An Overview of System Adequacy

Summer Outlook Report 2011 and Winter Review 2010-2011

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1. EXECUTIVE SUMMARY

The ENTSO-E Summer Outlook Report 2011, prepared at European level, is a monitoring tool for security of electricity supply. It presents the outcome of national and regional power balance forecast analyses between electricity generation and peak demand on a weekly basis from the end of May until the end of September 2011. Analysis is based on data collected and information made available by the ENTSO-E Members as of April 2011 and following updates made during May 2011.

For the coming summer period, particular consideration is given to the impact on the electricity transmission network and the short-term system adequacy in Europe of some nuclear capacity shutdowns, after the dramatic earthquake and tsunami in Japan.

The context in which the TSOs have formulated their expectations and forecasts for summer 2011 is particularly dominated by:

- The decisions taken to shut down a significant number of nuclear power plants in Germany from 18 March 2011 for a three month period; this Summer Outlook Report is based on the assumption that these plants will not be available all summer long.
- The risk and safety assessment stress tests on nuclear power plants ordered by the European Council of 24-25 March.
- The possible closure of additional plants that might come in the coming months.

An extraordinary Electricity Cross Border Committee convened by the Commission took place on 28 March 2011 during which ENTSO-E presented a preliminary assessment of the impact on the European transmission network of the shutdown of nuclear plants. During that meeting, ENTSO-E stressed that, besides concerns about the long-term adequacy at local or regional level, voltage and congestion management may present additional diffuculties due to the contribution of nuclear generation in voltage support and the modifications in power flow patterns, respectively. ENTSO-E also called for greater coordination between Member States in implementing measures with such impact on the transmission grid. The ENTSO-E Summer Outlook Report 2011, focusing on short-term adequacy, complements this initial assessment in order to raise awareness with regard to security of supply issues.

The Summer Outlook 2011 shows that, on the whole, the balance between generation and supply is expected to be maintained during the summer period in case of normal conditions. In the six regions analyzed, the balance between demand and supply is not considered at risk. Some countries will rely on imports for the whole summer period (Finland, Hungary, Poland and Latvia). **In case of extreme heat waves or high temperatures which lead to an increase in demand as well as additional generation constraints on power plants, reliability margins are reduced and tense situations might occur in some countries and regions.** A stressed situation for all of Europe might result if such extreme conditions occurred over regions on a large scale.

The moratorium in Germany resulted in the shutdown of 8.3 GW of nuclear capacity; 5 of these 8 nuclear power units are located in the southern part of Germany in the vicinity of the load centres in the Rhine/Main, Rhine/Neckar and Munich areas. This is compensated by running other units (including renewable energy sources) or increasing imports from neighbouring countries. Depending on the specific situation, it may lead to N-1 violations and/or voltage management challenges for the German TSOs.

The impact of unfavourable weather conditions (heat/dry spells) in constraining generation output can be exemplified in the case of France, where reduced margins are liable to be observed in such situations, in particular during the end of the summer period. In September 2011, imports up to 6000 MW could be necessary to cover the minimum required margin. Bulgaria is in a similar situation, where tense situations in the eastern costal areas in case of

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extended heat waves during the peak season are expected to be alleviated with important reinforcements of the transmission network to be in place by the beginning of the summer. Reduced margins are expected in Montenegro as well.

Considering the above, transmission network developments and reinforcements foreseen for this period will improve system security and congestion management. Positive effects in this respect have been highlighted in some countries such as Austria where the commissioning of new transmission lines will relieve congestion in important parts of the countries. In Italy the forecast margins for the coming summer are higher and, particularly in Sardinia, one of the two main insular areas, more comfortable than in previous years, due to the entry into operation of the second of the two new 500 MW HVDC undersea links with the Italian Peninsula (SAPEI).

The Winter Review 2010-2011 outlines what happened during the last winter period regarding weather conditions and any critical events, and their consequences for the power system, in comparison to the forecasts released in December 2010 in the Winter Outlook Report 2010-2011. The period under consideration is from December 2010 to March 2011.

The Winter Review 2010-2011 shows that no major adequacy problems occurred in Europe during the last winter period. The main risk identified by TSOs, namely the sensitivity of the load to low temperatures, became reality in most regions (in particular the North Sea, Baltic and Central South Regions), as the previous winter was colder than forecast. New record peak loads were metered in France, Great Britain and Ireland. The coldest temperatures were registered in December. The most remarkable events were related to wind power generation (i.e wind storms in Germany), and the low level of water reservoirs in some other countries (Norway and Sweden), which have required extreme vigilance from the respective TSOs for the secure operation of their networks.

1.1 Summer Outlook 2011

North Sea Region

Belgium, Denmark, France, Germany, Great Britain, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway

The sudden shutdown of eight German nuclear power plants following the events in Japan is expected to affect all of Germany. Missing plants pose a problem for the grid that could become critical due to subsequent changes in the power flow situation. Germany expects to see more intervention necessary to maintain system security. In particular, problems with maintaining N-1 security are expected, and with maintaining the voltage level in the south.

There is a fair chance of cooling water restrictions in some of the North Sea Region countries for river located plants, if the ongoing long period of reduced precipitation continues (especially in France) and in case of high summer temperatures. Also, Norway expects imports due to the extremely low hydro-reservoir situation.

Baltic Sea Region

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Sweden

Under normal conditions no critical situations are expected. Several countries have assessed the risk of critical events under conditions such as maintenance of main power plants or planned outages of interconnectors. Finland expects negative power balance all summer, while Poland and Latvia expect negative balance for parts of the summer. Other countries in the Baltic Sea Region expect a surplus of power all summer. The negative power balance in Finland, Poland and Latvia can be covered by imports from neighbouring countries.

Continental South West Region

France, Portugal, Spain

In normal conditions, no critical events are expected in Portugal or Spain. In France, should the present dryness continue or in case of heat waves, margins would be reduced and the situation could be stressed during the end of the summer. In case of high temperatures, margins would be reduced in France with possible stress situations for the end of the summer.

Continental South East Region

Bosnia-Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Greece, Hungary, Italy, Montenegro, Republic of Serbia, Romania, Slovenia

During the summer, no critical events are expected in this region. In normal conditions, Croatia, Greece, Hungary and Italy are dependent on imports from the neighbouring countries. In case of extreme conditions (low hydrology, high temperatures), Slovenia and Montenegro may also be dependent on imports.

Continental Central South Region

Austria, France, Germany, Italy, Slovenia, Switzerland

Within the Central South Region no supply and demand problem is expected to occur during the coming summer. Higher needs for imports are expected to arise in some countries (in case of high temperatures, heat wave and low hydro conditions).

An increase of load in comparison to the previous years is expected in most of the countries of the region (Austria, Italy). Due to the nuclear situation in Germany, higher generation of thermal power plants has been forecast in Austria.

CONTINENTAL CENTRAL EAST REGION

Austria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia

Despite the nuclear shutdown in Germany, no adequacy problems are expected in the forthcoming summer period. This shutdown will be compensated by imports and by running more expensive generating units. The “missing” nuclear power plants are expected to cause changes in the power flows, which in certain conditions may become a critical problem for the transmission network of Germany and neighbouring countries.
Most of the countries expect an increase in consumption during the period. Hungary and Slovenia foresee increased imports in case of extended heat waves.
Overall, all the countries in the region consider that no severe adequacy risks are identified.

ISOLATED SYSTEMS

Cyprus

No supply demand balance problem is expected to occur on the island. A reduction of the national generating capacity is expected for the coming summer due to the dismantling of three important generators.

Iceland

The generation capacity in Iceland is expected to be sufficient to meet peak demand this summer in normal as well as severe conditions. Landsnet does not anticipate any particular problems in the isolated Icelandic power system.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

No supply and demand problem is expected to occur in the Albanian power system in the coming summer in both normal and severe conditions. The northern interconnections will be strengthened with a new 400 kV interconnection line with Montenegro to be put into operation at the end of April 2011. It is expected that the new tie-line will have a positive effect on the facilitation of energy exchanges in the region.

Ukraine West

N/A

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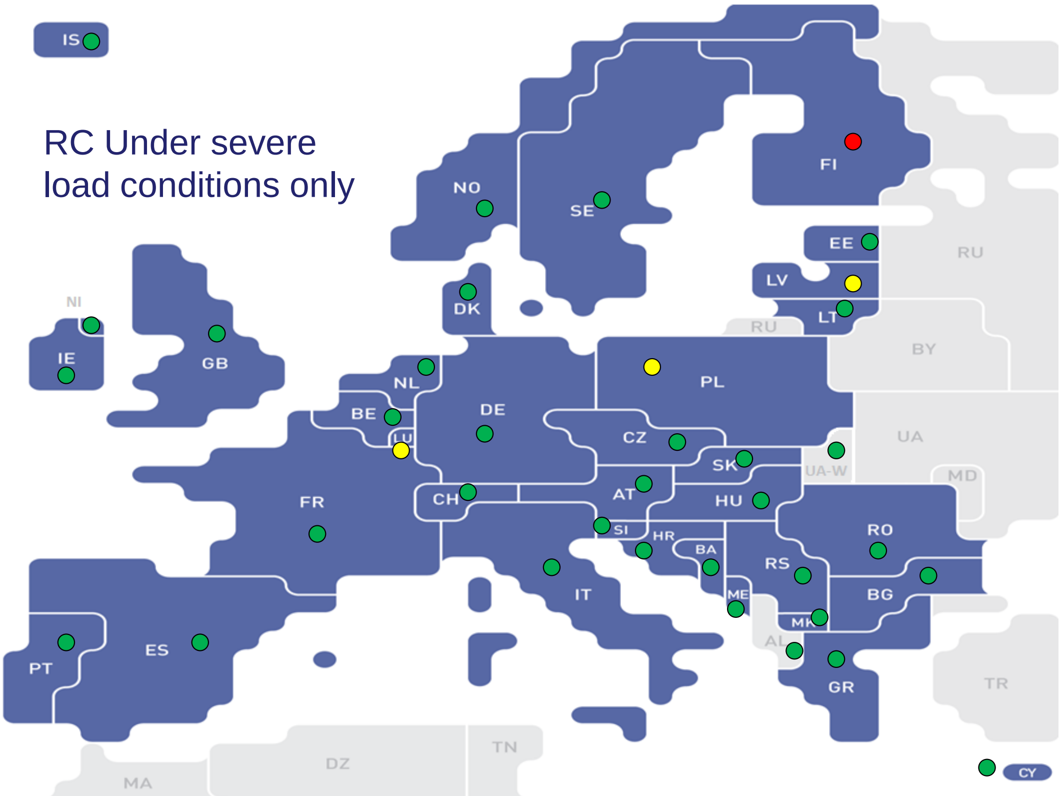
PAN-EUROPEAN OVERVIEW

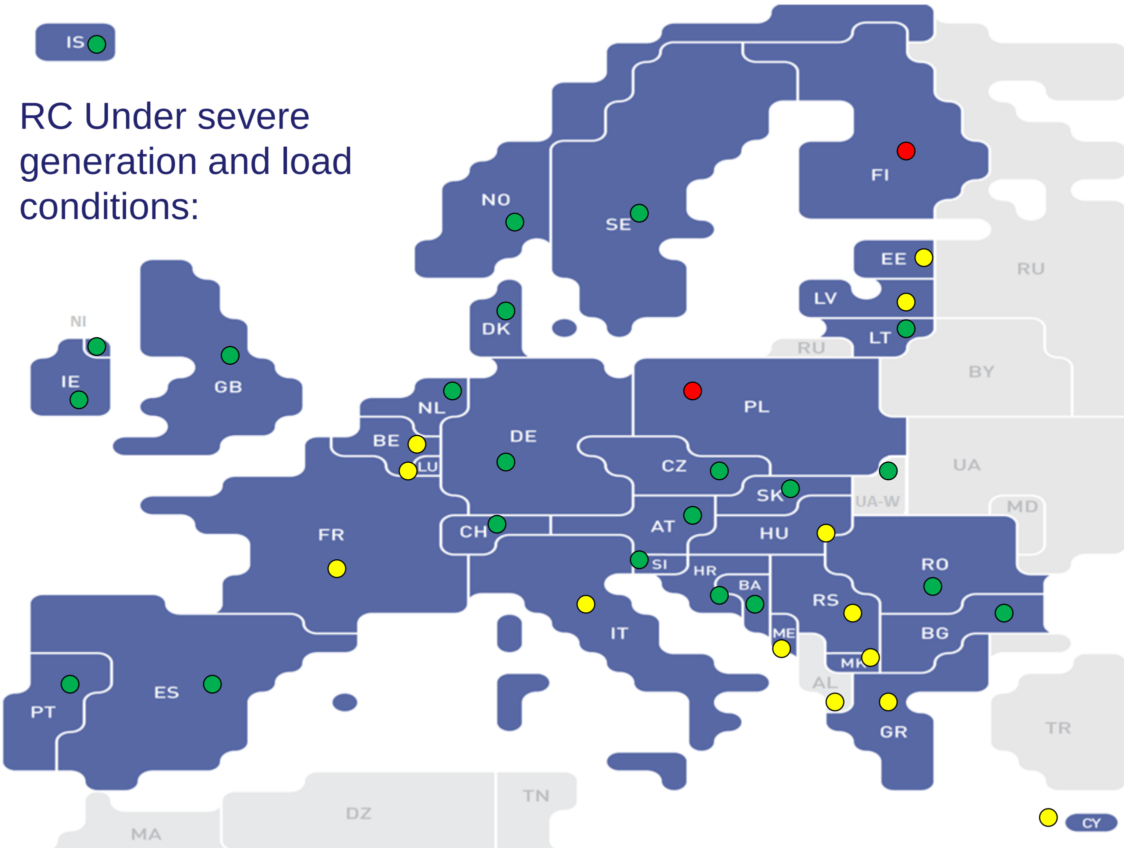
The following map shows the countries where margins are expected to be tight for the coming summer if severe load conditions occur. The colour scale is based on individual country assessments of the Remaining Capacity (RC), outlined in chapters 3 and 6, the colour codes are as follows:

- Green: RC is positive for the whole summer period.
- Yellow: RC is below zero for least one week during the summer period.
- Red: RC is below zero for the whole summer period.



The following map shows the countries where margins are expected to be tight for the coming summer in case of severe temperature conditions or prolonged dryness, which would lead to constraints on the generation side. The colour scale is based on individual country assessments of the Remaining Capacity (RC), outlined in chapters 3 and 6, the colour codes are as follows:

- Green: RC is positive for the whole summer period.
- Yellow: RC is below zero for least one week during the summer period.
- Red: RC is below zero for the whole summer period.



1.2 Winter Review 2010-2011

NORTH SEA REGION

Belgium, Denmark, France, Germany, Great Britain, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway, Republic of Ireland

For the North Sea Region, due to a high amount of installed wind power generation capacity in Germany, several situations with strong winds had to be handled. The windstorm “Carmen” moved over Germany and in consequence led to a wind infeed of 21 000 MW in Germany (in 50Hertz control area 9 785 MW). To avoid overload of grid elements and because of an N-1 security violation in the 50Hertz control area, the generation of power plants and renewable-based generating units had to be adapted.

There are some worries about the levels in the water reservoirs in the North and especially in Norway. The level has been very low and it still is.

The weather in all countries has been very cold, which, combined with a long-lasting winter, has led to a high energy consumption level.

BALTIC SEA REGION

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Sweden

For the Baltic Sea Region a very low level for the hydro reservoirs in Norway and Sweden through the whole winter led to a situation with a large import need to the Nordic market and to Sweden/Norway especially. This has so far not led to an unacceptable security of supply situation for the region. However, the extremely low hydro reservoir situation in Norway has led to an energy balance alert, especially in southern parts of Norway. As a result of this situation, the market prices have risen to a very high level in all the Nordic countries.

The weather in all countries has been very cold, which, combined with a long-lasting winter, has led to a high energy consumption level.

CONTINENTAL SOUTH WEST REGION

France, Portugal, Spain

In the Continental South West region, temperatures during last winter were close to average, except in December, which was characterised by 3 successive cold spells and periods of snow. The main risk identified in the Winter Outlook report was the sensitivity of the load to low temperatures. A better availability of the French generation fleet in comparison to the previous winter 2009-2010 induced higher levels of export compared to the previous winter, except during December.

CONTINENTAL SOUTH EAST REGION

Bosnia-Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Greece, Hungary, Italy, Montenegro, Republic of Serbia, Romania, Slovenia

In the Continental South East Region, during last winter there were no unusual or critical events. Hungary, Serbia, FYROM, Greece and Italy depended on imports. The temperatures were in line with the yearly averages, with short periods of time with low temperatures. This winter was characterised by good hydrological conditions in the southern part of the region.

CONTINENTAL CENTRAL SOUTH REGION

Austria, France, Germany, Italy, Slovenia, Switzerland

In the Central South Region, winter 2011 was colder than forecast in the Winter Outlook. December was recognised as the coldest month in some countries in comparison to the forecasts (i.e. Slovenia, Switzerland). As a consequence of the cold weather and better economic conditions in these countries, a higher level of demand and consumption characterised the winter period in the region. This was particularly visible in Slovenia, Austria, and Italy and in France, where a new peak load was registered in December (96.710 MW on 15 December 2010). More rainfall and favourable hydro conditions were also registered. No system adequacy problem or remarkable stressed event occurred during the period, except for major cold spells in some countries due to the weather conditions.

CONTINENTAL CENTRAL EAST REGION

Austria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia

All countries in the region, with the exception of Czech Republic, reported an increase in their consumption in the winter period compared with the same period in the previous year. No adequacy problems were identified. Special measures were taken to avoid N-1 security violations during periods with high wind generation in the control areas of Germany. Some problems with satisfying the N-1 criteria were observed in Poland due to high unplanned load

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flows from Germany. The shut-down of Krsko Nuclear Plant for 1 week in March did not cause an adequacy risk in Slovenia and Croatia.

There were no extreme cold waves. All TSOs provided the required conditions for normal market operations in the region.

ISOLATED SYSTEMS

Cyprus

Climatic conditions in winter 2010-2011 in Cyprus were mild, as expected. For Cyprus, the stressed periods for system adequacy occur during the summer period. The Cyprus system is an isolated system.

