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ELECTRICITY FOR EUROPE

# Power Statistics & Trends 2013

## FULL REPORT

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

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

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

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

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

**Economic Development**
- Growth, added-value, efficiency

**Environmental Leadership**
- Commitment, innovation, pro-activeness

**Social Responsibility**
- Transparency, ethics, accountability

December 2013

# Power Statistics & Trends 2013

## FULL REPORT

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# Power Statistics & Trends 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 States[1], 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.

[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.

## 2 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.

## 4 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.

## 5 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.

## 6 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, sources[2] 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.

# 1 ENERGY POLICY CONTEXT

*MEMBER STATES OPT FOR DIVERGING POLICIES*

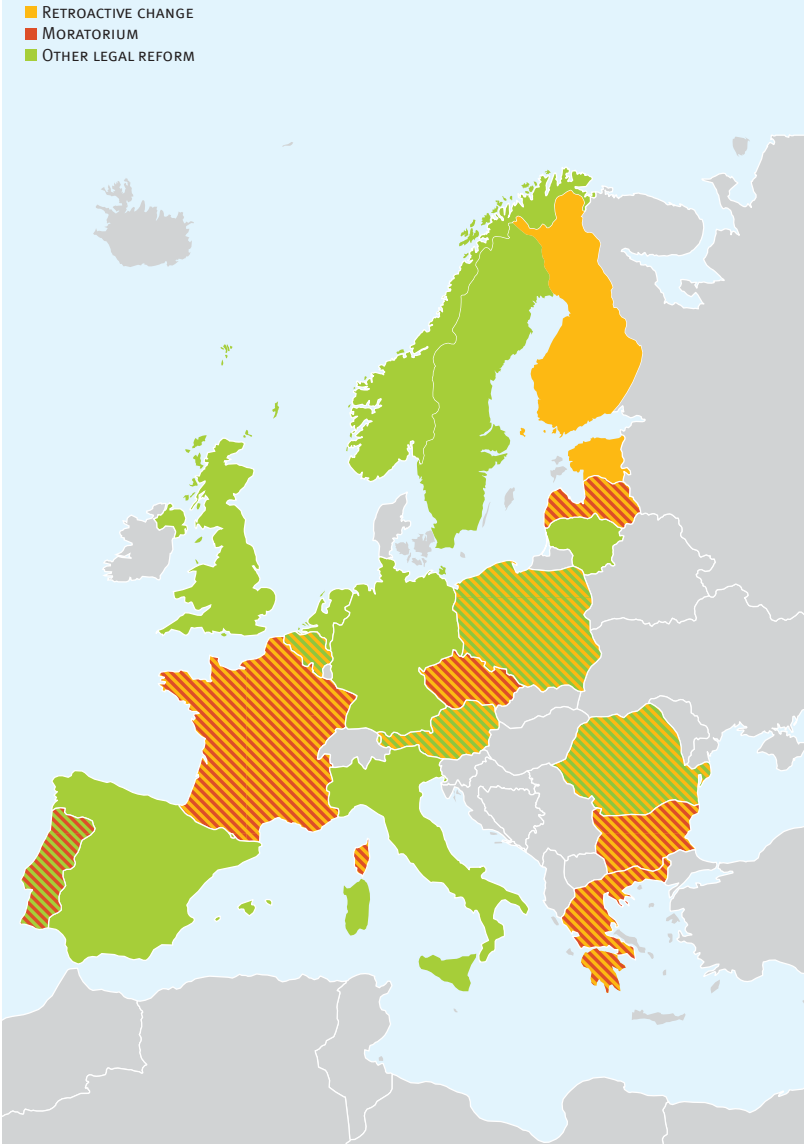
## GREY CLOUDS OF REGULATORY UNCERTAINTY

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 Europe[4]




[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 forward-looking 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.

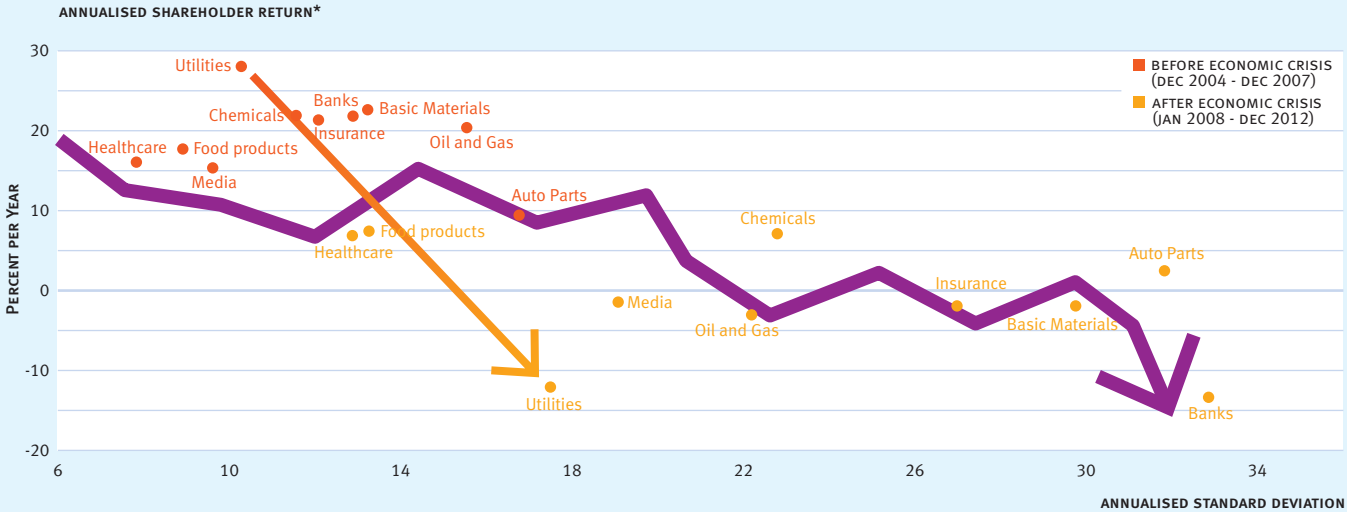
## Commission agenda 2014-2018: Competitiveness, fragmentation, post 2020

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, $CO_2$ 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 performance[7]

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




*Utilities include grid companies. Prices are calculated on an annual basis.

[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.

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?

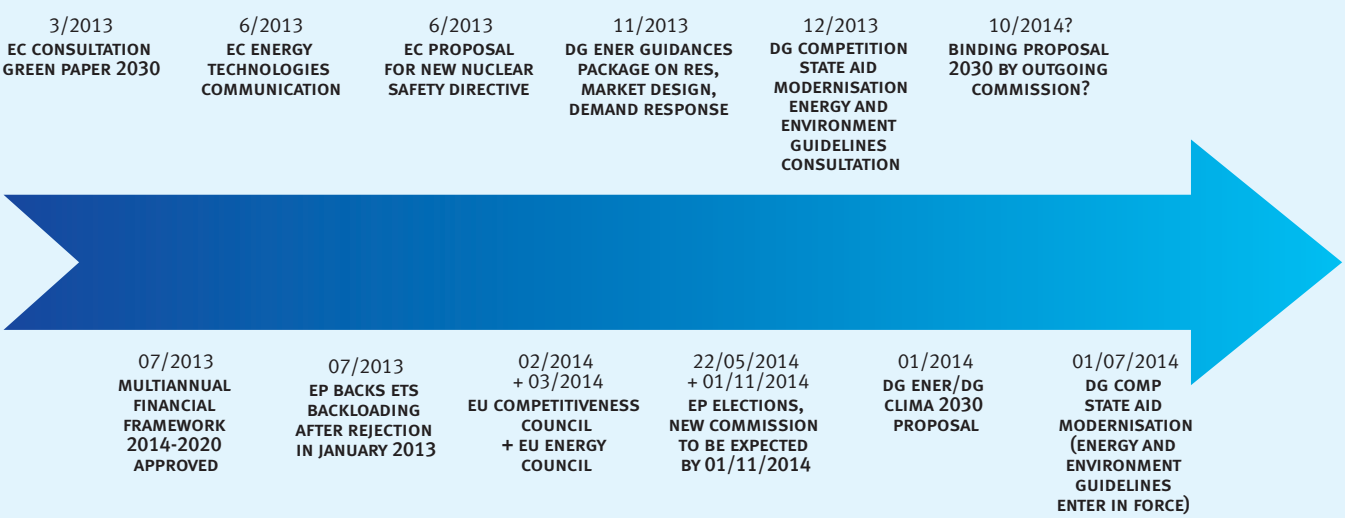
2013-14 has seen national energy policies increasingly diverge, with governments elaborating various proposals for national energy market design, struggling with national RES support schemes, or taking national measures to reduce carbon emissions. Lip service is paid to Europe and the EU internal energy 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.

### Figure 3: Energy policy Events 2013-2014[9]




[9] Source EURELECTRIC Power Statistics and Trends 2013.

