

POWER STATISTICS & TRENDS 2013 full report

2013



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

POWER STATISTICS & TRENDS 2013 Full report

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POWER STATISTICS & TRENDS 2013

2013



The 2013 edition of Power Statistics and Trends presents a comprehensive and independent analysis of the European electricity sector, based on the latest available data from 33 EURELECTRIC member countries. It provides an overview of the most relevant factors shaping the present and future of the European electricity sector.

Power Statistics and Trends 2013 highlights the most significant developments in the period 2010-2012 and provides an outlook of major trends up to 2030. The full report also includes data from 1980, 1990 and 2000, enabling a view of the electricity sectors evolution over three decades.

Integrated thematic coverage includes policy, economic, technology and environmental areas, providing a comprehensive picture of current issues and expected trends.

Country data is provided by 27 EU Member States¹, as well as Norway, Turkey, Switzerland and an increasing number of Energy Community countries, currently including Bosnia-Herzegovina, Serbia and Ukraine. Power Statistics and Trends therefore offers a unique, extended European analysis.

Findings of Power Statistics and Trends are primarily based on EURELECTRICS's own data, submitted by a network of country experts. These statistics reflect country specific perceptions of the respective electricity industries. In particular, the forecasts are not necessarily official national forecasts, but are best engineering estimates. Annually updated forecasts mirror the changing policy and economic environments.

We would like to express our gratitude to all contributing country data experts.

 $^{^{\}scriptscriptstyle 1}\,$ Croatian data was not available for the 2013 edition.

Key Messages 2013

1

ENERGY POLICY CONTEXT MEMBER STATES OPT FOR DIVERGING POLICIES

The current period is characterised by regulatory uncertainty and increased national intervention, leading to a slowdown – if not setback – of energy market integration in Europe.



DEMAND TRENDS STAGNATING TOGETHER

Demand in 2012 stagnated at the 2011 level, after a significant 2% decrease from 2010 to 2011. This overall picture of stabilisation conceals widely varying developments across the region, with some countries experiencing a growth in demand, others experiencing a decline, and yet others reporting stagnating electricity demand.

3

GENERATION TRENDS EUROPE GOES BLACK AND GREEN

The picture for different electricity generation technologies is one of contrasts: the EU appears to have shifted from the recent trend of 'RES plus gas' to 'RES plus coal'. From 2011 to 2012 generation from renewable resources increased by 7% and coal-fired generation grew by 13%. This was accompanied by a significant 23% drop in gas-fired generation. Nuclear generation also declined by 2.8%. *Power Statistics and Trends 2013* reveals stagnating demand, stationary emissions and an increase in subsidy driven capacity additions – although this trend is slowing down. Replacing the preference for RES and gas, in evidence since 2009, technology choice seems to have shifted to a preference for black and green, i.e. coal and renewables. *Power Statistics and Trends 2013* also reveals significant divergences across countries, most notably in electricity demand. This trend is mirrored in diverging national policies, reinforcing the currently observed energy policy fragmentation within the EU.



INSTALLED CAPACITY TRENDS *RES STILL INCREASING, ALBEIT AT A SLOWER PACE*

RES capacities continued to increase in 2012, albeit at a slower year-on-year rate of 11%, compared to 15% in 2011. A common characteristic of added RES capacities throughout the whole period is that they are subsidy driven. The overall slowdown of RES growth is expected to continue as national RES support policies continue to change.



POWER PRICES IN EUROPE *surging charges*

Electricity bills are on the rise, propelling affordability and industrial competitiveness concerns to the fore of the energy policy debate. Policy costs imposed through taxes and levies weigh considerably on retail prices, growing three times faster than other price components and now accounting for more than a quarter of the average household customer bill.



ENVIRONMENTAL TRENDS *STATIONARY CO*₂ *EMISSIONS*

Although electricity consumption stagnated and low-carbon generation increased in 2012, the increase in coal-fired generation meant that CO_2 emissions did not fall. For 2013, sources² predict a black and green scenario, in which emissions are expected to rise, due to the policy choices of major EU economies. EURELECTRIC members do not believe this trend to be sustainable, anticipating a switch from coal to gas by 2020.

² Source: Platts data 2013 – quoted in Franke, Andreas, German Coal extends dominance in Power Mix, European Power Daily, October 10th 2013.



ENERGY POLICY CONTEXT MEMBER STATES OPT FOR DIVERGING POLICIES

GREY CLOUDS OF REGULATORY UNCERTAINTY

The environment for European utilities has been difficult throughout the reporting period. Nevertheless, there have also been some positive signs, for instance a new concern in Brussels with costs and competitiveness, with markets and fragmentation. The innovation agenda for energy is being reconsidered; research and development policies are likely to be freed from their current isolation and better integrated into general energy policy.

On the downside, regulatory uncertainty - both on national and EU level – has severely impacted all generation technologies, including also RES. The recession has hit demand and is one of the reasons why utilities' current business model is increasingly questioned. Subsidised renewable power generation has led to a decreasing wholesale market price, averaging €40 per MWh for Central West in the reported period, putting off investors all across Europe. At the same time, retail prices have continued to rise, primarily driven by increasing taxation.³ Germany, for instance, can expect to see spectacular increases of up to 30-35%. Even in the face of high retail prices, however, customers remain largely unresponsive. This is unsurprising: the only part of the bill that would incentivise them to shift demand - the energy component - is becoming less relevant compared to skyrocketing taxes and levies. As a result, investment in demand response programmes is slow to get off the ground.

The following map reveals that as many as 13 EU member states have opted for retroactive changes or moratoria to their RES support schemes.

FIGURE 1: OVERVIEW OF RES SUPPORT CHANGES IN EUROPE⁴

Retroactive change
 Moratorium
 Other legal reform



³ Source: Boston Consulting Group, Towards a new balance of Power. Short Discussion, September 2013.

⁴ Source: EURELECTRIC 2013.



Utilities, which were previously considered safe havens for investment, have lost their attractiveness compared to other sectors, as the following figure displays.⁵

European utilities have called on European and national policymakers to provide guidance and orientation by sticking to a consistent and transparent long-term regulatory framework, instead of adopting boost and bust policies and intervening into markets by picking winning technologies.

Over the past year, utilities have engaged through EURELECTRIC's Innovation Action Plan in a both introspective and forwardlooking exercise that put technologies, business models and processes, as well as innovation policies, under closer scrutiny.⁶ In cooperation with European policymakers EURELECTRIC promotes innovation as a key element for the energy transition. New opportunities have been identified, in particular in the 'new downstream' arena, an opportunity potentially worth annually 70bn by 2030, making up for losses in traditional business segments. The right regulatory environment is decisive for moving from promise to practice on this issue.

Commission agenda 2014-2018: Competitiveness, fragmentation, post 2020

The term of the current European Parliament and Commission ends in 2014. The European Parliament elections around 22 May 2014 might yield results that grant seats to several anti-EU nationalists, making a common European approach to energy policy increasingly difficult.

The energy policy agenda for the next Commission includes establishing the 2030 framework, encompassing a decision on a possible continuation of today's three-target approach (on renewables, CO₂ reduction and energy efficiency), as well as action to reinforce the EU Emissions Trading Scheme (ETS). It includes an overarching concern with EU competitiveness, energy prices and costs, especially compared to other geographies. This concern has increasingly moved centre-stage and could be termed a new priority, after liberalisation (starting in 1990), and environment and climate concerns (starting in 2007/9). The Competitiveness Summit in February 2014 and the current in-depth analysis by DG Energy on energy costs and prices,

FIGURE 2: UTILITIES STOCK MARKET PERFORMANCE⁷



European utilities'stock market performance has recently deteriorated...

⁵ For a detailed analysis of the investment situation in the EU, see EURELECTRIC's Investment Action Plan Brussels December 2012.

⁶ Source: EURELECTRIC, Utilities Powerhouses of Innovation. Brussels May 2013.

⁷ Source: Data Stream, Mc Kinsey Industry Vision.

PERCENT PER YEAR

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underline this new trend. In line with this development are the more market-oriented wording of the DG Competition proposals on state aid reform and DG Energy in their guidance package on public intervention, released in October 2013.

At the same time, the new Commission will have to find an answer to the centrifugal tendencies within the EU, which is experiencing more and more national proposals and legislation on energy policy. The Commission could opt either for a minimalist approach by trying to coordinate such national approaches, for a medium one in trying to achieve compatibility among member states, or a maximum solution in setting the agenda and taking a proactive stance. The 2030 framework and the discussion around it will be seen as the crucial test in this respect.

Without an explicit European energy policy competence and strategy, the EU risks, over the period 2014-2018, losing control and reversing progress made on market integration in previous decades, opening the door even wider for the renationalisation of energy policy and in many cases return to regulation. This double failure on the liberalisation agenda, i.e. progressively losing sight of Europe and the market, will translate into high additional costs for European citizens as well as growing disparities between member states in terms of security of supply, climate ambitions and prices.⁸ At the same time, a one size fits all strategy also cannot be the name of the game: European energy policy 2.0 has to take greater account of regional specificities and regional integration as one step towards the internal energy market. The regions identified by the EU energy regulators, as well as the Pentalateral Forum, provide useful, but so far largely unexploited instruments in this regard.

THE AGENDA 2013-2014: STATE AID REFORM, GUIDANCES AND 2030

State aid modernisation – a renewed focus on markets and costs?

With RES now accounting for 22% of European power generation, and in light of national considerations to support specific generation technologies such as nuclear through changing market designs, DG Competition has opened up a draft of its new *Guidelines on Environmental and Energy Aid for 2014-2020* for consultation. The guidelines are thus not just an amendment of the existing ones, but represent a significant change. Their scope is much more extensive, covering for instance carbon capture and storage (CCS), energy infrastructure, and capacity mechanisms. The new guidelines enter into force in mid-2014.

When it comes to RES, the overhaul of the guidelines will implicitly lead beyond the case law of Preussen Elektra, in which the small share of RES in the system was used to justify RES support. The common concern of stakeholders and policymakers will now be to avoid retroactive change. This is not an easy task considering the existing inflexible support schemes as well as their long duration of often 15 to 20 years.

Long-term projections highly controversial: the 2030 agenda

The 2030 discussion is about the post 20/20/20 agenda: which new targets should be set for the next decade? What is the assessment of the 20/20/20 three targets experience – in particular the problem of interactions between the different instruments delivering each target. The ETS – a truly EU-wide harmonised approach – is being undermined by the national implementation of the Renewables Directive and the Energy Efficiency Directive. And not only are these national policies very loosely harmonised at best, but they also strongly influence price formation in the ETS allowances market. This raises a key question whether a strong ETS would be a better way to promote renewables and energy efficiency.

A consultation run by the European Commission on its Green Paper has revealed a largely shared "ETS plus" stance, hesitance towards a new energy efficiency target, and contrasted views on the RES target. From an industry perspective an ETS plus approach is the preferred choice: a strong ETS as the key driver plus strong RDD support for immature technologies. If ever a

⁸ See here for example the EC commissioned report Booz&Co 2013 Benefits of an integrated European Energy Market.



RES target would find consensus it is indeed crucial to set the instruments for reaching it in such a way that they are European, market based and include the lessons learnt from the very costly practice since 2009. Clarity for the next decade is vital for investment decisions by the sector and should come timely. De facto final decisions both on ETS and on 2030 are to be expected at earliest around 2016, when the new Commission is fully functional.

Fragmentation of energy policies: an internal energy market by 2014?

2013-14 has seen national energy policies increasingly diverge, with governments elaborating various proposals for national energy market design, struggling with national RES support schemes, or taking national measures to reduce carbon emissions. Lip service is paid to Europe and the EU internal energy market, sometimes as a footnote, but often little thought appears to be given as to how the national measure could be integrated into the wider EU energy market context. As a result, current developments in several member states are not in line with the objective of an integrated EU electricity market. Attempts to achieve energy self-sufficiency, state interventions impacting

wholesale and retail prices, discretionary taxation and divergent national approaches on carbon prices place obstacles to the development of the internal market.

Greater attention should also be paid to alleviate the multiple overlapping energy priorities, uncoordinated national RES support schemes, national CO_2 taxes, regulated end user prices and other incentives and restrictions which are the root cause for the current energy policy failures.

EURELECTRIC believes that the EU internal energy market (IEM) is now genuinely at a turning point. Either the EU rapidly changes course and pushes member states to align their various national policies and targets, which overlap – or even contradict – EU policies. Or we will very soon witness a deterioration of the IEM, due to insufficient action to prompt a decisive move towards liquid, well-functioning electricity markets.

In light of these worrying trends DG Energy has published legally non-binding guidance on RES support, on RES cooperation mechanisms, and also on generation adequacy and demand response. Its goal is to support member states with reforms and to foster a European dimension and certain convergence.



⁹ Source EURELECTRIC Power Statistics and Trends 2013.



DEMAND TRENDS *STAGNATING TOGETHER*

After years of highly volatile evolution, EU-27 demand in 2012 stabilized at the 2011 level. However, overall stagnation conceals diverging country development patterns. Some countries experienced an increase in electricity demand, most notably Bulgaria (9,8%), Latvia (6,9%) and Malta (4,5%) while countries such as Belgium (-8,5%), Cyprus (-8%) reported a large decrease. The EU's bigger economies also show diverging demand evolution. Germany, Italy, the Netherlands and the United Kingdom reported contractions exceeding 2%. Demand in Spain and Poland fell by more than 1%, meanwhile France and Sweden reported increases. Combined demand in Norway, Switzerland, Turkey and the EU-27 countries marginally increased, mostly due to the 5% and 10% increase in Norway and Turkey respectively.

Demand forecast 2020

Demand for the EU-27 is estimated to grow from 3081 TWh in 2010 to 3250 TWh in 2020 at an annual growth rate of 0.5%.

In 2012 demand for 2020 was forecasted at 3,327 TWh, showcasing a pessimistic 5% decrease compared to the 2011 estimate. *Power Statistics and Trends 2013* reveals similar expectations. Demand in 2020 is estimated at a 2% lower level than in the previous edition. Forecasts reflect *inter alia* the effects of the economic crisis and the increasingly prominent role of energy efficiency policies implemented throughout Europe.

Demand is forecasted to decrease most notably in Germany from 568 TWh in 2010 to 507 TWh in 2020. The United Kingdom (-0.91% p.a.) is expected to consume slightly less electricity by 2020.

The graph displays typical demand development patterns in selected EURELECTRIC member countries. While demand is expected to fall by 1.8% p.a. in Germany, it is predicted to stagnate in Sweden, with a marginal increase of 0.13% p.a. in the observed decade. Turkey is forecasted to see an annual increase of almost 3%. Germany and Turkey have been reporting demand development trends in line with the 2020 predictions since 2010.



FIGURE 4: DEMAND DEVELOPMENT IN SELECTED COUNTRIES¹⁰

¹⁰ Source: EURELECTRIC Power Statistics and Trends Data Base.



Demand evolution patterns are expected be highly divergent across countries in Europe. Countries showing increase of more than 3% are geographically spread across Europe, however common characteristics are smaller economies and population. These countries include Estonia (3.7% p.a.), Cyprus (3.33% p.a.), and Czech Republic (3%). Growth will be significantly slower in countries such as Belgium (0.47% p.a.) or Italy (0.02% p.a.).

FIGURE 5: DEMAND IN THE EU27¹¹

Country		TOTAL DEM	and in TWh		Year-O	N-YEAR	Annual Growth Rate
	2010	2011	2012	2020	2011/2010	2012/2011	2020/2010
Austria (at)	65	65	65.6	72.8	0.00%	0.92%	1.20%
Belgium (be)	90.1	87.4	79.9	94.3	-3.00%	-8.58%	0.47%
Bulgaria (bg)	32.50	34.40	37.8	52.7	5.85%	9.88%	6.22%
Cyprus (cy)	4.80	5.00	4.60	6.4	4.17%	-8.00%	3.33%
CZECH REPUBLIC (CZ)	59.30	58.60	58.80	77.5	-1.18%	0.34%	3.07%
Germany (de)	568.50	562.90	551.20	507	-0.99%	-2.08%	-1.08%
Denmark (dk)	36.00	33.80	33.30	38.2	-6.11%	-1.48%	0.61%
Spain (es)	280.00	273.00	271.00	340	-2.50%	-0.73%	2.14%
Finland (fi)	87.70	84.20	85.20	99	-3.99%	1.19%	1.29%
France (fr)	513.20	479.20	489.50	507.9	-6.63%	2.15%	0.38%
United Kingdom (uk)	380.20	369.80	371.90	345.7	-2.74%	0.57%	-0.91%
Greece (gr)	59.20	58.60	58.40	64.7	-1.01%	-0.34%	0.93%
Hungary (hu)	39.80	40.10	39.90	45.5	0.75%	-0.50%	1.43%
Ireland (ie)	26.10	25.00	24.50	31.40	-4.21%	-2.00%	2.82%
Italy (IT)	330.40	334.60	328.20	329	1.27%	-1.91%	0.02%
Lithuania (lt)	10.30	10.40	10.60	12.4	0.97%	1.92%	1.70%
LUXEMBOURG (LU)	6.70	6.60	6.80	7.2	-1.49%	3.03%	0.59%
LATVIA (LV)	7.30	7.20	7.70	8.9	-1.37%	6.94%	1.56%
Malta (mt)	2.10	2.20	2.30	2.4012	4.76%	4.55%	0.43%
Netherlands (nl)	117.10	118.20	115.10	124.7	0.94%	-2.62%	0.83%
Poland (pl)	142.00	143.30	142.40	160.7	0.92%	-0.63%	1.29%
Portugal (pt)	55.00	53.30	51.50	52.7	-3.09%	-3.38%	0.23%
Romania (ro)	53.40	54.90	54.40	64.2	2.81%	-0.91%	1.80%
Sweden (se)	147.00	140.30	142.50	144.4	-4.56%	1.57%	0.13%
Slovenia (SI)	11.70	12.40	12.6313	15.8	5.98%	1.85%	2.51%
Estonia (ee)	7.431	7.155	7.327	10.1	-3.71%	2.40%	3.78%
Slovakia (sk)	26.436	28.006	28.663	35.2	5.94%	2.35%	2.28%
TOTAL EU27	3,159.27	3,095.56	3,081.72	3,250.80	-2.058%	-0.447%	0.55%

¹¹ Source: EURELECTRIC Power Statistics and Trends Data Base.

¹² Source: EURELECTRIC estimate.

¹³ Source: Global Data Power e Track Data Base (highlighted data).



TECHNOLOGY TRENDS EUROPE GOES BLACK AND GREEN

Total generation in the EU-27 marginally increased in 2012, after a remarkable decrease of 5% in 2011.

Renewable based generation accounted for 22,3% of the electricity fed into the grids of the European Union in 2012, a year-on-year increase of 7%. By the end of the decade renewables are predicted to be the second largest component of the EU energy mix, accounting for 34% of the total generation.

FIGURE 6: ELECTRICITY GENERATION SHARES IN THE EU27 COUNTRIES¹⁴







ELECTRICITY GENERATION EU-27 – 2020



¹⁴ Source: EURELECTRIC Power Statistics and Trends Data Base.



Even though nuclear generation decreased by 2.8% to 835 TWh, from 2011 to 2012, due to stagnating overall generation, its share remained almost constant at the 2010 level. The share of nuclear is predicted to fall slightly by the end of the decade, but it will nevertheless still account for a quarter of total generation.

Fossil fuel fired generation decreased by 4% in the same period and made up less than half of total generation for the first time in the history of the EU. Natural gas- fired power generation accounted for the lion share of the reduction, decreasing by 23% (or 165 TWh). In addition coal prices have dropped by more than a third over 2012-2013, and fell to a year low of \notin 60.60 for a metric ton.¹⁵ Gas prices have remained stable since 2011. The significant drop in the use of gas for electricity generation occurred mostly to the benefit of coal market shares. While generation by all conventional technologies decreased, coal-fired generation increased by 13% (or 70 TWh). In other words, European electricity generation shifted from gas-fired towards coal-fired generation. The latter generation proved it was a prominent player in major European markets, as it rose by 22% in Spain and 31% in the United Kingdom from 2011 to 2012.

Figure 7 displays historic development and forecasted evolution of electricity generation in the EU27 countries. Looking beyond EU borders, total electricity generation in Norway, Turkey and Switzerland grew significantly faster than in the EU-27. Aggregated generation grew by 15% in Norway, 10% in Turkey and 9% in Switzerland. Stagnating demand, slightly decreasing nuclear generation and several other trends in the Ukraine were similar to those in the EU. Nevertheless, total generation grew by double the EU figure due to increased exports.



FIGURE 7: GENERATION BY PRIMARY ENERGY 2030 OUTLOOK IN THE EU 27¹⁶

¹⁵ Platts data 2013 – quoted in Franke, Andreas, German Coal extends dominance in Power Mix, European Power Daily, October 10th 2013.

¹⁶ Source: EURELECTRIC Power Statistics and Trends Data Base.



Forecasts by EURELECTRIC members reveal low expectations for significantly higher carbon prices by 2020

Assumptions by EURELECTRIC members regarding the role of coal and gas in the energy mix of 2020 are especially noteworthy in the light of the above analyzed recent developments. They expect the ratio between coal- and gas-fired generation to shift to 1:1.8, with 307 TWh of coal- and 560 TWh of gas-fired generation in the EU-27 in 2020.

This mosaic of insignificant carbon price signal, cheap coal, expensive gas and reduced demand, combined with low wholesale prices and subsidised RES has pushed gas out of the market. Since its qualities as back-up generation are as uncontested, as is its climate advantage compared to unabated coal, gas-fired power plants play a central role in discussions on strategic reserve and capacity remuneration mechanisms. The most prominent example is the newly set up state-of-the-art Irsching gas plant in southern Germany, which became a reserve shortly after commissioning.

Despite the strong support of EURELECTRIC members for strengthening the ETS, confidence in this instrument without reform is low. According to Power Statistics and Trends 2013 members do not expect CO_2 emission prices to reach even as high as \in 30 by 2020. Price level of \in 30 was foreseen for trading period 3. This means that, CO_2 prices are currently predicted to play no major role in the increasing importance attributed to gas-fired generation. ETS reform could change this situation. The driver for more gas would hence not be the ETS, but rather various effects of the Industrial Emissions Directive (IED) and newly set up capacity markets supportive to gas.



FIGURE 8: ALTERED GAS – COAL RATIO IN ELECTRICITY GENERATION BY 2020¹⁷

¹⁷ Source: EURELECTRIC *Power Statistics and Trends* Data Base.



CAPACITY TRENDS *RES CAPACITIES AND SUPPORT COSTS STILL ON THE RISE*

Between 2011 and 2012, installed capacity increased by 2% throughout the EU. Unsurprisingly, renewable technologies accounted for the full increase, as fossil fuel fired capacities fell by 3%, nuclear capacities marginally decreased and installed RES capacities grew by 10%.

Looking at the 15% increase in the previous period, it becomes clear that the subsidy-driven RES capacity increase was sustained, but continued at a slower pace. This slowdown can hardly be attributed to the observed demand drop, as in most markets RES are not exposed to market signals. Instead, RES capacity development is mainly shaped by regulatory changes and increased uncertainty regarding future amendments of existing support schemes.

The share of renewable energy totaled 32.9%, an increase of 2.8 percentage points compared to 2011. Installed RES capacity grew most prominently in Italy (+15%) and Germany (+14%).



FIGURE 9: INSTALLED CAPACITY SHARES IN THE EU-27¹⁸



¹⁸ Source: EURELECTRIC *Power Statistics and Trends* Data Base.



Much like the support schemes themselves, the support amounts vary widely across the EU. The following graph displays the aggregated cost of RES support in 19 EU countries, totalling €26.3bn in 2010 and reaching €38bn in 2012.¹⁹ High costs for RES support raise increasing concerns in the light of budget constraints and EU-wide austerity measures. EURELECTRIC sees the development of RES in the EU as an important diversification of the power mix as well as a contribution to the climate agenda, but disagrees with the chosen path, which has led to cost overrun and market distortions, ultimately threatening power systems and RES development itself.



FIGURE 10: AMOUNT OF RES SUPPORT IN EU COUNTRIES IN 2011²⁰

¹⁹ Source CERA 2013.

²⁰ Source: EURELECTRIC, CEER – Status Review of Renewable and Energy Efficiency Support Schemes in Europe. EURELECTRIC calculations for Poland, no data available for Danish average support amount.



Taxes and levies increasingly weigh on power bills, growing faster than any other price component. 2013 will be remembered as the year during which affordability and competitiveness were propelled to the fore of the energy policy debate. Surging bills, electricity price freezes or price brakes have become commonplace in the lexicon of policymakers, industry representatives and citizens alike.

The lasting recession and the gloomy short-term economic outlook are putting strains on Europe's ability to sustain its transition to a low-carbon energy system. Reflecting this, attention in policy circles has shifted from debating the virtues of a greener and smarter power sector to considering the impacts of Europe's energy and climate 'great leap forward' on household and business budgets.

Indeed, household bills are on the rise. While public opinion often assumes that Europe's utility companies must be

overcharging their customers, data from the Commission's statistics office Eurostat²¹ show that electricity companies are not the prime culprits.²²

Eurostat's Data Base does not contain a detailed bill breakdown, but data on the three main components are nevertheless provided. These are: energy and supply, network costs, and taxes and levies. As shown in Figure 11, all different elements are actually contributing to the current price surge. However, the increase in the fiscal component is by far the strongest.

For customers consuming between 2,500 kWh and 5,000 kWh per year, energy/supply and networks costs went up by about 9.5% and 11.5% respectively between 2008 and 2012, in line with the evolution of general price indexes. However, the increase in taxes and levies is almost three times as big, standing at 29%. For customers consuming less or more electricity the tax surge was even bigger, increasing by 32% and 33% respectively.



Figure 11: Average electricity bill for EU-28 household customers consuming between 2,500 KWh and 5,000 KWh per year²³

²¹ To comply with competition law, EURELECTRIC does not directly collect information on electricity prices. Instead, we rely on impartial data from third parties, e.g. Eurostat.

²² While Eurostat strives to provide harmonised data, this is not always possible as member states account for different expenditures under different headings. For instance, even though the majority of member states include renewable support within the taxes and levies component, Spain includes it in network charges and the UK in energy and supply. This limits the comparability of data.

²³ Source: Eurostat, Energy and Environment Data Base, retrieved 7 October 2013.

This should not come as a surprise: electricity bills are too often seen by governments as vehicles underpinning their fiscal policies, as the recent introduction of so-called 'Robin Hood' taxes in a number of EU countries has revealed. Furthermore, taxes and levies are used to fund public support for renewable energies, domestic fossil fuel mining and use, cogeneration, etc. Moreover, the true scale of the tax share is often even bigger than the official tax component would seem to suggest: taxes, other than consumption-based taxation, are often included under energy and supply costs.

Since 2008 none of the EU member states has reduced taxes and levies for customers consuming more than 2,500 kWh/year,

while Belgium (-2.6%), Ireland (-1.5%) and Luxembourg (-0.4%) all reduced charges for customers consuming less.

Even more striking: while the EU-28 average increase stood at 29%, some member states actually experienced significantly larger rises of the tax component. Among those, the biggest increase was recorded in Latvia (394%), followed by Portugal (108%), Greece and Estonia (both at 82%), Romania (80%), and Spain (74%).

As a result, the part of the bill set by market forces today accounts for only 43% of the total electricity bill invoiced to customers.

Figure 12: Average variation of bill's main components for EU-28 household customers consuming 2,500 kWh – 5,000 kWh per year (2008-2012)²⁴



Figure 13 : Weight of components on average EU-28 electricity bill for household customers consuming 2,500 kWh – 5,000 kWh per year and percentage point (p.p.) variation 2012 on 2008²⁵



²⁴ Source: Eurostat, Energy and Environment Data Base, retrieved 7 October 2013.

²⁵ Source: Eurostat, Energy and Environment Data Base, retrieved 7 October 2013.

The rest is made up of regulatory costs, covering the operation and expansion of transmission and distribution networks (30%), but also taxes and levies (26%).²⁶

Even though the observation period is limited, Figure 13 powerfully describes the trend at play in Europe: energy and supply as well as network costs are gradually reducing, whereas taxes and levies are piling up.

In parallel, the electricity price for industrial customers is rising too, though a significantly slower than for households – eight countries actually witnessed lower prices in 2012 compared to 2008 (Figure 14).²⁷

An analysis of the bill elements for industrial customers shows a similar trend to the one witnessed for households. While energy and supply costs are decreasing or only moderately increasing, taxes and levies are skyrocketing and have increased substantially in almost all member states in only four years.²⁸

Figure 15 below shows the weight of the fiscal component on the total bill for industrial consumers in the different member countries in 2012. Since taxation is a matter left to member states, it is not surprising to see that the weight varies quite a lot, from no taxes whatsoever in Latvia, Romania and Latvia to almost 35% in Germany.



FIGURE 14: CHANGE OF INDUSTRY BILLS IN EU-28 (EXCLUDING FRANCE)²⁹

FIGURE 15: WEIGHT OF TAXES AND LEVIES ON INDUSTRY ENERGY BILL PER MEMBER STATE ³⁰



²⁶ Difference is due to rounding; see data labels in the graph for more accurate figures.

²⁷ Eurostat collects data for seven different categories of industrial customers, from businesses using less than 20 MWh/year to those using more than 150 GWh/year. For simplicity, our analysis here focuses on a median consumption bandwidth, i.e. consumption between 2,000 MWh and 20,000 MWh.

- ²⁸ The bill for industrial customers decreased in Croatia, Denmark, Lithuania, Netherlands and Poland.
- ²⁹ Source: Eurostat, Energy and Environment Data Base, retrieved 7 October 2013.
- ³⁰ Source: Eurostat, Energy and Environment Data Base, retrieved 7 October 2013.



ENVIRONMENTAL TRENDS *STATIONARY CO*₂ *EMISSIONS*

Although total electricity consumption fell by 2% in 2011 and it remained constant in 2012, the increase in coal-fired generation meant that CO_2 emissions failed to fall correspondingly.

EURELECTRIC is concerned that RES support schemes, that were introduced to achieve the EU's 20% RES target, are undercutting the CO_2 price. Such an effect increases the costs of the transition to low- carbon electricity, while having no diminishing impact on emission values. Historic data shows that, increasing RES generation was closely accompanied by increase in unabated coal-fired generation. Results of the Power Statistics and Trends 2013 generation technology analysis show that, coal is on a renaissance track in the EU, largely to the detriment of gas. This has an important impact on emissions. In Germany alone, coal plants have increased their production in the first three quarters of 2013 by 5%, up to 189.4 TWh. Gas-fired generation dropped by 18% in the same period to 29 TWh. The insignificant CO₂ price signal of around \in 5 per tonne needs to rise to at least \notin 40 per tonne to revise this trend³¹.

Continuing the climate agenda and reinforcing the instruments needed to achieve it, should thus be among policymakers' main objectives for the years ahead.



³¹ Source ISE based on EEX transparency platform and German Statistical Office, quoted by European Power Daily, German coal extends dominance in power mix, 10.10.2013.

³² Source: EURELECTRIC.

³³ Source: DG CLIMA, Carbon Market Final Report 2012.



ENERGY COMMUNITY TRENDS 2010-2012 EUROPE'S EIGHTH REGION

Power Statistics and Trends extends its analysis to the EU neighbouring area, most notably to the Energy Community, by displaying significant trends in the region. EURELECTRIC's *Energy EU Neighbourhood* network of experts aims to further strengthen cooperation and provide comprehensive insights.³⁴

Energy Community (EnC) was established in 2005 and currently consists of the Contracting Parties (CP): Albania, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Serbia, Ukraine, United Nations Interim Administration Mission in Kosovo³⁵ and the European Union. Aggregated population of these countries accounts for 150 Million people. Georgia will become a full member in 2014. Since its EU accession, Croatia has had Participant status. Armenia, Norway and Turkey are observer countries. In 2013, the Energy Community Treaty was extended until 2026.

Demand, Installed Capacity and Generation in the Energy Community

Electricity demand, much like in the European Union is characterised by stagnation in the period 2010-2012, indicating that effects of economic crisis are still present. The very modest increase in installed generating capacities can be primarily attributed to the rehabilitation of existing power plants and the commissioning of several small – scale renewable projects.

Indigenous generation of electricity was highly affected by weather conditions in 2011. Extremely unfavourable hydrology conditions were reported. Record low levels in hydro power reservoirs and low run-of-river hydro power plant inflows were recorded. In certain cases, low temperatures affected supply of coal to thermal power plants. The cold wave all over Europe in February 2012 triggered record high consumption of both gas and electricity in the EU as well as in the EnC. The duration of the cold wave was unexpected and prompted emergency measures in all Contracting Parties. EnC Governments applied a variety of safeguard measures to reduce electricity demand.



FIGURE 18: INSTALLED CAPACITY AND GENERATION IN THE ENERGY COMMUNITY IN 2012³⁶

³⁴ Power Statistics and Trends 2013 Full- Report provides data from Serbia, Ukraine and Bosnia and Herzegovina, however this chapter bases its analysis on data from all EnC countries.

³⁵ Designation in line with UNSCR 1244 and the ICJ ruling Kosovo's declaration of independence.

³⁶ Source: Energy Community Secretariat, Annual Implementation Report 2013.

Disturbances in February 2012 highlighted the level of interconnectedness of electricity and gas supplies in the region. Stable gas supplies were critical to maintain the stability of power systems.

The 8th Region

The Regional Action Plan for the SEE Wholesale Market Opening defines the steps for regional market integration in the 8th Region, which includes the Contracting Parties as well as Italy, Slovenia, Croatia, Romania and Hungary. The foreseen transposition of the Third Energy Package by 1 January 2015 will form the framework for the regional electricity market development. Despite the progress being made by the Contracting Parties, implementation of the *acquis communautaire* and translation into binding commitments are significantly delayed and remain a huge challenge in the region.

All Contracting Parties TSOs, except the Moldavian, have introduced market-based mechanisms for explicit cross-border capacity auctions. The TSOs of Serbia, Romania and Hungary and the TSOs of Croatia, Slovenia and Hungary have introduced joint auctions. Implementation of price coupling in the 8th Region entails a step-wise approach, starting from bilateral/ trilateral market coupling. Further integration requires the implementation of market reforms at an increased pace.

Ukraine-wholesale market liberalisation ahead

In October 2013 Ukraine has adopted the Law on liberalisation of wholesale electricity market which aims to contribute to the sector's reform and regional market integration. Ukraine is increasingly integrated also into the EU gas market through reversed gas flows, which started in 2013 from Hungary and Poland.



³⁷ Source: Energy Community Secretariat, Annual Implementation Report 2013.

The fact, that the Western Balkans' energy supply mix is heavily dependent on a single source of gas supply, prompts for further diversification. The SEE region lies on the path of the Southern Gas corridors essential for the future security of supply of the entire EU. Two regional major infrastructure projects in gas interconnection such as the Gazprom-backed South Stream gas pipeline (construction commenced in December 2012) and TAP project for the Caspian gas delivery to Europe, will have major impacts on the SE- European market.

RES

The RES Directive (2009/28/EC) was adopted within the Energy Community following the decision of the Ministerial Council. Contracting Parties accepted binding RES targets for 2020. National targets under the RES Directive are not directly based on physical potentials but on the existing RES generation and GDP. Consequently, the EnC countries will be eligible to make use of statistical transfers, joint support schemes and joint projects between EU Member States and EnC Parties.

Energy efficiency: Energy Community seven times more energy intensive than the EU average!

The Energy Community on average is approximately seven times more intensive in primary energy (0.83 toe/1000 USD) than average EU-27 (0.12 toe/1000 USD). This is mainly due to the ageing energy infrastructure, transmission and distribution energy losses, and low energy efficiency in the end-use sector. On the other hand, the Energy Community consumed less energy per capita (1.38 toe/capita) than the EU-27 (2.38 toe/capita). All Contracting Parties committed to energy savings targets of 9% of their final energy consumption by 2018 over a nine year period starting in 2010 through their respective National Energy Efficiency Action Plans.

CONCLUSIONS

The Energy Community has proven to be an effective framework for regional and continental cooperation. It might serve as a cooperation model for other regions, such as Middle- East and North- Africa. The importance of the transposition and implementation of the Third Energy Package in the context of fostering market liberalisation, providing security of supply and adequate conditions for investments remain in the center of the activities of the next period. The modernisation and construction of the new regional infrastructure will require significant resources. The Projects of Common Interests in the region partly respond to this concern. Many of the countries in the region have a credit rating below investment grade, which further limits the amount of credit available. In light of these circumstances, the region will likely require a combination of public sector funding, bilateral/multilateral assistance and project financing. The implementation of market liberalisation measures and the establishment of a regulatory environment, attractive to investments, further remain key challenges.

POWER STATISTICS & TRENDS 2013 full report

2013

1. GENERAL INFORMATION

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) for each of the 27 EU Member States³ plus Switzerland, Norway, Turkey and certain Energy Community member states. Forecasts for 2020 and 2030 are also included.

Note 1: The category "services" also includes transport. This applies to all tables below.

AUSTRIA (AT)							
	1980	1990	2000	2010	2011	2020	2030
Agriculture	6.2	5.3	3.8	3.6	3.6	3.6	3.8
Industry	41.8	46.2	57.4	65.5	66.1	81.4	101.7
Services	68.3	92.2	125.4	150.1	151.3	184.8	223.2
Total Value Added	116.2	143.7	186.6	219.4	221.0	269.8	328.8
Gross Domestic Product	130.6	161.7	207.5	241.9	244.0	297.7	362.8
Private Final Consumption Expenditure	72.6	89.0	110.9	130.5	131.7	152.7	186.1
Gross Fixed Capital Formation	36.0	40.5	50.8	50.7	51.2	65.5	79.8

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	2.6	3.1	2.9	2.7	1.5	3.2	3.8
Industry	42.7	51.6	103.8	104.2	60.1	123.3	145.9
Services	81.9	98.9	121.7	154.0	201.1	182.3	215.7
Total Value Added	127.2	153.6	224.7	258.3	292.6	308.8	365.5
Gross Domestic Product	154.4	190.9	252.0	290.0	294.4	343.2	406.2
Private Final Consumption Expenditure	86.0	103.0	123.4	216.8	170.5	256.6	303.7
Gross Fixed Capital Formation	27.0	32.0	53.4	60.0	65.0	71.0	84.0

Note: Data are based on the 2005 price level.

³ 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.

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

BULGARIA (bg)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Agriculture			0.4	0.3	0.3		
Industry			1.1	1.3	1.3		
Services			0.8	12.0	12.1		
Total Value Added			9.3	1.5	1.5		
Gross Domestic Product			10.1	15.1	15.2		
Private Final Consumption Expenditure			6.5	10.1	10.2		
Gross Fixed Capital Formation			1.7	3.0	2.6		

Note: Data are based on the 2005 price level.

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			3.3	5.1	52.0	4.0	6.4
Industry			25.3	41.8	425.0	42.8	69.0
Services			33.6	42.0	427.0	74.2	101.9
Total Value Added			62.3	88.9	904.0	121.2	157.4
Gross Domestic Product			69.3	99.2	1.009.0	135.4	196.6
Private Final Consumption Expenditure			36.4	54.0	549.0	73.2	102.0
Gross Fixed Capital Formation			21.1	33.2	352.0	44.0	63.0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	18.6	22.7	13.6	19.5	15.1	25.0	29.0
Industry	442.7	511.0	576.2	541.5	571.5	690.0	720.0
Services	727.4	964.6	1.332.1	1.594.0	1.640.0	1.800.0	2.000.0
Total Value Added	1.188.7	1.498.3	1.921.7	2.158.0	2.229.3	2.600.0	2.800.0
Gross Domestic Product	1.275.0	1.592.4	2.159.2	2.375.7	2.454.8	2.800.0	2.840.0
Private Final Consumption Expenditure	458.7	726.6	1.287.2	1.350.8	1.381.9	1.475.0	1.620.0
Gross Fixed Capital Formation	185.5	278.3	426.3	424.5	451.6	495.0	550.0

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

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	1.2	1.7	2.6	2.0	1.8	4.1	4.6
Industry	19.1	22.7	28.1	25.4	25.6	38.4	43.9
Services	83.0	104.7	1.362.0	147.8	150.0	166.8	187.9
Total Value Added	103.3	129.0	166.9	175.2	177.4	209.1	236.5
Gross Domestic Product	122.5	151.1	194.5	223.4	206.6	2.444.2	272.4
Private Final Consumption Expenditure	67.2	78.3	92.6	117.7	100.2	123.6	139.2
Gross Fixed Capital Formation	22.3	28.0	39.5	44.9	21.4	36.3	

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

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			0.3				
Industry			1.5				
Services			0.8				
Total Value Added			5.4				
Gross Domestic Product			6.1				
Private Final Consumption Expenditure			3.4				
Gross Fixed Capital Formation			1.6				

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	28.2	27.2	24.3	24.7	24.6		
Industry	127.1	154.2	208.3	305.5	310.3		
Services	275.1	362.1	465.1	850.1	868.6		
Total Value Added							
Gross Domestic Product	430.4	543.6	697.6	1.180.3	1.203.4		
Private Final Consumption Expenditure	284.7	358.6	586.4	1.008.8	1.021.1		
Gross Fixed Capital Formation	96.7	146.2	195.3	282.1	270.1		

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	4.2	4.1	4.0	4.5	4.8		
Industry	20.5	27.6	39.6	47.1	48.0		
Services	42.9	60.7	71.5	82.9	84.6		
Total Value Added	68.5	92.3	115.2	134.7	137.6		
Gross Domestic Product	79.7	107.8	132.2	156.9	161.3	183.0	213.0
Private Final Consumption Expenditure	40.8	57.9	65.3	84.9	86.9		
Gross Fixed Capital Formation	17.8	26.4	26.5	29.1	31.1		

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Agriculture				46.6			
Industry				400.8			
Services				1.148.5			
Total Value Added				1.595.9			
Gross Domestic Product	1.032.0	1.306.0	1.587.0	1.773.0	1.809.0	2.053.0	2.451.0
Private Final Consumption Expenditure	275.2	549.5	783.9	976.6			
Gross Fixed Capital Formation	113.8	210.5	280.7	343.3			

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	9.8	12.3	12.4	12.0		11.7	12.6
Industry	252.4	298.6	481.2	433.4		460.2	559.9
Services	731.3	987.9	991.7	1.531.5		1.869.9	2.441.3
Total Value Added	993.4	1.298.8	1.485.3	1.976.6		2.341.8	3.013.7
Gross Domestic Product	1.103.8	1.443.2	1.646.5	2.212.0		2.630.0	3.385.5
Private Final Consumption Expenditure	626.2	890.8	1.036.4	1.410.1		1.662.6	2.101.6
Gross Fixed Capital Formation	147.7	227.5	253.9	340.7		508.8	709.8

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

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			7.9	7.4	7.0		
Industry			16.8	20.8	19.2		
Services			95.7	158.7	146.0		
Total Value Added			120.4	186.9	172.2		
Gross Domestic Product			136.3	193.8	180.0	179.2	
Private Final Consumption Expenditure			98.6	137.0	126.1		
Gross Fixed Capital Formation			29.5	35.5	28.5		

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	3.7	3.7	2.4	2.8	3.5	3.8	4.4
Industry	4.5	5.9	19.5	23.5	24.0	27.0	31.0
Services	29.7	32.6	40.5	48.6	49.0	58.0	70.0
Total Value Added	37.9	42.3	62.4	52.0	76.5	88.8	105.4
Gross Domestic Product	44.5	50.4	72.4	88.0	89.4	105.0	122.0
Private Final Consumption Expenditure	22.2	23.7	37.5	43.8	44.0	50.0	58.0
Gross Fixed Capital Formation	17.7	19.3	16.2	16.9	16.3	18.5	21.0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			3.2	3.1			
Industry			39.5	47.7			
Services			50.9	103.2			
Total Value Added			93.6	154.0			
Gross Domestic Product			104.6	154.0			
Private Final Consumption Expenditure			50.1	84.0			
Gross Fixed Capital Formation		11.3	24.5	18.7			

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Agriculture		23.0	29.0	28.0	28.0		
Industry		304.0	334.0	315.0	316.0		
Services		721.0	864.0	934.0	940.0		
Total Value Added		1.049.0	1.229.0	1.276.0	1.283.0		
Gross Domestic Product		1.167.0	1.368.0	1.418.0	1.424.0		
Private Final Consumption Expenditure		686.0	812.0	855.0	856.0		
Gross Fixed Capital Formation		244.0	278.0	271.0	266.0		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	1.9	4.0	0.7	0.7	0.8	1.2	1.6
Industry	6.8	10.3	3.3	5.2	5.7	7.6	9.8
Services	1.2	1.7	7.0	10.8	11.3	15.6	20.1
Total Value Added	9.9	16.0	11.0	16.8	17.8	24.4	31.5
Gross Domestic Product	11.2	18.0	12.4	19.0	20.1	27.5	35.6
Private Final Consumption Expenditure		4.4	8.2	12.3	13.0	17.9	23.1
Gross Fixed Capital Formation		2.8	3.0	4.2	4.5	6.2	8.1

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

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			0.1	0.1			
Industry			2.6	2.0			
Services			38.2	55.1			
Total Value Added			22.6	29.9			
Gross Domestic Product			25.4	33.2	33.7	43.2	53.8
Private Final Consumption Expenditure			9.6	11.6			
Gross Fixed Capital Formation			4.8	7.0			

Note: Data are based on the 2005 price level.

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	0.6	1.1	0.3	0.4	0.3	0.6	0.9
Industry	4.0	6.0	1.4	1.8	1.7	2.3	2.6
Services	2.2	3.3	4.3	6.7	8.1	7.6	7.5
Total Value Added	6.8	10.4	6.0	8.9	10.1	10.5	11.0
Gross Domestic Product	7.9	11.9	6.8	12.4	13.0	17.4	19.3
Private Final Consumption Expenditure	2.6	4.0	4.2	6.4	7.0	7.2	7.5
Gross Fixed Capital Formation	1.1	1.7	1.6	1.9	2.6	2.3	2.2

• **МАLTА** (мт)

	1980	1990	2000	2010	2011	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product			4.0	4.7	4.9		
Private Final Consumption Expenditure			2.6	3.0	3.2		
Gross Fixed Capital Formation			0.9	0.7	0.7		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Agriculture		8.1	9.9	9.5			
Industry		117.1	152.7	114.6			
Services		152.9	210.8	370.6			
Total Value Added		278.1	373.4	494.8	512.4	540.0	630.0
Gross Domestic Product		306.0	418.0	550.9	569.0	600.0	660.0
Private Final Consumption Expenditure		230.5	302.7	401.8	410.2	430.0	480.0
Gross Fixed Capital Formation		60.9	91.7	98.7	101.2	107.0	118.0

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

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			9.3	10.4	10.6	12.3	14.0
Industry			59.2	87.3	90.0	118.5	147.3
Services			118.4	176.0	181.7	242.3	324.0
Total Value Added			186.8	273.7	282.3	373.1	485.3
Gross Domestic Product	152.9	148.3	210.0	307.3	320.6	430.4	572.5
Private Final Consumption Expenditure		71.0	134.6	196.5	204.9	275.2	365.9
Gross Fixed Capital Formation		31.0	49.8	61.2	63.8	85.7	114.0

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

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	3.0	4.3	3.8	3.6	3.6	4.1	5.1
Industry	21.6	27.7	35.8	33.2	32.6	34.3	42.0
Services	47.7	65.7	89.9	105.3	104.0	114.9	140.9
Total Value Added	72.2	97.6	129.4	142.1	140.3	153.3	187.9
Gross Domestic Product	85.1	113.9	152.2	163.0	160.4	174.9	214.2
Private Final Consumption Expenditure	51.1	68.6	93.7	105.6	101.5	100.4	122.5
Gross Fixed Capital Formation	18.8	24.6	40.4	32.5	29.0	26.2	32.1

ROMANIA (RO)

	1980	1990	2000	2010	2011	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

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	3.9	5.0	4.6	4.8	5.2	6.7	8.0
Industry	32.6	40.7	65.4	75.9	78.9	108.8	140.1
Services	104.1	136.6	159.5	201.5	210.2	268.0	328.8
Total Value Added	140.6	182.3	229.4	282.3	294.3	383.6	476.9
Gross Domestic Product	169.9	211.2	261.3	323.3	335.3	435.5	541.4
Private Final Consumption Expenditure	92.7	110.0	128.9	158.9	158.9	222.4	282.0
Gross Fixed Capital Formation	31.4	43.4	47.5	60.5	60.5	84.4	113.4

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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 (sκ)

	1980	1990	2000	2010	2011	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				

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

+ SWITZERLAND (сн)

	1980	1990	2000	2010	2011	2020	2030
Agriculture		3.2	3.2	2.9	3.1		
Industry		70.1	71.3	86.1	90.8		
Services		174.1	198.9	235.5	236.3		
Total Value Added		247.7	273.4	324.6	330.2		
Gross Domestic Product		259.9	289.7	343.8	349.6		
Private Final Consumption Expenditure		146.3	168.6	194.0	196.4		
Gross Fixed Capital Formation		59.6	65.3	71.4	74.6		

Note: Data are based on the 2005 price level.