Iceland

No significant event occurred during the last winter period. The installed generation capacity provided an acceptable level of system adequacy.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

No major unexpected or unusual event occurred during the winter period. The average temperature was close to the forecast, and severe conditions associated with increased electricity demand and peak load did not occur. A higher level of hydro was recorded.

Ukraine West

N/A

2. INTRODUCTION AND METHODOLOGY

2.1 Scope & Objectives of the Report

2.1.1 Summer Outlook Report

The objective of the ENTSO-E Summer Outlook Report is to present member TSOs' views as regards any national or regional matters of concern regarding security of supply for the coming summer, and the possibilities of neighbouring countries to contribute to the generation/demand balance in critical situations.

The analysis is performed on a weekly basis.

The period considered for the Summer Outlook is from 31 May to 30 September 2011.

2.1.2 Winter Review Report

The ENTSO-E Winter Outlook 2010-2011 was published on 2 December 2011 on the ENTSO-E website.

The winter review report, prepared at European level, aims to present a summary of the national and regional power balances between the forecast electricity generation and peak demand on a weekly basis. The period taken into consideration for the outlook was from 6 December 2010 to 10 April 2011. However, due to the timeline of delivery of the retrospective data, the majority of TSOs closed their data collection at the end of March.

The objective of the winter review is now to present what happened during the winter time in respect to weather conditions and other factors and the consequences for the power system that occurred in reality in comparison to the forecasts reported last December 2010 in the Winter Outlook report.

2.2 Sources of Information & Methodology

2.2.1 Summer Outlook Report

The summer outlook report is based on the answers to a questionnaire sent to every ENTSO-E member in April 2011 (see Appendix 3). The questions asked aim to identify any potential system problems forecast for the coming summer by each TSO, any mechanisms or arrangements in place to manage the identified risks, the source(s) and likely availability of power imports where required, and to identify any issues likely to affect interconnectors or circuits which could affect the availability of imports.

If any particular high-risk weeks/periods were highlighted when answering the questionnaire, quantified generation and peak load data were sought for the periods in question. No specific analysis was carried out to simulate the power flows on the whole European High Voltage interconnected network at national and regional level.

ENTSO-E uses the information sent and available to its member TSOs in respect of nuclear actions taken at national country level from March 2011 onward to shut down nuclear power plants following Japan's Fukushima crisis. In this respect, TSOs reported if they expect any generation adequacy problems or other network-related concerns to be identified for the coming summer in respect to nuclear reduction and other generation constraints under stressed situations (such as droughts and hot spells).

Appendix 2 shows the individual country responses to the Summer Outlook Questionnaire.

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2.2.2 Winter Review Report

The winter review report is based on the answers to a questionnaire sent to every European TSO in April 2011 (see Appendix 3). The methodology is developed as a qualitative comparison of forecast and actual market conditions and events, based on a narrative description given by the TSOs with regard to the previous winter period.

TSOs have been invited to provide quantitative data where possible to illustrate how the winter turned out against what was forecast (e.g. actual peak load and difference compared with forecast in normal and extreme conditions, major disturbances and their effect on generation or transmission capability, etc.).

Appendix 1 shows the individual country responses to the Winter Review Questionnaire.

2.3 Aims and Methodology

2.3.1 General Considerations

The ENTSO-E Summer Outlook report is prepared in compliance with art. 8, lett. f) of the EC Regulation n. 714/2009, by which ENTSO-E is requested to adopt adequacy outlooks for the winter and summer period.

The report is also a tool to show studies produced by TSOs to report on and forecast system adequacy, and it also stimulates further studies.

The report is also expected to facilitate the monitoring of the security of electricity supply in Europe on a short-term basis. With this aim, the European Commission convenes biannual Electricity Cross-Border Committee meetings, where the ENTSO-E summer or winter electricity outlook is discussed with member states with the aim of information sharing.

TSOs have presented their views concerning national and regional system adequacy forecasts for the coming summer time, having regard to the balance between demand and supply and the possibility that neighbouring countries can contribute to it in case of critical situations.

The information is based on the answers to a questionnaire sent to every TSO last April aiming to report about expected conditions from the end of May to the end of September 2011. The questions are related to TSOs’ practices in order to present countries’ forecasts on a common basis.

2.3.2 Methodology and future implementation

The methodology consists in identifying the ability of generation to meet the demand by calculating the so-called “remaining capacity”.

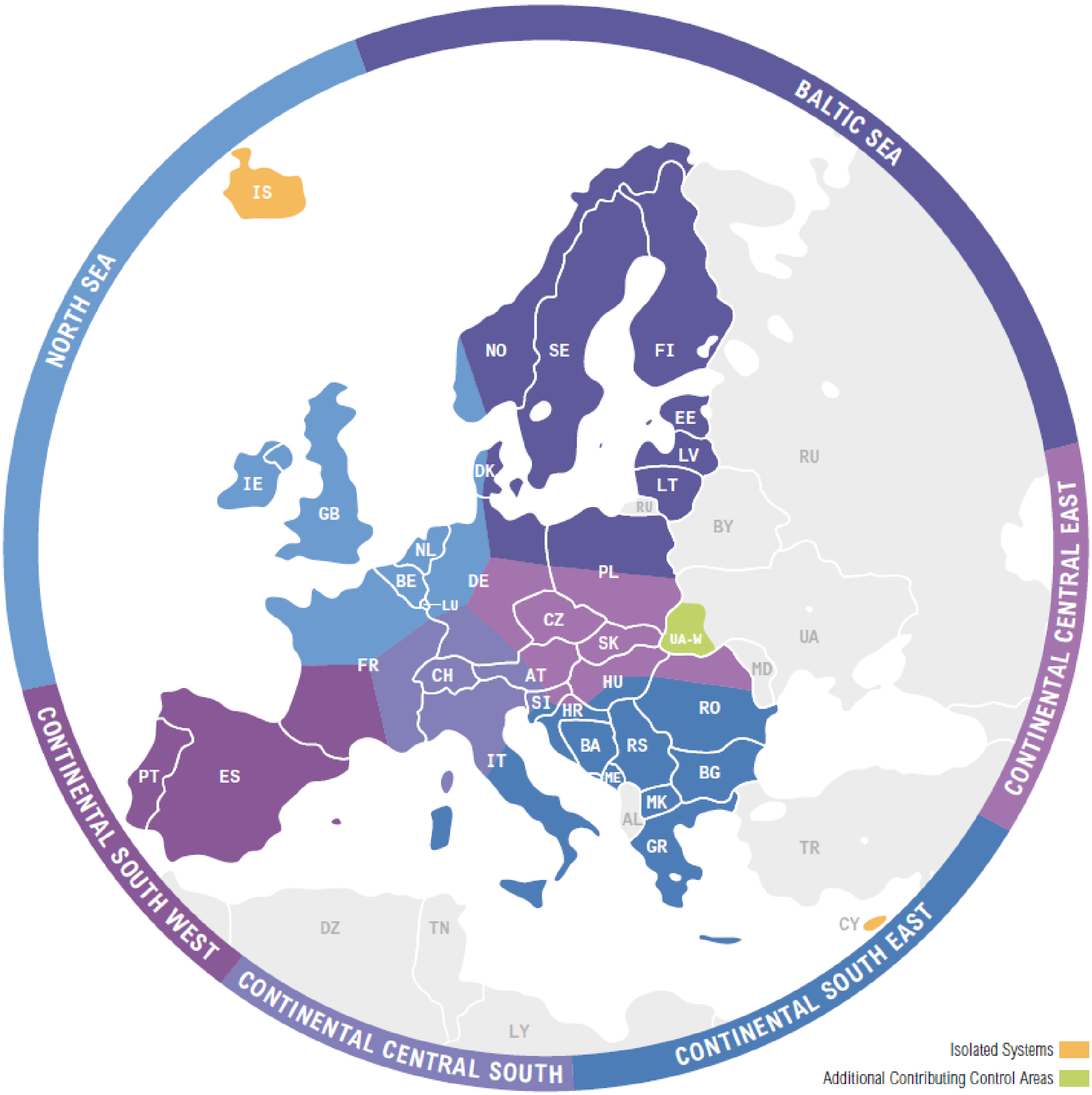
The figures in the individual country responses in the Appendix show the National Generating Capacity, the Reliably Available Capacity and the peak load under normal and severe conditions. The remaining capacity is calculated for normal conditions. The remaining capacity is also evaluated with firm import/export contracts and for severe weather conditions. In addition, for the coming summer period, **remaining capacity was also assessed under severe load conditions, in case of hot weather as well as in case of generation constraints due to forecast restrictions on generation capacity.** This assessment was also presented at regional level to show the short term adequacy for the coming summer.

For future implementation of the reports, a review project on short-term system adequacy methodology is currently under assessment within ENTSO-E.

2.4 List of Contributing Countries

This report has been drawn up by ENTSO-E "WG System Adequacy and Market Modelling" under the System Development Committee with contributions from all TSOs belonging to the regions listed below, plus Albania and Ukraine West.

The identification of blocks relates to the regions under the ENTSO-E System Development Committee, as shown below:



North Sea Region

Belgium, Denmark, France, Germany, Great Britain, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway

Baltic Sea Region

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Sweden

Continental South West Region

France, Portugal, Spain

Continental South East Region

Bosnia-Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Greece, Hungary, Italy, Montenegro, Republic of Serbia, Romania, Slovenia

Continental Central South Region

Austria, France, Germany, Italy, Slovenia, Switzerland

Continental Central East Region

Austria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia

Isolated Systems

Cyprus, Iceland

Additional Contributing Countries

Albania, Ukraine West

3. SUMMER OUTLOOK 2011

3.1 Main Results - Risk Factors

There are a number of key factors which are likely to affect the balance between demand and supply when preparing the short-term outlook reports on system adequacy. These factors rest on the information made available by TSOs and include in particular the following:

- **Temperatures** which influence the level of the load;
- **Precipitation levels** affecting hydro generation availability, particularly as a consequence of the winter rainfall.
- **Cooling systems for power plants and other constraints on the generation side**

Particular attention has been given since year 2008 to both the effects and the drop of electricity demand due to **the economic and financial crisis. This attention will continue for year 2011 even though positive signals are expected to occur for the coming summer.**

In addition, for year 2011 TSOs have been requested to give special attention to nuclear generation capacity, due to political reactions to Japan's Fukushima nuclear disaster, which caused the shutdown of several large generating plants, in particular in German nuclear units. This was complemented by the Decision taken at EU level to start "stress tests on nuclear plants" in the second half of 2011 in reference to safety measures.

Among the other factors having effects on the generation side are the following:

- **Outages of large units** (particularly thermal and nuclear plants), including routine overhauls and unplanned unavailability, but also extension of the duration of planned outages;
- **Hydrologic conditions**, low inflows leading to reduced generation of hydro units;
- Market conditions on fuels, especially **gas**, with possible effects on the energy that can be generated by Combined Cycle Gas Turbines.
- **After 11 March 2011,** the tsunami in Japan and the subsequent Fukushima nuclear disaster caused immediate reactions at national and EU level, and the shutdown of nuclear plants in Germany, with effects on interconnections and different patterns of import and export between countries.
- Further unplanned decommissioning of important nuclear plants that might occur during the next summer period due to political decisions, with no information on timing and clarity available to the TSOs.

The last set of important factors is linked to network conditions, such as:

- **Extreme climatic conditions**, which could affect the availability of the network and generation capacity.
- **Congestions** that limit the possible use of generation or, in extreme cases, the supply of local loads.
- **Loop-flows**, due to the physical laws of electricity transmission, which may stress the network and/or limit transfer capacities.
- **Wind feed-in** due to an increase of wind generation and wind capacity**.**
- **Generation-load imbalances in other countries** within the same interconnected block that could lead to unforeseen flows through the country.

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Tenser situation with regard to network management due to the nuclear shutdown. Among them:

- Changes in the power flow situation and additional TSO intervention on the grid to maintain system security (in order to avoid N-1 violations).
- Voltage control and reactive power balance in some countries during the nuclear shutdown.

3.2 Main Features

The most stressed periods generally occur at peak load.

In normal conditions, high risk periods have been considered as follows:

- Second half of June, July and first half of August in Greece
- July and August in Albania

In severe load conditions, in case of high temperatures and heat waves, the high risk periods are reported as follows:

- Second half of June, July and first half of August in Greece.
- Possible tense situation in Bulgaria (in particular in the eastern coastal area).
- Weeks 30 and 31 in Cyprus.
- During the whole summer period, Hungary could be dependent upon imports.
- Week 35 in Italy and in Denmark.
- Weeks 31 to 35 in Montenegro, because of the expected additional need for imports.
- June – July in Poland.
- Beginning of May in Latvia.

In severe load conditions and with possible generation constraints, in case of hot and dry spells the margins are expected to be tight for all the summer period, particularly within Finland and Poland. They are expected to be tenser in some weeks of the coming summer in Estonia, Latvia, France, Belgium, Serbia, Hungary, Italy, Montenegro, FYROM, Greece and Albania.

More detailed information is reported on a regional basis in the following section 3.3 and on a country basis in Appendix 2.

3.3 Comments per Regions

NORTH SEA REGION

Belgium, Denmark, France, Germany, Great Britain, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway

The sudden shutdown of eight German nuclear power plants following the events in Japan is expected to affect the whole of Germany. Missing plants pose a problem for the grid that could become critical due to subsequent changes in the power flow situation. Germany expects to see more intervention necessary to maintain system security. In particular, N-1 violations and problems with maintaining the voltage level in the south are expected.

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There is a fair chance of cooling water restrictions in some of the North Sea Region countries for river-located plants after longer periods of reduced precipitation and high summer temperatures. In case of high temperatures or heat waves, margins are expected to be reduced in France with a need for imports up to 6000 MW in September to cover the minimum required margin. This is expected to affect Great Britain, Germany and Belgium in the region. The availability of imports from Belgium and Germany might be slightly reduced in case of extreme heat waves and thermal constraints of power plants in northern France.

For the North Sea Region, a sensitivity assessment in case of severe load conditions due to high temperatures and constraints on the generation plants indicates that the margins are expected to be tight in particular in France (end of July, second half of August and September) and Belgium. However, for the overall Region, the margins are considered appropriate to cover the load and on the whole the situation in the Region is not considered at risk of shortage.

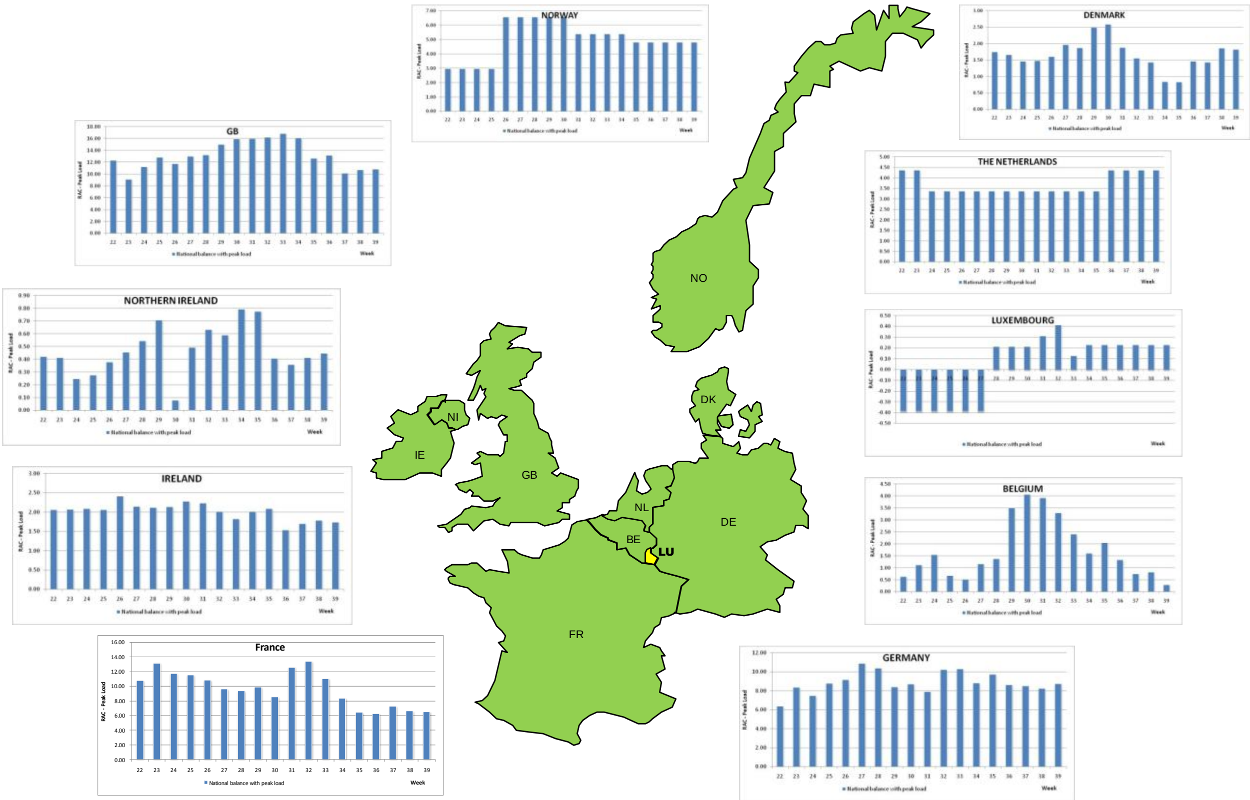


Fig. 1. Regional overview of individual power balances (GW) under severe load conditions, without import or export. Trend per country is shown. Colours depend on the values shown in the individual power balances: green when RC is positive for the whole summer period, yellow if RC is below zero for least one week, and red if RC is below zero for the whole summer period.