# 2 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

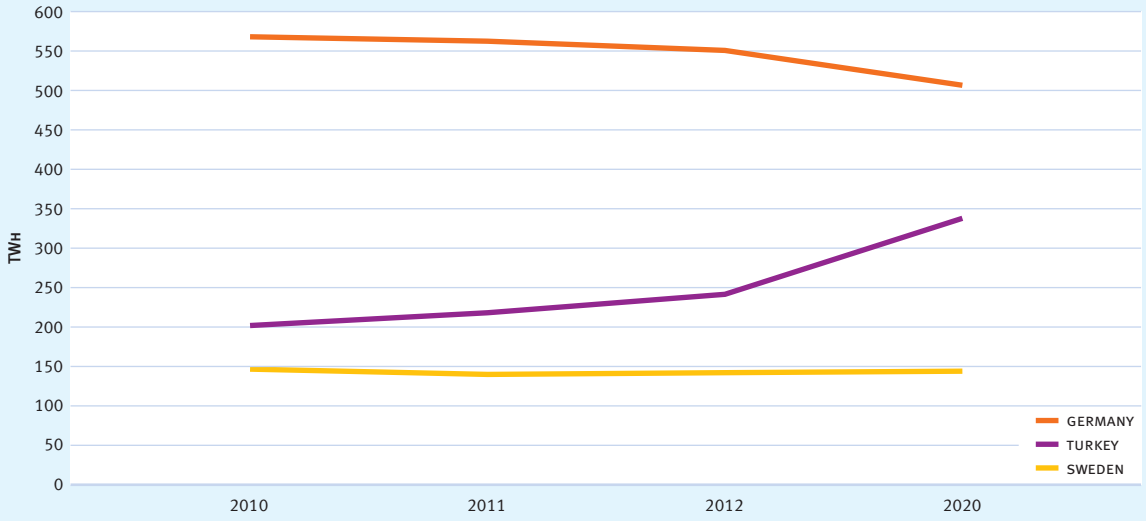
Demand for the EU-27 is estimated to grow from 3081 TWh in 2010 to 3250 TWh in 2020 at an annual growth rate of 0.5%.

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.

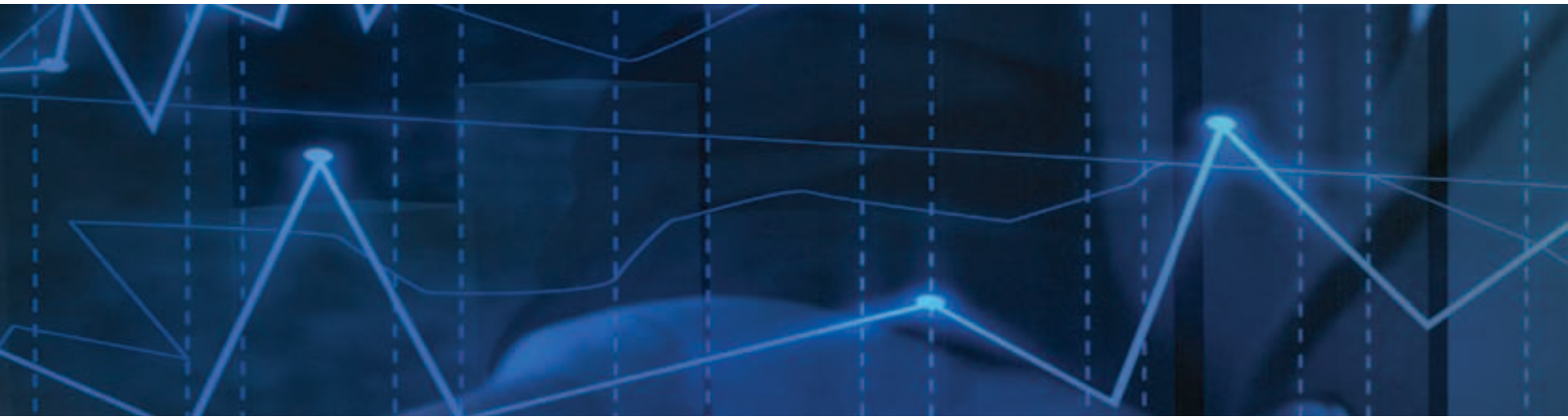
Demand is forecasted to decrease most notably in Germany from 568 TWh in 2010 to 507 TWh in 2020. The United Kingdom (-0.91% p.a.) is expected to consume slightly less electricity by 2020.

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 countries**[10]




[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 EU27[11]

| Country | Total Demand in TWh | | | | Year-On-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 | 2.40[12] | 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 | 12.63[13] | 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).

# 3 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 COUNTRIES[14]

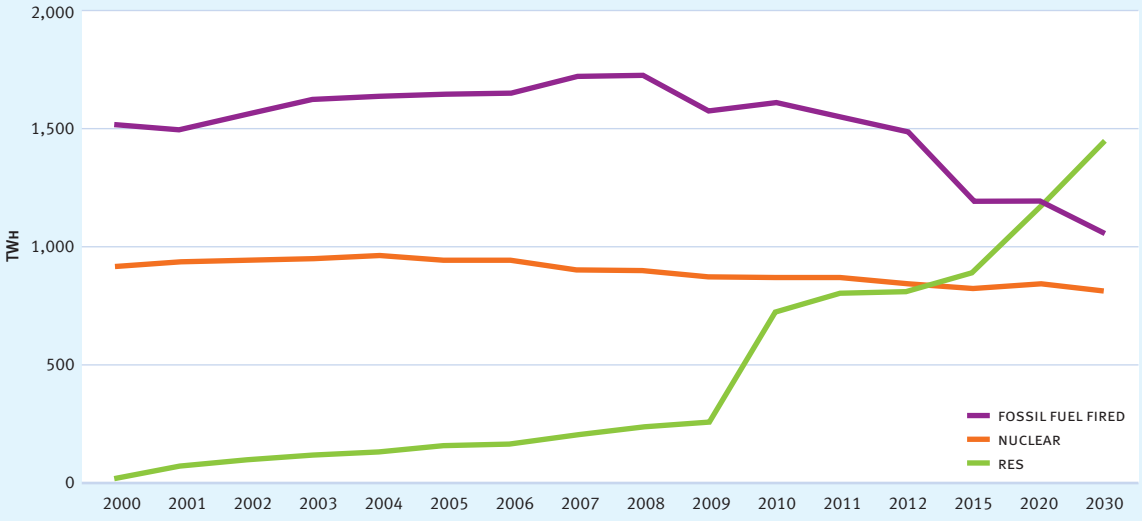

[14] Source: EURELECTRIC Power Statistics and Trends Data Base.

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 €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 27[16]**




[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.

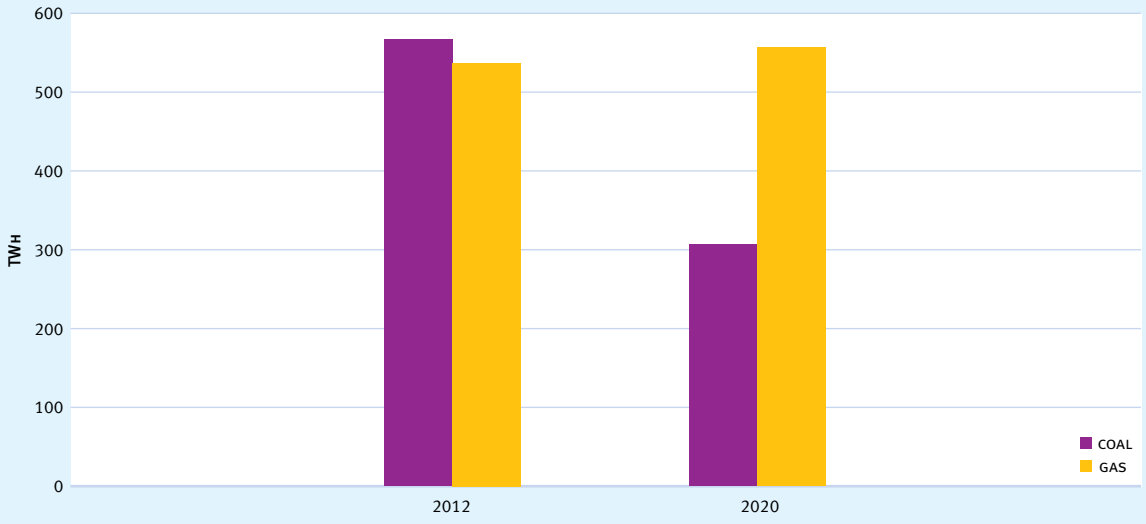
## Forecasts by EURELECTRIC members reveal low expectations for significantly higher carbon prices by 2020

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 €30 by 2020. Price level of €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 2020[17]




