.5	9.0	9.6
Total Generation	TWh	281.1	290.7	289.2

LITHUANIA (LT)

		2009	2010	2011
Nuclear	TWh	10.0	0	0
Conventional Thermal	TWh	2.7	3.6	2.7
Hydro Power	TWh	1.1	1.3	1.1
Total Other Renewables	TWh	0.3	0.4	0.7
of which Wind	TWh	0.2	0.2	0.5
Total Generation	TWh	14.1	5.3	4.5

LUXEMBOURG (LU)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	2.8	2.9	2.3
Hydro Power	TWh	0.8	1.4	1.1
Total Other Renewables	TWh	0.2	0.2	0.2
of which Wind	TWh	0.1	0.1	0.1
Total Generation	TWh	3.8	4.1	3.7

LATVIA (LV)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	1.8	2.8	3.0
Hydro Power	TWh	3.4	3.4	2.8
Total Other Renewables	TWh	0.2	0.2	0.1
of which Wind	TWh	0.2	0.2	0.1
Total Generation	TWh	5.4	6.4	5.9

MALTA (MT)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	2.2	2.1	2.2
Hydro Power	TWh	0	0	0
Total Other Renewables	TWh	0	0	0.0
of which Wind	TWh	0	0	0
Total Generation	TWh	2.2	2.1	2.2

TABLE 6.2.1 Electricity Generation

NETHERLANDS (NL)

		2009	2010	2011
Nuclear	TWh	4.2	4.0	4.0
Conventional Thermal	TWh	94.8	100.0	92.8
Hydro Power	TWh	0.1	0.1	0.1
Total Other Renewables	TWh	10.0	10.3	12.1
of which Wind	TWh	4.6	4.0	5.1
Total Generation	TWh	109.2	114.4	109.0

POLAND (PL)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	130.5	133.7	140.9
Hydro Power	TWh	3.0	3.1	2.6
Total Other Renewables	TWh	5.5	7.0	8.1
of which Wind	TWh	1.1	1.6	2.7
Total Generation	TWh	139.0	143.8	151.6

PORTUGAL (PT)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	29.3	23.8	26.2
Hydro Power	TWh	8.9	16.4	12.0
Total Other Renewables	TWh	10.3	12.4	12.2
of which Wind	TWh	7.6	9.1	9.1
Total Generation	TWh	48.7	52.9	51.0

ROMANIA (RO)

		2009	2010	2011
Nuclear	TWh	11.8	10.1	11.7
Conventional Thermal	TWh	30.0	26.2	24.1
Hydro Power	TWh	15.7	16.0	15.6
Total Other Renewables	TWh	0	0.5	
of which Wind	TWh	0	0.5	1.1
Total Generation	TWh	57.5	52.8	

SWEDEN (SE)

		2009	2010	2011
Nuclear	TWh	50.0	55.6	58.0
Conventional Thermal	TWh	4.4	6.5	6.4
Hydro Power	TWh	64.9	66.7	65.8
Total Other Renewables	TWh	13.9	16.0	10.1
of which Wind	TWh	2.5	3.5	6.1
Total Generation	TWh	133.2	144.9	146.5

TABLE 6.2.1 Electricity Generation

SLOVENIA (SI)

		2009	2010	2011
Nuclear	TWh	5.7	5.9	
Conventional Thermal	TWh	5.9	5.8	
Hydro Power	TWh	4.7	3.4	
Total Other Renewables	TWh	0.2	0.2	
of which Wind	TWh		0.0	
Total Generation	TWh	16.5	15.2	

SLOVAKIA (SK)

		2009	2010	2011
Nuclear	TWh	13.1	13.6	14.4
Conventional Thermal	TWh	6.3	5.6	6.3
Hydro Power	TWh	4.7	5.5	4.0
Total Other Renewables	TWh	0.4	0.5	0.9
of which Wind	TWh	0	0	0
Total Generation	TWh	24.4	26.1	26.5

SWITZERLAND (CH)

		2009	2010	2011
Nuclear	TWh	26.1	25.2	23.1
Conventional Thermal	TWh	1.9	2.2	1.8
Hydro Power	TWh	37.1	37.5	31.3
Total Other Renewables	TWh	1.2	1.4	1.4
of which Wind	TWh	0	0	
Total Generation	TWh	66.5	66.3	57.6

NORWAY (NO)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	4.7	5.1	4.8
Hydro Power	TWh	126.1	118.4	122.1
Total Other Renewables	TWh	1.0	0.9	1.3
of which Wind	TWh	1.0	0.9	1.3
Total Generation	TWh	131.8	124.4	128.1

TURKEY (TR)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	156.6	155.4	171.6
Hydro Power	TWh	36.0	51.8	52.3
Total Other Renewables	TWh	2.2	4.0	5.4
of which Wind	TWh	1.5	2.9	4.7
Total Generation	TWh	194.8	211.2	229.4

TABLE 6.2.1 Electricity Generation

BOSNIA HERZEGOVINA (BA)

		2009	2010	2011
Nuclear	TWh	0	0	
Conventional Thermal	TWh	8.2	7.9	
Hydro Power	TWh	6.3	8.2	
Total Other Renewables	TWh	0	0	
of which Wind	TWh	0	0	
Total Generation	TWh	14.6	16.1	

CROATIA (HR)

		2009	2010	2011
Nuclear	TWh	0	0	
Conventional Thermal	TWh	5.5	4.8	
Hydro Power	TWh	6.8	8.3	
Total Other Renewables	TWh	0	0	
of which Wind	TWh	0.1	0.1	
Total Generation	TWh	12.3	13.2	

SERBIA (RS)

		2009	2010	2011
Nuclear	TWh	0	0	0
Conventional Thermal	TWh	25.1	23.4	26.9
Hydro Power	TWh	11.1	12.5	9.2
Total Other Renewables	TWh	0	0	0
of which Wind	TWh	0	0	0
Total Generation	TWh	36.2	35.9	36.1

UKRAINE (UA)

		2009	2010	2011
Nuclear	TWh	82.9	89.2	
Conventional Thermal	TWh	78.4	85.9	
Hydro Power	TWh	11.8	13.0	
Total Other Renewables	TWh			
of which Wind	TWh	0.0	0.1	
Total Generation	TWh	173.1	188.1	

6.3 Electricity Balances

TABLE 6.3.1

Electricity Balances

The tables below give the electricity balances for each of the 27 EU Member States plus Switzerland, Norway, Turkey and some Energy Community countries in 2011.

AUSTRIA (AT)

		2009	2010	2011
Pumping	TWh	-3.9	-4.5	-5.1
Imports	TWh	19.5	19.9	25.0
Exports	TWh	18.8	17.6	16.8
Total Demand	TWh	67.8	69.5	66.8

BELGIUM (BE)

		2009	2010	2011
Pumping	TWh	1.8	1.7	1.6
Imports	TWh	9.4	12.3	13.2
Exports	TWh	11.3	11.8	10.7
Total Demand	TWh	83.8	90.4	86

BULGARIA (BG)

		2009	2010	2011
Pumping	TWh	0.9	0.9	1.2
Imports	TWh	2.6	1.2	1.5
Exports	TWh	7.7	9.6	12.1
Total Demand	TWh	30.4	32.5	31.3

CYPRUS (CY)

		2009	2010	2011
Pumping	TWh		0.0	0.0
Imports	TWh		0.0	0.0
Exports	TWh		0.0	0.0
Total Demand	TWh	4.7	4.8	5.0

CZECH REPUBLIC (CZ)

		2009	2010	2011
Pumping	TWh	-0.7	-0.8	-0.7
Imports	TWh	8.6	6.6	10.5
Exports	TWh	22.2	21.6	27.5
Total Demand	TWh	61.6	63.7	65.2

GERMANY (DE)

		2009	2010	2011
Pumping	TWh	-7.6	-8.6	-7.5
Imports	TWh	40.6	42.2	50.0
Exports	TWh	54.9	59.9	56.0
Total Demand	TWh	534.8	565.0	565.8

DENMARK (DK)

		2009	2010	2011
Pumping	TWh		0.0	
Imports	TWh	11.2	10.6	11.7
Exports	TWh	10.9	11.7	10.4
Total Demand	TWh	35.1	36.0	34.7

TABLE 6.3.1 Electricity Balances

ESTONIA (EE)

		2009	2010	2011
Pumping	TWh	0.0		
Imports	TWh	3.0		
Exports	TWh	2.9		
Total Demand	TWh	8.7	8.3	

SPAIN (ES)

		2009	2010	2011
Pumping	TWh	-4.0	-4.4	-3.1
Imports	TWh	7.0	5.2	7.9
Exports	TWh	15.0	13.5	14.2
Total Demand	TWh	274.0	278.0	273.1

FINLAND (FI)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	15.5	15.7	17.7
Exports	TWh	3.4	5.2	3.8
Total Demand	TWh	81.3	87.7	84.4

FRANCE (FR)

		2009	2010	2011
Pumping	TWh	-6.7	-6.5	6.8
Imports	TWh	19.4	20.3	9.4
Exports	TWh	45.1	50.8	66.3
Total Demand	TWh	486.7	513.2	478.2

UNITED KINGDOM (UK)

		2009	2010	2011
Pumping	TWh	2.7	2.7	4.0
Imports	TWh	6.6	7.1	4.8
Exports	TWh	3.7	4.5	1.6
Total Demand	TWh	369.1	366.4	342.3

GREECE (GR)

		2009	2010	2011
Pumping	TWh	-0.4	0.0	-0.4
Imports	TWh	6.8	8.5	7.2
Exports	TWh	2.6	2.8	3.9
Total Demand	TWh	58.9	59.2	58.6

HUNGARY (HU)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	11.0	9.9	14.7
Exports	TWh	5.5	4.7	8.0
Total Demand	TWh	38.9	39.8	40.2

TABLE 6.3.1 Electricity Balances

IRELAND (IE)

		2009	2010	2011
Pumping	TWh			0.0
Imports	TWh			
Exports	TWh			
Total Demand	TWh	25.1	25.4	26.8

ITALY (IT)

		2009	2010	2011
Pumping	TWh	-5.8	-4.5	-2.5
Imports	TWh	47.1	46.0	47.3
Exports	TWh	2.1	1.8	1.7
Total Demand	TWh	320.3	330.5	332.3

LITHUANIA (LT)

		2009	2010	2011
Pumping	TWh	-1.0	-1.0	-0.8
Imports	TWh	0.7	7.1	8.7
Exports	TWh	3.6	1.1	2.0
Total Demand	TWh	10.2	10.3	10.4

LUXEMBOURG (LU)

		2009	2010	2011
Pumping	TWh	-1.0	-1.1	-1.5
Imports	TWh	6.0	6.8	7.1
Exports	TWh	2.6	3.0	2.7
Total Demand	TWh	6.2	6.7	6.6