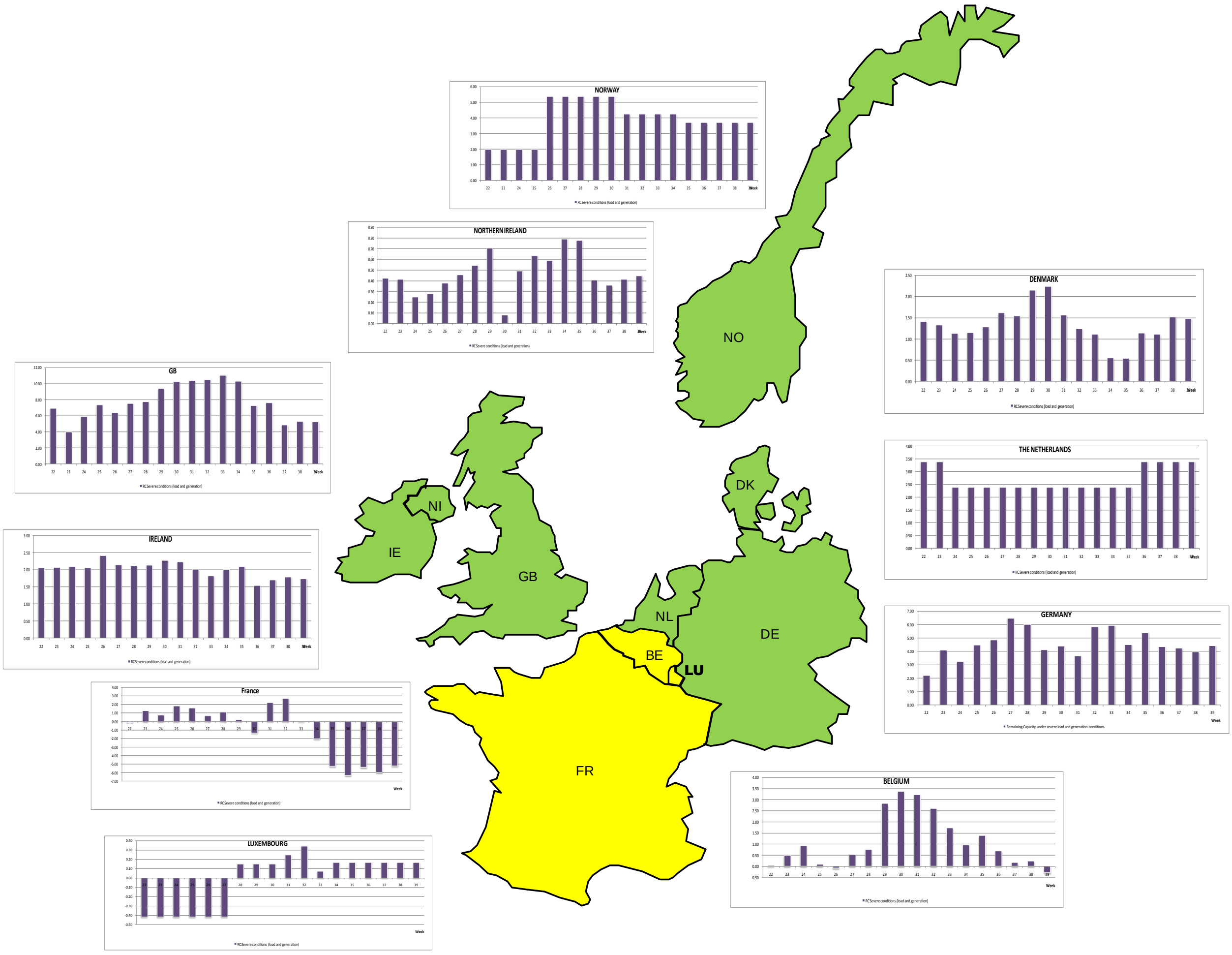


Fig. 2. Regional overview of individual power balances (GW) under severe load conditions and generation constraints, without import or export. Trend per country is shown. Colours depend on the values shown in the individual power balances: green when RC is positive for the whole summer period, yellow if RC is below zero for least one week, and red if RC is below zero for the whole summer period.

In France, a high increase of consumption (calculated at +7°C above reference temperatures) and many generation reductions (around 11 300 MW) have been taken into account to simulate what happened in August 2003 and July 2006.

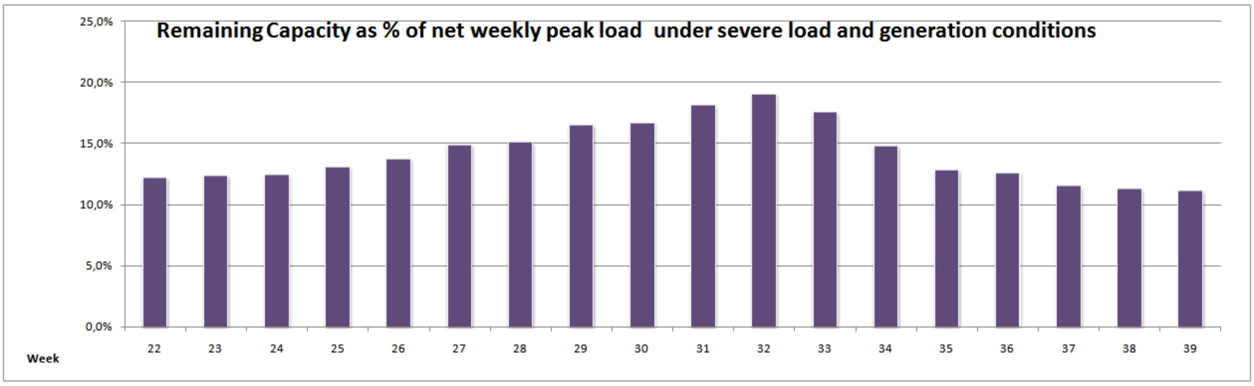


Fig. 3. Regional overview of remaining capacity under severe load conditions and generation constraints as % of net weekly peak load. Trend per region is shown. No specific analysis simulates import and export power flows between the countries in the region.

BALTIC SEA REGION

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Sweden

In normal conditions no critical events are expected. Several countries have assessed the risk of critical events in conditions such as e.g. maintenance of main power plants or planned outages of interconnectors. Finland expects negative power balance all summer, while Poland and Latvia expect negative balance for parts of the summer. Other countries in the Baltic Sea Region expect a surplus of power during the whole summer. The negative power balance in Finland, Poland and Latvia can be covered by imports from the neighbouring countries.

In case of severe load conditions and constraints on the generation plants, the margins are expected to be tight, especially in Finland and Poland. However, both the margins and the import capacity from the neighbouring countries are expected to be good. Therefore the margins in the overall Region are considered appropriate to cover the load in a severe load situation.

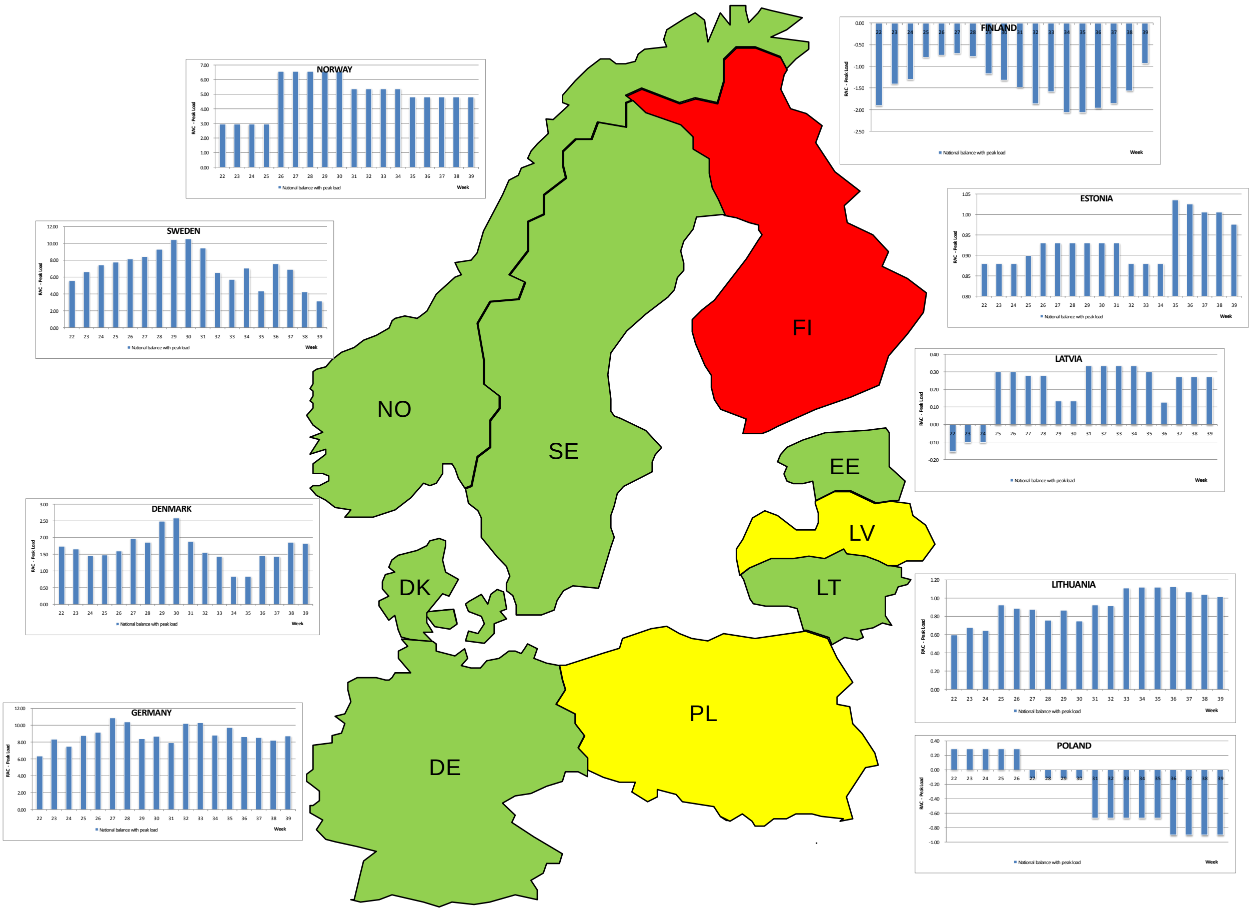


Fig. 1. Regional overview of individual power balances (GW) under severe load conditions, without import or export. Colours depend on the values shown in the individual power balances: green when RC is positive for the whole summer period, yellow if RC is below zero for least one week, and red if RC is below zero for the whole summer period.

The columns in Fig. 1 represent weeks 22 to 39 of 2011 and are based on weekly estimates. As the balance data range differs from 0.14 GW in Latvia to 10.53 GW in Sweden, different scales are used for each country chart.

In total, the Baltic Sea Region has a positive power balance for summer 2011 in both normal and severe load conditions. When viewed nation by nation, a few countries have a negative power balance (see Fig. 1), but when taking possible imports from neighbouring countries into account these are balanced out, as both the necessary power surplus and transmission capacities are expected to be available.

Adding all the individual balances in the region shows that, in total, the region has a positive balance of 10-20 GW (depending on the week) in severe load conditions. German data is excluded, because net weekly peak load is presented under normal load conditions. Taking into account Germany’s net weekly peak load under normal conditions, the region’s balance is 19-29 GW (depending on the week).This is on the assumption that the severe load conditions of all countries (excluding Germany) occur simultaneously. Previous statistical assessments, however, indicate that the simultaneous peak load is less than 98 % of the sum of all peak loads. Also, wind power is not necessarily available at peak load and therefore only a smaller part of the installed wind capacities is included in the power balance. There are 38.9 GW of installed wind power in the Baltic Sea Region. Countries in the region have included between 0 % and 12 % in their national power balance, and on average for the Baltic Sea Region approximately 5 % of this is included in the power balance. Looking at this from a regional view, it was chosen to assume 6 %[1] availability of all wind power in the regional power balance.

A regional power balance has been calculated based on the individual power balances, which are described in more detail for each country in this report. The regional power balance, which assumes a 2 % reduction in severe load conditions and that the wind power in each country has an availability of 6 %, improves the overall power balance to 11-21 GW (depending on the week) under severe load conditions, excluding Germany, and 21-32 GW taking into account Germany's data on net weekly peak load in normal conditions.

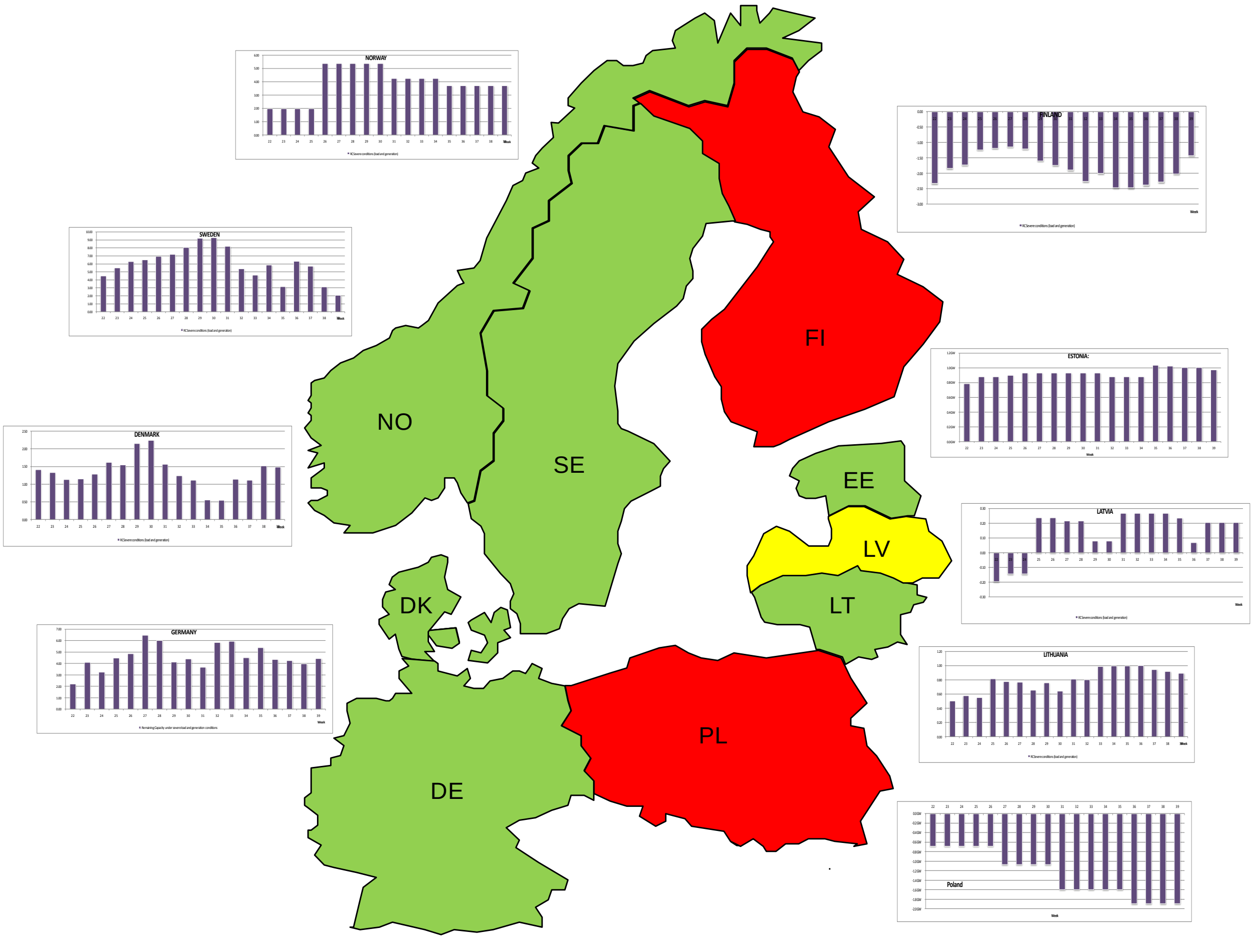


Fig. 2. Regional overview of individual power balances (GW) under severe load conditions and generation constraints, without import or export. Trend per country is shown. Colours depend on the values shown in the individual power balances: green when RC is positive for the whole summer period, yellow if RC is below zero for least one week, and red if RC is below zero for the whole summer period.

[1] Based on previous assessments for the Nordic region alone, where at least 6 % of the installed wind power capacity will be available with 90 % probability.

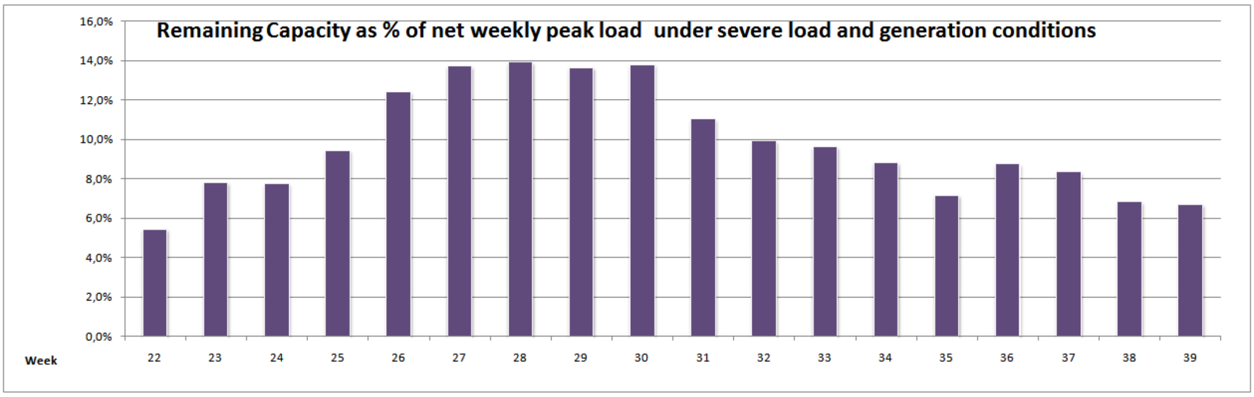


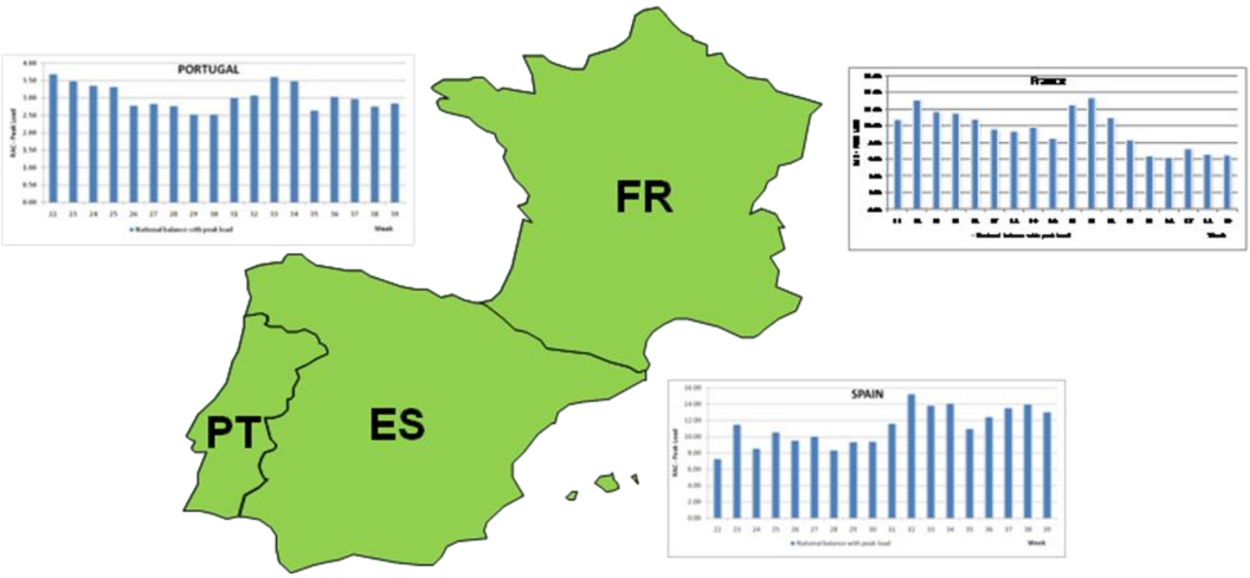
Fig. 3. Regional overview of remaining capacity under severe load conditions and generation constraints as % of net weekly peak load. Trend per region is shown. No specific analysis simulates import and export power flows between the countries in the region.