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

# 4 CAPACITY TRENDS

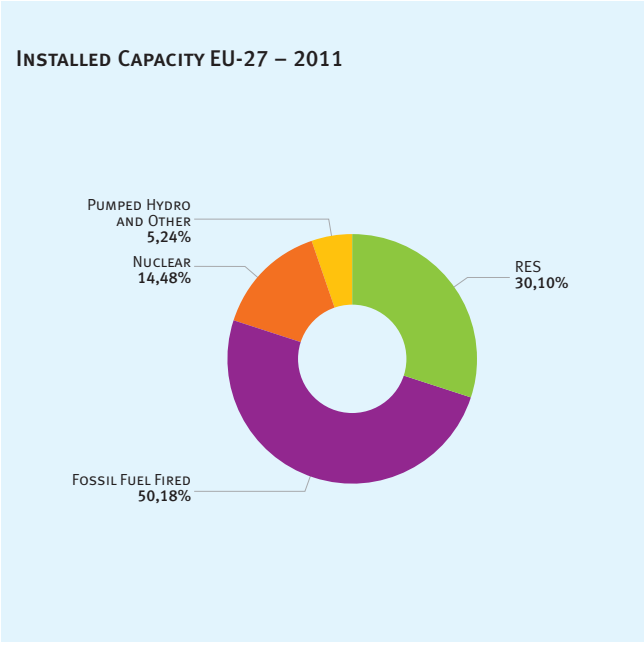
## *RES CAPACITIES AND SUPPORT COSTS STILL ON THE RISE*

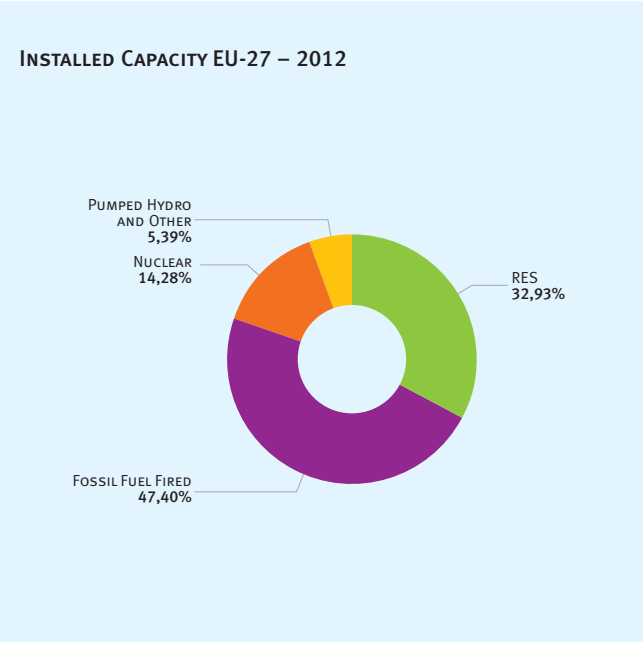
Between 2011 and 2012, installed capacity increased by 2% throughout the EU. Unsurprisingly, renewable technologies accounted for the full increase, as fossil fuel fired capacities fell by 3%, nuclear capacities marginally decreased and installed RES capacities grew by 10%.

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-27**[18]



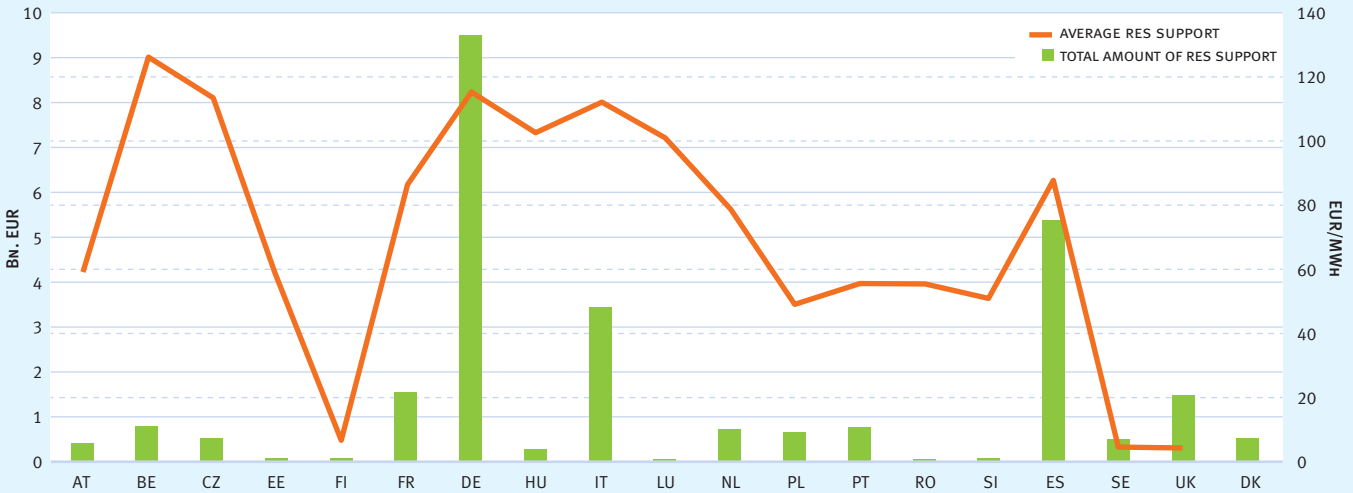




[18] Source: EURELECTRIC *Power Statistics and Trends* Data Base.

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 2011[20]




[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.

# 5 POWER PRICES IN EUROPE

## *SURGING CHARGES*

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.

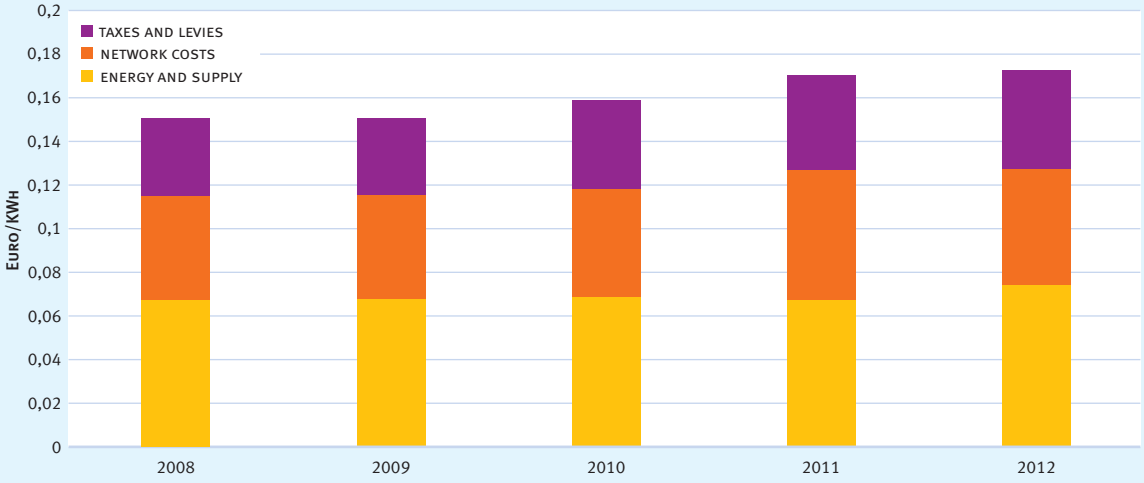
The lasting recession and the gloomy short-term economic outlook are putting strains on Europe's ability to sustain its transition to a low-carbon energy system. Reflecting this, attention in policy circles has shifted from debating the virtues of a greener and smarter power sector to considering the 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 Eurostat[21] 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 YEAR[23]**




[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]**

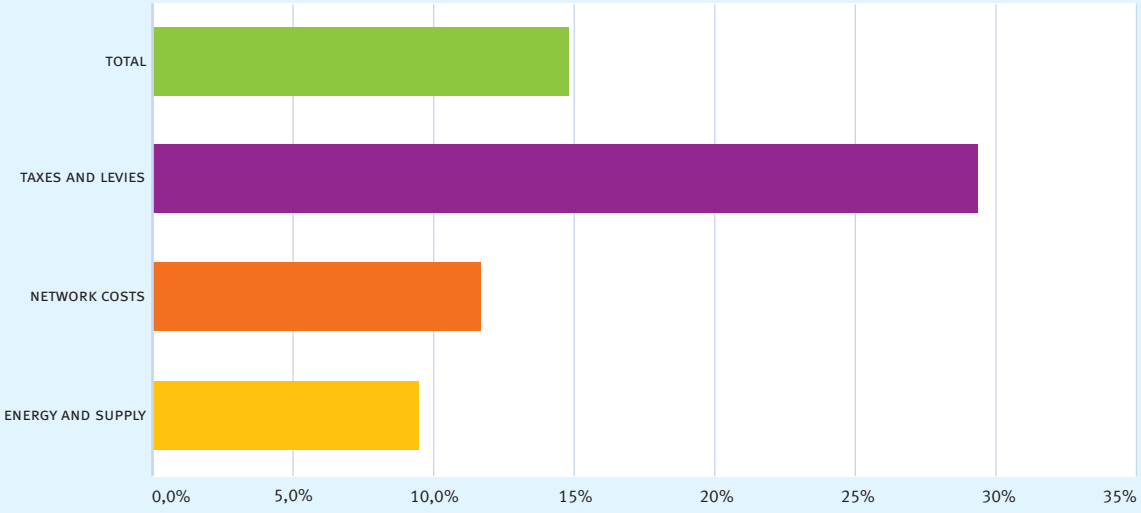
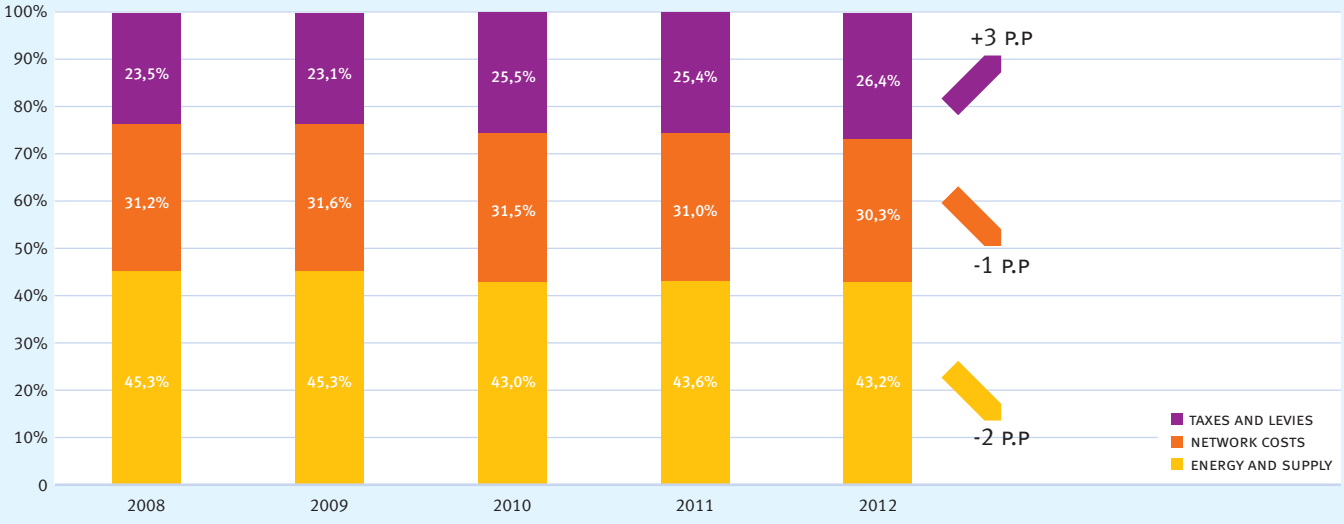