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	4.1	3.8	3.7	4.1	4.0	4.0	4.0
Industry	34.0	32.9	67.2	72.5	71.4	75.0	79.0
Services	66.6	79.4	106.7	147.4	151.1	168.0	189.0
Total Value Added	104.7	116.1	177.6	224.0	226.4	247.0	272.0
Gross Domestic Product	119.1	152.6	219.6	254.4	257.4	282.0	312.0
Private Final Consumption Expenditure	52.5	62.5	87.3	122.0	125.0	145.0	168.0
Gross Fixed Capital Formation	27.1	25.3	37.9	49.0	52.7	62.0	72.0

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Agriculture	24.2	27.1	33.5	37.9	40.0		
Industry	22.6	43.6	63.4	94.9	103.9		
Services	54.3	86.2	176.2	277.5	302.2		
Total Value Added	96.4	154.4	273.6	409.9	445.7		
Gross Domestic Product	91.8	152.5	310.3	453.6	492.7		
Private Final Consumption Expenditure			215.5	318.9	343.4		
Gross Fixed Capital Formation		31.5	59.0	94.4	111.4		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product		10.6	6.0	12.7	13.1	21.9	
Private Final Consumption Expenditure							
Gross Fixed Capital Formation							

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Agriculture							
Industry							
Services							
Total Value Added							
Gross Domestic Product			25.7				
Private Final Consumption Expenditure							
Gross Fixed Capital Formation							
TABLE 1.1.1

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

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Agriculture			1.7	2.0	2.0		
Industry			4.3	4.6	4.8		
Services			8.1	12.7	12.8		
Total Value Added			13.9	19.1	19.4		
Gross Domestic Product			15.6	22.4	22.8		
Private Final Consumption Expenditure				18.1	17.9		
Gross Fixed Capital For mation				4.7	5.1		

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Agriculture				6.1	8.2		
Industry				19.2	22.1		
Services				20.5	25.0		
Total Value Added				70.8	86.4		
Gross Domestic Product				80.3	96.6		
Private Final Consumption Expenditure				67.8	82.6		
Gross Fixed Capital Formation				14.5	17.9		

1.1 TRENDS IN GENERAL ECONOMIC INDICATORS

TABLE 1.1.2

POPULATION (IN 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 certain Energy Community member states from 1980 to 2011. Estimates for 2020 and 2030 are also displayed.

Country	1980	1990	2000	2010	2011	2020	2030
AT	7,549	7,729	8,110	8,361	8,339	8,788	9,191
BE	9,863	9,987	10,263	11,001	11,095	11,541	12,218
BG	8,728	8,487	8,131	7,505	-	6,914	6,452
СҮ	1,000	1,000	1,000	1,000	1,000	1,000	1,000
CZ	10,327	10,363	10,273	10,533	10,532	10,284	10,102
DE	78,275	79,365	82,260	81,752	81,844	80,176	78,188
DK	5,124	5,146	5,349	5,561	5,575	5,697	5,880
EE	1,477	1,571	1,372	1,284	-	1,221	1,202
ES	37,743	39,434	41,117	46,153	46,196	47,112	47,600
FI	4,788	4,998	5,181	5,375	5,401	5,631	5,848
FR	54,029	56,841	59,267	63,089	63,409	65,962	68,532
UK	56,329	57,288	58,886	62,262	63,182	67,173	71,392
GR	9,643	10,161	10,931	11,310	11,290	11,526	11,578
HU	10,709	10,375	10,222	10,014	9,986	9,901	9,704
IE	3,401	3,506	3,790	4,481	-	5,449	5,901
IT	56,479	56,744	56,961	60,626	60,821	62,497	63,483
LT	3,420	3,698	3,487	3,200	3,008	2,898	2,805
LU	365	384	439	512	512	-	-
LV	2,515	2,658	2,380	2,150	2,070	1,992	2,002
MT	-	352	389	418	416	-	-
NL	14,100	14,947	15,922	16,575	16,660	17,200	17,700
PL	35,735	38,183	38,254	38,254	38,538	38,395	37,565
РТ	9,819	9,873	10,331	10,573	10,542	10,560	10,570
RO	22,201	23,207	22,435	21,414	-	20,990	20,368
SE	8,318	8,591	8,883	9,416	9,483	10,269	10,727
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
СН	6,335	6,751	7,204	7,870	7,955	8,402	8,739
NO	4,079	4,233	4,478	4,858	4,920	5,511	6,037
TR	44,990	55,561	64,693	73,723	74,724	82,077	88,428
BA	4,092	4,347	3,830	3,843	3,840	-	-
HR	4,601	4,784	4,437	-	-	-	-
RS	9,262	9,885	7,516	7,291	7,187	7,117	6,889
UA	-	51,839	49,425	45,963	45,779	-	-

1.2 General Presentation of the Electricity Sector in 2011

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 2011, including certain Energy Community member states.

* Includes entities which have a share equal or greater to 5% of production or supply.

Country	Genei	RATION*	TRANSMISSION	DISTRIBUTION	Su	PPLY*
	NUMBER	MARKET SHARE	Number	Number	NUMBER	MARKET SHARE
AT	6		3	138	6	-
BE	3	95%	1	28	4	89%
BG	-	-	-		-	-
СҮ	1	-	1	1	1	-
CZ	1	60%	1	3	3	90%
DE	4	59%	4	870	3	40%
DK	2		1	72	-	-
EE	-	•	•	•	-	-
ES	4	64%	1	350	4	86%
FI	-	•	1	83	-	-
FR	-	•	1	•	-	-
UK	9	•	3	19	6	100%
GR	2	82,28%	1	1	1	92,30%
HU	3	67%	1	6	5	68,5%
IE	4	81%	1	1	5	98%
IT	4	49%	1	135	2	45%
LT	8	90,5%	1	1	4	85,4%
LU	1	6%	1	5	2	80%
LV	1	87%	1	11	2	77%
MT	1	100%	0	1	1	100%
NL	4	55%	1	9	4	70%
PL	9	81%	1	7	5	100%
PT	2	53,6%	1	3	3	90,9%
RO	-		-	•	-	-
SE	-		-	•	-	-
SI	-		-	•	-	-
SK	-	-	-	-	-	-
СН	-	-	1	730	-	-
NO	5	60%	1	140	4	50%
TR	3	-	1	21%	3	42%
BA	3	-	1	4	-	
RS	1	99%	1	5	1	99%
UA	7	88,2%	1	42	43,4	6%

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)*.

1.2 GENERAL PRESENTATION OF THE ELECTRICITY SECTOR IN 2011

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 2011 of the electricity sector in each EU 27 Member States plus Switzerland, Norway, Turkey and of certain Energy Community member states.

	Employees (Number)	ANNUAL INVESTMENTS (Million of EUR)	TURNOVER (Million of EUR)
AT	20,000	1,500	19,000
BE	17,000	1,250	25,000
BG			-
CY	2,200	189	1,017
CZ	18,000	1,000	3,500
DE	132,300	26,500	71,000
DK	·	•	-
EE	-	• •	-
ES	20,848	3,202	24,993
FI	10,000	1,500	13,500
FR	-		-
UK	-		30,421
GR	20,821	1,108	5,514
HU	11,662		3,790
IE	•		-
IT	57,000		41,900
LT	•		-
LU	•		-
LV	7,200	300	1,150
MT	1,008	84	336
NL	•		-
PL	68,217	2,684	11,922
РТ	•		•
RO	•		•
SE	•		•
SI	•		•
SK	-	-	•
СН	12,000	· · · · ·	•
NO	11,500	1,800	9,875
TR	-	-	
BA	•	· · · · · · · · · · · · · · · · · · ·	•
RS	29,500		•
UA	194,500	-	7,659

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

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 certain Energy Community member states, from 1980 to 2011. 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	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	5,700	7,400	8,800				
Total Demand (TWh)							
Date of Peak Demand (month of the year)				1			
Connected System (*)							
Peak Demand (MW)	5,700	7,400	8,800	9,748	9,720		
Total Demand (TWh)	36	47	57	65	65	73	79
Date of Peak Demand (month of the year)					12		
Use factor of Connected Peak Demand (h/a)	6,368	6,338	6,466				
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	7,900	10,400	12,653	14,391	14,314		
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	1	12	1		
Connected System (*)							
Peak Demand (MW)	7,900	10,428	12,653	14,391	14,314		
Total Demand (TWh)	48	63	83	90	86	94	102
Date of Peak Demand (month of the year)	12	12	1	12	1		
Use factor of Connected Peak Demand (h/a)	6,038	6,004	6,453	6,309	6,375	6,309	
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET			12,244	13,766	14,033		

(*) Without isolated system

2010

table 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	6,900	8,100	7,100	7,270	6,897	10,500	13,340
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	1	1	2	12	12
Connected System (*)							
Peak Demand (MW)	6,900	8,100	7,100	7,270	6,897	10,500	13,340
Total Demand (TWh)	35	41	32	33	34	53	67
Date of Peak Demand (month of the year)	12	12	1	1	2	12	12
Use factor of Connected Peak Demand (h/a)	5,049	5,079	4,485	6	4,987	5,019	5,052
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

SCYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	200	372	688	1,148	922	1,525	2,150
Total Demand (TWh)							
Date of Peak Demand (month of the year)	7	7	7	8	7	7	7
Connected System (*)							
Peak Demand (MW)	200	372	688	1,191	922	1,650	2,150
Total Demand (TWh)	1	2	3	5	5	7	12
Date of Peak Demand (month of the year)	7	7	7	7	7	7	7
Use factor of Connected Peak Demand (h/a)	0	0	0	0	0	0	0
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)		9,000	9,000	11,204	10,900	14,000	14,500
Total Demand (TWh)							
Date of Peak Demand (month of the year)		2	1	1	2	1	1
Connected System (*)							
Peak Demand (MW)		9,000	9,000	11,204	10,900	14,000	14,500
Total Demand (TWh)		57	57	64	63	78	83
Date of Peak Demand (month of the year)		2	1	1	2	1	1
Use factor of Connected Peak Demand (h/a)		6,333	6,333	5,712	5,376	6,458	6,640
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	52,200	63,100	76,800	79,300	81,200	74,000	73,000
Total Demand (TWh)							
Date of Peak Demand (month of the year)			11	12	12	12	12
Connected System (*)							
Peak Demand (MW)	52,200	63,100	76,800	79,300	81,200	74,000	73,000
Total Demand (TWh)	351	415	536	569	563	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	7,169	6,932	6,851	6,493
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

TABLE 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	4,700	5,900	6,200	6,300	6,100	6,900	8,000
Total Demand (TWh)							
Date of Peak Demand (month of the year)	2	2	2	2	1	2	2
Connected System (*)							
Peak Demand (MW)	4,700	5,900	6,200	6,800	6,230	6,900	8,000
Total Demand (TWh)	24	31	35	35	34	41	45
Date of Peak Demand (month of the year)	2	2	2	2	1	2	2
Use factor of Connected Peak Demand (h/a)	5,085	5,220	5,600	5,600	5,600	5,600	5,600
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)			1,262	1,590		1,767	
Total Demand (TWh)							
Date of Peak Demand (month of the year)			12	2		1	
Connected System (*)							
Peak Demand (MW)			1,262	1,590		1,767	
Total Demand (TWh)						10	
Date of Peak Demand (month of the year)						1	
Use factor of Connected Peak Demand (h/a)							
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	19,151	26,292	35,275	46,974	46,933	55,553	66,373
Total Demand (TWh)							
Date of Peak Demand (month of the year)							
Connected System (*)							
Peak Demand (MW)	18,572	25,160	33,236	44,122	44,107	51,634	61,338
Total Demand (TWh)	96	135	195	261	256	313	381
Date of Peak Demand (month of the year)	1	1	1	1	1	6	6
Use factor of Connected Peak Demand (h/a)	5,160	5,378	5,872	5,905	5,796	6,052	6,205
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	6,600	10,450	12,400	14,600	15,000	16,500	18,100
Total Demand (TWh)							
Date of Peak Demand (month of the year)	2	1	1	1	2	1	1
Connected System (*)							
Peak Demand (MW)	6,600	10,450	12,400	14,600	15,000	16,500	18,100
Total Demand (TWh)	40	62	79	88	84	99	109
Date of Peak Demand (month of the year)	2	1	1	1	2	1	1
Use factor of Connected Peak Demand (h/a)	6,049	5,965	6,384	6,007	5,613	6,000	6,022
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

table 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	44,100	63,400	72,400	96,710	91,720	104,200	110,400
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	1	12	1	1	1
Connected System (*)							
Peak Demand (MW)	44,100	63,400	72,400	96,710	91,720	104,200	110,500
Total Demand (TWh)	249	350	441	513	479	508	540
Date of Peak Demand (month of the year)	12	12	1	12	1	1	1
Use factor of Connected Peak Demand (h/a)	5,639	6	6,086				
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	52,100	57,300	64,100	62,029	60,578	59,601	65,037
Total Demand (TWh)							
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	66,287	60,758	59,601	65,037
Total Demand (TWh)	265	309	372	354	328	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	5,700	5,834	5,800	5,800
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET	49,495	54,435	60,895	58,927	57,549	56,621	61,785

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,554	4,924	8,531	9,794	9,868	11,170	
Total Demand (TWh)							
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	9,794	9,868	11,170	
Total Demand (TWh)	21	30	45	54	53	61	
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	5,463	5,361	5,434	
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET				7,852	6,584	7,452	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	5,127	6,554	5,800	6,064	5,931	7,000	7,700
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	12	12	11	7	7
Connected System (*)							
Peak Demand (MW)	5,127	6,554	5,800	6,064	5,931	7,000	7,700
Total Demand (TWh)	31	39	38	40	40	46	50
Date of Peak Demand (month of the year)	12	12	12	12	11	7	7
Use factor of Connected Peak Demand (h/a)	6,070	5,969	6,618	6,565	6,761	6,500	6,494
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET				5,866	5,622	6,600	7,200

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TABLE 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	1,800	2,500	3,800	5,026	4,899	5,243	6,085
Total Demand (TWh)							
Date of Peak Demand (month of the year)	1	12	12	12	12	12	12
Connected System (*)							
Peak Demand (MW)	1,800	2,500	3,800	5,026	4,899	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	12	12	12	12
Use factor of Connected Peak Demand (h/a)	5,123	5,344	5,700	5,026	4,899	5,243	6,085
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	31,400	40,500	49,019	56,425	56,474		
Total Demand (TWh)							
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	56,474		
Total Demand (TWh)	180	235	299	331	335		
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	5,856	5,926		
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET			48,313	54,925	51,047		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	2,200	2,800	1,500	1,817	1,715	2,120	2,360
Total Demand (TWh)							
Date of Peak Demand (month of the year)			12	12	12	12	12
Connected System (*)							
Peak Demand (MW)	2,200	2,800	1,500	1,817	1,715	2,120	2,360
Total Demand (TWh)	11	14	8	10	10	12	15
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	5,660	6,060	5,860	6,010
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	500	600	900	1,080	1,188	1,300	1,500
Total Demand (TWh)							
Date of Peak Demand (month of the year)				12	12	12	12
Connected System (*)							
Peak Demand (MW)	500	600	900	1,080	1,188	1,300	1,500
Total Demand (TWh)	4	4	6	7	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	6,181		5,538	5,000
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET				1,050		1,180	1,320

table 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1,700	1,900	1,200	1,320	1,260	1,650	1,970
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	1	1	2	1	1
Connected System (*)							
Peak Demand (MW)	1,700	1,900	1,200	1,320	1,260	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	2	1	1
Use factor of Connected Peak Demand (h/a)	4,710	5,210	4,750	5,503	5,710	5,390	5,480
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET				1,270			

• **МАLTA** (мт)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	102	230	354	400	414		
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	1	7	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), 3 rd Wednesday, 18:00h CET	0	0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	11,000	13,000	15,180	18,162	18,320	19,330	21,350
Total Demand (TWh)							
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	18,162	18,320	19,330	21,350
Total Demand (TWh)	60	76	105	117	118	125	138
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), 3 rd Wednesday, 18:00h CET			12,255	17,510	17,662	18,200	21,200

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	19,133	21,476	20,471	23,543	23,149	25,515	29,239
Total Demand (TWh)							
Date of Peak Demand (month of the year)	1	1	1	1	12	12	12
Connected System (*)							
Peak Demand (MW)	19,133	21,476	20,471	23,543	23,149	25,515	29,239
Total Demand (TWh)	112	119	124	142	143	161	186
Date of Peak Demand (month of the year)	1	1	1	1	12	12	12
Use factor of Connected Peak Demand (h/a)	5,843	5,560	6,057	6,032	6,190	6,298	6,348
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET		19,986	19,716	22,597	21,953	23,850	27,331

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TABLE 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,055	4,969	7,585	9,836	9,610	9,245	10,857
Total Demand (TWh)							
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	9,403	9,192	8,940	10,500
Total Demand (TWh)	16	27	38	52	51	51	60
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	5,551	5,494	5,687	5,694
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET			5,752	7,245	7,302		

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	9,100	9,600	7,370	7,890		10,525	13,769
Total Demand (TWh)							
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), 3 rd Wednesday, 18:00h CET				6,375		9,528	11,810

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	17,700	23,300	26,000	26,300	26,200	24,100	23,800
Total Demand (TWh)							
Date of Peak Demand (month of the year)	2	11	1	12	2	1	1
Connected System (*)							
Peak Demand (MW)	17,700	23,300	26,000	26,300	26,200	24,100	23,800
Total Demand (TWh)	94	140	147	147	140	144	145
Date of Peak Demand (month of the year)	2	11	1	12	2	1	1
Use factor of Connected Peak Demand (h/a)	5,309	6,006	5,637	5,589	5,354	6,000	6,100
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET			23,800	24,127	23,226	24,100	24,800

SLOVENIA (sı)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	1,400	1,700	1,700	2,241	1,996	2,476	2,842
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	12	12	12	3	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), 3 rd Wednesday, 18:00h CET							

table 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,300	4,100	4,050	4,800		5,600	6,200
Total Demand (TWh)							
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), 3 rd Wednesday, 18:00h CET							

+ SWITZERLAND (СН)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	6,700	8,500	9,000	10,749	10,072		
Total Demand (TWh)							
Date of Peak Demand (month of the year)	1	12	1	12	1		
Connected System (*)							
Peak Demand (MW)	6,700	8,500	9,000	10,749	10,072		
Total Demand (TWh)	39	50	56	64	63	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), 3 rd Wednesday, 18:00h CET							

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	14,098	17,047	20,216	23,994	22,129	24,500	25,500
Total Demand (TWh)							
Date of Peak Demand (month of the year)	2	11	12	1	2	1	1
Connected System (*)							
Peak Demand (MW)	14,098	17,047	20,216	23,994	22,129	24,500	25,500
Total Demand (TWh)	82	105	122	132	125	136	140
Date of Peak Demand (month of the year)	2	11	12	1	2	1	1
Use factor of Connected Peak Demand (h/a)	5,833	6,131	6,030	5,501	5,653	5,551	5,490
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)	3,947	9,180	19,524	33,392	36,122		
Total Demand (TWh)							
Date of Peak Demand (month of the year)	11	12	11	8	7		
Connected System (*)							
Peak Demand (MW)	3,947	9,180	19,524	33,392	36,122		
Total Demand (TWh)	23	54	122	202	219		
Date of Peak Demand (month of the year)	11	12	11	8	7		
Use factor of Connected Peak Demand (h/a)	5,878	5,828	6,254	6,058	6,049		
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

TABLE 2.1.1

ANNUAL ELECTRICITY AND PEAK DEMAND

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	1	2	2	2	2	3	
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	1	12	12	12		
Connected System (*)							
Peak Demand (MW)	1	2	2	2	2	3	
Total Demand (TWh)	7	12	9	12	13	18	
Date of Peak Demand (month of the year)	12	1	12	12	12		
Use factor of Connected Peak Demand (h/a)	5,993	5,882	5,719			6,780	
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)						4	5
Total Demand (TWh)							
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), 3 rd Wednesday, 18:00h CET							

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Total System							
Peak Demand (MW)	3,806	5,053	6,593	6,579	6,372	7,030	7,750
Total Demand (TWh)							
Date of Peak Demand (month of the year)	12	1	1	12	2	12	12
Connected System (*)							
Peak Demand (MW)	3,806	5,053	6,593	6,579	6,372	7,030	7,750
Total Demand (TWh)	19	28	30	34	34	39	43
Date of Peak Demand (month of the year)	12	1	1	12	2	12	12
Use factor of Connected Peak Demand (h/a)	5	5	4	5	5	6	6
Peak Demand (connected system), 3 rd Wednesday, 18:00h CET							

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
TOTAL SYSTEM							
Peak Demand (MW)				30,501	29,551		
Total Demand (TWh)							
Date of Peak Demand (month of the year)				1	1		
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), 3 rd Wednesday, 18:00h CET							

2.2 SECTORAL BREAKDOWN

TABLE 2.2.1

BREAKDOWN OF TOTAL DEMAND (TWH)

The tables below display the breakdown of total demand (in TWh) from 1980 to 2011 in each of the 27 EU Member States plus Switzerland, Norway, Turkey and certain 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	2010	2011	2020	2030
Final Consumption	33.7	43.9	53.7	61.5	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	27.2	27.3	29.7	31.2
Transport	2.3	2.7	3.6	3.5	3.2	5.9	9.3
Services	2.3	4.0	12.4	12.5	13.2	14.1	14.2
Households	8.8	11.2	14.8	17.4	17.0	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	5.4	5.4	5.1	4.8
Total Electricity Demand	36.3	46.9	56.9	65.0	65.0	72.8	78.5

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	45.0	59.0	79.9	85.9	83.3	90.0	98.0
of which Agriculture		0	0.3	0.8	0.3	0.8	0.9
Industry		31.6	41.4	40.7	40.5	42.1	44.2
Transport		1.2	1.4	1.7	1.6	3.3	3.3
Services		7.8	12.2	22.2	21.6	22.0	23.3
Households		18.4	23.7	20.2	19.3	22.3	26.3
Network Losses - in TWh	2.7	3.6	3.7	4.2	4.1	4.3	3.9
Network Losses - in %	5.7	5.8	4.4	4.7		4.6	0
Total Electricity Demand	47.7	62.6	83.6	90.1	87.4	94.3	101.9

BULGARIA (BG)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	31.5	36.9	25.4	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	4.5		6.1	6.2
Network Losses - in %	10.0	10.4	19.9	13.8	0	11.6	9.2
Total Electricity Demand	34.9	41.2	31.7	32.5	34.4	52.7	67.4

BREAKDOWN OF TOTAL DEMAND (TWH)

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	0.7	1.5	3.1	4.8	4.6	6.4	0
of which Agriculture	0	0.1	0.1	0.2	0.1	0.2	
Industry	0.3	0.4	0.6	0.8	0.8	1.0	
Transport	0	0	0	2.1	1.1	2.8	
Services	0.2	0.5	1.3	1.7	0.9	2.5	
Households	0.2	0.5	1.1	0.2	1.7		
Network Losses - in TWh	0.1	0.1	0.2	0.2	0.2	0	0
Network Losses - in %	12.5	5.3	6.3	3.7		0	
Total Electricity Demand	0.8	1.9	3.2	4.8	5.0	6.4	11.5

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	43.1	53.0	52.3	59.3	58.6	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	31.1	30.4	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	10.6	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	4.4	6.1	6.4
Network Losses - in %	7.7	7.0	8.2	7.6	7.5	7.9	7.7
Total Electricity Demand	46.7	57.0	57.0	59.3	58.6	77.5	83.0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	337.0	398.2	501.4	540.6	535.2	483.0	453.0
of which Agriculture	7.0	7.2	7.5	9.0	9.0	8.0	8.0
Industry	175.0	199.0	239.1	249.7	249.6	210.0	195.0
Transport	11.0	11.0	15.9	16.7	16.6	20.0	25.0
Services	58.0	81.0	108.4	123.5	123.4	115.0	105.0
Households	86.0	100.0	130.5	141.7	136.6	130.0	120.0
Network Losses - in TWh	14.0	17.0	34.1	27.9	27.7	24.0	21.0
Network Losses - in %	4.0	4.1	6.4	4.9	4.9	4.7	4.4
Total Electricity Demand	351.0	415.2	535.5	568.5	562.9	507.0	474.0

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	21.8	28.6	32.4	32.8	32.1	35.8	41.1
of which Agriculture	1.9	2.4	2.6	2.5	2.4	2.8	2.8
Industry	5.5	8.4	9.6	8.5	8.4	10.2	11.9
Transport	0.1	0.2	0.5	0.6	0.5	0.5	0.5
Services	6.9	8.6	10.2	11.5	11.2	12.2	14.2
Households	7.4	9.0	9.5	9.8	9.5	10.1	11.7
Network Losses - in TWh	2.1	2.2	2.3	1.8	1.7	2.4	2.7
Network Losses - in %	8.8	7.1	6.6	5.0	5.0	6.3	6.2
Total Electricity Demand	23.9	30.8	34.7	36.0	33.8	38.2	43.8

table 2.2.1

Breakdown of Total Demand (TWH)

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	5.5	7.3	5.4	7.2		9.3	0
of which Agriculture	1.2	2.0	0.2			0.8	
Industry	3.0	3.5	2.2			5.4	
Transport	0.7	0.8	1.5			0.1	
Services	0.1	0.2	0.1			1.7	
Households	0.5	0.9	1.5			1.3	
Network Losses - in TWh	1.0	1.1	1.2	1.1		0.8	0
Network Losses - in %	14.9	13.6	18.6	14.6	0	7.6	
Total Electricity Demand	6.5	8.4	6.7	7.4	7.2	10.1	0

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	92.0	131.0	198.0	258.8	252.6	315.0	383.0
of which Agriculture	2.0	4.0	5.0	5.5	5.3	6.0	6.0
Industry	57.0	68.0	86.0	99.3	96.8	116.0	134.0
Transport	2.0	4.0	4.0	4.4	4.3	7.0	10.0
Services	12.0	25.0	53.0	77.5	75.7	96.0	119.0
Households	20.0	31.0	50.0	72.1	70.4	91.0	115.0
Network Losses - in TWh	10.0	15.0	17.0	21.4	20.9	25.0	28.0
Network Losses - in %	9.8	10.3	7.9	7.6	7.7	7.4	6.8
Total Electricity Demand	102.0	146.0	215.0	280.0	273.0	340.0	411.0

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	37.6	59.5	76.5	84.9	81.7	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	41.5	40.7	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	18.2	17.6	20.0	22.0
Households	8.2	14.6	18.1	23.6	21.8	23.0	24.0
Network Losses - in TWh	2.3	2.9	2.6	2.8	2.5	3.0	3.0
Network Losses - in %	5.8	4.7	3.3	3.2	3.0	3.0	2.8
Total Electricity Demand	39.9	62.3	79.2	87.7	84.2	99.0	109.0

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	231.5	322.9	410.7	476.1	444.2	470.9	500.8
of which Agriculture	1.5	2.1	2.7	3.4	3.5	9.6	10.6
Industry	117.9	141.2	167.6	151.7	143.2	138.5	143.3
Transport	6.9	6.7	8.9	8.8	8.8	16.7	29.5
Services	43.6	76.0	102.8	145.0	141.1	137.8	145.8
Households	61.5	96.9	128.7	167.1	147.6	168.3	171.6
Network Losses - in TWh	17.2	26.6	29.9	37.1	34.9	37.1	39.5
Network Losses - in %	6.9	7.6	6.8	7.2	7.3	7.3	7.3
Total Electricity Demand	248.7	349.6	440.6	513.2	479.2	507.9	540.3

table 2.2.1

BREAKDOWN OF TOTAL DEMAND (TWH)

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	243.2	284.4	340.3	337.0	325.9	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	113.0	110.4	122.0	130.0
Transport	3.0	5.3	8.6	4.0	4.1	5.0	5.0
Services	51.4	70.9	90.5	97.0	95.9	101.0	109.0
Households	86.1	93.8	111.8	119.0	111.6	95.0	111.0
Network Losses - in TWh	21.6	25.0	31.2	16.0	27.5	16.0	18.0
Network Losses - in %	8.2	8.1	8.4	4.2		4.6	4.8
Total Electricity Demand	264.8	309.4	371.5	380.2	369.8	345.7	377.2

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	20.3	29.6	45.4	54.4	53.9	59.5	0
of which Agriculture	0.4	1.5	2.9	2.5	2.5	2.8	
Industry	10.9	13.3	15.9	13.7	13.2	14.5	
Transport	0.1	0.1	0.1	0.1	0.1	0.3	
Services	3.3	5.6	12.3	20.2	20.2	22.2	
Households	5.6	9.1	14.2	17.9	17.9	19.7	
Network Losses - in TWh	1.6	2.9	4.5	4.8	4.7	5.2	0
Network Losses - in %	7.3	8.9	9.0	8.1	8.0	8.0	
Total Electricity Demand	21.9	32.5	49.9	59.2	58.6	64.7	0

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	28.2	35.5	33.9	36.0	36.3	41.5	45.7
of which Agriculture	1.5	1.6	1.0	0.6	0.7	0.9	1.0
Industry	19.2	18.4	15.5	13.2	13.7	16.0	18.0
Transport	0.6	1.4	1.8	2.0	2.1	2.0	3.0
Services	2.5	5.4	5.8	9.2	8.9	9.6	9.7
Households	4.4	8.7	9.8	11.0	10.9	13.0	14.0
Network Losses - in TWh	3.1	4.1	4.7	3.8	3.8	4.0	4.3
Network Losses - in %	9.9	10.4	12.2	9.5	9.5	8.8	8.6
Total Electricity Demand	31.3	39.6	38.6	39.8	40.1	45.5	50.0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	8.4	11.8	20.3	0		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	0		0	0
Network Losses - in %	11.0	8.9	8.8			0	0
Total Electricity Demand	10.0	13.5	22.7	25.4	26.8	31.4	35.3

Breakdown of Total Demand (TWH)

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	163.6	218.7	279.3	309.9	313.8	0	0
of which Agriculture	2.6	4.2	4.9	5.6	5.9		
Industry	100.0	119.5	148.2	138.4	140.0		
Transport	4.8	6.3	8.5	10.7	10.7		
Services	18.4	36.0	56.6	85.6	87.0		
Households	37.8	52.7	61.1	69.6	70.1		
Network Losses - in TWh	16.6	16.4	19.2	20.6	20.8	0	0
Network Losses - in %	9.2	7.0	6.4	6.2	6.2		
Total Electricity Demand	180.3	235.1	298.5	330.4	334.6	0	0

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	9.5	12.8	7.0	9.2	9.5	11.3	13.1
of which Agriculture	1.8	2.7	0.2	0.2	0.2	0.2	0.2
Industry	5.0	6.2	3.3	3.1	3.6	3.7	4.3
Transport	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Services	1.4	1.9	1.6	3.3	2.9	4.2	4.9
Households	1.1	1.8	1.8	2.6	2.6	3.1	3.6
Network Losses - in TWh	1.4	1.5	1.3	1.1	0.9	1.2	1.1
Network Losses - in %	12.8	10.5	15.7	10.7	8.7	9.7	7.7
Total Electricity Demand	10.9	14.3	8.3	10.3	10.4	12.4	14.2

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	3.5	4.1	5.6	6.8		7.2	7.5
of which Agriculture				0.1		0.1	0.1
Industry				4.5		4.6	4.7
Transport				0.1		0.2	0.3
Services				1.1		1.2	1.2
Households				1.0		1.0	1.1
Network Losses - in TWh	0	0	0	0.1		0.1	0.1
Network Losses - in %				1.5	0	1.4	1.3
Total Electricity Demand	3.6	4.2	5.8	6.7	6.6	7.2	7.5

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	6.7	8.7	4.7	6.3	6.2	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	1.7	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	2.1	1.8	2.2	2.5
Network Losses - in TWh	1.3	1.2	1.0	0.7	1.0	1.1	1.3
Network Losses - in %				9.6	13.9	12.4	12.0
Total Electricity Demand	8.0	9.9	5.7	7.3	7.2	8.9	10.8

BREAKDOWN OF TOTAL DEMAND (TWH)

MALTA (MT)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	0	0	1.6	1.9	1.9	0	0
of which Agriculture							
Industry							
Transport							
Services							
Households							
Network Losses - in TWh	0	0	0.3	0.2	0.2	0	0
Network Losses - in %	0	0	16.2	10.9	11.0	0	0
Total Electricity Demand	0.5	1.2	1.9	2.1	2.2	0	0

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	57.2	72.4	100.6	112.7	113.6	119.8	132.3
of which Agriculture	2.0	1.9	11.9	6.3	7.6	8.0	8.9
Industry	31.0	32.0	38.0	45.0	44.2	46.6	51.5
Transport	1.3	1.3	1.8	2.3	2.3	2.4	2.7
Services	7.9	20.7	24.2	26.8	27.8	29.3	32.4
Households	15.3	16.5	24.6	32.2	31.7	33.5	37.0
Network Losses - in TWh	2.5	3.1	4.0	4.5	4.6	4.9	5.4
Network Losses - in %	4.2	4.1	3.8	3.8	3.9	3.9	3.9
Total Electricity Demand	59.7	75.5	104.7	117.1	118.2	124.7	137.7

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	99.6	108.0	109.8	130.1	132.7	149.3	173.0
of which Agriculture	5.8	8.1	4.8	0.5	0.4	1.7	1.9
Industry	66.8	54.7	53.3	55.5	58.2	58.9	64.8
Transport	4.8	6.0	5.8	4.8	4.2	3.6	4.1
Services	11.5	18.6	24.9	38.6	39.9	52.8	64.0
Households	10.7	20.6	21.0	30.7	30.0	32.3	38.3
Network Losses - in TWh	12.2	11.4	14.2	11.9	10.6	11.4	11.8
Network Losses - in %	10.9	9.5	11.5	8.4	7.4	7.1	6.4
Total Electricity Demand	111.9	119.4	124.0	142.0	143.3	160.7	185.6

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	14.6	23.8	38.9	50.5	49.2	48.5	57.0
of which Agriculture	0.1	0.3	0.7	1.0	1.0	1.0	1.1
Industry	8.4	11.5	15.8	17.5	17.0	16.6	19.2
Transport	0.3	0.3	0.5	0.7	0.6	0.7	0.9
Services	2.5	5.7	11.8	16.8	16.8	16.2	19.4
Households	3.3	5.9	10.0	14.5	13.8	14.0	16.5
Network Losses - in TWh	1.9	3.4	3.7	4.4	4.1	4.2	4.9
Network Losses - in %	11.5	12.5	8.7	8.0	7.7	8.0	7.9
Total Electricity Demand	16.5	27.1	42.5	55.0	53.3	52.7	62.0

BREAKDOWN OF TOTAL DEMAND (TWH)

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	57.9	60.3	39.8	0		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	0		7.3	8.5
Network Losses - in %	6.5	8.9	14.2	0		11.3	10.4
Total Electricity Demand	62.0	66.1	46.4	53.4	54.9	64.2	81.0

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	85.8	130.7	135.5	135.2	130.6	133.5	134.2
of which Agriculture	2.5	3.2	3.0	3.2	3.0	2.8	2.8
Industry	42.1	65.1	65.3	59.2	59.2	59.1	57.0
Transport	2.3	2.5	3.2	2.4	2.6	4.1	8.5
Services	13.9	23.2	24.3	27.0	26.1	27.3	27.4
Households	25.1	36.7	39.7	43.4	39.6	40.3	38.6
Network Losses - in TWh	8.2	9.3	11.1	11.8	9.7	10.9	11.0
Network Losses - in %	8.7	6.6	7.6	8.0	6.9	7.5	7.6
Total Electricity Demand	94.0	139.9	146.6	147.0	140.3	144.4	145.2

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	5.1	8.6	10.7	0		14.0	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		0.9	0
Network Losses - in %	8.9	6.5	7.0	0		5.7	
Total Electricity Demand	5.6	9.2	11.5	16.1	12.4	15.8	0

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	20.5	25.1	23.7	28.5		32.3	36.5
of which Agriculture	1.2	1.3	0.9	1.1		1.3	1.4
Industry	13.6	15.2	11.5	13.0		14.1	15.7
Transport	0.8	1.1	1.0	1.3		1.4	1.5
Services	2.6	3.7	4.5	6.0		7.3	8.8
Households	2.3	3.8	5.8	7.1		8.2	9.1
Network Losses - in TWh	1.7	1.8	2.0	2.5		2.9	3.0
Network Losses - in %	7.7	6.7	7.8	9.4	0	8.2	7.6
Total Electricity Demand	22.2	26.9	25.7	26.6	26.8	35.2	39.5

table 2.2.1

BREAKDOWN OF TOTAL DEMAND (TWH)

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	35.3	46.6	52.4	59.8	58.6		
of which Agriculture	0.4	0.9	1.0	1.0	1.0		
Industry	11.9	17.2	18.1	19.3	19.2		
Transport	2.1	4.0	4.2	4.9	4.7		
Services	10.8	11.3	13.4	16.0	15.7		
Households	10.1	13.2	15.7	18.6	17.9		
Network Losses - in TWh	3.2	3.7	3.9	4.5	4.4		
Network Losses - in %	8.3	7.4	6.9	7.0	7.0		
Total Electricity Demand	38.5	50.3	56.3	64.3	63.0	69.4	72.1

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	75.1	97.6	111.1	121.7	115.0	125.0	129.0
of which Agriculture			1.8	2.2	1.8	2.0	2.0
Industry	39.3	45.9	51.1	51.2	49.2	54.0	54.0
Transport	0.7	0.6	0.7	1.7	1.6	2.0	2.0
Services	11.5	19.9	23.2	26.8	26.1	28.0	30.0
Households	23.6	31.2	34.2	39.8	36.3	39.0	41.0
Network Losses - in TWh	7.1	6.9	10.8	10.3	10.1	11.0	11.0
Network Losses - in %	8.6	6.6	8.9	7.8	8.1	8.1	7.9
Total Electricity Demand	82.2	104.5	121.9	132.0	125.1	136.0	140.0

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	20.4	46.8	98.3	172.1	186.1	434.5	
of which Agriculture	0.2	0.5	3.1	5.6	5.1	7.4	
Industry	12.2	27.3	48.8	79.3	88.0	227.8	
Transport	0.1	0.4	0.4	0.6	0.7	4.0	
Services	4.4	9.5	22.1	45.1	48.0	105.1	
Households	3.5	9.1	23.9	41.4	44.3	90.2	
Network Losses - in TWh	2.8	6.7	23.8	30.2	32.4	65.0	
Network Losses - in %	12.1	12.5	19.5	14.9	14.8		
Total Electricity Demand	23.2	53.5	122.1	202.3	218.5		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	6.6	10.2	7.7	10.7	11.1		
of which Agriculture	0.1	0.1	0.0				
Industry	3.6	5.8	3.1				
Transport	0.1	0.2	0.1				
Services	0.7	1.0	1.1				
Households	2.2	3.2	3.5	4.5	4.5		
Network Losses - in TWh	0.8	1.3	1.7	1.6	1.5		
Network Losses - in %	10.6	11.3	17.8	13.0	11.9		
Total Electricity Demand	7.4	11.5	9.4	12.3	12.6	17.9	

table 2.2.1

Breakdown of Total Demand (TWH)

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	12.0	15.7	14.7				
of which Agriculture	0.3	0.5	0.3				
Industry	5.2	5.9	2.8				
Transport	0.4	0.4	0.3				
Services	1.4	2.0	2.7				
Households	2.9	4.5	5.7				
Network Losses - in TWh	1.2	1.6	2.1				
Network Losses - in %	10.3	10.7	15.0		0		
Total Electricity Demand	11.7	15.0	14.0	18.0	17.6	24.0	32.0

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption	16.3	24.9	24.5	28.1	28.6	34.1	37.5
of which Agriculture	0.1	0.2	0.2	0.3	0.3		
Industry	9.1	13.2	5.8	7.7	8.1		
Transport	0.3	0.4	0.4	0.5	0.5		
Services	0.6	1.1	4.1	4.9	5.0		
Households	6.1	10.1	14.0	14.6	14.7		
Network Losses - in TWh	2.5	3.0	5.1	6.0	5.8	5.2	5.6
Network Losses - in %	12.9	10.7	17.2	17.3	16.7	13.3	12.9
Total Electricity Demand	19.4	27.7	29.6	34.6	35.0	39.4	43.1

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Final Consumption				147.5	150.8		
of which Agriculture				3.4	3.5		
Industry				71.5	73.0		
Transport				9.5	9.9		
Services				18.3	18.3		
Households				37.7	38.5		
Network Losses - in TWh				36.2	36.9		
Network Losses - in %				19.7	19.7		
Total Electricity Demand				183.7	187.5		

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 certain Energy Community member states, from 1980 to 2011. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

AUSTRIA (AT)							
	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	4,150	5,060	6,121	6,326	7,079	7,058	7,989
of which multifuel							
Hard Coal	140	1,080	1,460	1,226	1,171	750	750
Brown Coal	440	760	421	0	0	0	0
Oil	1,170	950	870	359	362	39	0
Natural Gas	2,180	2,050	3,090	4,298	5,102	5,778	6,878
Derived Gas	220	220	280	443	444	491	561
PUMPED HYDRO	4,690	6,200	6,330	7,523	7,765	9,903	11,303
RENEWABLES			857	6,891	14,908	20,066	26,766
Hydro							
of which Run of River	3,520	4,670	5,400	5,396	5,444	6,016	6,616
of which Reservoir							
Wind			77	1,013	1,106	3,000	4,000
of which Wind Onshore			77	1,013	1,106	3,000	4,000
of which Wind Offshore			0	0		0	0
Solar			5	35	72	500	4,000
of which PV				35	72		
of which CSP							
Geothermal				1	1	1	1
Biogas			6	79	10	179	279
Biomass			769	334	382	434	534
Waste				21	22	21	21
Other (Wave/Tidal etc)				12	106	12	12
OTHER							
Peat							
Not Specified	160	150	140	660	641	559	473
TOTAL	12,620	16,190	18,048	21,400	22,600	27,683	35,228

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	1,666	5,500	5,713	5,926	5,927	4,037	0
FOSSIL FUEL FIRED	8,210	7,154	8,051	7,126	7,988	9,880	15,255
of which multifuel							
Hard Coal			1,959	760	760	1,153	3,828
Brown Coal			0				
Oil			494	288	677	996	656
Natural Gas			5,097	5,601	6,074	7,731	10,771
Derived Gas			501	477	477		
Pumped Hydro	1,056	1,307	1,310	1,307	1,307	1,307	1,307
Renewables	72	99	115	2,886	3,558	7,845	8,999
Hydro	72	94	103	118	119	94	94
of which Run of River	72	94	103	118	119	94	94
of which Reservoir							
Wind	0	5	12	912	1,069	4,181	4,951
of which Wind Onshore			12	882	874	2,063	2,443
of which Wind Offshore			0	30	195	2,118	2,508
Solar		0	0	904	1,391	1,500	1,587
of which PV				904	1,391	1,500	1,587
of which CSP							
Geothermal	0	0	0	0	0	20	40
Biogas				58	58	70	75
Biomass				711	738	1,680	1,989
Waste				183	183	300	350
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified		79	496	1,076	1,318		
Total	11,004	14,139	15,685	18,322	20,098	23,069	25,561

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	1,300	2,700	3,500	1,900	2,000	2,000	2,581
FOSSIL FUEL FIRED	4,830	5,655	4,934	5,269	6,403	8,587	8,444
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1,966	2,021	1,394	1,151	1,761	1,842	1,842
Brown Coal	1,924	2,814	2,960	3,064	3,858	4,500	4,500
Oil	450	420	220	275	275	237	157
Natural Gas	490	400	360	789	509	2,008	1,945
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	150	150	570	938	938	1,000	1,000
Renewables	0	0	0	513	2,887	3,994	5,350
Hydro					2	2	2
of which Run of River	40	40	40	143	157	326	326
of which Reservoir					2	2	2
Wind	0	0	0	488	516	1,127	3,345
of which Wind Onshore	0	0	0	0	0		
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	154	528	664
of which PV							
of which CSP							
Geothermal	0	0	0			0	0
Biogas	0	0	0	0		0	
Biomass	0	0	0	0	4	55	57
Waste	0	0	0	0		0	
Other (Wave/Tidal etc)	0	0	0	0		0	
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
TOTAL	7,830	10,155	10,384	10,406	12,228	15,581	18,390

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

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	264	462	988	1,438	1,553	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	1,438	1,553	428	188
Natural Gas	0	0	0			1,770	2,490
Derived Gas	0	0	0			0	0
PUMPED HYDRO	0	0	0				
RENEWABLES	0	0	0	95	136		
Hydro							
of which Run of River	0	0	0				
of which Reservoir							
Wind	0	0	0	82	116		
of which Wind Onshore	0	0	0	82	116		
of which Wind Offshore	0	0	0				
Solar	0	0	0	6	6		
of which PV							
of which CSP							
Geothermal	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0	7	7		
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				
OTHER							
Peat							
Not Specified	0	0	0			0	0
Total	264	462	988	1,533	1,689	2,198	2,678

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	1,651	1,651	3,900	3,970	3,830	6,000
FOSSIL FUEL FIRED	9,060	10,634	10,491	11,793	11,889	10,295	8,878
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1,447	1,373	1,776	10,769	10,788	2,659	2,659
Brown Coal	7,442	9,090	7,976	8,971		6,445	5,000
Oil	0	0	123	123	123	123	0
Natural Gas	106	106	197	1,024	1,102	649	800
Derived Gas	65	65	419	447		419	419
Pumped Hydro	490	490	1,140	1,147	1,147	1,140	1,140
Renewables	0	8	1	3,233	3,244	2,378	2,750
Hydro				1,056	1,055		
of which Run of River	182	224	221	276		252	252
of which Reservoir							
Wind	0	0	1	218	219	550	900
of which Wind Onshore	0	0	1	218	219	550	900
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	1,959		1,820	1,850
of which PV				1,959	1,971		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	7		0	0
Biomass	0	8	0	0	0	0	0
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER							
Peat							
Not Specified	139	125	0	0	0	0	0
TOTAL	10,499	13,760	14,232	20,073	20,250	18,544	19,749

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	8,607	22,406	22,396	20,477	12,068	8,107	0
FOSSIL FUEL FIRED	63,536	63,761	81,997	83,729	83,373	70,700	58,300
of which multifuel	10,128	8,723	9,521	8,700	8,600		
Hard Coal	26,893	31,090	30,123	27,890	27,240	20,800	16,800
Brown Coal	12,997	11,298	20,050	20,377	20,083	19,700	10,800
Oil	12,035	7,229	7,218	5,788	5,500	600	400
Natural Gas	11,611	14,144	20,127	24,902	25,700	28,000	28,400
Derived Gas			4,479	4,772	4,850	1,600	1,900
Pumped Hydro	3,785	4,017	4,654	5,710	5,710	8,000	8,500
Renewables	2,669	3,634	11,924	56,413	66,063	117,700	143,900
Hydro	2,666	2,834	4,738	4,062	4,180	4,300	4,350
of which Run of River			3,404	1,365	1,365	1,400	1,450
of which Reservoir			1,334	300	300	300	350
Wind	3	48	6,094	27,204	28,752	49,000	67,000
of which Wind Onshore	3	48	6,094	27,124	28,564	39,000	44,000
of which Wind Offshore	0	0	0	80	188	10,000	23,000
Solar	0	2	62	17,488	24,785	54,000	61,000
of which PV	0	0	62	17,488	24,785	54,000	61,000
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	7	7	300	400
Biogas	0	140	250	2,773	3,274	3,800	4,000
Biomass	0	50	260	2,184	2,350	3,200	4,000
Waste	0	560	520	1,330	1,350	1,700	1,700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
TOTAL	78,597	93,818	120,971	166,329	167,214	204,507	210,700

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0			0	0
FOSSIL FUEL FIRED	6,609	7,762	30	9,271	9,241	8,900	8,100
of which multifuel	0	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
Oil	2,165	839	800	1,077	1,063	600	600
Natural Gas	0	45	2,176	2,917	2,920	4,800	5,000
Derived Gas	0	0	0	0		0	0
Pumped Hydro	0	0	0			0	0
RENEWABLES	1	438	2,662	4,160	4,511	5,600	7,300
Hydro	9	9	9	9	9		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	1	343	2,417	3,802	3,950	5,600	7,300
of which Wind Onshore	1	343	2,377	2,934		3,474	3,974
of which Wind Offshore	0	0	40	868		2,126	3,326
Solar	0	0	0	0	28	0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0			0	0
Biogas	0	0	0	78	69	0	0
Biomass	0	95	245	258	127	0	0
Waste	0	0	0	379	327	0	0
Other (Wave/Tidal etc)	0	0	0			0	0
OTHER							
Peat							
Not Specified	0	0	0		44	0	0
Total	6,619	8,209	12,417	13,420	13,437	14,509	15,409

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR			0	0		0	
FOSSIL FUEL FIRED			3,211	2,931	2,994	2,873	
of which multifuel			0	176		176	
Hard Coal			0	0		0	
Brown Coal			2,976	2,000		1,973	
Oil			10	0		0	
Natural Gas			207	184		400	
Derived Gas			18	44		500	
Pumped Hydro			0	0		0	
RENEWABLES			0	209		1,177	
Hydro							
of which Run of River			2	4		5	
of which Reservoir							
Wind			0	149		900	
of which Wind Onshore	0	0	0	149		400	
of which Wind Offshore			0	0		500	
Solar			0	0		0	
of which PV							
of which CSP							
Geothermal			0	0		0	
Biogas			2	2		10	
Biomass			0	74		250	
Waste			0	0		17	
Other (Wave/Tidal etc)			0	0		0	
OTHER							
Peat							
Not Specified							
Total			3,213	3,105	3,242	4,055	

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

SPAIN (ES)

	1090	1000	2000	2010	2011	2020	2020
	1980	1990	2000	2010	2011	2020	2050
NUCLEAR	1,065	7,000	7,486	7,483	7,535	7,483	9,916
Fossil Fuel Fired	15,088	19,382	25,747	47,488	48,464	48,418	46,887
of which multifuel	1,000	1,045	3,116	0	0	0	0
Hard Coal	4,358	8,621	9,494	9,500	9,500	8,856	2,984
Brown Coal	1,800	1,800	1,930	1,929	1,929	0	0
Oil	8,930	8,510	10,697	5,816	5,785	6,159	7,277
Natural Gas	0	451	3,626	30,243	31,250	33,403	36,626
Derived Gas	0	0	0	0	0	0	0
PUMPED HYDRO	2,621	4,900	4,900	4,836	4,836	7,057	7,551
Renewables	10,554	11,696	15,395	38,489	40,406	58,890	78,986
Hydro	10,554	11,661	12,767	13,732	13,713	14,194	14,715
of which Run of River	850	940	1,080	1,160	1,163	1,160	1,160
of which Reservoir	9,704	10,721	11,687	12,572	12,549	13,034	13,555
Wind	0	35	2,243	19,314	20,381	34,957	50,899
of which Wind Onshore	0	35	2,243	19,314	20,381		
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	1	4,283	5,118	8,138	11,321
of which PV	0	0	1	3,615	4,090	5,838	9,021
of which CSP	0	0	0	668	1,028	2,300	2,300
Geothermal							
Biogas	0	0	28	160	173	282	382
Biomass	0	0	97	459	496	743	1,043
Waste	0	0	259	541	525	576	626
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total	29,328	42,978	53,528	98,298	101,241	121,848	143,340

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	2,210	2,310	2,640	2,730	2,752	4,604	7,395
FOSSIL FUEL FIRED	5,377	6,057	7,848	6,890	6,324	6,148	5,331
of which multifuel	0	0	0	0	0		
Hard Coal	2,601	3,506	3,760	2,699	3,303		
Brown Coal	0	0	0	0	0		
Oil	2,224	1,140	1,395	1,349	1,352		
Natural Gas	552	1,411	2,693	2,842	1,669		
Derived Gas	0	0	0	0	0		
Pumped Hydro	0	0	0	0	0	0	0
Renewables	3,250	3,817	4,362	5,679	5,253	8,278	9,785
Hydro	2,318	2,621	2,882	3,084	3,111	3,330	3,400
of which Run of River							
of which Reservoir							
Wind	0	0	38	197	199	2,565	3,870
of which Wind Onshore	0	0	38	197	199		
of which Wind Offshore	0	0	0	0	0		
Solar							
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0	0		
Biogas							
Biomass	932	1,196	1,442	2,240	1,884	2,342	2,474
Waste				158	59	41	41
Other (Wave/Tidal etc)	0	0	0	0	0		
OTHER	185	986	1,408	1,441	1,905		
Peat	185	986	1,354	1,441	1,905	1,562	1,275
Not Specified	0	0	54	0	0	221	219
TOTAL	11,022	13,170	16,258	16,740	16,234	20,813	24,005

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	14,394	55,750	63,183	63,130	63,130	63,000	56,000
FOSSIL FUEL FIRED	29,032	22,673	26,799	27,399	27,813	19,200	26,000
of which multifuel	0	0	0	0	0		
Hard Coal	12,800	11,900	10,300	7,942	7,942		
Brown Coal	227	100	0	0	0		
Oil	15,254	10,073	11,080	10,447	10,332		
Natural Gas	550	0	4,141	8,963	9,539		
Derived Gas	201	600	800				
Pumped Hydro	1,614	4,293	4,302	25,390	4,263	4,300	4,300
RENEWABLES	240	240	718	7,864	31,608	47,000	75,000
Hydro					21,131	20,900	20,900
of which Run of River	7,743	7,453	7,505	7,612	11,952	7,600	7,600
of which Reservoir					9,179	13,300	13,300
Wind	0	0	38	5,764	6,692	16,000	30,000
of which Wind Onshore	0	0			6,692	16,000	24,500
of which Wind Offshore	0	0				0	5,500
Solar	0	0	6	878	2,503	8,000	20,000
of which PV				878	2,503	8,000	20,000
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	34	214	250	0	0
Biomass	0	0	20	272	284	1,800	2,600
Waste	0	0	380	737	748		
Other (Wave/Tidal etc)	240	240	240			300	1,500
OTHER							
Peat							
Not Specified	0	0	0	0	0		
Total	62,711	103,410	115,338	123,783	126,814	133,500	161,300

Note: This table includes autoproducers.