CONTINENTAL SOUTH WEST REGION

France, Portugal, Spain

No critical events are expected during this summer in the region. Even for the extreme conditions, low wind generation, very drought conditions and a very high thermal forced outage rate, problems with the generation/demand balances are not expected. Spain expects similar demand to the previous summer, and Portugal does not depend on imports of electricity during the summer. France will rely on imports in case of extreme heat waves and high temperatures.

For the Continental South West Region, a sensitivity assessment in case of severe load conditions due to hot temperature and constraints on the generation plants indicates that the margins are expected to be tight particularly in France (end of July, second half of August and September). However, for the overall region the margins are considered appropriate to cover the load and on the whole the situation is not considered at risk of shortage.



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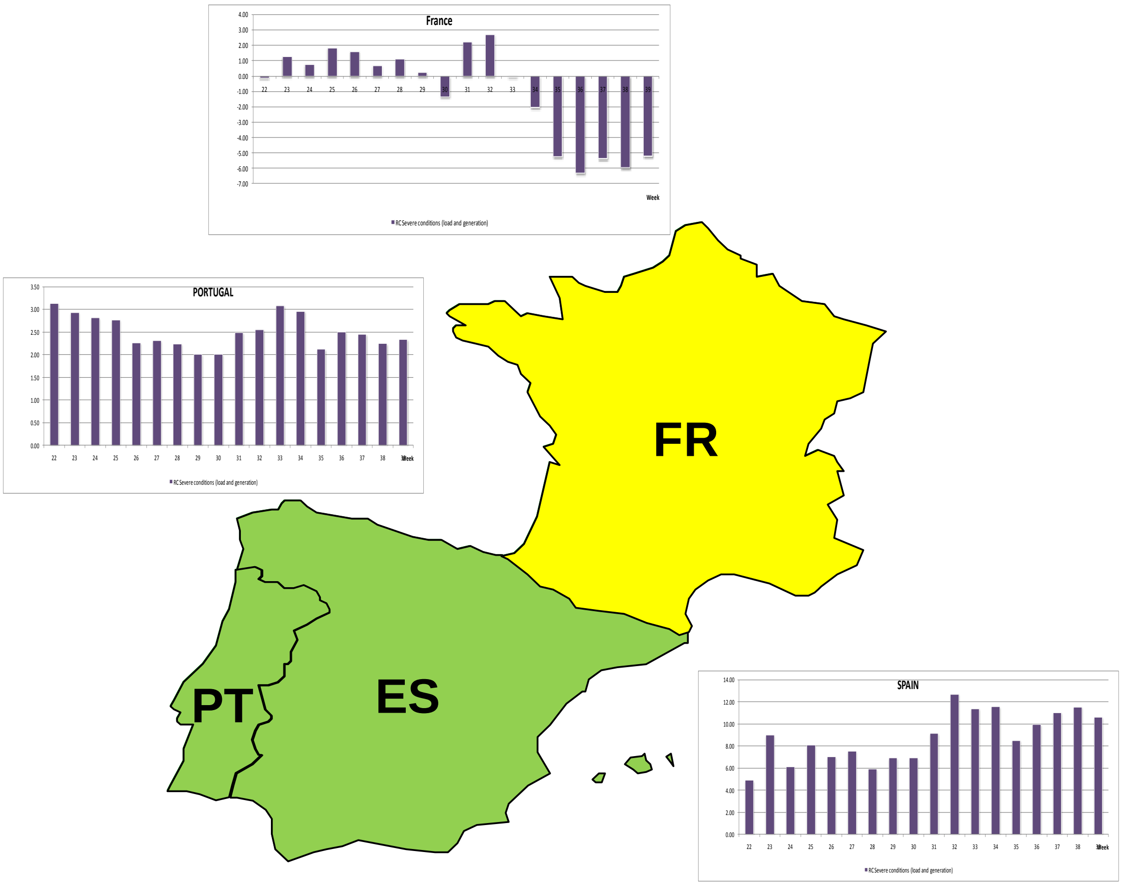

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In France, a high increase in consumption (calculated at +7°C above reference temperatures) and many generation reductions (around 11 300 MW) have been taken into account to simulate what happened in August 2003 and July 2006

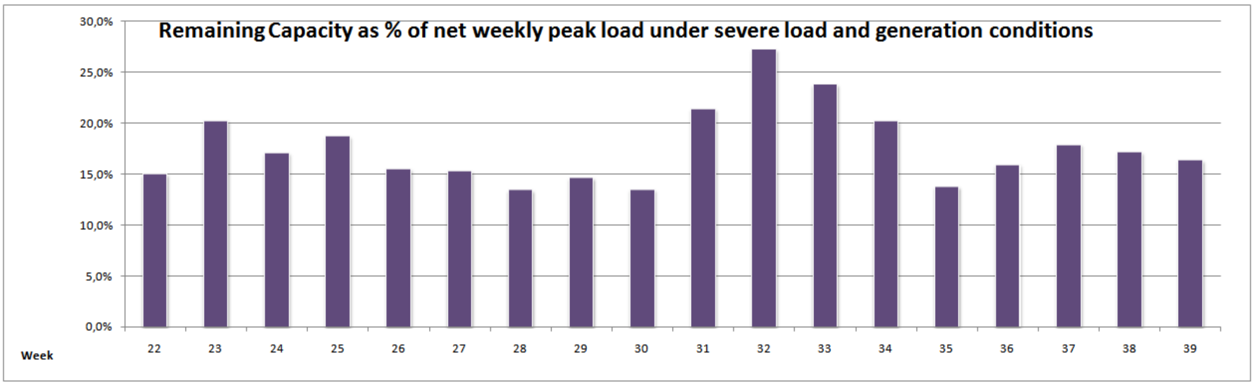


Fig. 3. Regional overview of remaining capacity under severe load conditions and generation constraints as % of net weekly peak load. Trend per region is shown. No specific analysis simulates import and export power flows between the countries in the region.

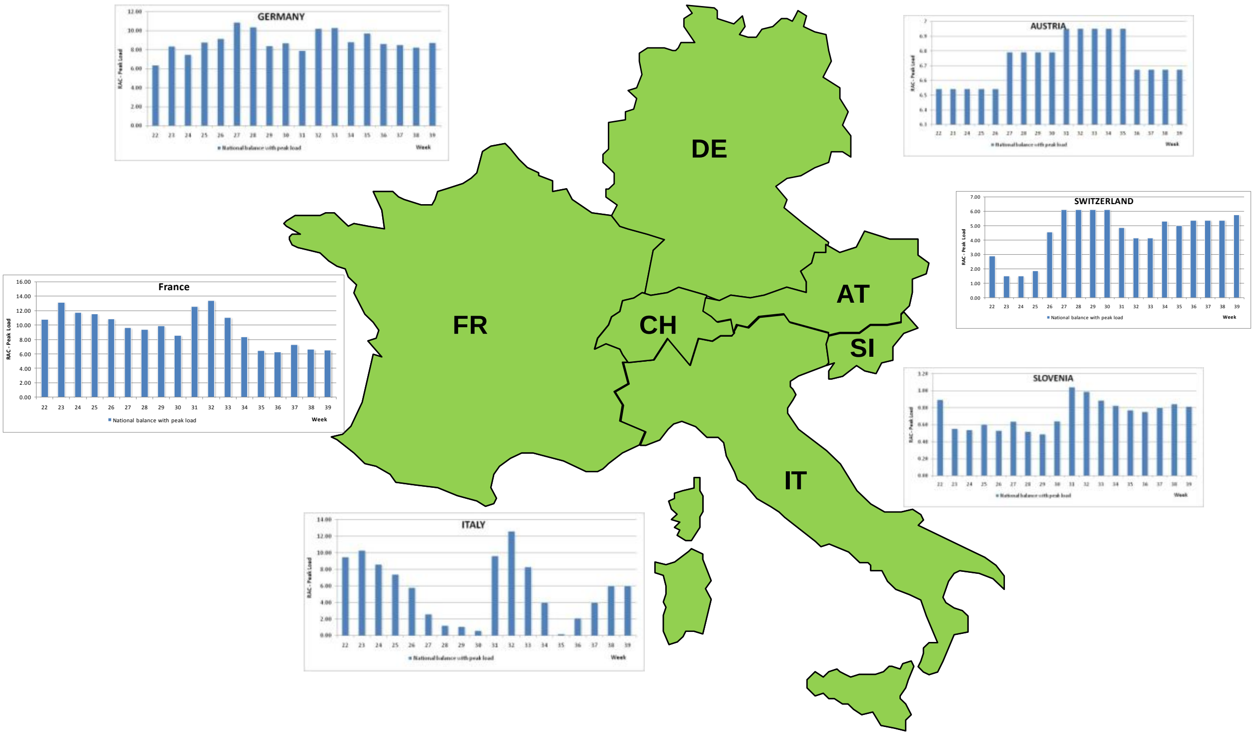
CONTINENTAL CENTRAL SOUTH REGION

Austria, France, Germany, Italy, Slovenia, Switzerland

Within the Central South Region no supply and demand problem is expected to occur during the coming summer. Higher imports are expected to happen between the countries (in case of high temperatures, heat wave and low hydro conditions). In case of high temperatures or heat waves, margins are expected to be reduced in France, with a need for imports of up to 6000 MW to cover the minimum required margin. This is expected to affect Italy and Switzerland.

An increase of load in comparison to the previous years is expected in most of the countries of the region (Austria, Italy). Due to the nuclear situation in Germany, higher generation of thermal power plants has been forecast in Austria.

For the Continental Central South Region, in case of severe load conditions due to high temperatures and additional constraints on the generation plants, such as restrictions to the use of cooling water due to heat waves, the margins are expected to be tight particularly in Italy, France (end of July, second half of August and September). However, for the overall region, the margins are considered appropriate to cover the load and on the whole the situation is not considered at risk of shortage.



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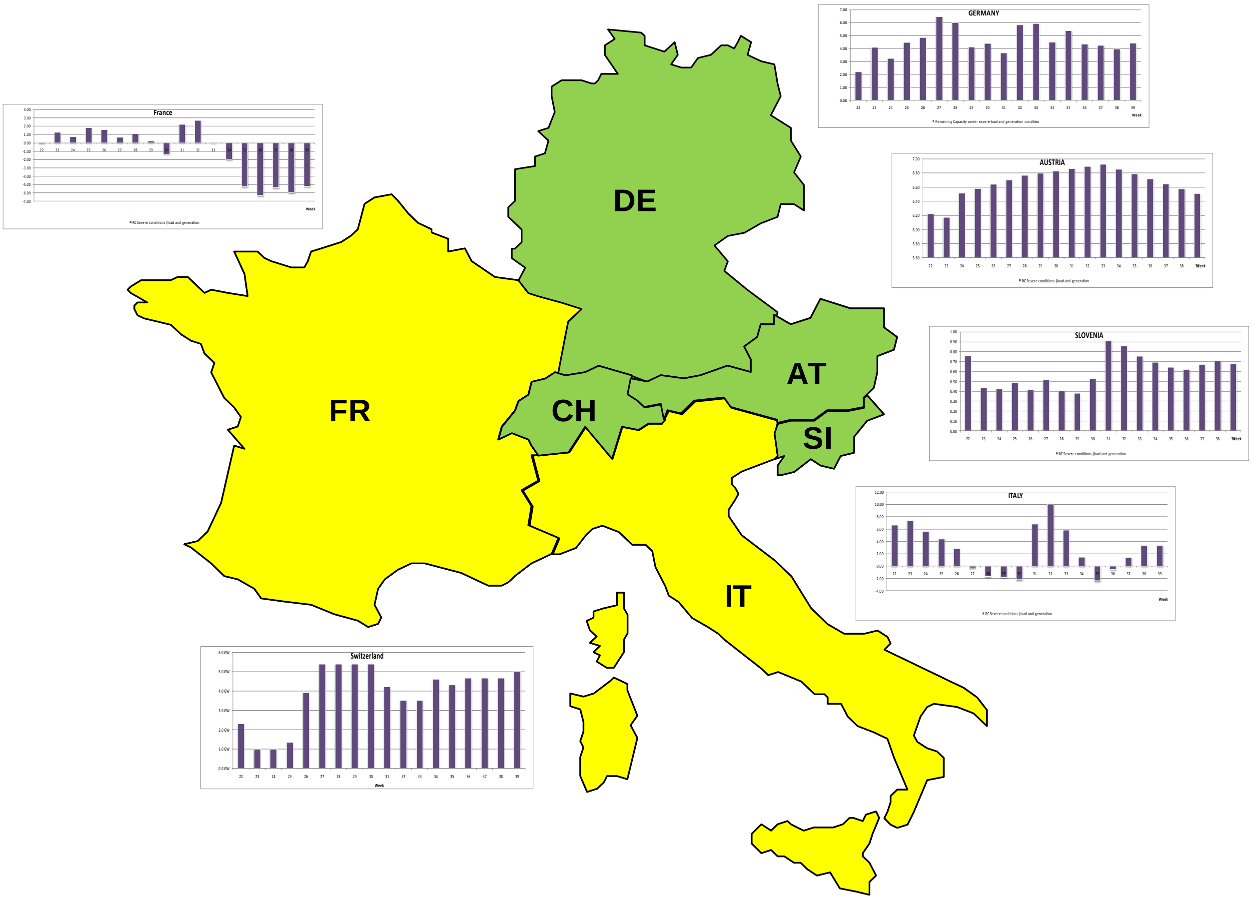

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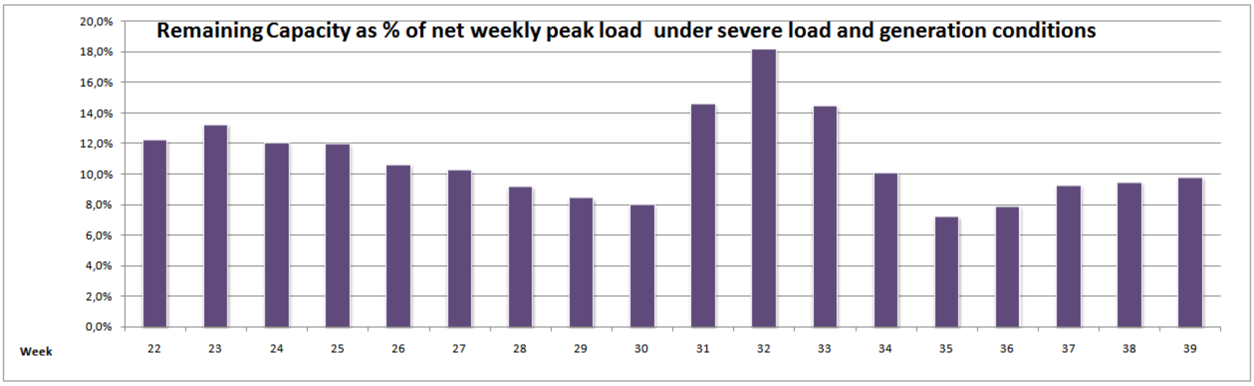


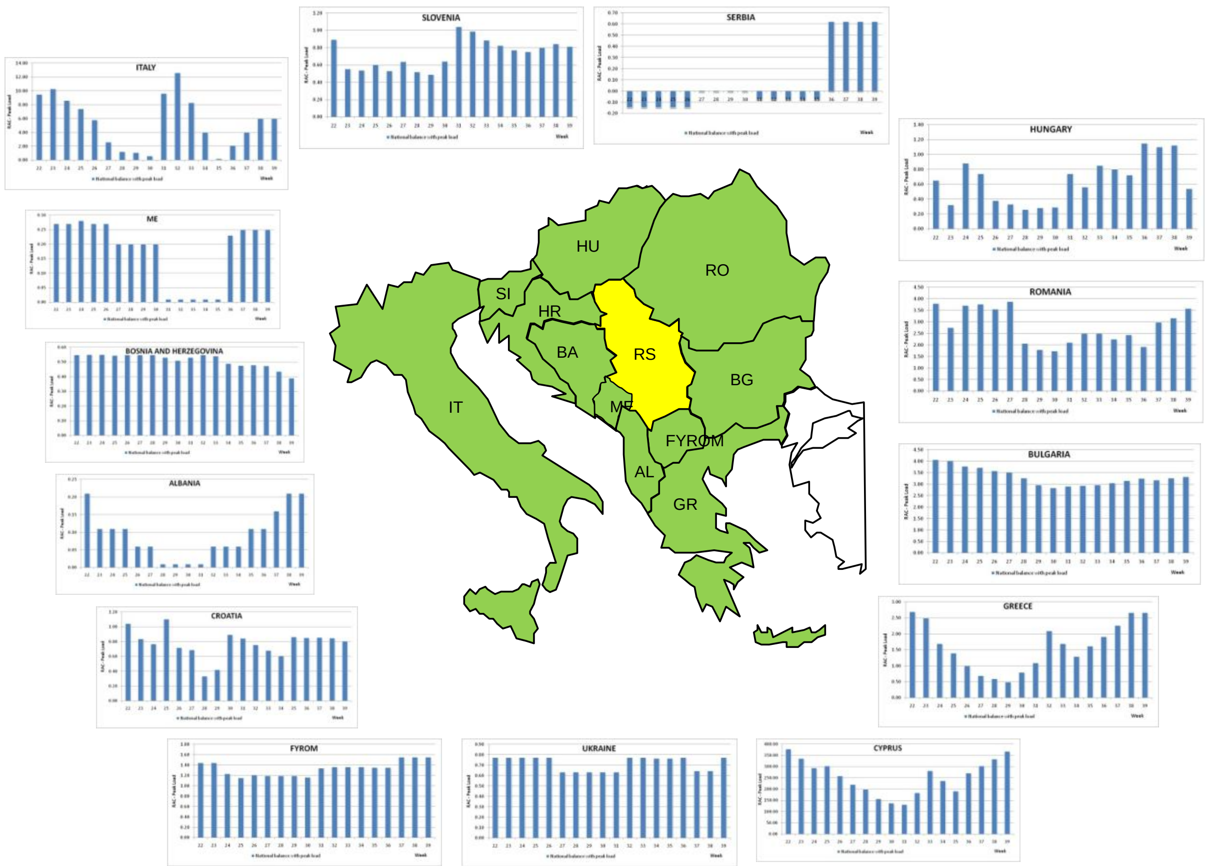
Fig. 3. Regional overview of remaining capacity under severe load conditions and generation constraints as % of net weekly peak load. Trend per region is shown. No specific analysis simulates import and export power flows between the countries in the region.