**Figure 13 : Weight of components on average EU-28 electricity bill for household customers consuming 2,500 kWh – 5,000 kWh per year and percentage point (p.p.) variation 2012 on 2008[25]**




[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]

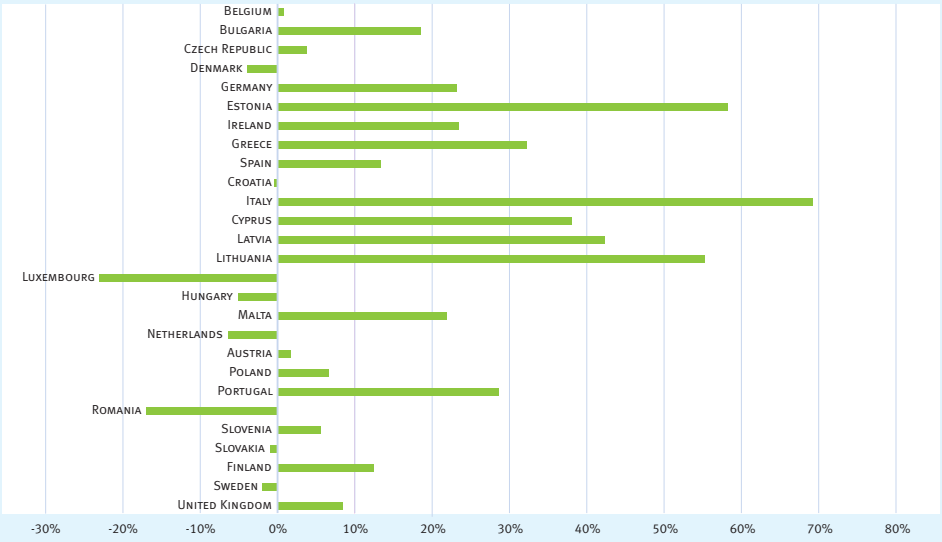
Even though the observation period is limited, Figure 13 powerfully describes the trend at play in Europe: energy and supply as well as network costs are gradually reducing, whereas taxes and levies are piling up.

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]

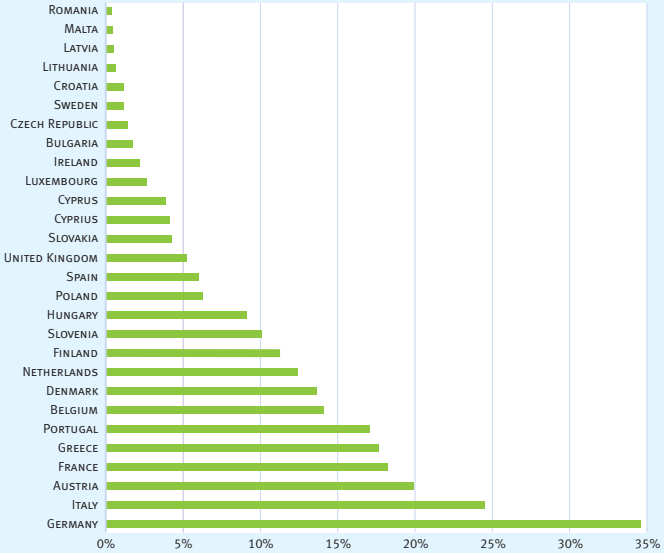
An analysis of the bill elements for industrial customers shows a similar trend to the one witnessed for households. While energy and supply costs are decreasing or only moderately increasing, taxes and levies are skyrocketing and have increased substantially in almost all member states in only four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

# 6 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 $CO_2$ price signal of around €5 per tonne needs to rise to at least €40 per tonne to revise this trend[31].

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

**FIGURE 16: DEMAND AND $CO_2$ EMISSIONS[32]**

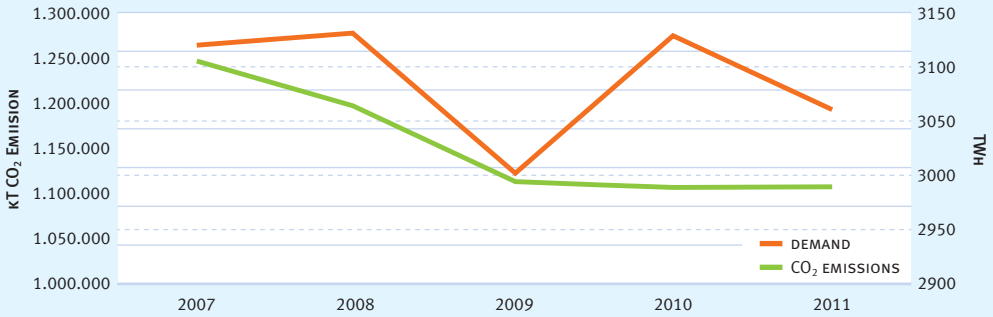
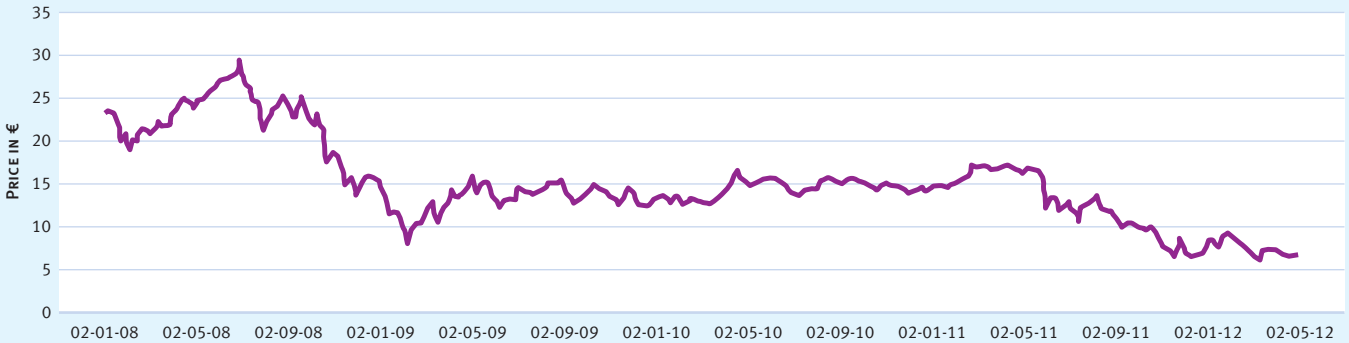



**FIGURE 17: CARBON PRICES 2008-2012[33]**




[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.

# 7 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]

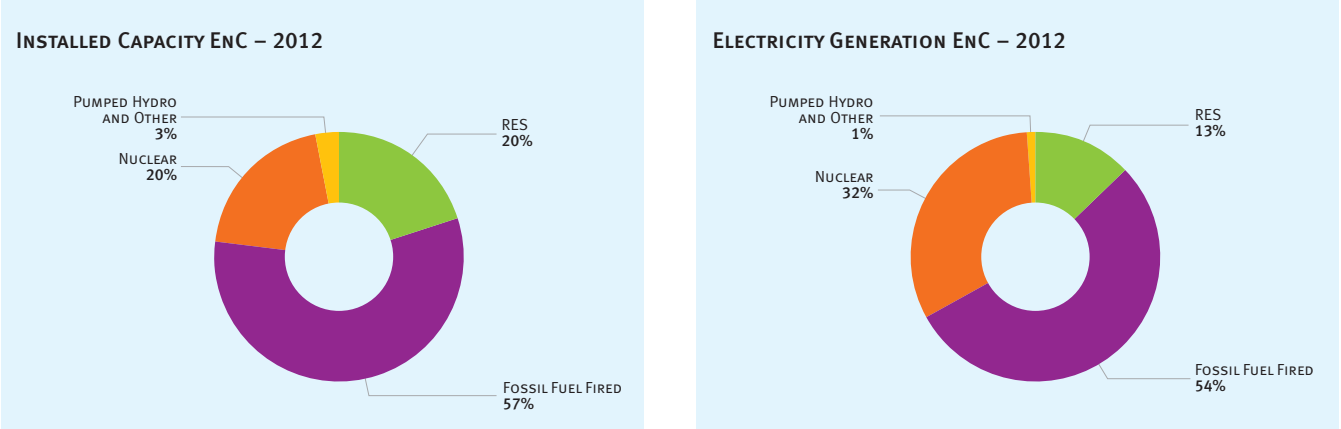
Energy Community (EnC) was established in 2005 and currently consists of the Contracting Parties (CP): Albania, Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia, Moldova, Montenegro, Serbia, Ukraine, United Nations Interim Administration Mission in Kosovo[35] and the European Union. Aggregated 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 2012[36]




[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 inter-connectedness 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.