LATVIA (LV)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	4.3	4.0	4.0
Exports	TWh	2.6	3.1	2.8
Total Demand	TWh	7.0	7.3	7.2

MALTA (MT)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	0.0	0.0	0.0
Exports	TWh	0.0	0.0	0.0
Total Demand	TWh	2.0	2.0	2.2

NETHERLANDS (NL)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	15.5	15.6	20.6
Exports	TWh	10.6	12.8	11.5
Total Demand	TWh	114.1	117.1	118.1

TABLE 6.3.1 Electricity Balances

POLAND (PL)

		2009	2010	2011
Pumping	TWh	-0.9	-0.8	-0.6
Imports	TWh	7.4	6.3	6.8
Exports	TWh	9.6	7.7	12.0
Total Demand	TWh	135.9	141.6	145.8

PORTUGAL (PT)

		2009	2010	2011
Pumping	TWh	-0.9	-0.5	-0.7
Imports	TWh	7.6	5.8	4.4
Exports	TWh	2.8	3.2	1.6
Total Demand	TWh	52.6	55.0	53.1

ROMANIA (RO)

		2009	2010	2011
Pumping	TWh		-0.1	
Imports	TWh		1.0	
Exports	TWh		3.0	
Total Demand	TWh	55.2	50.6	

SWEDEN (SE)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	13.8	14.9	14.8
Exports	TWh	9.1	12.9	22.0
Total Demand	TWh	137.9	147.0	139.2

SLOVENIA (SI)

		2009	2010	2011
Pumping	TWh		0.0	
Imports	TWh		0.7	
Exports	TWh		0.6	
Total Demand	TWh	12.3	16.1	

SLOVAKIA (SK)

		2009	2010	2011
Pumping	TWh	-0.3	-0.5	-0.5
Imports	TWh	8.9	7.3	11.2
Exports	TWh	7.7	6.3	10.5
Total Demand	TWh	25.4	26.6	26.8

SWITZERLAND (CH)

		2009	2010	2011
Pumping	TWh	-2.5	-2.5	-2.3
Imports	TWh	30.6	66.8	75.5
Exports	TWh	31.8	66.3	73.7
Total Demand	TWh	61.8	64.3	57.1

TABLE 6.3.1 Electricity Balances

NORWAY (NO)

		2009	2010	2011
Pumping	TWh	-0.6	0.5	1.7
Imports	TWh	6.2	14.7	11.3
Exports	TWh	14.6	7.1	14.3
Total Demand	TWh	122.8	132.0	125.1

TURKEY (TR)

		2009	2010	2011
Pumping	TWh	0.0	0.0	0.0
Imports	TWh	0.8	1.1	4.5
Exports	TWh	1.5	1.9	3.6
Total Demand	TWh	185.9	202.3	230.3

BOSNIA HERZEGOVINA (BA)

		2009	2010	2011
Pumping	TWh			
Imports	TWh	0.9	1.1	
Exports	TWh	3.9	4.9	
Total Demand	TWh	11.6	12.3	

CROATIA (HR)

		2009	2010	2011
Pumping	TWh	0.1	0.2	
Imports	TWh	7.6	6.8	
Exports	TWh	1.0	1.9	
Total Demand	TWh	17.7	18.0	

SERBIA (RS)

		2009	2010	2011
Pumping	TWh	0.9	1.0	0.9
Imports	TWh	5.2	5.6	6.7
Exports	TWh	6.6	5.9	7.0
Total Demand	TWh	33.3	34.1	34.5

UKRAINE (UA)

		2009	2010	2011
Pumping	TWh			
Imports	TWh			
Exports	TWh			
Total Demand	TWh	168.5	183.4	

7. Comments

The comments below provide additional information on the main developments for the electricity sector in the various Member States and on the assuptions used to provide data. Please note that not all Member States provided comments nor answered all the questions.

You can also find further information on those national developments at the following link: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%202011

AUSTRIA (AT)

1. General comments on electricity supply and demand situation in your country.

The electricity generation pattern of Austria is dominated by hydropower with a share of nearly 60% in total electricity generation. In addition, 7% of electricity is produced by renewable energies, thus about 67% of total electricity production is contributed by renewable electricity, the highest share in all European Union member states.

Austria's electricity industry showed a good performance in 2010 with a non-availability of electricity services of only 31.7 minutes per customer. To maintain the high performance standards, it is inevitable to further expand the Austrian grid. At the moment the enlargement of the 380kV-grid, which will close Austria's 380 kV high voltage ring, is in progress as one of the major projects.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓ (‹ 10)			
2015-2020		✓		
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The Austrian electricity market has been completely liberalised on October 1st 2001, with Austria taking a pioneering role in the liberalisation process in the EU. The 1998 Electricity Act (ElWOG) implemented the EU internal electricity market directive into Austrian law.

In 2010 the ElWOG was completely revised and published with the most substantial change of the legal framework of the Austrian electricity market since the liberalisation. One major focus of ElWOG 2010 centres in unbundling rules for DSOs and TSOs. To comply with EU regulations, the legal form and organisational structure of the Austrian Regulatory Authority was changed in addition. ElWOG 2010 also introduced changes in consumer rights as well as in the supplier switching processes. The main focus of the latter centred on reducing the time of the switching process to 3 weeks and on introducing a data hub for the exchange of data relevant to the switching process. With the release of the revised ElWOG 2010 a nation-wide roll-out of smart meters is also intended and substantial monitoring rules for market participants are foreseen.

4. Comments on assumptions and drivers behind the forecasts on technologies.

The assumptions on forecasts on the generation technologies are based on information provided by the major Austrian electricity companies. The emphasis of future investment in the upcoming years is placed in the expansion of renewable energies and pumped storage plants. However, thermal power plants will be further required not only for balancing and back-up purposes but also to balance expected future increases in electricity demand.

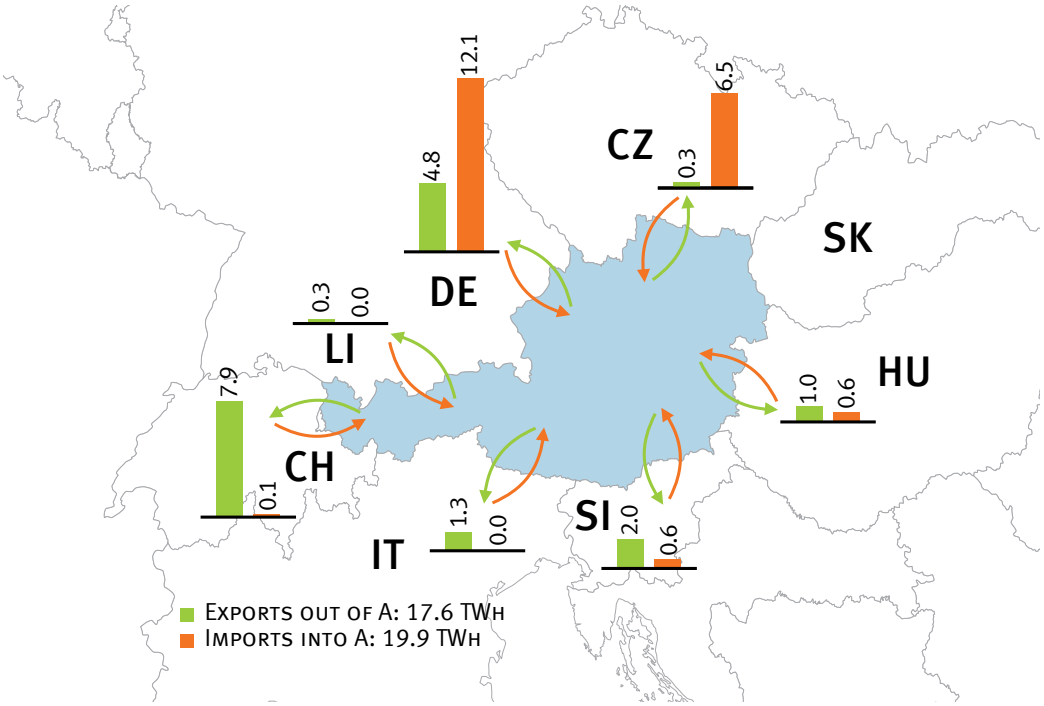
The major drivers for the expected upraise in renewable energy technologies will result from the implementation of the Austrian Renewable Energy Act 2011 (*Ökostromgesetz 2011*) in combination with the expected increase of wind and solar power in Europe. The latest amendment of the Austrian Renewable Electricity Act indicates the following goals for renewable electricity capacities until 2020: 1,000 MW for hydro power, 2,000 MW for wind power, 200 MW for biomass and biogas and 1,200 MW for photovoltaic. To further support the expansion of hydro power, the Austrian government presented a master plan ("*Masterplan Wasserkraft*"). The study indicates an additional technically and economically feasible hydropower potential of 13 TWh whereof 7 TWh could be realised until 2020. Investments in thermal power plants (especially gas) are planned to go along with increases in electricity demand.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Until 2001 Austria had been a net exporter of electricity. However, the situation has changed. Today there is a negative physical exchange balance which accounted for 4.8 TWh in 2008 and fell to 0.7 TWh in 2009 due to the decrease in electricity consumption caused by the impact of the global financial crisis. In 2010 the negative physical exchange balance increased again to 2.3 TWh.

The major partners in electricity exchange are Germany, the Czech Republic and Switzerland due to well developed cross border networks. In 2010, exchanges with these countries amount to 85% of total exchange. Electricity exchange with other neighbouring countries is rather low, as bottlenecks still exist on the border lines.

Physical energy exchange between Austria and its neighbouring countries in 2010 in TWh



Source: Oesterreichs Energie, E-Control

CYPRUS (CY)

1. General comments on electricity supply and demand situation in your country.

Demand:

For the last 10 years the electricity demand on the island has an average growth of 5%.

However on July 11th 2011, extensive damage to EAC's Vasilikos Power Station was caused by a severe explosion in the adjacent naval military base resulting in complete interruption of its operation and a prolonged outage of its generating units. Before the explosion Vasilikos Power Station contributed 50% to the generation system capacity and 60% to the energy production of the island.

The demand-capacity gap right after the incident was severe. The expected maximum demand for the summer of 2011 was 1155 MW and the nominal available capacity of the existing generating units right after the incident was 760 MW.

The above incident together with the financial crisis has had a detrimental effect on the demand requirements with the 2011 units sold reduced to the 2008 levels.

The above trend is expected to continue.

Supply:

The Electricity Authority of Cyprus is the sole supplier of Electricity on the island. Generation is carried out mainly from conventional generating units. RES penetration to the market at the end of 2011 stood at 3.6% with a target of 16% for 2020.

There is enough capacity so that the supply is carried out without interruption. Because of the abovementioned incident at Vasilikos Power station the demand-capacity gap has been successfully managed by the installation of temporary generating units. The need of these temporary units will gradually be reduced with the return to service of the damaged Vasilikos Power Station Units. Full operation of the Vasilikos Power Station is expected by mid 2013.