UNITED KINGDOM (UK)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	5,767	11,353	12,486	10,865	10,663	8,980	12,710
FOSSIL FUEL FIRED	60,689	57,850	60,728	71,120	68,265	54,547	46,155
of which multifuel	4,510	5,030	7,092				
Hard Coal	43,668	40,739	30,529	23,085	23,072	15,599	1,987
Brown Coal	0	0	0	0		0	0
Oil	16,241	15,862	5,474	3,638	3,638	3,735	4,138
Natural Gas	80	549	24,025	44,397	41,555	35,214	40,030
Derived Gas	700	700	700	0		0	0
PUMPED HYDRO	1,059	2,787	2,788	2,744	2,744	2,744	2,744
Renewables	0	130	1,335	9,215	12,264	41,919	82,520
Hydro				1,641	1,676		
of which Run of River	0	0	0	1,521	1,545	0	0
of which Reservoir				119	130		
Wind	0	9	412	5,386	6,488	26,349	56,941
of which Wind Onshore	0	9	408	4,311	4,638	14,224	20,985
of which Wind Offshore	0	0	4	1,341	1,838	12,125	35,956
Solar	0	0	2	94	993		
of which PV				94	993		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	90	425	1,239	1,314	0	0
Biomass	0	0	157	426	1,259		
Waste	0	31	338	428	544		
Other (Wave/Tidal etc)	0	0	1	3	3	1,557,020	15,570
OTHER							
Peat							
Not Specified	0	0	0	0		0	4,588
TOTAL	68,800	73,530	78,822	93,944	93,937	105,446	145,973

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	
FOSSIL FUEL FIRED	3,909	6,097	7,558	10,859	11,500	10,027	
of which multifuel	0	0	0	0		0	
Hard Coal	0	0	0	4,682	4,456	0	
Brown Coal	1,863	3,889	4,461	4,682	4,456	2,871	
Oil	2,046	2,192	1,967	2,432	2,469	1,838	
Natural Gas	0	16	1,129	3,745	4,575	5,318	
Derived Gas	0	0	0	0		0	
Pumped Hydro	0	315	699	699	699	699	
Renewables	0	3	261	4,057	4,817	10,408	
Hydro				2,516	2,524	2,943	
of which Run of River	0	0	0	197	205	282	
of which Reservoir				2,319	2,319	2,661	
Wind	0	1	205	1,302	1,642	3,550	
of which Wind Onshore	0	1	205	1,302	1,642	3,408	
of which Wind Offshore	0	0	0	0	0	142	
Solar	0	0	0	198	606	3,637	
of which PV				198	606	3,265	
of which CSP						372	
Geothermal	0	2	0	0	0	120	
Biogas	0	0	21	41	45	135	
Biomass	0	0	0	0	0	23	
Waste	0	0	36	0	0	0	
Other (Wave/Tidal etc)	0	0	0	0	0	0	
OTHER							
Peat							
Not Specified	0	0	0	0	0	0	
TOTAL	5,324	8,508	10,891	15,615	17,016	21,134	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	1,654	1,752	1,892	1,892	1,892	3,020
Fossil Fuel Fired	4,796	4,881	5,725	6,181	6,860	6,690	6,440
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	163	1,247	398	0	0
Brown Coal	1,728	1,900	1,736	1,073	849	680	490
Oil	306	481	1,229	410	407	407	407
Natural Gas	2,763	2,500	2,597	4,592	4,342	5,603	5,543
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	0	0	0	0	0	0
Renewables	0	0	18	680	745	1,608	1,540
Hydro				50	50	66	70
of which Run of River	46	48	47	50	50	66	70
of which Reservoir	0	0	0	0	0	0	0
Wind	0	0	0	240	325	750	750
of which Wind Onshore	0	0	0	240	325	750	750
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	63	63
of which PV	0	0	0	0	0	63	63
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	10	10
Biogas	0	0	0	21	40	100	100
Biomass	0	0	0	348	309	599	517
Waste	0	0	18	21	21	30	40
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	19	63	0	0	0	0
Total	4,842	6,602	7,605	8,753	9,497	10,190	11,000

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
Fossil Fuel Fired	1,848	3,256	3,921	5,277	6,325	6,006	6,171
of which multifuel	0	844	865	3,900	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	3,300	3,300	4,592	5,000
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	292	292	292	292	292	292	292
RENEWABLES	0	0	133	1,400	1,763	4,241	4,460
Hydro					222		
of which Run of River	8	8	19	32	222	222	222
of which Reservoir					0		
Wind	0	0	118	1,400	1,557	3,918	4,137
of which Wind Onshore	0	0	118	1,400	1,557	3,593	3,812
of which Wind Offshore	0	0	0	0	0	325	325
Solar	0	0	0	0	0	0	0
of which PV					0		
of which CSP					0		
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	15	0	0	0	0
Biomass	0	0	0	0	0	231	231
Waste	0	0	0	0	16	92	92
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER							
Peat				297	297		
Not Specified	0	0	128	346		346	346
Total	2,360	3,768	4,708	7,553	8,618	11,123	11,507

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	1,424	0	0	0	0		
FOSSIL FUEL FIRED	29,146	37,232	53,384	72,397	73,251		
of which multifuel	12,608	19,523	34,006	31,254	30,497		
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
PUMPED HYDRO	3,654	6,188	6,957	7,544	7,544		
RENEWABLES	12,601	13,078	14,999	26,230	37,339		
Hydro	12,173	12,582	13,389	13,977	14,193		
of which Run of River	2,730	3,109	3,453	4,765	4,783		
of which Reservoir	9,443	9,473	9,935	9,212	9,409		
Wind			363	5,794	6,918		
of which Wind Onshore			363	5,794	6,918		
of which Wind Offshore	0	0	0	0	0		
Solar			6	3,470	12,773		
of which PV			6	3,470	12,773		
of which CSP	0	0	0	0	0		
Geothermal	428	496	590	728	728		
Biogas			171	486	725		
Biomass			207	1,007	1,174		
Waste			273	768	828		
Other (Wave/Tidal etc)	0	0	0	0	0		
OTHER	0	50	164	318	310		
Peat			0	0	0		
Not Specified	0	50	164	318	310		0
TOTAL	46,825	56,548	75,504	106,489	118,443		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	2,367	2,367	0	0	0	1,303
FOSSIL FUEL FIRED	2,171	2,452	2,477	2,525	2,574	2,278	1,880
of which multifuel	2,023	2,304	2,329	2,344	2,393	1,662	792
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	144	144
Natural Gas	66	1,322	1,731	2,377	2,426	2,134	1,736
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	0	760	760	760	950	1,140
RENEWABLES	0	0	0	321	363	1,242	1,510
Hydro				116	116	131	131
of which Run of River	0	0	0	0	116	131	131
of which Reservoir				0	0	0	0
Wind	0	0	0	161	188	750	1,000
of which Wind Onshore	0	0	0	161	188	750	1,000
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	20	30
of which PV				0	0	20	30
of which CSP					0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	44	49	324	332
Waste	0	0	0	0	0	17	17
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER					0	0	0
Peat					0	0	0
Not Specified	0	0	0	0	0	0	0
TOTAL	2,277	4,924	5,717	3,606	3,687	4,470	5,833

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	85	80	51	505	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	505	505	530	550
Derived Gas	85	80	51	0		0	0
Pumped Hydro	1,096	1,096	1,096	1,096	1,096	1,296	1,296
Renewables	5	5	20	95	95	133	153
Hydro							
of which Run of River	11	11	15	15	15	15	15
of which Reservoir							
Wind	0	0	15	50	50	60	70
of which Wind Onshore	0	0	15	50	50	60	70
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	25	30	120	160
of which PV	0	0	0	25	30	120	160
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	1	15	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
OTHER							
Peat							
Not Specified	4	4	0	0	0	0	0
Total	1,218	1,213	1,199	1,728	1,728	1,991	2,031

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	
FOSSIL FUEL FIRED	503	533	595	867	856	949	
of which multifuel				0			
Hard Coal	0	0	0	0	0	149	270
Brown Coal	0	0	0	0	0		
Oil	190	67	75	30	0		
Natural Gas	313	466	520	837	856	800	
Derived Gas	0	0	0	0			
Pumped Hydro	0	0	0	0	0	0	
Renewables	1,487	1,487	1,515	1,633	1,674	2,081	2,312
Hydro	1,487	1,487	1,513	1,576	1,576	1,590	1,590
of which Run of River	1,487	1,487	1,513	1,576	1,576	1,590	1,590
of which Reservoir							
Wind	0	0	2	31	36	300	400
of which Wind Onshore	0	0	2	31	36	150	200
of which Wind Offshore	0	0	0	0	0	150	200
Solar	0	0	0	0		1	2
of which PV				0	0	1	2
of which CSP							
Geothermal	0	0	0	0	0	5	
Biogas	0	0	0	11	33	60	120
Biomass	0	0	0	5	5	80	150
Waste	0	0	0	10	24	45	50
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat	60	50	20	0	0		
Not Specified	0	0	0	0		0	0
TOTAL	2,050	2,070	2,130	2,500	2,530	3,030	3,380

MALTA (MT)

	1000	1000			0.044		
	1980	1990	2000	2010	2011	2020	2030
NUCLEAR		0	0	0	0		
Fossil Fuel Fired		289	571	571	571		
of which multifuel			0	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		
Pumped Hydro		0	0	0	0		
RENEWABLES		0	0	0	5		
Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
of which Reservoir		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		
Solar		0	0	0	5		
of which PV		0	0	0	5		
of which CSP		0	0	0	0		
Geothermal		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		
OTHER		0	0	0	0		
Peat		0	0	0	0		
Not Specified		0	0	0	0		
Total				571	576		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	498	449	449	485	485	485	2,985
FOSSIL FUEL FIRED	14,370	15,334	18,305	22,941	24,153	29,872	25,045
of which multifuel							
Hard Coal	1,936	3,839	4,176	4,157	4,157	6,690	4,622
Brown Coal	0	0	0	0	0	0	0
Oil	742	37	37	0		0	0
Natural Gas	11,050	10,524	13,629	17,810	19,022	22,208	19,449
Derived Gas	642	934	500	974	974	974	974
PUMPED HYDRO	0	0	0	0	0	0	0
RENEWABLES		227	778	3,144	3,356	12,300	16,500
Hydro				38	38	100	100
of which Run of River	0	37	37	38	38	40	40
of which Reservoir		0	0	0	0	0	0
Wind		57	435	2,241	2,316	7,000	9,000
of which Wind Onshore		57	435	2,013	2,088	4,000	6,000
of which Wind Offshore		0	0	228	228	3,000	3,000
Solar		0	0	78	88	4,000	6,000
of which PV				78	88	4,000	6,000
of which CSP				0	0	0	0
Geothermal						0	0
Biogas							
Biomass		20	53	290	316	550	700
Waste		150	290	535	636	750	800
Other (Wave/Tidal etc)		0	0	0	0	60	60
OTHER							
Peat							
Not Specified	0	0	0	0	0	0	0
Total	14,868	16,047	19,569	26,608	28,033	42,757	44,630

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	2,878
Fossil Fuel Fired	21,624	26,433	28,457	29,282	29,985	31,191	27,512
of which multifuel	0	0	0	0	0	0	0
Hard Coal	16,844	17,812	20,525	20,169	20,026	19,422	15,851
Brown Coal	4,395	8,236	7,759	8,092	8,949	7,800	7,054
Oil	385	385	0	0	0	0	0
Natural Gas	0	0	174	1,022	1,011	3,904	4,542
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	645	1,195	1,622	1,772	1,772	1,776	1,776
Renewables	0	0	516	1,778	2,605	8,221	9,973
Hydro				553	558	607	648
of which Run of River	204	204	365	412	417	417	417
of which Reservoir			138	141	141	190	231
Wind	0	0	4	1,096	1,782	6,725	8,075
of which Wind Onshore	0	0	4	1,096	1,782	5,825	5,825
of which Wind Offshore	0	0	0	0	0	900	2,250
Solar	0	0	0	0	1	2	32
of which PV				0	1	2	32
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	75	94	0	0
Biomass	0	0	9	54	170	886	1,217
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER							
Peat							
Not Specified	0	0	0	0	0	1	1
Total	22,910	28,394	30,604	32,833	34,361	41,188	42,139

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
Fossil Fuel Fired	2,026	4,122	5,979	9,087	9,249	8,254	6,968
of which multifuel	0	0	0	0	0	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	2,830	2,809	420	345
Natural Gas	0	0	1,168	4,501	4,684	7,258	6,623
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	68	604	604	1,035	1,035	3,949	5,049
Renewables	2,403	2,727	4,304	8,670	9,602	12,191	13,843
Hydro	2,399	2,723	3,865	4,016	4,420	5,151	5,404
of which Run of River	1,561	2,007	2,402	2,596	3,000	3,085	3,328
of which Reservoir	838	716	1,463	1,421	1,420	2,065	2,075
Wind	0	0	89	3,906	4,367	5,420	6,570
of which Wind Onshore	0	0	89	3,906	4,367	5,420	6,570
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	132	174	739	924
of which PV	0	0	0	132	174	689	819
of which CSP	0	0	0	0	0	50	105
Geothermal	4	4	14	23	23	40	40
Biogas	0	0	1	30	49	60	70
Biomass	0	0	9	116	116	300	340
Waste	0	0	326	446	454	476	486
Other (Wave/Tidal etc)	0	0	0	0	0	6	10
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
TOTAL	4,496	7,454	10,887	18,792	19,887	24,394	25,860

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	655	1,300	1,300	2,630	4,130
FOSSIL FUEL FIRED	10,710	13,470	8,040	9,166	8,901	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	5,459	5,391	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	3,707	3,510	4,096	4,622
Derived Gas	0	0	0	0		0	0
Pumped Hydro	0	0	0	0	0	1,213	1,213
RENEWABLES	0	0	0	6,588	7,175	3,535	5,189
Hydro				6,087	6,145		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	479	1,006	3,496	4,996
of which Wind Onshore	0	0	0	401		3,496	4,996
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	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
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
Total	13,700	18,400	13,865	17,054	17,376	23,929	26,728

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	4,625	9,970	9,439	9,150	9,363	10,030	8,310
FOSSIL FUEL FIRED			3,760	5,035	4,793	2,920	2,920
of which multifuel							
Hard Coal			913	130	130	0	0
Brown Coal	0	0	0	0		0	0
Oil			2,421	3,764	3,522	1,800	1,800
Natural Gas	0	0	290	1,005	1,005	1,000	1,000
Derived Gas			136	136	136	120	120
Pumped Hydro	350	350	0	0	0	0	0
Renewables	14,150	15,984	17,695	21,516	22,291	26,900	31,000
Hydro	14,150	15,980	16,229	16,200	16,197	16,400	16,600
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	14,150	15,980	16,229	16,200	16,197	16,400	16,600
Wind	0	4	241	2,163	2,899	5,700	9,500
of which Wind Onshore				2,000	2,736		
of which Wind Offshore				163	163		
Solar	0	0	0				
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0		
Biomass				2,860	2,870	4,100	4,200
Waste				293	325	700	700
Other (Wave/Tidal etc)				0	0	0	0
OTHER	7,949	7,368	0	0	0	0	0
Peat							
Not Specified	7,949	7,368	0	0	0	0	0
Total	27,074	33,672	30,894	35,701	36,447	39,850	42,230

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	630	670	656	696	696	1,796
FOSSIL FUEL FIRED	1,015	1,093	1,341	1,482	1,280	1,880	1,491
of which multifuel	0	0	0	0			
Hard Coal	872	950	970				
Brown Coal	0	0	0				
Oil	143	143	143	123			
Natural Gas	0	0	228	381			
Derived Gas	0	0	0	0			
Pumped Hydro	0	0	0	0	180	583	583
Renewables	0	0	0				
Hydro				905	905	1,199	1,661
of which Run of River	663	779	868	905	905	1,199	1,661
of which Reservoir							
Wind	0	0	0	0	0	10	235
of which Wind Onshore	0	0	0	0	0	10	235
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	45	116	549	1,116
of which PV				45	116	549	1,116
of which CSP				0	0	0	0
Geothermal	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				
OTHER							
Peat							
Not Specified	0	0	0				
Total	1,678	2,502	2,879	3,146	3,066	3,502	5,541

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	820	1,640	2,460	1,820	1,940	2,460	
FOSSIL FUEL FIRED	2,463	2,705	2,834	2,614	2,896	3,114	
of which multifuel	0	0	0	0		0	
Hard Coal	773	793	747	1,214	1,214	456	
Brown Coal	684	684	619	365		339	
Oil	70	98	98	85		80	
Natural Gas	936	1,130	1,370	1,305	1,429	2,239	
Derived Gas	0	0	0	0		0	
Pumped Hydro	138	873	873	916	916	873	
Renewables	0	0	10	2,430	2,400	160	
Hydro				1,562	1,562		
of which Run of River							
of which Reservoir							
Wind	0	0	1	3	3	60	
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	
Solar	0	0	0	0		0	
of which PV				194	507		
of which CSP							
Geothermal	0	0	0	10		10	
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	
OTHER							
Peat							
Not Specified	0	0	0	0		0	
TOTAL	4,496	7,454	10,887	18,792	19,887	24,394	25,860
SWITZERLAND (CH)

	1980	1000	2000	2010	2011	2020	2030
NUCLEAD	1.040	2.050	2 1 6 2	2010	2011	2020	2000
	1,940	2,950	5,102	3,233	3,270	2,900	2,100
		700	049	770	750		
of which multiplet							
Hard Coal							
Brown Coal							
Natural Gas							
Derived Gas							
PUMPED HYDRO				1,839	1,839	4,000	4,000
RENEWABLES							
Hydro				11,841	11,888	12,100	12,400
of which Run of River				3,768	3,810	3,800	2,900
of which Reservoir				8,037	8,078	8,300	8,500
Wind	0	0	3	42	45	200	550
of which Wind Onshore	0	0	3	42	45	200	500
of which Wind Offshore	0	0	0	0		0	0
Solar	0	2	15	111	192	300	800
of which PV				111	192	300	800
of which CSP							
Geothermal	0	0	0	0	0		
Biogas							
Biomass							
Waste		75	137	179	174		
Other (Wave/Tidal etc)		0	0	0	0		
OTHER							
Peat							
Not Specified							
TOTAL		15,332	17,182	17,727	18,101		

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	35	35	63	915	1,005	1,200	1,200
of which multifuel	0	0	0	0		0	0
Hard Coal	0	0	0	0		0	0
Brown Coal	0	0	0	0		0	0
Oil	0	0	0	0		0	0
Natural Gas	35	35	63	915	1,005	1,200	1,200
Derived Gas	0	0	0	0		0	0
Pumped Hydro	594	1,228	1,269				
RENEWABLES	19,801	26,602	27,515	30,375	30,745	34,200	36,000
Hydro	19,801	26,602	27,502	29,945	30,230	32,200	33,000
of which Run of River							
of which Reservoir							
Wind	0	0	13	430	515	2,000	3,000
of which Wind Onshore	0	0	13	430	515	2,000	2,500
of which Wind Offshore	0	0	0			0	500
Solar	0	0	0	0	0	0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		0	0
Waste			22	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	203	228	218			0	0
Тотац	19,836	26,637	27,578	31,290	31,750	35,400	37,200

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0		
Fossil Fuel Fired	2,975	9,536	16,029	32,172	33,805		
of which multifuel	184	372	1,358	5,326	6,803		
Hard Coal	323	332	480	3,751	4,376		
Brown Coal	1,047	4,874	6,509	8,228	8,227		
Oil	1,605	2,120	1,996	1,773	1,480		
Natural Gas		2,210	7,044	18,420	19,722		
Derived Gas							
Pumped Hydro				0	0		
Renewables	2,143	6,782	11,235	17,352	19,106		
Hydro	2,131	6,764	11,175	15,831	17,137		
of which Run of River	77	130	280	2,686	3,544		
of which Reservoir	2,054	6,634	10,895	13,145	13,593		
Wind			19	1,320	1,729		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV				0	0		
of which CSP							
Geothermal		18	18	94	114		
Biogas			4	70	89		
Biomass							
Waste	12		19	37	37		
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
TOTAL	5,118	16,318	27,264	49,524	52,911		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0		
Fossil Fuel Fired	1,370	1,962	1,778	1,778	1,745		
of which multifuel							
Hard Coal	1,317	1,909	1,725		1,745		
Brown Coal							
Oil	53	53	53		0		
Natural Gas	0	0	0	0	0		
Derived Gas	0	0	0	0	0		
Pumped Hydro	440	440	440	440	440		
Renewables	0	0	0	0			
Hydro				1,943	1,943		
of which Run of River	5	7	10	8	8		
of which Reservoir				1,935	1,935		
Wind	0	0	0	0			
of which Wind Onshore	0	0	0	0	0		
of which Wind Offshore	0	0	0	0			
Solar	0	0	0	0			
of which PV							
of which CSP							
Geothermal	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			
OTHER							
Peat							
Not Specified	0	0	0	0			
Total	2,579	3,995	3,754	3,834	3,688		

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	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							
PUMPED HYDRO				257	257		
RENEWABLES	0	0	0				
Hydro							
of which Run of River							
of which Reservoir							
Wind	0	0	0				
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total				4,164	4,164	4,207	

SERBIA (RS)

	1980	1990	2000	2010	2011	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			
Hard Coal	0	0	0	3,963	3,963	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
Pumped Hydro	0	614	614	614	614	614	1,050
RENEWABLES	1,855	2,189	2,190	2,249	2,249	2,846	3,096
Hydro	1,855	2,189	2,190	2,249	2,249	2,569	2,596
of which Run of River	1,578	1,787	1,822	1,852	1,852	2,225	2,225
of which Reservoir	277	402	368	397	397	371	371
Wind	0	0	0	0	0	250	500
of which Wind Onshore	0	0	0	0		250	500
of which Wind Offshore	0	0	0	0			
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0			
Biomass	0	0	0	0			
Waste	0	0	0	0			
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified	0	0	0	0			
TOTAL	5,267	8,537	7,150	7,185	7,185	8,920	9,366

UKRAINE (UA)							
	1980	1990	2000	2010	2011	2020	2030
NUCLEAR				13,835	13,835		
Fossil Fuel Fired				33,774	33,702		
of which multifuel							
Hard Coal				27,347	27,272		
Brown Coal							
Oil							
Natural Gas				6,427	6,430		
Derived Gas							
PUMPED HYDRO				862	862		
RENEWABLES				4,691	4,912		
Hydro				4,597	4,604		
of which Run of River							
of which Reservoir							
Wind				86	121		
of which Wind Onshore							
of which Wind Offshore							
Solar				8	188		
of which PV				8	188		
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total				53,162	53,311		

3.1 GENERATION EQUIPMENT - CAPACITY

TABLE 3.1.1.2

GENERATION EQUIPMENT – NUCLEAR CAPACITY BY COUNTRY (MW)

The tables below display the nuclear generating capacity in the 27 EU Member States. plus installed capacity in Switzerland. Norway. Turkey and certain Energy Community member states. from 1980 to 2011. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

Country	1980	1990	2000	2010	2011	2020	2030
AT	0	0	0	0	0	0	0
BE	1,666.0	5,500.0	5,713.0	5,926.0	5,927.0	4,037.0	0
BG	1,300.0	2,700.0	3,500.0	1,900.0	2,000.0	2,000.0	2,581.0
СҮ	0	0	0	0	0	0	0
CZ	0	1,651.0	1,651.0	3,900.0	3,970.0	3,830.0	6,000.0
DE	8,607.0	22,406.0	22,396.0	20,477.0	12,068.0	8,107.0	0
DK	0	0	0	-	-	0	0
EE	-	-	0	0	-	0	-
ES	1,065.0	7,000.0	7,486.0	7,483.0	7,535.0	7,483.0	9,916.0
FI	2,210.0	2,310.0	2,640.0	2,730.0	2,752.0	4,604.0	7,395.0
FR	14,394.0	55,750.0	63,183.0	63,130.0	63,130.0	63,000.0	56,000.0
UK	5,767.0	11,353.0	12,486.0	10,865.0	10,663.0	8,980.0	12,710.0
GR	0	0	0	0	0	0	-
HU	0	1,654.0	1,752.0	1,892.0	1,892.0	1,892.0	3,020.0
IE	0	0	0	0	0	0	0
IT	1,424.0	0	0	0	0		-
LT	0	2,367.0	2,367.0	0	0	0	1,303.0
LU	0	0	0	0	0	0	0
LV	0	0	0	0	0	0	-
MT	-	0	0	0	0	-	-
NL	498.0	449.0	449.0	485.0	485.0	485.0	2,985.0
PL	0	0	0	0	0	0	2,878.0
PT	0	0	0	0	0	0	0
RO	0	0	655.0	1,300.0	1,300.0	2,630.0	4,130.0
SE	4,625.0	9,970.0	9,439.0	9,150.0	9,363.0	10,030.0	8,310.0
SI	0	630.0	670.0	656.0	696.0	696.0	1,796.0
SK	820.0	1,640.0	2,460.0	1,820.0	1,940.0	2,460.0	-
СН	1,940.0	2,950.0	3,162.0	3,253.0	3,278.0	2,900.0	2,100.0
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	-
RS	0	0	0	0	0	0	0
UA	-	-	-	13,835.0	13,835.0	-	-

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 certain Energy Community member states, from 1980 to 2011. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

AUSTRIA (AT)							
	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	4,150	5,060	6,121	6,326	7,079	7,058	7,989
of which multifuel							
Hard Coal	140	1,080	1,460	1,226	1,171	750	750
Brown Coal	440	760	421	0	0	0	0
Oil	1,170	950	870	359	362	39	0
Natural Gas	2,180	2,050	3,090	4,298	5,102	5,778	6,878
Derived Gas	220	220	280	443	444	491	561

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	8,210	7,154	8,051	7,126	7,988	9,880	15,255
of which multifuel							
Hard Coal			1,959	760	760	1,153	3,828
Brown Coal			0				
Oil			494	288	677	996	656
Natural Gas			5,097	5,601	6,074	7,731	10,771
Derived Gas			501	477	477		

BULGARIA (BG)

	1980	1990	2000	2010	2011	2020	2030	
Fossil Fuel Fired	4,830	5,655	4,934	5,269	6,403	8,587	8,444	
of which multifuel	0	0	0	0	0	0	0	
Hard Coal	1,966	2,021	1,394	1,151	1,761	1,842	1,842	
Brown Coal	1,924	2,814	2,960	3,064	3,858	4,500	4,500	
Oil	450	420	220	275	275	237	157	
Natural Gas	490	400	360	789	509	2,008	1,945	
Derived Gas	0	0	0	0	0	0	0	

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	264	462	988	1,438	1,553	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	1,438	1,553	428	188
Natural Gas	0	0	0			1,770	2,490
Derived Gas	0	0	0			0	0

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	9,060	10,634	10,491	11,793	11,889	10,295	8,878
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1,447	1,373	1,776	10,769	10,788	2,659	2,659
Brown Coal	7,442	9,090	7,976	8,971		6,445	5,000
Oil	0	0	123	123	123	123	0
Natural Gas	106	106	197	1,024	1,102	649	800
Derived Gas	65	65	419	447		419	419

GERMANY (DE)

· · · ·							
	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	63,536	63,761	81,997	83,729	83,373	70,700	58,300
of which multifuel	10,128	8,723	9,521	8,700	8,600		
Hard Coal	26,893	31,090	30,123	27,890	27,240	20,800	16,800
Brown Coal	12,997	11,298	20,050	20,377	20,083	19,700	10,800
Oil	12,035	7,229	7,218	5,788	5,500	600	400
Natural Gas	11,611	14,144	20,127	24,902	25,700	28,000	28,400
Derived Gas			4,479	4,772	4,850	1,600	1,900

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030	
Fossil Fuel Fired	6,609	7,762	30	9,271	9,241	8,900	8,100	
of which multifuel	0	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	
Oil	2,165	839	800	1,077	1,063	600	600	
Natural Gas	0	45	2,176	2,917	2,920	4,800	5,000	
Derived Gas	0	0	0	0		0	0	

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired			3,211	2,931	2,994	2,873	
of which multifuel			0	176		176	
Hard Coal			0	0		0	
Brown Coal			2,976	2,000		1,973	
Oil			10	0		0	
Natural Gas			207	184		400	
Derived Gas			18	44		500	

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

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030	
Fossil Fuel Fired	15,088	19,382	25,747	47,488	48,464	48,418	46,887	
of which multifuel	1,000	1,045	3,116	0	0	0	0	
Hard Coal	4,358	8,621	9,494	9,500	9,500	8,856	2,984	
Brown Coal	1,800	1,800	1,930	1,929	1,929	0	0	
Oil	8,930	8,510	10,697	5,816	5,785	6,159	7,277	
Natural Gas	0	451	3,626	30,243	31,250	33,403	36,626	
Derived Gas	0	0	0	0	0	0	0	

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	5,377	6,057	7,848	6,890	6,324	6,148	5,331
of which multifuel	0	0	0	0	0		
Hard Coal	2,601	3,506	3,760	2,699	3,303		
Brown Coal	0	0	0	0	0		
Oil	2,224	1,140	1,395	1,349	1,352		
Natural Gas	552	1,411	2,693	2,842	1,669		
Derived Gas	0	0	0	0	0		

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	29,032	22,673	26,799	27,399	27,813	19,200	26,000
of which multifuel	0	0	0	0	0		
Hard Coal	12,800	11,900	10,300	7,942	7,942		
Brown Coal	227	100	0	0	0		
Oil	15,254	10,073	11,080	10,447	10,332		
Natural Gas	550	0	4,141	8,963	9,539		
Derived Gas	201	600	800				

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	60,689	57,850	60,728	71,120	68,265	54,547	46,155
of which multifuel	4,510	5,030	7,092				
Hard Coal	43,668	40,739	30,529	23,085	23,072	15,599	1,987
Brown Coal	0	0	0	0		0	0
Oil	16,241	15,862	5,474	3,638	3,638	3,735	4,138
Natural Gas	80	549	24,025	44,397	41,555	35,214	40,030
Derived Gas	700	700	700	0		0	0

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	3,909	6,097	7,558	10,859	11,500	10,027	
of which multifuel	0	0	0	0		0	
Hard Coal	0	0	0	4,682	4,456	0	
Brown Coal	1,863	3,889	4,461	4,682	4,456	2,871	
Oil	2,046	2,192	1,967	2,432	2,469	1,838	
Natural Gas	0	16	1,129	3,745	4,575	5,318	
Derived Gas	0	0	0	0		0	

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	4,796	4,881	5,725	6,181	6,860	6,690	6,440
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	0	163	1,247	398	0	0
Brown Coal	1,728	1,900	1,736	1,073	849	680	490
Oil	306	481	1,229	410	407	407	407
Natural Gas	2,763	2,500	2,597	4,592	4,342	5,603	5,543
Derived Gas	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	1,848	3,256	3,921	5,277	6,325	6,006	6,171
of which multifuel	0	844	865	3,900	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	3,300	3,300	4,592	5,000
Derived Gas	0	0	0	0	0	0	0

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	29,146	37,232	53,384	72,397	73,251		
of which multifuel	12,608	19,523	34,006	31,254	30,497		
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	2,171	2,452	2,477	2,525	2,574	2,278	1,880
of which multifuel	2,023	2,304	2,329	2,344	2,393	1,662	792
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	144	144
Natural Gas	66	1,322	1,731	2,377	2,426	2,134	1,736
Derived Gas	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	85	80	51	505	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	505	505	530	550
Derived Gas	85	80	51	0		0	0

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	503	533	595	867	856	949	
of which multifuel				0			
Hard Coal	0	0	0	0	0	149	270
Brown Coal	0	0	0	0	0		
Oil	190	67	75	30	0		
Natural Gas	313	466	520	837	856	800	
Derived Gas	0	0	0	0			

MALTA (MT)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired		289	571	571	571		
of which multifuel			0	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		

NETHERLANDS	(NL)						
	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	14,370	15,334	18,305	22,941	24,153	29,872	25,045
of which multifuel							
Hard Coal	1,936	3,839	4,176	4,157	4,157	6,690	4,622
Brown Coal	0	0	0	0	0	0	0
Oil	742	37	37	0		0	0
Natural Gas	11,050	10,524	13,629	17,810	19,022	22,208	19,449
Derived Gas	642	934	500	974	974	974	974

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	21,624	26,433	28,457	29,282	29,985	31,191	27,512
of which multifuel	0	0	0	0	0	0	0
Hard Coal	16,844	17,812	20,525	20,169	20,026	19,422	15,851
Brown Coal	4,395	8,236	7,759	8,092	8,949	7,800	7,054
Oil	385	385	0	0	0	0	0
Natural Gas	0	0	174	1,022	1,011	3,904	4,542
Derived Gas	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	2,026	4,122	5,979	9,087	9,249	8,254	6,968
of which multifuel	0	0	0	0	0	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	2,830	2,809	420	345
Natural Gas	0	0	1,168	4,501	4,684	7,258	6,623
Derived Gas	0	0	0	0	0	0	0

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	10,710	13,470	8,040	9,166	8,901	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	5,459	5,391	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	3,707	3,510	4,096	4,622
Derived Gas	0	0	0	0		0	0

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired			3,760	5,035	4,793	2,920	2,920
of which multifuel							
Hard Coal			913	130	130	0	0
Brown Coal	0	0	0	0		0	0
Oil			2,421	3,764	3,522	1,800	1,800
Natural Gas	0	0	290	1,005	1,005	1,000	1,000
Derived Gas			136	136	136	120	120

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	1,015	1,093	1,341	1,482	1,280	1,880	1,491
of which multifuel	0	0	0	0			
Hard Coal	872	950	970				
Brown Coal	0	0	0				
Oil	143	143	143	123			
Natural Gas	0	0	228	381			
Derived Gas	0	0	0	0			

SLOVAKIA (sĸ)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	2,463	2,705	2,834	2,614	2,896	3,114	
of which multifuel	0	0	0	0		0	
Hard Coal	773	793	747	1,214	1,214	456	
Brown Coal	684	684	619	365		339	
Oil	70	98	98	85		80	
Natural Gas	936	1,130	1,370	1,305	1,429	2,239	
Derived Gas	0	0	0	0		0	

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired		700	649	770	750		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	35	35	63	915	1,005	1,200	1,200
of which multifuel	0	0	0	0		0	0
Hard Coal	0	0	0	0		0	0
Brown Coal	0	0	0	0		0	0
Oil	0	0	0	0		0	0
Natural Gas	35	35	63	915	1,005	1,200	1,200
Derived Gas	0	0	0	0		0	0

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	2,975	9,536	16,029	32,172	33,805		
of which multifuel	184	372	1,358	5,326	6,803		
Hard Coal	323	332	480	3,751	4,376		
Brown Coal	1,047	4,874	6,509	8,228	8,227		
Oil	1,605	2,120	1,996	1,773	1,480		
Natural Gas		2,210	7,044	18,420	19,722		
Derived Gas							

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Fossil Fuel Fired	1,370	1,962	1,778	1,778	1,745		
of which multifuel							
Hard Coal	1,317	1,909	1,725		1,745		
Brown Coal							
Oil	53	53	53		0		
Natural Gas	0	0	0	0	0		
Derived Gas	0	0	0	0	0		

CROATIA (HR)

	1980	1990	2000	2010	2011	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	2010	2011	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			
Hard Coal	0	0	0	3,963	3,963	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	2010	2011	2020	2030
Fossil Fuel Fired				33,774	33,702		
of which multifuel							
Hard Coal				27,347	27,272		
Brown Coal							
Oil							
Natural Gas				6,427	6,430		
Derived Gas							

3.1 GENERATION EQUIPMENT - CAPACITY

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 certain Energy Community member states, from 1980 to 2011. Forecasts for 2020 and 2030 have also been included. The capacity is expressed in MW.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	4,690	6,200	6,330	7,523	7,765	9,903	11,303
Renewables			857	6,891	14,908	20,066	26,766
Hydro							
of which Run of River	3,520	4,670	5,400	5,396	5,444	6,016	6,616
of which Reservoir							
Wind			77	1,013	1,106	3,000	4,000
of which Wind Onshore			77	1,013	1,106	3,000	4,000
of which Wind Offshore			0	0		0	0
Solar			5	35	72	500	4,000
of which PV				35	72		
of which CSP							
Geothermal				1	1	1	1
Biogas			6	79	10	179	279
Biomass			769	334	382	434	534
Waste				21	22	21	21
Other (Wave/Tidal etc)				12	106	12	12

BELGIUM (be)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1,056	1,307	1,310	1,307	1,307	1,307	1,307
Renewables	72	99	115	2,886	3,558	7,845	8,999
Hydro	72	94	103	118	119	94	94
of which Run of River	72	94	103	118	119	94	94
of which Reservoir							
Wind	0	5	12	912	1,069	4,181	4,951
of which Wind Onshore			12	882	874	2,063	2,443
of which Wind Offshore			0	30	195	2,118	2,508
Solar		0	0	904	1,391	1,500	1,587
of which PV				904	1,391	1,500	1,587
of which CSP							
Geothermal	0	0	0	0	0	20	40
Biogas				58	58	70	75
Biomass				711	738	1,680	1,989
Waste				183	183	300	350
Other (Wave/Tidal etc)							

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030	
Pumped Hydro	150	150	570	938	938	1,000	1,000	
Renewables	0	0	0	513	2,887	3,994	5,350	
Hydro					2	2	2	
of which Run of River	40	40	40	143	157	326	326	
of which Reservoir					2	2	2	
Wind	0	0	0	488	516	1,127	3,345	
of which Wind Onshore	0	0	0	0	0			
of which Wind Offshore	0	0	0	0	0	0	0	
Solar	0	0	0	0	154	528	664	
of which PV								
of which CSP								
Geothermal	0	0	0			0	0	
Biogas	0	0	0	0		0		
Biomass	0	0	0	0	4	55	57	
Waste	0	0	0	0		0		
Other (Wave/Tidal etc)	0	0	0	0		0		

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0				
Renewables	0	0	0	95	136		
Hydro							
of which Run of River	0	0	0				
of which Reservoir							
Wind	0	0	0	82	116		
of which Wind Onshore	0	0	0	82	116		
of which Wind Offshore	0	0	0				
Solar	0	0	0	6	6		
of which PV							
of which CSP							
Geothermal	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0	7	7		
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	490	490	1,140	1,147	1,147	1,140	1,140
Renewables	0	8	1	3,233	3,244	2,378	2,750
Hydro				1,056	1,055		
of which Run of River	182	224	221	276		252	252
of which Reservoir							
Wind	0	0	1	218	219	550	900
of which Wind Onshore	0	0	1	218	219	550	900
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	1,959		1,820	1,850
of which PV				1,959	1,971		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	7		0	0
Biomass	0	8	0	0	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	2010	2011	2020	2030
Pumped Hydro	3,785	4,017	4,654	5,710	5,710	8,000	8,500
Renewables	2,669	3,634	11,924	56,413	66,063	117,700	143,900
Hydro	2,666	2,834	4,738	4,062	4,180	4,300	4,350
of which Run of River			3,404	1,365	1,365	1,400	1,450
of which Reservoir			1,334	300	300	300	350
Wind	3	48	6,094	27,204	28,752	49,000	67,000
of which Wind Onshore	3	48	6,094	27,124	28,564	39,000	44,000
of which Wind Offshore	0	0	0	80	188	10,000	23,000
Solar	0	2	62	17,488	24,785	54,000	61,000
of which PV	0	0	62	17,488	24,785	54,000	61,000
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	7	7	300	400
Biogas	0	140	250	2,773	3,274	3,800	4,000
Biomass	0	50	260	2,184	2,350	3,200	4,000
Waste	0	560	520	1,330	1,350	1,700	1,700
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0			0	0
Renewables	1	438	2,662	4,160	4,511	5,600	7,300
Hydro	9	9	9	9	9		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	1	343	2,417	3,802	3,950	5,600	7,300
of which Wind Onshore	1	343	2,377	2,934		3,474	3,974
of which Wind Offshore	0	0	40	868		2,126	3,326
Solar	0	0	0	0	28	0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0			0	0
Biogas	0	0	0	78	69	0	0
Biomass	0	95	245	258	127	0	0
Waste	0	0	0	379	327	0	0
Other (Wave/Tidal etc)	0	0	0			0	0

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro			0	0		0	
Renewables			0	209		1,177	
Hydro							
of which Run of River			2	4		5	
of which Reservoir							
Wind			0	149		900	
of which Wind Onshore	0	0	0	149		400	
of which Wind Offshore			0	0		500	
Solar			0	0		0	
of which PV							
of which CSP							
Geothermal			0	0		0	
Biogas			2	2		10	
Biomass			0	74		250	
Waste			0	0		17	
Other (Wave/Tidal etc)			0	0		0	

SPAIN (es)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	2,621	4,900	4,900	4,836	4,836	7,057	7,551
RENEWABLES	10,554	11,696	15,395	38,489	40,406	58,890	78,986
Hydro	10,554	11,661	12,767	13,732	13,713	14,194	14,715
of which Run of River	850	940	1,080	1,160	1,163	1,160	1,160
of which Reservoir	9,704	10,721	11,687	12,572	12,549	13,034	13,555
Wind	0	35	2,243	19,314	20,381	34,957	50,899
of which Wind Onshore	0	35	2,243	19,314	20,381		
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	1	4,283	5,118	8,138	11,321
of which PV	0	0	1	3,615	4,090	5,838	9,021
of which CSP	0	0	0	668	1,028	2,300	2,300
Geothermal							
Biogas	0	0	28	160	173	282	382
Biomass	0	0	97	459	496	743	1,043
Waste	0	0	259	541	525	576	626
Other (Wave/Tidal etc)							

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables	3,250	3,817	4,362	5,679	5,253	8,278	9,785
Hydro	2,318	2,621	2,882	3,084	3,111	3,330	3,400
of which Run of River							
of which Reservoir							
Wind	0	0	38	197	199	2,565	3,870
of which Wind Onshore	0	0	38	197	199		
of which Wind Offshore	0	0	0	0	0		
Solar							
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0	0		
Biogas							
Biomass	932	1,196	1,442	2,240	1,884	2,342	2,474
Waste				158	59	41	41
Other (Wave/Tidal etc)	0	0	0	0	0		

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1,614	4,293	4,302	25,390	4,263	4,300	4,300
RENEWABLES	240	240	718	7,864	31,608	47,000	75,000
Hydro					21,131	20,900	20,900
of which Run of River	7,743	7,453	7,505	7,612	11,952	7,600	7,600
of which Reservoir					9,179	13,300	13,300
Wind	0	0	38	5,764	6,692	16,000	30,000
of which Wind Onshore	0	0			6,692	16,000	24,500
of which Wind Offshore	0	0				0	5,500
Solar	0	0	6	878	2,503	8,000	20,000
of which PV				878	2,503	8,000	20,000
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	34	214	250	0	0
Biomass	0	0	20	272	284	1,800	2,600
Waste	0	0	380	737	748		
Other (Wave/Tidal etc)	240	240	240			300	1,500

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1,059	2,787	2,788	2,744	2,744	2,744	2,744
Renewables	0	130	1,335	9,215	12,264	41,919	82,520
Hydro				1,641	1,676		
of which Run of River	0	0	0	1,521	1,545	0	0
of which Reservoir				119	130		
Wind	0	9	412	5,386	6,488	26,349	56,941
of which Wind Onshore	0	9	408	4,311	4,638	14,224	20,985
of which Wind Offshore	0	0	4	1,341	1,838	12,125	35,956
Solar	0	0	2	94	993		
of which PV				94	993		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	90	425	1,239	1,314	0	0
Biomass	0	0	157	426	1,259		
Waste	0	31	338	428	544		
Other (Wave/Tidal etc)	0	0	1	3	3	15,570	15,570

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	315	699	699	699	699	
RENEWABLES	0	3	261	4,057	4,817	10,408	
Hydro				2,516	2,524	2,943	
of which Run of River	0	0	0	197	205	282	
of which Reservoir				2,319	2,319	2,661	
Wind	0	1	205	1,302	1,642	3,550	
of which Wind Onshore	0	1	205	1,302	1,642	3,408	
of which Wind Offshore	0	0	0	0	0	142	
Solar	0	0	0	198	606	3,637	
of which PV				198	606	3,265	
of which CSP						372	
Geothermal	0	2	0	0	0	120	
Biogas	0	0	21	41	45	135	
Biomass	0	0	0	0	0	23	
Waste	0	0	36	0	0	0	
Other (Wave/Tidal etc)	0	0	0	0	0	0	

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables	0	0	18	680	745	1,608	1,540
Hydro				50	50	66	70
of which Run of River	46	48	47	50	50	66	70
of which Reservoir	0	0	0	0	0	0	0
Wind	0	0	0	240	325	750	750
of which Wind Onshore	0	0	0	240	325	750	750
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	63	63
of which PV	0	0	0	0	0	63	63
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	10	10
Biogas	0	0	0	21	40	100	100
Biomass	0	0	0	348	309	599	517
Waste	0	0	18	21	21	30	40
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	292	292	292	292	292	292	292
Renewables	0	0	133	1,400	1,763	4,241	4,460
Hydro					222		
of which Run of River	8	8	19	32	222	222	222
of which Reservoir					0		
Wind	0	0	118	1,400	1,557	3,918	4,137
of which Wind Onshore	0	0	118	1,400	1,557	3,593	3,812
of which Wind Offshore	0	0	0	0	0	325	325
Solar	0	0	0	0	0	0	0
of which PV					0		
of which CSP					0		
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	15	0	0	0	0
Biomass	0	0	0	0	0	231	231
Waste	0	0	0	0	16	92	92
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	3,654	6,188	6,957	7,544	7,544		
Renewables	12,601	13,078	14,999	26,230	37,339		
Hydro	12,173	12,582	13,389	13,977	14,193		
of which Run of River	2,730	3,109	3,453	4,765	4,783		
of which Reservoir	9,443	9,473	9,935	9,212	9,409		
Wind			363	5,794	6,918		
of which Wind Onshore			363	5,794	6,918		
of which Wind Offshore	0	0	0	0	0		
Solar			6	3,470	12,773		
of which PV			6	3,470	12,773		
of which CSP	0	0	0	0	0		
Geothermal	428	496	590	728	728		
Biogas			171	486	725		
Biomass			207	1,007	1,174		
Waste			273	768	828		
Other (Wave/Tidal etc)	0	0	0	0	0		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	760	760	760	950	1,140
RENEWABLES	0	0	0	321	363	1,242	1,510
Hydro				116	116	131	131
of which Run of River	0	0	0	0	116	131	131
of which Reservoir				0	0	0	0
Wind	0	0	0	161	188	750	1,000
of which Wind Onshore	0	0	0	161	188	750	1,000
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	20	30
of which PV				0	0	20	30
of which CSP					0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	44	49	324	332
Waste	0	0	0	0	0	17	17
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1,096	1,096	1,096	1,096	1,096	1,296	1,296
RENEWABLES	5	5	20	95	95	133	153
Hydro							
of which Run of River	11	11	15	15	15	15	15
of which Reservoir							
Wind	0	0	15	50	50	60	70
of which Wind Onshore	0	0	15	50	50	60	70
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	25	30	120	160
of which PV	0	0	0	25	30	120	160
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	1	15	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