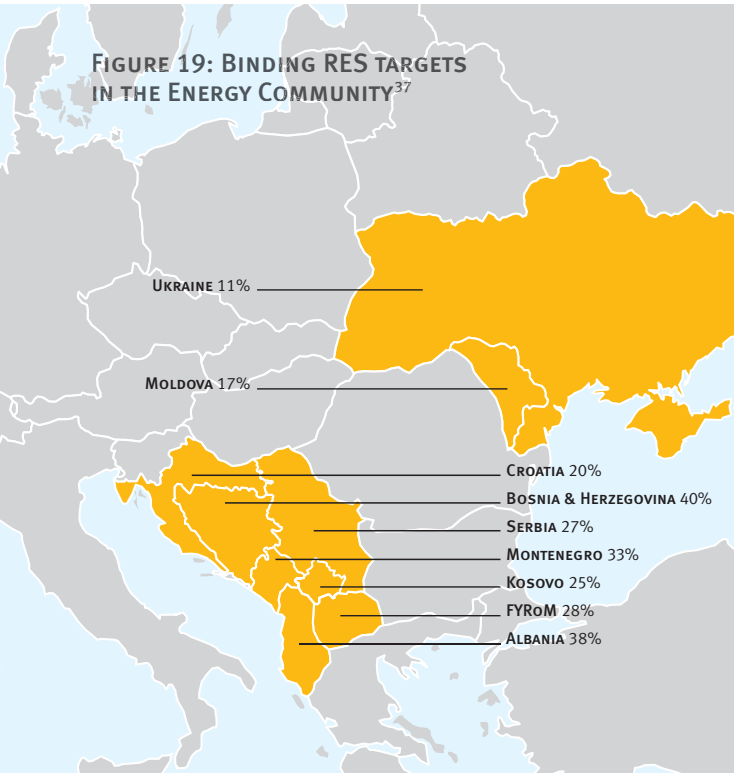



FIGURE 19: BINDING RES TARGETS IN THE ENERGY COMMUNITY[37]

## Gas corridors

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.

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

# Power Statistics & Trends 2013

## FULL REPORT

# 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 States[3] 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.

## TABLE 1.1.1 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 | |

## TABLE 1.1.1 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 (UK)

| | 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 |

## TABLE 1.1.1 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 |

## TABLE 1.1.1 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 |

### MALTA (MT)

| | 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 (SK)

| | 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 (CH)

| | 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 |

### 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 | | |

## 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 |
| CY | 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 |
| PT | 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 |
| CH | 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 | Generation* | | Transmission | Distribution | Supply* | |
|---|---|---|---|---|---|---|
| | Number | Market Share | Number | Number | Number | Market Share |
| AT | 6 | - | 3 | 138 | 6 | - |
| BE | 3 | 95% | 1 | 28 | 4 | 89% |
| BG | - | - | - | - | - | - |
| CY | 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 | - | - | - | - | - | - |
| CH | - | - | 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)*.

**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 |
| PT | - | - | - |
| RO | - | - | - |
| SE | - | - | - |
| SI | - | - | - |
| SK | - | - | - |
| CH | 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | 12,244 | 13,766 | 14,033 | | |

(*) Without isolated system

## 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), 3rd Wednesday, 18:00h CET | | | | | | | |

### CYPRUS (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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | | | | |

(*) Without isolated system

## 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), 3rd 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | | | | |

(*) Without isolated system

## 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), 3rd Wednesday, 18:00h CET | | | | | | | |

### UNITED KINGDOM (UK)

| | 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | 5,866 | 5,622 | 6,600 | 7,200 |

(*) Without isolated system

## 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), 3rd 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | 1,050 | | 1,180 | 1,320 |

(*) Without isolated system

## TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

### LATVIA (LV)

| | 1980 | 1990 | 2000 | 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), 3rd Wednesday, 18:00h CET | | | | 1,270 | | | |

### MALTA (MT)

| | 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | 19,986 | 19,716 | 22,597 | 21,953 | 23,850 | 27,331 |

(*) Without isolated system

## 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | 23,800 | 24,127 | 23,226 | 24,100 | 24,800 |

### SLOVENIA (SI)

| | 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), 3rd Wednesday, 18:00h CET | | | | | | | |

(*) Without isolated system

## TABLE 2.1.1 ANNUAL ELECTRICITY AND PEAK DEMAND

### SLOVAKIA (SK)

| | 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), 3rd Wednesday, 18:00h CET | | | | | | | |

### SWITZERLAND (CH)

| | 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | | | | |

### 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), 3rd Wednesday, 18:00h CET | | | | | | | |

(*) Without isolated system

## 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), 3rd 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), 3rd 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), 3rd 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), 3rd Wednesday, 18:00h CET | | | | | | | |

(*) Without isolated system

# 2.2 Sectoral Breakdown

**TABLE 2.2.1**

## Breakdown of Total Demand (TWh)

The tables below display the breakdown of total demand (in TWh) 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 |

## TABLE 2.2.1 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 (UK)

| | 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 (HU)

| | 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 |

## TABLE 2.2.1 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 |

## TABLE 2.2.1 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 |

## TABLE 2.2.1 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 (SK)

| | 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 |

### 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 |

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

### 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 |

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

### 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 |

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

### 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)

| | 1980 | 1990 | 2000 | 2010 | 2011 | 2020 | 2030 |
|---|---|---|---|---|---|---|---|
| **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 |

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

### 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.

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

### 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 | |

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

### 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 |

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

### 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 |

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

### 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 |

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

### MALTA (MT)

| | 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 |

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

### 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 |

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

### 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 |

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

### 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 (SK)

| | 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 |

## TABLE 3.1.1.1 Generation Equipment – Capacity by Primary Energy (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 |
| **Fossil Fuel Fired** | | 700 | 649 | 770 | 750 | | |
| *of which multifuel* | | | | | | | |
| Hard Coal | | | | | | | |
| Brown Coal | | | | | | | |
| Oil | | | | | | | |
| 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 |
| **Total** | 19,836 | 26,637 | 27,578 | 31,290 | 31,750 | 35,400 | 37,200 |

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

### 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 | | |

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

### 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 |

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

### 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 | | |

## 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 |
| CY | 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 | - |
| CH | 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 |

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

### 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 | | |

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

### 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 (UK)

| | 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 (HU)

| | 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 |

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

### 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 | | |

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

### 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 |

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

### 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 (SK)

| | 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 |

### 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 | | | | | | | |

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

### 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 | | | | | | | |

## 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 | |

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

### 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 |

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

### 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) | | | | | | | |

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

### 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 (UK)

| | 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 |

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

### 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 (HU)

| | 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 |

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

### 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 |

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

### 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 |

### MALTA (MT)

| | 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 |

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

### 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 |

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

### 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 (SK)

| | 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 | |

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

### SWITZERLAND (CH)

| | 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)

| | 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 |

### 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) | | | | | | | |

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

### 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) | | | | | | | |

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

### 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) | | | | | | | |

## 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 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 |

## TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

### 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 |
| 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 |

## TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

### 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 |

## TABLE 3.1.2 GENERATION EQUIPMENT – CAPACITY BY TECHNOLOGY (MW)

### MALTA (MT)

| | 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 |

## TABLE 3.1.2 Generation Equipment – Capacity by Technology (MW)

### 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 |

### 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 | | |

## 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)

| | 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 (UK)

| | 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 (SK)

| | 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)

### 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 |

## 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 |

### CYPRUS (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 (UK)

| | 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 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 |

## 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 (SK)

| | 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 (CH)

| | 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 |

### 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 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 |

## TABLE 3.2.1.1 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 |

## Table 3.2.1.1 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.

## TABLE 3.2.1.1 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 |

## Table 3.2.1.1 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 (UK)

| | 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 |

## TABLE 3.2.1.1 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 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 |

## TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

### LATVIA (LV)

| | 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 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 |

## Table 3.2.1.1 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 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 | |

## TABLE 3.2.1.1 Annual Electricity Generation by Primary Energy (TWh)

### SLOVAKIA (SK)

| | 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 |

### 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 | | |

## Table 3.2.1.1 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 | | |

## 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 |
| CY | 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 | - |
| CH | 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 | - | - |

## TABLE 3.2.1.3 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 |

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

### 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.

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

### 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 (UK)

| | 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 (HU)

| | 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 |

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

### 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 | | |

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

### 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 |

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

### 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 (SK)

| | 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 |

### 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 | | |

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

### 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 | | | | | | | |

## 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 |

## Table 3.2.1.4 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 |

## TABLE 3.2.1.4 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 (UK)

| | 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 |

## TABLE 3.2.1.4 ANNUAL RENEWABLES ELECTRICITY GENERATION BY COUNTRY (TWH)

### GREECE (GR)

| | 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 (HU)

| | 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 |

## TABLE 3.2.1.4 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 |

### MALTA (MT)

| | 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 |

## TABLE 3.2.1.4 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 |

## TABLE 3.2.1.4 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 (SK)

| | 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 ELECTRICITY GENERATION BY COUNTRY (TWH)