Legal changes:

Cyprus is at an advanced stage of finalizing the amendments to the national legislation for transforming directives 2009/28/EC (Promotion of RES), 2009/72/EC (Internal electricity market) and 2009/73/EC (Internal natural gas market) into national law. It is expected that all required changes will be approved by Parliament before the end of 2012.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

Assumptions on the evolution of CO2 prices are based on the study by Cyprus Energy Regulating Authority (CERA) concerning the promotion of RES.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012		‹ 10			
2015-2020					
Beyond 2020			✓		

3. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear	✓	
Steam Thermal Units		Need to increase efficiency on order to accommodate more cost effectively CCS technologies.
Gas Turbine Units		Need to increase both efficiency and flexibility in order to accommodate large scale integration of RES technologies.
Combined Cycle Units		Need to increase both efficiency and flexibility in order to accommodate large scale integration of RES technologies.
Internal Combustion Units	✓	
Hydro		A feasibility study concerning the installation of hydro pump storage systems in Cyprus in order to accommodate high RES penetration after 2020 has been recently carried out.
Non-fuel Renewables		High interest for the installation of RES technologies in Cyprus especially solar technologies (CSP and PVs).
New Technologies (e.g. Fuel Cells)	✓	

4. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Cyprus has been an isolated island and is not currently interconnected.

5. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

The factors taken into account for the calculation of NO_x emissions are the hours of operation for each unit, the individual flue gas outflow rate from the units and the average NO_x hourly emission value from each unit. The formula used for the calculation of NO_x emissions is the following:

NO_x emissions (kg/year) = Flue gas outflow rate (Nm3/hour)* Hours of operation of boilers (hours/year) * NO_x average value (mg/Nm3) * 10-6 (kg/mg)

The factors taken into account for the calculation of SO_2 emissions are the fuel oil consumption for each unit and the percentage of sulfur in the fuel. The formula used for the calculation of SO_2 emissions is the following:

SO_2 emissions (kg/year) = Fuel Oil consumption (tones/year) * percentage of sulfur in the fuel (%) * coefficient of conversion of S into SO_2 * 103 (kg/tonne)

CZECH REPUBLIC (CZ)

1. General comments on electricity supply and demand situation in your country.

There exists relatively good and extensive description in the regulator's report here: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National%20Reporting%202011/NR_En/C11_NR_Czech%20Rep-EN.pdf.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

Assumptions on the evolution of CO2 prices are based on the study by Cyprus Energy Regulating Authority (CERA) concerning the promotion of RES.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012				
2015-2020				
Beyond 2020				

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

See point 1.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear	✓	
Steam Thermal Units	✓	
Gas Turbine Units	✓	
Combined Cycle Units	✓	
Internal Combustion Units	✓	
Hydro	✓	
Non-fuel Renewables	✓	
New Technologies (e.g. Fuel Cells)	✓	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

CZ is pure exporter (saldo ~ 20 % of production) at the moment, partners are neighbouring countries. Restrictions of the exports are awaited.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation. No comments.

7. Any other comments on the electricity sector in your country. No comments.

GERMANY (DE)

1. General comments on electricity supply and demand situation in your country.

The economic recovery in 2010, electricity demand nearly reached its pre-crisis level again. Although improvements in energy efficiency will have a restraining effect on consumption, a slight increase is expected, because electricity will partially substitute fossil fuels in heating and transportation.

In 2011, the share of renewable energies in electricity generation was close to 20 percent. Due to the outage of 8 nuclear power plants in March 2011, the share of nuclear fell from 23 percent in 2010 to 18 percent in 2011.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓				
2015-2020		✓			
Beyond 2020			✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

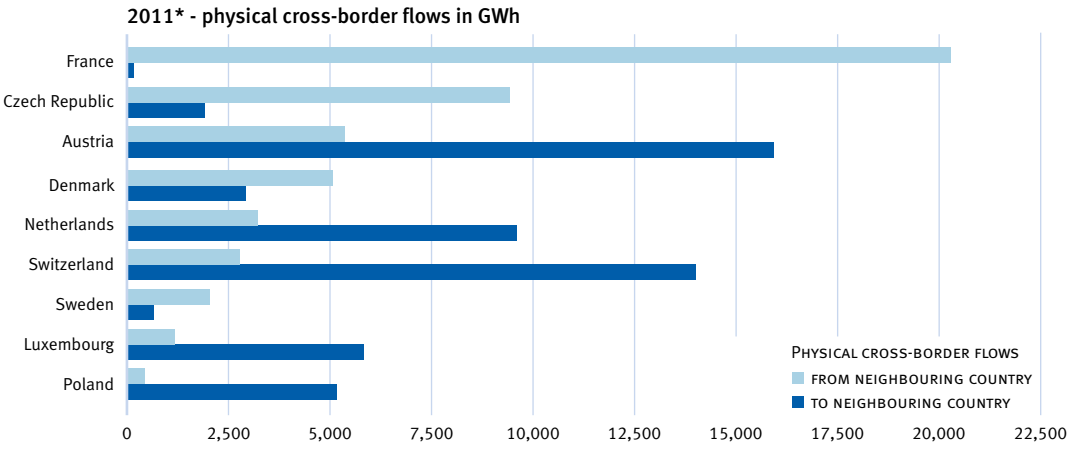
Following Fukushima, the German government took the decision to phase out nuclear by 2022. Therefore, the last nuclear power plants in Germany will be shut down on December 31st, 2022.

In 2011, also the EEG (Erneuerbare-Energien-Gesetz) was amended. Apart from changes in the structure of the feed-in tariffs, new instruments were created to promote the marketing of renewable energies. These instruments shall initiate the integration of renewable energies into the market.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Phase out up to 2022.
Steam Thermal Units	✓	
Gas Turbine Units		Will be needed as back-up capacity.
Combined Cycle Units	✓	
Internal Combustion Units	✓	
Hydro	✓	Potential is limited.
Non-fuel Renewables		Will furthermore strongly increase, integration into the market is necessary.
New Technologies (e.g. Fuel Cells)	✓	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?



Source: BDEW * provisional

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Emission data only contains emissions from electricity generation in the public supply sector.

SPAIN (ES)

1. General comments on electricity supply and demand situation in your country.

The large development of RES-E and important investments in CCGT plants together with the decrease of electricity demand has led to a certain overcapacity situation in the Spanish electricity system. Certain risk exists for the recovery of investments of thermal plants.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓				
2015-2020	✓				
Beyond 2020		✓			

In 2012, CO_2 prices are lower than 10€ and this tendency is expected to follow until 2020. Beyond 2020, this tendency could change if specific political measures are carried out on this matter.

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

At both the EU and national levels, it is necessary to overcome the lack of stability in the regulatory framework. The continuous modification of regulation gives rise to a lack of legal security that affects the decisions of investors. Furthermore, it is necessary to ensure the consistency and coherence of the regulatory framework.

At EU level, the establishment of ambitious energy policy and climate change targets without analyzing the real impact on the EU and national economies and the affordability is quite dangerous for the competitiveness of the EU at global level and the member states' own competitiveness. Targets should be realistic (possible from the technical and economic points of view) in order to be able to achieve them in a gradual development of the member states, in a way that the competitiveness distortion can be accepted.

At national level, some of the main worries in regulatory issues are the following:

- The elimination of the tariff deficit.
- An adequate retribution of the distribution activity. Not all the investments have the official recognition.
- Integration of RES into the market.
- A clear and foreseeable capacity payment system.
- The development of regional markets.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Political risk and public acceptance are key barriers for nuclear but it is necessary to fight climate change. Companies will only construct a nuclear plant if there is an agreement at state level (Parliament) and legal security for investment recovery.
Steam Thermal Units		CO_2 is a barrier but CCS will allow maintaining a diversified mix. Without CCS, new steam thermal plants (coal plants) could have a difficult future. If CCS goes ahead, the availability of transport system and the access to storage (in other MS) will really affect the investment decision.
Gas Turbine Units		In Spain, given the small difference in cost investments, companies prefer to build CCGT instead of GT.
Combined Cycle Units		Present overcapacity situation. CCGT will be the preferred option as back-up and peaking plants.
Internal Combustion Units		CHP mainly for industry and some services (hotels). Internal combustion units for small island isolated systems.
Hydro		Lack of public acceptance. A local/ regional issue. Some increase can be expected in small hydro. New pumping plants could be built to support intermittent RES-E but a clear framework is needed to facilitate the investments and their recovery.
Non-fuel Renewables		There is a favorable political support at state, regional and local level. Economic and dispatch priority support will continue. The new plants for the near future will be RES plants.
New Technologies (e.g. Fuel Cells)		For the time being, politicians are paying special attention to electric vehicles.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The lack of interconnection capacity with France is one of the main problems for the Spanish electricity system. This gives rise to an isolated functioning of the Iberian market. Furthermore, such a lack of interconnection does not allow introducing the electricity generated in Spain into the EU market. Therefore, the present overcapacity of Spain cannot contribute to saving investments in the EU. We should also point out that the lack of interconnection will not allow a development of the entire potential of the Spanish renewables sources. Interconnection is needed to integrate the Spanish RES-E in the EU market.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

- Real data: Direct measures in stack
- Future data: Specific emissions taking into account the foreseen reductions and the regulatory framework

7. Any other comments on the electricity sector in your country.

- Need for sufficient tariffs to cover the present costs of every player and to facilitate the development of the smart grid and metering.
- The RES-E development of Spain has been too accelerated, resulting in an economic unbalance of the electricity system.
- A fast and large development of the expensive solar PV and CSP has resulted in a high level of subsidies that are not accompanied by the necessary increase of the access tariffs leading to a tariff deficit. This affects the economy of the incumbent companies.
- Need of appropriate capacity payments to allow the recovery of investments in thermal conventional plants. The functioning of these plants does not correspond with the one foreseen at the time of deciding and constructing them. At present, these plants function as back-up plants.
- Need to reduce the number of customers with regulated price.
- What to do with situations of hourly zero price in the electricity wholesale market due to an excess of intermittent RES-E? Does economic theory have a solution for such a situation?

FINLAND (FI)

1. General comments on electricity supply and demand situation in your country.

Electricity demand in Finland is divided with about 50% for industry and 50% to other end-use. Both the economic overall development and the future of energy-intensive industries (paper, metals, chemicals) will determine the future power consumption. It is expected that without major changes in the economic structure the power consumption will increase slowly (order of 1%/a) in future. During the on-going economic downturn the consumption has dropped remarkably.

The electricity generation in Finland is open for investments to any energy source or generation form and is based on competitive market. Only nuclear investments require a political decision which is made by government and ratified by the parliament.