CONTINENTAL SOUTH EAST REGION

Bosnia-Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Greece, Hungary, Italy, Montenegro, Republic of Serbia, Romania, Slovenia

During this summer, no critical events are expected in this region. In normal conditions Croatia, Greece, Hungary and Italy are dependent upon imports from the neighbouring countries. In case of extreme conditions (low hydrology, high temperatures), Slovenia and Montenegro may also be dependent on imports. To prevent even the smallest possibility of rolling blackouts in the eastern coastal area of Bulgaria in case of extended heat waves during the peak tourist season, an intensive reinforcement of the transmission network in that part of the country is going on.

For the Continental South East Region, in case of severe load conditions due to high temperatures and additional constraints on the generation plants, such as restrictions in the use of cooling water due to a heat wave, the margins are expected to be tight particularly in Italy, Hungary, Montenegro, Serbia, Former Yugoslav Republic of Macedonia, Greece and Albania. However, for the overall region, the margins are considered appropriate to cover the load and on the whole the situation is not considered at risk of shortage.



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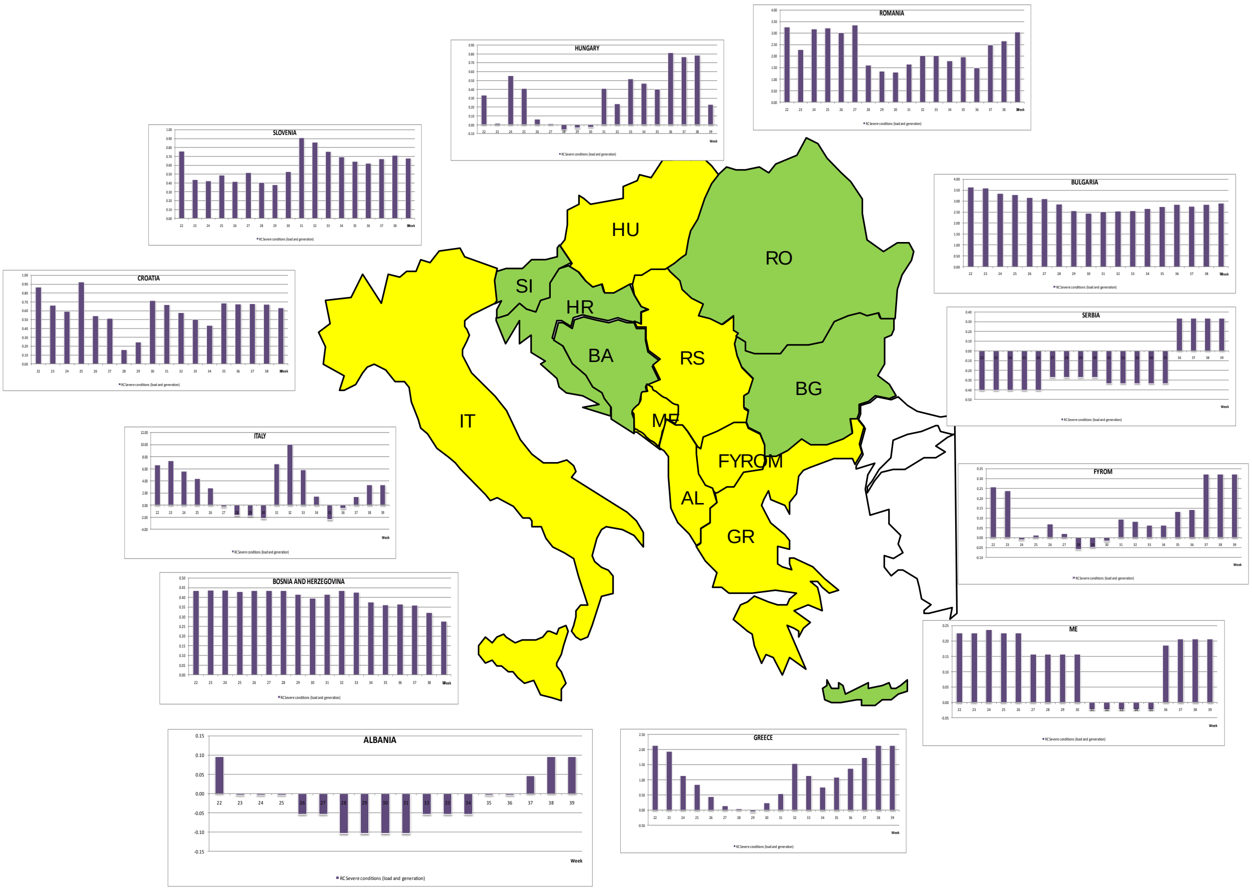

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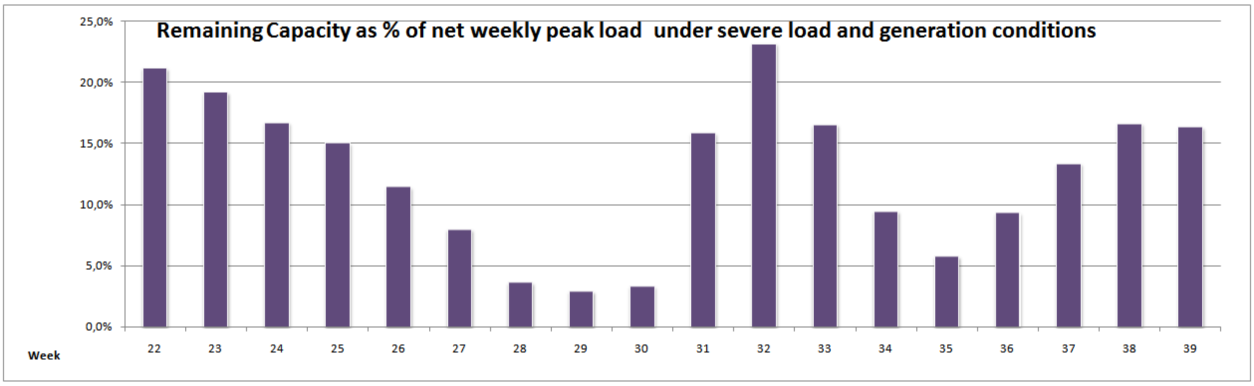

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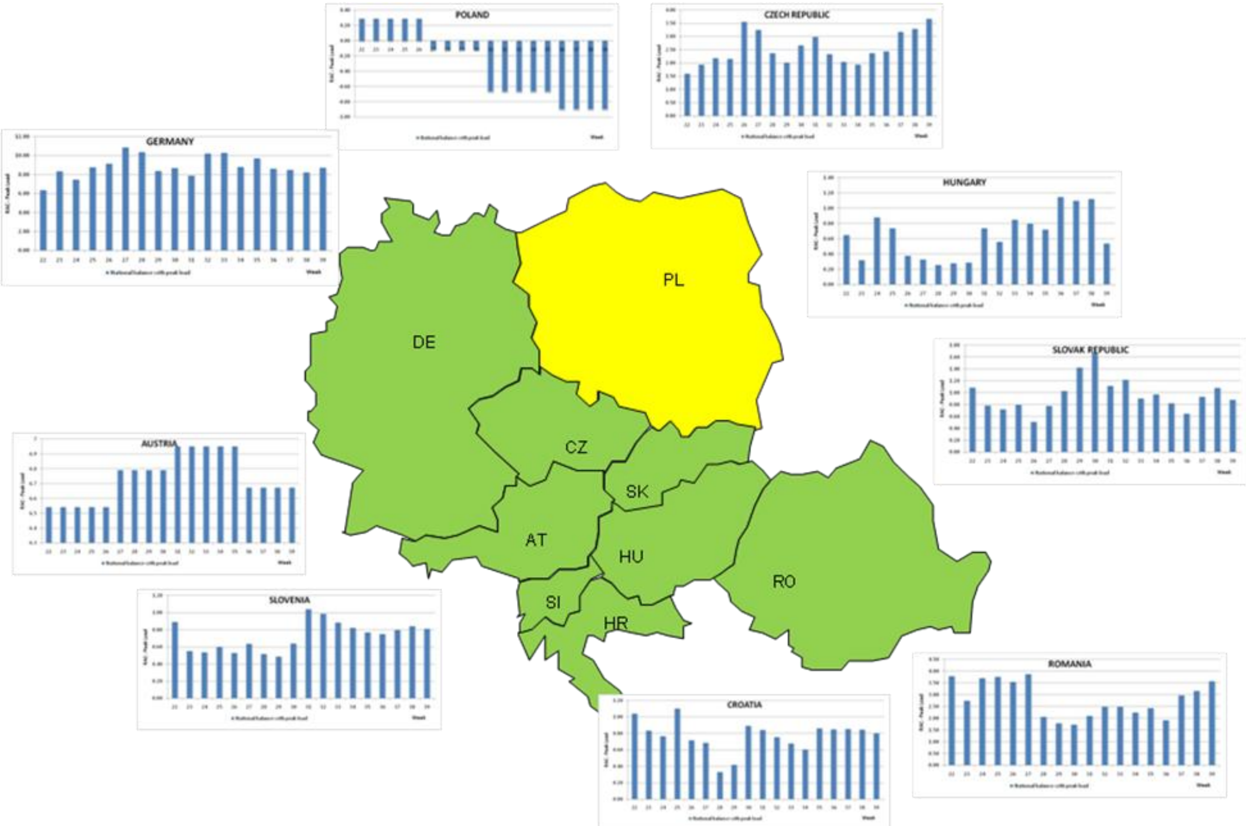
CONTINENTAL CENTRAL EAST

Austria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia

Despite the shutting down of "*7+1"* nuclear power plants in Germany, no adequacy problems are expected in the forthcoming summer period. This will be compensated by imports and by running more expensive generating units. The "missing" nuclear power plants are expected to cause changes in the power flows, which may in certain conditions become a critical problem for the transmission network.
Most of the countries expect an increase in consumption during the period. Hungary and Slovenia foresee increased imports in case of extended heat waves.
Overall, all the countries in the region consider that no severe adequacy risks are identified.

For the Continental Central East Region, in case of severe load conditions due to high temperatures and constraints on the generation plants, such as restrictions to the use of cooling water due to heat or shutdown of important power plants, the margins are expected to be tight particularly in Poland and Hungary. However, for the overall region, the margins are considered appropriate to cover the load and on the whole the situation is not considered at risk of shortage.



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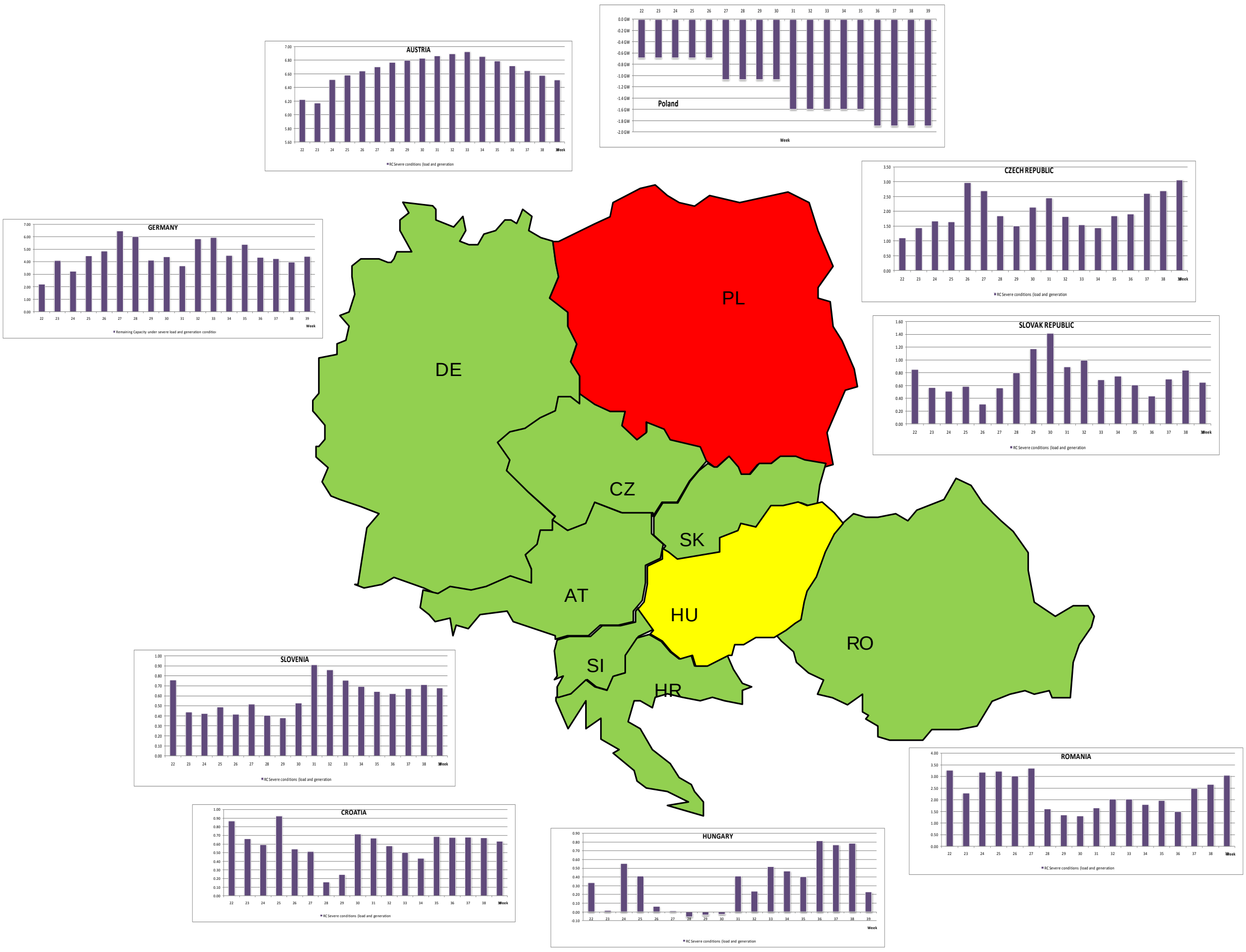

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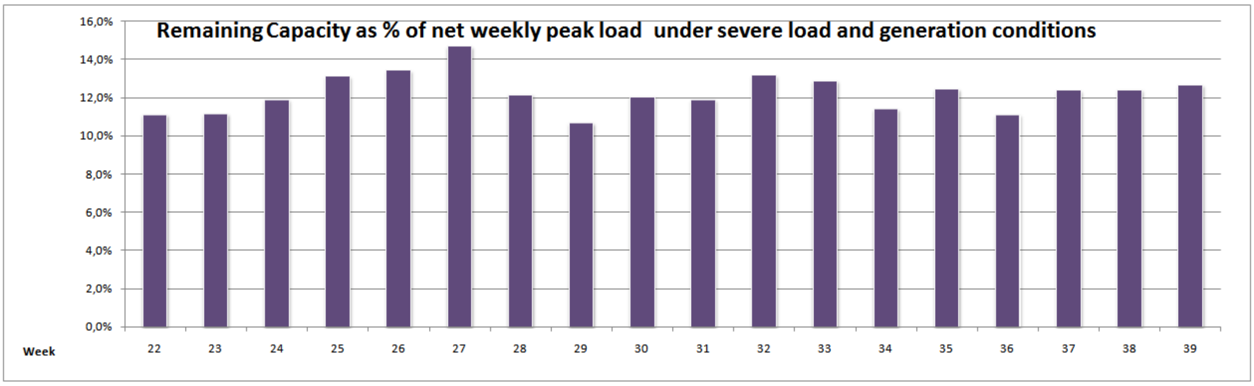


Fig. 3. Regional overview of remaining capacity under severe load conditions and generation constraints as % of net weekly peak load. Trend per region is shown. No specific analysis simulates import and export power flows between the countries in the region.

ISOLATED SYSTEMS

Cyprus

If the 72.5 MW gas turbine does not reach the deadline of week 25, then, in the event of the loss of the largest generator of the system (130 MW), the available capacity will be less than the peak load prediction for severe conditions. There are 3 mechanisms which, if applied, will avoid the high risk period during this summer.

Iceland

The generation capacity in Iceland is expected to be sufficient to meet peak demand this summer in normal as well as severe conditions. Landsnet does not anticipate any particular problems in the isolated Icelandic power system.