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	
Renewables	1,487	1,487	1,515	1,633	1,674	2,081	2,312
Hydro	1,487	1,487	1,513	1,576	1,576	1,590	1,590
of which Run of River	1,487	1,487	1,513	1,576	1,576	1,590	1,590
of which Reservoir							
Wind	0	0	2	31	36	300	400
of which Wind Onshore	0	0	2	31	36	150	200
of which Wind Offshore	0	0	0	0	0	150	200
Solar	0	0	0	0		1	2
of which PV				0	0	1	2
of which CSP							
Geothermal	0	0	0	0	0	5	
Biogas	0	0	0	11	33	60	120
Biomass	0	0	0	5	5	80	150
Waste	0	0	0	10	24	45	50
Other (Wave/Tidal etc)	0	0	0	0		0	0

• **МАLTА** (мт)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro		0	0	0	0		
Renewables		0	0	0	5		
Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
of which Reservoir		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		
Solar		0	0	0	5		
of which PV		0	0	0	5		
of which CSP		0	0	0	0		
Geothermal		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	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables		227	778	3,144	3,356	12,300	16,500
Hydro				38	38	100	100
of which Run of River	0	37	37	38	38	40	40
of which Reservoir		0	0	0	0	0	0
Wind		57	435	2,241	2,316	7,000	9,000
of which Wind Onshore		57	435	2,013	2,088	4,000	6,000
of which Wind Offshore		0	0	228	228	3,000	3,000
Solar		0	0	78	88	4,000	6,000
of which PV				78	88	4,000	6,000
of which CSP				0	0	0	0
Geothermal						0	0
Biogas							
Biomass		20	53	290	316	550	700
Waste		150	290	535	636	750	800
Other (Wave/Tidal etc)		0	0	0	0	60	60

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	645	1,195	1,622	1,772	1,772	1,776	1,776
Renewables	0	0	516	1,778	2,605	8,221	9,973
Hydro				553	558	607	648
of which Run of River	204	204	365	412	417	417	417
of which Reservoir			138	141	141	190	231
Wind	0	0	4	1,096	1,782	6,725	8,075
of which Wind Onshore	0	0	4	1,096	1,782	5,825	5,825
of which Wind Offshore	0	0	0	0	0	900	2,250
Solar	0	0	0	0	1	2	32
of which PV				0	1	2	32
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	75	94	0	0
Biomass	0	0	9	54	170	886	1,217
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	68	604	604	1,035	1,035	3,949	5,049
Renewables	2,403	2,727	4,304	8,670	9,602	12,191	13,843
Hydro	2,399	2,723	3,865	4,016	4,420	5,151	5,404
of which Run of River	1,561	2,007	2,402	2,596	3,000	3,085	3,328
of which Reservoir	838	716	1,463	1,421	1,420	2,065	2,075
Wind	0	0	89	3,906	4,367	5,420	6,570
of which Wind Onshore	0	0	89	3,906	4,367	5,420	6,570
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	132	174	739	924
of which PV	0	0	0	132	174	689	819
of which CSP	0	0	0	0	0	50	105
Geothermal	4	4	14	23	23	40	40
Biogas	0	0	1	30	49	60	70
Biomass	0	0	9	116	116	300	340
Waste	0	0	326	446	454	476	486
Other (Wave/Tidal etc)	0	0	0	0	0	6	10

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	1,213	1,213
Renewables	0	0	0	6,588	7,175	3,535	5,189
Hydro				6,087	6,145		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	479	1,006	3,496	4,996
of which Wind Onshore	0	0	0	401		3,496	4,996
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	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

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	350	350	0	0	0	0	0
Renewables	14,150	15,984	17,695	21,516	22,291	26,900	31,000
Hydro	14,150	15,980	16,229	16,200	16,197	16,400	16,600
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	14,150	15,980	16,229	16,200	16,197	16,400	16,600
Wind	0	4	241	2,163	2,899	5,700	9,500
of which Wind Onshore				2,000	2,736		
of which Wind Offshore				163	163		
Solar	0	0	0				
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0		
Biomass				2,860	2,870	4,100	4,200
Waste				293	325	700	700
Other (Wave/Tidal etc)				0	0	0	0

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	180	583	583
Renewables	0	0	0				
Hydro				905	905	1,199	1,661
of which Run of River	663	779	868	905	905	1,199	1,661
of which Reservoir							
Wind	0	0	0	0	0	10	235
of which Wind Onshore	0	0	0	0	0	10	235
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	45	116	549	1,116
of which PV				45	116	549	1,116
of which CSP				0	0	0	0
Geothermal	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	138	873	873	916	916	873	
Renewables	0	0	10	2,430	2,400	160	
Hydro				1,562	1,562		
of which Run of River							
of which Reservoir							
Wind	0	0	1	3	3	60	
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	
Solar	0	0	0	0		0	
of which PV				194	507		
of which CSP							
Geothermal	0	0	0	10		10	
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	

SWITZERLAND (сн)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro				1,839	1,839	4,000	4,000
Renewables							
Hydro				11,841	11,888	12,100	12,400
of which Run of River				3,768	3,810	3,800	2,900
of which Reservoir				8,037	8,078	8,300	8,500
Wind	0	0	3	42	45	200	550
of which Wind Onshore	0	0	3	42	45	200	500
of which Wind Offshore	0	0	0	0		0	0
Solar	0	2	15	111	192	300	800
of which PV				111	192	300	800
of which CSP							
Geothermal	0	0	0	0	0		
Biogas							
Biomass							
Waste		75	137	179	174		
Other (Wave/Tidal etc)		0	0	0	0		

NORWAY (NO)

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	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	594	1,228	1,269				
Renewables	19,801	26,602	27,515	30,375	30,745	34,200	36,000
Hydro	19,801	26,602	27,502	29,945	30,230	32,200	33,000
of which Run of River							
of which Reservoir							
Wind	0	0	13	430	515	2,000	3,000
of which Wind Onshore	0	0	13	430	515	2,000	2,500
of which Wind Offshore	0	0	0			0	500
Solar	0	0	0	0	0	0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		0	0
Waste			22	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro				0	0		
Renewables	2,143	6,782	11,235	17,352	19,106		
Hydro	2,131	6,764	11,175	15,831	17,137		
of which Run of River	77	130	280	2,686	3,544		
of which Reservoir	2,054	6,634	10,895	13,145	13,593		
Wind			19	1,320	1,729		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV				0	0		
of which CSP							
Geothermal		18	18	94	114		
Biogas			4	70	89		
Biomass							
Waste	12		19	37	37		
Other (Wave/Tidal etc)							

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	440	440	440	440	440		
Renewables	0	0	0	0			
Hydro				1,943	1,943		
of which Run of River	5	7	10	8	8		
of which Reservoir				1,935	1,935		
Wind	0	0	0	0			
of which Wind Onshore	0	0	0	0	0		
of which Wind Offshore	0	0	0	0			
Solar	0	0	0	0			
of which PV							
of which CSP							
Geothermal	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	2010	2011	2020	2030
Pumped Hydro				257	257		
Renewables	0	0	0				
Hydro							
of which Run of River							
of which Reservoir							
Wind	0	0	0				
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste	0	0	0	0			
Other (Wave/Tidal etc)	0	0	0	0			

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	614	614	614	614	614	1,050
RENEWABLES	1,855	2,189	2,190	2,249	2,249	2,846	3,096
Hydro	1,855	2,189	2,190	2,249	2,249	2,569	2,596
of which Run of River	1,578	1,787	1,822	1,852	1,852	2,225	2,225
of which Reservoir	277	402	368	397	397	371	371
Wind	0	0	0	0	0	250	500
of which Wind Onshore	0	0	0	0		250	500
of which Wind Offshore	0	0	0	0			
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0			
Biomass	0	0	0	0			
Waste	0	0	0	0			
Other (Wave/Tidal etc)							

UKRAINE (UA)							
	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro				862	862		
RENEWABLES				4,691	4,912		
Hydro				4,597	4,604		
of which Run of River							
of which Reservoir							
Wind				86	121		
of which Wind Onshore							
of which Wind Offshore							
Solar				8	188		
of which PV				8	188		
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

3.1 GENERATION EQUIPMENT - CAPACITY

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 certain Energy Community members.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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	12.919	13.209	15.919	17.919
Non-fuel Renewables	100	110	170	1.495	1.179	4.147	8.847
New Technologies (e.g. Fuel Cells)							
Not Specified	1.944	2.619	3.870	660	641	559	473
Total	12.620	16.190	18.040	21.400	22.628	27.683	35.228

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	1.666	5.500	5.713	5.926	5.927	4.037	0
Steam Thermal Units	0	6.324	4.272	3.149	3.193	0	0
Gas Turbine Units	0	276	1.281	1.723	1.754	0	0
Combined Cycle Units	0	186	2.792	3.878	4.320	0	0
Internal Combustion Units	0	169	200	288	677	0	0
Hydro	1.128	1.401	1.413	1.425	1.425	1.401	1.401
Non-fuel Renewables	0	5	14	1.816	2.801	7.521	8.905
New Technologies (e.g. Fuel Cells)	0						
Not Specified	8.210	280	0	116		10.470	15.255
Total	11.004	14.141	15.685	18.322	20.098	20.609	25.561

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	1.300	2.700	3.500	1.900	2.000	2.000	2.581
Steam Thermal Units	4.830	5.655	4.934	5.269	6.403	8.587	8.444
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	1.700	1.800	1.950	2.724	3.151	2.250	2.460
Non-fuel Renewables	0	0	0	513	674	1.710	3.066
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0	0	0	0	0
Total	7.830	10.155	10.384	10.406	12.228	15.581	18.375

TABLE 3.1.2 GENERATION EQUIP

GENERATION EQUIPMENT – CAPACITY BY TECHNOLOGY (MW)

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	264	462	800	930	900	630	390
Gas Turbine Units	0	0	188	188	188	188	188
Combined Cycle Units	0	0	0	220	365	1,380	2,100
Internal Combustion Units	0	0	0	100	100	0	0
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	0	0	95	154		
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	0	0	0	0	0	0
Total	264	462	988	1,533	1,707	2,198	2,678

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	1,651	1,651	3,900	3,970	3,830	6,000
Steam Thermal Units	8,889	10,463	10,009	10,770	10,788	9,144	7,368
Gas Turbine Units	171	171	63	433	511	489	800
Combined Cycle Units	0	0	419	590	591	579	700
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	1,300	1,342	2,089	2,203	2,201	2,121	2,121
Non-fuel Renewables	0	8	1	2,177	2,190	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	20,073	20,250	18,544	19,749

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	8,607	22,406	22,396	20,477	12,068	8,107	0
Steam Thermal Units			64,580	62,903	61,959	40,200	27,800
Gas Turbine Units	3,450	3,900	4,157	5,900	5,900	6,000	6,200
Combined Cycle Units			14,000	18,970	19,768	22,000	22,200
Internal Combustion Units			290	2,240	2,720	3,200	3,300
Hydro	6,451	6,851	9,392	11,137	11,255	13,700	14,300
Non-fuel Renewables			6,156	44,702	53,544	103,300	128,400
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	78,597	93,818	120,971	166,329	167,214	196,507	202,200

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	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	2010	2011	2020	2030
Nuclear			0	0		0	
Steam Thermal Units			1,429			1,973	
Gas Turbine Units						900	
Combined Cycle Units			0			0	
Internal Combustion Units			10			0	
Hydro			2	4		5	
Non-fuel Renewables			0			900	
New Technologies (e.g. Fuel Cells)			0			0	
Not Specified			0			277	
Total			2,441	2,630		3,350	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	1,065	7,000	7,486	7,483	7,535	7,483	9,916
Steam Thermal Units	14,088	17,677	23,498	19,532	19,534	18,155	13,596
Gas Turbine Units	0	0	304	422	433	304	1,552
Combined Cycle Units	0	0	0	23,783	24,649	26,962	28,187
Internal Combustion Units	1,000	1,705	2,329	4,912	5,042	4,598	5,601
Hydro	13,175	16,561	17,667	18,568	18,549	21,251	22,266
Non-fuel Renewables	0	35	2,244	23,598	25,499	43,095	62,220
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	29,328	42,978	53,528	98,298	101,240	121,848	143,338

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	2,210	2,310	2,640	2,730	2,752	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	3,084	3,111	3,330	3,400
Non-fuel Renewables	0	0	38	197	199	2,565	3,870
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0	0	0	0	0
Total	11,022	13,170	16,258	16,740	16,234	20,813	24,005

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	14,394	55,750	63,183	63,130	63,130	63,000	56,000
Steam Thermal Units	29,032	22,673	26,799	27,399	29,095	11,400	14,200
Gas Turbine Units	0	0	0			2,000	8,000
Combined Cycle Units	0	0	0			6,900	6,900
Internal Combustion Units	0	0	0			1,000	1,000
Hydro	19,285	24,987	25,356	25,390	25,394	25,200	25,200
Non-fuel Renewables	240	240	718	7,864	9,195	24,000	50,000
New Technologies (e.g. Fuel Cells)	0	0	0			0	0
Not Specified	0	0	0			0	0
Total	62,711	103,410	115,338	123,783	126,814	133,500	161,300

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	5,767	11,353	12,486	10,865	10,663	8,980	12,710
Steam Thermal Units	57,051	54,522	38,874	36,036	34,170	23,648	16,892
Gas Turbine Units	3,638	3,130	1,291	1,779	1,706	1,133	1,339
Combined Cycle Units	0	229	21,058	33,305	32,389	40,607	45,856
Internal Combustion Units	0	90	425	0		0	0
Hydro	2,344	4,197	4,273	4,384	4,419	5,088	5,208
Non-fuel Renewables	0	9	415	4,848	10,589	33,477	62,935
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	68,800	73,530	78,822	93,944	93,937	113,409	146,139

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	3,508	5,495	5,676	6,106	5,868	3,281	
Gas Turbine Units	255	294	343	573	557	580	
Combined Cycle Units	0	16	920	3,363	4,193	5,275	
Internal Combustion Units	146	292	676	858	925	1,049	
Hydro	1,416	2,408	3,072	3,215	3,224	3,642	
Non-fuel Renewables	0	3	205	1,500	2,248	7,307	
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	15,615	17,015	21,134	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	1,654	1,752	1,892	1,892	1,892	3,020
Steam Thermal Units	4,594	4,678	4,392	3,623	3,342	1,800	690
Gas Turbine Units	202	202	408	555	616	670	1,200
Combined Cycle Units	0	0	988	1,445	2,325	3,500	3,700
Internal Combustion Units	0	0	0	558	577	720	850
Hydro	46	48	47	50	50	66	70
Non-fuel Renewables	0	0	0	630	695	1,542	1,470
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	8,753	9,497	10,190	11,000

IRELAND (IE)

	1980	1990	2000	2010	2011	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	2,400	1,912	2,844	3,686
Combined Cycle Units	115	258	735	0	2,996	0	0
Internal Combustion Units	0	0	15	529	529	529	224
Hydro	512	512	526	539	530	539	539
Non-fuel Renewables	0	0	118	1,200	1,557	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	7,433	8,618	10,044	11,617

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	1,424	0	0	0	0		
Steam Thermal Units	27,492	34,761	40,048	22,845	22,242		
Gas Turbine Units	1,465	2,120	5,314	3,369	3,454		
Combined Cycle Units	0	115	7,840	46,217	47,523		
Internal Combustion Units	189	236	833	2,227	2,758		
Hydro	15,826	18,770	20,346	21,521	21,737		
Non-fuel Renewables	428	496	960	9,992	20,419		
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	50	164	318	310		
Total	46,824	56,548	75,504	106,489	118,443		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	2,367	2,367	0	0	0	1,303
Steam Thermal Units	2,171	2,452	2,477	2,536	2,590	2,147	1,285
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	33	33	472	944
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	106	105	913	875	876	1,081	1,271
Non-fuel Renewables	0	0	0	161	188	770	1,030
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	3,606	3,687	4,470	5,833

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	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	505	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	95	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	1,728	1,728	1,991	2,031

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	563	583	600	230	242	240	270
Gas Turbine Units	0	0	0	0	0	20	20
Combined Cycle Units	0	0	0	604	614	700	780
Internal Combustion Units	0	0	14	60	62	180	320
Hydro	1,487	1,487	1,513	1,576	1,576	1,590	1,590
Non-fuel Renewables	0	0	3	30	36	300	400
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	
Not Specified	0	0	0	0	0	0	
Total	2,050	2,070	2,130	2,500	2,530	3,030	3,380

• **МАLTA** (мт)

	1980	1990	2000	2010	2011	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	0	5		
New Technologies (e.g. Fuel Cells)			0	0	0		
Not Specified			0	0	0		
Total			571	571	576		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	498	449	449	485	485	485	2,985
Steam Thermal Units	0	6,100	7,009	8,858	8,962	10,051	9,035
Gas Turbine Units	522	314	1,131	1,317	1,322	868	737
Combined Cycle Units	3,815	8,800	8,485	9,925	11,142	1,616	12,612
Internal Combustion Units	0	139	1,582	3,606	3,609	3,993	4,061
Hydro	0	37	37	38	38	100	100
Non-fuel Renewables	0	208	876	2,319	2,404	11,000	15,000
New Technologies (e.g. Fuel Cells)				0	0	100	100
Not Specified	10,033	0	0	60	71	100	100
Total	14,868	16,047	19,569	26,608	28,033	42,757	44,630

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	2,878
Steam Thermal Units	21,624	26,433	28,039	28,260	28,974	27,287	22,970
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	174	1,022	1,011	3,904	4,542
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	1,287	1,960	2,134	2,325	2,341	2,346	2,346
Non-fuel Renewables	0	0	4	1,096	1,782	6,725	8,075
New Technologies (e.g. Fuel Cells)	0	0	0	0	1	3	33
Not Specified	0	0	9	129	264	886	1,217
Total	22,910	28,394	30,604	32,832	34,361	41,188	42,139

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	1,537	3,262	4,236	4,512	4,593	2,071	1,672
Gas Turbine Units	165	329	329	334	358	227	267
Combined Cycle Units	0	0	990	3,829	3,829	5,670	4,755
Internal Combustion Units	323	531	759	1,004	1,088	1,122	1,170
Hydro	2,467	3,327	4,469	5,051	5,455	9,100	10,453
Non-fuel Renewables	4	4	103	4,061	4,564	6,205	7,544
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	18,792	19,887	24,394	25,860

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	655	1,300	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	5,908	6,438	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	2010	2011	2020	2030
Nuclear	4,625	9,970	9,439	9,150	9,363	10,030	8,310
Steam Thermal Units	6,180	5,661	3,644	6,581	6,414	6,120	6,220
Gas Turbine Units	1,695	1,687	1,341	1,607	1,574	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	16,200	16,197	16,400	16,600
Non-fuel Renewables	0	4	241	2,163	2,899	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	35,701	36,447	39,850	42,230

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	630	670	656	696	696	1,796
Steam Thermal Units	1,015	1,093	1,026		826	1,009	704
Gas Turbine Units	0	0	228		370	472	388
Combined Cycle Units	0	0	84		84	282	282
Internal Combustion Units	0	0	0				
Hydro	663	779	868	984	1,090	1,782	2,245
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	3,066	4,241	5,415

SLOVAKIA (sk)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	820	1,640	2,460	1,820	1,940	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	2010	2011	2020	2030
Nuclear	1,940	2,950	3,162	3,253	3,278	2,900	2,100
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	11,410	11,582	13,229	13,520	13,723	16,100	16,400
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total				17,727	18,101	20,200	20,850

NORWAY (NO)

	1980	1990	2000	2010	2011	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	665	755	950	950
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	19,598	26,375	27,262	29,945	30,230	32,200	33,000
Non-fuel Renewables	0	0	0	430	515	2,000	3,000
New Technologies (e.g. Fuel Cells)	0	0	0			0	0
Not Specified	203	228	218	0		0	0
Total	19,836	26,637	27,578	31,290	31,750	35,400	37,200

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units		0	8,509	12,437	13,028		
Gas Turbine Units		0	449	2,085	2,560		
Combined Cycle Units		0	6,854	16,075	16,353		
Internal Combustion Units		0	241	1,578	1,880		
Hydro	2,131	6,764	11,175	15,831	17,137		
Non-fuel Renewables		18	36	1,414	1,843		
New Technologies (e.g. Fuel Cells)							
Not Specified	2,987	9,536	0	104	110		
Total	5,118	16,318	27,264	49,524	52,911		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units	1,317	1,909	1,725				
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units	53	53	53				
Hydro	1,210	2,034	1,976	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	2010	2011	2020	2030
Nuclear	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	2010	2011	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	
Internal Combustion Units	450	450	52	27	27		
Hydro	1,855	2,803	2,804	2,863	2,863	3,210	3,646
Non-fuel Renewables	0	0	0	0	0	250	500
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	2010	2011	2020	2030
Nuclear				13,835	13,835		
Steam Thermal Units				33,774	33,702		
Gas Turbine Units				0	0		
Combined Cycle Units				0	0		
Internal Combustion Units				0	0		
Hydro				5,458	5,465		
Non-fuel Renewables				94	309		
New Technologies (e.g. Fuel Cells)				0	0		
Not Specified				0	0		
Total				53,162	53,311		

3.1 GENERATION EQUIPMENT - CAPACITY

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 certain Energy Community member states. Capacity is expressed in MW, and differentiated by primary energy. The tables present both historical data (from 1980 to 2011) and estimates for 2020 and 2030.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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				
Peat							
Other Non-Renewables	474	481	520				
Total	1,784	2,469	3,730	5,642			

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels		310	158	609		943	
Hard Coal							
Oil							
Natural Gas		59	1,160	1,715		2,658	
Renewables		19	39	82		126	
Peat							
Other Non-Renewables		151	154	175		272	
Total		540	1,464	2,577		4,000	

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	148	120	110	120	120	120	120
Oil	460	390	270	290	260	237	237
Natural Gas	426	404	294	366	366	674	696
Renewables	0	0	0	0	0	0	0
Peat							
Other Non-Renewables	0	0	0	0	0	0	0
Total	1,034	914	674	723	713	771	771

< CYPRUS (CY)

	1980	1990	2000	2010	2011	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		
Peat							
Other Non-Renewables	0	0	0	0	0		
Total	0	0	0	0	0		

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

CZECH REPUBLIC (cz)

	1000	1000		0.04.0	0044		
	1980	1990	2000	2010	2011	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
Peat							
Other Non-Renewables	0	0	0	0	0	0	0
Total	0	2,265	4,188	4,188	4,188	4,800	5,030

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal				7,650	7,650		
Oil				700	700		
Natural Gas				14,400	14,550		
Renewables				2,600	2,900		
Peat	0	0	0	0	0	0	0
Other Non-Renewables				2,050	2,100		
Total	6,819	8,996	18,500	27,400	27,900	35,000	38,000

DENMARK (DK)

	1980	1990	2000	2010	2011	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	
Peat							
Other Non-Renewables	0	0	0	298		0	
Total	3,591	7,881	9,166	8,750		8,892	

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			190			176	
Hard Coal			0			0	
Oil			0			0	
Natural Gas			17			100	
Renewables			9			277	
Peat							
Other Non-Renewables			289			0	
Total			505			553	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal	0	0	81	42	42	42	42
Oil	525	900	1,448	1,006	970	1,561	1,676
Natural Gas	0	451	3,322	4,697	4,842	6,137	6,887
Renewables							
Peat							
Other Non-Renewables							
Total	525	1,351	4,851	5,746	5,854	7,740	8,605

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			0	0	0	0	0
Hard Coal			1,468	958	1,700	417	437
Oil			158	290	246	170	158
Natural Gas			1,797	2,442	1,626	2,864	2,518
Renewables			1,442	2,109	1,879	2,253	2,385
Peat	185	986	1,354	1,441	1,905	1,562	1,275
Other Non-Renewables				158	59		
Total	2,839	4,000	5,903	7,048	7,252	7,273	6,927

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			0				
Hard Coal			211				
Oil			211				
Natural Gas			2,530				
Renewables			843				
Peat							
Other Non-Renewables			422				
Total			4,217				

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0			
Hard Coal	877	527	152	176	306	131	78
Oil	1,077	884	266	70	55	58	60
Natural Gas	43	315	3,154	4,560	4,423	4,655	4,861
Renewables	0	0	110	257	306	689	1,318
Peat							
Other Non-Renewables	527	400	769	888	880	0	0
Total	2,524	2,126	4,451	5,950	5,970	5,533	6,316

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	33	33	33	33	33	33	
Hard Coal	0	0	21	62	62	65	
Oil	132	154	153	125	116	116	
Natural Gas	0	16	28	209	209	236	
Renewables	0	0	0	0	0	40	
Peat							
Other Non-Renewables	0	0	0	0	0	0	
Total	165	203	234	429	420	490	

HUNGARY (HU)

	1980	1990	2000	2010	2011	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	1,893	1,727	1,090	1,100
Renewables	0	0	0	85	85	500	500
Peat	0	0	0	0	0	0	0
Other Non-Renewables	0	0	81	0	0	0	0
Total	770	813	844	2,008	1,842	1,600	1,600
TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			0	0		0	
Hard Coal			0	0		0	
Oil			0	0		0	
Natural Gas			100	150		200	
Renewables			0	0		0	
Peat				297	297		
Other Non-Renewables			18	18		18	
Total			118	168		289	307

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Peat			0	0	0		
Other Non-Renewables							
Total	5,249	4,540	11,892	23,671	23,136		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	314	594	619	612	661	792	792
Hard Coal	0	0	0	0	0	0	0
Oil	148	148	148	148	148	144	144
Natural Gas	0	0	0	33	33	32	64
Renewables	0	0	0	44	49	324	332
Peat					0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	462	742	767	837	891	1,292	1,332

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	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	501	505	530	550
Renewables	0	0	0	0	0	0	0
Peat							
Other Non-Renewables	0	0	0	0	0	0	0
Total	4	4	51	501	505	530	550

LATVIA (LV)

	1980	1990	2000	2010	2011	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	870	870	900	900
Renewables	0	0	0	20	22	75	110
Peat	60	50	20	0	0		
Other Non-Renewables	0	0	0	0	0		
Total	562	587	595	893	895	975	1,010

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

MALTA (MT)

	1980	1990	2000	2010	2011	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		
Peat		0	0	0	0		
Other Non-Renewables	0	0	0	0	0		
Total	0	0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal	1,163	1,163	930	1,480	1,480	1,240	625
Oil							
Natural Gas	2,652	4,131	5,925	10,291	10,252	12,129	12,675
Renewables	0	0	0	418	486	631	700
Peat							
Other Non-Renewables	0	0	145	130	130	0	0
Total	3,815	5,294	7,000	12,319	12,348	14,000	14,000

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	7,063	7,914	6,724	6,044	5,921	5,292	5,035
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	174	950	1,595	3,360	3,468
Renewables	0	0	0	37	60	42	42
Peat							
Other Non-Renewables	0	0	0	0	0	0	0
Total	7,063	7,914	6,897	7,031	6,961	8,272	8,545

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	0	0	0	0	0
Oil	430	589	690	513	493	0	0
Natural Gas	0	0	178	672	855	1,588	1,868
Renewables	0	0	238	343	350	372	383
Peat	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	430	589	1,106	1,528	1,698	1,960	2,250

ROMANIA (RO)

	1980	1990	2000	2010	2011	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
Peat							
Other Non-Renewables	0	0	0	0		0	0
Total	3,580	6,570	3,800	3,500		4,520	4,942

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels						0	0
Hard Coal						0	0
Oil						90	90
Natural Gas						1,000	1,000
Renewables				2,860	2,870	4,800	4,900
Peat							
Other Non-Renewables						120	120
Total	3,179	3,280	3,196	4,779	4,946	6,010	6,110

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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	
Peat							
Other Non-Renewables	0	0	0	0		0	
Total	58	103	103	103		103	

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	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	
Peat							
Other Non-Renewables	0	0	0	0		0	
Total	897	1,139	1,259	1,651		2,085	

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Peat							
Other Non-Renewables							
Total							

NORWAY (NO)

	1980	1990	2000	2010	2011	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	665	755	950	950
Renewables			22				
Peat							
Other Non-Renewables	203	228	217				
Total	203	228	239	665	755	950	950

TABLE 3.1.3.1 CHP Capacity by Fuel (MW)

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			1,173	2,462	2,783		
Hard Coal			133	159	159		
Oil			540	253	227		
Natural Gas			616	2,443	2,732		
Renewables			0	0	0		
Peat							
Other Non-Renewables			12	56	77		
Total			2,474	5,373	5,978		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	53	53	53				
Hard Coal	1,317	1,909	1,725				
Oil							
Natural Gas							
Renewables	1,210	2,034	1,976				
Peat							
Other Non-Renewables							
Total	2,579	3,995	3,754				

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	129	353	353	353	353		
Hard Coal	663	663	663	663	663	382	
Oil	0	84	84	0	0	0	0
Natural Gas	80	80	5	6	6	450	450
Renewables	0	0	0	0	0		
Peat							
Other Non-Renewables	0	0	0	0	0		
Total	872	1,180	1,105	1,022	1,022	832	450

3.1 GENERATION EQUIPMENT - CAPACITY

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. Therefore, 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 from generating companies and auto-producers. Capacity is indicated for each of the 27 EU Member States plus Switzerland, Norway, Turkey and certain Energy Community countries.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Multifuels				1,758			
Other Non-Renewables				820			
Total		540	1,464	2,577		4,000	

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	194	274	360	656	656	707	707
Autoproducers	840	640	314	310	320	325	325
Total	1,034	914	674	723	713	771	771

SCYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	0	0	0	0	0		
Autoproducers	0	0	0	0	0		
Total	0	0	0	0	0		

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Electricity Generating Companies	6,819	8,996	10,000	18,800	19,400		
Autoproducers	0	0	8,500	8,600	8,500		
Total	6,819	8,996	18,500	27,400	27,900	35,000	38,000

DENMARK (DK)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Electricity Generating Companies			449				
Autoproducers			56				
Total			505			553	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies							
Autoproducers	525	1,351	4,851	5,746	5,854	7,740	8,605
Total	525	1,351	4,851	5,746	5,854	7,740	8,605

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies							
Autoproducers							
Total	2,839	4,000	5,903	7,048	7,252	7,273	6,927

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies							
Autoproducers							
Total			4,217				

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	0	0	600	2,270		1,554	1,554
Autoproducers	2,524	2,126	3,878	3,783		3,979	4,762
Total	2,524	2,126	4,451	5,950	5,970	5,533	6,316

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	0	0	21	62	62	65	
Autoproducers	165	203	214	367	358	425	
Total	165	203	234	429	420	490	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	615	615	517	1,686	1,512	1,200	1,100
Autoproducers	155	198	327	322	330	400	500
Total	770	813	844	2,008	1,842	1,600	1,600

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies			60	100		166	166
Autoproducers			58	68		123	141
Total			118	168		289	307

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	29	209	7,698	18,216	17,945		
Autoproducers	5,220	4,331	4,194	5,455	5,191		
Total	5,249	4,540	11,892	23,671	23,136		

TABLE 3.1.3.2 CHP CAF

CHP CAPACITY BY COMPANY TYPE (MW)

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	411	691	691	744	729	1,163	1,203
Autoproducers	51	51	76	93	162	129	129
Total	462	742	767	837	891	1,292	1,332

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	0	0	0	385	385	385	385
Autoproducers	4	4	51	110	110	145	165
Total	4	4	51	501	505	530	550

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	520	520	520	853	755	710	710
Autoproducers	42	67	75	140	140	265	300
Total	562	587	595	893	895	975	1,010

MALTA (MT)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Electricity Generating Companies	3,553	4,534	6,000	4,729	4,633	5,500	5,500
Autoproducers	262	760	1,000	7,590	7,715	8,500	8,500
Total	3,815	5,294	7,000	12,319	12,348	14,000	14,000

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	4,280	5,132	5,002	5,470	5,450	6,295	6,307
Autoproducers	2,783	2,783	1,896	1,510	1,510	1,977	2,238
Total	7,063	7,914	6,897	7,031	6,961	8,272	8,545

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	56	56	56	1,295	1,466	1,960	2,250
Autoproducers	374	533	1,050	233	232	0	0
Total	430	589	1,106	1,528	1,698	1,960	2,250

ROMANIA (RO)

	1980	1990	2000	2010	2011	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

Supply

8

TABLE 3.1.3.2 CHP Capacity by Company Type (MW)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	2,171	2,524	2,264	3,827	4,119	4,510	4,580
Autoproducers	1,008	756	932	952	827	1,500	1,530
Total	3,179	3,280	3,196	4,779	4,946	6,010	6,110

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	58	103	103	103		103	
Autoproducers	0	0	0	0		0	
Total	58	103	103	103		103	

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	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 (сн)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies							
Autoproducers							
Total							

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	0	0	0	665	755	950	950
Autoproducers	203	228	239	0	0	0	0
Total	203	228	239	665	755	950	950

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies			189	2,227	3,745		
Autoproducers			2,285	3,146	2,233		
Total			2,474	5,373	5,978		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Electricity Generating Companies	2,527	3,943	3,701				
Autoproducers	53	53	53				
Total	2,579	3,995	3,754				

SERBIA (RS)

	1980	1990	2000	2010	2011	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 certain Energy Community members from 1980 to 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	2010	2011	2020	2030
Nuclear	196	747	899	870	853	841	805
FOSSIL FUEL FIRED	1,301	1,267	1,536	1,621	1,553	1,218	1,046
of which multifuel	98	93	85	43	43	5	5
Hard Coal	554	588	559	535	551	310	284
Brown Coal	223	290	317	308	270	260	161
Oil	342	188	173	73	64	44	46
Natural Gas	151	172	450	749	706	572	511
Derived Gas	32	28	34	32	27	17	17
Pumped Hydro	20	31	42	44	42	50	57
Renewables	175	181	260	646	657	1,003	1,277
Hydro	168	166	202	320	265	280	269
of which Run of River	108	96	119	129	117	77	71
of which Reservoir	115	115	138	143	135	113	111
Wind	0	0	23	146	175	410	650
of which Wind Onshore	0	0	17	130	150	223	328
of which Wind Offshore	0	0	0	4	2	59	204
Solar	0	0	0	23	44	85	113
of which PV	0	0	0	23	44	68	85
of which CSP	0	0	0	1	2	7	6
Geothermal	3	3	5	5	6	3	4
Biogas	0	1	3	28	35	35	39
Biomass	4	6	14	64	64	113	123
Waste	1	4	13	30	28	25	26
Other (Wave/Tidal etc)	1	1	1	0	0	1	5
Other	1	4	5	8	7	5	3
Peat	1	3	4	7	6	5	3
Not Specified	1	2	2	5	2	9	1
TOTAL	1,842	2,362	2,890	3,202	3,096	3,083	3,093

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 Electr

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

AUSTRIA (AT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	11	15	17	21	20	16	16
of which multifuel							
Hard Coal	0	4	6	5	5	2	2
Brown Coal	2	2	2	0	0	0	0
Oil	5	2	1	1	1	0	0
Natural Gas	4	7	7	14	12	13	13
Derived Gas	0	1	1	2	2	1	1
Pumped Hydro	8	9	13	13	13	18	20
Renewables				35	44	62	73
Hydro							
of which Run of River	21	23	30	28	25	33	36
of which Reservoir							
Wind				2	2	6	9
of which Wind Onshore				2	2	6	9
of which Wind Offshore				0		0	0
Solar				0	0	0	4
of which PV				0	0		
of which CSP							
Geothermal				0	0	0	0
Biogas				0	1	1	1
Biomass				2	4	2	3
Waste				0	0	0	0
Other (Wave/Tidal etc)				0		0	0
OTHER							
Peat							
Not Specified	1	1	0	1	0	1	1
TOTAL	41	49	60	67	63	79	90

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	12	43	48	46	46	32	0
Fossil Fuel Fired	38	27	33	38	31	39	71
of which multifuel							
Hard Coal	12	20	16	6	5	4	28
Brown Coal							
Oil	17	1	1	0	0	2	3
Natural Gas	6	5	16	31	25	33	37
Derived Gas	3					3	3
Pumped Hydro	1	1	1	1	1	1	1
Renewables	0	1	2	7	9	23	28
Hydro	0	0	0	0	0	0	1
of which Run of River	0	0	0	0	0	0	1
of which Reservoir							
Wind		0	0	1	2	11	16
of which Wind Onshore			0	1	2	4	6
of which Wind Offshore			0	0	0	7	10
Solar		0	0	1	1	3	4
of which PV				1	1	3	4
of which CSP							
Geothermal		0	0	0	0	0	0
Biogas			0	1	0	1	1
Biomass			0	3	3	5	6
Waste	0	1	1	2	2	3	3
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total	51	71	84	91	85	99	101

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	6	14	17	14	15	15	21
FOSSIL FUEL FIRED	22	22	17	22	26	30	43
of which multifuel	0	0	0	0		0	0
Hard Coal	7	7	2	20	24		
Brown Coal	9	11	12	15			
Oil	3	2	1	0		6	9
Natural Gas	3	2	2	2	2	6	10
Derived Gas	0	0	0	0			
Pumped Hydro	0	0	0	1	1	1	1
RENEWABLES	0	0	0	6	4	81	106
Hydro				5	3	46	45
of which Run of River	0	0	0	0			
of which Reservoir							
Wind	0	0	0	0	1	22	45
of which Wind Onshore	0	0	0	2		5	7
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		9	12
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0	0	3	7
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
Total	31	38	37	47	46	67	89

🥑 CYPRUS (cy)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	1	2	3	5	5	9	12
of which multifuel	0	0	0			0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0			0	0
Oil	1	2	3			1	1
Natural Gas	0	0	0			8	11
Derived Gas	0	0	0			0	0
PUMPED HYDRO	0	0	0			0	0
RENEWABLES	0	0	0	0	0	0	0
Hydro							
of which Run of River	0	0	0			0	0
of which Reservoir							
Wind	0	0	0	0	0		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0				
Solar	0	0	0				
of which PV							
of which CSP							
Geothermal	0	0	0				
Biogas	0	0	0				
Biomass	0	0	0				
Waste	0	0	0				
Other (Wave/Tidal etc)	0	0	0				
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
Total	1	2	3	5	5	9	12

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWH)

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	12	13	26	27	26	35
FOSSIL FUEL FIRED	46	45	53	48	49	50	50
of which multifuel	0	0	0	0	0	0	0
Hard Coal	7	6	7	5	5	8	7
Brown Coal	37	38	43	43	43	39	40
Oil	1	0	0	0	0	0	0
Natural Gas	0	0	2	3	4	2	2
Derived Gas	1	1	2	0	0	2	1
Pumped Hydro	1	0	1	1	3	1	1
Renewables	0	0	0	4	3	4	4
Hydro				3			
of which Run of River	1	1	1			1	1
of which Reservoir							
Wind	0	0	0	0	0	2	4
of which Wind Onshore	0	0	0	0	0	2	4
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	1	0	1	1
of which PV				1	2		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1	0	2	2
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER							
Peat							
Not Specified	0	0	0	0	0	8	0
TOTAL	49	58	68	79	81	90	93

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	41	139	161	133	102	59	0
FOSSIL FUEL FIRED	289	261	335	350	345	278	190
of which multifuel	43	36	39	34	34		
Hard Coal	87	75	131	107	104	75	54
Brown Coal	105	129	136	132	138	118	56
Oil	25	9	5	8	6	1	0
Natural Gas	59	34	47	87	84	78	74
Derived Gas	13	14	15	16	13	6	6
Pumped Hydro	1	3	4	6	6	10	11
Renewables	16	21	39	105	124	193	227
Hydro	16	18	25	21	17	21	22
of which Run of River	15	17	24	20	16	20	21
of which Reservoir	1	1	1	1	1	1	1
Wind	0	0	10	38	49	90	116
of which Wind Onshore	0	0	10	38	48	60	64
of which Wind Offshore	0	0	0	0	1	30	52
Solar	0	0	0	12	20	33	37
of which PV	0	0	0	12	20	33	37
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	2	3
Biogas	0	0	0	16	20	27	29
Biomass	0	0	2	11	11	12	13
Waste		2	3	8	8	8	8
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
TOTAL	347	423	539	595	577	539	429

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR							
FOSSIL FUEL FIRED	24	30	30	24	20	27	24
of which multifuel	0	0	0	0		0	0
Hard Coal	21	29	17	16	14	10	7
Brown Coal	0	0	0	0		0	0
Oil	3	1	4	1	0	1	1
Natural Gas	0	0	9	8	6	14	14
Derived Gas	0	0	0	0		0	0
Pumped Hydro	0	0	0	0		0	0
RENEWABLES	0	0	6	12	15	17	23
Hydro							
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	4	8	10	17	23
of which Wind Onshore	0	0				8	9
of which Wind Offshore	0	0				8	14
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	1	4	4	0	0
Waste	0	0	1	1	1	0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
TOTAL	24	31	35	37	35	38	44

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR			0	0		0	
FOSSIL FUEL FIRED			9	12		10	
of which multifuel			0			1	
Hard Coal			0	0		0	
Brown Coal			8	11		9	
Oil			0	0		0	
Natural Gas			1	0		1	
Derived Gas			0	0		1	
Pumped Hydro			0	0		0	
RENEWABLES			0	1		4	
Hydro							
of which Run of River			0	0		0	
of which Reservoir							
Wind			0	0		2	
of which Wind Onshore			0	0		1	
of which Wind Offshore			0	0		1	
Solar			0	0		0	
of which PV							
of which CSP							
Geothermal			0	0		0	
Biogas			0	0		0	
Biomass			0	1		1	
Waste			0	0		0	
Other (Wave/Tidal etc)			0	0		0	
OTHER							
Peat							
Not Specified				0		0	
TOTAL	17	15	9	13		14	

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

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	5	52	60	60	55	58	77
FOSSIL FUEL FIRED	69	69	119	131	136	159	154
of which multifuel	3	3	4	0	0	0	0
Hard Coal	22	46	62	20	36	26	15
Brown Coal	7	11	14	6	8	0	0
Oil	37	8	23	14	13	21	25
Natural Gas	3	4	20	92	79	112	114
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	3	5	3	3	2	5	5
Renewables	28	21	34	98	87	133	178
Hydro	28	21	28	42	30	36	37
of which Run of River	1	0	0	7	5	0	0
of which Reservoir	27	21	28	35	25	36	37
Wind	0	0	5	43	41	76	112
of which Wind Onshore	0	0	5	43	41	76	112
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	7	9	14	20
of which PV	0	0	0	6	7	8	14
of which CSP	0	0	0	1	2	6	6
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	1	1	1	2
Biomass	0	0	0	2	3	3	4
Waste	0	0	1	3	3	3	3
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	105	147	216	292	280	355	414

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	7	18	22	22	22	36	58
FOSSIL FUEL FIRED	17	15	18	25	19	16	15
of which multifuel	0	0	0	0	0		
Hard Coal	11	9	8	14	9	5	4
Brown Coal	0	0	0	0	0	0	0
Oil	4	2	1	0	0	1	1
Natural Gas	2	4	8	11	9	10	10
Derived Gas	0	0	0	0	0		
Pumped Hydro	0	0	0	0	0	0	0
RENEWABLES	14	15	23	23	23	34	38
Hydro	10	11	15	13	12	15	15
of which Run of River							
of which Reservoir							
Wind	0	0	0	0	1	6	9
of which Wind Onshore	0	0	0	0	1	6	9
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	0	0			
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	3	4	8	10	10	13	13
Waste			0	0	0	1	1
Other (Wave/Tidal etc)			0	0	0	0	0
OTHER	1	3	5	7	6	5	3
Peat	1	3	4	6	5	5	3
Not Specified	1	1	1	1	1		
TOTAL	39	52	67	77	70	92	115

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	58	298	395	408	421	420	375
FOSSIL FUEL FIRED	119	45	50	60	52	49	45
of which multifuel	0	0	0	0			
Hard Coal	60	29	26	19	13	16	9
Brown Coal	1	0	0	0			
Oil	45	7	8	8	8	2	4
Natural Gas	6	3	11	30	31	31	31
Derived Gas	8	5	3	2			
Pumped Hydro	1	4	5	68	6	5	5
RENEWABLES	1	1	3	15	65	113	162
Hydro					45	62	62
of which Run of River	42	32	37	33	34		
of which Reservoir					11		
Wind	0	0	0	10	12	31	58
of which Wind Onshore	0	0		10	12		
of which Wind Offshore	0	0		0			
Solar	0	0	0	1	2	9	22
of which PV				1	2	9	22
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	1	1		
Biomass	0	0	0	1	1	10	16
Waste	0	0	2	3	3		
Other (Wave/Tidal etc)	1	1	1	0		1	4
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
Total	247	400	517	550	543	587	588

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	32	59	78	56	63	57	74
FOSSIL FUEL FIRED	229	234	270	281	252	139	88
of which multifuel	20	22	30				1
Hard Coal	204	209	115	102	103	33	35
Brown Coal	0	0	0	0		0	0
Oil	23	21	6	4	3	5	0
Natural Gas	0	2	145	168	173	104	53
Derived Gas	2	2	4	2	2	0	0
Pumped Hydro	1	2	3	3	3	3	3
RENEWABLES	0	1	5	25	33	118	203
Hydro				4	6	9	
of which Run of River	0	0	0	4	6	9	0
of which Reservoir							
Wind	0	0	1	10	16	67	163
of which Wind Onshore	0	0		7	10		52
of which Wind Offshore	0	0	0	3			112
Solar	0	0	0	0	0	5	6
of which PV				0	0	5	
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	1	2	5	6		
Biomass	0	0	1	5	5	37	33
Waste	0	0	1	2			
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	0	0	0	0			
TOTAL	266	300	361	366	334	329	375

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWH)

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	
Fossil Fuel Fired	18	30	45	43	47	43	
of which multifuel							
Hard Coal	0	0	0	0	0	0	
Brown Coal	9	23	31	27	28	22	
Oil	9	7	9	5	5	2	
Natural Gas			6	11	15	20	
Derived Gas	0	0	0	0	0	0	
Pumped Hydro	0	0	1	0	0	0	
Renewables	0	0	1	11	8	19	
Hydro				7	4	5	
of which Run of River	0	0	0	1	1	1	
of which Reservoir				7	3	4	
Wind	0	0	0	3	3	8	
of which Wind Onshore	0	0	0	3	3	7	
of which Wind Offshore	0	0	0	0	0	0	
Solar	0	0	0	0	1	5	
of which PV				0	1	4	
of which CSP						1	
Geothermal	0	0	0	0	0	1	
Biogas	0	0	0	0	0	1	
Biomass						0	
Waste	0	0	0	0	0	0	
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified	0	0	0	0	0	0	
Total	21	32	50	54	56	63	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	14	14	15	15	14	22
Fossil Fuel Fired	24	15	21	17	17	19	16
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	1	1	1	1	0	0
Brown Coal	12	8	8	5	5	3	3
Oil	6	1	5	0	0	0	0
Natural Gas	6	5	7	11	11	15	13
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	0	0	0	0	0	3
Renewables	0	0	0	2	2	5	5
Hydro				0	0	0	0
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	0	0	0	0	0	0	0
Wind	0	0	0	1	1	2	2
of which Wind Onshore	0	0	0	1	1	2	2
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	1	1
Biomass	0	0	0	2	1	3	3
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	24	29	35	35	34	38	43

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	9	13	21	21	21	20	23
of which multifuel	0	2	3		7		
Hard Coal	0	6	6	4	4	2	2
Brown Coal	2	2	2	0	0	0	0
Oil	5	2	4	0	0	0	0
Natural Gas	2	4	9	17	7	18	21
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	0	0	0	1	0	0
RENEWABLES			0	2	3	6	7
Hydro					1		
of which Run of River				0	1	0	0
of which Reservoir					0		
Wind			0	2	3	6	6
of which Wind Onshore			0	0	3	6	6
of which Wind Offshore				0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV					0		
of which CSP					0		
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	1	1
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
OTHER					0		
Peat							
Not Specified	0	0	0	2	0	1	1
Total	17	24	38	32	24	29	34

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	2	0	0	0	0		
FOSSIL FUEL FIRED	126	167	206	211	207		
of which multifuel							
Hard Coal	14	30	24	36	41		
Brown Coal	0	0	0	0	0		
Oil	101	97	84	22	21		
Natural Gas	9	37	93	148	141		
Derived Gas	3	3	4	5	5		
Pumped Hydro	2	3	7	3	2		
Renewables	48	34	50	76	82		
Hydro	45	31	44	51	45		
of which Run of River	18	12	16	22	20		
of which Reservoir	27	20	28	29	26		
Wind	0	0	1	9	10		
of which Wind Onshore	0	0	1	9	10		
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	0	2	11		
of which PV	0	0	0	2	11		
of which CSP	0	0	0	0	0		
Geothermal	3	3	4	5	5		
Biogas	0	0	1	2	3		
Biomass	0	0	1	5	5		
Waste	0	0	0	2	2		
Other (Wave/Tidal etc)	0	0	0	0	0		
OTHER	0	0	1	1	1		
Peat			0	0	0		
Not Specified	0	0	1	1	1		
TOTAL	177	205	263	291	291		

TABLE 3.2.1.1 ANNUAL E

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	16	7	0	0	0	10
FOSSIL FUEL FIRED	11	10	2	4	3	5	6
of which multifuel	10	10	2	3	2	3	3
Hard Coal	0	0	0	0	0	0	0
Brown Coal	0	0	0	0	0	0	0
Oil	10	5	1	0	0	0	0
Natural Gas	0	6	1	4	3	4	6
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	0	0	1	1	1	1
Renewables	0	0	0	1	1	3	3
Hydro				1	1	1	1
of which Run of River	0	0	0	1	1	1	1
of which Reservoir				0	0	0	0
Wind	0	0	0	0	1	2	2
of which Wind Onshore	0	0	0	0	1	2	2
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV	0	0	0	0	0	0	0
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	1	1
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	11	26	10	5	5	9	20

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
Fossil Fuel Fired	1	1	0	3	2	3	3
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	3	2	3	3
Derived Gas	1	1	0	0	0	0	0
Pumped Hydro	0	1	1	1	1	1	1
Renewables	0	0	0	0	0	0	0
Hydro							
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	0	0	0	0
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		0	0
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
Total	1	1	1	4	4	4	4

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

LATVIA (LV)