Electricity is generated with several production forms and fuels. There are approximately 140 electricity generating companies and more than 400 power plants in Finland. The heat demand of industry and municipalities with district heating networks is largely utilised for combined heat and power production which covers the biggest share of Finnish generation of electricity. Natural gas, coal, peat and biomass are the main fuels for CHP power plants. Biomass is gaining market share in these power plants that are mainly fluidized bed multi-fuel boilers.

Finland has two operating nuclear power plants with 4 reactors. One additional nuclear unit is under construction and will be operational in near future. A positive decision in principle for two new nuclear units were taken in 2010. These would be operational in 2020s.

Conventional condensing power capacity in Finland is mainly from 1970s and part of the capacity will most probably be closed during this decade due to low profitability and need of major environmental investments. There are no plans for new condensing power plants.

New hydro power investments are limited due to environmental protection of rivers. New support scheme – guaranteed price for production – for wind will increase investments in wind power during this decade.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

Finnish Energy Industries as a joint organisation of market players and cannot take any position on future market prices.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012					
2015-2020					
Beyond 2020					

3. Comments on main legal changes for the electricity sector, on a national level, from a European level.

EU:

- The energy efficiency directive will change the role of electricity retailers or distribution companies. How big the change will be remains to be seen.
- Fuzz around the emissions trading scheme may change the role of this market-oriented steering mechanism.
- The unbalanced targets with renewables, emissions and efficiency are leading to suboptimal future with huge amount of national regulation instead of European market-oriented solutions. The post-2020 policies will determine the future of the power market.

Finland:

- Implementation of industrial emissions directive and renewal of legislation on environmental permitting may change the capacity structure of power generation.
- Government considers taxation of generation of nuclear and hydro power.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		One reactor under construction. 2 additional positive decisions in principal for additional nuclear, these project are in tendering phase and are expected to be operational in 2020's.
Steam Thermal Units		It is supposed that some oil and coal condensing power plants will be shut down because of the IED during this decade. No new condensing power plants are being considered to be built. There will be replacement investments for CHP. Mainly fuelled with forest biomass and peat.
Gas Turbine Units		No new commercial gas-turbine power plants under process. The fuel price too high for expected power price levels.
Combined Cycle Units		The same applies.
Internal Combustion Units	✓	
Hydro		Difficult to proceed with new hydro project due to problems in licensing and environmental reasons.
Non-fuel Renewables		The Finnish government´s target of 6 TWh/2500 MW wind power until 2020 is expected to be reached. The amount of solar power and wave power is expected to be negligible. Finland has no potential for tidal power.
New Technologies (e.g. Fuel Cells)	✓	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

In total, Finland is a major net importer of electricity. This is expected to change in 2020s when new nuclear units will be on-line.

Finland is part of the Nordic electricity market with rather strong connections with Sweden and with a connection to Norway and to Estonia. The exchange is totally driven by market prices.

The power balance between Finland and other Nordic countries depends strongly on the availability of hydro power mainly in Norway and in Sweden. Over the past few years the import and export has been more or less in balance, but the balance varies strongly between the years.

Electricity is imported from Russia with power lines of 1,400 MW capacity. The import pattern has changed dramatically since autumn 2011. The reason is the capacity payment for Russian generators during their own morning and evening peaks. Power flows to Finland the most when it is needed the least. Total import has dropped some ten percent.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

SO_2 and NO_x emissions are reported by the energy producers to environmental authority. The information is gathered and reported by Statistics Finland. In combined heat and power production the emissions are divided into energy products (heat, steam, electricity) according to produced energy.

There are no future scenarios for these emissions for electricity generation only.

UNITED KINGDOM (GB)

1. General comments on electricity supply and demand situation in your country.

The UK has legislation in place setting limits on the emissions of greenhouse gases as far ahead as 2050. There is also legislation mandating a minimum level of renewable energy in 2020.

In 2011 National Grid replaced a single 'best view' forecast of electricity and gas demand with scenarios representing three different views of the future. For 2012 we have again produced three scenarios, **Slow Progression**, **Gone Green** and **Accelerated Growth**. In response to feedback we have broadened the range of possible futures covered by the scenarios.

Gone Green (our 'best view') has been designed to meet the environmental targets; 15% of all energy from renewable sources by 2020, greenhouse gas emissions meeting the carbon budgets out to 2027, and an 80% reduction in greenhouse gas emissions by 2050. The data submitted is based on our Gone Green scenario.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012		✓			
2015-2020				✓	
Beyond 2020					✓

3. Comments on main legal changes for the electricity sector, on a national level, from a European level.

Electricity Market Reform as outlined in the draft Energy Bill, includes the introduction of new long-term contracts (Feed-in Tariff with Contracts for Difference), a Carbon Price Floor, a Capacity Mechanism, including demand response as well as generation, and an Emissions Performance Standard (EPS) set at 450g CO_2/kWh to reinforce the requirement that no new coal-fired power stations are built without CCS, but also to ensure necessary investment in gas can take place.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Slight delay (early 2020s Average additional 7 year AGR extensions).
Steam Thermal Units		Coal – Majority of plant closed by mid 2020s due to age and emissions legislation. Some new coal with CCS after 2025.
Gas Turbine Units		
Combined Cycle Units		New build predominantly in period to mid 2020s. Some CCGT capacity with CCS after 2025.
Internal Combustion Units		
Hydro		
Non-fuel Renewables		Offshore Wind: Round 3 delivers for 2020. Supply chain maintained post 2020. Wave & Tidal: Limited build up of capacity, mainly post 2020.
New Technologies (e.g. Fuel Cells)		

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

We anticipate that exports from GB will increase following the addition of the East-West interconnector, although some displacement of flows may take place. Over the longer term, we expect net exports from GB to gradually decline as Ireland develops more indigenous power generation, notably wind capacity.

The level of interconnection capacity increases to 8.6 GW by 2030. We expect both annual imports and exports to rise from current levels in line with the increase in interconnection capacity, with exports increasing markedly from latter part of this decade onwards as renewable generation increases so that GB becomes a net exporter to the continent by the early 2020s.

GREECE (GR)

1. General comments on electricity supply and demand situation in your country.

Currently there is an oversupply in the interconnected system as many new CCGT units have become operational in 2011-2012 increasing the available generating capacity, whilst at the same time there is a significant decrease in demand because of the Greek economic crisis. Prevailing hydrological conditions and cross-border trading also play an important role in the a.m. oversupply.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	0-10 €	10-20 €	20-30 €	30-50 €	› 50 €
2012	‹ 10				
2015-2020	✓				
Beyond 2020	✓				

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

Since 2003 there is “mandatory pool” in the Greek electricity market, meaning that all producers sell their energy to the System Operator and all suppliers buy their energy from the System Operator; bilateral contracts between producers and suppliers are not provided for. This is expected to change from 2014 and onwards as a consequence of the integration of the EU electricity market. Bilateral contracts between producers and suppliers and a Greek power exchange are expected to come into force.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		No perspective for nuclear.
Steam Thermal Units		Many old thermal units fuelled by lignite, natural gas and oil will be gradually decommissioned till 2020 and replaced by new thermal units mainly CCGT and lignite.
Gas Turbine Units		Open cycle gas turbines are mainly used in non-interconnected islands. A couple of open cycle gas turbines (150 MW each) are expected in the interconnected system till 2020, mainly for enabling high RES penetration.
Combined Cycle Units		In the period 2011-2013 approximately 2100 MW net capacity from CCGTs will become operational. No further investments in CCGT plants are expected until 2020.
Internal Combustion Units		Used only in the non-interconnected islands. Will be gradually replaced by interconnections with the mainland (e.g. Cyclades by 2015 and Crete around 2020 etc.)
Hydro		There is limited potential for new large hydro (and often reactions from local communities), but significant potential for small hydro. Large hydro with pump storage is important for enabling high RES penetration.
Non-fuel Renewables		There is very high potential both in the mainland and the islands and sufficient incentives for high RES penetration; focus is mainly on PV and wind.
New Technologies (e.g. Fuel Cells)		No significant impact on power generation in the visible future.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Historically there are imports of electricity from adjacent Balkan countries (mainly Bulgaria) and exports of electricity to Italy, because of the differential in wholesale electricity prices in the area. Imports from Italy to Greece are also expected but only during critical periods. This trend is not expected to change significantly in the coming years but price convergence is expected to gradually reduce the profit margin of cross-border trading; hence net imports are expected to gradually drop to approx. zero. From mid-2011 and onwards cross-border electricity trading with Turkey also takes place.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Until 2007 discontinuous measurements / emission factors were used for the calculation / estimation of PPC's SO_2 / NO_x emissions with the exemption of new Large Combustion Plants with build-in continuous measurement systems. Since 2008, all Large Combustion Plants of PPC use continuous measurements according to Large Combustion Plants Directive (2001/80/EC). For combustion plants not falling under the scope of LCPD, emissions are calculated using discontinuous measurements or estimated using emission factors (in certain small islands where no measurement takes place).

HUNGARY (HU)

1. General comments on electricity supply and demand situation in your country.

Traditionally, Hungary has been an electricity importing country for several years. Despite of the several new combine cycle units starting operation in 2011, the amount of the imported electricity increased.

The domestic electricity generation is dominated by Paks Nuclear Power Plant (more than 43% of gross electricity generated in 2011), but also the gas fired power plants (30%), and the lignite and coal fired units (18%) have a large share in the generation mix. RES (including waste) reached 7.6% of the gross electricity generated in Hungary.

Before the economic crisis beginning in autumn 2008, the annual electricity demand increased slightly at an almost stable growth rate. Also the peak loads had been growing, especially the summer peak loads. In 2009, a large, but temporary decrease was experienced. Although the annual net electricity consumption started increasing again, the pre-crisis level of consumption has not been reached yet. Electricity consumption is closely linked to economic development; and the expectations for the next years seem somewhat unclear.

The decommissioning of several older power plant units is expected in the next years. Some of them were already mothballed in 2011 and 2012 due to unprofitability.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020		✓		
Beyond 2020			✓	

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

In 2011, a new Hungarian Energy Strategy until 2030 was approved by the Parliament. Based on this framework document, several action plans will be elaborated, including an action plan on the development of electricity generating capacity.

Recently, the legal framework and support system of CHP electricity generation was also changed.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Additional unit(s) at Paks Nuclear Power Plant is (are) planned starting operation after 2020. No final investment decision.
Steam Thermal Units		New units not expected (excluding biomass).
Gas Turbine Units		Two peaking units started commercial operation in 2011; additional back-up units will be needed due to the planned large scale extension of Paks Nuclear Power Plant.
Combined Cycle Units		Several new units came into operation in 2011. Further projects are planned, but there is no final investment decision on them.
Internal Combustion Units		Mostly biogas units are expected, further development of small scale CHP generation is subject to the support system.
Hydro		No major hydro projects expected.
Non-fuel Renewables		Wind energy development is subject to the national renewable energy policy and the related support system.
New Technologies (e.g. Fuel Cells)		Pilot research projects only.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

As it was mentioned earlier, Hungary is an electricity importing country at the moment. From 2009, about 15% of the national net electricity consumption is covered by import. The major partners are the Czech Republic, Romania, West-Ukraine ('Burstyn Island') and other countries of the region.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

In the relevant table, only the data of power plants above 50 MW (large power plants) are contained. Past data were taken from the publications of the Hungarian Energy Office; but also the reports of power plants submitted to the system operator were considered.