### SWITZERLAND (CH)

| | 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 |

### 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) | | | | | | | |

## 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 |

## TABLE 3.2.2 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 | |

## TABLE 3.2.2 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 |

## TABLE 3.2.2 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 | | |

## TABLE 3.2.2 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 |

### MALTA (MT)

| | 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 | | |

## TABLE 3.2.2 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 |

## TABLE 3.2.2 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 (SK)

| | 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 |

## TABLE 3.2.2 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 |

### 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 | |

## 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 | | |

## 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 |

## TABLE 3.2.3 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 (UK)

| | 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 |

## TABLE 3.2.3 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 |

## TABLE 3.2.3 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 (SK)

| | 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 |

### 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 | | |

## TABLE 3.2.3 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 |

## TABLE 4.1.1 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 | | | |

## TABLE 4.1.1 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 |

## TABLE 4.1.1 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 | | |

## TABLE 4.1.1 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 (UK)

| | 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 | | |

## TABLE 4.1.1 TOTAL ENERGY USE (MTOE)

### HUNGARY (HU)

| | 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 | | |

## TABLE 4.1.1 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 |

## TABLE 4.1.1 Total Energy Use (Mtoe)

### MALTA (MT)

| | 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 |

## TABLE 4.1.1 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 |

## TABLE 4.1.1 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 (SK)

| | 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 (CH)

| | 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 |

### 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 |

## TABLE 4.2.1 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 | |

## TABLE 4.2.1 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 (UK)

| | 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 |

## TABLE 4.2.1 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 |

### MALTA (MT)

| | 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 | | |

## 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 |

## TABLE 4.2.1 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 (SK)

| | 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 (CH)

| | 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 | | | |

### 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 | | | | |

## TABLE 4.2.1 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 |

## TABLE 4.3.1 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 |

## TABLE 4.3.1 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 (UK)

| | 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 |

## TABLE 4.3.1 Electricity Balances (TWh)

### MALTA (MT)

| | 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 |

## TABLE 4.3.1 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 |

## TABLE 4.3.1 Electricity Balances (TWh)

### 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)

| | 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 (UK)

| | 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 |

### MALTA (MT)

| | 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 (CH)

| | 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 |

### 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 ($SO_2$) and nitrogen oxides ($NO_x$): acidifying gases which cause acid rain and have harmful effects on ecosystems and human health.

### AUSTRIA (AT)

| | 1980 | 1990 | 2000 | 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 (UK)

| | 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 |

### GREECE (GR)

| | 1980 | 1990 | 2000 | 2010 | 2011 | 2020 | 2030 |
|---|---|---|---|---|---|---|---|
| Sulphur Dioxide $SO_2$ | | 272 | 343 | 165 | | | |
| Nitrogen Oxides $NO_x$ | | 61 | 99 | 110 | | | |
| Carbon Dioxide $CO_2$ | | 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 |

## 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 | 2011 | 2020 | 2030 |
|---|---|---|---|---|---|---|---|
| Sulphur Dioxide $SO_2$ | | 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 $CO_2$ | | 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 (MT)

| | 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 | 2011 | 2020 | 2030 |
|---|---|---|---|---|---|---|---|
| Sulphur Dioxide $SO_2$ | 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 $CO_2$ | | 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 (SK)

| | 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 (CH)

| | 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 |

### 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 |

## TABLE 6.1.1 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 |

## TABLE 6.1.1 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 |

## TABLE 6.1.1 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 (UK)

| | | 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 |

## TABLE 6.1.1 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 |

## TABLE 6.1.1 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 |

### MALTA (MT)

| | | 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 (SK)

| | | 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 (CH)

| | | 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 |

### 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 | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 21 | 20 | 20 |
| *of which Coal* | TWh | 5 | 5 | 4 |
| *of which Gas* | TWh | 14 | 12 | 10 |
| Renewables | TWh | 35 | 44 | 33 |
| *of which Hydro* | TWh | | | 27 |
| *of which Wind* | TWh | 2 | 2 | 2 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 13 | 13 | 16 |
| Total | TWh | 67 | 63 | 69 |

## BELGIUM (BE)

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

## BULGARIA (BG)

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

## TABLE 6.2.1 Electricity Generation

### CYPRUS (CY)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 5 | 5 | 4 |
| *of which Coal* | TWh | | | |
| *of which Gas* | TWh | | | |
| Renewables | TWh | 0 | 0 | 0 |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | | | |
| Total | TWh | 5 | 5 | 5 |

### CZECH REPUBLIC (CZ)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 26 | 27 | 29 |
| Fossil Fired | TWh | 48 | 49 | 47 |
| *of which Coal* | TWh | 5 | 5 | 4 |
| *of which Gas* | TWh | 3 | 4 | 4 |
| Renewables | TWh | 4 | 3 | 5 |
| *of which Hydro* | TWh | 3 | | 2 |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | 1 | 2 | 2 |
| Pumped Hydro | TWh | 1 | 3 | 1 |
| Total | TWh | 79 | 81 | 81 |

### GERMANY (DE)

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

### DENMARK (DK)

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

# TABLE 6.2.1 Electricity Generation

## ESTONIA (EE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | | |
| Fossil Fired | TWh | 12 | | |
| *of which Coal* | TWh | 0 | | |
| *of which Gas* | TWh | 0 | | |
| Renewables | TWh | 1 | | |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | 0 | | |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | 0 | | |
| Total | TWh | 13 | | |

## SPAIN (ES)

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

## FINLAND (FI)

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

## FRANCE (FR)

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

# TABLE 6.2.1 Electricity Generation

## UNITED KINGDOM (UK)

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

## GREECE (GR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 43 | 47 | 47 |
| *of which Coal* | TWh | 0 | 0 | 28 |
| *of which Gas* | TWh | 11 | 15 | 14 |
| Renewables | TWh | 11 | 8 | 10 |
| *of which Hydro* | TWh | 7 | 4 | 4 |
| *of which Wind* | TWh | 3 | 3 | 4 |
| *of which PV* | TWh | 0 | 1 | 2 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 54 | 56 | 57 |

## HUNGARY (HU)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 15 | 15 | 15 |
| Fossil Fired | TWh | 17 | 17 | 15 |
| *of which Coal* | TWh | 1 | 1 | 6 |
| *of which Gas* | TWh | 11 | 11 | 9 |
| Renewables | TWh | 2 | 2 | 2 |
| *of which Hydro* | TWh | 0 | 0 | 0 |
| *of which Wind* | TWh | 1 | 1 | 1 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 35 | 34 | 32 |

## IRELAND (IE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 21 | 21 | 27 |
| *of which Coal* | TWh | 4 | 4 | 7 |
| *of which Gas* | TWh | 17 | 7 | 16 |
| Renewables | TWh | 2 | 3 | 4 |
| *of which Hydro* | TWh | | 1 | 1 |
| *of which Wind* | TWh | 2 | 3 | 3 |
| *of which PV* | TWh | | 0 | 0 |
| Pumped Hydro | TWh | 0 | 1 | 0 |
| Total | TWh | 32 | 24 | 31 |

## TABLE 6.2.1 Electricity Generation

### ITALY (IT)

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

### LITHUANIA (LT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 4 | 3 | 3 |
| *of which Coal* | TWh | 0 | 0 | 0 |
| *of which Gas* | TWh | 4 | 3 | 3 |
| Renewables | TWh | 1 | 1 | 1 |
| *of which Hydro* | TWh | 1 | 1 | 0 |
| *of which Wind* | TWh | 0 | 1 | 1 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 1 | 1 | 1 |
| Total | TWh | 5 | 5 | 5 |

### LUXEMBOURG (LU)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 3 | 2 | 3 |
| *of which Coal* | TWh | 0 | 0 | 0 |
| *of which Gas* | TWh | 3 | 2 | 3 |
| Renewables | TWh | 0 | 0 | 0 |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | 1 | 1 | 1 |
| Total | TWh | 4 | 4 | 4 |

### LATVIA (LV)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 3 | 3 | 2 |
| *of which Coal* | TWh | 0 | 0 | 0 |
| *of which Gas* | TWh | 3 | 3 | 2 |
| Renewables | TWh | 4 | 3 | 4 |
| *of which Hydro* | TWh | 3 | 3 | 4 |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 6 | 6 | 6 |

## TABLE 6.2.1 Electricity Generation

### MALTA (MT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 2 | 2 | 2 |
| *of which Coal* | TWh | 0 | 0 | 0 |
| *of which Gas* | TWh | 0 | 0 | 0 |
| Renewables | TWh | 0 | 0 | 0 |
| *of which Hydro* | TWh | 0 | 0 | 0 |
| *of which Wind* | TWh | 0 | 0 | |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 2 | 2 | 2 |

### NETHERLANDS (NL)

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

### POLAND (PL)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 134 | 137 | 134 |
| *of which Coal* | TWh | 129 | 132 | 129 |
| *of which Gas* | TWh | 5 | 5 | 5 |
| Renewables | TWh | 11 | 12 | 11 |
| *of which Hydro* | TWh | 4 | 3 | 1 |
| *of which Wind* | TWh | 2 | 3 | 3 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 2 | 1 | 1 |
| Total | TWh | 144 | 149 | 146 |

### PORTUGAL (PT)

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

## TABLE 6.2.1 Electricity Generation

### ROMANIA (RO)

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

### SWEDEN (SE)

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

### SLOVENIA (SI)

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

### SLOVAKIA (SK)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 14 | 14 | 14 |
| Fossil Fired | TWh | 6 | 6 | 6 |
| *of which Coal* | TWh | 3 | 3 | 3 |
| *of which Gas* | TWh | 3 | 3 | 3 |
| Renewables | TWh | 6 | 5 | 5 |
| *of which Hydro* | TWh | 5 | 4 | 4 |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | 0 | 0 | 1 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 26 | 27 | 27 |