	1020	1000	2000	2010	2011	2020	2020
Newsyan	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	
FOSSIL FUEL FIRED	2	2	1	3	3	3	3
of which multifuel							
Hard Coal	0	0	0	0	0	1	1
Brown Coal	0	0	0	0	0		
Oil	0	0	0	0	0		
Natural Gas	1	2	1	3	3	2	2
Derived Gas	0	0	0	0	0	0	
PUMPED HYDRO	0	0	0	0	0	0	
Renewables	3	5	3	4	3	5	5
Hydro	3	5	3	3	3	3	3
of which Run of River	3	5	3	3		3	3
of which Reservoir							
Wind	0	0	0	0	0	1	1
of which Wind Onshore	0	0	0	0	0	1	1
of which Wind Offshore	0	0	0	0	0	1	1
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP							
Geothermal	0	0	0	0	0		
Biogas	0	0	0	0	0	0	0
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
OTHER							
Peat	0	0	0	0	0		
Not Specified	0	0	0	0		0	0
TOTAL	5	6	4	6	6	8	8

MALTA (MT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR		0	0	0	0		
FOSSIL FUEL FIRED		1	2	2	2		
of which multifuel			0	0	0		
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			2	2	2		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		
Pumped Hydro		0	0	0	0		
RENEWABLES		0	0	0	0		
Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
of which Reservoir		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		
Solar		0	0	0	0		
of which PV		0	0	0	0		
of which CSP		0	0	0	0		
Geothermal		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		
OTHER		0	0	0	0		
Peat		0	0	0	0		
Not Specified		0	0	0	0		
TOTAL	0	1	2	2	2		

TABLE 3.2.1.1 Annual Electricity Ge

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	4	3	4	4	4	4	25
Fossil Fuel Fired	56	64	81	100	94	89	74
of which multifuel							
Hard Coal	7	25	29	22	21	34	24
Brown Coal	0	0	0	0	0	0	0
Oil	23	0	0	0	0	0	0
Natural Gas	24	37	48	75	69	51	46
Derived Gas	2	2	3	3	3	4	4
Pumped Hydro	0	0	0	0	0	0	0
Renewables		1	1	10	11	30	37
Hydro				0	0	0	0
of which Run of River	0	0	0	0	0	0	0
of which Reservoir				0	0	0	0
Wind			1	4	5	17	22
of which Wind Onshore			1	3	4	8	13
of which Wind Offshore			0	1	1	9	9
Solar			0	0	0	4	6
of which PV				0	0	4	6
of which CSP				0	0	0	0
Geothermal							
Biogas			0	1	1	2	3
Biomass			0	4	4	4	5
Waste			0	1	1	2	2
Other (Wave/Tidal etc)			0	0	0	0	0
OTHER							
Peat				0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	60	69	86	114	109	123	137

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	18
FOSSIL FUEL FIRED	110	120	129	134	137	139	141
of which multifuel	0	0	0	0	0	0	0
Hard Coal	86	71	83	85	85	85	90
Brown Coal	22	48	46	45	48	48	45
Oil	2	0	0	0	0	0	0
Natural Gas	0	0	0	5	5	6	6
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	1	2	2	2	1	1	1
Renewables	0	0	0	11	12	23	27
Hydro				4	3	3	3
of which Run of River	1	1	1	1	1	1	1
of which Reservoir				1	1	1	1
Wind	0	0	0	2	3	16	20
of which Wind Onshore	0	0	0	2	3	13	13
of which Wind Offshore	0	0	0	0	0	3	7
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	5	6	4	5
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER				0	0	0	0
Peat							
Not Specified	0	0	0	0	0	0	0
TOTAL	113	123	133	144	149	162	187

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	7	18	30	24	26	25	28
of which multifuel	0	0	0	0	0	0	0
Hard Coal	1	9	14	7	9	4	0
Brown Coal	0	0	0	0	0	0	0
Oil	6	10	9	2	2	1	1
Natural Gas	0	0	7	15	15	20	28
Derived Gas	0	0	0	0	0	0	0
Pumped Hydro	0	1	1	2	2	2	3
RENEWABLES	8	9	12	27	23	28	32
Hydro	8	9	10	14	10	11	12
of which Run of River	6	6	7	10	8	8	8
of which Reservoir	2	2	3	4	3	4	3
Wind	0	0	0	9	9	11	13
of which Wind Onshore	0	0	0	9	9	11	13
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	1	2
of which PV	0	0	0	0	0	1	2
of which CSP	0	0	0	0	0	0	1
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1	1	2	2
Waste	0	0	1	2	3	3	3
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
OTHER	0	0	0	0	0	0	0
Peat	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
TOTAL	15	27	42	53	51	56	63

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	5	11	11	22	33
FOSSIL FUEL FIRED	49	46	27	25	30	23	26
of which multifuel	22	21	7	5		1	1
Hard Coal	7	4	4	19	22	2	6
Brown Coal	13	15	14	18		12	8
Oil	6	9	3	1		0	0
Natural Gas	23	18	7	7	8	8	13
Derived Gas	0	0	0	0		0	0
Pumped Hydro	0	0	0	0	0	0	0
RENEWABLES	0	0	0	21	16	6	9
Hydro				20	15		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	0	1	6	8
of which Wind Onshore	0	0	0	0		6	8
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		0	1
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0
OTHER							
Peat							
Not Specified	0	0	0	0		0	0
TOTAL	62	57	47	57	57	68	85

TABLE 3.2.1.1 ANNUAL ELECTR

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	25	65	55	56	58	75	53
Fossil Fuel Fired	10	3	5	6	5	5	5
of which multifuel							
Hard Coal	0	1	2	1	1	0	0
Brown Coal	0	0	0	1		0	0
Oil	9	1	1	2	2	1	1
Natural Gas	0	0	0	2	2	3	3
Derived Gas		1	1	1	1	1	1
Pumped Hydro	0	0	0	0	0	0	0
Renewables	59	73	82	83	84	96	106
Hydro	58	71	78	67	67	68	69
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	58	71	78	67	67	68	69
Wind	0	0	1	4	6	13	21
of which Wind Onshore							
of which Wind Offshore							
Solar	0	0	0	0	0	0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0		
Biomass	0	1	2	7	6	10	10
Waste	0	1	2	6	5	6	6
Other (Wave/Tidal etc)	0	0	0	0	0		
OTHER							
Peat	0	0	0	1	1	0	0
Not Specified							
TOTAL	93	142	142	145	148	177	164

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	4	5	6		6	3
FOSSIL FUEL FIRED	4	4	5	6		8	12
of which multifuel			0				
Hard Coal	4	4	4	1		1	1
Brown Coal	0	0	0	4		6	10
Oil	0	0	0	0		0	0
Natural Gas	0	0	0	1		1	1
Derived Gas	0	0	0	0		0	0
Pumped Hydro	0	0	0				
Renewables	0	0	0	0		1	2
Hydro							
of which Run of River	0	0	0				
of which Reservoir							
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	
Solar	0	0	0	0		0	
of which PV							
of which CSP							
Geothermal	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	
OTHER							
Peat							
Not Specified	0	0	0	0		0	
TOTAL	7	11	13	15	14	15	

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

SLOVAKIA (sκ)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	4	11	15	14	14	16	
FOSSIL FUEL FIRED	12	9	9	6	6	15	
of which multifuel	0	0	0	0		0	
Hard Coal	4	4	3	3	3	2	
Brown Coal	4	3	2	2		2	
Oil	1	1	1	0		0	
Natural Gas	4	2	3	3	3	11	
Derived Gas	0	0	0	0		0	
PUMPED HYDRO	0	0	0	0	0	0	
RENEWABLES	0	0	0	6	5	1	
Hydro				5	4		
of which Run of River							
of which Reservoir							
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	
Solar	0	0	0	0		0	
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	
Biogas	0	0	0	0		0	
Biomass	0	0	0	0		1	
Waste	0	0	0	0		0	
Other (Wave/Tidal etc)	0	0	0	0		0	
OTHER							
Peat							
Not Specified	0	0	0	0		0	
TOTAL	19	23	29	26	27	36	

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	14	22	25	25	26	22	9
FOSSIL FUEL FIRED	1	1	2	2	2	2	9
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
PUMPED HYDRO	2	2	2	2	2		
RENEWABLES	32	29	37	36	33	37	41
Hydro	32	29	36	35	31	35	36
of which Run of River	15	14	18	16	15	17	17
of which Reservoir	17	15	18	19	17	19	19
Wind		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	0
Solar		0	0	0	0	0	1
of which PV							
of which CSP							
Geothermal		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	1	1	1		
Other (Wave/Tidal etc)		0	0	0	0	0	0
OTHER							
Peat							
Not Specified							
TOTAL	48	54	65	66	63	61	59

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWH)

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	0	0	0	5	5	2	2
of which multifuel	0	0	0	0		0	0
Hard Coal	0	0	0			0	0
Brown Coal	0	0	0	0		0	0
Oil	0	0	0	0		0	0
Natural Gas	0	0	0	5	5	2	2
Derived Gas	0	0	0	0		0	0
Pumped Hydro	1	2	2	1	2	3	3
Renewables	83	121	142	119	123	138	143
Hydro	83	120	141	118	122	132	135
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	1	1	6	8
of which Wind Onshore	0	0	0	1	1	6	7
of which Wind Offshore	0	0	0	0		0	1
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
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
OTHER							
Peat							
Not Specified	0	0	1	0	0	0	0
TOTAL	83	121	142	124	128	140	145

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0		
Fossil Fuel Fired	11	31	88	148	161		
of which multifuel		2	15	20	20		
Hard Coal	1	1	3	16	24		
Brown Coal	5	18	32	32	33		
Oil	6	4	9	2	1		
Natural Gas		9	44	96	102		
Derived Gas	0	0	1	2	2		
Pumped Hydro	0	0	0	0	0		
Renewables	11	23	30	55	57		
Hydro	11	23	30	51	51		
of which Run of River	0	1	1	7	10		
of which Reservoir	10	22	30	45	42		
Wind	0	0	0	3	5		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV				0	0		
of which CSP							
Geothermal		0	0	1	1		
Biogas			0	0	0		
Biomass							
Waste	0		0	0	0		
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
TOTAL	23	54	119	203	218		

ANNUAL ELECTRICITY GENERATION BY PRIMARY ENERGY (TWH)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0		
FOSSIL FUEL FIRED	5	10	6	8	10		
of which multifuel	0	0	0	0	0		
Hard Coal	5	10	6	8	10		
Brown Coal							
Oil	0	0	0	0	0		
Natural Gas							
Derived Gas							
PUMPED HYDRO							
RENEWABLES	0	0	0	8	4		
Hydro							
of which Run of River	0	0	0	0	0		
of which Reservoir							
Wind	0	0	0	0	0		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total	10	13	10	16	14		

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0		0	
FOSSIL FUEL FIRED	3	4	4	5	5		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Pumped Hydro				0	0		
RENEWABLES	0	0	0	0		0	
Hydro							
of which Run of River							
of which Reservoir							
Wind	0	0	0	0			
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
TOTAL	9	8	11	15	12	20	

TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWH)

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR	0	0	0	0	0	0	0
FOSSIL FUEL FIRED	15	28	19	23	27	31	34
of which multifuel	1	1	0	0	0	0	0
Hard Coal	0	0	0	23	27	0	0
Brown Coal	14	26	19	23	27	28	32
Oil	1	1	0	0	0		
Natural Gas	0	2	0	0	0	3	3
Derived Gas	0	0	0	0	0		
Pumped Hydro	0	1	1	1	1	1	1
Renewables	11	8	10	12	9	12	13
Hydro	11	8	10	12	9	11	11
of which Run of River	10	7	9	11	8	10	10
of which Reservoir	1	1	1	2	1	1	1
Wind	0	0	0	0	0	1	2
of which Wind Onshore						1	2
of which Wind Offshore							
Solar	0	0	0	0	0		
of which PV				0	0		
of which CSP							
Geothermal	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		
OTHER							
Peat							
Not Specified	0	0	0	0	0		
TOTAL	25	37	30	36	36	44	48

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
NUCLEAR				89	90		
FOSSIL FUEL FIRED				86	93		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Pumped Hydro							
Renewables				13	11		
Hydro							
of which Run of River							
of which Reservoir							
Wind							
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							
OTHER							
Peat							
Not Specified							
Total				188	194		

3.2 ELECTRICITY GENERATION

TABLE 3.2.1.2

ANNUAL NUCLEAR ELECTRICITY GENERATION BY COUNTRY (TWH)

The tables below present the nuclear annual electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and certain Energy Community members from 1980 to 2011. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

Country	1980	1990	2000	2010	2011	2020	2030
AT	0	0	0	0	0	0	0
BE	11.9	42.7	48.2	45.7	45.9	31.8	0
BG	5.7	13.5	16.8	14.4	15.2	15.2	20.5
СҮ	0	0	0	0	0	0	0
CZ	0	11.8	12.7	26.0	27.0	25.9	35.0
DE	41.0	139.0	160.7	133.0	102.2	59.0	0
DK	-	-	-	-	-	-	-
EE	-	-	0	0	-	0	-
ES	5.0	52.0	60.0	59.5	55.4	58.0	77.0
FI	6.6	18.1	21.6	21.9	22.3	36.3	58.3
FR	57.9	297.9	395.2	407.9	421.1	420.1	375.2
UK	32.3	58.7	78.3	56.4	62.7	57.0	74.3
GR	0	0	0	0	0	0	-
HU	0	13.7	14.1	14.8	14.7	14.2	22.0
IE	0	0	0	0	0	0	0
IT	2.1	0	0	0	0	-	-
LT	0	15.7	7.4	0	0	0	9.8
LU	0	0	0	0	0	0	0
LV	0	0	0	0	0	0	-
MT	-	0	0	0	0	-	-
NL	4.0	3.3	3.7	4.0	4.1	4.0	25.3
PL	0	0	0	0	0	0	18.4
PT	0	0	0	0	0	0	0
RO	0	0	5.1	10.7	10.8	22.2	33.0
SE	25.3	65.2	54.8	55.6	58.0	75.4	52.9
SI	0	4.4	4.8	5.9	-	6.1	3.1
SK	4.2	11.2	15.2	14.0	14.0	15.8	-
СН	13.7	22.3	24.9	25.2	25.6	22.0	9.0
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	-
RS	0	0	0	0	0	0	0
UA	-	-	-	89.2	90.3	-	-

Supply

ANNUAL FOSSIL FUEL FIRED ELECTRICITY GENERATION BY COUNTRY (TWH)

The tables below present the fossil fuel fired annual electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and certain Energy Community members from 1980 to 2011. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

AUSTRIA (AT)							
	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	11.2	15.2	17.3	21.0	19.5	16.3	16.2
of which multifuel							
Hard Coal	0	3.7	5.9	5.0	5.1	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	1.0	0.1	0
Natural Gas	3.6	6.8	7.0	14.0	11.7	12.8	13.0
Derived Gas	0.3	0.7	1.3	1.7	1.8	1.1	1.1

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Fossil fueled	38.0	26.5	32.6	37.7	31.0	38.7	71.4
of which multifuel							
Hard Coal	12.2	19.8	16.0	5.7	5.4	3.5	28.4
Brown Coal							
Oil	17.3	1.3	0.7	0.4	0.3	2.2	2.7
Natural Gas	5.6	5.4	15.9	31.4	25.3	33.0	37.1
Derived Gas	2.9					2.6	3.2

BULGARIA (BG)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	21.8	22.2	17.1	21.8	25.9	30.0	43.0
of which multifuel	0	0	0	0		0	0
Hard Coal	7.4	6.8	2.0	20.1	23.8		
Brown Coal	9.4	11.2	12.3	15.2			
Oil	2.5	2.1	1.2	0.2		6.1	8.6
Natural Gas	2.5	2.0	1.6	1.6	2.1	5.6	10.0
Derived Gas	0	0	0	0			

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	1.0	2.0	3.4	5.1	4.7	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	2010	2011	2020	2030
FOSSIL FUELED	46.3	44.9	52.7	48.0	49.0	50.4	50.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	6.8	5.6	6.6	4.5	4.5	7.7	7.0
Brown Coal	37.3	38.0	42.6	42.8	43.0	39.2	40.0
Oil	1.1	0.4	0.3	0	0	0	0
Natural Gas	0.2	0.2	1.7	3.0	4.0	2.0	2.0
Derived Gas	0.9	0.7	1.5	0	0	1.5	1.0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	288.7	260.7	334.9	350.1	344.7	277.6	190.4
of which multifuel	42.8	35.9	39.2	34.0	34.0		
Hard Coal	87.0	75.0	131.2	107.4	103.9	75.0	54.0
Brown Coal	105.0	129.0	136.1	132.2	137.9	118.0	56.0
Oil	25.0	9.0	5.4	7.9	6.4	0.6	0.4
Natural Gas	59.0	34.0	47.0	86.6	83.5	78.0	74.0
Derived Gas	12.7	13.7	15.2	16.0	13.0	6.0	6.0

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	23.9	30.4	29.9	24.3	20.1	26.9	24.0
of which multifuel	0	0	0	0		0	0
Hard Coal	20.8	29.4	16.7	16.1	13.9	9.9	7.0
Brown Coal	0	0	0	0		0	0
Oil	3.1	0.8	4.4	0.8	0.4	1.0	1.0
Natural Gas	0	0.2	8.8	7.7	5.8	14.0	14.0
Derived Gas	0	0	0	0		0	0

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED			8.5	11.7		10.1	
of which multifuel			0			1.2	
Hard Coal			0	0		0	
Brown Coal			7.8	11.0		9.0	
Oil			0.1	0		0	
Natural Gas			0.5	0.3		0.6	
Derived Gas			0.1	0.4		0.5	

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

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030	
FOSSIL FUELED	69.0	69.0	119.0	131.3	135.8	159.0	154.0	
of which multifuel	3.0	3.0	4.0	0	0	0	0	
Hard Coal	22.0	46.0	62.0	20.0	35.6	26.0	15.0	
Brown Coal	7.0	11.0	14.0	5.5	8.1	0	0	
Oil	37.0	8.0	23.0	13.5	13.4	21.0	25.0	
Natural Gas	3.0	4.0	20.0	92.3	78.7	112.0	114.0	
Derived Gas	0	0	0	0	0	0	0	

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	17.3	15.0	17.9	25.0	18.7	16.2	15.1
of which multifuel	0	0	0	0	0		
Hard Coal	11.4	9.0	8.2	13.6	9.1	5.4	4.4
Brown Coal	0	0	0	0	0	0	0
Oil	4.2	1.6	1.3	0.4	0.4	0.6	0.6
Natural Gas	1.7	4.4	8.4	11.0	9.2	10.2	10.1
Derived Gas	0	0	0	0	0		

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

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	118.8	45.1	49.9	59.5	51.5	48.7	44.8
of which multifuel	0	0	0	0			
Hard Coal	59.6	29.3	25.8	19.1	13.4	15.5	9.1
Brown Coal	0.6	0.4	0	0			
Oil	45.2	7.2	7.9	8.0	7.6	1.9	4.3
Natural Gas	5.9	2.8	10.9	29.9	30.5	31.3	31.4
Derived Gas	7.6	4.6	3.4	2.4			

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	228.9	233.6	269.8	281.4	252.3	139.4	88.1
of which multifuel	20.0	22.0	30.0				0.7
Hard Coal	203.9	209.1	114.7	102.3	103.1	33.4	34.7
Brown Coal	0	0	0	0		0	0
Oil	22.7	20.5	5.9	4.3	2.8	5.0	0
Natural Gas	0.3	2.0	145.0	167.9	172.5	103.6	53.4
Derived Gas	2.0	2.0	4.2	2.3	2.3	0	0

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	17.9	30.0	45.2	42.9	47.3	43.4	
of which multifuel							
Hard Coal	0	0	0	0	0	0	
Brown Coal	9.0	23.0	30.9	27.4	27.6	22.0	
Oil	8.9	7.1	8.7	5.0	4.8	1.7	
Natural Gas			5.6	10.5	15.0	19.7	
Derived Gas	0	0	0	0	0	0	

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	23.8	14.6	20.8	17.3	16.8	18.5	15.5
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0	1.0	0.8	0.8	0.6	0	0
Brown Coal	12.0	7.8	8.4	4.7	5.3	3.4	2.5
Oil	5.9	1.0	4.5	0.4	0.4	0.4	0.4
Natural Gas	5.9	4.8	7.1	11.4	10.5	14.7	12.6
Derived Gas	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	8.9	12.5	21.3	20.9	20.5	19.8	23.3
of which multifuel	0	1.8	2.6		7.0		
Hard Coal	0.1	5.5	6.4	3.5	3.8	2.3	2.0
Brown Coal	1.5	2.0	1.6	0	0	0	0
Oil	5.3	1.5	4.4	0.3	0.1	0	0
Natural Gas	2.0	3.5	8.9	17.1	7.2	17.5	21.3
Derived Gas	0	0	0	0	0	0	0

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	125.5	167.3	205.9	211.2	207.3		
of which multifuel							
Hard Coal	13.6	29.8	23.8	35.9	40.7		
Brown Coal	0	0	0	0	0		
Oil	100.5	97.4	84.3	22.3	20.7		
Natural Gas	8.7	36.8	93.4	148.3	140.6		
Derived Gas	2.7	3.3	4.3	4.7	5.4		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	10.6	10.2	2.0	3.6	2.8	4.7	5.8
of which multifuel	10.4	9.7	1.7	3.3	2.4	3.0	3.0
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	0.1	0.1	0.3	0.3
Natural Gas	0.3	5.5	1.4	3.5	2.7	4.4	5.5
Derived Gas	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	0.7	0.5	0.4	2.9	2.3	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	2.9	2.3	3.0	3.1
Derived Gas	0.5	0.5	0	0	0	0	0

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	1.5	1.8	1.2	2.9	2.8	3.1	3.4
of which multifuel							
Hard Coal	0	0	0	0	0	1.1	1.0
Brown Coal	0	0	0	0	0		
Oil	0.4	0.2	0.2	0	0		
Natural Gas	1.0	1.6	1.0	2.9	2.8	2.1	2.3
Derived Gas	0	0	0	0	0	0	

MALTA (MT)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED		1.1	1.8	2.1	2.2		
of which multifuel			0	0	0		
Hard Coal			0	0	0		
Brown Coal			0	0	0		
Oil			1.8	2.0	2.0		
Natural Gas		0	0	0	0		
Derived Gas		0	0	0	0		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	55.7	64.4	80.7	100.0	93.5	88.9	73.9
of which multifuel							
Hard Coal	7.0	25.1	29.2	21.9	20.8	34.1	23.6
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	74.9	69.2	50.9	46.4
Derived Gas	2.0	1.9	3.2	3.1	3.4	3.9	3.9

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	110.1	119.8	129.2	133.7	137.2	139.2	141.0
of which multifuel	0	0	0	0	0	0	0
Hard Coal	86.1	71.2	82.9	84.5	84.5	84.6	89.9
Brown Coal	21.9	48.2	45.9	44.7	47.7	48.3	44.5
Oil	2.1	0.4	0	0	0	0.4	0.4
Natural Gas	0	0	0.4	4.5	5.0	5.8	6.2
Derived Gas	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	6.9	18.2	29.5	23.8	26.2	24.7	28.2
of which multifuel	0	0	0	0	0	0	0
Hard Coal	0.6	8.7	13.7	6.6	9.1	4.3	0
Brown Coal	0	0	0	0	0	0	0
Oil	6.3	9.5	9.2	2.4	2.2	0.8	0.5
Natural Gas	0	0	6.6	14.9	14.9	19.5	27.7
Derived Gas	0	0	0	0	0	0	0

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	49.2	46.0	27.4	25.3	30.1	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	18.5	22.0	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	6.8	8.1	8.5	12.7
Derived Gas	0	0	0	0		0	0

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	9.5	3.2	4.5	5.9	4.9	4.8	4.8
of which multifuel							
Hard Coal	0.2	1.0	1.5	0.8	0.6	0	0
Brown Coal	0	0.1	0	0.6		0	0
Oil	9.3	1.2	1.4	1.7	1.5	0.8	0.8
Natural Gas	0	0.3	0.4	2.2	1.7	2.6	2.6
Derived Gas		0.7	1.1	1.2	1.2	1.4	1.4

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	3.8	4.0	4.6	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 (sκ)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	12.1	8.8	8.5	6.0	6.0	14.7	
of which multifuel	0	0	0	0		0	
Hard Coal	4.2	3.6	2.6	3.0	3.0	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	3.0	3.0	10.5	
Derived Gas	0	0	0	0		0	

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	0.8	0.7	1.7	2.2	1.9	2.4	9.0
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030	
FOSSIL FUELED	0	0	0	5.1	4.8	2.0	2.0	
of which multifuel	0	0	0	0		0	0	
Hard Coal	0	0	0			0	0	
Brown Coal	0	0	0	0		0	0	
Oil	0	0	0	0		0	0	
Natural Gas	0	0	0	5.1	4.8	2.0	2.0	
Derived Gas	0	0	0	0		0	0	

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	11.1	31.4	88.3	147.7	160.6		
of which multifuel		2.0	15.1	20.0	20.0		
Hard Coal	0.8	0.5	2.9	15.9	23.7		
Brown Coal	4.7	18.0	32.4	31.9	33.0		
Oil	5.6	3.6	8.7	2.1	0.8		
Natural Gas		9.3	43.5	96.3	101.6		
Derived Gas	0	0	0.8	1.5	1.5		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	5.5	9.7	5.6	7.9	9.6		
of which multifuel	0.0	0.0	0.0	0	0		
Hard Coal	5.5	9.7	5.6	7.9	9.6		
Brown Coal							
Oil	0.0	0.0	0.0	0	0		
Natural Gas							
Derived Gas							

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	2.6	4.3	4.0	4.8	5.1		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
FOSSIL FUELED	14.5	28.2	19.4	23.4	26.9	30.7	34.1
of which multifuel	0.9	0.7	0.0	0.0	0	0	0
Hard Coal	0	0	0	23.2	26.5	0	0
Brown Coal	13.6	25.9	19.1	23.2	26.5	28.1	31.6
Oil	0.9	0.7	0.0	0.0	0		
Natural Gas	0.1	1.6	0.3	0.2	0.4	2.6	2.6
Derived Gas	0	0	0	0	0		

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Fossil fueled				86.0	93.0		
of which multifuel							
Hard Coal							
Brown Coal							
Oil							
Natural Gas							
Derived Gas							

3.2 ELECTRICITY GENERATION

table 3.2.1.4

Annual Renewables Electricity Generation by Country (TWH)

The tables below present the renewables annual electricity generation in the 27 EU Member States plus Switzerland, Norway, Turkey and certain Energy Community members from 1980 to 2011. Estimates for 2020 and 2030 have also been included. Electricity generation is expressed in TWh.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	8	9	13	13	13	18	20
Renewables				35	44	62	73
Hydro							
of which Run of River	21	23	30	28	25	33	36
of which Reservoir							
Wind				2	2	6	9
of which Wind Onshore				2	2	6	9
of which Wind Offshore				0		0	0
Solar				0	0	0	4
of which PV				0	0		
of which CSP							
Geothermal				0	0	0	0
Biogas				0	1	1	1
Biomass				2	4	2	3
Waste				0	0	0	0
Other (Wave/Tidal etc)				0		0	0

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1	1	1	1	1	1	1
Renewables	0	1	2	7	9	23	28
Hydro	0	0	0	0	0	0	1
of which Run of River	0	0	0	0	0	0	1
of which Reservoir							
Wind		0	0	1	2	11	16
of which Wind Onshore			0	1	2	4	6
of which Wind Offshore			0	0	0	7	10
Solar		0	0	1	1	3	4
of which PV				1	1	3	4
of which CSP							
Geothermal		0	0	0	0	0	0
Biogas			0	1	0	1	1
Biomass			0	3	3	5	6
Waste	0	1	1	2	2	3	3
Other (Wave/Tidal etc)							

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	1	1	1	1
Renewables	0	0	0	6	4	81	106
Hydro				5	3	46	45
of which Run of River	0	0	0	0			
of which Reservoir							
Wind	0	0	0	0	1	22	45
of which Wind Onshore	0	0	0	2		5	7
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		9	12
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0	0	3	7
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)							

TABLE 3.2.1.4 Annual Renewables Electricity Generation by Country (TWH)

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0			0	0
RENEWABLES	0	0	0	0	0	0	0
Hydro							
of which Run of River	0	0	0			0	0
of which Reservoir							
Wind	0	0	0	0	0		
of which Wind Onshore	0	0	0				
of which Wind Offshore	0	0	0				
Solar	0	0	0				
of which PV							
of which CSP							
Geothermal	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	2010	2011	2020	2030
Pumped Hydro	1	0	1	1	3	1	1
RENEWABLES	0	0	0	4	3	4	4
Hydro				3			
of which Run of River	1	1	1			1	1
of which Reservoir							
Wind	0	0	0	0	0	2	4
of which Wind Onshore	0	0	0	0	0	2	4
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	1	0	1	1
of which PV				1	2		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1	0	2	2
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
PUMPED HYDRO	1	3	4	6	6	10	11
Renewables	16	21	39	105	124	193	227
Hydro	16	18	25	21	17	21	22
of which Run of River	15	17	24	20	16	20	21
of which Reservoir	1	1	1	1	1	1	1
Wind	0	0	10	38	49	90	116
of which Wind Onshore	0	0	10	38	48	60	64
of which Wind Offshore	0	0	0	0	1	30	52
Solar	0	0	0	12	20	33	37
of which PV	0	0	0	12	20	33	37
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	2	3
Biogas	0	0	0	16	20	27	29
Biomass	0	0	2	11	11	12	13
Waste		2	3	8	8	8	8
Other (Wave/Tidal etc)	0	0	0	0	0	0	0
Annual Renewables Electricity Generation by Country (TWH)

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0		0	0
RENEWABLES	0	0	6	12	15	17	23
Hydro							
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	4	8	10	17	23
of which Wind Onshore	0	0				8	9
of which Wind Offshore	0	0				8	14
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	1	4	4	0	0
Waste	0	0	1	1	1	0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro			0	0		0	
Renewables			0	1		4	
Hydro							
of which Run of River			0	0		0	
of which Reservoir							
Wind			0	0		2	
of which Wind Onshore			0	0		1	
of which Wind Offshore			0	0		1	
Solar			0	0		0	
of which PV							
of which CSP							
Geothermal			0	0		0	
Biogas			0	0		0	
Biomass			0	1		1	
Waste			0	0		0	
Other (Wave/Tidal etc)			0	0		0	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	3	5	3	3	2	5	5
RENEWABLES	28	21	34	98	87	133	178
Hydro	28	21	28	42	30	36	37
of which Run of River	1	0	0	7	5	0	0
of which Reservoir	27	21	28	35	25	36	37
Wind	0	0	5	43	41	76	112
of which Wind Onshore	0	0	5	43	41	76	112
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	7	9	14	20
of which PV	0	0	0	6	7	8	14
of which CSP	0	0	0	1	2	6	6
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	1	1	1	2
Biomass	0	0	0	2	3	3	4
Waste	0	0	1	3	3	3	3
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
RENEWABLES	14	15	23	23	23	34	38
Hydro	10	11	15	13	12	15	15
of which Run of River							
of which Reservoir							
Wind	0	0	0	0	1	6	9
of which Wind Onshore	0	0	0	0	1	6	9
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	0	0			
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	3	4	8	10	10	13	13
Waste			0	0	0	1	1
Other (Wave/Tidal etc)			0	0	0	0	0

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1	4	5	68	6	5	5
Renewables	1	1	3	15	65	113	162
Hydro					45	62	62
of which Run of River	42	32	37	33	34		
of which Reservoir					11		
Wind	0	0	0	10	12	31	58
of which Wind Onshore	0	0		10	12		
of which Wind Offshore	0	0		0			
Solar	0	0	0	1	2	9	22
of which PV				1	2	9	22
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	1	1		
Biomass	0	0	0	1	1	10	16
Waste	0	0	2	3	3		
Other (Wave/Tidal etc)	1	1	1	0		1	4

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1	2	3	3	3	3	3
Renewables	0	1	5	25	33	118	203
Hydro				4	6	9	
of which Run of River	0	0	0	4	6	9	0
of which Reservoir							
Wind	0	0	1	10	16	67	163
of which Wind Onshore	0	0		7	10		52
of which Wind Offshore	0	0	0	3			112
Solar	0	0	0	0	0	5	6
of which PV				0	0	5	
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	1	2	5	6		
Biomass	0	0	1	5	5	37	33
Waste	0	0	1	2			
Other (Wave/Tidal etc)	0	0	0	0		0	0

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

GREECE (GR)

	1090	1000	2000	2010	2011	2020	2020
	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	1	0	0	0	
RENEWABLES	0	0	1	11	8	19	
Hydro				7	4	5	
of which Run of River	0	0	0	1	1	1	
of which Reservoir				7	3	4	
Wind	0	0	0	3	3	8	
of which Wind Onshore	0	0	0	3	3	7	
of which Wind Offshore	0	0	0	0	0	0	
Solar	0	0	0	0	1	5	
of which PV				0	1	4	
of which CSP						1	
Geothermal	0	0	0	0	0	1	
Biogas	0	0	0	0	0	1	
Biomass						0	
Waste	0	0	0	0	0	0	
Other (Wave/Tidal etc)							

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	3
RENEWABLES	0	0	0	2	2	5	5
Hydro				0	0	0	0
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	0	0	0	0	0	0	0
Wind	0	0	0	1	1	2	2
of which Wind Onshore	0	0	0	1	1	2	2
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	1	1
Biomass	0	0	0	2	1	3	3
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	1	0	0
Renewables			0	2	3	6	7
Hydro					1		
of which Run of River				0	1	0	0
of which Reservoir					0		
Wind			0	2	3	6	6
of which Wind Onshore			0	0	3	6	6
of which Wind Offshore				0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV					0		
of which CSP					0		
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	1	1
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

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	2	3	7	3	2		
RENEWABLES	48	34	50	76	82		
Hydro	45	31	44	51	45		
of which Run of River	18	12	16	22	20		
of which Reservoir	27	20	28	29	26		
Wind	0	0	1	9	10		
of which Wind Onshore	0	0	1	9	10		
of which Wind Offshore	0	0	0	0	0		
Solar	0	0	0	2	11		
of which PV	0	0	0	2	11		
of which CSP	0	0	0	0	0		
Geothermal	3	3	4	5	5		
Biogas	0	0	1	2	3		
Biomass	0	0	1	5	5		
Waste	0	0	0	2	2		
Other (Wave/Tidal etc)	0	0	0	0	0		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
PUMPED HYDRO	0	0	0	1	1	1	1
RENEWABLES	0	0	0	1	1	3	3
Hydro				1	1	1	1
of which Run of River	0	0	0	1	1	1	1
of which Reservoir				0	0	0	0
Wind	0	0	0	0	1	2	2
of which Wind Onshore	0	0	0	0	1	2	2
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	0	0
of which PV	0	0	0	0	0	0	0
of which CSP	0	0	0	0	0	0	0
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	1	1
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	1	1	1	1	1	1
RENEWABLES	0	0	0	0	0	0	0
Hydro							
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	0	0	0	0
of which Wind Onshore	0	0	0	0		0	0
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		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)

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
PUMPED HYDRO	0	0	0	0	0	0	
Renewables	3	5	3	4	3	5	5
Hydro	3	5	3	3	3	3	3
of which Run of River	3	5	3	3		3	3
of which Reservoir							
Wind	0	0	0	0	0	1	1
of which Wind Onshore	0	0	0	0	0	1	1
of which Wind Offshore	0	0	0	0	0	1	1
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP							
Geothermal	0	0	0	0	0		
Biogas	0	0	0	0	0	0	0
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

• **МАLТА** (мт)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro		0	0	0	0		
Renewables		0	0	0	0		
Hydro		0	0	0	0		
of which Run of River		0	0	0	0		
of which Reservoir		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		
Solar		0	0	0	0		
of which PV		0	0	0	0		
of which CSP		0	0	0	0		
Geothermal		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	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables		1	1	10	11	30	37
Hydro				0	0	0	0
of which Run of River	0	0	0	0	0	0	0
of which Reservoir				0	0	0	0
Wind			1	4	5	17	22
of which Wind Onshore			1	3	4	8	13
of which Wind Offshore			0	1	1	9	9
Solar			0	0	0	4	6
of which PV				0	0	4	6
of which CSP				0	0	0	0
Geothermal							
Biogas			0	1	1	2	3
Biomass			0	4	4	4	5
Waste			0	1	1	2	2
Other (Wave/Tidal etc)			0	0	0	0	0

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1	2	2	2	1	1	1
RENEWABLES	0	0	0	11	12	23	27
Hydro				4	3	3	3
of which Run of River	1	1	1	1	1	1	1
of which Reservoir				1	1	1	1
Wind	0	0	0	2	3	16	20
of which Wind Onshore	0	0	0	2	3	13	13
of which Wind Offshore	0	0	0	0	0	3	7
Solar	0	0	0	0	0	0	0
of which PV				0	0	0	0
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	5	6	4	5
Waste	0	0	0	0	0	0	0
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0.1	0.5	1.2	2.4	1.6		
Renewables	8	9	12	27	23	28	32
Hydro	8	9	10	14	10	11	12
of which Run of River	6	6	7	10	8	8	8
of which Reservoir	2	2	3	4	3	4	3
Wind	0	0	0	9	9	11	13
of which Wind Onshore	0	0	0	9	9	11	13
of which Wind Offshore	0	0	0	0	0	0	0
Solar	0	0	0	0	0	1	2
of which PV	0	0	0	0	0	1	2
of which CSP	0	0	0	0	0	0	1
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
Biomass	0	0	0	1	1	2	2
Waste	0	0	1	2	3	3	3
Other (Wave/Tidal etc)	0	0	0	0	0	0	0

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables	0	0	0	21	16	6	9
Hydro				20	15		
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	0	1	6	8
of which Wind Onshore	0	0	0	0		6	8
of which Wind Offshore	0	0	0	0		0	0
Solar	0	0	0	0		0	0
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	0
Biogas	0	0	0	0		0	0
Biomass	0	0	0	0		0	1
Waste	0	0	0	0		0	0
Other (Wave/Tidal etc)	0	0	0	0		0	0

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0	0	0
Renewables	59	73	82	83	84	96	106
Hydro	58	71	78	67	67	68	69
of which Run of River	0	0	0	0	0	0	0
of which Reservoir	58	71	78	67	67	68	69
Wind	0	0	1	4	6	13	21
of which Wind Onshore							
of which Wind Offshore							
Solar	0	0	0	0	0	0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0		
Biomass	0	1	2	7	6	10	10
Waste	0	1	2	6	5	6	6
Other (Wave/Tidal etc)	0	0	0	0	0		

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
PUMPED HYDRO	0	0	0				
Renewables	0	0	0	0		1	2
Hydro							
of which Run of River	0	0	0				
of which Reservoir							
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	
Solar	0	0	0	0		0	
of which PV							
of which CSP							
Geothermal	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 (sκ)

	1980	1990	2000	2010	2011	2020	2030
PUMPED HYDRO	0	0	0	0	0	0	
Renewables	0	0	0	6	5	1	
Hydro				5	4		
of which Run of River							
of which Reservoir							
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	
Solar	0	0	0	0		0	
of which PV				0	0		
of which CSP							
Geothermal	0	0	0	0		0	
Biogas	0	0	0	0		0	
Biomass	0	0	0	0		1	
Waste	0	0	0	0		0	
Other (Wave/Tidal etc)	0	0	0	0		0	

TABLE 3.2.1.4 Annual Renewables

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

+ SWITZERLAND (сн)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	2	2	2	2	2		
Renewables	32	29	37	36	33	37	41
Hydro	32	29	36	35	31	35	36
of which Run of River	15	14	18	16	15	17	17
of which Reservoir	17	15	18	19	17	19	19
Wind		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	0
Solar		0	0	0	0	0	1
of which PV							
of which CSP							
Geothermal		0	0	0	0		
Biogas		0	0	0	0		
Biomass		0	0	0	0		
Waste		0	1	1	1		
Other (Wave/Tidal etc)		0	0	0	0	0	0

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	1	2	2	1	2	3	3
Renewables	83	121	142	119	123	138	143
Hydro	83	120	141	118	122	132	135
of which Run of River	0	0	0	0		0	0
of which Reservoir							
Wind	0	0	0	1	1	6	8
of which Wind Onshore	0	0	0	1	1	6	7
of which Wind Offshore	0	0	0	0		0	1
Solar	0	0	0	0		0	0
of which PV							
of which CSP							
Geothermal	0	0	0	0	0	0	0
Biogas	0	0	0	0	0	0	0
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

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	0	0	0	0		
Renewables	11	23	30	55	57		
Hydro	11	23	30	51	51		
of which Run of River	0	1	1	7	10		
of which Reservoir	10	22	30	45	42		
Wind	0	0	0	3	5		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV				0	0		
of which CSP							
Geothermal		0	0	1	1		
Biogas			0	0	0		
Biomass							
Waste	0		0	0	0		
Other (Wave/Tidal etc)							

table 3.2.1.4

ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro							
Renewables	0	0	0	8	4		
Hydro							
of which Run of River	0	0	0	0	0		
of which Reservoir							
Wind	0	0	0	0	0		
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro				0	0		
Renewables	0	0	0	0		0	
Hydro							
of which Run of River							
of which Reservoir							
Wind	0	0	0	0			
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro	0	1	1	1	1	1	1
Renewables	11	8	10	12	9	12	13
Hydro	11	8	10	12	9	11	11
of which Run of River	10	7	9	11	8	10	10
of which Reservoir	1	1	1	2	1	1	1
Wind	0	0	0	0	0	1	2
of which Wind Onshore						1	2
of which Wind Offshore							
Solar	0	0	0	0	0		
of which PV				0	0		
of which CSP							
Geothermal	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 3.2.1.4 Annual Renewables Electricity Generation by Country (TWH)

UKRAINE (UA)							
	1980	1990	2000	2010	2011	2020	2030
Pumped Hydro							
RENEWABLES				13	11		
Hydro							
of which Run of River							
of which Reservoir							
Wind							
of which Wind Onshore							
of which Wind Offshore							
Solar							
of which PV							
of which CSP							
Geothermal							
Biogas							
Biomass							
Waste							
Other (Wave/Tidal etc)							

3.2 ELECTRICITY GENERATION

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, Turkey and certain Energy Community countries.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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	41	37	51	56
Non-fuel Renewables	0	0	0	5	7	11	17
New Technologies (e.g. Fuel Cells)	0	0	0				
Not Specified	12	17	17				
Total	41	49	60	67	63	79	90

BELGIUM (be)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	12	43	48	46	46	32	0
Steam Thermal Units		25	17	15	12		
Gas Turbine Units		1	5	8	6		
Combined Cycle Units		0	11	18	16		
Internal Combustion Units		0	1	1	3		
Hydro	1	1	2	2	1	2	2
Non-fuel Renewables	0	0	0	2	3	14	17
New Technologies (e.g. Fuel Cells)							
Not Specified	38	1	0	0	0	47	82
Total	51	71	84	92	87	95	101

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	6	14	17	14	15	15	21
Steam Thermal Units	22	22	17	20	22	33	35
Gas Turbine Units	0	0	0	2	2	2	2
Combined Cycle Units	0	0	0	0			
Internal Combustion Units	0	0	0	0		0	0
Hydro	4	2	3	6	5	5	5
Non-fuel Renewables	0	0	0	1	23	3	3
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0	0		0	0
Total	31	38	37	42	46	57	65

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

CYPRUS (CY)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	1	2	3	5	4	1	2
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	0	0	7	10
Internal Combustion Units	0	0	0	0	1	0	0
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	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	5	9	12

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	12	13	26	27	26	35
Steam Thermal Units	44	44	50	50	45	51	40
Gas Turbine Units	0	0	0	2	0	3	3
Combined Cycle Units	0	0	0	2	4	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	1	3	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	86	81	90	93

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	41	139	161	133	102	59	0
Steam Thermal Units			296	286	284	227	145
Gas Turbine Units			6	9	9	10	15
Combined Cycle Units			37	78	75	67	57
Internal Combustion Units			1	13	16	21	23
Hydro	17	21	29	27	23	31	33
Non-fuel Renewables	0	0	10	49	68	125	156
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	347	423	539	595	577	539	429

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear			0	0		0	
Steam Thermal Units			8			9	
Gas Turbine Units			0			1	
Combined Cycle Units			0			0	
Internal Combustion Units			0			0	
Hydro			0	0		0	
Non-fuel Renewables			0			2	
New Technologies (e.g. Fuel Cells)			0			0	
Not Specified			0			2	
Total			8	12	12	14	

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	5	52	60	60	55	58	77
Steam Thermal Units	66	61	110	44	62	76	70
Gas Turbine Units	3	3	1	3	3	1	2
Combined Cycle Units	0	0	0	64	51	75	73
Internal Combustion Units	1	5	7	27	27	14	18
Hydro	30	26	31	45	32	41	42
Non-fuel Renewables	0	0	5	50	50	90	132
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	105	147	216	292	280	355	414

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	7	18	22	22	22	36	58
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	10	11	15	13	12	15	15
Non-fuel Renewables	0	0	0	0	1	6	9
New Technologies (e.g. Fuel Cells)	0	0	0				
Not Specified	22	23	31	42	35	35	32
Total	39	52	67	77	70	92	115

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	58	298	395	408	421	420	375
Steam Thermal Units	119	45	50	60	52	31	30
Gas Turbine Units						2	4
Combined Cycle Units						24	24
Internal Combustion Units						2	2
Hydro	70	57	72	68	50	68	68
Non-fuel Renewables				15	20	41	85
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	247	400	517	550	543	587	588

UNITED KINGDOM (UK)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	32	59	78	56	63	57	74
Steam Thermal Units	229	234	145	117	124	59	68
Gas Turbine Units	0	0	0			0	0
Combined Cycle Units	0	0	126	168	140	115	53
Internal Combustion Units	0	1	2	0			
Hydro	5	7	8	3	3	11	10
Non-fuel Renewables	0	0	1	12	18	85	170
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	266	300	361	361	347	329	375

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	17	29	39	30	29	23	
Gas Turbine Units	1	1	1	0	0	0	
Combined Cycle Units	0	0	4	10	15	20	
Internal Combustion Units	1	1	2	3	3	1	
Hydro	3	2	4	8	4	5	
Non-fuel Renewables	0	0	0	3	4	14	
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	
Not Specified	0	0	0	0	0	0	
Total	21	32	50	54	56	63	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	14	14	15	15	14	22
Steam Thermal Units	24	15	17	12	9	5	4
Gas Turbine Units	0	0	1	1	1	1	1
Combined Cycle Units	0	0	3	6	6	14	12
Internal Combustion Units	0	0	0	2	2	3	3
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	0	0	1	1	2	2
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	36	34	38	43

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	2	4	5	8
Gas Turbine Units	1	1	4	15	7	11	12
Combined Cycle Units	0	0	0	0	7	0	0
Internal Combustion Units	1	1	1	0	0	1	1
Hydro	8	12	17	1	1	3	3
Non-fuel Renewables	0	0	0	2	4	6	7
New Technologies (e.g. Fuel Cells)				0	0	0	0
Not Specified	0	0	0	0	1	1	1
Total	10	14	23	26	24	27	31

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	2	0	0	0	0		
Steam Thermal Units	124	164	145	54	58		
Gas Turbine Units	1	2	17	4	4		
Combined Cycle Units	0	1	43	154	146		
Internal Combustion Units	0	1	3	8	10		
Hydro	47	35	50	54	47		
Non-fuel Renewables	3	3	5	16	26		
New Technologies (e.g. Fuel Cells)	0	0	0	0	0		
Not Specified	0	0	1	1	1		
Total	177	205	263	291	291		

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	16	7	0	0	0	10
Steam Thermal Units	11	10	2	4	3	5	5
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	0	0	1	3
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	0	0	1	1	1	1	1
Non-fuel Renewables	0	0	0	0	1	2	2
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	5	5	9	20

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	0	0	0	0		0	0
Gas Turbine Units	1	1	0	0		0	0
Combined Cycle Units	0	0	0	3		3	3
Internal Combustion Units	0	0	0	0		0	0
Hydro	0	1	1	1	1	2	2
Non-fuel Renewables	0	0	0	0		0	0
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	1	1	1	4		4	4

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	
Steam Thermal Units	2	2	1	1	1	1	1
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	2	1	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	1	1	2
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	
Not Specified	0	0	0	0	0	0	
Total	5	6	4	6	6	8	8

• **МАLTА** (мт)

	1980	1990	2000	2010	2011	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		

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	4	3	4	4	4	4	25
Steam Thermal Units	38	19	33	31	26	28	23
Gas Turbine Units	1	1	6	6	5	5	5
Combined Cycle Units	17	44	36	51	50	44	35
Internal Combustion Units	0	0	5	13	12	12	11
Hydro	0	0	0	0	0	0	0
Non-fuel Renewables	0	1	2	10	11	30	37
New Technologies (e.g. Fuel Cells)							
Not Specified	0	0	0	0	0	0	0
Total	60	69	86	114	109	123	137

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	18
Steam Thermal Units	110	120	129	129	132	133	135
Gas Turbine Units	0	0	0	0	0	0	0
Combined Cycle Units	0	0	0	5	5	6	6
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	3	3	4	4	3	3	3
Non-fuel Renewables	0	0	0	2	3	16	20
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	5	6	4	5
Total	113	123	133	144	149	162	187

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	6	17	21	12	15	12	8
Gas Turbine Units	0	0	0	1	1	1	1
Combined Cycle Units	0	0	6	11	10	13	20
Internal Combustion Units	1	1	3	4	4	4	4
Hydro	8	9	12	16	12	14	14
Non-fuel Renewables	0	0	0	10	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	53	51	56	63

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	5	11	11	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

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	25	65	55	56	58	75	53
Steam Thermal Units	10	5	9	19		21	21
Gas Turbine Units	0	0	0	0		0	0
Combined Cycle Units	0	0	0	0		0	0
Internal Combustion Units	0	0	0	0		0	0
Hydro	58	71	78	67	66	68	69
Non-fuel Renewables	0	0	0	4		13	21
New Technologies (e.g. Fuel Cells)	0	0	0	0		0	0
Not Specified	0	0	0	0		0	0
Total	93	142	142	145		177	164

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	4	5	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	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 (sκ)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	4	11	15	14	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	6	4	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	

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	14	22	25	25	26	22	9
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	34	31	38	38	34		
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	48	54	65	66	63	61	59

Annual Electricity Generation by Technology (TWH)