The summer period is used for scheduled maintenance on the generating units. The maintenance is in general scheduled such that it does not jeopardize the power and energy balances.

The installed generation capacity connected to the Icelandic transmission system is 2.4 GW, of which 77 % is hydro based and 23 % based on geothermal energy. No new generating capacity is planned this summer.

A long-term generation capacity assessment and load forecast for the Icelandic power system are made by Landsnet every year and reported in the Transmission System Development Plan and Energy and Power Balance report. For short-term assessment, studies are made by Landsnet on a weekly basis of generation capacity, reserves and load forecast.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

For the upcoming summer period, it is considered that the adequacy and security of the Albanian power system is not threatened in normal weather conditions, considering the planned availability of production and transmission facilities, the available importable capacity of interconnections, and strengthening of northern interconnections with new 400 kV interconnection line with Montenegro that will be put into operation at the end of April 2011.

In case of severe conditions, the additional import quantities will be procured using the available import capacity of the interconnections.

Ukraine West

No comment

4. WINTER REVIEW 2010-2011

4.1 Summary of responses by regions in the ENTSO-E Winter Review Report 2010-2011

In comparison to the forecasts made by TSOs for winter 2011, the following occurred last winter and is reported hereinafter with a summary on a country basis:

NORTH SEA REGION

Belgium, Denmark, France, Germany, Great Britain, Ireland, Luxembourg, Netherlands, Northern Ireland, Norway

Belgium

The Winter 2010-2011 adequacy forecast study carried out in September 2010 for the Elia control area, which comprises Belgium and the SOTEL area (a part of the G-D of Luxembourg), revealed that the desired safety level of 1050 MW for the generation-load balance would be reached during the entire winter period 2010-2011. This analysis remained valid even when assuming severe temperature conditions.

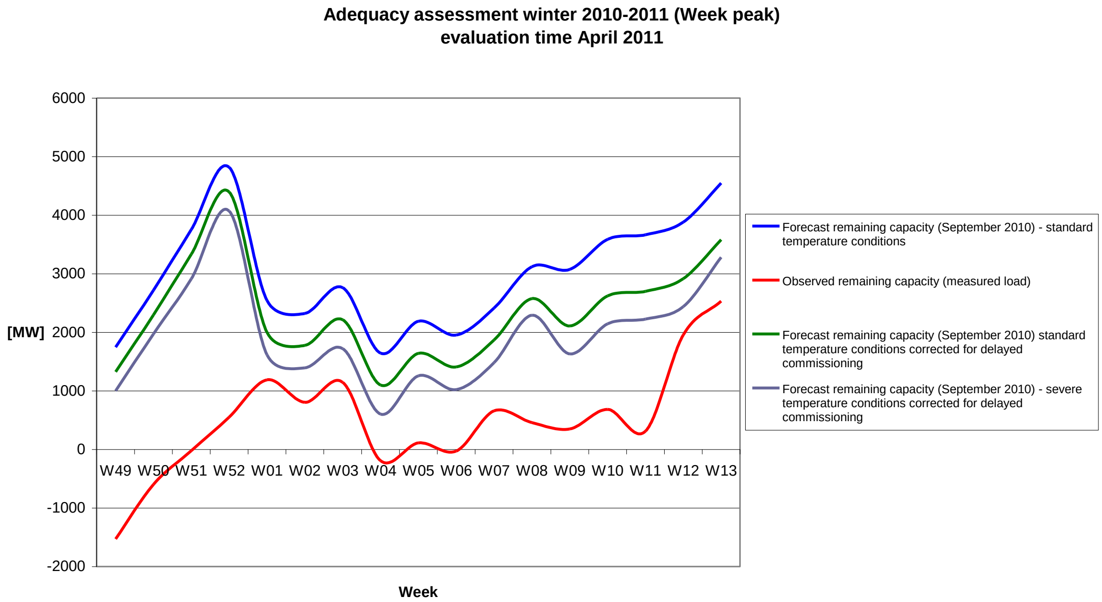
The two main risk factors for the Elia grid, potentially jeopardizing the positive winter adequacy assessment, that were identified during this study were:

- a generation-demand imbalance for the whole of the ENTSO-E North Sea region;
- unplanned outages at the main generation plants in Belgium.

In reality, the desired safety level of 1050 MW for the generation-load balance was not attained during the assessed moments of weeks 49 to 51 of 2010 and the hours selected for weeks 4 and 6 of 2011. The assessment below only focuses on the moments assessed in September 2010.

Figure 1 gives an overview of the forecast remaining capacity (evaluation time September 2010) and the observed remaining capacity for the week peaks of winter 2010-2011.

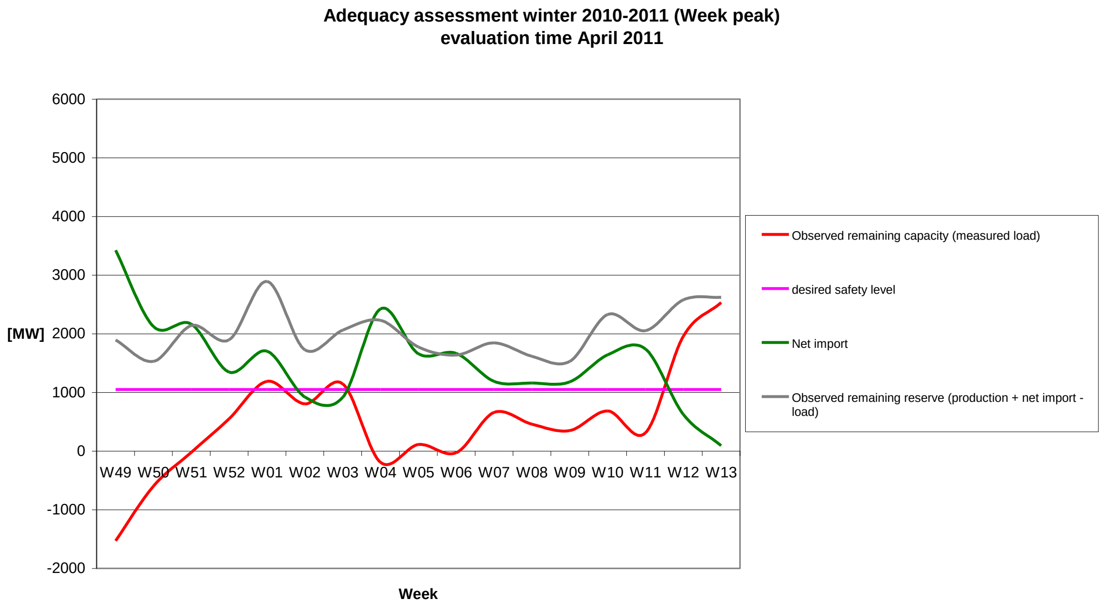
Figure 1: Adequacy assessment Winter 2010-2011



Elia did not expect any congestion problems on its grid for winter 2010-2011 due to the minimization of planned outages of international lines during critical winter periods.

In general, the system adequacy for winter 2010-2011 was positive, as unforeseen unavailability of power units was compensated by a net import within the North Sea Region during the weeks in which the desired safety level was not obtained. This is illustrated by Figure 2. During the past winter there were other moments besides those reported in this assessment, where the desired safety level of 1050 MW was not obtained using the national generator units. However, the desired safety level could be attained when taking into account the net import at those moments.

Figure 2: Observed adequacy versus net import in winter 2010-2011



Denmark

See the Baltic Sea Region.

France

During winter 2010-2011, temperatures were quite close to the average, except in December. December was characterized by 3 successive cold spells and periods of snow with severe climatic conditions. With an average temperature more than 3° C below the seasonal mean, December 2010 was the coolest December of the last 40 years. Such snowfalls in December have not been registered for 30 years, at least in many areas. The main risk identified in the Winter Outlook report was the sensitivity of the load to low temperatures. This risk occurred during all the winter due to low temperatures. During cold weather observed in December, the French consumption reached a peak at 96 710 MW on 15 December 2010 (last winter, the peak was 93 080 MW). These levels of consumption caused low voltage problems and induced risk for the security of the system especially in the West and South East regions.

As a consequence, RTE took some measures:

- RTE used a « safety order » to avoid voltage collapse
- RTE used Short Message Service (SMS) and website alerts to encourage people to reduce electricity consumption at peak demand periods in the West and South East regions.

The national consumption adjusted for meteorological contingencies reaches 488.1 TWh in 2010, 1.9 % more than in 2009, after a decrease of 1.6 % the year before. Customers connected to the RTE network and customers supplied by the distribution networks contribute to this increase. Large scale industry and SMI/SME consumption has not yet reached the level it had before the economic crisis, whereas the growth in consumption by business and private customers continues.

On the generation side, production capacity connected to the RTE network increased by about 1430 MW due particularly to the connection of 2 combined-cycle gas units, 2 combustion turbines, 1 wind farm at 225 kV, and 3 thermal groups with renewable energy source at 63 kV. Further important development of wind generation took place with an increase of installed capacity of about 950 MW, as well as an important increase of photovoltaic generation on the distribution networks (which reached about 760 MW of installed capacity at the end of 2010).

From the end of November to mid-December, low voltage constraints occurred during the period of high consumption, especially in western and northern France due to cold spells.

Several times during winter 2010-2011 interconnection capacities were saturated, especially on the Italian, Swiss and German interconnections.

A better availability of the French generation fleet in comparison to the previous winter 2009-2010 induced higher levels of exports compared to the previous winter, except during December (cold spell). The balance of exchanges was positive this winter (i.e. France remained a net exporter), with a higher level in comparison with the previous winter except during December because of the cold wave.

Germany

<u>EnBW - Control Area:</u>

Congestion management, including the „C function“ implemented on the borders of D-CH and D-F, has proved to be successful.

<u>Amprion – Control Area:</u>

Consumption was at a high level. No more concern was reported at the impact of the financial crisis.

TenneT-DE- Control Area:

Both the Krümmel and Brunsbüttel nuclear power plants in Northern Germany remained out of service during the winter months. This situation did not lead to any system adequacy problems. Due to the high amount of installed wind power generation capacity, several situations with strong winds had to be handled with feed-in management operations.
On 4 and 5 February 2011 the wind feed-in in Northern Germany reached a historical maximum, resulting in nearly 9000 MW. To avoid N-1 violations on the interconnectors, several different measures had to be taken and the day-ahead trade in the CWE region had to be restricted for the first time.

50Hertz Control Area:

On 24 December 2010 long wave oscillations of the overhead transmission line were the reason for an outage of the 380 kV Leitung Klostermansfeld – Wolmirstedt line. On 28 December 2010 the line was taken back into operation.
On 11 November 2010 the windstorm "Carmen" moved over Germany, which consequently led to wind infeed of 21000 MW in Germany (in the 50Hertz control area 9785 MW). To avoid overload of grid elements and because of an N-1 security violation in the 50Hertz control area, the generation of power plants and renewable-based generating units had to be adapted in accordance with Article 13 (2) EnWG.
In the period from 11 to 13 December 2010, because of an N-1 security violation in the 50Hertz control area, the generation of power plants and renewable-based generating units had to be adapted in accordance with Article 13 (2) EnWG. Due to high load on the tie-line with TenneT Germany, it was necessary to apply market related measures.
In the period 4 to 8 February 2011, to avoid a N-1 security violation in the 50Hertz control area, the DC-Loop Flow (clockwise) was arranged. To avoid an N-1 security violation on the tie-line Remptendorf – Redwitz, it was necessary to apply market related measures (redispatch with TenneT Germany).
Due to the Krümmel and Brunsbüttel nuclear plants being out of service, the resulting impacts on the load flow and the voltage control in the region of Hamburg had to be considered at any time.
The average energy feed-in during the period from November 2010 to March 2011 in the control area of 50Hertz Transmission was 2146 MW. The highest feed-in of wind energy in this period was 9794 MW.

Great Britain

December 2010 was the coldest on record and the peak winter demand of 59 700 MW occurred in the half hour ending 17:30 hrs on Tuesday 7 December. This was slightly higher than the forecast 1 in 20 peak demand of 59 000 MW, but corrected to normal weather it was 55 300 MW, just below the forecast based on normal weather. There was sufficient generation available, demand was met in full and no system warnings were issued.

The severe cold weather eased by the end of December. January had temperatures close to normal and February was warmer than average.
The Winter Outlook report indicated that there would be sufficient margin to meet a 1 in 20 demand plus required reserve as long as there were no interconnector exports. In the event, demand was 600 MW higher and there was an export to Northern Ireland of 400 MW but these were balanced out by imports from France of 1000 MW. The forecast in the Winter Outlook report was conservatively based on units undergoing commissioning not being available, but some of the new CCGTs did in fact make a contribution to the generation at the time of the winter peak demand.

Wind power at the time of the winter peak amounted to 130 MW or just 0.2 % of the total, which was lower than the 250 MW assumed in the forecast.
During the cold weather in December the increase in gas prices made coal-fired generation more economic than gas-fired generation. As a result, coal took a larger proportion of the total generation. For the rest of the winter, the two fuels were closely aligned in terms of generation cost and had a similar share of the total electricity supplied.

Ireland

There were no significant issues during the winter 2010-2011 period. The winter peak demand occurred on Tuesday 21 December 2010. The peak was 5090 MW (exported). This was an increase on the previous year's peak of 4950 MW (exported). The wind generation at the time of the peak demand was 51 MW. The predicted winter peak in the Winter Outlook report was 4750 MW* (exported). At the time of writing the Winter Outlook report (June 2010), the year-to-date average demand growth was positive at 0.96%. This trend continued for the rest of the year. For the second winter in a row, extreme cold weather throughout December led to peak loads being significantly higher than expected. The system forced outage rate for December 2010 was 10.6 %, which was in line with the system forced outage rate used in the Winter Outlook report. Notwithstanding the higher peak demands due to the extreme weather conditions, the system remained well within the capacity adequacy standard for the winter period.

**The Winter Outlook report for 2010-2011 was a combined outlook for Ireland and Northern Ireland.*

Luxembourg

During the whole month of December 2010, Luxembourg, like many countries in the region, was affected by heavy snowfalls, followed in January 2011 by some floods along the riversides. The climatic temperature conditions were not severe during this period and especially during the whole of the winter. This had no influence on the security of supply in the grid.

Netherlands

In the Winter Outlook 2010-2011 no risks were foreseen. Average temperatures were lower than expected, but this did not lead to any excessive situations.
Due to high winds in the north-western part of Europe, there were some stressed periods for the Dutch interconnectors during winter 2010-2011 and this led to an ultimate reduction of the Net Transfer Capacity on 4 February 2010. This reduction was needed to maintain network safety and could be taken within the limits of the regulations. The curtailments could be made within the available capacity and therefore did not lead to extra measurements or problems within the network.
There were no specific fuel, generation, demand or exchange pricing events that caused serious stressed periods.
The average reduction occurred in 18 % of the working days up to maximum curtailment of approximately 1000 MW in respect of a total import capacity of 3850 MW, exclusive of the NorNed cable.

Northern Ireland

The winter 2010-2011 period in Northern Ireland was one of the coldest on record, with December 2010 being the coldest December on record and also the coldest month recorded in the last 100 years with a mean temperature of -0.6° Celsius. A record low temperature of -18.7° Celsius was recorded on 23 December 2010. Some inland areas experienced the longest uninterrupted sub-zero spell since January 1881.
Despite the higher than predicted peak demands due to the extreme cold weather and snowy conditions, the transmission network experienced no major ice accretion, storm damage or faults. The system also remained within the capacity adequacy standard for the duration of the winter period.

Norway

See the Baltic Sea Region.

BALTIC SEA REGION

Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Sweden

Denmark
It was again a cold winter. The winter had already started in November. The cold weather did not cause any problems in the transmission network. The cold weather raised the prices in the spot market, but not to an abnormally high level.

Estonia
The winter of 2010-2011 was extraordinarily cold. The average temperature was below zero in all the winter months; the minimum temperature was below -30 degrees Celsius. Despite the relatively cold temperatures, the maximum peak load of Estonia was not reached.
In February a failure occurred with Estlink for 181 hours, which is the longest unplanned outage of Estlink in its history.

Finland
This was another consecutive long and cold winter in Finland. In summary, the system adequacy in Finland was not at risk during the winter period. Production capacity reserves would have been sufficient to cover any single production or interconnection failure. Finland is in any case dependent on imports from neighbouring systems.

Germany

See the North Sea Region.

Latvia
Relatively low air temperature this winter was the main reason that total electricity consumption during the winter period increased by 1-2 % compared to the previous year. There were no significant outages in power transmission lines and generation, or unexpected situations during the 2010-2011 winter period.

Lithuania
The total winter electricity consumption increase was 2.6% compared with the previous year as was expected in the Winter Outlook 2010-2011, mainly because of weather conditions.
In the Winter Outlook, no risks were foreseen and no risks occurred during the period. There were no unexpected generation and transmission line outages that could have caused system adequacy problems during the winter period.

Norway

Cold weather, precipitation lower than normal and an extremely low reservoir situation have resulted in an energy situation alert in Norway. Southern Norway has been in the worst situation. The low reservoir situation is the result of the second dry year in a row. Five areas in Norway are separated into discrete price areas to ensure high imports. Statnett is following the power and energy situation especially closely.

November to March was colder than normal. Due to the low temperatures, demand was higher than expected. Actual peak demand in winter 2010-2011 was 23.3 GW. This occurred on 3 December, hour 9.

Due to the low reservoir situation, production was lower than normal. This also led to large imports. Norway has imported from all the neighbouring countries (Netherlands, Denmark, Sweden, Finland, Russia) all winter.

Poland

See the Continental Central East Region

Sweden

Just as during winter 2009-2010, Swedish area prices on the Nordic electricity market during winter 2010-2011 were very high, compared to previous winters. Unavailable capacity of the nuclear power plants due to problems with efficiency upgrades and prolonged revision periods, combined with high loads due to cold weather, caused prices to rise. In addition, hydropower generation was limited by the low levels in the Swedish hydropower reservoirs during the whole winter. Even though the inflow during winter is usually low, the historically low level of the inflows to Swedish reservoirs during December contributed to the low reservoir levels. It should also be mentioned that the extremely low reservoir levels in Norway were limiting Norwegian hydropower generation, so the possibility of importing from Norway was limited.