IRELAND (IE)

1. General comments on electricity supply and demand situation in your country.

Due to the recession and associated reduction in demand, supply is easily able to cater for demand into the foreseeable future.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	‹ €10 for 2012			
2015-2020	✓			
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

There are questions over the development of European electricity markets particularly liquidity in Eastern European markets.

Also questions over SEM (the combined electricity market of Ireland and Northern Ireland, Single Electricity Market) compliance with the European target model.

Thirdly the SEM could combine BETTA in the next 5 to 10 years.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		None – public opinion firmly against.
Steam Thermal Units		No new builds expected.
Gas Turbine Units		A number expected to be built over the next few years.
Combined Cycle Units		Generator of choice for all new baseload builds. 1 expected to be built over the next 5 years.
Internal Combustion Units	✓	
Hydro		Resource has been fully exploited.
Non-fuel Renewables		Wind is continuing to be built and is increasing its market share.
New Technologies (e.g. Fuel Cells)	✓	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Currently there is one functioning interconnector between Northern Ireland and GB which predominately imports into Northern Ireland. A new 500MW interconnector between Ireland and Wales is expected to come into service at the end of 2012.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

NO_x and SO_x emissions are calculated from fuel used, using a conversion factor.

ITALY (IT)

1. General comments on electricity supply and demand situation in your country.

In 2010 the electricity demand reached 330.5 TWh, increasing by 3.2% compared to the previous years. This increase followed the significant drop (-5.7%) registered in 2009 and represent the best trend in the last 7 years, returning in one year to demand levels of 2005. But the demand is again low compared to the levels of 2008 (339 TWh). Accordingly, in 2010 the net production increased by 3.4% compared to the previous year, with a value of 290.7 TWh. Because of supply overcapacity, thermal supply is suffering of low demand and RES development, particularly of photovoltaic supply. Only in 2010 the photovoltaic production increased of 177% and the trend shows a strong growth even for the future years. Moreover thermal supply is suffering for forecasted increase of costs due to environmental limits and future investments for compliance with environmental regulation (abatement techniques and CCS), infrastructures deficiencies and fragmentation of administrative process.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020		✓		
Beyond 2020		✓	✓	

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

It depends on the time-period. In the short term the sector will show a downsizing effect due to entry of small operators of RES plants (RES development for RES 2020 compliance) and huge increase of photovoltaic systems. In the medium term, sector will show potential output reduction due to efficiency measures but also the development of potential market coupling due to compliance with provision of the third energy package (grid codes, international transmission capacity, development of grid interconnections). In the longer term sector will show potential development due to inclusion of transport in the efficiency and climate longer term objectives.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		No development
Steam Thermal Units		Low development
Gas Turbine Units		Moderate development for balancing RES
Combined Cycle Units		Moderate development due to oversupply
Internal Combustion Units		No development
Hydro		Low development
Non-fuel Renewables		High development
New Technologies (e.g. Fuel Cells)		Low development

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Italy is basically an importing country. Major partners are France and Switzerland. During 2010, the electricity demand was met for 86.6% with the national production (86.0% in 2009), for a value equal to 286.3 billion kWh, net of consumption of auxiliary services and pumping, registering a 4.0% increase compared to 2009. The remaining part of the demand (13.4%) was covered by net imports from other countries for a value equal to 44.2 billion kWh in 2010, decreasing by 1.8% compared to the previous year. It is forecasted a decrease of imports due to internal overcapacity and external increased balance between Available Capacity and Demand.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

It is the same as in Europe (please see Goteborg Protocol and LRTAP Convention) and, usually for LCP, they are not calculated but measured.

LITHUANIA (LT)

1. General comments on electricity supply and demand situation in your country.

Final electricity consumption in 2011 was 9.46 TWh representing an increase about 2.6% on the previous year. In 2011, the major consuming sector was industry (3.61 TWh). It has increased about 17.6%. About 1.97 TWh were exported during the year 2011. Losses in the network have decreased about 12% i.e. from 0.99 TWh in 2010 to 0.87 TWh in 2011.

Throughout 2011 the power generation structure had changed. 2011 the main sources of electric power generation in Lithuania come's AB Lietuvos Elektrine and others power plants. About 53% of output was generated in the thermal power plants, about 22% in the hydro and Kruonis PSPP, 15% in the renewable power plants and 10% by autoproducers.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020	✓			
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The reform of the electric power sector aims to enhance the efficiency of the electric power sector in Lithuania and increase Lithuania's energy autonomy. The activity model for the sector is based on the requirements of the European Union's Third Energy Package in order to create conditions for the integration of Lithuania's electric power system into the EU market and to guarantee financing of the strategic energy projects being implemented at present. According that AB Lietuvos energija performs electric energy production and supply, electric energy import and export and electricity sales activities. Litgrid AB – Lithuanian electricity transmission system operator, managing electricity flows in Lithuania and maintaining stable operation of the national electricity system. AB LESTO is Lithuanian distribution network operator.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		By 2020 Lithuania plans to have the new nuclear PP – Visaginas NPP. Chain study, special transport and communication plan and road safety audit were made.
Steam Thermal Units		
Gas Turbine Units		
Combined Cycle Units		By 2013 plan to have ninth unit in the AB Lietuvos Elektrine.
Internal Combustion Units		
Hydro		By 2014 plan to have fifth unit in the Kruonis HPSPP.
Non-fuel Renewables		Electricity production from renewable energy sources is one of the most important energy policies priorities and by 2020 must be no less 23% of final consumption.
New Technologies (e.g. Fuel Cells)		

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Lithuanian power system imported 84 percent of the country's domestic electricity demand. In 2011, as compared to 2010, exports were up about 73 percent. Imports were up about 22 percent (2011 compared to 2010). In 2011 Lithuania imported electricity from Latvia and Belarus. Russia is the main country to which is exported electricity from Lithuania.

6. Any other comments on the electricity sector in your country.

The main objectives in the Lithuanian electricity sector: strategic projects of power links with Sweden and Poland, which will ensure energy independence of Lithuania, as well as the preparation for synchronous operation with electricity transmission system of continental Europe.

LUXEMBOURG (LU)

1. General comments on electricity supply and demand situation in your country.

Demand:

The electricity supply in Luxembourg is arranged via two separate networks: a large public grid owned and operated by Creos Luxembourg is connected to the transmission grid of Amprion GmbH in Germany and an industrial grid connected to the Belgian transmission grid of Elia System Operator S.A. and operated by an industrial client. The public grid supplies most of Luxembourg end consumers. Overall electricity demand in Luxembourg amounted to 6.6 TWh in 2011, with a decrease of the consumption in the public grid of -1.5% compared to 2010.

Supply:

A large pump storage plant of 1,100 MW is located in Luxembourg but is connected to the grid of Amprion by dedicated lines. An increase by 200 MW of the installed capacity to reach a total power output of about 1,300 MW is ongoing and will be commissioned in 2013.

A CCGT power plant of 376 MW is located in the south of Luxembourg and delivers energy to the Belgian grid.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020				
Beyond 2020				

Creos cannot take any position on mid and long term CO_2 market prices evolution. Prices evolution will be influenced, amongst others, by EU and states support of renewables.

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The electricity market situation in Luxembourg is directly linked to the market situation in Germany. As the capacity of the German-Luxembourgian interconnection lines is sufficient to cover the load situation, no capacity allocation is needed.

Creos is participating in NWE market coupling initiative which is the pilot project for European market integration.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		No development foreseen.
Steam Thermal Units		
Gas Turbine Units		Possible
Combined Cycle Units		Possible
Internal Combustion Units		
Hydro		Possible but limited potential.
Non-fuel Renewables		Strongly promoted.
New Technologies (e.g. Fuel Cells)		

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The major part of the electricity is imported from the German border for the public grid and from the Belgian border for the industrial grid. On the public grid, small and medium CHP plants and renewable plants were built in the last years to reduce import dependency. Those are promoted by the government for the coming years.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Emissions are measured by continuous measurement systems.

7. Any other comments on the electricity sector in your country.

Creos is currently studying the technical and economic feasibilities of interconnections with neighboring countries (Belgium and France). The objective is twofold: improve the security of supply of Luxembourg and contribute to the integration of the electricity market.

LATVIA (LV)

1. General comments on electricity supply and demand situation in your country.

The electricity production from RES in Latvia is mainly of country's final consumption (about 60%). Electricity production is from hydro, natural gas, biogas, wind and biomass.

The total Latvia's electricity demand level per capita (2930 kWh in 2010) is one of the lowest of the EU, including electricity demand in industry sector. Final consumption was 6.3TWh in 2010, of which agriculture was 2%, Industry 24%, Transport 2%, Services 40% and Household 33%.

We have prognoses for increase of the electricity demand to 4200 kWh per capita (2020) mainly in the transport sector, industry and also in agriculture.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020	✓			
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The main directions of the energy policy are aimed at improving security of energy supply of the country by encouraging diversification of supplies of the primary energy resources and by creating conditions for increasing self-provision of electricity generation, as well as by preventing isolation of the regional electricity market through new interconnections. Creation of competition conditions for promoting the use of renewable and local energy resources and environmental protection also play a role.

A draft of Renewable Energy Law is elaborated in Latvia in order to transpose the requirements stipulated in the Directive 2009/28/EC, the drafts of the necessary regulations and amendments to normative acts are being prepared and worked out.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear	-	research
Steam Thermal Units	✓	-
Gas Turbine Units	✓	-
Combined Cycle Units	-	yes
Internal Combustion Units	-	small generators
Hydro	✓	-
Non-fuel Renewables		about 300 MW WPP
New Technologies (e.g. Fuel Cells)	✓	-

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Latvia is still rather poor country with deficit electricity balance. Earlier the electricity import was from Lithuania, Estonia and Russia. Since Ignalina's NPP near Latvia is closed in the end of December 2009 and we have electricity import from Russia, Estonia and Finland. The Baltic States are quite isolated regions in the European internal energy market. Within the framework of Trans-European Energy Network (TEN-E) programme, the project of circle Kurzeme (330kV line in the west part of Latvia) is being implemented.

Electricity major partners will be the new Visaginas NPP in Lithuania.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

For large combustion plants the emissions of NO_x are monitored using Continuous Emission Monitoring (CEMs) equipments. The calculations of NO_x from electricity generation are based on the average data from CEMs. Emission calculation method is set in the category A permit for polluting activities.