NORWAY (NO)

	1980	1990	2000	2010	2011	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	2	2	1	1
Combined Cycle Units	0	0	0	3	3	1	1
Internal Combustion Units	0	0	0	0	0	0	0
Hydro	83	120	141	118	122	132	135
Non-fuel Renewables	0	0	0	1	1	6	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	124	128	140	145

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units			42	43	51		
Gas Turbine Units			2	9	11		
Combined Cycle Units			43	91	93		
Internal Combustion Units			1	5	5		
Hydro	11	23	30	51	51		
Non-fuel Renewables		0	0	4	5		
New Technologies (e.g. Fuel Cells)							
Not Specified	11	31		0	0		
Total	22	54	119	203	218		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0		
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units	0	0	0				
Internal Combustion Units	4	3	5				
Hydro	4	3	5	8			
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total	10	13	10				

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0		0	
Steam Thermal Units							
Gas Turbine Units							
Combined Cycle Units							
Internal Combustion Units							
Hydro	6	4	6	8	5	6	
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)							
Not Specified							
Total			11	16		20	

3.2 ELECTRICITY GENERATION

TABLE 3.2.2

ANNUAL ELECTRICITY GENERATION BY TECHNOLOGY (TWH)

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Nuclear	0	0	0	0	0	0	0
Steam Thermal Units	11	24	18	21	24	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	12	9	12	13
Non-fuel Renewables	0	0	0	0	0	1	2
New Technologies (e.g. Fuel Cells)	0	0	0	0	0	0	0
Not Specified	0	0	0	0	0	0	0
Total	25	37	30	36	36	44	49

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Nuclear				89	90		
Steam Thermal Units				86	93		
Gas Turbine Units				0	0		
Combined Cycle Units				0	0		
Internal Combustion Units				0	0		
Hydro							
Non-fuel Renewables							
New Technologies (e.g. Fuel Cells)				0	0		
Not Specified				13	11		
Total				188	194		

3.2 ELECTRICITY GENERATION

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 certain Energy Community members. Generation is expressed in TWh, and differentiated by primary energy. The table present both historical data (from 1980 to 2011) and estimates for 2020 and 2030.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Multifuels							
Hard Coal		6.6	0.1	0.3	0.2	0.2	
Oil		0.5	0.4	0.3	0.2	0.2	
Natural Gas		0.3	4.7	12.0	11.7	16.3	
Renewables		0	0.5	1.8	2.1	5.5	
Other Non-Renewables		0	0	0	0		
Total		7.3	5.7	14.4	14.1	22.2	

BULGARIA (bg)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0		0	0
Hard Coal	0.8	0.7	0.6	2.5	2.1	2.5	2.5
Oil	2.5	2.1	1.2	0.0	0.0	0.0	0.0
Natural Gas	2.5	2.0	1.6	1.7	1.7	2.7	2.7
Renewables	0	0	0	0	0.0	0.2	0.2
Other Non-Renewables	0	0	0	0		0	0
Total	5.8	4.8	3.4	4.2	3.8	5.4	5.4

🛫 CYPRUS (cy)

	1980	1990	2000	2010	2011	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 3.2.3 CHP Generation (TWH)

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	11.0	15.0	17.0	7.6	6.4	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	8.7	7.5	20.0	20.0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels							
Hard Coal				20.8	19.3		
Oil				2.2	1.9		
Natural Gas				54.6	56.5		
Renewables				11.8	12.7		
Other Non-Renewables				3.9	3.5		
Total	38.0	60.0	64.5	93.3	90.9	115.0	125.0

DENMARK (DK)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Multifuels			0.4			0.3	
Hard Coal			0			0	
Oil			0			0	
Natural Gas			0.2			0.2	
Renewables			0.0			1.5	
Other Non-Renewables			0.5			0	
Total			1.2			2.0	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	0	0	1.0	0.1	0.1	0	0
Oil	0	2.0	7.0	2.7	2.5	7.0	8.0
Natural Gas	1.0	1.0	18.0	25.6	25.2	36.0	40.0
Renewables	0	0	0	0	0	0	0
Other Non-Renewables	0	0	0	0	0	0	0
Total	1.0	3.0	26.0	28.3	27.8	43.0	48.0

CHP GENERATION (TWH)

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			0	0	0	0	0
Hard Coal			4.0	4.3	4.0	3.5	3.0
Oil			1.2	0.3	0.3	0.4	0.4
Natural Gas			8.0	10.8	9.0	9.7	10.0
Renewables			8.8	8.8	8.7	10.0	10.6
Other Non-Renewables				0.5	0.5		
Total	10.8	16.1	24.5	28.1	25.5	26.9	26.8

FRANCE (FR)

	1980	1990	2000	2010	2011	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 (υκ)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0		0	0
Hard Coal	2.9	2.3	0.6	1.5	1.6	0.4	0.3
Oil	4.1	3.9	1.5	0.7	0.5	0.2	0.2
Natural Gas	0.2	1.3	19.0	43.2	35.0	21.0	21.9
Renewables	0	0	0.5	3.4	3.6	3.3	6.2
Other Non-Renewables	1.8	2.8	3.7	9.7	6.1		
Total	9.0	10.3	25.3	58.5	46.9	24.9	28.6

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0.1		0.1	
Hard Coal	0	0	0.1	0.1		0.1	
Oil	0.6	0.7	0.7	0.7		0.7	
Natural Gas	0	0.1	0.1	1.2		1.2	
Renewables	0	0	0	0		0.2	
Other Non-Renewables	0	0	0	0		0	
Total	0.6	0.8	1.0	2.1		2.3	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			0.6	0	0	0	0
Hard Coal			0.8	0.1	0.1	0	0
Oil			0	0	0	0	0
Natural Gas			1.0	6.0	5.2	3.0	3.0
Renewables			0	0.4	0.1	1.5	1.5
Other Non-Renewables			0.1	0.1	0	0	0
Total	2.3	2.0	2.5	6.6	5.4	4.5	4.5

TABLE 3.2.3 CHP Generation (TWH)

IRELAND (IE)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Multifuels							
Hard Coal							
Oil							
Natural Gas							
Renewables							
Other Non-Renewables							
Total	19.7	15.8	57.9	108.3	98.5		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	1.1	2.5	1.1	1.5	1.3	3.6	3.6
Hard Coal	0	0	0	0	0	0	0
Oil	0.2	0.5	0.3	0.1	0.1	0.3	0.3
Natural Gas	0	0	0	0.2	0.2	0.3	0.3
Renewables	0	0	0	0.2	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	1.9	5.5	5.5

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	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	3.0	2.1	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	3.0	2.1	3.0	3.1

LATVIA (LV)

	1980	1990	2000	2010	2011	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	2.8	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	2.8	2.8	2.3	2.7

CHP GENERATION (TWH)

MALTA (MT)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Multifuels							
Hard Coal		4.8	6.5	5.1	3.8	6.7	3.4
Oil			0	0	0	0	0
Natural Gas		19.3	41.5	54.2	52.1	60.7	63.8
Renewables		0	0	1.8	2.1	2.7	3.0
Other Non-Renewables		0	1.0	0.6	0.6	0	0
Total	16.0	24.1	49.0	61.8	58.6	70.2	70.2

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	26.9	26.0	28.1	24.8	23.4	25.3	32.4
Oil	0	0	0	0	0	0	0
Natural Gas	0	0	0.4	5.0	5.2	5.7	6.1
Renewables	0	0	0	0.2	0.2	0.3	0.3
Other Non-Renewables	0	0	0	0	0	0	0
Total	26.9	26.0	28.5	30.0	28.8	31.3	38.8

PORTUGAL (PT)

	1980	1990	2000	2010	2011	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	1.0	0.9	0	0
Natural Gas	0	0	0.7	4.2	4.6	6.7	7.7
Renewables	0	0	0.4	2.0	2.1	2.1	2.4
Other Non-Renewables	0	0	0	0	0	0	0
Total	1.2	1.6	4.9	7.1	7.6	8.8	10.0

ROMANIA (RO)

	1980	1990	2000	2010	2011	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

CHP GENERATION (TWH)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0		0	0
Hard Coal	0.2	1.1	1.5	0.8		0	0
Oil	8.3	1.1	1.4	1.2		0.6	0.6
Natural Gas	0	0.3	0.4	2.2		2.6	2.6
Renewables	0.6	1.7	3.8	11.5		16.0	16.3
Other Non-Renewables	0.0	0.6	1.4	2.3		1.4	1.4
Total	9.1	4.8	8.5	17.9		20.6	20.9

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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 (sκ)

	1980	1990	2000	2010	2011	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	

NORWAY (NO)

	1980	1990	2000	2010	2011	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	2.9	2.8	1.0	1.0
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	2.9	2.8	1.0	1.0

C. TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Multifuels			2.0	3.2	3.8		
Hard Coal			0.4	0.2	0.2		
Oil			0.9	0.1	0.1		
Natural Gas			1.5	3.9	4.5		
Renewables			0	0	0		
Other Non-Renewables			0	0.1	0.1		
Total	0	0	4.8	7.5	8.7		

3 CHP GENERATION (TWH)

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Multifuels	0	0	0	0	0	0	0
Hard Coal	2.4	1.9	1.2	2.4	2.5	2.1	0
Oil	0	0	0	0	0	0	0
Natural Gas	0.1	1.6	0.3	0.2	0.4	2.6	2.6
Renewables	0	0	0	0	0		
Other Non-Renewables	0	0	0	0	0		
Total	2.5	3.5	1.4	2.6	2.9	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 certain Energy Community countries. Gathered data show both historical information (from 1980 to 2011) 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	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	23.7	25.1	29.2	32.9	34.1	35.0	34.3
2. Non Energy Uses and Bunkers	2.2	2.2	2.6	2.6	2.7	2.7	2.6
3. PRIMARY ENERGY FOR ENERGY USES	21.4	22.9	26.6	30.2	31.4	32.3	31.7
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	5.5	6.8	7.7	8.9	8.4	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	25.6	26.0	27.4	26.8
of which 6.a Agriculture	0.7	0.6	0.6	0.6	0.5	0.5	0.5
6.b Industry	5.4	5.2	6.1	7.3	7.5	8.1	8.1
6.c Transport	4.0	5.0	7.1	8.6	8.6	9.2	9.1
6.d Services	1.8	1.8	2.3	2.7	3.2	2.8	2.8
6.e Households	5.0	5.8	6.5	6.4	6.2	6.8	6.6

TOTAL ENERGY USE (MTOE)

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	49.3	48.7	59.2	61.5	59.7	57.9	52.3
2. Non Energy Uses and Bunkers	6.3	3.1	6.7	7.5	7.6	7.0	6.0
3. PRIMARY ENERGY FOR ENERGY USES	43.0	45.6	52.5	54.0	52.0	50.9	46.3
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	11.4	11.4	14.9	14.6	13.0	13.7	12.5
of which 4.a Primary Electricity	2.3	2.3	8.7	7.9	7.3		
4.b Thermal Power Generation	9.1	9.1	6.2	6.0	5.8		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	11.2	2.3	2.3	3.2	2.7	2.8	2.5
6. FINAL ENERGY CONSUMPTION	31.8	34.2	44.4	44.3	38.9	38.9	36.2
of which 6.a Agriculture	0.5	0.4	0.6	0.8	0.8	0.4	0.3
6.b Industry	12.8	15.1	21.4	19.3	13.3	13.6	12.9
6.c Transport	5.9	7.7	9.6	10.3	10.7	9.8	9.1
6.d Services	3.0	2.8	3.4	5.0	4.4	5.3	5.0
6.e Households	9.6	8.2	9.4	8.9	7.4	10.1	9.2

BULGARIA (bg)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		1.6	2.4	5.2			
2. Non Energy Uses and Bunkers		0.1	0.3	0.3			
3. PRIMARY ENERGY FOR ENERGY USES		1.5	2.1	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			

TOTAL ENERGY USE (MTOE)

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	50.5	49.7	40.2	45.5	45.6	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	44.9	44.9	44.0	44.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	13.8	15.2	17.0	16.9	16.9	17.9	18.5
of which 4.a Primary Electricity	0.5	3.1	3.5	6.1	6.1	6.7	6.8
4.b Thermal Power Generation	13.3	12.1	13.5	14.0	14.1	11.2	11.7
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	18.6	18.4	15.3	16.9	16.9	15.0	15.2
6. FINAL ENERGY CONSUMPTION	31.9	31.3	24.4	28.8	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	12.9	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	6.4	6.1	6.3

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	274.5	350.0	344.0	339.6	324.8	287.0	235.0
2. Non Energy Uses and Bunkers	19.2	22.5	27.7	31.1	30.0	23.0	19.0
3. PRIMARY ENERGY FOR ENERGY USES	255.3	327.5	316.3	308.5	294.8	264.0	216.0
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	89.2	138.7	127.4	130.9	123.2	110.0	80.0
of which 4.a Primary Electricity	19.7	40.8	47.7	51.2	45.0	47.0	40.0
4.b Thermal Power Generation	69.5	97.9	79.7	79.7	78.2	63.0	40.0
5. Consumption and Losses in the Energy Sector	74.6	104.9	95.8	83.2	79.7	72.0	49.0
6. FINAL ENERGY CONSUMPTION	180.7	222.6	220.5	225.3	215.1	192.0	167.0
of which 6.a Agriculture	3.0	3.2	3.0	3.0	3.0	3.0	2.0
6.b Industry	61.9	69.9	57.8	61.9	62.9	54.0	48.0
6.c Transport	40.0	55.8	65.7	61.1	61.3	58.0	51.0
6.d Services	27.4	37.9	32.3	35.4	32.2	24.0	20.0
6.e Households	48.4	55.8	61.7	63.9	55.7	53.0	46.0

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	19.8	18.0	19.5	20.2	18.9	18.1	18.7
2. Non Energy Uses and Bunkers	0.4	0.3	0.3	0.3	0.3	0.3	0.3
3. PRIMARY ENERGY FOR ENERGY USES	19.4	17.7	19.2	19.9	18.6	17.8	18.4
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	6.2	5.4	6.6	6.8	5.9		
of which 4.a Primary Electricity	0	0.1	0.4	0.7	0.8	2.2	2.6
4.b Thermal Power Generation	6.2	5.4	6.2	6.1	51.0		
5. Consumption and Losses in the Energy Sector	5.0	4.1	4.4	4.5	3.8		
6. FINAL ENERGY CONSUMPTION	14.3	13.5	14.8	15.5	14.8	15.1	15.5
of which 6.a Agriculture	0.9	1.0	1.0	0.9	0.8	0.8	0.8
6.b Industry	3.1	2.7	3.0	2.4	2.4	2.4	2.4
6.c Transport	3.4	4.1	4.8	5.0	5.0	5.5	5.8
6.d Services	1.9	1.7	1.8	2.1	2.0	1.9	1.9
6.e Households	5.0	4.0	4.2	5.1	4.5	4.2	4.3

TOTAL ENERGY USE (MTOE)

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS			4.6				
2. Non Energy Uses and Bunkers			1.5				
3. PRIMARY ENERGY FOR ENERGY USES			3.2				
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION			2.1				
of which 4.a Primary Electricity							
4.b Thermal Power Generation							
5. Consumption and Losses in the Energy Sector			0.9				
6. FINAL ENERGY CONSUMPTION			2.3				
of which 6.a Agriculture			0.1				
6.b Industry			0.5				
6.c Transport			0.2				
6.d Services			0.3				
6.e Households			1.2				

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	73.0	92.0	130.0	130.1	129.3	165.0	183.0
2. Non Energy Uses and Bunkers	4.0	6.0	10.0	7.1	7.0	21.0	23.0
3. PRIMARY ENERGY FOR ENERGY USES	70.0	85.0	120.0	123.0	122.3	143.0	160.0
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	25.0	34.0	47.0	49.9	51.5	69.0	81.0
of which 4.a Primary Electricity	8.0	17.0	22.0	9.1	8.5	43.0	57.0
4.b Thermal Power Generation	18.0	17.0	25.0	40.7	43.3	26.0	24.0
5. Consumption and Losses in the Energy Sector	21.0	28.0	35.0	34.2	36.3	41.0	44.0
6. FINAL ENERGY CONSUMPTION	49.0	58.0	85.0	88.8	86.1	102.0	116.0
of which 6.a Agriculture	2.0	2.0	3.0	2.2	2.1	2.0	2.0
6.b Industry	23.0	22.0	30.0	21.5	21.1	29.0	34.0
6.c Transport	16.0	23.0	34.0	36.9	35.7	43.0	51.0
6.d Services	2.0	3.0	7.0	11.3	11.0	11.0	11.0
6.e Households	5.0	7.0	12.0	16.9	16.2	17.0	19.0

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	23.1	27.8	33.4	37.6	36.2	37.0	
2. Non Energy Uses and Bunkers	0.9	1.1	1.3	1.7	2.4		
3. PRIMARY ENERGY FOR ENERGY USES	22.2	26.7	32.2	35.9	33.8		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	6.7	9.0	11.3	13.0	12.0		
of which 4.a Primary Electricity	2.6	5.6	6.9	6.8	6.9		
4.b Thermal Power Generation	4.1	3.4	4.4	6.2	5.1		
5. Consumption and Losses in the Energy Sector	4.4	5.5	7.4	8.7	8.0		
6. FINAL ENERGY CONSUMPTION	17.7	21.2	24.8	27.2	25.8	26.7	24.5
of which 6.a Agriculture	0.8	0.9	0.8	0.9	0.7		
6.b Industry	8.2	9.6	12.5	12.3	11.9		
6.c Transport	2.8	4.0	4.3	4.9	5.1		
6.d Services	1.6	2.4	2.7	3.1	2.8		
6.e Households	4.3	4.3	4.5	6.0	5.3		

TOTAL ENERGY USE (MTOE)

FRANCE (FR)

	1980	1990	2000	2010	2011	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 (υκ)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	214.5	227.6	247.1	227.0	211.0	206.7	219.2
2. Non Energy Uses and Bunkers	10.0	13.9	14.5	9.0	8.0	9.0	9.0
3. PRIMARY ENERGY FOR ENERGY USES	204.5	213.7	232.6	218.0	202.0	197.7	210.2
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	68.4	78.2	84.6	71.2	61.0	51.9	49.2
of which 4.a Primary Electricity	9.2	18.6	23.7	14.5	17.0	21.2	31.2
4.b Thermal Power Generation	59.2	59.6	61.1	56.8	45.0	30.7	18.0
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	62.1	66.4	73.4	68.4	65.0	58.1	62.9
6. FINAL ENERGY CONSUMPTION	142.4	147.3	159.2	149.6	137.0	139.7	147.3
of which 6.a Agriculture	1.4	1.3	1.2	1.0	1.0	1.0	1.0
6.b Industry	48.3	38.7	35.3	27.7	25.9	28.7	27.9
6.c Transport	35.6	48.6	55.5	55.2	54.0	57.5	59.9
6.d Services	17.3	17.9	20.3	17.3	17.6	16.5	18.1
6.e Households	39.8	40.8	46.9	48.5	38.9	36.0	40.4

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	16.5	24.9	31.7	31.6	30.6		
2. Non Energy Uses and Bunkers	1.3	3.9	5.0	3.8	3.8		
3. PRIMARY ENERGY FOR ENERGY USES	15.2	21.0	26.7	27.8	26.8		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	5.1	8.8	12.1	11.9	12.0		
of which 4.a Primary Electricity	0.3	0.2	0.5	0.9	0.7		
4.b Thermal Power Generation	4.8	8.6	11.6	11.0	11.3		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	4.0	6.5	8.1	8.8	8.0		
6. FINAL ENERGY CONSUMPTION	11.2	14.5	18.6	19.0	18.8		
of which 6.a Agriculture	0.8	1.0	1.1	0.8	0.4		
6.b Industry	4.0	3.9	4.5	3.5	3.3		
6.c Transport	4.0	5.8	7.2	8.2	7.7		
6.d Services	0.4	0.7	1.3	1.9	1.9		
6.e Households	2.0	3.1	4.5	4.6	5.5		

TOTAL ENERGY USE (MTOE)

HUNGARY (ни)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	30.1	29.1	24.8	26.0	25.2	29.0	31.0
2. Non Energy Uses and Bunkers			1.7	2.0	2.0	2.0	2.0
3. PRIMARY ENERGY FOR ENERGY USES			23.1	24.0	23.2	27.0	29.0
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	10.0	11.5	9.5	9.7	9.4	10.0	11.9
of which 4.a Primary Electricity	2.3	6.1	4.0	4.2	4.7	5.0	6.9
4.b Thermal Power Generation	7.7	5.4	5.5	5.5	4.7	5.0	5.0
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR			7.2	7.3	6.8	8.5	9.0
6. FINAL ENERGY CONSUMPTION	21.0	20.5	15.9	16.7	16.1	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	2.9	2.8	3.5	4.0
6.c Transport	3.0	3.0	3.0	4.5	4.3	5.0	5.5
6.d Services	2.9	2.8	3.4	3.2	3.1	3.5	4.0
6.e Households	5.3	7.0	5.2	5.7	5.5	5.9	5.9

IRELAND (IE)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		156.5	177.3	178.8	175.7		
2. Non Energy Uses and Bunkers		13.0	10.1	12.5	13.5		
3. PRIMARY ENERGY FOR ENERGY USES		143.5	167.2	166.3	162.2		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION		46.2	57.2	63.1	63.6		
of which 4.a Primary Electricity		6.0	8.2	9.4	9.7		
4.b Thermal Power Generation		40.3	49.0	53.7	53.9		
5. Consumption and Losses in the Energy Sector		35.6	41.9	42.6	41.0		
6. FINAL ENERGY CONSUMPTION		107.9	125.3	123.7	121.2		
of which 6.a Agriculture		2.9	2.9	2.7	2.7		
6.b Industry		35.8	39.7	31.1	30.1		
6.c Transport		34.2	42.5	42.0	42.0		
6.d Services		8.9	12.6	16.3	15.0		
6.e Households		26.1	27.6	31.7	31.3		

TOTAL ENERGY USE (MTOE)

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	12.2	17.2	7.5	7.0	7.3	9.3	11.7
2. Non Energy Uses and Bunkers	0.9	0.9	0.6	0.9	1.4	1.3	1.4
3. PRIMARY ENERGY FOR ENERGY USES	11.3	16.3	6.9	6.2	5.9	8.0	10.3
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	2.3	6.2	2.3	0.8	0.7	2.0	4.6
of which 4.a Primary Electricity	0	4.1	1.9	0.1	0.1	0.2	3.1
4.b Thermal Power Generation	2.3	2.1	0.4	0.7	0.6	1.8	1.5
5. Consumption and Losses in the Energy Sector	2.5	7.2	3.1	1.4	1.2	2.1	3.5
6. FINAL ENERGY CONSUMPTION	8.8	9.1	3.8	4.8	4.7	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	0.9	0.9	1.3	1.5
6.c Transport	1.7	1.7	1.0	1.6	1.5	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	1.5	1.7	1.8

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		3.6	3.6	4.5			
2. Non Energy Uses and Bunkers		0	0	0			
3. PRIMARY ENERGY FOR ENERGY USES		3.6	3.6	4.5			
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION		0	0.1	0.6			
of which 4.a Primary Electricity		0	0.0	0			
4.b Thermal Power Generation		0	0.1	0.6			
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR		0.2	0.2	0.4			
6. FINAL ENERGY CONSUMPTION		3.4	3.5	4.1			
of which 6.a Agriculture		0	0.0	0			
6.b Industry		1.9	0.7	0.6			
6.c Transport		0.9	1.9	2.5			
6.d Services		0	0.4	0.4			
6.e Households		0.5	0.5	0.5			

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	8.0	8.7	4.0	4.8	4.5	6.0	6.8
2. Non Energy Uses and Bunkers	0.1	0.5	0.1	0.3	0.2	0.2	0.3
3. PRIMARY ENERGY FOR ENERGY USES	7.9	8.2	3.9	4.5	4.3	5.8	6.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	1.0	1.4	1.3	0.8	0.7	1.3	1.7
of which 4.a Primary Electricity	0.5	0.7	0.6	0.3	0.3	0.5	0.9
4.b Thermal Power Generation	0.5	0.7	0.7	0.7	0.4	0.8	0.8
5. Consumption and Losses in the Energy Sector	1.2	1.7	0.6	0.2	0.2	0.5	0.6
6. FINAL ENERGY CONSUMPTION	6.7	6.5	3.3	4.3	4.1	5.3	5.9
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	0.9	0.8	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	1.3	1.7	1.8

Total Energy Use (Mtoe)

• **МАLTA** (мт)

	1980	1990	2000	2010	2011	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			
of which 4.a Primary Electricity			0.5	0.6			
4.b Thermal Power Generation			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	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	74.2	78.0	87.3	101.0	92.9	98.0	108.3
2. Non Energy Uses and Bunkers	10.6	13.9	14.5	17.6	15.4	16.3	18.0
3. PRIMARY ENERGY FOR ENERGY USES	63.6	64.1	72.8	83.4	77.5	81.8	90.3
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	12.4	16.8	22.2	25.7	24.0	22.1	23.8
of which 4.a Primary Electricity	0.9	3.0	2.7	1.2	1.3	1.4	1.5
4.b Thermal Power Generation	11.5	13.8	19.5	24.5	22.7	20.7	22.3
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	11.7	12.6	14.6	15.2	14.6	14.7	16.2
6. FINAL ENERGY CONSUMPTION	51.9	51.5	58.2	68.9	63.6	67.1	74.1
of which 6.a Agriculture	3.7	3.7	4.2	5.5	3.7	3.9	4.3
6.b Industry	22.3	21.8	25.0	30.5	28.5	30.0	33.1
6.c Transport	7.8	8.4	11.0	12.3	12.5	13.3	14.7
6.d Services	5.6	7.0	7.7	9.3	9.3	9.8	10.9
6.e Households	12.5	10.4	10.3	11.4	9.7	10.2	11.3

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	124.6	100.7	90.3	101.9	102.9	101.7	118.5
2. Non Energy Uses and Bunkers	0.1	0.1	2.0	5.5	5.4	3.8	4.4
3. PRIMARY ENERGY FOR ENERGY USES	124.5	100.6	88.3	96.4	97.5	97.9	114.1
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	30.6	32.4	31.7	33.6	35.1	34.2	34.9
of which 4.a Primary Electricity	0.7	0.7	0.9	1.1	1.3	4.2	5.1
4.b Thermal Power Generation	29.9	31.7	30.8	32.5	33.8	30.0	29.8
5. Consumption and Losses in the Energy Sector	36.5	33.6	29.8	31.6	33.6	25.1	29.7
6. FINAL ENERGY CONSUMPTION	88.0	67.0	58.5	64.9	63.9	72.8	84.4
of which 6.a Agriculture	3.0	2.9	5.3	3.8	3.6	5.0	4.2
6.b Industry	48.0	27.1	21.6	14.7	16.1	20.9	24.0
6.c Transport	10.0	9.9	9.5	16.9	17.1	18.7	23.3
6.d Services	2.0	2.1	4.7	8.5	8.1	8.8	12.8
6.e Households	25.0	25.0	17.4	21.0	19.0	19.4	20.1

TOTAL ENERGY USE (MTOE)

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	11.6	18.3	26.2	24.4	23.6	23.5	24.5
2. Non Energy Uses and Bunkers	1.1	2.8	3.2	3.1	3.2	2.7	2.7
3. PRIMARY ENERGY FOR ENERGY USES	10.5	15.5	23.0	21.4	20.4	20.8	21.8
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	3.9	4.9	7.4	7.4	7.6	6.4	7.0
of which 4.a Primary Electricity	2.2	0.8	1.1	2.5	2.1	1.9	2.4
4.b Thermal Power Generation	1.7	4.1	6.2	4.9	5.4	4.5	4.6
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	3.1	3.9	5.5	4.1	4.3	4.4	4.6
6. FINAL ENERGY CONSUMPTION	7.4	11.6	17.5	17.3	16.1	16.4	17.2
of which 6.a Agriculture	0.4	0.6	0.5	0.5	0.4	0.5	0.5
6.b Industry	3.2	4.3	5.7	5.4	4.9	5.0	5.2
6.c Transport	2.1	3.6	6.6	6.4	6.0	6.1	6.4
6.d Services	0.4	0.8	1.8	2.0	2.0	2.0	2.1
6.e Households	1.1	2.4	2.9	3.0	2.8	2.9	3.0

ROMANIA (RO)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	50.1	59.8	62.0	63.8		65.0	64.5
2. Non Energy Uses and Bunkers	1.7	2.7	3.3	4.7		5.7	6.0
3. PRIMARY ENERGY FOR ENERGY USES	48.4	57.1	58.7	59.0		59.4	58.5
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	21.1	33.6	34.1	32.8		33.3	32.6
of which 4.a Primary Electricity	19.7	33.0	33.0	30.6		31.0	30.3
4.b Thermal Power Generation	1.4	0.6	1.1	2.2		2.3	2.3
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	16.6	25.0	25.1	24.3		25.0	24.2
6. FINAL ENERGY CONSUMPTION	31.8	32.1	33.6	34.7		34.4	34.3
of which 6.a Agriculture	1.1	0.7	0.7	0.9		0.8	0.8
6.b Industry	13.0	12.3	13.7	13.1		14.2	14.6
6.c Transport	5.9	7.2	7.5	8.5		8.1	7.7
6.d Services	3.4	4.0	4.0	4.2		4.5	4.6
6.e Households	8.5	7.9	7.8	7.9		6.9	6.7

TOTAL ENERGY USE (MTOE)

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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 (sκ)

	1980	1990	2000	2010	2011	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	14.6		19.8	
of which 6.a Agriculture							
6.b Industry							
6.c Transport							
6.d Services							
6.e Households							

+ SWITZERLAND (сн)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	17.5	19.5	20.2	28.4	27.0		
2. Non Energy Uses and Bunkers	0.4	0.2	0.2	0.5	0.6		
3. PRIMARY ENERGY FOR ENERGY USES	17.1	19.3	21.2	27.9	26.5		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	7.2	9.4	11.4	10.2	9.6		
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	6.1	6.1		
6. FINAL ENERGY CONSUMPTION	16.4	18.7	20.4	21.8	20.4		
of which 6.a Agriculture	0.4	0.6	0.3	0.3	0.3		
6.b Industry	3.3	3.5	4.0	4.1	3.9		
6.c Transport	4.5	6.1	7.2	7.3	7.4		
6.d Services	2.9	3.1	3.3	3.6	3.2		
6.e Households	5.3	5.4	5.5	6.5	5.5		
TABLE 4.1.1

TOTAL ENERGY USE (MTOE)

NORWAY (NO)

	1980	1990	2000	2010	2011	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

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS	32.0	53.0	80.5	109.3	114.5		
2. Non Energy Uses and Bunkers	0.6	1.0	2.4	3.8	7.4		
3. PRIMARY ENERGY FOR ENERGY USES	31.4	52.0	78.1	105.4	107.1		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION	4.3	10.7	24.8	39.1	41.4		
of which 4.a Primary Electricity	1.0	2.1	2.7	5.3	5.5		
4.b Thermal Power Generation	3.3	8.6	22.1	33.8	35.9		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR	4.4	11.3	18.5	25.5	24.5		
6. FINAL ENERGY CONSUMPTION	27.0	40.7	59.6	79.9	82.6		
of which 6.a Agriculture	1.0	2.0	3.1	5.1	5.8		
6.b Industry	8.0	14.6	24.5	30.7	30.8		
6.c Transport	5.2	8.7	12.0	15.2	16.0		
6.d Services	0	0	0	0	0		
6.e Households	12.8	15.4	20.0	28.9	30.0		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS		7.0					
2. Non Energy Uses and Bunkers		0.1					
3. PRIMARY ENERGY FOR ENERGY USES		7.0					
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION		2.4					
of which 4.a Primary Electricity		0.3					
4.b Thermal Power Generation		2.1					
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR		2.4					
6. FINAL ENERGY CONSUMPTION		4.6					
of which 6.a Agriculture		0.2					
6.b Industry		2.7					
6.c Transport		0.8					
6.d Services		0.1					
6.e Households		0.9					

TABLE 4.1.1

TOTAL ENERGY USE (MTOE)

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
1. TOTAL PRIMARY ENERGY REQUIREMENTS				15.1	15.8		
2. Non Energy Uses and Bunkers				1.3	1.3		
3. PRIMARY ENERGY FOR ENERGY USES				13.9	14.5		
4. PRIMARY ENERGY USED FOR ELECTRICITY GENERATION				6.7	8.0		
of which 4.a Primary Electricity				0.4	0.8		
4.b Thermal Power Generation				6.3	7.2		
5. CONSUMPTION AND LOSSES IN THE ENERGY SECTOR				5.6	5.8		
6. FINAL ENERGY CONSUMPTION				8.3	8.7		
of which 6.a Agriculture				0.1	0.1		
6.b Industry				2.5	2.8		
6.c Transport				2.2	2.1		
6.d Services				1.0	1.2		
6.e Households				2.4	2.5		

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 certain Energy Community countries, both on an historical basis (from 1980 to 2011) and as forecasts (for 2020 and 2030).

AUSTRIA (AT)

	1980	1990	2000	2010	2011	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	9,748	9,720		
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	2010	2011	2020	2030
Total Internal Net Generating Capacity	14,141	15,685	17,496	20,609			
Foreseeable not Available Capacity				2,970			
Connected Peak Demand	7,900	10,428	12,653	14,391	14,314		
Reserve Capacity				960			
Country Balance				2,875		0	
Net Transfer Capacity							

BULGARIA (bg)

	1980	1990	2000	2010	2011	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	6,897	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	2010	2011	2020	2030
Total Internal Net Generating Capacity	264	462	988	1,338	1,553	2,198	2,678
Foreseeable not Available Capacity	0	0	0	0	0		
Connected Peak Demand	200	372	688	1,191	922	1,650	2,150
Reserve Capacity	40	72	138	268	310	440	536
Country Balance	26	30	162	-80	320	108	-8
Net Transfer Capacity	0	0	0	0		0	0

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity		13,800	14,200	16,400	16,500	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	11,204	10,900	14,000	14,500
Reserve Capacity		1,800	2,000	1,500	1,500	2,000	2,000
Country Balance		900	1,100	1,700	1,700	3,000	3,000
Net Transfer Capacity		2,500	2,500	3,000	3,000	3,000	3,000

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	78,600	93,800	106,500	145,400	153,300	176,200	179,000
Foreseeable not Available Capacity	6,900	8,200	10,400	36,700	44,400	78,900	85,000
Connected Peak Demand	52,200	63,100	76,800	79,300	81,200	74,000	73,000
Reserve Capacity	17,600	21,300	13,000	13,900	12,300	14,100	13,500
Country Balance	1,900	1,200	6,300	15,500	15,500	9,200	7,500
Net Transfer Capacity				19,800	16,197	22,400	22,400

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	6,619	8,109	11,225	12,909	11,500	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	6,230	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	5,800	8,000	8,000

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity			2,441	2,630		4,055	
Foreseeable not Available Capacity							
Connected Peak Demand			1,262	1,590		1,767	
Reserve Capacity						250	
Country Balance			1,179	1,040		2,038	
Net Transfer Capacity						1,900	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	27,910	40,808	50,528	95,945	98,282	115,005	134,590
Foreseeable not Available Capacity	5,402	6,616	9,357	29,101	28,502	45,280	61,736
Connected Peak Demand	18,572	25,160	33,236	44,122	44,107	51,634	61,338
Reserve Capacity	2,568	3,745	5,152	7,340	7,057	7,824	8,854
Country Balance	1,368	5,288	2,783	15,382	18,616	10,267	2,662
Net Transfer Capacity		1,200	2,080	3,500	4,200	5,680	5,680

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	11,022	13,170	16,258	16,740	16,234	20,813	24,005
Foreseeable not Available Capacity	1,032	850	2,537	3,640	2,874	4,900	5,900
Connected Peak Demand	6,600	10,450	12,400	14,600	15,000	16,500	18,100
Reserve Capacity	924	1,463	1,047	1,420	1,480		
Country Balance	2,466	407	274	-2,920	-3,120		
Net Transfer Capacity		2,510	3,100	3,850	4,650	5,300	

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	62,711	53,235	115,338	123,783	126,814	133,500	161,300
Foreseeable not Available Capacity				26,495			
Connected Peak Demand	44,100	63,400	72,400	96,710	91,720	104,200	110,500
Reserve Capacity				3,826			
Country Balance				-3,248			
Net Transfer Capacity				10,895		1	

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	68,800	73,500	78,800	93,146	93,397	113,409	146,139
Foreseeable not Available Capacity	0	0	300	3,468		22,878	42,231
Connected Peak Demand	52,100	57,300	64,100	66,287	60,758	59,601	65,037
Reserve Capacity	10,400	11,500	12,800	13,257		11,920	13,007
Country Balance	6,300	4,700	1,600	10,133		19,010	25,864
Net Transfer Capacity	0	2,000	2,000	3,188		6,088	8,088

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	4,514	7,274	9,692	13,580	14,449	18,445	
Foreseeable not Available Capacity	0	0	150	1,563	2,051	4,677	
Connected Peak Demand	3,554	4,924	8,531	9,794	9,868	11,170	
Reserve Capacity	890	1,230	1,454	1,469	1,480	1,676	
Country Balance	70	1,120	-443	754	1,050	923	
Net Transfer Capacity				1,200	1,200	1,200	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	5,015	6,681	7,855	8,753	9,497	10,190	11,000
Foreseeable not Available Capacity			360	1,617	1,743	2,000	2,200
Connected Peak Demand	5,127	6,554	5,800	6,064	5,931	7,000	7,700
Reserve Capacity	800	1,000	600	810	810	950	1,100
Country Balance	100	800	1,095	262	1,013	240	0
Net Transfer Capacity			340	2,000	2,000	3,500	3,500

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	2,400	3,800	4,700	7,500	8,618	11,787	
Foreseeable not Available Capacity	100	100	100	100	0	100	
Connected Peak Demand	1,800	2,500	3,800	5,026	4,899	5,224	6,085
Reserve Capacity	600	800	950	1,800	3,719	1,750	
Country Balance	100	400	-150	0	0	4,713	
Net Transfer Capacity	0	0	300	600	800	800	800

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	46,824	56,548	75,504	106,489	118,443		
Foreseeable not Available Capacity			22,104	37,189	41,455		
Connected Peak Demand	31,400	40,500	49,019	56,425	56,474		
Reserve Capacity			4,381	12,875	20,514		
Country Balance			0	0	0		
Net Transfer Capacity			5,400	8,040	8,325		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	2,277	4,924	5,756	3,606	3,687	4,470	5,833
Foreseeable not Available Capacity	10	10	50	810	810	1,464	1,327
Connected Peak Demand	2,200	2,800	1,500	1,817	1,715	2,120	2,360
Reserve Capacity	300	600	600	350	350	750	1,400
Country Balance	-233	1,514	3,606	629	812	136	746
Net Transfer Capacity	2,000	3,000	3,000	3,000	3,230	4,780	4,780

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	1,214	1,209	1,199	1,728		1,991	2,031
Foreseeable not Available Capacity	100	100	100	100		100	100
Connected Peak Demand	500	600	900	1,080	1,188	1,300	1,500
Reserve Capacity	100	100	100	100		100	100
Country Balance	514	409	99	428		491	331
Net Transfer Capacity	0	0	0	0		0	0

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	2,050	2,070	2,130	2,500	2,530	3,030	3,380
Foreseeable not Available Capacity	750	750	750	850	850	950	1,050
Connected Peak Demand	1,700	1,900	1,200	1,320	1,260	1,650	1,970
Reserve Capacity	120	120	120	400	460	550	550
Country Balance	-520	-700	60	-70	-10	-120	-190
Net Transfer Capacity	600	700	630	1,500	2,000	2,000	2,200

• **МАLTA** (мт)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	0	0	0	0	0		
Foreseeable not Available Capacity	0	0	0	0	0		
Connected Peak Demand	0	0	0	0	0		
Reserve Capacity	0	0	0	0	0		
Country Balance	0	0	0	0	0		
Net Transfer Capacity	0	0	0	0	0		

4.2 CAPACITY BALANCES

TABLE 4.2.1

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	14,868	16,049	19,569	26,606	28,033	42,757	44,630
Foreseeable not Available Capacity	1,100	1,100	1,100	1,330	1,402	2,138	2,232
Connected Peak Demand	11,000	13,000	15,180	18,162	18,320	19,330	21,350
Reserve Capacity	3,300	3,700	3,000	3,269	3,298	3,479	3,843
Country Balance	-532	-1,751	289	3,846	5,014	17,810	17,206
Net Transfer Capacity	3,200	3,200	3,600	4,550	5,550	8,750	8,750

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	22,910	28,394	30,604	32,832	34,361	41,188	42,139
Foreseeable not Available Capacity	0	0	11	1,028	2,813	6,527	7,794
Connected Peak Demand	19,133	21,476	20,471	23,543	23,149	25,515	29,239
Reserve Capacity	3,827	5,047	4,913	3,767	3,704	4,082	4,678
Country Balance	3,225	5,979	5,209	4,495	5,472	5,063	428
Net Transfer Capacity				820	820	1,320	1,320

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	3,974	6,660	9,662	17,485	18,877	23,248	24,818
Foreseeable not Available Capacity	247	506	254	4,437	5,304	6,930	8,578
Connected Peak Demand	3,000	4,861	6,909	9,403	9,192	8,940	10,500
Reserve Capacity	774	1,013	2,112	3,274	3,521	4,015	4,438
Country Balance	-47	281	387	371	860	3,363	1,303
Net Transfer Capacity	550	550	850	1,600	1,600	2,560	2,560

ROMANIA (RO)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Total Internal Net Generating Capacity	27,074	33,672	30,894	35,701		39,850	40,950
Foreseeable not Available Capacity	2,600	2,603	2,781	4,220		6,875	9,725
Connected Peak Demand	17,700	23,300	26,000	26,300	26,200	24,100	23,800
Reserve Capacity	1,200	1,200	1,200	1,200		1,200	1,200
Country Balance	5,574	6,569	913	3,981		7,374	5,825
Net Transfer Capacity	2,905	4,975	8,455	8,570		11,220	13,020

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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 (sκ)

	1980	1990	2000	2010	2011	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 (сн)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	14,107	15,441	17,333	17,900			
Foreseeable not Available Capacity	3,800	4,100	4,400	4,900			
Connected Peak Demand	6,700	8,500	9,000	10,749	10,072		
Reserve Capacity	1,000	1,000	1,000	1,000			
Country Balance	2,607	1,841	2,933	1,251			
Net Transfer Capacity			6,000	6,000			

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	19,836	26,637	27,577	31,290	31,750	35,400	37,200
Foreseeable not Available Capacity	2,817	3,784	3,930	5,013	5,000	5,500	6,500
Connected Peak Demand	14,098	17,047	20,216	23,994	22,129	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	1,083	3,421	4,200	5,500
Net Transfer Capacity			3,650	5,400			

C• TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity			26,173	47,610	51,057		
Foreseeable not Available Capacity			3,809	11,610	15,463		
Connected Peak Demand	3,947	9,180	19,524	33,392	36,122		
Reserve Capacity			1,657	1,576	178		
Country Balance			1,183	1,032	-706		
Net Transfer Capacity			638				

CAPACITY BALANCES ONLY FOR INTERCONNECTED PART (MW)

BOSNIA HERZEGOVINA (BA)

	· · · ·						
	1980	1990	2000	2010	2011	2020	2030
Total Internal Net Generating Capacity	2,579	3,995	3,754	3,688	3,688		
Foreseeable not Available Capacity	300	300	300	300	300		
Connected Peak Demand	1	2	2	2	2	3	
Reserve Capacity	440	440	440	440	440		
Country Balance	609	1,294	1,374	2,173	2,150		
Net Transfer Capacity							

SERBIA (RS)

	1980	1990	2000	2010	2011	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	6,579	6,372	7,030	7,750
Reserve Capacity				600	600	700	700
Country Balance	931	3,038	584	6	213	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 certain Energy Community countries from 1980 to 2011. 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 from 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	2010	2011	2020	2030
Electricity Production	40.7	48.8	60.2	67.0	63.4	78.5	90.3
Pumping	-0.5	-1.4	-2.0	-4.5	5.0	-9.2	-11.8
Imports	3.2	6.8	13.8	19.9	24.9	24.8	29.8
Exports	7.1	7.3	15.1	17.6	16.7	21.3	29.8
Trade Balance	-3.9	-0.5	-1.3	2.3	8.2	3.5	0.0
Demand (Including losses)	36.3	46.9	56.9	65.0	65.0	72.8	78.5

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	51.0	70.8	83.8	91.2	85.0	98.7	101.3
Pumping		0.8	1.6	18.0	1.7	1.7	1.7
Imports		4.7	11.6	12.4	13.2	13.2	13.0
Exports		8.5	7.3	11.8	10.6	11.5	10.4
Trade Balance		-3.8	4.3	0.6	2.6	1.6	2.6
Demand (Including losses)	47.7	62.6	83.6	90.1	87.4	94.3	101.9

BULGARIA (BG)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	31.2	37.5	36.8	46.7	45.8	66.5	88.7
Pumping	-0.1	-0.1	-0.5	0.9	1.2	-0.8	-0.8
Imports	4.7	5.4	1.0	1.2	1.5	0.0	0.0
Exports	0.9	1.6	5.6	9.6	12.1	13.0	20.5
Trade Balance	3.8	3.8	-4.6	8.4	10.6	-13.0	-20.5
Demand (Including losses)	34.9	41.2	31.7	32.5	34.4	52.7	67.4

🛫 CYPRUS (cy)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	1.0	2.0	3.4	5.2	5.0	8.6	11.5
Pumping	0.0	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	0.0
Exports	0.0	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	4.8	5.0	6.4	11.5

ELECTRICITY BALANCES (TWH)

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	48.7	58.1	67.7	79.0	81.0	89.9	93.0
Pumping	-0.5	-0.4	-0.7	-0.8	-0.7	-0.5	-0.5
Imports	0.0	0.0	2.4	11.1	14.1	10.5	12.0
Exports	1.5	0.7	12.4	26.0	31.3	12.5	16.0
Trade Balance	-1.5	-0.7	-10.0	-15.0	-16.2	-2.0	-4.0
Demand (Including losses)	46.7	57.0	57.0	59.3	58.6	77.5	83.0

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	347.0	423.0	538.5	594.8	576.9	539.1	428.7
Pumping	-2.0	-2.0	-6.0	-8.6	-7.8	-125.0	-14.5
Imports	16.2	25.1	45.1	42.2	49.7		
Exports	10.2	26.0	42.1	59.9	56.0		
Trade Balance	6.0	-0.9	3.0	-17.7	-6.3	-13.6	61.8
Demand (Including losses)	351.0	415.2	535.5	568.5	562.9	507.0	474.0

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030	
Electricity Production	23.9	30.8	35.2	37.2	34.9	38.2	43.8	
Pumping	0.0	0.0	0.0			0.0	0.0	
Imports	2.0	12.0	8.3	10.6	11.7	0.0	0.0	
Exports	1.6	4.9	7.7	12.7	11.3	0.0	0.0	
Trade Balance	0.4	7.1	0.6	-1.1	1.3	0.0	0.0	
Demand (Including losses)	23.9	30.8	34.7	36.0	33.8	38.2	43.8	

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	17.2	15.4	8.6	13.0		14.2	
Pumping			0.0				
Imports	0.4	1.5	0.4				
Exports	11.1	8.5	1.3				
Trade Balance	-10.7	-7.0	-0.9				
Demand (Including losses)	6.5	8.4	6.7	7.4	7.2	10.1	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	105.0	147.0	216.0	291.5	280.3	355.0	414.0
Pumping	-2.0	-1.0	-5.0	-4.5	-3.2	-7.0	-8.0
Imports	2.0	3.0	12.0	5.2	7.9	13.0	22.0
Exports	4.0	4.0	8.0	13.5	14.0	20.0	17.0
Trade Balance	-2.0	-1.0	4.0	-8.3	-6.1	-7.0	5.0
Demand (Including losses)	102.0	146.0	215.0	280.0	273.0	340.0	411.0

ELECTRICITY BALANCES (TWH)

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	38.7	51.6	67.3	77.2	70.4	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	15.7	17.7		
Exports	1.2	0.4	0.3	5.2	3.8		
Trade Balance	1.2	10.7	11.9	10.5	13.9	6.9	-5.5
Demand (Including losses)	39.9	62.3	79.2	87.7	84.2	99.0	109.0

FRANCE (FR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	246.6	400.2	516.7	550.2	542.9	587.0	587.6
Pumping	-1.0	-4.9	-6.6	-6.5	-6.8	-7.0	-7.0
Imports	15.6	6.7	3.7	20.3	9.4		
Exports	12.5	52.4	73.2	50.8	66.3		
Trade Balance	3.1	-45.8	-69.5	30.5	56.9	72.1	40.3
Demand (Including losses)	248.7	349.6	440.6	513.2	479.2	507.9	540.3

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	266.3	300.1	360.8	366.0	334.2	329.0	374.7
Pumping	-1.5	-2.6	-3.5	3.2	2.9	2.7	2.7
Imports	0.0	11.9	14.3	7.1	8.7	13.2	13.5
Exports	0.0	0.0	0.1	4.5	2.5	10.5	31.5
Trade Balance	0.0	11.9	14.2	2.7		2.7	-18.0
Demand (Including losses)	264.8	309.4	371.5	380.2	369.8	345.7	377.2

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	21.3	32.1	49.9	53.5	55.7	62.7	
Pumping	0.0	-0.3	-0.6	0.0	-0.4	-0.6	
Imports	0.7	1.3	1.7	8.5	7.2	6.5	
Exports	0.1	0.6	1.7	2.8	3.9	3.9	
Trade Balance	0.6	0.7	0.0	5.7	3.3	2.6	
Demand (Including losses)	21.9	32.5	49.9	59.2	58.6	64.7	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	23.9	28.5	35.2	34.6	33.5	38.0	42.8
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	10.2	13.3	6.2	9.9	14.6	16.5	17.2
Exports	2.8	2.2	2.8	4.7	8.0	9.0	10.0
Trade Balance	7.4	11.1	3.4	5.2	6.6	7.5	7.2
Demand (Including losses)	31.3	39.6	38.6	39.8	40.1	45.5	50.0

TABLE 4.3.1 Electricity Balances (TWH)