CONTINENTAL SOUTH WEST REGION

France, Portugal, Spain

France

See the North Sea Region.

Portugal

This winter was characterised by heterogeneous climatic conditions: there were a few sequences of days in December and January where temperatures were significantly below the average, but during February temperatures were, in general, relatively high. Electricity demand recovered during 2010 but, in the second half of the winter season, stayed below the previous year's values. Winter peak demand occurred in January, but remained 2.1 % below the all-time high record set in 2010.

Spain

Actual demand was slightly higher than expected for the month of December 2010, and slightly lower than expected for the months of January and February 2011. The winter peak demand was reached in the second half of January 2010 (44 107 MW), due to the low temperatures on that period. However, this winter peak demand was lower than the historical peak demand (44 900 MW, reached during winter 2007). There was no significant stress level for the system adequacy.

CONTINENTAL SOUTH EAST REGION

Bosnia-Herzegovina, Bulgaria, Croatia, Former Yugoslav Republic of Macedonia (FYROM), Greece, Hungary, Italy, Montenegro, Republic of Serbia, Romania, Slovenia

Bosnia-Herzegovina

During winter 2010-2011 there were no unusual events in the power system of Bosnia and Herzegovina. Electricity consumption was increased compared to winter 2009-2010, because of lower temperatures than last winter.

Bulgaria

A slight increase (0.7 %) in consumption was observed for the period December 2010 – March 2011 compared with the same period last year. There were no stressing periods of the system adequacy during the months of analysis. There were no significant problems with generation capacities and failure rates were as expected. Water levels in the big reservoirs were slightly above target levels and hydro plants experienced normal operation in the peak zone of the daily load curve. During the whole period, Bulgaria exported electricity to neighbouring countries.

Croatia

In comparison with winter 2009/2010, the average consumption of Croatian power system was higher. Extremely good condition of hydro accumulations made possible a very high electricity generation in hydro power plants. Generation of thermal power plants and electicity imports had also important role in supply. There was not any significant disturbance in system.

Former Yugoslav Republic of Macedonia (FYROM)

Generally, the winter 2010-2011 conditions were very close to the forecast ones from the point of view of temperatures, and the levels of our reservoirs are very high. There was no unexpected situation during the winter period. The operation of the power system was secure and reliable over all the winter period. Water reservoirs were at a very high level because of the good hydrological conditions this year, so the HPPs also contributed to the security of the system. According to all the above, the generation-load balance on the Macedonian system was not at risk during the winter 2010-2011.

Greece

At the beginning of the winter, Greece experienced more than average storage of water in the hydro reservoirs. This is crucial for the summer season, which is the season with the maximum demand of the year. In general, the winter did not have severe conditions. The temperatures were in general mild with only a short period with low temperatures. The demand starting from January was lower than expected and even lower than the previous year. The reason for this reduction is that economic conditions have had an effect on the industrial production process and led to lower energy demand.

Hungary

The temperature was slightly higher than that of the last year. Demand increased by 2 % as a result of the economic conditions. The import was lower than the expected. No other unexpected situations arose.

Italy

See Continental Central South Region

Montenegro

During the winter there were no unusual or significant system events. In this part of the year, average hydro conditions were registered.

Republic of Serbia

Planned maintenances of generation capacities were successfully completed before the cold snap, so the Serbian power system passed through the winter period without huge problems. Import contracts from neighbouring systems were realized in December, January and February with the beginning of low temperatures, as was planned.

Romania

During winter 2010-2011, the precipitation amounts were largely normal but there were periods with higher or smaller temperatures than the climatological monthly averages. On certain days the positive or negative temperature deviations were important, but even the very low temperatures did not affect the power system adequacy.

In the period December 2010 - February 2011, national consumption increased by about 5-6 % over the same period in winter 2009-2010. Concerning the recorded weekly peak load versus forecast weekly peak load, there were certain small deviations.

Slovenia

The review shows that December was the coldest month in winter 2010-11 and also colder than the average. No specific risk was identified for the winter period 2010-2011 and no unexpected situations occurred during the period.
On the generation side, hydro production was higher than estimated. On 23 March an outage of the NPP Krsko occurred, but it was back in regular operation on 30 March.

Better economic conditions and low temperatures resulted in higher demand. Consumption in winter 2010-11 was higher than estimated in the Winter Outlook 2010-2011. Consumption by industrial consumers was higher by about 10.6 % and consumption by distribution companies was higher by about 1.7 %. The total consumption of electrical energy on the transmission network in winter 2010-2011 was 2.9 % higher than estimated.

CONTINENTAL CENTRAL SOUTH REGION

Austria, France, Germany, Italy, Slovenia, Switzerland

Austria

Winter 2010-2011 was colder compared to winter 2009-2010 and to the forecasts. Peak loads were also higher than expected, thanks to the recovery of the economic situation after the crisis in 2008-2009. No extreme weather conditions occurred.

France

See North Sea Region

Germany

See North Sea Region

Italy

The adequacy evaluations for winter 2010-2011 showed no particular risks for capacity adequacy and peak load coverage or for the national supply system. The winter season registered essentially steady temperatures in comparison with the previous period, with a very small increase in demand. In addition, high hydro conditions marked the first part of the winter period: values above the multi-year average capability factor were recorded, reflecting a rainy winter.
There was nothing to remark for generation availability with respect to the planned maintenance. The installed generating capacity grew with a significant contribution from wind farms and photovoltaic solar parks, with a total increase of 200 MW.
As far as demand is concerned, during the first part of the winter period (from October to December 2010), both load and energy requirements were higher in comparison to the same period of 2009, but still lower than those recorded before the economic crisis. The record power peak normally seen in winter was not exceeded in this period. For the last period of winter (January – March 2011) monthly consumption showed a small decrease.
The Italian northern interconnection has been characterised, for most of the time, by import conditions from the four neighbouring systems bordering the northern interconnection.
In terms of physical flows, the interconnection recorded a variable performance of import/export balance of energy. The HVDC cable interconnecting Italy with Greece was basically characterised by prevalent import conditions towards the Italian system.
Operation of the new PSTs in Divaca, begun in December 2010, is affecting the flow pattern on the Italian northern border. Such PSTs contributed to limit loop flows on the I-SI border. Following the agreement between Terna, ELES and Swissgrid on a coordination procedure for the operation of PSTs on the I-SI border, an additional remedial action to the already existing ones is now available to control the distribution of the physical flows on the interconnected grid.

The total net production registered a decrease of 1.0%, balanced with an increase in the energy exchanged with foreign countries. Furthermore, the monthly hydroelectric capability factor has showed a constant increase, with percentage values above the corresponding values recorded in the previous winter. Essentially the same result was seen for the fullness of hydro reservoirs.

Slovenia

See Continental South East Region

Switzerland

The review shows that December 2010 registered relatively lower temperatures with a lot of precipitation in comparison to the forecasts, while January 2011, February 2011 and March 2011 registered higher temperatures, with little precipitation.

CONTINENTAL CENTRAL EAST REGION

Austria, Croatia, Czech Republic, Germany, Hungary, Poland, Romania, Slovak Republic, Slovenia

Austria

See Continental Central South Region

Croatia

See Continental South East Region

Czech Republic

The winter temperatures were average, and no significant temperature variations were recorded. Due to the economic crisis, there is still a notable decline in load and consumption, by around 2 % in comparison to levels in 2008. No specific events were recorded.

Germany

See North Sea Region

Hungary

See Continental South East Region

Poland

In December 2010, a very high level of outages and non-usable capacity periodically caused a lower than required level of system services reserve. The Polish TSO registered unprecedented high energy prices on the balance market.

On 3-5 February 2011 there was an emergency situation in the Polish power system (the yellow alert light was turned on). The situation was caused by very high unplanned load flows from the German system (as a result of high wind generation in the northern part of Germany) in connection with a broken insulator in the Krajnik substation of the line to Vierraden (50HzT).

Romania

See Continental South East Region

Slovak Republic

During the whole winter period, no critical situation or unusual event in the power system of Slovakia occurred. The operation was secure and reliable. The months of December and February were colder than the previous winter, and in January and March the weather was warmer. Overall, weather conditions were similar to the winter before, and the average temperature from December to March was 0.8 ° C (1.2 ° C the winter before).

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Slovenia

See Continental South East Region

ISOLATED SYSTEMS

Cyprus

Climatic conditions in winter 2010-2011 in Cyprus were mild as expected.

Stressed periods for system adequacy in Cyprus occur during the summer period. The Cyprus system is an isolated system. No interconnections exist with other countries.

Iceland

The installed generation capacity provided acceptable system adequacy during the winter period.
The curtailment of primary energy delivery, due to disturbances, was approx. 110 MWh in the winter period. The total yearly energy fed into the transmission system was 16.507 GWh in 2010.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

During the winter of 2010-2011, the Albanian power system did not encounter any unexpected or unusual events or conditions. The average temperature was near the predicted one, and we did not face severe conditions associated with increased electricity demand and peak load. Interconnection has been available during the whole period, without any outage, and we did not face any difficulty with NTC quantity, cross-border allocation, and relationships with market participants.

Ukraine West

No comments

5. LESSONS LEARNED

The main learning points derived from ENTSO-E reporting and outlooks can be summarized as follows:

- The importance of the economic conditions, which have significant impact on the load, and the need to consider them in system adequacy forecasts; nearly all TSOs underline the difficulty of making accurate forecasts of generation demand patterns in the current circumstances, due to uncertainties about the recovery of economic activity and its impact on electricity demand.
- The negative trend of electricity consumption may still necessitate regulatory mitigation mechanisms through which the impact on transmission businesses is limited in order not to affect planned investments in network development.
- Attention should be paid to the sensitivity of the load to high temperatures and also the availability of the generation fleet (i.e. nuclear).
- **Attention to nuclear decommissioning is expected after the Fukushima events in March 2011 as concerns network management, voltage problems and change of the patterns in electricity.**
- **In respect to the nuclear crisis in Europe, clarity and timing of information for TSOs is essential to prepare and make forecasts and for network management also.**
- Attention should be paid to the increase of wind generation capacity and its effects on the network constraints.
- **Efficient coordination with market players is especially needed (especially in case of stress on the nuclear supply), as well as reinforced coordination of TSOs in respect to maintenance of transmission networks in case of important events (such as nuclear).**
- The coordination of TSOs in "special cases" is important and market-related mitigation measures may be needed. In addition, some neighbouring networks may be affected by loop flows and even congestion, underlining the need for good cross-border coordination.
- Possible generation reductions (e.g. lower hydro generation due to drought, reduction of available thermal generation due to problems with cooling water or increased level of outages) should be considered when assessing the summer outlook, as they may have significant impact on the generation-load balance.
- Common mode failures of generation may occur (e.g. simultaneous loss of several units at the same time due to climatic conditions).
- In some countries grid transmission capacity may also be an issue in case of heat waves.
- Dependence on data available to external parties is considered a great concern for some TSOs when performing short-term adequacy reports.

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6. APPENDICES

6.1 Appendix 1: Detailed Individual Country Responses to Winter Review 2010-2011

ALBANIA

AUSTRIA

BELGIUM

BOSNIA & HERZEGOVINA

BULGARIA

CROATIA

CYPRUS

CZECH REPUBLIC

DENMARK

ESTONIA

FINLAND

FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

FRANCE

GERMANY

GREAT BRITAIN

GREECE

HUNGARY

ICELAND

IRELAND

ITALY

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LATVIA

LITHUANIA

LUXEMBOURG

MONTENEGRO

NETHERLANDS

NORTHERN IRELAND

NORWAY

POLAND

PORTUGAL

REPUBLIC OF SERBIA

ROMANIA

SLOVAK REPUBLIC

SLOVENIA

SPAIN

SWEDEN

SWITZERLAND

UKRAINE-WEST

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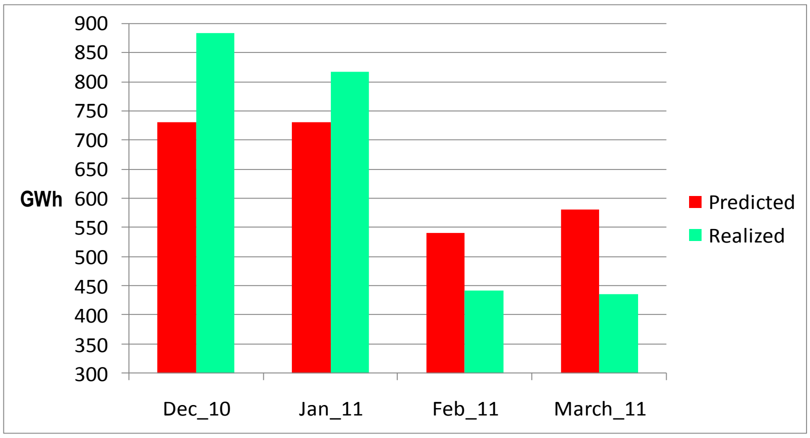
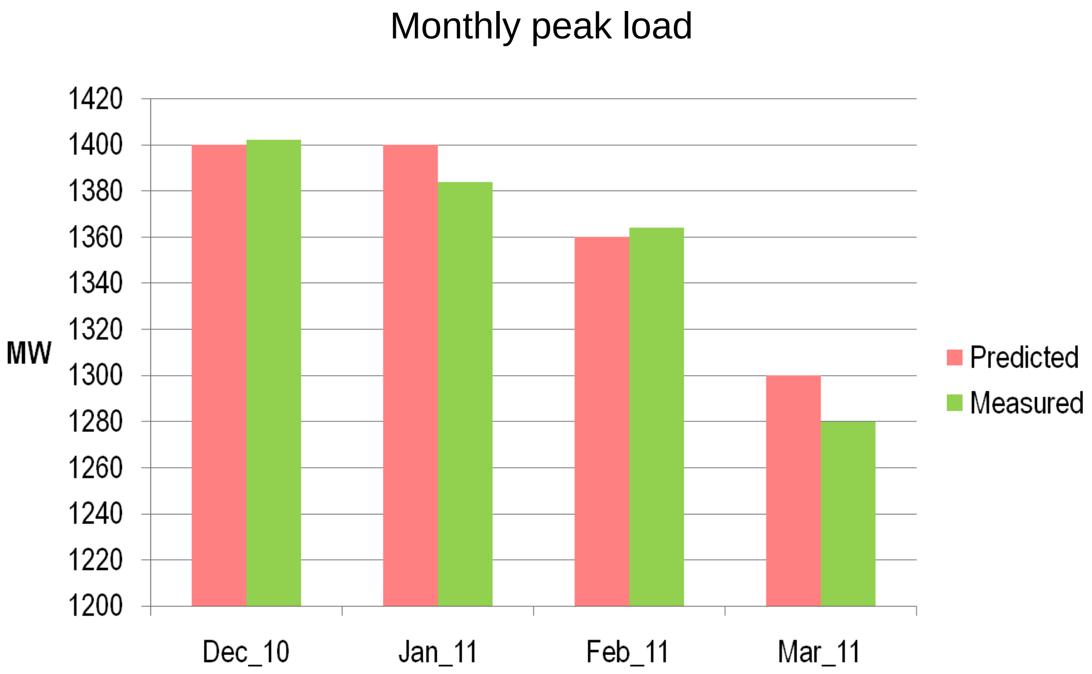
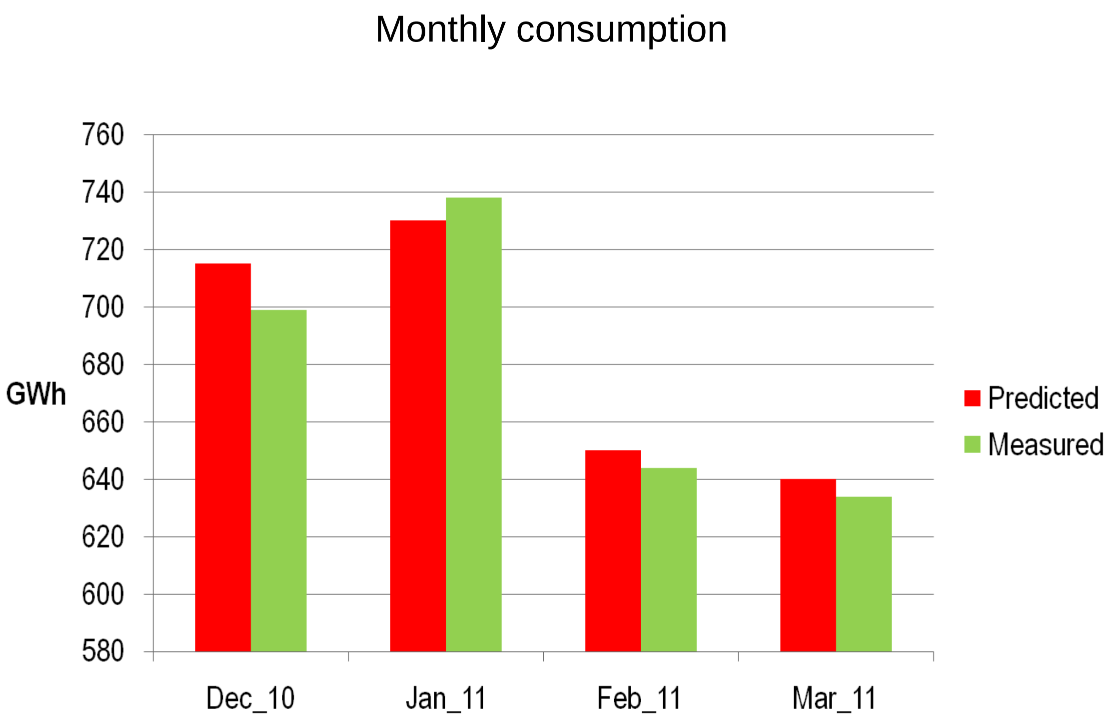
ALBANIA

During the winter of 2010-2011, the Albanian power system did not encounter any unexpected and unusual events or conditions. The average temperature was near the predicted one, and we did not face severe conditions associated with increased electricity demand and peak load.
Water levels in reservoirs of Drini Cascade (the country's main source of generation) were above target levels due to abundant inflows during December and January. Hydro power plants operated normally at full capacity, and during this period about 270 GWh were exported. During the next period, February and March, inflows at Drini River reduced visibly, and the regime was turned to import, as predicted. During this period about 200 GWh were imported.
Interconnection was available during the whole period without any outages, and we did not face any difficulty with NTC quantity, cross-border allocation or relationships with market participants.
The following diagrams present a comparison between forecast and realized data.