The fuel and emissions for electricity generation in cogeneration mode is in compliance with Directive 2004/8EC. Calculation methods for smaller power stations are similar.

The SO_2 containing in fuels, such as fuel and diesel oil is not normally used for electricity generation in Latvia. It is used as emergency fuel only. In cases when such fuel is used, the calculations of SO_2 emission are based on sulphur content in the fuel and amount of used fuel.

7. Any other comments on the electricity sector in your country.

Latvia continues to apply to the average level of GDP per capita in the EU. Latvian electricity sector is not the biggest GHG polluter, compared with transport and other sectors. The rapid increase in the cost of electricity is disturbing the growth of the economic development, especially after the global financial crisis 2008.

MALTA (MT)

1. General comments on electricity supply and demand situation in your country.

Enemalta Corporation by virtue of the Electricity Market Regulations is the sole supplier of electricity on the islands. Enemalta Corporation currently operates two Power Stations. These stations with a total combined nominal installed capacity of 571 MW, are interconnected together by means of the existing grid. A combination of steam units, combined cycle and open cycle gas turbines are used in order to meet the demand of the country. Malta has no indigenous primary energy resources and therefore Enemalta Corporation relies entirely on imported fuels, mainly heavy fuel oil and gasoil.

The electricity generated in Malta in 2010 was 2.1 TWh which is a decrease of 8% compared to the record figure registered in 2007 although it is equivalent to an overall increase of 10% compared to 2000 figures. This drop in electricity demand was mainly attributed to the international financial situation as well as a result of the demand elasticity of the Maltese consumers besides other factors. Nonetheless it is anticipated that this 'shock' in demand projection will be diluted in the coming years, in fact the electricity generated in 2011 increased to 2.2 TWh.

In order to replace the aging plant at Marsa Power Station, the Corporation is investing in a 144 MW diesel engine plant which is presently being commissioned. This will improve the overall efficiency in electricity generation besides resulting in a reduction in emissions.

At present Malta is isolated from the European grid however a project to construct a 200 MW HVAC interconnection between Malta and Sicily are underway. This interconnection will increase security of supply by diversifying the sources of supply and would facilitate the integration of renewable energy sources. The interconnector will permit Malta to source electricity from generating plant benefiting from economies of scale and operating at higher efficiencies than are possible with the small plant suitable for local use, including electricity produced by low carbon or carbon neutral generators thereby assisting in reducing emissions overall. It will allow the supply of energy from new and diverse geographical sources at costs which are not directly driven by the cost of fuel oil.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020		✓		
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The Third Energy Package has been transposed. No major legal changes are envisaged at this stage.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		
Steam Thermal Units		No projects planned at this stage.
Gas Turbine Units		No projects planned at this stage.
Combined Cycle Units		No projects planned at this stage.
Internal Combustion Units		As outlined in question 1, Enemalta Corporation is currently commissioning a 144 MW new generating plant consisting of eight diesel engines.
Hydro		
Non-fuel Renewables		The local share of renewable energy sources is expected to increase in view of the 10% target as established by the climate and energy package.
New Technologies (e.g. Fuel Cells)		

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Currently Malta is isolated from the European grid. Interconnection with Sicily/Italy and supported by the EU is on the way.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation

Continuous Emissions Monitoring.

NETHERLANDS (NL)

Comments to Chapter 1

Dutch economy:

The Dutch economy recovered slightly in 2010 from the deep recession in 2009. Production grew again, especially as a result of the improved demand from abroad. Expenditure, however, still lagged behind. Final consumption of households grew very slightly and enterprises invested less than in the previous year. Final consumption of general government grew a little. The growth in unemployment came to a halt in the first half of the year, then fell sharply but remained above the average of 2009. Real disposable income of households continued to decline. The net worth of pension funds did recover to some extent, however. The government budget deficit was reduced as a result of increased income, but the government debt increased further, as the national accounts figures of the Netherlands for 2010 show. The National Accounts represent the official statistical review of the Dutch economy, available on www.cbs.nl/StatLine.

Statistics – new reference year:

The reference year for the figures at constant prices and for the volume indices and the indices of deflators has been changed from 2000 into 2005.

Statistics – new standard industrial classification (SBI 2008):

The National Accounts have implemented – according to European agreements – a new Standard industrial classification: the SBI 2008. This classification replaces the hitherto used SBI 1993. Compared to the SBI 1993, the SBI 2008 gives more possibilities to publish at a detailed level about service industries, which reflects the increasing importance of services in the economy. The standard industrial classification provides a hierarchical classification of economic activities. Because the SBI 2008 does not fit completely to the level of detail used in compiling the national accounts, the national accounts use in some cases a somewhat different classification. However, this classification is based on units ('SBI-groups') arising from the standard industrial classification.

In order to complete the tables in this chapter, the gathered figures from the National Accounts have been used. As from the year 2009 the economic figures are based on the 2005 price level.

1. General comments on electricity supply and demand situation in your country.

With regard to the supply in the Netherlands the number of plans for new thermal generation capacity in the Netherlands remains high. Between 2011 and 2020 an expansion of 13 GW is expected, which is an increase of 50%. The total generation capacity will exceed 40 GW.

The demand growth is estimated to develop 1.5% annually from 117 TWh in 2011 up to 129 TWh in 2020 based on historic growth figures of electricity consumption which correlated to economic growth. Though the estimated load values in the energy efficiency scenario of the Dutch NREAP resulting in an average growth rate of 0.9% up to 2020. In relation to the security of supply, after many years of dependence on imports, the Netherlands is now self-sufficient in electricity. There will be an interesting increase of export potential.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

These assumptions very much depending on political measures to meet emission targets.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020		✓		
Beyond 2020			✓	

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

Defined by the European directive for renewable energy the Netherlands should generate 14% of the total energy consumption in 2020 by renewable sources. Therefore the government will stimulate use of biofuels in the transport sector, use of large amounts of biomass instead of coal in the electricity sector, imports from renewable energy and use of smart techniques, grids and applications to use renewable sources in generation processes via legislation and subsidies (SDE+).
(Source: Energy report 2011, Ministry of Economic Affairs, Agriculture & Innovation, June 2011).

4. Comments on assumptions and drivers behind the forecasts on technologies

In the development of the North-West European electricity market, the attractiveness of the Netherlands as a location has been a prominent factor in producers' investment plans. As there are many projects to be built and also planned with different technologies, the investment climate must be positive, however governmental and/or local subsidies as well as licences can boost investments in a certain technology. In the table the generator companies estimations on plans for building generation capacity until 2020 are given, but without an uncertainty factor.

Technologies	No opinion	Comments on projects in your country
Nuclear	✓	0 GW
Steam Thermal Units	✓	up to 2.0 GW
Gas Turbine Units	✓	0 GW
Combined Cycle Units	✓	up to 7.6 GW
Internal Combustion Units	✓	up to 0.2 GW
Hydro	✓	0 GW
Non-fuel Renewables	✓	up to3.7 GW
New Technologies (e.g. Fuel Cells)	✓	n/a

Before 2015 new generation capacity will be built: 7,3 GW. Whether the other plans as from 2015 will lead to real investments and real commissioned generation capacity, is nowadays very much depending on political, financial and economical developments.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

This supply development is one of the reasons behind TenneTs' expansion of its transmission grid. After connecting England (BritNed) and Norway (NorNed) successfully, TenneT is planning new interconnections with Germany and Norway. So TenneT is investing considerably in strengthening the market and in integrating sustainably generated electricity. The available Dutch import/export capacity will develop from 4.2 GW in 2011 to 7.2 GW in 2018.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

The IPCC (Intergovernmental Panel on Climate Change) has developed a standard method to calculate the GHG emission per sector, which results in the Revised Guidelines Good Practice Guidance for emissions, a guideline for the Dutch calculations of GHG emissions.

7. Any other comments on the electricity sector in your country.

TenneT is investing billions of euros in upgrading and expanding the high voltage grid over the next few years. This concerns investments which were also mentioned in the Energy Report, i.e. guaranteeing the security of supply, promoting the development of the energy market and realising a transition to renewable energy. Strong international links will enable the Netherlands to benefit from price convergence and to integrate sustainably generated electricity, such as wind power and hydropower, more efficiently.

POLAND (PL)

1. General comments on electricity supply and demand situation in your country.

Till the year 2025 the production from existing brown coal and hard coal Plants, CHP's and Autoproducers – will be on the similar level as in the past. Increase of demand will be dealt with by all kind of generation technologies (coal, gas, renewable), and after year 2025 by nuclear technologies too.

All new brown and hard coal fired plant should be CCS Ready and they will be equipped with it after that CCS installations will be commercial available on the market.

Improving of electric energy efficiency, increasing its productivity, and reducing energy consumption in all sectors of the economy is still actual and very important target for national economy.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020		✓		
Beyond 2020		✓		

3. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Based on Government information first nuclear Plant is expected after year 2020 (Year 2025 more realistic).
Steam Thermal Units		All new units should be CCS Ready technology.
Gas Turbine Units		Possible development. In the future, as a source of capacity to reach Peak Demand.
Combined Cycle Units		It develop depends on the gas prices an gas availability.
Internal Combustion Units	-	
Hydro		No new System hydro power plants.
Non-fuel Renewables		Most of the capacity will be built in wind turbines.
New Technologies (e.g. Fuel Cells)		Their influence for the system will be marginal.

4. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Polish transmission system is interconnected with the neighbouring countries Sweden, Germany, Slovakia, Czech Republic, Belarus and Ukraine. Interconnections with Belarus and some with Ukraine due to connection of Polish power system with the UCTE, are temporarily out of operation. Only two interconnections operating in radial mode are left.

Until the year 2020 it is planned to start to operate a new interconnection with Lithuania to increase import capacity.

5. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Emissions values are based on the individual emissions factors received from the Power plants and CHP's Operators. Factors for Autoproducers are prepared base on the data presented in the emission statistics published by Energy Market Agency Co. (Polish name – ARE SA).

6. Any other comments on the electricity sector in your country.

- Statistical data are base on official information published by Energy Market Agency Co. (Polish name – ARE SA).

- Forecast data (year 2015 till 2025) were taken from PSE Operator S.A. "Development Program for Domestic Transmission System - Expected scenario" prepared in the mid of the year 2009 accepted by Polish Regulatory Office (URE) for acceptation and from the material prepared by PSE Operator S.A. for the Ministry of Economy in March 2011.
- Projections for year 2030 are expert estimations mostly based on assumed trends presented in the PSE Operator SA "Development Program for Domestic Transmission System – Expected scenario" and in the material prepared for the Ministry of Economy in March 2011.

In the section "Biomass production" (*Table 3.2.1*) is included production of electricity from co-fire biomass process in the conventional coal and lignite thermal Plants and CHP's.