## TABLE 6.2.1 Electricity Generation

### SWITZERLAND (CH)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 25 | 26 | 24 |
| Fossil Fired | TWh | 2 | 2 | 2 |
| *of which Coal* | TWh | | | |
| *of which Gas* | TWh | | | |
| Renewables | TWh | 36 | 33 | 39 |
| *of which Hydro* | TWh | 35 | 31 | 37 |
| *of which Wind* | TWh | 0 | 0 | |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | 2 | 2 | 2 |
| Total | TWh | 66 | 63 | 68 |

### NORWAY (NO)

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

### TURKEY (TR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 148 | 161 | 175 |
| *of which Coal* | TWh | 16 | 24 | 66 |
| *of which Gas* | TWh | 96 | 102 | 103 |
| Renewables | TWh | 55 | 57 | 65 |
| *of which Hydro* | TWh | 51 | 51 | 58 |
| *of which Wind* | TWh | 3 | 5 | 6 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 0 | 0 | 0 |
| Total | TWh | 203 | 218 | 239 |

### BOSNIA HERZEGOVINA (BA)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | |
| Fossil Fired | TWh | 8 | 10 | |
| *of which Coal* | TWh | 8 | 10 | |
| *of which Gas* | TWh | | | |
| Renewables | TWh | 8 | 4 | |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | 0 | 0 | |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | | | |
| Total | TWh | 16 | 14 | |

# TABLE 6.2.1 Electricity Generation

## CROATIA (HR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | | |
| Fossil Fired | TWh | 5 | 5 | |
| *of which Coal* | TWh | | | |
| *of which Gas* | TWh | | | |
| Renewables | TWh | 0 | | |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | 0 | | |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | 0 | 0 | |
| Total | TWh | 15 | 12 | |

## SERBIA (RS)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 0 | 0 | 0 |
| Fossil Fired | TWh | 23 | 27 | 25 |
| *of which Coal* | TWh | 0 | 0 | 24 |
| *of which Gas* | TWh | 0 | 0 | 0 |
| Renewables | TWh | 12 | 9 | 9 |
| *of which Hydro* | TWh | 12 | 9 | 9 |
| *of which Wind* | TWh | 0 | 0 | 0 |
| *of which PV* | TWh | 0 | 0 | 0 |
| Pumped Hydro | TWh | 1 | 1 | 1 |
| Total | TWh | 36 | 36 | 35 |

## UKRAINE (UA)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Nuclear | TWh | 89 | 90 | 90 |
| Fossil Fired | TWh | 86 | 93 | 97 |
| *of which Coal* | TWh | | | |
| *of which Gas* | TWh | | | |
| Renewables | TWh | 13 | 11 | 11 |
| *of which Hydro* | TWh | | | |
| *of which Wind* | TWh | | | |
| *of which PV* | TWh | | | |
| Pumped Hydro | TWh | | | |
| Total | TWh | 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 | TWh | -4.5 | 5.0 | -5.6 |
| Imports | TWh | 19.9 | 24.9 | 23.3 |
| Exports | TWh | 17.6 | 16.7 | 20.5 |
| **Total Demand** | TWh | 65.0 | 65.0 | 65.6 |

## BELGIUM (BE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 18.0 | 1.7 | 1.7 |
| Imports | TWh | 12.4 | 13.2 | 16.8 |
| Exports | TWh | 11.8 | 10.6 | 6.9 |
| **Total Demand** | TWh | 90.1 | 87.4 | 79.9 |

## BULGARIA (BG)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.9 | 1.2 | |
| Imports | TWh | 1.2 | 1.5 | |
| Exports | TWh | 9.6 | 12.1 | |
| **Total Demand** | TWh | 32.5 | 34.4 | 37.8 |

## CYPRUS (CY)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 0.0 | 0.0 | 0.0 |
| Exports | TWh | 0.0 | 0.0 | 0.0 |
| **Total Demand** | TWh | 4.8 | 5.0 | 4.6 |

## CZECH REPUBLIC (CZ)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -0.8 | -0.7 | -0.7 |
| Imports | TWh | 11.1 | 14.1 | 11.6 |
| Exports | TWh | 26.0 | 31.3 | 28.7 |
| **Total Demand** | TWh | 59.3 | 58.6 | 58.8 |

## GERMANY (DE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -8.6 | -7.8 | -8.2 |
| Imports | TWh | 42.2 | 49.7 | 44.2 |
| Exports | TWh | 59.9 | 56.0 | 67.3 |
| **Total Demand** | TWh | 568.5 | 562.9 | 551.2 |

## DENMARK (DK)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | | | |
| Imports | TWh | 10.6 | 11.7 | 15.9 |
| Exports | TWh | 12.7 | 11.3 | 11.7 |
| **Total Demand** | TWh | 36.0 | 33.8 | 33.3 |

## TABLE 6.3.1 Electricity Balances

### ESTONIA (EE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | | | |
| Imports | TWh | | | |
| Exports | TWh | | | |
| **Total Demand** | TWh | 7.4 | 7.2 | |

### SPAIN (ES)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -4.5 | -3.2 | -5.0 |
| Imports | TWh | 5.2 | 7.9 | 7.4 |
| Exports | TWh | 13.5 | 14.0 | 18.9 |
| **Total Demand** | TWh | 280.0 | 273.0 | 271.0 |

### FINLAND (FI)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 15.7 | 17.7 | 19.1 |
| Exports | TWh | 5.2 | 3.8 | 1.6 |
| **Total Demand** | TWh | 87.7 | 84.2 | 85.2 |

### FRANCE (FR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -6.5 | -6.8 | -6.7 |
| Imports | TWh | 20.3 | 9.4 | 12.1 |
| Exports | TWh | 50.8 | 66.3 | 57.2 |
| **Total Demand** | TWh | 513.2 | 479.2 | 489.5 |

### UNITED KINGDOM (UK)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 3.2 | 2.9 | 3.0 |
| Imports | TWh | 7.1 | 8.7 | |
| Exports | TWh | 4.5 | 2.5 | |
| **Total Demand** | TWh | 380.2 | 369.8 | 371.9 |

### GREECE (GR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | -0.4 | -0.3 |
| Imports | TWh | 8.5 | 7.2 | 6.0 |
| Exports | TWh | 2.8 | 3.9 | 4.2 |
| **Total Demand** | TWh | 59.2 | 58.6 | 58.4 |

### HUNGARY (HU)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 9.9 | 14.6 | 17.0 |
| Exports | TWh | 4.7 | 8.0 | 9.0 |
| **Total Demand** | TWh | 39.8 | 40.1 | 39.9 |

## TABLE 6.3.1 Electricity Balances

### IRELAND (IE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | | 0.1 | 0.2 |
| Imports | TWh | | 2.4 | 2.2 |
| Exports | TWh | | 0.0 | 0.0 |
| **Total Demand** | TWh | 25.4 | 26.8 | 33.3 |

### ITALY (IT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -4.5 | -2.5 | -2.6 |
| Imports | TWh | 46.0 | 47.5 | 45.4 |
| Exports | TWh | 1.8 | 1.8 | 2.3 |
| **Total Demand** | TWh | 330.4 | 334.6 | 328.2 |

### LITHUANIA (LT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -1.0 | -0.8 | -0.7 |
| Imports | TWh | 7.1 | 8.7 | 8.6 |
| Exports | TWh | 1.1 | 2.0 | 1.9 |
| **Total Demand** | TWh | 10.3 | 10.4 | 10.6 |

### LUXEMBOURG (LU)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -1.1 | -1.5 | -1.6 |
| Imports | TWh | 6.8 | 7.1 | 6.5 |
| Exports | TWh | 3.0 | 2.7 | 2.4 |
| **Total Demand** | TWh | 6.7 | 6.6 | 6.8 |

### LATVIA (LV)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 4.0 | 4.0 | 4.8 |
| Exports | TWh | 3.1 | 2.8 | 3.2 |
| **Total Demand** | TWh | 7.3 | 7.2 | 7.7 |

### MALTA (MT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 0.0 | 0.0 | 0.0 |
| Exports | TWh | 0.0 | 0.0 | 0.0 |
| **Total Demand** | TWh | 2.1 | 2.2 | 2.3 |

### NETHERLANDS (NL)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 15.6 | 20.6 | 32.2 |
| Exports | TWh | 12.8 | 11.5 | 15.0 |
| **Total Demand** | TWh | 117.1 | 118.2 | 115.1 |

## TABLE 6.3.1 Electricity Balances

### POLAND (PL)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -0.8 | -0.6 | -0.7 |
| Imports | TWh | 6.3 | 6.8 | 9.8 |
| Exports | TWh | 7.7 | 12.0 | 12.6 |
| **Total Demand** | TWh | 142.0 | 143.3 | 142.4 |

### PORTUGAL (PT)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -0.5 | -0.7 | -1.4 |
| Imports | TWh | 5.8 | 6.7 | 10.8 |
| Exports | TWh | 3.2 | 3.9 | 2.9 |
| **Total Demand** | TWh | 55.0 | 53.3 | 51.5 |

### ROMANIA (RO)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.3 | 0.2 | 0.1 |
| Imports | TWh | 1.8 | 2.9 | 4.5 |
| Exports | TWh | 4.7 | 4.8 | 4.3 |
| **Total Demand** | TWh | 53.4 | 54.9 | 54.4 |