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	17.0	24.1	38.2	31.9	24.4	29.3	33.6
Pumping		0.0	0.2		0.1	1.5	6.5
Imports		0.0	0.1		2.4	1.0	1.8
Exports		0.0	0.1		0.0	0.6	4.8
Trade Balance	9.5	13.0	22.3	27.0		30.1	32.5
Demand (Including losses)	10.0	13.5	22.7	25.4	26.8	31.4	35.3

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	177.4	205.3	263.3	290.7	291.4		
Pumping	-3.2	-4.8	-9.1	-4.5	-2.5		
Imports	8.1	35.6	44.8	46.0	47.5		
Exports	2.0	0.9	0.5	1.8	1.8		
Trade Balance	6.1	34.7	44.3	44.2	45.7		
Demand (Including losses)	180.3	235.1	298.5	330.4	334.6		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	11.0	26.3	10.0	5.3	4.5	8.8	20.2
Pumping	0.0	0.0	-0.4	-1.0	-0.8	-1.1	-1.1
Imports	0.0	0.0	0.2	7.1	8.7	6.7	0.7
Exports	0.1	12.0	1.5	1.1	2.0	1.9	5.6
Trade Balance	-0.1	-12.0	-1.3	6.0	6.7	4.8	-4.9
Demand (Including losses)	10.9	14.3	8.3	10.3	10.4	12.4	14.2

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	1.0	1.3	1.3	4.1	3.7	4.2	4.4
Pumping	-0.2	-1.0	-1.2	-1.1	-1.5	-1.2	-1.2
Imports	3.0	4.7	6.4	6.8	7.1	7.6	7.7
Exports	0.2	0.8	0.7	3.0	2.7	3.4	3.4
Trade Balance	2.8	3.9	5.7	3.8		4.2	4.3
Demand (Including losses)	3.6	4.2	5.8	6.7	6.6	7.2	7.5

LATVIA (LV)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	4.6	6.4	4.0	6.4	5.9	7.7	8.3
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	
Imports	5.4	6.5	4.7	4.0	4.0	3.8	3.6
Exports	2.0	3.0	3.0	3.1	2.8	2.8	3.0
Trade Balance	3.4	3.5	1.7	0.9	1.2	1.0	0.6
Demand (Including losses)	8.0	9.9	5.7	7.3	7.2	8.9	10.8

ELECTRICITY BALANCES (TWH)

• **МАЦТА** (мт)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	0.5	1.1	1.8	2.1	2.2		
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	1.2	1.9	2.1	2.2		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	59.7	68.8	85.8	114.3	109.1	122.7	136.7
Pumping	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imports	0.0	9.9	22.9	15.6	20.6	17.0	17.0
Exports	0.0	0.4	4.0	12.8	11.5	15.0	16.0
Trade Balance	0.0	9.5	18.9	2.8	91.0	2.0	1.0
Demand (Including losses)	59.7	75.5	104.7	117.1	118.2	124.7	137.7

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	113.3	123.1	133.2	144.2	149.2	161.8	186.7
Pumping	-1.2	-2.6	-2.8	-0.8	-0.6	-1.1	-1.1
Imports	4.2	10.4	3.3	6.3	6.8	0.0	0.0
Exports	4.4	11.5	9.7	7.7	12.0	0.0	0.0
Trade Balance	-0.2	-1.1	-6.4	-1.4	-5.2	0.0	0.0
Demand (Including losses)	111.9	119.4	124.0	142.0	143.3	160.7	185.6

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	14.8	27.3	42.2	52.9	51.2	55.5	62.8
Pumping	-0.1	-0.2	-0.6	-0.5	-0.7	-0.4	-0.5
Imports		0.2	4.7	5.8	6.7		
Exports		0.1	3.8	3.2	3.9		
Trade Balance	1.8	0.0	0.9	2.6	2.8	-2.4	-0.3
Demand (Including losses)	16.5	27.1	42.5	55.0	53.3	52.7	62.0

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	61.5	56.7	47.1	56.5	57.0	68.4	85.5
Pumping	0.0	0.0	0.0	0.3	0.2	-0.2	-0.5
Imports	0.5	9.5	0.8	1.8	2.9	1.5	1.5
Exports	0.1	0.0	1.5	4.7	4.8	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	53.4	54.9	64.2	81.0

ELECTRICITY BALANCES (TWH)

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	93.4	141.7	141.7	144.9	147.5	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	14.9	12.5		
Exports	2.8	14.7	13.6	12.9	19.7		
Trade Balance	0.5	-1.8	4.7	2.1	-7.2	-30.1	-16.3
Demand (Including losses)	94.0	139.9	146.6	147.0	140.3	144.4	145.2

SLOVENIA (SI)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	7.0	11.2	12.6	15.2	14.1	14.9	
Pumping	0.0	0.0	0.0	0.0	0.2	1.7	
Imports	0.9	0.6	0.5	0.7	7.0		
Exports	0.3	1.2	2.4	0.6	8.3		
Trade Balance	0.6	-0.6	-1.9	0.1	-1.3		
Demand (Including losses)	5.6	9.2	11.5	16.1	12.4	15.8	18.8

SLOVAKIA (sk)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	18.6	22.5	28.7	26.0	27.0	35.6	
Pumping	-0.2	-0.8	-0.3	-0.5	-0.5	-0.4	
Imports		6.0	6.3	7.3	11.2	0.0	
Exports		0.8	9.0	6.3	10.5	0.0	
Trade Balance	3.4	5.2	-2.7	0.0		0.0	
Demand (Including losses)	22.2	26.9	25.7	26.6	26.8	35.2	39.5

SWITZERLAND (CH)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	48.2	54.1	65.3	66.3	62.9	61.0	59.0
Pumping	-1.5	-1.7	-2.0	-2.5	-2.5		
Imports	9.9	22.8	39.9	66.8	83.3		
Exports	18.1	24.9	47.0	66.3	80.7		
Trade Balance	-8.2	-2.1	-7.1	0.5	2.6	10.0	15.0
Demand (Including losses)	38.5	50.3	56.3	64.3	63.0	69.4	72.1

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	83.2	120.8	141.8	124.4	128.1	140.0	145.0
Pumping	-0.5	-0.3	-0.9	0.5	1.7	2.4	2.4
Imports	1.8	0.3	1.5	14.7	11.3	5.0	5.0
Exports	2.3	16.2	20.5	7.1	14.3	9.0	10.0
Trade Balance	-0.5	-15.9	-19.1	7.6	-3.0	-3.0	-5.0
Demand (Including losses)	82.2	104.5	121.9	132.0	125.1	136.0	140.0

ELECTRICITY BALANCES (TWH)

C TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	23.3	54.2	118.7	203.0	217.6		
Pumping	0.0	0.0	0.0	0.0	0.0		
Imports	1.3	0.2	3.8	1.2	4.5		
Exports	0.0	0.9	0.4	1.9	3.6		
Trade Balance	1.3	-0.7	3.4	-0.7	0.9		
Demand (Including losses)	23.2	53.5	122.1	202.3	218.5		

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	9.7	13.1	10.4	16.1	14.0		
Pumping				0.0	0.0		
Imports				3.1	4.2		
Exports	2.4	1.6	1.0	6.9	5.7		
Trade Balance	7.4	11.5	9.4	3.8	1.5		
Demand (Including losses)	7.4	11.5	9.4	12.3	12.6	17.9	

CROATIA (HR)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	8.8	8.1	11.1	15.2	11.8	19.6	
Pumping	0.0	0.1	0.1	0.2			
Imports	3.3	7.5	3.5	6.8		2.8	
Exports	0.4	0.5	0.5	1.9		0.5	
Trade Balance							
Demand (Including losses)	11.7	15.0	14.0	18.0	17.6	24.0	32.0

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production	25.4	36.5	29.7	35.9	36.1	43.7	47.7
Pumping	0.1	1.2	0.7	1.0	0.8	1.1	1.1
Imports	0.2	0.4	2.7	5.6	6.7		
Exports	1.3	2.4	1.3	5.9	7.0		
Trade Balance	-1.1	-2.0	1.4	-0.3	-0.3		
Demand (Including losses)	19.4	27.7	29.6	34.6	35.0	39.4	43.1

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Electricity Production				187.9	193.9		
Pumping							
Imports				0.0	0.0		
Exports				4.2	6.4		
Trade Balance				-4.2	-6.4		
Demand (Including losses)				183.7	187.5		

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 certain Energy Community countries. from 1980 to 2011. 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	2010	2011	2020	2030
Hard Coal	0.3	27.0	32.4	44.0	46.6	22.3	19.8
Brown Coal	13.4	13.0	11.3	0.0	0.0	0.0	0.0
Oil	20.7	1.1	7.0	11.5	9.2	0.7	0.0
Natural Gas	20.2	37.7	37.4	101.3	88.0	92.2	90.3
Derived Gas	0.0	0.0	8.3	12.8	13.6	7.8	7.4
Biomass							
Peat							
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	2010	2011	2020	2030
Hard Coal		162.3	109.7	39.9	32.4		
Brown Coal							
Oil		132.0	61.0	37.0			
Natural Gas		61.3	150.8	247.3	187.9		
Derived Gas		28.7	27.5	170.2	186.0		
Biomass		5.2	61.3	36.5	44.5		
Peat							
Other Fuels		10.1	13.1	26.0	26.7		
Thermal Total		384.3	349.0	494.4	405.0		

TABLE 5.1.1

FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

BULGARIA (bg)

	1980	1990	2000	2010	2011	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							
Peat							
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	2010	2011	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	12.9	22.5	38.3	42.0	50.2	4.6	3.3
Natural Gas	0.0	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	0.0
Biomass							
Peat							
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	12.9	22.5	38.3	42.0	50.2	62.7	81.0

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	82.0	63.0	76.1	64.0	64.0	76.4	76.4
Brown Coal	448.0	426.0	445.0	510.0	50.5	359.1	350.0
Oil	11.0	5.0	5.6	3.0	3.0	2.4	2.4
Natural Gas	2.0	2.0	9.4	9.0	8.9	7.8	10.0
Derived Gas	9.0	7.0	20.1	21.5	20.0	21.4	15.4
Biomass							
Peat							
Other Fuels	2.0	2.0	4.3	0.5	0.5	1.0	1.0
Thermal Total	554.0	505.0	560.5	608.0	602.4	468.1	455.2

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	1,046.0	1,270.0	1,268.0	1,012.0	961.0	701.0	504.0
Brown Coal	962.0	1,731.0	1,420.0	1,364.0	1,410.0	1,208.0	573.0
Oil	209.0	108.0	71.0	63.0	51.0	5.0	4.0
Natural Gas	551.0	336.0	396.0	576.0	538.0	561.0	532.0
Derived Gas	0.0	98.0	85.0	105.0	98.0	34.0	34.0
Biomass	0.0	64.0	96.0	215.0	216.0	261.0	305.0
Peat	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	2,768.0	3,543.0	3,240.0	3,120.0	3,058.0	2,509.0	1,648.0

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

DENMARK (DK)

	4000	4000		0040	0.0.4.4		
	1980	1990	2000	2010	2011	2020	2030
Hard Coal	214.0	227.0	134.0	139.0	114.0	100.0	70.0
Brown Coal	0.0	0.0	0.0	0.0		0.0	0.0
Oil	48.0	33.0	40.0	8.0	4.0	20.0	20.0
Natural Gas	0.0	30.0	69.0	57.0	43.0	160.0	170.0
Derived Gas	0.0	0.0	0.0	0.0		0.0	0.0
Biomass	0.0	6.0	11.0	41.0	39.0		
Peat							
Other Fuels	0.0	1.0	29.0	0.0		0.0	0.0
Thermal Total	262.0	297.0	256.0	248.0	203.0	280.0	260.0

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal			0.0			0.0	
Brown Coal			0.0			0.0	
Oil			0.4			0.0	
Natural Gas			3.0			0.4	
Derived Gas			0.0				
Biomass						4.7	
Peat							
Other Fuels			85.5			92.7	
Thermal Total			88.9				

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	233.0	467.0	601.0	247.0	434.0	248.0	118.0
Brown Coal	93.0	130.0	137.0	13.0	43.0	0.0	0.0
Oil	362.0	55.0	177.0	181.0	165.0	175.0	211.0
Natural Gas	46.0	52.0	129.0	696.0	922.0	666.0	679.0
Derived Gas							
Biomass				32.0	32.0	34.0	37.0
Peat							
Other Fuels							
Thermal Total	734.0	704.0	1.044.0	1.137.0	1.564.0	1.089.0	1.008.0

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	102.7	61.3	55.4	103.2	64.6	32.0	24.0
Brown Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oil	26.8	9.7	3.3	2.7	2.6	4.0	3.0
Natural Gas	12.6	24.8	43.2	46.9	40.0	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	55.8	60.0	80.0	76.0
Peat	4.0	17.2	21.5	38.5	34.2	32.0	14.0
Other Fuels			8.7	10.3	10.3		
Thermal Total	171.3	142.1	173.7	257.4	211.7	195.0	160.0

Note: Biomass data for 1980 and 1990 include other fossil fuels. The total sum for data between 2000 and 2011 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	2010	2011	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							
Peat							
Other Fuels	0.0	9.7	10.5				
Thermal Total	1.228.0	455.0	493.0				

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	2.135.7	2.086.7	1.200.4	1.070.2	1.089.7	435.8	363.5
Brown Coal	0.0	0.0	0.0	0.0		0.0	0.0
Oil	321.1	351.7	64.9	49.3	32.8	0.6	0.2
Natural Gas	17.6	23.4	1.168.4	1.344.9	1.105.7	893.7	416.3
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass			8.1	26.8		96.9	189.8
Peat							
Other Fuels	4.6	35.2	122.5	217.4	238.1	53.5	47.8
Thermal Total	2.893.9	3.177.8	3.378.2	3.264.9	3.120.5	1.480.5	1.017.5

GREECE (GR)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	0.0	0.0	0.0	4.4	0.9	0.0	
Brown Coal	105.7	258.8	340.1	312.4	320.7	221.2	
Oil	93.8	78.3	90.1	52.5	49.7	15.0	
Natural Gas	0.0	0.0	58.5	86.3	100.1	131.9	
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	
Biomass							
Peat							
Other Fuels							
Thermal Total	199.5	337.1	488.6	455.6	471.4	368.1	

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	0.0	16.0	11.0	6.8	2.1	0.0	0.0
Brown Coal	160.0	108.0	104.0	63.7	68.9	45.0	25.0
Oil	44.0	19.0	43.0	4.6	1.3	1.5	1.5
Natural Gas	109.0	74.0	77.0	115.6	100.6	135.0	130.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass				26.9	25.7	40.0	45.0
Peat	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Fuels	0.0	0.0	1.0	3.1	3.3	3.0	0.0
Thermal Total	313.0	217.0	236.0	220.7	172.9	181.5	156.5

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

IRELAND (IE)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	0.0	51.0	61.0	64.0	128.0	55.8	41.4
Brown Coal	19.0	24.0	21.0	25.0	0.0	11.6	0.0
Oil	51.0	14.0	44.0	10.0	1.3	0.0	0.2
Natural Gas	18.0	34.0	76.0	124.0	120.0	107.0	113.3
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass					0.0	0.0	0.0
Peat					69.0		
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	88.0	123.0	202.0	223.0	318.0	174.5	154.9

ITALY (IT)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	124.2	285.1	253.3	376.9	418.2		
Brown Coal	13.0	11.0	0.0	0.0	0.0		
Oil	959.5	916.7	818.8	227.9	210.7		
Natural Gas	81.9	338.4	787.9	1.030.3	967.0		
Derived Gas	32.3	38.8	40.5	42.8	48.7		
Biomass		1.3	12.2	93.6	106.0		
Peat			0.0	0.0	0.0		
Other Fuels		6.0	1.7	0.7	0.0		
Thermal Total	1.210.8	1.597.2	1.914.4	1.772.1	1.750.6		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	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	3.3	3.1	3.1	3.1
Natural Gas	3.1	48.8	11.6	33.7	29.0	39.2	46.9
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass	0.0	0.0	0.0	1.8	2.2	14.3	14.6
Peat	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	101.4	90.5	16.6	38.8	34.3	56.6	172.2

LUXEMBOURG (LU)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal			0.0				
Brown Coal			0.0				
Oil			0.0				
Natural Gas			0.1				
Derived Gas			0.0				
Biomass							
Peat							
Other Fuels			0.0				
Thermal Total			0.1				

TABLE 5.1.1

FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

LATVIA (LV)

	1980	1990	2000	2010	2011	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	10.9	10.5	10.9	11.9
Derived Gas	0.0	0.0	0.0	0.0	0.0		
Biomass	0.0	0.0	0.0	0.0	0.1	0.3	1.0
Peat	0.7	0.7	0.5	0.0	0.0	0.0	
Other Fuels	0.0	0.0	0.0	0.0	0.0		
Thermal Total	8.9	10.4	6.6	10.9	10.6	18.4	21.7

• **МАLТА** (мт)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal			0.0	0.0	0.0		
Brown Coal			0.0	0.0	0.0		
Oil			22.2	24.4	25.1		
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		
Peat			0.0	0.0	0.0		
Other Fuels			0.0	0.0	0.0		
Thermal Total			22.2	24.4	25.1		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	61.0	234.0	219.0	195.0	182.0	299.0	207.0
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	0.0	0.0	0.0
Natural Gas	214.0	317.0	360.0	664.0	601.0	442.0	403.0
Derived Gas	16.0	18.0	24.0				
Biomass				82.0	82.0	102.0	126.0
Peat				0.0	0.0	0.0	0.0
Other Fuels	0.0	0.0	6.0	52.0	56.0	65.0	65.0
Thermal Total	505.0	571.0	610.0	1.076.0	1.007.0	925.0	997.0

POLAND (PL)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	955.0	754.0	773.3	783.3	786.5	677.6	699.4
Brown Coal	260.0	549.0	495.3	470.3	502.3	444.3	406.3
Oil	29.0	17.0	0.0	0.0	0.0	2.6	2.6
Natural Gas	0.0	0.0	16.1	39.5	44.5	34.8	36.9
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass			0.2	62.8	75.7	89.3	96.3
Peat							
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	1.356.1	1.409.0	1.248.6	1.241.5

TABLE 5.1.1 Fuel Consumption for Electricity Generation (PJ)

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	3.6	84.5	133.6	66.6	91.7	43.0	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	21.3	18.3	6.1	3.9
Natural Gas	0.0	0.0	48.0	87.0	85.3	101.3	145.8
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass	0.0	0.0	0.0	9.9	10.9	26.0	29.9
Peat	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Fuels	4.1	3.2	13.5	19.3	20.8	11.4	12.4
Thermal Total	69.3	172.2	260.2	204.0	227.0	187.7	192.0

ROMANIA (RO)

	1980	1990	2000	2010	2011	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							
Peat							
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	2010	2011	2020	2030
Hard Coal	1.0	5.3	7.9	3.6	2.9	0.0	0.0
Brown Coal							
Oil	54.6	6.0	7.7	8.9	4.0	3.1	3.1
Natural Gas	0.0	1.7	2.1	10.4	8.8	12.1	12.1
Derived Gas	0.2	3.9	5.5	6.4	6.0	6.5	6.5
Biomass	3.6	8.6	19.1	64.2	61.0	73.8	75.2
Peat	0.0	0.3	0.3	3.0	2.7	0.0	0.0
Other Fuels							
Thermal Total	55.8	17.1	23.4	32.2	24.5	21.7	21.7

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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							
Peat							
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	2010	2011	2020	2030
Hard Coal							
Brown Coal							
Oil	23.2	10.3					
Natural Gas							
Derived Gas							
Biomass							
Peat							
Other Fuels							
Thermal Total	139.0	97.0	122.0	143.0		157.0	

SWITZERLAND (сн)

	1980	1990	2000	2010	2011	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							
Peat							
Other Fuels							
Thermal Total							

NORWAY (NO)

	1980	1990	2000	2010	2011	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	33.8	31.5	12.0	12.0
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Peat							
Other Fuels	1.6	5.6	7.4	0.0	0.0	0.0	0.0
Thermal Total	1.6	5.6	7.4	33.8	31.5	12.0	12.0

C. TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	20.0	9.0	33.0	165.6	241.0		
Brown Coal	50.0	208.0	385.0	404.2	436.3		
Oil	70.0	47.0	149.0	37.2	22.8		
Natural Gas		97.0	357.0	814.3	846.0		
Derived Gas							
Biomass							
Peat							
Other Fuels				4.9	1.6		
Thermal Total	140.0	361.0	924.0	1.426.2	1.547.7		

TABLE 5.1.1

FUEL CONSUMPTION FOR ELECTRICITY GENERATION (PJ)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal		77.3	38.4	90.1	109.6		
Brown Coal		42.4	25.1	33.1	37.3		
Oil		1.0					
Natural Gas							
Derived Gas							
Biomass							
Peat							
Other Fuels							
Thermal Total							

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal	0.0	2.4	0.0	0.2	0.0	0.0	0.0
Brown Coal	171.6	297.7	209.1	269.0	302.0	375.3	375.3
Oil				0.7	1.0		
Natural Gas				7.0	12.7		
Derived Gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biomass							
Peat							
Other Fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Thermal Total	171.6	300.2	209.1	276.8	315.6	375.3	375.3

UKRAINE (UA)

	1980	1990	2000	2010	2011	2020	2030
Hard Coal				22.917.0	26.291.0		
Brown Coal							
Oil							
Natural Gas							
Derived Gas							
Biomass							
Peat							
Other Fuels							
Thermal Total				22.917.0	26.291.0		

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 certain Energy Community countries. Data are gathered on an historical basis (from 1980 to 2011) 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 (SO₂) and nitrogen oxides (NO₄): acidifying gases which cause acid rain and have harmful effects on ecosystems and human health.

AUSTRIA (AT)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	109.9	15.1	3.1				
Nitrogen Oxides NO _x	26.5	14.5	7.7				
Carbon Dioxide CO ₂	11,550	12,400	9,700	10,552	10,500	7,720	7,296

BELGIUM (BE)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	352	95.15	60.51	0.46	0.64		
Nitrogen Oxides NO _x	84	60.5	42.33	3.68	3.51		
Carbon Dioxide CO ₂	31,604	23,504	23,259	21,235	17,358	22,000	29,000

BULGARIA (BG)

· · ·							
	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Sulphur Dioxide SO ₂	16	29	30.6	20.3	21.16	2	3
Nitrogen Oxides NO _x	2.6	4.1	4.6	6.3	6.07	2.3	2.8
Carbon Dioxide CO ₂	964	1,667	2,836	3,867	3,730	2,821	3,381

CZECH REPUBLIC (cz)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂		400	62	54	51.3	53	43
Nitrogen Oxides NO _x		58	63	50	47.5	52.8	41.35
Carbon Dioxide CO ₂		42,000	55,750	40,000	38,000	40,500	40,000

GERMANY (DE)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	3660	2040	163	130	136	98	
Nitrogen Oxides NO _x	990	385	182	220	224	188	
Carbon Dioxide CO ₂	327,000	289,100	279,000	268,000	268,000	225,000	

Note: Data cover only the public supply sector.

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

DENMARK (DK)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	207	119	14	4	3	7,6	7
Nitrogen Oxides NO _x	121	90	47	18	18	16,1	16
Carbon Dioxide CO ₂	22,868	27,337	21,099	16,715	15,513	18,000	18,000

ESTONIA (EE)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂		175.89	74.45			2	
Nitrogen Oxides NO _x		16.31	10.32			9.6	
Carbon Dioxide CO ₂		20,158	10,866			8,550	

SPAIN (ES)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	1,835	1,442	1,063	92	138	112	100
Nitrogen Oxides NO _x	225	210	281	75	122	51	36
Carbon Dioxide CO ₂	59,187	64,331	89,678	58,891	72,270	70,929	61,527

FINLAND (FI)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	112	52	13.9	15.7			
Nitrogen Oxides NO _x	54	38	19.4	26.5			
Carbon Dioxide CO ₂	13,000	10,000	11,700	17,800	13,300	12,100	8,600

FRANCE (FR)

	1980	1990	2000	2010	2011	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	34,206	27,267	28,000	23,800

UNITED KINGDOM (υκ)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	3,013	2,731	826.07	136		67.9	
Nitrogen Oxides NO _x	861.58	777.72	349.23	260.8		146.3	
Carbon Dioxide CO ₂	220,080	203,196	158,408	156,195	156,438	79,166	51,381

<u>+</u>= **GREECE** (GR) 1980 1990 2000 2010 Sulphur Dioxide SO₂ 272 343 165 Nitrogen Oxides NO_x 61 99 110 Carbon Dioxide CO₂ 40,580 51,450 47,167 49,417 38,000

HUNGARY (HU)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	654	439	356	8.7	12.2	8	5
Nitrogen Oxides NO _x		30	30	12.89	11.7	13	15
Carbon Dioxide CO ₂			20,595	13,040	11,887	11,000	9,000

2030

Environment

TABLE 5.2.1

EMISSIONS FROM ELECTRICITY GENERATION (KILOTONS)

IRELAND (IE)

	1980	1990	2000	2010	2011	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	2010	2011	2020	2030
Sulphur Dioxide SO ₂	1,510	855	438	44	40		
Nitrogen Oxides NO _x	405	490	255	82	75		
Carbon Dioxide CO ₂	96,300	123,400	134,000	118,000	118,000		

LITHUANIA (LT)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	96.4	40.9	4.9	3.3	3.1	3.3	3.3
Nitrogen Oxides NO _x	15.3	13.6	2.5	6.4	5.6	8.6	9.9
Carbon Dioxide CO ₂	7,880	6,054	1,053	2,177	1,890	2,473	2,911

LUXEMBOURG (LU) 1980 1990 2000 2010 2030 Sulphur Dioxide SO₂ 0.14 0.02 0.0057 0.009 0.009 Nitrogen Oxides NO_x 0.3 0.45 0.62 0.697 0.697 Carbon Dioxide CO₂ 840 1,040 1,056 1,019 1,019

LATVIA (LV)

	1980	1990	2000	2010	2011	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	2.5	2.4	3.6	4.1
Carbon Dioxide CO ₂	840	900	570	750	720	1,300	1,500

• MALTA (мт)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂			25.1	7.994	7.773		
Nitrogen Oxides NO _x			4.7	4.902	3.958		
Carbon Dioxide CO ₂			1,682	1,878.3	1,932		

NETHERLANDS (NL)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	196	45	16	10	10	12	11
Nitrogen Oxides NO _x	84	73	43	32	32	32	30
Carbon Dioxide CO ₂	35,400	38,600	42,509	59,500	60,000	75,000	80,000

POLAND (PL) 1980 1990 2000 2010 2030 Sulphur Dioxide SO₂ 1770 1450 739.4 336.5 331.8 292 297.1 Nitrogen Oxides NO_x 362 221 212.4 209.6 200.1 208.3 Carbon Dioxide CO₂ 138,300 127,271.9 132,153.9 135,920 117,650 118,452

TABLE 5.2.1 Emissions from Electricity Generation (kilotons)

PORTUGAL (PT)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	92	184	149.29	14.78	12.86	5.61	1.51
Nitrogen Oxides NO _x	20	63	72.71	41.69	34.69	23.59	18.62
Carbon Dioxide CO ₂	5,080	15,000	20,097.38	14,248.3	16,559.49	12,813.65	11,702.22

ROMANIA (RO)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	530	607	486	198		34	27
Nitrogen Oxides NO _x	126	134	79	48		26	28
Carbon Dioxide CO ₂	39,255	43,701	25,803	22,497		17,547	16,989

SWEDEN (SE)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	65.98	9.54	2.67	4.83	6.83	3.55	3.61
Nitrogen Oxides NO _x	9.76	3.46	2.99	6.42	5,63	6.27	6.37
Carbon Dioxide CO ₂	4,270.67	1,458.12	2,006.16	2,886.35	2,339.15	1,860.32	1,860.32

SLOVENIA (SI)

	1980	1990	2000	2010	2011	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 (sĸ)

	1980	1990	2000	2010	2011	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 (сн)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂							
Nitrogen Oxides NO _x							
Carbon Dioxide CO ₂				1,900	1,800		

NORWAY (NO)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	0.1	0.2	0.3	1.4	1.3	0.5	0.5
Nitrogen Oxides NO _x	0.3	0.4	0.6	3	2.8	1.2	1.2
Carbon Dioxide CO ₂	264	340	546	2,345	2,200	900	900

C· TURKEY (TR)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂	239	790	1,399	413.8	621.3		
Nitrogen Oxides NO _x	35	89	209	316.1	263.6		
Carbon Dioxide CO ₂	11,896	30,325	72,089	106,824	117,359		

TABLE 5.2.1

EMISSIONS FROM ELECTRICITY GENERATION (KILOTONS)

BOSNIA HERZEGOVINA (BA)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂		375.88	82.34	342.3		56.97	
Nitrogen Oxides NO _x		48.06	18.19	26.1		5.72	
Carbon Dioxide CO ₂		15,254.06	4,054	9,743			

SERBIA (RS)

	1980	1990	2000	2010	2011	2020	2030
Sulphur Dioxide SO ₂		296.2		326	370		
Nitrogen Oxides NO _x		86.8		43	53		
Carbon Dioxide CO ₂		36,202		27,190	30,523		

6. EARLY POWER STATISTICS - 2012

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 certain Energy Community countries, in 2012. The capacity is expressed in MW.

AUSTRIA (AT)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	6,326	7,079	7,300
of which Coal	MW	1,226	1,171	1,170
of which Gas	MW	4,298	5,102	5,100
Renewables	MW	6,891	14,908	7,400
of which Hydro	MW			5,350
of which Wind	MW	1,013	1,106	1,350
of which PV	MW	35	72	35
Pumped Hydro	MW	7,523	7,765	7,700
Total	MW	21,400	22,600	23,000

BELGIUM (BE)

		2010	2011	2012
Nuclear	MW	5,926	5,927	5,926
Fossil Fired	MW	7,126	7,988	7,427
of which Coal	MW	760	760	645
of which Gas	MW	5,601	6,074	6,407
Renewables	MW	2,886	3,558	5,340
of which Hydro	MW	118	119	119
of which Wind	MW	912	1,069	1,406
of which PV	MW	904	1,391	2,690
Pumped Hydro	MW	1,307	1,307	1,307
Total	MW	18,322	20,098	20,019

TOTAL INSTALLED CAPACITY

BULGARIA (bg)

		2010	2011	2012
Nuclear	MW	1,900	2,000	
Fossil Fired	MW	5,269	6,403	
of which Coal	MW	1,151	1,761	
of which Gas	MW	789	509	
Renewables	MW	513	2,887	
of which Hydro	MW		2	
of which Wind	MW	488	516	
of which PV	MW			
Pumped Hydro	MW	938	938	
Total	MW	10,406	12,228	

🛫 CYPRUS (cy)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	1,438	1,553	1,598
of which Coal	MW			
of which Gas	MW			
Renewables	MW	95	136	173
of which Hydro	MW			
of which Wind	MW	82	116	148
of which PV	MW			
Pumped Hydro	MW			
Total	MW	1,533	1,689	1,770

CZECH REPUBLIC (cz)

		2010	2011	2012
Nuclear	MW	3,900	3,970	4,040
Fossil Fired	MW	11,793	11,889	11,915
of which Coal	MW	10,769	10,788	10,644
of which Gas	MW	1,024	1,102	1,271
Renewables	MW	3,233	3,244	3,418
of which Hydro	MW	1,056	1,055	1,069
of which Wind	MW	218	219	263
of which PV	MW	1,959	1,971	2,086
Pumped Hydro	MW	1,147	1,147	1,147
Total	MW	20,073	20,250	20,520

GERMANY (DE)

		2010	2011	2012
Nuclear	MW	20,477	12,068	12,068
Fossil Fired	MW	83,729	83,373	85,304
of which Coal	MW	27,890	27,240	26,667
of which Gas	MW	24,902	25,700	25,640
Renewables	MW	56,413	66,063	75,359
of which Hydro	MW	4,062	4,180	5,650
of which Wind	MW	27,204	28,752	31,308
of which PV	MW	17,488	24,785	32,389
Pumped Hydro	MW	5,710	5,710	5,710
Total	MW	166,329	167,214	178,441

TOTAL INSTALLED CAPACITY

DENMARK (DK)

		2010	2011	2012
Nuclear	MW			
Fossil Fired	MW	9,271	9,241	4,899
of which Coal	MW	4,899	4,899	4,899
of which Gas	MW	2,917	2,920	2,898
Renewables	MW	4,160	4,511	4,779
of which Hydro	MW	9	9	0
of which Wind	MW	3,802	3,950	4,166
of which PV	MW	0	0	0
Pumped Hydro	MW			
Total	MW	13,420	13,437	14,021

ESTONIA (EE)

		2010	2011	2012
Nuclear	MW	0		
Fossil Fired	MW	2,931	2,994	
of which Coal	MW	0		
of which Gas	MW	184		
Renewables	MW	209		
of which Hydro	MW			
of which Wind	MW	149		
of which PV	MW			
Pumped Hydro	MW	0		
Total	MW	3,105	3,242	

SPAIN (ES)

		2010	2011	2012
Nuclear	MW	7,483	7,535	7,550
Fossil Fired	MW	47,488	48,464	47,283
of which Coal	MW	9,500	9,500	10,922
of which Gas	MW	30,243	31,250	30,656
Renewables	MW	38,489	40,406	43,395
of which Hydro	MW	13,732	13,713	13,753
of which Wind	MW	19,314	20,381	22,053
of which PV	MW	3,615	4,090	4,402
Pumped Hydro	MW	4,836	4,836	4,836
Total	MW	98,298	101,241	103,064

FINLAND (FI)

		2010	2011	2012
Nuclear	MW	2,730	2,752	2,752
Fossil Fired	MW	6,890	6,324	8,529
of which Coal	MW	2,699	3,303	3,303
of which Gas	MW	2,842	1,669	1,669
Renewables	MW	5,679	5,253	5,442
of which Hydro	MW	3,084	3,111	3,139
of which Wind	MW	197	199	288
of which PV	MW	0	0	0
Pumped Hydro	MW	0	0	0
Total	MW	16,740	16,234	16,723

TOTAL INSTALLED CAPACITY

FRANCE (FR)

		2010	2011	2012
Nuclear	MW	63,130	63,130	63,130
Fossil Fired	MW	27,399	27,813	27,808
of which Coal	MW	7,942	7,942	7,914
of which Gas	MW	8,963	9,539	10,520
Renewables	MW	28,879	31,608	33,533
of which Hydro	MW	21,015	21,131	21,224
of which Wind	MW	5,764	6,692	7,449
of which PV	MW	878	2,503	3,515
Pumped Hydro	MW	4,375	4,263	4,183
Total	MW	123,783	126,814	128,680

UNITED KINGDOM (υκ)

		2010	2011	2012
Nuclear	MW	10,865	10,663	9,739
Fossil Fired	MW	71,120	68,265	56,335
of which Coal	MW	23,085	23,072	22,081
of which Gas	MW	44,397	41,555	31,476
Renewables	MW	9,215	12,264	15,474
of which Hydro	MW	1,641	1,676	1,688
of which Wind	MW	5,386	6,488	8,871
of which PV	MW	94	993	1,655
Pumped Hydro	MW	2,744	2,744	2,744
Total	MW	93,944	93,937	84,292

GREECE (GR)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	10,859	11,500	11,524
of which Coal	MW	4,682	4,456	4,456
of which Gas	MW	3,745	4,575	4,575
Renewables	MW	4,057	4,817	5,861
of which Hydro	MW	2,516	2,524	2,532
of which Wind	MW	1,302	1,642	1,753
of which PV	MW	198	606	1,531
Pumped Hydro	MW	699	699	699
Total	MW	15,615	17,016	18,084

HUNGARY (HU)

		2010	2011	2012
Nuclear	MW	1,892	1,892	1,892
Fossil Fired	MW	6,181	6,860	6,853
of which Coal	MW	1,247	398	1,236
of which Gas	MW	4,592	4,342	4,346
Renewables	MW	680	745	825
of which Hydro	MW	50	50	52
of which Wind	MW	240	325	324
of which PV	MW	0	0	0
Pumped Hydro	MW	0	0	0
Total	MW	8,753	9,497	9,570

TOTAL INSTALLED CAPACITY

IRELAND (IE)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	5,277	6,325	9,301
of which Coal	MW	847	847	1,331
of which Gas	MW	3,300	3,300	5,468
Renewables	MW	1,400	1,763	2,332
of which Hydro	MW		222	211
of which Wind	MW	1,400	1,557	2,109
of which PV	MW		0	0
Pumped Hydro	MW	292	292	292
Total	MW	7,553	8,618	11,925

ITALY (IT)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	72,397	73,251	73,594
of which Coal	MW			
of which Gas	MW			
Renewables	MW	26,230	37,339	42,948
of which Hydro	MW	13,977	14,193	14,299
of which Wind	MW	5,794	6,918	7,949
of which PV	MW	3,470	12,773	16,350
Pumped Hydro	MW	7,544	7,544	7,544
Total	MW	106,489	118,443	124,087

LITHUANIA (LT)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	2,525	2,574	2,691
of which Coal	MW	0	0	0
of which Gas	MW	2,377	2,426	2,547
Renewables	MW	321	363	452
of which Hydro	MW	116	116	116
of which Wind	MW	161	188	274
of which PV	MW	0	0	8
Pumped Hydro	MW	760	760	760
Total	MW	3,606	3,687	3,903

LUXEMBOURG (LU)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	505	505	505
of which Coal	MW	0	0	0
of which Gas	MW	505	505	505
Renewables	MW	95	95	185
of which Hydro	MW			38
of which Wind	MW	50	50	51
of which PV	MW	25	30	90
Pumped Hydro	MW	1,096	1,096	1,096
Total	MW	1,728	1,728	1,780

TOTAL INSTALLED CAPACITY

LATVIA (LV)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	867	856	951
of which Coal	MW	0	0	0
of which Gas	MW	837	856	951
Renewables	MW	1,633	1,674	1,707
of which Hydro	MW	1,576	1,576	1,586
of which Wind	MW	31	36	60
of which PV	MW	0	0	0
Pumped Hydro	MW	0	0	0
Total	MW	2,500	2,530	2,658

• **МАLTA** (мт)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	571	571	620
of which Coal	MW	0	0	0
of which Gas	MW	0	0	0
Renewables	MW	0	5	16
of which Hydro	MW	0	0	0
of which Wind	MW	0	0	
of which PV	MW	0	5	15
Pumped Hydro	MW	0	0	0
Total	MW	571	576	636

NETHERLANDS (NL)

		2010	2011	2012
Nuclear	MW	485	485	485
Fossil Fired	MW	22,941	24,153	24,314
of which Coal	MW	4,157	4,157	4,157
of which Gas	MW	17,810	19,022	20,157
Renewables	MW	3,144	3,356	3,349
of which Hydro	MW	38	38	38
of which Wind	MW	2,241	2,316	2,431
of which PV	MW	78	88	200
Pumped Hydro	MW	0	0	0
Total	MW	26,608	28,033	28,148

POLAND (PL)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	29,282	29,985	29,420
of which Coal	MW	20,169	20,026	28,531
of which Gas	MW	1,022	1,011	889
Renewables	MW	1,778	2,605	3,749
of which Hydro	MW	553	558	580
of which Wind	MW	1,096	1,782	2,562
of which PV	MW	0	1	1
Pumped Hydro	MW	1,772	1,772	1,764
Total	MW	32,833	34,361	34,933
table 6.1.1

TOTAL INSTALLED CAPACITY

PORTUGAL (PT)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	9,087	9,249	8,445
of which Coal	MW	1,756	1,756	1,756
of which Gas	MW	4,501	4,684	4,742
Renewables	MW	8,670	9,602	9,844
of which Hydro	MW	4,016	4,420	4,430
of which Wind	MW	3,906	4,367	4,520
of which PV	MW	132	174	239
Pumped Hydro	MW	1,035	1,035	1,289
Total	MW	18,792	19,887	19,578

ROMANIA (RO)

		2010	2011	2012
Nuclear	MW	1,300	1,300	1,300
Fossil Fired	MW	9,166	8,901	9,460
of which Coal	MW	5,459	5,391	5,064
of which Gas	MW	3,707	3,510	4,396
Renewables	MW	6,588	7,175	7,997
of which Hydro	MW	6,087	6,145	6,196
of which Wind	MW	479	1,006	1,753
of which PV	MW	0	0	21
Pumped Hydro	MW	0	0	0
Total	MW	17,054	17,376	18,757

SWEDEN (SE)

		2010	2011	2012
Nuclear	MW	9,150	9,363	9,363
Fossil Fired	MW	5,035	4,793	4,666
of which Coal	MW	130	130	130
of which Gas	MW	1,005	1,005	1,005
Renewables	MW	21,516	22,291	23,354
of which Hydro	MW	16,200	16,197	16,203
of which Wind	MW	2,163	2,899	3,745
of which PV	MW			24
Pumped Hydro	MW	0	0	
Total	MW	35,701	36,447	37,383

SLOVENIA (SI)

		2010	2011	2012
Nuclear	MW	656	696	
Fossil Fired	MW	1,482	1,280	
of which Coal	MW			
of which Gas	MW	381		
Renewables	MW			
of which Hydro	MW	905	905	
of which Wind	MW	0	0	
of which PV	MW	45	116	
Pumped Hydro	MW	0	180	
Total	MW	3,146	3,066	

table 6.1.1

TOTAL INSTALLED CAPACITY

SLOVAKIA (sκ)

		2010	2011	2012
Nuclear	MW	1,820	1,940	1,940
Fossil Fired	MW	2,614	2,896	3,190
of which Coal	MW	1,214	1,214	1,039
of which Gas	MW	1,305	1,429	1,540
Renewables	MW	2,430	2,400	2,385
of which Hydro	MW	1,562	1,562	1,618
of which Wind	MW	3	3	3
of which PV	MW	194	507	524
Pumped Hydro	MW	916	916	916
Total	MW	7,780	8,152	8,431

+ SWITZERLAND (сн)

		2010	2011	2012
Nuclear	MW	3,253	3,278	
Fossil Fired	MW	770	750	
of which Coal	MW			
of which Gas	MW			
Renewables	MW			
of which Hydro	MW	11,841	11,888	
of which Wind	MW	42	45	
of which PV	MW	111	192	
Pumped Hydro	MW	1,839	1,839	
Total	MW	17,727	18,101	

NORWAY (NO)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	915	1,005	1,005
of which Coal	MW	0		
of which Gas	MW	915	1,005	1,005
Renewables	MW	30,375	30,745	31,395
of which Hydro	MW	29,945	30,230	30,695
of which Wind	MW	430	515	700
of which PV	MW			
Pumped Hydro	MW			
Total	MW	31,290	31,750	32,400

C TURKEY (TR)

		2010	2011	2012	
Nuclear	MW	0	0	0	
Fossil Fired	MW	32,172	33,805	35,029	
of which Coal	MW	3,751	4,376	13,186	
of which Gas	MW	18,420	19,722	20,435	
Renewables	MW	17,352	19,106	22,042	
of which Hydro	MW	15,831	17,137	19,620	
of which Wind	MW	1,320	1,729	2,261	
of which PV	MW	0	0	0	
Pumped Hydro	MW	0	0	0	
Total	MW	49,524	52,911	57,072	

TABLE 6.1.1

TOTAL INSTALLED CAPACITY

BOSNIA HERZEGOVINA (BA)					
		2010	2011	2012	
Nuclear	MW	0	0		
Fossil Fired	MW	1,778	1,745		
of which Coal	MW		1,745		
of which Gas	MW	0	0		
Renewables	MW	0			
of which Hydro	MW	1,943	1,943		
of which Wind	MW	0			
of which PV	MW				
Pumped Hydro	MW	440	440		
Total	MW	3,834	3,688		

CROATIA (HR)

		2010	2011	2012
Nuclear	MW	0		
Fossil Fired	MW	1,683	1,683	
of which Coal	MW			
of which Gas	MW			
Renewables	MW			
of which Hydro	MW			
of which Wind	MW			
of which PV	MW			
Pumped Hydro	MW	257	257	
Total	MW	4,164	4,164	

SERBIA (RS)

		2010	2011	2012
Nuclear	MW	0	0	0
Fossil Fired	MW	4,322	4,322	4,322
of which Coal	MW	0	0	3,963
of which Gas	MW	359	359	359
Renewables	MW	2,249	2,249	2,249
of which Hydro	MW	2,249	2,249	2,249
of which Wind	MW	0	0	0
of which PV	MW	0	0	0
Pumped Hydro	MW	614	614	614
Total	MW	7,185	7,185	7,185

UKRAINE (UA)

		2010	2011	2012
Nuclear	MW	13,835	13,835	13,835
Fossil Fired	MW	33,774	33,702	33,891
of which Coal	MW	27,347	27,272	27,408
of which Gas	MW	6,427	6,430	64,828
Renewables	MW	4,691	4,912	5,190
of which Hydro	MW	4,597	4,604	4,610
of which Wind	MW	86	121	263
of which PV	MW	8	188	318
Pumped Hydro	MW	862	862	862
Total	MW	53,162	53,311	53,778

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 certain Energy Community countries in 2012. Electricity generation is expressed in TWh.