PORTUGAL (PT)

1. General comments on electricity supply and demand situation in your country.

Demand:

Data for Portugal includes islands information (Azores and Madeira), being the total demand referred to the whole country.

Regarding data for the Mainland Portugal, in 2010:

- Electricity demand supplied through the public transmission network reached 52.2 TWh, characterized by an increase over the previous year of 4.6%. The final consumption increased 3.7%;
- Ordinary Regime Generation (PRO) plants met around 60% of the total demand while the Special Regime Generation (PRE) met 34%. The international trade balance corresponded to 5% of total demand;
- The peak demand for the connected system occurred in January, with 9 403 MW.

Regarding data for the islands Azores and Madeira, in 2010 the electricity consumption represented 3.4% of the total electricity consumption of the whole country.

In table "Annual Energy and Peak Demand", data for the Connected System does not include:

- demand of Azores and Madeira islands;
- demand of autoproducers for its own use.

Supply:

In the coming years, there are no expected major problems in meeting the forecast demand, although in a system like the Portuguese, with an increasing penetration of intermittent primary energy sources like wind, the normal operation will rely more and more on operational reserve adequacy. This reserve is mainly provided by hydro plants, which are a significant component of the installed capacity.

On the other hand, the ratios of the hydroelectric generation between dry/average/wet hydro conditions are approximately 0,5/1,0/1,5. This hydrological variability results in strong variations of the annual thermal generation and, therefore, the fuel consumption and the atmospheric emissions.

Concerning the hydro conditions, 2010 was a wet year. The hydro power generation had an increase of 88% over the previous year (dry year). Electricity output from generation units operating under special regime conditions pursued its increasing trend, mainly due to the commissioning of 331 MW in new wind farms that raised the total wind installed capacity in the whole country to 3 907 MW.

In the Mainland Portugal and also in 2010, the Ordinary Regime Generation (PRO) represented 64% of the domestic generation. The Special Regime Generation (PRE) represented 36% against 32% in 2009.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020	✓			
Beyond 2020		✓		

3. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		
Steam Thermal Units		
Gas Turbine Units		
Combined Cycle Units		In the last years, 4 units were commissioned. There are some new projects planned.
Internal Combustion Units		
Hydro		There are several projects in construction and planned.
Non-fuel Renewables		
New Technologies (e.g. Fuel Cells)		

4. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Iberian Electricity Market (MIBEL) was created in June 2007 and constitutes a joint initiative from the Governments of Portugal and Spain, aiming the construction of a regional electricity market.

The only partner of Portugal is Spain. In 2010 Portugal imported 5.8 TWh and exported 3.2 TWh.

SWEDEN (SE)

1. General comments on electricity supply and demand situation in your country.

The capacity balance is strong. New capacity built at the moment is bio fuel fired CHP plants and wind power under the current scheme to introduce 25 TWh renewable electricity 2002 to 2020. There are also capacity enlargements in existing nuclear power plants.

The demand is expected to show only minor increase. Sweden has a large share of electricity intensive industries that most likely will have only minor growth. Some 20% of the electricity demand is used for electric space and water heating in buildings. This will partly be substituted with heat pumps in mainly single family houses. The ongoing development towards more efficient appliances will also counter act an increase in electricity demand. The two main drivers for higher electricity demand is the increase in population and the possible introduction of electric vehicles.

Variation in precipitation and temperature gives variation both in the hydro power production and the demand for electric heating between different years. These variations are usually met by export/import to the neighboring countries.

In the long perspective the existing nuclear power plants will be shut down. The expected life is 50 years for the oldest plants and 50 to 60 years for the newest. Today there are no restrictions to build replacement nuclear plants on existing sites. In July 2012 Vattenfall has made a request to the Swedish Radiation Safety Authority as one step in the process to assess how existing nuclear should be replaced when the phase-out is to be initiated some time in the later half of the 2020s.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020	✓			
Beyond 2020		✓		

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

All EU directives have been implemented and there is at the moment no new legal changes anticipated. The latest change was the introduction of 4 price areas November 1, 2011.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Existing plants may be replaced after 50 to 60 years.
Steam Thermal Units		Bio fuel fired CHP plants are currently built.
Gas Turbine Units		Not considered.
Combined Cycle Units		Not considered.
Internal Combustion Units		Not considered.
Hydro		Only small size plants likely to be built. Increased efficiency in existing plants will increase output.
Non-fuel Renewables		Ambitious scheme to build new wind farms.
New Technologies (e.g. Fuel Cells)	✓	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Swedish transmission grid is connected to Norway, Finland, Denmark, Poland and Germany. Whether there is a net annual export or import depends on deviations in domestic supply and demand. Variations in precipitation have great impact on hydro power production and outages in nuclear power plants lead to loss of production. Due to a high share of electric space heating the demand varies with changes in out door temperature. Year 2000 was warm and the demand dropped 4.6 TWh while 2010 was cold and the demand was 3.6 TWh higher than expected.

The highest annual net export is 10.7 TWh (1999) and the highest net import is 12.8 TWh (2003). The accumulated net export 1940 – 2011 is however only 6.1 TWh.

As can be seen in table 4.3 there is expected to be a net export under the forecast period given normal weather and no unexpected outages in the production plants.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation..

Calculations for emissions are based on the type and amount of fuel used for electricity generation together with specific emission values in accordance with Statistics Sweden and the Swedish Environmental Protection Agency.

SWITZERLAND (CH)

1. General comments on electricity supply and demand situation in your country.

The national government worked out a new energy strategy. Concrete measures will follow 2014-2015. The forecast data for electricity production and demand are based on the middle scenario from the VSE-project “Vorschau 2012””

2. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		The national government decided (5.2011) not to replace the existing power plants after end of their life time.
Steam Thermal Units		
Gas Turbine Units		
Combined Cycle Units		
Internal Combustion Units		
Hydro		High importance (55% share of national production) ; potential for additional production is limited (+5-10%).
Non-fuel Renewables		Substantial technical potential; support by feed-in tariff.
New Technologies (e.g. Fuel Cells)		

3. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?.

The major partners are our neighbours (Germany, France, Italy and Austria). In general Switzerland has an import surplus in winter and exports in summer.

NORWAY (NO)

1. General comments on electricity supply and demand situation in your country.

Hydroelectric power generates 97 per cent of Norway's electricity production. The annual production depends on precipitation and reservoirs and may vary between 100 – 140 TWh. Total reservoir content for Norway is 82 TWh and annual average production 126 TWh. Norway's domestic gross consumption totals some 125 TWh per year. The high consumption of electricity per capita, almost 25.000 kWh per person, is partly explained by the electricity-intensive industry and partly by cold climate and use of electricity for heating.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	✓			
2015-2020	✓			
Beyond 2020	✓			

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

The renewable energy directive lays down a target for Norway's renewable energy share of 67.5 percent by 2020. This represents an increase of around 9.5 percentage points from 2005. Renewable energy will thus account for more than two-thirds of Norway's energy consumption in 2020. As part of achieving this target, a new support scheme is now in place. Norway and Sweden established a common market for green certificates 1 January 2012 with a common goal of developing 26,4 TWh of new, renewable electricity production by 2020. The new scheme will be in operation until 2035.

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear	✓	
Steam Thermal Units	✓	
Gas Turbine Units		
Combined Cycle Units	✓	
Internal Combustion Units	✓	
Hydro		Several small hydro power plants will be built the next 8-10 years due to incentives (6-8 TWh).
Non-fuel Renewables		Due to the incentives, some windfarms will be built as well (4-5 TWh).
New Technologies (e.g. Fuel Cells)		

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Norway is part of the NordPool exchange area – Norway, Sweden, Finland, Denmark and the Baltic area – and the electricity flow depends on differences between price areas. As from 2012, a common green certificate marked between Norway and Sweden has been implemented. This incentive is supposed to increase renewable production with 26 TWh the next 10 years, 50 per cent in each country. This increased production will most likely result in an increasing power surplus in the Nordic region towards 2020. There are several plans to build new cable connections to continental Europe to establish sufficient exchange capacity. The implementation is however a major challenge.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

No issue; close to 100 per cent renewable electricity production.

7. Any other comments on the electricity sector in your country.

Maintaining a well-functioning electricity market in the coming period 2012-2022 with large investments to be undertaken, reduced profitability due to power surplus (green certificates) and tighter framework conditions (Water framework directive, high taxation rates and high owner dividend expectations) is a challenge to the sector.

TURKEY (TR)

1. General comments on electricity supply and demand situation in your country.

Electrical energy in Turkey is mainly supplied from thermal and hydro resources. By the end of 2010, installed capacity had reached 49,524 MW, of which 65.2% were thermal and 32% were hydro resources. Wind and geothermal contributed 2.8%. In 2010, total electricity demand reached 210.4 TWh, representing an increase of 8.4%. Demand is expected to reach 244 TWh in 2012 and 433.9 TWh in 2020. Peak demand is anticipated to reach 38,000 MW in 2012 and 61,340 MW in 2020 from a level of 23,392 MW in 2010.[1]

Consumption per capita is expected to be 3,250 kWh in 2012 and 5,700 kWh in 2020, compared to 2,854 kWh in 2010.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	› 30 €
2012	✓		
2015-2020		✓	
Beyond 2020			✓

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

Turkey has been experiencing a wide restructuring and privatisation programme in line with EU Directives and norms towards the creation of a liberalised, transparent and non-discriminatory electricity market, which was officially opened up in 2003 after the enforcement of the Electricity Market Law No:4628 in 2001. Following the Electricity Market Law, secondary legislation has been prepared and issued in accordance with EU legislation, including the Electricity Market Balancing and Settlement Mechanism that started its actual operation by 1 August 2006. Full market opening is envisaged by the year 2011.

4. Comments on investment climate for new power plants: which are the best to build? Please provide brief comments on each technology.

Technologies	Positive	Negative	No opinion	Comments/evidence on projects in your country
Nuclear	✓			
Steam Thermal Units	✓			
Gas Turbine Units		✓		
Combined Cycle Units	✓			
Internal Combustion Units			✓	
Hydro	✓			
Non-fuel Renewables	✓			
New Technologies (e.g. Fuel Cells)	✓			

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

In 2010, power was imported from Turkmenistan via the power system of Iran with 150 MW capacity, and from Georgia on isolated region mode with 150 MW depending upon the concluded agreements, while power was exported to Syria with 250 MW capacity and to Iraq with 200 MW over the existing interconnection lines. Furthermore, within the context of the trial synchronous operation of the Turkish power system and the ENTSO-E system, power was imported from Greece with 400 MW capacity and exported to Bulgaria with 300 MW capacity as of 18 September 2010.

[1] Presently, long-term generation expansion planning studies are unable to be carried out as before, due to substantial intervention of the private sector in generation investments by the new Electricity Market Law.