### SWEDEN (SE)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 14.9 | 12.5 | 13.1 |
| Exports | TWh | 12.9 | 19.7 | 32.7 |
| **Total Demand** | TWh | 147.0 | 140.3 | 142.5 |

### SLOVENIA (SI)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.2 | |
| Imports | TWh | 0.7 | 7.0 | |
| Exports | TWh | 0.6 | 8.3 | |
| **Total Demand** | TWh | 11.7 | 12.4 | |

### SLOVAKIA (SK)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -0.5 | -0.5 | -0.3 |
| Imports | TWh | 7.3 | 11.2 | 13.5 |
| Exports | TWh | 6.3 | 10.5 | 13.1 |
| **Total Demand** | TWh | 26.6 | 26.8 | 26.8 |

### SWITZERLAND (CH)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | -2.5 | -2.5 | 2.4 |
| Imports | TWh | 66.8 | 83.3 | 86.8 |
| Exports | TWh | 66.3 | 80.7 | 89.0 |
| **Total Demand** | TWh | 64.3 | 63.0 | 63.4 |

## TABLE 6.3.1 Electricity Balances

### NORWAY (NO)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.5 | 1.7 | 1.5 |
| Imports | TWh | 14.7 | 11.3 | 4.1 |
| Exports | TWh | 7.1 | 14.3 | 22.0 |
| **Total Demand** | TWh | 132.0 | 125.1 | 130.0 |

### TURKEY (TR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | 0.0 |
| Imports | TWh | 1.2 | 4.5 | 5.8 |
| Exports | TWh | 1.9 | 3.6 | 3.0 |
| **Total Demand** | TWh | 202.3 | 218.5 | 241.9 |

### BOSNIA HERZEGOVINA (BA)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.0 | 0.0 | |
| Imports | TWh | 3.1 | 4.2 | |
| Exports | TWh | 6.9 | 5.7 | |
| **Total Demand** | TWh | 12.3 | 12.6 | 12.6 |

### CROATIA (HR)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 0.2 | | |
| Imports | TWh | 6.8 | | |
| Exports | TWh | 1.9 | | |
| **Total Demand** | TWh | 18.0 | 17.6 | |

### SERBIA (RS)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | 1.0 | 0.8 | 0.9 |
| Imports | TWh | 5.6 | 6.7 | 5.8 |
| Exports | TWh | 5.9 | 7.0 | 5.4 |
| **Total Demand** | TWh | 34.6 | 35.0 | 34.1 |

### UKRAINE (UA)

| | | 2010 | 2011 | 2012 |
|---|---|---|---|---|
| Pumping | TWh | | | |
| Imports | TWh | 0.0 | 0.0 | 0.1 |
| Exports | TWh | 4.2 | 6.4 | 9.7 |
| **Total Demand** | TWh | 183.7 | 187.5 | 188.4 |

# 7. Comments

The comments below provide additional information on the main developments for the electricity sector in the various Member States and on the assuptions used to provide data. Please note that not all Member States provided comments nor answered all the questions.

## SWITZERLAND (CH)

### 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.

### 3. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | The national government decided 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) | | |

**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 $CO_2$ 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 € |
|---|---|---|---|---|---|
| 2013 | ✓ | | | | |
| 2015-2020 | | ✓ | | | |
| Beyond 2020 | | | ✓ | | |

**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 | ✓ | |
| 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) | ✓ | |

**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 | ✓ | | | | |
| 2015-2020 | ✓ | | | | |
| Beyond 2020 | | ✓ | | | |

In 2012, $CO_2$ prices are lower than 10€ and this tendency is expected to follow until 2020. Beyond 2020, this tendency could change if specific political measures are carried out on this matter.

### 3. Comments on main legal changes for electricity sector, on a national level, from a European level. (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.

### 4. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | Political risk and public acceptance are key barriers for nuclear but it is necessary to fight climate change. Companies will only construct a nuclear plant if there is an agreement at state level (Parliament) and legal security for investment recovery. |
| Steam Thermal Units | | $CO_2$ is a barrier but CCS will allow maintaining a diversified mix. Without CCS, new steam thermal plants (coal plants) could have a difficult future. 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. |

### 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.<br>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.<br>No new condensing power plants are being considered to be built. There will be replacement investments for CHP.<br>Mainly fuelled with forest biomass and peat. |
| Gas Turbine Units | | No new commercial gas-turbine power plants under process.<br>The fuel prices are too high for expected power price levels. |
| Combined Cycle Units | | The same applies as above. |
| Internal Combustion Units | ✓ | |
| 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.<br>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) | ✓ | |

### 4. Comments on the methodology used in your own country to calculate $SO_2$ and $NO_x$ emissions from electricity generation.

$SO_2$ and $NO_x$ emissions are reported by the energy producers to 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 | ✓ | | | | |
| 2015-2020 | ✓ | | | | |
| Beyond 2020 | | ✓ | | | |

### 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 | ✓ | |
| 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 $SO_2$ and $NO_x$ 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 $CO_2$ 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 | ✓ | | | |

### 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 suppliers and a Greek power exchange are expected to come in force.

### 4. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | No perspective for nuclear. |
| Steam Thermal Units | | Many old thermal units fuelled by lignite, natural gas and oil will be gradually decommissioned 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.<br>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 $SO_2$ and $NO_x$ emissions from electricity generation.

Until 2007 discontinuous measurements / emission factors were used for the calculation / estimation of PPC's $SO_2$ / $NO_x$ emissions with the exemption of new Large Combustion Plants with 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 $CO_2$ 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.

### 4. Comments on assumptions and drivers behind the forecasts on technologies.

| 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. |

### 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 3. Comments on main legal changes for electricity sector, on a national level, from a European level.

It depends on the time-period. In the short term the sector will show a downsizing effect due to 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 $SO_2$ and $NO_x$ emissions from electricity generation.

It is the same as in Europe (please see Goteborg Protocol and LRTAP Convention) and, usually for LCP, they are not calculated but measured.

## LITHUANIA (LT)

### 1. General comments on electricity supply and demand situation in your country.

Final electricity consumption in 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 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 5th 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.

## MALTA (MT)

### 1. General comments on electricity supply and demand situation in your country.

Enemalta Corporation by virtue of the Electricity Market Regulations is the sole supplier of electricity on the islands. Enemalta Corporation currently operates two Power Stations. These stations with a total combined 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 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 assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | |
| Steam Thermal Units | | |
| Gas Turbine Units | | |
| Combined Cycle Units | | |
| Internal Combustion Units | | 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 $SO_2$ and $NO_x$ 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 3. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | ✓ | |
| Steam Thermal Units | ✓ | |
| Gas Turbine Units | ✓ | |
| Combined Cycle Units | ✓ | |
| Internal Combustion Units | ✓ | |
| 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) | ✓ | |

### 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 $SO_2$ and $NO_x$ 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 $CO_2$ 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 | | ✓ | | |
| Beyond 2020 | | ✓ | | |

### 3. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | Based on Government information 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 $SO_2$ and $NO_x$ emissions from electricity generation.

Emissions values are based on the individual emissions factors received from the Power plants and CHP's Operators. Factors for Autoproducers are prepared 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 $CO_2$ prices in the future? Please tick the correct assumption in the table below.

| $CO_2$ Prices | 0-10 € | 20-30 € | 30-50 € | › 50 € |
|---|---|---|---|---|
| 2012 | ✓ | | | |
| 2015-2020 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 3. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | |
| Steam Thermal Units | | |
| Gas Turbine Units | | |
| Combined Cycle Units | | 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 $CO_2$ prices in the future? Please tick the correct assumption in the table below.

Future development of the price of $CO_2$ certificates

| $CO_2$ Prices | 0-20 € |
|---|---|
| 2012 | |
| 2015-2020 | ✓ |
| After 2020 | ✓ |

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 deficit- e.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 $SO_2$ and $NO_x$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 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.

### 4. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | No perspective for nuclear. |
| Steam Thermal Units | | Old conventional low efficient thermal units will be gradually decommissioned 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. |

### 5. Comments on the methodology used in your own country to calculate $SO_2$ and $NO_x$ emissions from electricity generation.

After equipment installation, 90% of the TPP generation has continuous monitoring of annual $SO_2$ and $NO_x$ 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

The average $CO_2$ price 2012 was 7.35 €.

### 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.

### 4. Comments on assumptions and drivers behind the forecasts on technologies.

| Technologies | No opinion | Comments/evidence on projects in your country |
|---|---|---|
| Nuclear | | Existing plants may be replaced after 50 to 60 years. |
| Steam Thermal Units | | Bio fuel fired CHP plants are currently built. |
| Gas Turbine Units | | Not considered. |
| Combined Cycle Units | | Not considered. |
| Internal Combustion Units | | Not considered. |
| Hydro | | Only small size plants likely to be built. Increased efficiency in existing plants will increase output. |
| Non-fuel Renewables | | Ambitious scheme to build new wind farms. |
| New Technologies (e.g. Fuel Cells) | ✓ | |

### 5. Comments on exports/imports of electricity from/to your country, balances etc. Who are your major partners?

The Swedish transmission grid is connected to Norway, Finland, Denmark, Poland and Germany. Whether there is a net annual export or import depends on deviations in domestic supply and demand. Variations in precipitation have great impact on hydro power production and outages in nuclear power plants 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.

## 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 $CO_2$ 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 | ✓ | | | |
| Beyond 2020 | | ✓ | | |

### 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 (EPİAŞ) 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 $SO_2$ and $NO_x$ 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 $CO_2$.

### 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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