AUSTRIA (AT)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	21	20	20
of which Coal	ТѠн	5	5	4
of which Gas	ТѠн	14	12	10
Renewables	ТѠн	35	44	33
of which Hydro	ТѠн			27
of which Wind	ТѠн	2	2	2
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	13	13	16
Total	ТѠн	67	63	69

BELGIUM (BE)

		2010	2011	2012
Nuclear	ТWн	46	46	38
Fossil Fired	ТѠн	38	31	25
of which Coal	ТѠн	6	5	5
of which Gas	ТѠн	31	25	19
Renewables	ТѠн	7	9	11
of which Hydro	ТѠн	0	0	0
of which Wind	ТѠн	1	2	3
of which PV	ТѠн	1	1	2
Pumped Hydro	ТѠн	1	1	1
Total	ТѠн	91	85	75

BULGARIA (bg)

		2010	2011	2012
Nuclear	ТѠн	14	15	14
Fossil Fired	ТѠн	22	26	25
of which Coal	ТѠн	20	24	
of which Gas	ТѠн	2	2	
Renewables	ТѠн	6	4	1
of which Hydro	ТѠн	5	3	4
of which Wind	ТѠн	0	1	
of which PV	ТѠн	0	0	
Pumped Hydro	ТѠн	1	1	1
Total	ТѠн	47	46	46

ELECTRICITY GENERATION

🛫 CYPRUS (cy)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	5	5	4
of which Coal	ТѠн			
of which Gas	ТѠн			
Renewables	ТѠн	0	0	0
of which Hydro	ТWн			
of which Wind	ТѠн	0	0	0
of which PV	ТѠн			
Pumped Hydro	ТWн			
Total	ТWн	5	5	5

CZECH REPUBLIC (cz)

		2010	2011	2012
Nuclear	ТѠн	26	27	29
Fossil Fired	ТѠн	48	49	47
of which Coal	ТѠн	5	5	4
of which Gas	ТѠн	3	4	4
Renewables	ТѠн	4	3	5
of which Hydro	ТѠн	3		2
of which Wind	ТѠн	0	0	0
of which PV	ТѠн	1	2	2
Pumped Hydro	ТѠн	1	3	1
Total	Т₩н	79	81	81

GERMANY (DE)

		2010	2011	2012
Nuclear	ТѠн	133	102	94
Fossil Fired	ТѠн	350	345	344
of which Coal	ТѠн	107	104	108
of which Gas	ТѠн	87	84	68
Renewables	ТѠн	105	124	138
of which Hydro	ТѠн	21	17	21
of which Wind	ТѠн	38	49	46
of which PV	ТѠн	12	20	28
Pumped Hydro	ТѠн	6	6	6
Total	Т₩н	595	577	583

DENMARK (DK)

		2010	2011	2012		
Nuclear	ТѠн					
Fossil Fired	ТѠн	24	20	17		
of which Coal	ТѠн	16	14	10		
of which Gas	ТѠн	8	6	6		
Renewables	ТѠн	12	15	12		
of which Hydro	ТѠн					
of which Wind	ТѠн	8	10	10		
of which PV	ТѠн					
Pumped Hydro	ТѠн	0				
Total	ТѠн	37	35	29		

ELECTRICITY GENERATION

ESTONIA (EE)

		2010	2011	2012
Nuclear	ТѠн	0		
Fossil Fired	Т₩н	12		
of which Coal	Т₩н	0		
of which Gas	ТѠн	0		
Renewables	ТѠн	1		
of which Hydro	ТѠн			
of which Wind	ТѠн	0		
of which PV	ТѠн			
Pumped Hydro	ТѠн	0		
Total	ТѠн	13		

SPAIN (ES)

		2010	2011	2012
Nuclear	ТWн	60	55	59
Fossil Fired	ТWн	131	136	138
of which Coal	ТѠн	20	36	54
of which Gas	ТѠн	92	79	48
Renewables	ТѠн	98	87	87
of which Hydro	ТѠн	42	30	23
of which Wind	ТѠн	43	41	48
of which PV	ТѠн	6	7	8
Pumped Hydro	ТѠн	3	2	4
Total	Т₩н	292	280	288

FINLAND (FI)

		2010	2011	2012
Nuclear	ТѠн	22	22	22
Fossil Fired	ТѠн	25	19	19
of which Coal	ТѠн	14	9	7
of which Gas	ТѠн	11	9	6
Renewables	ТѠн	23	23	27
of which Hydro	ТѠн	13	12	17
of which Wind	ТѠн	0	1	1
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	Т₩н	77	70	68

FRANCE (FR)

		2010	2011	2012
Nuclear	ТѠн	408	421	405
Fossil Fired	Т₩н	60	52	48
of which Coal	ТѠн	19	13	18
of which Gas	ТѠн	30	31	23
Renewables	ТѠн	77	65	83
of which Hydro	Т₩н	62	45	58
of which Wind	ТѠн	10	12	15
of which PV	Т₩н	1	2	4
Pumped Hydro	ТѠн	6	6	6
Total	ТѠн	550	543	541

ELECTRICITY GENERATION

UNITED KINGDOM (UK)

		2010	2011	2012
Nuclear	ТѠн	56	63	64
Fossil Fired	Т₩н	281	252	234
of which Coal	Т₩н	102	103	136
of which Gas	ТѠн	168	173	98
Renewables	ТѠн	25	33	26
of which Hydro	ТѠн	4	6	5
of which Wind	Т₩н	10	16	19
of which PV	Т₩н	0	0	1
Pumped Hydro	ТѠн	3	3	3
Total	ТѠн	366	334	326

GREECE (GR)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	43	47	47
of which Coal	ТѠн	0	0	28
of which Gas	Т₩н	11	15	14
Renewables	ТѠн	11	8	10
of which Hydro	Т₩н	7	4	4
of which Wind	Т₩н	3	3	4
of which PV	Т₩н	0	1	2
Pumped Hydro	ТѠн	0	0	0
Total	ТWн	54	56	57

HUNGARY (HU)

		2010	2011	2012
Nuclear	ТѠн	15	15	15
Fossil Fired	ТWн	17	17	15
of which Coal	ТѠн	1	1	6
of which Gas	ТѠн	11	11	9
Renewables	Т₩н	2	2	2
of which Hydro	ТѠн	0	0	0
of which Wind	ТѠн	1	1	1
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	ТWн	35	34	32

IRELAND (IE)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	Т₩н	21	21	27
of which Coal	Т₩н	4	4	7
of which Gas	Т₩н	17	7	16
Renewables	Т₩н	2	3	4
of which Hydro	Т₩н		1	1
of which Wind	ТѠн	2	3	3
of which PV	ТѠн		0	0
Pumped Hydro	ТѠн	0	1	0
Total	ТѠн	32	24	31

ELECTRICITY GENERATION

ITALY (IT)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	211	207	193
of which Coal	ТѠн	36	41	0
of which Gas	ТѠн	148	141	125
Renewables	ТѠн	76	82	90
of which Hydro	ТѠн	51	45	41
of which Wind	ТѠн	9	10	13
of which PV	ТѠн	2	11	18
Pumped Hydro	ТѠн	3	2	7.5
Total	ТѠн	291	291	285

LITHUANIA (LT)

		2010	2011	2012
Nuclear	ТWн	0	0	0
Fossil Fired	ТѠн	4	3	3
of which Coal	ТWн	0	0	0
of which Gas	ТWн	4	3	3
Renewables	ТWн	1	1	1
of which Hydro	ТWн	1	1	0
of which Wind	ТWн	0	1	1
of which PV	ТWн	0	0	0
Pumped Hydro	ТWн	1	1	1
Total	Т₩н	5	5	5

LUXEMBOURG (LU)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	3	2	3
of which Coal	ТѠн	0	0	0
of which Gas	ТѠн	3	2	3
Renewables	ТWн	0	0	0
of which Hydro	ТѠн			
of which Wind	ТѠн	0	0	0
of which PV	ТѠн			
Pumped Hydro	ТWн	1	1	1
Total	ТWн	4	4	4

LATVIA (LV)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	3	3	2
of which Coal	ТѠн	0	0	0
of which Gas	ТѠн	3	3	2
Renewables	ТѠн	4	3	4
of which Hydro	ТѠн	3	3	4
of which Wind	ТѠн	0	0	0
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	Т₩н	6	6	6

ELECTRICITY GENERATION

MALTA (MT)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	Т₩н	2	2	2
of which Coal	Т₩н	0	0	0
of which Gas	ТѠн	0	0	0
Renewables	ТѠн	0	0	0
of which Hydro	ТѠн	0	0	0
of which Wind	ТѠн	0	0	
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	Т₩н	2	2	2

NETHERLANDS (NL)

		2010	2011	2012
Nuclear	ТѠн	4	4	3
Fossil Fired	ТѠн	100	94	82
of which Coal	ТѠн	22	21	23
of which Gas	ТѠн	75	69	60
Renewables	ТѠн	10	11	12
of which Hydro	ТѠн	0	0	0
of which Wind	ТѠн	4	5	5
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	ТѠн	114	109	98

POLAND (PL)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	134	137	134
of which Coal	ТѠн	129	132	129
of which Gas	ТѠн	5	5	5
Renewables	ТѠн	11	12	11
of which Hydro	ТѠн	4	3	1
of which Wind	ТѠн	2	3	3
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	2	1	1
Total	Т₩н	144	149	146

PORTUGAL (PT)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	Т₩н	24	26	24
of which Coal	ТѠн	7	9	12
of which Gas	ТѠн	15	15	10
Renewables	ТѠн	27	23	19
of which Hydro	ТѠн	14	10	5
of which Wind	ТѠн	9	9	10
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	2	2	2
Total	ТѠн	53	51	45

ELECTRICITY GENERATION

ROMANIA (RO)

		2010	2011	2012
Nuclear	ТѠн	11	11	11
Fossil Fired	ТѠн	25	30	29
of which Coal	ТѠн	19	22	20
of which Gas	ТѠн	7	8	8
Renewables	ТѠн	21	16	15
of which Hydro	ТѠн	20	15	12
of which Wind	ТѠн	0	1	3
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	ТѠн	57	57	54

SWEDEN (SE)

		2010	2011	2012
Nuclear	ТѠн	56	58	61
Fossil Fired	ТѠн	6	5	3
of which Coal	ТѠн	1	1	1
of which Gas	ТѠн	2	2	2
Renewables	ТѠн	83	84	98
of which Hydro	ТѠн	67	67	78
of which Wind	ТѠн	4	6	7
of which PV	ТѠн			
Pumped Hydro	ТѠн	0	0	
Total	Т₩н	145	148	162

SLOVENIA (SI)

		2010	2011	2012
Nuclear	ТѠн	6		
Fossil Fired	ТѠн	6		
of which Coal	ТѠн	1		
of which Gas	ТѠн	1		
Renewables	ТѠн	0		
of which Hydro	ТѠн			
of which Wind	ТѠн	0		
of which PV	ТѠн			
Pumped Hydro	ТѠн			
Total	ТѠн	15	14	

SLOVAKIA (sκ)

		2010	2011	2012
Nuclear	ТѠн	14	14	14
Fossil Fired	ТѠн	6	6	6
of which Coal	ТѠн	3	3	3
of which Gas	ТѠн	3	3	3
Renewables	ТѠн	6	5	5
of which Hydro	ТѠн	5	4	4
of which Wind	ТWн	0	0	0
of which PV	ТWн	0	0	1
Pumped Hydro	ТѠн	0	0	0
Total	Т₩н	26	27	27

TABLE 6.2.1

ELECTRICITY GENERATION

+ SWITZERLAND (сн)

		2010	2011	2012
Nuclear	ТѠн	25	26	24
Fossil Fired	Т₩н	2	2	2
of which Coal	Т₩н			
of which Gas	ТѠн			
Renewables	ТѠн	36	33	39
of which Hydro	Т₩н	35	31	37
of which Wind	Т₩н	0	0	
of which PV	ТѠн			
Pumped Hydro	ТѠн	2	2	2
Total	ТWн	66	63	68

NORWAY (NO)

		2010	2011	2012
Nuclear	ТWн	0	0	0
Fossil Fired	ТѠн	5	5	4
of which Coal	ТѠн			
of which Gas	ТѠн	5	5	4
Renewables	ТѠн	119	123	144
of which Hydro	ТѠн	118	122	142
of which Wind	ТѠн	1	1	2
of which PV	ТѠн			
Pumped Hydro	ТѠн	1	2	
Total	ТѠн	124	128	148

C TURKEY (TR)

		2010	2011	2012
Nuclear	ТWн	0	0	0
Fossil Fired	ТѠн	148	161	175
of which Coal	ТѠн	16	24	66
of which Gas	ТѠн	96	102	103
Renewables	ТѠн	55	57	65
of which Hydro	ТѠн	51	51	58
of which Wind	ТѠн	3	5	6
of which PV	ТѠн	0	0	0
Pumped Hydro	ТѠн	0	0	0
Total	ТWн	203	218	239

BOSNIA HERZEGOVINA (BA)

		2010	2011	2012
Nuclear	ТѠн	0	0	
Fossil Fired	ТѠн	8	10	
of which Coal	Т₩н	8	10	
of which Gas	Т₩н			
Renewables	Т₩н	8	4	
of which Hydro	Т₩н			
of which Wind	Т₩н	0	0	
of which PV	Т₩н			
Pumped Hydro	ТѠн			
Total	ТѠн	16	14	

ELECTRICITY GENERATION

CROATIA (HR)

		2010	2011	2012
Nuclear	ТѠн	0		
Fossil Fired	ТѠн	5	5	
of which Coal	ТѠн			
of which Gas	ТѠн			
Renewables	ТѠн	0		
of which Hydro	ТѠн			
of which Wind	ТѠн	0		
of which PV	ТѠн			
Pumped Hydro	ТѠн	0	0	
Total	Т₩н	15	12	

SERBIA (RS)

		2010	2011	2012
Nuclear	ТѠн	0	0	0
Fossil Fired	ТѠн	23	27	25
of which Coal	ТѠн	0	0	24
of which Gas	ТѠн	0	0	0
Renewables	ТѠн	12	9	9
of which Hydro	Т₩н	12	9	9
of which Wind	Т₩н	0	0	0
of which PV	Т₩н	0	0	0
Pumped Hydro	ТѠн	1	1	1
Total	Т₩н	36	36	35

UKRAINE (UA)

		2010	2011	2012
Nuclear	ТѠн	89	90	90
Fossil Fired	ТѠн	86	93	97
of which Coal	ТWн			
of which Gas	ТWн			
Renewables	ТѠн	13	11	11
of which Hydro	ТѠн			
of which Wind	ТѠн			
of which PV	ТѠн			
Pumped Hydro	ТѠн			
Total	ТѠн	188	194	198

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 certain Energy Community countries in 2012.

AUSTRIA (AT)

		2010	2011	2012
Pumping	ТѠн	-4.5	5.0	-5.6
Imports	ТѠн	19.9	24.9	23.3
Exports	ТѠн	17.6	16.7	20.5
Total Demand	ТѠн	65.0	65.0	65.6

BELGIUM (BE)

		2010	2011	2012
Pumping	ТѠн	18.0	1.7	1.7
Imports	ТѠн	12.4	13.2	16.8
Exports	ТѠн	11.8	10.6	6.9
Total Demand	ТѠн	90.1	87.4	79.9

BULGARIA (bg)

		2010	2011	2012
Pumping	ТѠн	0.9	1.2	
Imports	ТѠн	1.2	1.5	
Exports	ТѠн	9.6	12.1	
Total Demand	ТѠн	32.5	34.4	37.8

SCYPRUS (CY)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	ТѠн	0.0	0.0	0.0
Exports	ТѠн	0.0	0.0	0.0
Total Demand	ТѠн	4.8	5.0	4.6

CZECH REPUBLIC (cz)

		2010	2011	2012
Pumping	ТѠн	-0.8	-0.7	-0.7
Imports	ТѠн	11.1	14.1	11.6
Exports	ТѠн	26.0	31.3	28.7
Total Demand	Т₩н	59.3	58.6	58.8

GERMANY (DE)

		2010	2011	2012
Pumping	ТѠн	-8.6	-7.8	-8.2
Imports	Т₩н	42.2	49.7	44.2
Exports	ТѠн	59.9	56.0	67.3
Total Demand	Т₩н	568.5	562.9	551.2

DENMARK (DK)

		2010	2011	2012	
Pumping	ТѠн				
Imports	ТѠн	10.6	11.7	15.9	
Exports	ТѠн	12.7	11.3	11.7	
Total Demand	Т₩н	36.0	33.8	33.3	

ELECTRICITY BALANCES

ESTONIA (EE)

		2010	2011	2012
Pumping	ТѠн			
Imports	ТѠн			
Exports	ТѠн			
Total Demand	Т₩н	7.4	7.2	

SPAIN (ES)

		2010	2011	2012
Pumping	ТѠн	-4.5	-3.2	-5.0
Imports	ТѠн	5.2	7.9	7.4
Exports	ТѠн	13.5	14.0	18.9
Total Demand	ТWн	280.0	273.0	271.0

FINLAND (FI)

		2010	2011	2012	
Pumping	ТѠн	0.0	0.0	0.0	
Imports	ТѠн	15.7	17.7	19.1	
Exports	ТѠн	5.2	3.8	1.6	
Total Demand	Т₩н	87.7	84.2	85.2	

FRANCE (FR)

		2010	2011	2012
Pumping	ТѠн	-6.5	-6.8	-6.7
Imports	ТѠн	20.3	9.4	12.1
Exports	ТѠн	50.8	66.3	57.2
Total Demand	Т₩н	513.2	479.2	489.5

UNITED KINGDOM (υκ)

		2010	2011	2012
Pumping	ТѠн	3.2	2.9	3.0
Imports	ТѠн	7.1	8.7	
Exports	ТѠн	4.5	2.5	
Total Demand	Т₩н	380.2	369.8	371.9

GREECE (GR)

		2010	2011	2012	
Pumping	ТѠн	0.0	-0.4	-0.3	
Imports	Т₩н	8.5	7.2	6.0	
Exports	ТѠн	2.8	3.9	4.2	
Total Demand	ТѠн	59.2	58.6	58.4	

HUNGARY (HU)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	ТѠн	9.9	14.6	17.0
Exports	ТѠн	4.7	8.0	9.0
Total Demand	ТѠн	39.8	40.1	39.9

ELECTRICITY BALANCES

IRELAND (IE)

		2010	2011	2012	
Pumping	ТѠн		0.1	0.2	
Imports	ТѠн		2.4	2.2	
Exports	ТѠн		0.0	0.0	
Total Demand	ТWн	25.4	26.8	33.3	ĺ

ITALY (IT)

		2010	2011	2012	
Pumping	ТѠн	-4.5	-2.5	-2.6	
Imports	Т₩н	46.0	47.5	45.4	
Exports	ТШН	1.8	1.8	2.3	
Total Demand	ТWн	330.4	334.6	328.2	

LITHUANIA (LT)

		2010	2011	2012
Pumping	ТѠн	-1.0	-0.8	-0.7
Imports	ТѠн	7.1	8.7	8.6
Exports	ТѠн	1.1	2.0	1.9
Total Demand	ТѠн	10.3	10.4	10.6

LUXEMBOURG (LU)

		2010	2011	2012
Pumping	ТѠн	-1.1	-1.5	-1.6
Imports	ТѠн	6.8	7.1	6.5
Exports	ТѠн	3.0	2.7	2.4
Total Demand	ТѠн	6.7	6.6	6.8

LATVIA (LV)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	Т₩н	4.0	4.0	4.8
Exports	ТѠн	3.1	2.8	3.2
Total Demand	Т₩н	7.3	7.2	7.7

MALTA (MT)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	ТWн	0.0	0.0	0.0
Exports	ТWн	0.0	0.0	0.0
Total Demand	ТWн	2.1	2.2	2.3

NETHERLANDS (NL)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	ТѠн	15.6	20.6	32.2
Exports	ТѠн	12.8	11.5	15.0
Total Demand	Т₩н	117.1	118.2	115.1

ELECTRICITY BALANCES

POLAND (PL)

		2010	2011	2012
Pumping	ТѠн	-0.8	-0.6	-0.7
Imports	ТѠн	6.3	6.8	9.8
Exports	ТWн	7.7	12.0	12.6
Total Demand	ТWн	142.0	143.3	142.4

PORTUGAL (PT)

		2010	2011	2012
Pumping	ТѠн	-0.5	-0.7	-1.4
Imports	Т₩н	5.8	6.7	10.8
Exports	ТѠн	3.2	3.9	2.9
Total Demand	ТWн	55.0	53.3	51.5

ROMANIA (RO)

		2010	2011	2012
Pumping	ТѠн	0.3	0.2	0.1
Imports	ТѠн	1.8	2.9	4.5
Exports	ТѠн	4.7	4.8	4.3
Total Demand	Т₩н	53.4	54.9	54.4

SWEDEN (SE)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	0.0
Imports	ТѠн	14.9	12.5	13.1
Exports	ТѠн	12.9	19.7	32.7
Total Demand	Т₩н	147.0	140.3	142.5

SLOVENIA (SI)

		2010	2011	2012
Pumping	ТѠн	0.0	0.2	
Imports	ТѠн	0.7	7.0	
Exports	ТѠн	0.6	8.3	
Total Demand	ТѠн	11.7	12.4	

SLOVAKIA (sĸ)

		2010	2011	2012
Pumping	ТѠн	-0.5	-0.5	-0.3
Imports	ТѠн	7.3	11.2	13.5
Exports	ТѠн	6.3	10.5	13.1
Total Demand	ТWн	26.6	26.8	26.8

SWITZERLAND (сн)

		2010	2011	2012
Pumping	ТѠн	-2.5	-2.5	2.4
Imports	ТѠн	66.8	83.3	86.8
Exports	ТШН	66.3	80.7	89.0
Total Demand	ТWн	64.3	63.0	63.4

ELECTRICITY BALANCES

NORWAY (NO)

		2010	2011	2012
Pumping	ТѠн	0.5	1.7	1.5
Imports	ТШН	14.7	11.3	4.1
Exports	ТѠн	7.1	14.3	22.0
Total Demand	ТѠн	132.0	125.1	130.0

C· TURKEY (TR)

	2010	2011	2012	
ТѠн	0.0	0.0	0.0	
ТѠн	1.2	4.5	5.8	
ТѠн	1.9	3.6	3.0	
ТWн	202.3	218.5	241.9	
	TWн TWн TWн TWн	2010 ТWн 0.0 TWH 1.2 TWH 1.9 TWH 202.3	2010 2011 TWH 0.0 0.0 TWH 1.2 4.5 TWH 1.9 3.6 TWH 202.3 218.5	201020112012TWH0.00.00.0TWH1.24.55.8TWH1.93.63.0TWH202.3218.5241.9

BOSNIA HERZEGOVINA (BA)

		2010	2011	2012
Pumping	ТѠн	0.0	0.0	
Imports	ТѠн	3.1	4.2	
Exports	ТѠн	6.9	5.7	
Total Demand	Т₩н	12.3	12.6	12.6

CROATIA (HR)

		2010	2011	2012
Pumping	ТѠн	0.2		
Imports	ТѠн	6.8		
Exports	ТѠн	1.9		
Total Demand	ТѠн	18.0	17.6	

SERBIA (RS)

		2010	2011	2012
Pumping	ТѠн	1.0	0.8	0.9
Imports	ТѠн	5.6	6.7	5.8
Exports	ТѠн	5.9	7.0	5.4
Total Demand	Т₩н	34.6	35.0	34.1

UKRAINE (UA)

		2010	2011	2012	
Pumping	ТѠн				
Imports	ТѠн	0.0	0.0	0.1	
Exports	ТѠн	4.2	6.4	9.7	
Total Demand	Т₩н	183.7	187.5	188.4	

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.

🕂 SWITZERLAND (сн)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

More than 50% of the Swiss electricity production is hydropower, with approximately 42% production occuring in winter and 48% in summer.

There is a trend to a higher percentage of electricity demand in winter. While in 1960/61, 49.5% of the whole electricity demand was used in winter, compared to 54.9% in 2011/12.

2. COMMENTS ON MAIN LEGAL CHANGES FOR ELECTRICITY SECTOR, ON A NATIONAL LEVEL, FROM A EUROPEAN LEVEL. (YOUR PERCEPTION)

The Swiss government presented a proposal for a new energy strategy. The proposal will be discussed in parliament and is planned to enter into force in 2015.

In order to guarantee security of supply in the future, the strategy is focusing on increased energy efficiency, the expansion of use of renewable energy, and, where necessary, on fossil-fuel-based electricity production (combined heat and power plants, gas-fired combined cycle power plants) and imports. Furthermore, Switzerland's electricity networks are to be expanded without delay and energy research is to be intensified.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		The national government decided not to replace the existing power plants after the end of their life time.
Steam Thermal Units		
Gas Turbine Units		Will be used to guarantee supply security if there is a problem once no nuclear power stations are available anymore in Switzerland.
Combined Cycle Units		Will be used to guarantee supply security if there is a problem once no nuclear power stations are available anymore in Switzerland.
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		
New Technologies (e.g. Fuel Cells)		

3. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

4. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Trade with EU countries is steadily increasing (86TWh import, 89 TWh export in 2012).

CZECH REPUBLIC (cz)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

The Czech Republic has a large excess of supply over demand making it the fourth largest exporting country in the EU. However, this position will progressively weaken as the lignite generation will decrease due to the depleting fuel reserves and some lignite plant closures.

The supply is dominated by lignite and nuclear together providing 80% of the generation.

The demand has been stagnating in the last two years because of the weak economic situation. It is expected to return to a moderate growth pace once the current recession is over.

2. What are your assumptions on the evolution of co₂ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	10-20 €	20-30 €	30-50 €	> 50 €
2013	✓				
2015-2020		✓			
Beyond 2020			\checkmark		

3. COMMENTS ON MAIN LEGAL CHANGES FOR ELECTRICITY SECTOR, ON A NATIONAL LEVEL, FROM A EUROPEAN LEVEL.

The Czech government approved a significant restriction of renewable support schemes. There will be no support payments for new PV and biogas projects as of January 2014. The support of hydro and wind plants will terminate at the end of 2014. This measure still has to be approved by the Parliament.

4. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		The National Energy Strategy assumes the construction of two new nuclear blocks which should replace the gradually declining lignite generation and assure the national security of supply.
Steam Thermal Units		No new plants are considered to be built, but modernisation of some older blocks is under way.
Gas Turbine Units		No new projects expected because of the economic siutation.
Combined Cycle Units		No new projects expected because of the economic situation.
Internal Combustion Units	1	
Hydro		The potential for new projects is very limited.
Non-fuel Renewables		The development of RES will slow as the support scheme will be largely cut.
New Technologies (e.g. Fuel Cells)	1	

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Czech Republic is a net electricity exporter, selling more than 17 TWh abroad in 2012. The main partner in 2012 was Austria, closely followed by Slovakia.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

Continuous emission monitoring is used in large combustion plants with a heat output of above 50MW.

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	0-20 €	10-20 €	20-30 €	30-50 €	> 50 €
2012	1				
2015-2020	1				
Beyond 2020		1			

In 2012, CO_2 prices are lower than $10 \in$ 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. (YOUR PERCEPTION)

At both EU and national level, it is necessary to overcome the lack of stability in the regulatory framework.

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, results in imbalances in the electricity system. 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 could be minimized.

At national level, some of the main worries in regulatory issues are the following:

- The elimination of the tariff deficit. Tariff deficit is originated because access tariffs are not enough to meet all the regulated costs. Regulated costs have dramatically increased in a large extent over the recent years due to the growing support of immature solar technologies. To deal with tariff deficit, the Government have firstly introduced in 2012, indiscriminate measures for cost reduction in regulated activities such as distribution and secondly in 2013, a set of taxes: on electricity production, on certain technologies such as nuclear and hydro and on fossil fuels for electricity generation.
- 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. Back-up services must be adequately remunerated.
- The integration of regional markets.

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. The key issue in CCS is the public acceptance of CO_2 storage.
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 generation plants could be built to support intermittent RES-E.
Non-fuel Renewables		There is a favorable political support at state, regional and local level. Economic and dispatch priority support will continue.
New Technologies (e.g. Fuel Cells)		For the time being, politicians are paying special attention to electric vehicles.

4. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

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 Iberian market into 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.
- From the beginning of 2012, there is a moratorium for support schemes to new RES projects.
- In systems with a large amount of RES, incomes from energy wholesale market are not enough and this must be complement by capacity payments to remunerate back-up services.
- Need to reduce the number of customers with regulated price.

FINLAND (FI)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Electricity demand is Finland is roughly distributed to about 50% for industry and 50% to other end-use which again is rather evenly divided with services and households. Both the economic overall development and especially 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 the future. During the on-going economic downturn the industrial consumption has dropped remarkably.

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. Manufacturing industry and municipally-owned energy companies own a relatively large amount of power generation capacity and they are active in wholesale electricity markets.

Electricity is generated with multiple 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 rectors. One additional nuclear unit is under construction and will be operational in the near future. A positive political decision in principle for two new nuclear units was taken in 2010. These will be operational in the 2020's.

Conventional condensing power capacity in Finland is mainly from 1970's and part of the capacity will most probably be closed during this decade due to low profitability and the need for major environmental investments. There are no plans for new condensing power plants.

New hydro power investments are limited due to environmental protection of rivers. State aid for wind power – guaranteed price for production – will increase investments in wind power during this decade.

2. Comments on main legal changes for electricity sector, on a national level, from a european level. (your perception)

EU:

- The policy architecture for 2020 appears to lead European electricity markets in capacity, system stability and cost-competitiveness challenges with EU wide measures struggling (ETS, common electricity market) and national measures leading (support for renewables, taxation, national market reforms for capacity remuneration). This complex situation is leading to fragmentation of markets, support based energy system and poor investment environment.
- The post-2020 policies will determine the future of the power market.

Finland:

- Implementation of industrial emissions directive and poor economic environment are leading to the closures of older condensing power capacity.
- The Government prepares power plant taxation for all emissions-free generation (nuclear, wind, hydro) built before 2004 in order to compensate the effect of EU ETS on the power market.

3. 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 projects are in tendering phase and are expected to be operational in the 2020's.			
Steam Thermal Units		It is expected 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 prices are too high for expected power price levels.			
Combined Cycle Units		The same applies as above.			
Internal Combustion Units	\checkmark				
Hydro		Difficult to proceed with new hydro projects 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 and 9 TWh in 2025 are 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)	\checkmark				

4. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation.

 SO_2 and NO_x emissions are reported by the energy producers to the 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.

FRANCE (FR)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Despite the crisis and a long winter (constraining the heating plan), the power system is balanced. However, the arrival of a large quantity of German electricity from PV or wind power at very low artificial prices starts to impact the nuclear power plants activity.

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	1				
2015-2020	1				
Beyond 2020		\checkmark			

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

The main concern is about the Green Paper on regulatory framework in 2030. Can the EU escape the nightmare of interaction between the usual three targets?

4. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Extension of life for the PWRs. The French EPR expected in 2016.
Steam Thermal Units		No project.
Gas Turbine Units		A few projects.
Combined Cycle Units	\checkmark	
Internal Combustion Units		No project.
Hydro		Some development up to 3GW.
Non-fuel Renewables		Political decision is not clear. May be 10GW more until 2020.
New Technologies (e.g. Fuel Cells)		No development in the short term.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Major partners: Germany, Belgium, Italy, Switzerland and UK. France will continue to have an export position with Belgium, Italy, Switzerland, UK and with Germany during the night, but increasing importations from Germany by day and also from Spain.

6. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation.

No comment, because these kind of emissions are very low.

7. ANY OTHER COMMENTS ON THE ELECTRICITY SECTOR IN YOUR COUNTRY.

The impact of RES on the power system indicates that the implementation of a capacity market is urging.

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 $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2013	< 5			
2015-2020	< 10			
Beyond 2020	1			

3. Comments on main legal changes for electricity sector, on a national level, from a European level.

Since 2003 there is a "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 2015 onwards as a consequence of the integration of the EU electricity market. Bilateral contracts between producers and a Greek power exchange are expected to come in force.

4. COMMENTS	S ON ASSUMPTIONS	AND DRIVERS	BEHIND THE FORECASTS	ON TECHNOLOGIES
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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 until 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 2011-2012 approximately 2100 MW net capacity from CCGTs became 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 2017 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. Because of recent RES feed-in tariffs significant reduction, RES penetration is expected to be decelerated in the near future.			
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. Since mid-2011 cross-border electricity trading with Turkey also takes place.

6. Comments on the methodology used in your own country to calculate $\rm SO_2$ and $\rm NO_x$ emissions from electricity generation.

Until 2007 discontinuous measurements / emission factors were used for the calculation / estimation of PPC's SO₂ / NO_x emissions with the exemption of new Large Combustion Plants with built-in continuous measurement systems. Since 2008, all Large Combustion Plants of PPC use continuous measurements according to the Large Combustion Plants Directive (2001/80/EC). For combustion plants not falling under the scope of the LCPD, emissions are calculated using discontinuous measurements or estimated using emission factors (in certain small islands where no measurement takes place).

IRELAND (IE)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Ireland has experienced a severe recession and previous supply and demand expectations have changed substantially, with a fall in demand now leaving a strong supply – demand margin.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012	< 20			
2015-2020	Direct price likely to be in this range, but could have taxes added to it			
Beyond 2020			Very hard to say, this would seem a reasonable level to incentivise low Carbon generation	

3. COMMENTS ON MAIN LEGAL CHANGES FOR ELECTRICITY SECTOR, ON A NATIONAL LEVEL, FROM A EUROPEAN LEVEL.

The integration of the Irish Single Electricity Market (SEM) with the European target model will be a significant challenge in the years ahead, and the legal underlining of this will be a key part.

Technologies	No opinion	Comments/evidence on projects in your country		
Nuclear		Nuclear is extremely unlikely to be built in Ireland at any stage in the medium or even long term.		
Steam Thermal Units		No new coal units likely but existing ones likely to continue.		
Gas Turbine Units		Likely to fade out as new technology comes on to replace it.		
Combined Cycle Units		1 new CCGT due in 2014.		
Internal Combustion Units		Likely to fade out as new technology comes on to replace it.		
Hydro		Existing units likely to continue.		
Non-fuel Renewables		Return to stronger building seems increasingly likely.		
New Technologies (e.g. Fuel Cells)		Some Tidal and Wave possible post 2020.		

4. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Ireland is a net importer of power from the United Kingdom and is not connected directly to any other states.

6. Comments on the methodology used in your own country to calculate SO_2 and NO_x emissions from electricity generation.

This sits outside my area of work, so I couldn't comment on it.

ITALY (IT)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

In 2011 the electricity demand reached 334.6 TWh, increasing by 1.3% compared to the previous years. This increase continues the positive trend (+3.2%) noted in 2010, after the significant drop (-5.7%) of 2009 when the demand returned in one year to levels of 2005. But the demand is again low compared to the levels of 2008 (339 TWh). In 2011 the net production increased only by 0.2% compared to the previous year, with a value of 291.4 TWh. The small growth of internal production has been compensated by the most significant increase of net import (+3.6%). Because of supply overcapacity, thermal supply is suffering fromlow demand and RES development, particularly of photovoltaic supply. Only in 2011 the photovoltaic production increased by 469% and the trend shows a growth even for the future years. Moreover thermal supply is suffering for forecasted increased costs due to environmental limits and future investments for compliance with environmental regulation, infrastructures deficiencies and fragmentation of administrative process.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012	1			
2015-2020	1			
Beyond 2020		1		

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 the entry of small operators of RES plants (RES development for RES 2020 compliance) and the huge increase of photovoltaic systems. In the medium term, the 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 the sector will show potential development due to the 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		No development			
Gas Turbine Units		Moderate development for balancing RES			
Combined Cycle Units		No development			
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 2011, the electricity demand was met for 86.3% with the national production (86.6% in 2010), for a value equal to 288.9 billion kWh, net of consumption of auxiliary services and pumping, registering a 0.9% increase compared to 2010. The remaining part of the demand (13.7%) was covered by net imports from other countries for a value equal to 45.7 billion kWh in 2011, increasing by 3.6% compared to the previous year.

6. Comments on the methodology used in your own country to calculate ${\rm SO}_{_2}$ and ${\rm NO}_{_x}$ 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 2012 was 9.66 TWh representing an increase compared to 2011. In 2012, the major consuming sector was industry (3.7 TWh). About 1.94 TWh were exported during 2012 year.

In 2012 the main sources of electric power generation in Lithuania were AB Lietuvos Elektrine. About 27% of output was generated in the thermal power plants, about 8% in the hydro and Kruonis PSPP, 5% in the wind power plants and 2% by autoproducers. About 58% of electricity was imported in 2012 year.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012	1			
2015-2020	1			
Beyond 2020		1		

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

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. 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 the 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		In the future Lithuania plans to have the new nuclear power plant.
Steam Thermal Units		
Gas Turbine Units		
Combined Cycle Units		
Internal Combustion Units		
Hydro		AB Lietuvos energija plans to have a 5 th unit in the Kruonis HPSPP.
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?

The Lithuanian power system imported about 58% of the country's domestic electricity demand. In 2012, as compared to 2011, exports were a little bit decreased: from 1.97 TWh in 2011 to 1.94 TWh in 2012. Imports were decreased also (2012 compared to 2011). Mainly Lithuania imported electricity from Latvia and Belarus.

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.

• **МАLTA** (мт)

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 capacity of 620MW at the end of 2012, are interconnected together by means of the existing grid. A combination of steam units, combined cycle, open cycle gas turbines and diesel engines 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 Corporation has recently commissioned a new plant having a gross capacity of 149MW with a net capacity of 144MW at the Delimara Power Station. The plant consists of 8 Wartsila V46 medium speed diesel engines of 17 MW each, plus a 12MW Steam Turbine in combined cycle mode. The plant is equipped with exhaust gas abatement equipment to reduce the emissions of $NO_x SO_2$ and dust. The total net efficiency (47.6%) is significantly better than the conversion efficiency of the plant it is replacing (typically around 30%).

At present Malta is isolated from the European grid however a project to construct a 200MW HVAC interconnection between Malta and Sicily is 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.

The electricity generated in Malta in 2012 was 2.27 TWh which is an increase of 4.6% compared to the previous year and an increase of 18.8% from the year 2000.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012	✓ (even < 10€)			
2015-2020	1			
Beyond 2020		\checkmark		

2. COMMENTS ON MAIN LEGAL CHANGES FOR ELECTRICITY SECTOR, ON A NATIONAL LEVEL, FROM A EUROPEAN LEVEL. (YOUR PERCEPTION)

The Third Energy Package has been transposed. No major legal changes are envisaged at this stage.

4. COMMENTS ON ASSUMPTION	S AND DRIVERS BEHIND	THE FORECASTS ON	TECHNOLOGIES
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Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		
Steam Thermal Units		
Gas Turbine Units		
Combined Cycle Units		
Internal Combustion Units		As outlined in question 1, Enemalta Corporation has recently commissioned a 144MW 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.

6. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation

Continuous Emissions Monitoring.

NORWAY (NO)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Hydroelectric power generates 97% of Norway's electricity production. The annual production depends on precipitation and reservoirs and may vary between 100 – 150 TWh. Total reservoir content for Norway is 82 TWh and an annual average production 126 TWh. Norway's domestic gross consumption totals some 128 TWh per year, the electricity-intensive industry counts for almost 30%. The average annual growth in gross consumption over the last 10 year period has been 1,3%.

2. What are your assumptions on the evolution of $\rm CO_2$ 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	0-20 €	20-30 €	30-50 €	> 50 €
2013	✓			
2015-2020	<i>√</i>			
Beyond 2020		1		

3. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear	\checkmark	
Steam Thermal Units	\checkmark	
Gas Turbine Units	\checkmark	
Combined Cycle Units	\checkmark	
Internal Combustion Units	\checkmark	
Hydro		Several small hydro power plants will be built the next 8 years due to incentives (5-7 TWh)
Non-fuel Renewables		Due to the incentives, some windfarms will be built as well (4-5 TWh)
New Technologies (e.g. Fuel Cells)	<i>√</i>	

4. 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 was implemented. This incentive is supposed to increase renewable production with 26 TWh within 2020, 50% 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.

5. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation.

No issue; close to 100% renewable electricity production.

POLAND (PL)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Presented analysis is based on the "Average Scenario" for the development of conventional sources (decommisioning and new units commissioning) prepared based on the results of surveys carried out by producers of electricity in December 2012.

Average Scenario takes into account only those new units for which the investments were resolved, contracts with contractors are signed and those investments for which in the near future is expected to be complete tender procedures.

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 $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012	1			
2015-2020		1		
Beyond 2020		1		

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 the first nuclear Plant is expected after the year 2020 (year 2024 is 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		Their development depends on the gas prices and gas availability.
Internal Combustion Units	-	
Hydro		No new System hydro power plants (Small hydro units only).
Non-fuel Renewables		Most of the capacity will be built in wind turbines (on shore and offshore units). New technologies for example Photovoltaic are expected too.
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 neighbouring countries Sweden, Germany, Slovakia, Czech Republic, Belarus and Ukraine. Interconnections with Belarus and some with Ukraine due to the connection of the Polish power system with the UCTE, are temporarily out of operation.

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, and NO, 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 based 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 is based on official information published by the Energy Market Agency Co. (Polish name ARE SA).
- Forecast data (year 2015 till 2030) is derived from the internal PSE S.A. analysis and from the material prepared by PSE S.A. for the Ministry of Economy in March 2013.
- In the section "Biomass production" for the statistical year (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 2011:

- Electricity demand supplied through the public transmission network reached 50.5 TWh, characterized by a decrease over the previous year of 3.3%. Final electricity consumption has decreased by 2.8%;
- Ordinary Regime Generation (PRO) plants met around 57% of the total demand while the Special Regime Generation (PRE) met 35%. The international trade balance corresponded to 5% of total demand;
- The peak demand for the connected system occurred in January, with 9 192 MW.

Regarding data for the islands Azores and Madeira, in 2011 the electricity consumption represented 3.3% 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 forecasted 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, 2011 was an average year. The hydro power generation had a decrease of 27% over the previous year (wet year). Electricity output from generation units operating under special regime conditions pursued its increasing trend, mainly due to the commissioning of 461 MW in new wind farms that raised the total wind installed capacity in the whole country to 4 367 MW.

Also in 2011 the Mainland Portugal Ordinary Regime Generation (PRO) represented 62% of the domestic generation. The Special Regime Generation (PRE) represented 38% against 36% in 2010.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-10€	20-30 €	30-50 €	> 50 €
2012	1			
2015-2020	1			
Beyond 2020		1		

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		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 at the construction of a regional electricity market.

The only partner of Portugal is Spain. In 2011 Portugal imported 6.7 TWh and exported 3.9 TWh.

ROMANIA (RO)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

At present the electricity consumption is decreasing, against a background of reduced consumption in energy intensive industries and of investments for increased energy efficiency. To this are added the effects of the economic crisis that have led to reducing the industrial production and the domestic consumption.

The forecasts of the transmission operator provide 4% consumption contraction in each of the following 4 years.

On the other hand the renewable boom has led to about 3000 MW newly installed, which lead to a capacity surplus in the generation domain. Such surplus is deepened in time by the high hydrological regime and leads to disconnecting the units of more expensive technologies (thermal, gas fired ones), which do not benefit of support schemes like the cogeneration plants.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

Future development of the price of CO₂ certificates

CO ₂ Prices	0-20 €
2012	
2015-2020	1
After 2020	1

Comments on main legal changes for the electricity sector, on a national level, from a European level.

The national legislation takes over the relative delay of European regulations. Their implementation takes place with time gaps, which has led to the European Commission's initiation of infringement procedures. The absence of energy strategy leads to partial regulations, devised for the short term in order to punctually solve certain problems of the industry generated by State inertia that attempts to maintain the industrial jobs.

However the Energy law 123/2012 has had a substantial contribution by making transparent the wholesale electricity transactions. Also, the persistent supervision of the electricity and gas market liberalisation calendar began in 2012 whose completion date is 1 January 2014 for non-domestic consumers and 2017 for the domestic ones will bring great changes on the market.

Re-setting the support schemes for renewable energy and the electricity obtained from cogeneration will provide sustainable safe bases for consumers' supply with electricity.

3. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

Nuclear – CNN 3 and 4 will register delays against the background of absent financing and the likelihood increases to drop the project.

Steam (thermal power plants) – As they have marginal production prices they are the most impacted by consumption reduction and increased renewable output. Restructuring will begin in the sense of reducing their costs to the market average.

Combined cycle (gas turbines) – It depends on the authorities' firmness in applying the calendar of regulated prices elimination, and on the development of the natural gas price.

Renewable sources – The installed capacities will reach at the end of 2013 the limits of system stability and safety as mentioned by the TSO. The further increase is conditioned by the adjustments of the National Regulatory Authority in order to avoid the governmental over-compensation of the support scheme and by the development of electricity and green certificates prices.

4. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The excess generation capacity and the support scheme for producers from renewable sources and under cogeneration have put pressure to reduce the sale price on the wholesale market. Overall Romania will have an excess balance. Electricity export is tempered by the similar situation occurring in neighbouring countries, respectively reduced demand, generation over-capacity and small prices. The absence of transmission infrastructure directly to the countries with electricity generation deficite.g. Turkey also limits the electricity export. The imminent coupling of the markets from Romania, Hungary, Slovakia and Poland is an opportunity to increase energy exports.

5. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation

Large combustion plants (LCP) are endowed with permanent monitoring installations indicating the concentration values of NO_x and SO_2 and implicitly the total amount of emissions. Mention should be made that calculation formulas are no longer used when determining the emission values of LCP.

SERBIA (rs)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

Electricity demand has shown little or no sign of advancement in the past several years. Total electricity consumption amounted to 34.5 TWh in 2011 and 33.6 TWh in 2012. The apparent stagnation of annual consumption in 2011/2010 and slight decrease in 2012/2011 of some 2.2% took place mostly due to considerable decline in industrial production. The biggest consumption drop of around 16% occurred at the high voltage level, while the low voltage consumption fell by 1%.

The consumption pattern of the Serbian power system is affected by the structure of economy causing rather low differences of load between work and weekend as well as between peak and off-peak hours.

Annual peaks are still achieved in winter (7.565 MW on 8 February 2012) partly due to the extremely cold climate and extensive use of electricity for heating.

When it comes to the generation mix, conventional thermal power generation has the largest share (nearly 70%). There is also significant hydro generation (some 30%), while the other (non-hydro) RES have played a very limited role so far. Unfavourable hydrological conditions during 2011 have caused some 14% lower HPP generation than average. As a result maximum generation was achieved by the conventional TPP generation causing a rise in GHG emissions.

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	0-20 €	20-30 €	30-50 €	> 50 €
2013	< 10			
2015-2020	<i>√</i>			
Beyond 2020		1		

3. COMMENTS ON MAIN LEGAL CHANGES FOR ELECTRICITY SECTOR, ON A NATIONAL LEVEL, FROM A EUROPEAN LEVEL. (YOUR PERCEPTION)

In early 2012 Serbia was granted the status of an official EU membership candidate. As of 25 June 2013 the European Council endorsed its conclusions and decided to open accession negotiations with Serbia. The first intergovernmental conference will be held in January 2014 at the very latest.

After initial electricity sector unbundling and steady progress in reforms and implementation of internal market legislation, Serbia adopted the new Energy Law in July 2011. A substantial list of energy sector by-laws has been adopted to harmonize Serbia's legislation with EU regulations. The draft of a new Serbian Energy Sector Development Strategy by 2030 is in the process of public consultations while its adoption is expected by late 2013.

The Energy Agency of the Republic of Serbia considers that there are three groups of issues vital for the future of the Serbian energy sector: provision of long-term energy supply security, opening of electricity and natural gas markets and establishment of a long-term pricing policy.

During 2011 and 2012, the Energy Agency Council approved amendments to the Grid Code, adopted the new Market Code, alongside the rules for cross-border capacity allocation with neighbouring countries and particularly bilateral joint auctions with Hungary and Romania.

Drafted in line with the European Union regulations, the Market Code sets the rules and procedures for balance responsibility, balancing market, calculation of imbalances and financial settlement between balance responsible parties.

The actual electricity market opening commenced on 1 January 2013 for the high voltage customers forcing the large industrial customers connected to the transmission network to select a supplier on the free market making the initial market opening some 10%. Additionally the TSO is now buying electricity to cover transmission system losses on the free market. The next step comes after 1 January 2014 with market opening for medium voltage customers (around 40%), while the entire electricity market will be liberalised after January 2015. Consequently, all consumers will be entitled to choose their own electricity supplier under market conditions, while this supplier could be any domestic or foreign supplier possessing a relevant licence.

RES institutional framework is relatively well developed. According to the Energy Community Decision adopting (October 2012) the RES Directive (2009/28/EC), Serbia drafted the National Renewable Energy Action Plan (NREAP) in June 2013 with a binding target for RES implementation until 2020.

The transposition of the RES Directive 2009/28/EC particularly implies achieving the target RES of 27% in GFEC (Gross Final Energy Consumption) calculated against the 2009 baseline year (21.2%).

By adopting the NREAP aimed at achieving the binding RES target, Serbia planned to invest some EUR 2,5 billion in the new power generation (1092 MW/3600 GWh) until 2020 from RES mostly wind, hydro and biomass. 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 incentivised feed-in tariffs.

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 after 2020 (1000 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 2018, 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 pump storage plants.
Non-fuel Renewables		There is a high potential and favourable government subsidies for RES plants (Wind, PV).
New Technologies (e.g. Fuel Cells)		No significant impact on power generation in the visible future.

4. COMMENTS ON ASSUMPTIONS AND DRIVERS BEHIND THE FORECASTS ON TECHNOLOGIES.

5. Comments on the methodology used in your own country to calculate SO, and NO, emissions from electricity generation.

After equipment installation, 90% of the TPP generation has continuous monitoring of annual SO_2 and NO_3 air emissions. By late 2014 all thermal power plants will be covered by continuous monitoring.

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 by heat pumps in mainly single family houses. The on-going 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 neighbouring 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 second half of the 2020s.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

CO ₂ Prices	0-20 €	20-30 €	30-50 €	> 50 €
2012				
2015-2020	<i>s</i>			
Beyond 2020		1		

The average CO₂ price 2012 was 7.35 \in .

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 on November 1st, 2011.

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)	✓			

4. COMMENTS ON ASSUMPTIONS AND DRIVERS B	BEHIND THE FORECASTS ON TECHNOLOGIES.
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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 leads to loss of production. Due to a high share of electric space heating the demand varies with changes in outdoor 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 19.6 TWh (2012) and the highest net import is 12.8 TWh (2003). The accumulated net export 1940 - 2012 is however only 25.7 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.

C TURKEY (TR)

1. GENERAL COMMENTS ON ELECTRICITY SUPPLY AND DEMAND SITUATION IN YOUR COUNTRY.

By the end of April 2013, installed capacity has become 58.042 MW, of which 60,4% from thermal and 34,9% hydro while wind and geothermal 4,4%. In line with the average 5% economic growth in Turkey in the last decade, demand increased from 133 TWh in 2002 to 242 TWh in 2012 while it is assumed to reach 433 TWh in 2020. Peak load is anticipated to reach 41.000 MW in 2013 and 66.845 MW in 2020 from its level of 39.045 MW in 2012.

2. What are your assumptions on the evolution of $\rm CO_2$ prices in the future? Please tick the correct assumption in the table below.

Turkey has not yet introduced an obligatory emission rights market, where CO_2 equivalent emissions are traded. On the other hand, a Voluntary Emission Market is being implemented since 2005.

CO ₂ Prices	10-20 €	20-30 €	> 30 €	> 50 €
2012	N/A			
2015-2020	1			
Beyond 2020		1		

3. Comments on main legal changes for electricity sector, on a national level, from a European level. (your perception)

In March 2013, a new EML has been published (no. 6446) which repeals the EML no 4628. And the new EML has put into force new provisions such as;

- Establishment of an independent energy exchange (EPIAŞ) and market operation activity to emphasize organized market structure in Turkish Electricity Market. Secondary regulation regarding establishment of the energy exchange will be published within 6 months by the Regulatory Authority (EPDK).
- Combination of wholesale and retail activities under "Supply License" to integrate supply activities in the market.
- Extensions on the incentives on generation and distribution companies to encourage investments in the market.

In addition, secondary regulation regarding unbundling of distribution and retail sales activities was published at the end of 2012 and these companies were legally unbundled starting from January 2013.
4. COMMENTS ON INVESTMENT CLIMATE FOR NEW POWER PLANTS: WHICH ARE THE BEST TO BUILD? PLEASE PROVIDE BRIEF COMMENTS ON EACH TECHNOLOGY.

Technologies	No opinion	Comments/evidence on projects in your country
Nuclear		Process is going on for the construction of Nuclear power plants in Turkey. There is no installed capacity yet, but the first unit is expected to be commissioned by 2020.
Steam Thermal Units		STU's are used coupled with several thermal fired technologies.
Gas Turbine Units		Due to high short run marginal costs, GTUs are not very common.
Combined Cycle Units		In the last few years considerable amount of projects are commissioned and significant amount is under construction.
Internal Combustion Units		Due to the high operation costs, ICUs are not very common.
Hydro		The number of Hydro power plants in Turkey is increasing steadily. The installed capacity reached around 20 GW and there is a considerable amount under construction, including those constructed by the state.
Non-fuel Renewables		Wind capacity is increasing, i.e the installed capacity is 2.3 GW as of end of 2012. And installation of the Solar PVs is planned with an installed capacity of 600 MW in the near future.
New Technologies (e.g. Fuel Cells)		Not very common.

5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

Turkey has interconnections with its all neighbouring countries (Greece, Bulgaria, Georgia, Armenia, Azerbaijan, Iran, Iraq and Syria). Electricity is being imported and/or exported via the interconnection lines existing with Greece, Bulgaria, Georgia, Azerbaijan, Iran and Iraq. Amongst the interconnection lines that import and export activities are being performed, ENTSO-E connection has the largest share in electricity trading.

5. Comments on the methodology used in your own country to calculate $\rm SO_2$ and $\rm NO_x$ emissions from electricity generation.

Turkish Statistics Institute (TurkStat) keeps track of the greenhouse gas emission inventory in Turkey. The Turkish Greenhouse Gas Inventory is submitted to the UNFCCC in the form of the Common Reporting Format. Greenhouse gas emission from electricity sector is 96,286,000 ton CO₂.

6. Any other comments on the electricity sector in your country.

In the direction of the aim of synchronous parallel connection Turkish Power system to ENTSO-E system and depending on the positive result of technical studies 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 18th December, 2009 and after the completion of tests in island mode of operation, a three party memorandum of understanding was signed between TEIAS, ESO EAD and HTSO for specifying the actions to be taken during trial parallel operation period on March 2010 and trial operation of the Turkish power system to ENTSO-E system with synchronous parallel connection for a certain period was commenced as of 18 September 2010.

Besides, Turkey takes part in regional interconnection projects namely, Eight Countries Interconnection Project among Egypt, Iraq, Jordan, Lebanon, Libya, Palestine, Syria and Turkey which is on a large scale completed. Another regional interconnection project is the Black Sea Regional Transmission Planning Project, which is financed by US-AID in the context of the Black Sea Economic Cooperation (BSEC) where Turkey actively participates in. Project's first and second phases have been satisfactorily completed and third phase has been started by 2010.

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