6. Any other comments on the electricity sector in your country.

On 18th December 2009 an agreement was signed between HTSO of Greece, Electricity System Operator EAD of Bulgaria, Amprion GmbH and Transpower of Germany and TEIAS of Turkey on the procedural steps and measures to achieve the interconnection of the Turkish power system with the ENTSO-E Continental Europe Synchronous Area, with the aim of moving to the synchronous parallel connection of the Turkish power system to the ENTSO-E system and depending on the positive result of technical studies.

After the completion of tests in island mode of operation, a three-party memorandum of understanding was signed in March 2010 between TEIAS, ESO EAD and HTSO specifying the actions to be taken during a trial parallel operation period. Trial operation of the Turkish power system to the ENTSO-E system with synchronous parallel connection for a certain period began as of 18 September 2010.

In addition, Turkey takes part in a number of regional interconnection projects. An interconnection project between eight countries – Egypt, Iraq, Jordan, Lebanon, Libya, Palestine, Syria and Turkey – is largely completed. Another important project in which Turkey participates is the Regional Transmission Planning Project financed by US-AID for Black See Economic Cooperation (BSEC). The project's first and second stages have been satisfactorily completed and the third stage was started by 2010.

SERBIA (RS)

1. General comments on electricity supply and demand situation in your country.

After a temporary decrease during 2009, average annual consumption growth in the last two years was about 1%. Consequently, Serbian gross consumption amounted to 34.07 TWh in 2010 and 34.45 TWh in 2011.

In recent years, there was a somewhat larger increase in the summer peak loads, but the annual peak load is still in the winter period (6579 MW in 2010, and 6372 MW in 2011), partly due to the cold climate and use of electricity for heating.

Regarding the generation mix, conventional thermal power generation has the largest share (nearly 70%). There is also significant hydro generation (about 30%), while RES have played a very limited role so far.

2. What are your assumptions on the evolution of CO_2 prices in the future? Please tick the correct assumption in the table below.

CO_2 Prices	10-20 €	20-30 €	30-50 €	› 50 €
2012	‹ 10			
2015-2020		✓		
Beyond 2020			✓	

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

In early 2012 Serbia was granted the status of an official EU membership candidate. The approval is just an inauguration of what will be a long and challenging process. Serbia has made great efforts to harmonize its laws with the EU regulations. The continuation of the process will bring about new obligations, primarily in terms of the date for the EU accession talks.

After initial unbundling in the electricity sector and steady progress in reforms and implementation of EU legislation, Serbia adopted the new Energy Act in July 2011.

The status, authority and independence of the Regulatory Agency in terms of tasks and responsibilities over the internal market has increased. The Agency is responsible for: price regulation including approval for regulated prices; licencing energy entities for the performance of energy activities; energy market monitoring; approval of the rules for cross-border capacity allocation; approval of TSO and DSO grid codes; approval of market and organized market codes; approval of a ten-year network development plan; service and supply quality monitoring; deciding appeals and implementation of international agreements etc.

In Serbia, the market consists of two segments, regulated market and competitive markets.

Public supply right is restricted to households and small enterprises by 2015. In the transition period, the new Energy Act envisages the suspension of the right of eligible (large commercial) customers to be supplied under the regulated tariffs. This is foreseen from 1 January 2013. The entire electricity market liberalisation is to follow in January 2015 at the latest.

RES institutional framework is relatively well developed. The applicable Serbian promotion scheme guarantees RES – electricity generators a 12-year power purchase agreement with state-owned power utility 'Electric Power Industry of Serbia' under the incentivized feed-in tariffs.

A substantial list of acts and regulations are under preparation (Regional Energy Strategy, National Energy Strategy, Rational Energy Use Act, Renewable Energy Act etc.).

4. Comments on assumptions and drivers behind the forecasts on technologies.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		No perspective for nuclear.
Steam Thermal Units		Old conventional low efficient thermal units will be gradually decommissioned by 2020 (900 MW) and replaced by new highly efficient lignite and gas fired units.
Gas Turbine Units		Investors prefer to build CCGT instead of GT.
Combined Cycle Units		CCGT will be a preferred option as reserve, back-up and peaking plants. By 2015, the new 450 MW gas unit will begin operating in Serbia.
Internal Combustion Units		Mainly for industrial use .
Hydro		Increase can be expected in both large and small hydro. Also there are projects for a new HP pumping plants.
Non-fuel Renewables		There is a high potential and favourable government support for RES plants (Wind, PV).
New Technologies (e.g. Fuel Cells)		No significant impact on power generation in the visible future.

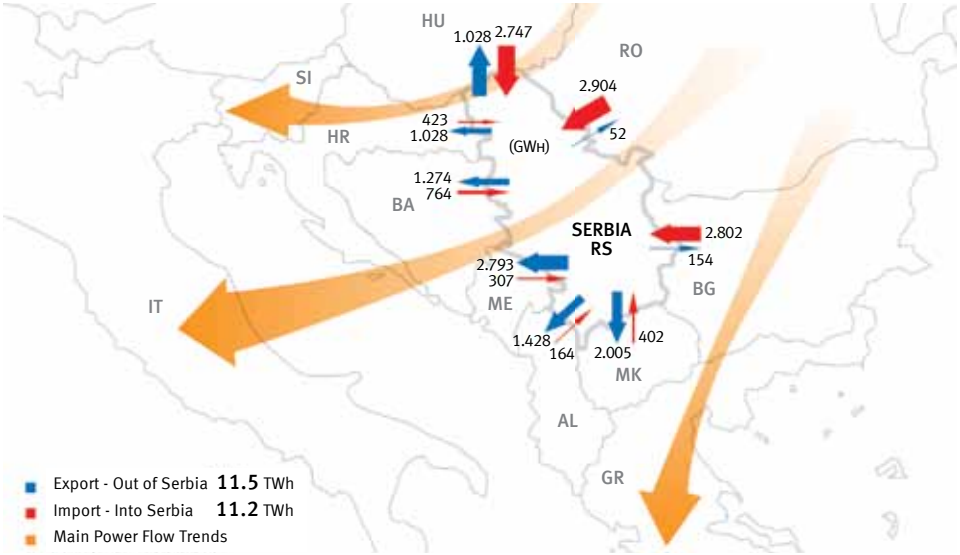
5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

When it comes to electricity balance, Serbia is almost self-sufficient, with minor seasonal deviations of shortages and surpluses. Serbia bordering with eight neighbouring power systems occupies a central position in the Balkan region and it represents a crucial factor in the regional energy market establishment.

Based on the highlights derived from the ENTSO-E's Regional Investment Plan (the 8th region[2]) stating that 'the main characteristic of the transmission network in the Continental South East region is inter-dependency', cross border exchanges between power systems significantly influence power flows in the rest of the network.

Transit power flows in the predominant East – West and North – South directions.

Commercial Power Flows in 2011



Historically there are electricity imports (mostly transit) from Bulgaria and Romania and exports to Greece and Italy. This trend (East to West and North to South) is not expected to change significantly in the coming years but price convergence is expected to gradually reduce the profit margin of cross-border trading.

[2] The 8th region (CSE Region) covers Hungary, Slovenia, Romania, Serbia, Bulgaria, FYR of Macedonia, Montenegro, Bosnia and Herzegovina, Croatia, Italy and Greece.

One of the main aims of investments in Serbia will be to strengthen the corridors through Serbia and to integrate conventional and large amounts of future RES.

Foreseen investments in infrastructure of national/regional interest in Serbia are focused towards:

- 400 kV interconnection between Serbia and the FYR of Macedonia
- 400 kV interconnection between Serbia and Romania
- 400 kV interconnection in triangle Serbia, Montenegro and Bosnia and Herzegovina

The newly established project, 1000 MW undersea DC cable between Montenegro and Italy (to be completed by 2015) will affect the chances of Serbia to transit electricity to Italy.

The above projects are a backbone of the overall regional supply security, market integration, connections of the new conventional and RES generation and the possibility to straighten transmission capabilities in the directions from East to West and from North to South of the region and further to Italy as well as other Western Europe countries.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Annual SO_2 and NO_x air emissions are calculated based on individual (discontinuous) measurements (carried out by the authorized institutions). The calculation is based on the generating units' utilization time, flue gas flow and SO_2 and NO_x mass concentrations reduced to normal conditions (depending on the type of fuel fired). In future, measurements will be based on continuous monitoring (software package).

7. Any other comments on the electricity sector in your country.

According to various assessments and studies, Serbia has a large and diverse renewable energy potential.

Total estimated RES potential in Serbia is approximately 4,3 Mtoe (biomass 49%, hydro 30%, solar 13%, wind 4%, geothermal 4%). Utilization of this potential is currently at the level of 18%, but it is almost entirely based on electricity generation in large HPPs.

The total hydropower potential in Serbia is some 17.000 GWh (1.5 Mtoe), out of which some 60% is currently utilized. The unused potential (0.6 Mtoe) is located mainly in the catchment areas of the Drina and Morava rivers and it can be utilized for large as well as for small HPPs. Hydro generation still has the lowest carbon footprint and the highest conversion efficiency. It also contributes to security of supply and the deployment of other renewable energy sources.

Serbia has expressed a keen interest in promoting regional cooperation in the energy sector and has initiated a proposal for a regional strategy within the Energy Community.

The Energy Community Ministerial Council decided in 2011 to prepare its first Regional Energy Strategy[3] in order to integrate national priorities into a larger vision. The transition into an integrated SEE market and energy efficient and low-carbon economy will require significant investments into energy generation, transport and storage in the Energy Community.

Preliminary regional analyses indicate that between 2012-2020 generation capacity is forecasted to grow by approximately 12.5 GW (electricity), which represents an increase of above 60% compared to the 2009 capacity. To this end, Serbia's contribution is some 25% (3.2 GW), requiring investments of about EUR 5 billion.

Serbia is ready to offer several very attractive regional generation projects, especially pumped-storage facilities (Djerdap 3 and Bistrica PSHPPs).

Still the most critical point is the market opening and integration into the regional and single European market.

Local regional markets are on average underdeveloped and still rely on bilateral trade.

An SEE wholesale market coupled to other European power markets is expected to deliver less volatility to market prices, improve market liquidity, and enable more efficient use of existing cross-border capacity, while establishing a reliable and trustworthy price reference for the region and enhancing investor confidence.

Due to the high portion of coal-fired generation, Serbia will be sensitive to CO_2 prices.

Ambitious transition to low carbon economy is no easy task for energy sector in Serbia. Serbia has to choose a coherent path to become a part of the EU integration process (where climate policy should determine energy policy) on one side, and to obtain security of supply, cost efficiency and responsible energy mix without eroding national energy sovereignty, on the other side.

[3] The Regional Energy Strategy covers all nine Contracting Parties of the Energy Community: Albania, Bosnia and Herzegovina, Croatia, FYROM, Moldova, Montenegro, Serbia, UNMIK/Kosovo, and Ukraine.

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