Monthly production




Monthly peak load
MW
1420
1400
1380
1360
1340
1320
1300
1280
1260
1240
1220
1200
Dec_10
Jan_11
Feb_11
Mar_11
Predicted
Measured


Monthly consumption
GWh
760
740
720
700
680
660
640
620
600
580
Dec_10
Jan_11
Feb_11
Mar_11
Predicted
Measured

AUSTRIA

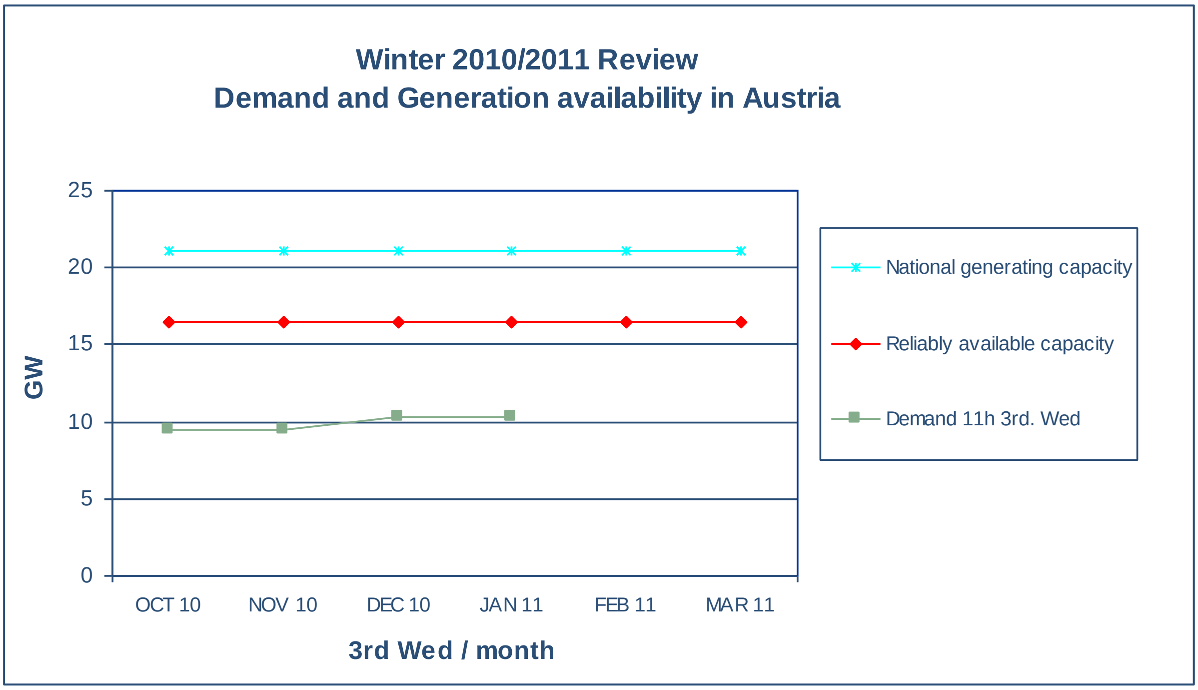
Winter 2010-2011 was colder in comparison to the previous year. Furthermore the economic situation in Austria recovered after the crisis in 2008/2009. Therefore the peak loads were higher than expected.

During the first half of winter there was more rainfall, in the second half less compared to the previous winter. No extreme weather conditions occurred.

Review of the situation by monthly period:

The control area of TIWAG was successfully integrated into the control area of APG by 1 January 2011. An important 380 kV line between St. Peter (AT) and Salzburg (AT) was commissioned in winter 2010-2011.

Demand and Generation balance



Due to the high share of pump storage power plants the reliably available capacity is above demand.

During the construction of the Salzburgleitung I (St. Peter (AT) –Salzburg (AT)) a critical disconnection had to be realized for 5 months. This period was successfully managed by applying various congestion management measures.

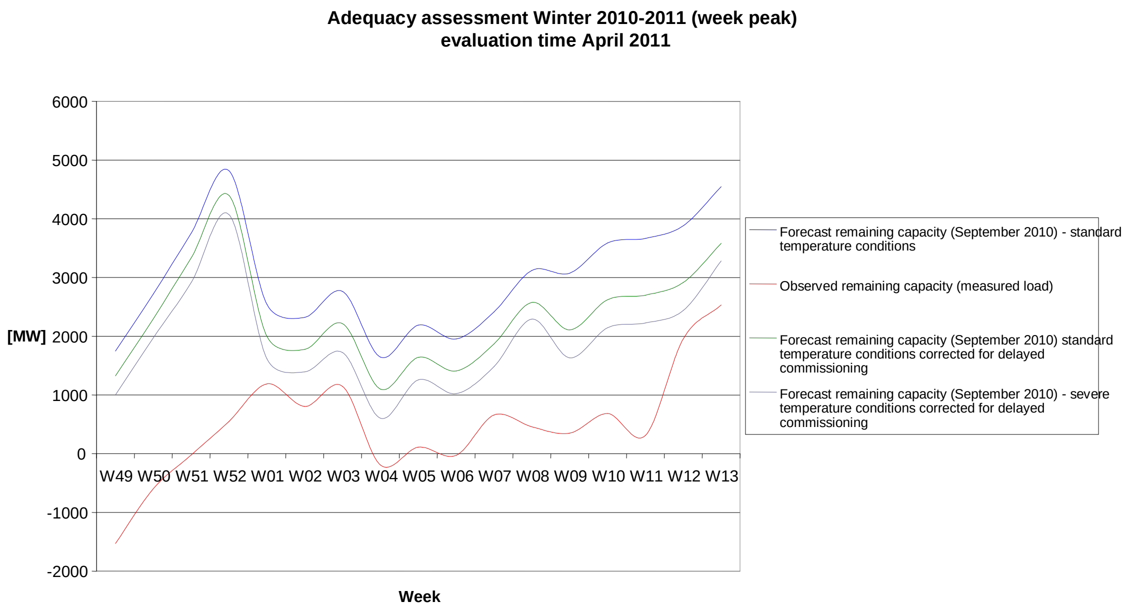
BELGIUM

The Winter 2010-2011 adequacy forecast study carried out in September 2010 for the Elia control area, which comprises Belgium and the SOTEL area (a part of the G-D of Luxembourg), revealed that the desired safety level of 1050 MW for the generation-load balance would be reached during the entire winter period 2010-2011. This analysis remained valid even when assuming severe temperature conditions.
The two main risk factors for the Elia grid, potentially jeopardizing the positive winter adequacy assessment, that were identified during this study were:

- a generation-demand imbalance for the whole of the ENTSO-E North Sea Region;
- unplanned outages at the main generation plants in Belgium.

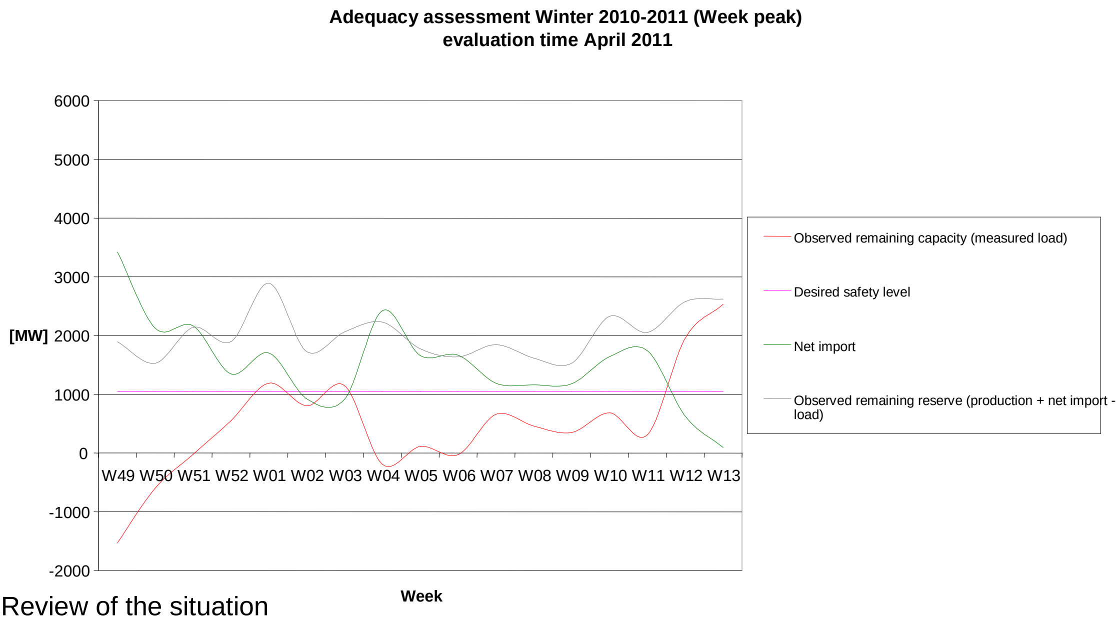
In reality, the desired safety level of 1050 MW for the generation-load balance was not attained during the assessed moments of weeks 49 till 51 of 2010 and the hours selected for weeks 4 and 6 of 2011. The assessment below only focuses on the moments assessed in September 2010.
Figure 1 gives an overview of the forecast remaining capacity (evaluation time September 2010) and the observed remaining capacity for the week peaks of winter 2010-2011.

Figure 1: Adequacy assessment winter 2010-2011



Elia did not expect any congestion problems on its grid for winter 2010-2011 due to the minimization of planned outages of international lines during critical winter periods.
In general, the system adequacy for winter 2010-2011 was positive, as unforeseen unavailability of power units was compensated by a net import within the North Sea Region during the weeks in which the desired safety level was not obtained. This is illustrated by Figure 2. During the past winter there were other moments besides those reported in this assessment, where the desired safety level of 1050 MW was not obtained through national generator units. However, the desired safety level could be attained when taking into account the net import at these moments.

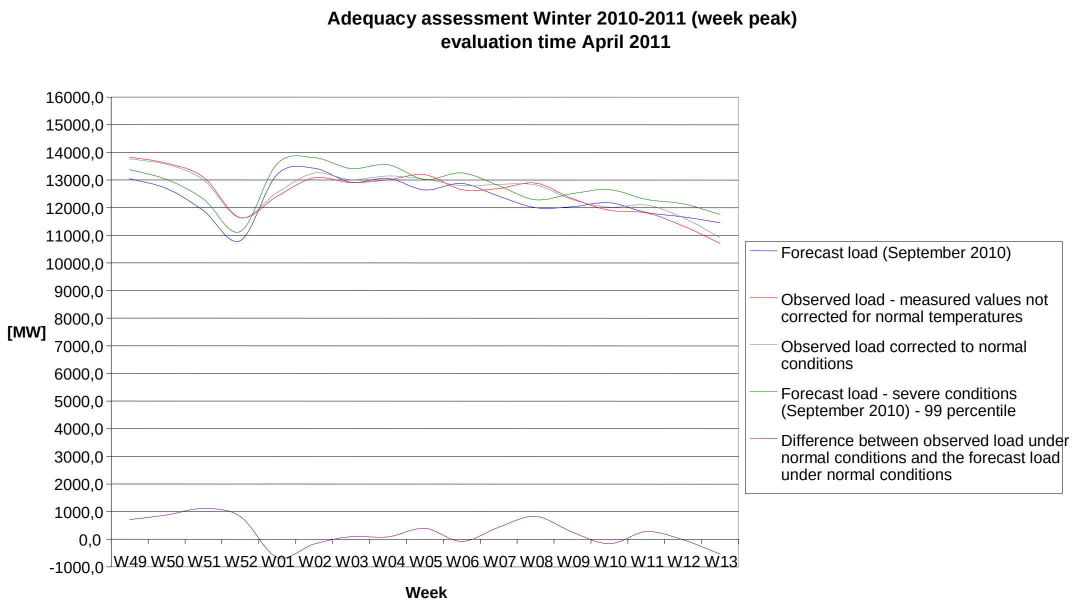
Figure 2: Observed adequacy versus net import in winter 2010-2011



Review of the situation

Demand:
The forecast demand levels took into account normal temperature conditions and severe conditions. The observed load was therefore rescaled to normal winter temperatures so that a comparison could be made. A deviation between the forecast and observed load under normal conditions of between +1.1 GW and -0.7 GW was recorded (see Figure 3).

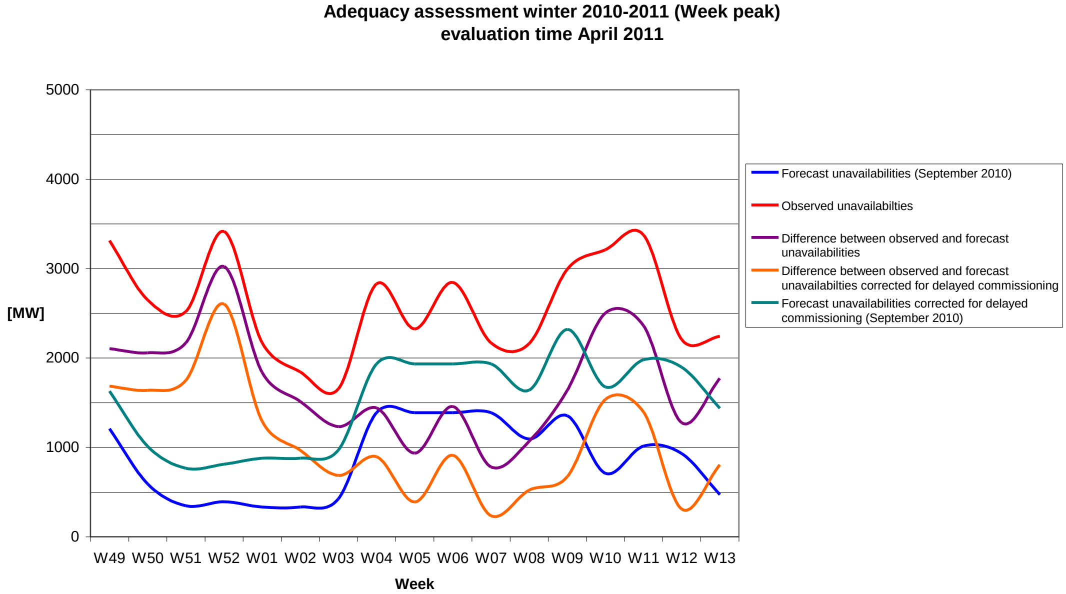
Figure 3: Forecast and actual demand levels



Unavailabilities:
The forecast unavailabilities took into account only known unavailabilities at the moment of the assessment. A deviation between the forecast and observed unavailabilities, between +3 GW

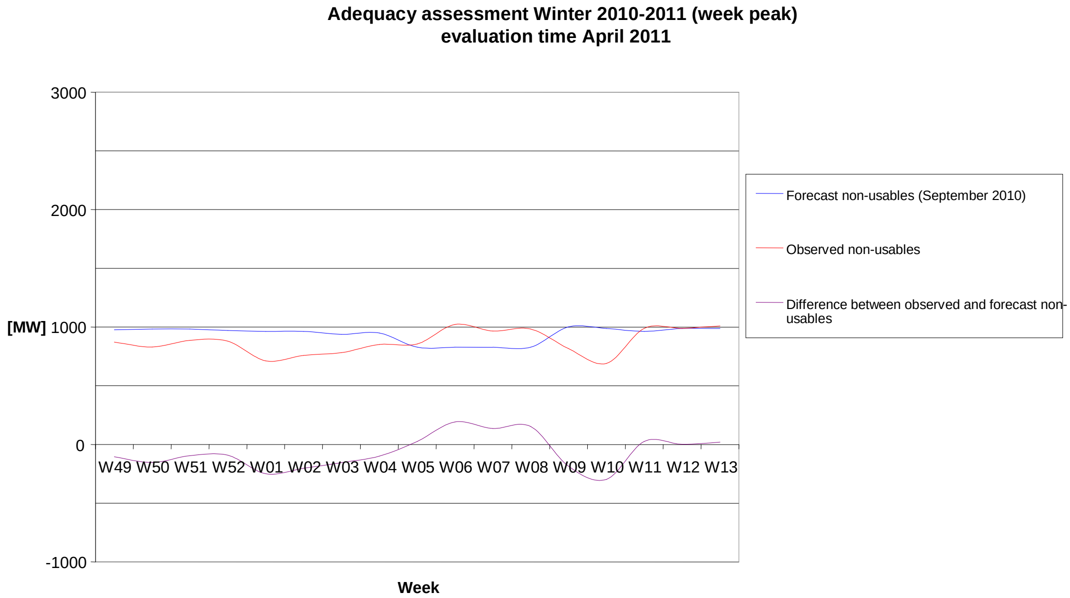
and +0.8 GW, was recorded (see Figure 4). Further, there were some delays in the commissioning of thermal units that were foreseen as being available during the winter. Therefore a corrected forecast taking into account these delays is also presented in Figure 4. The deviation between this corrected forecast and the observed unavailabilities varies between +2.6 GW and +0.2 GW. From week 49 of 2010 to week 1 of 2011, the higher observed than forecast unavailability was significantly affected by the unforeseen outage of a nuclear unit (1 GW). In weeks 10 and 11 the difference was partially caused by an extension of the maintenance period of a nuclear unit (1 GW).

Figure 4: Forecast and observed unavailabilities



<u>Non-usables</u>:
A deviation between the forecast and observed non-usables of between +0.2 GW and -0.3 GW was recorded (see Figure 5)

Figure 5: Forecast and observed non-usables



Transmission infrastructures

No reduction of the simultaneous import capacity occurred due to the unavailability of grid elements due to maintenance or projects.

Use of interconnections:

Figure 6 and Figure 7 give an indication of the utilisation of the capacity of the interconnection between France and Belgium and between the Netherlands and Belgium during winter 2010-2011. In order to assess the utilisation of an interconnection, the available interconnection capacity is compared to the nominated interconnection capacity. Figures 6 and 7 illustrate that during winter 2010-2011 the interconnection between France and Belgium (Figure 6) was used much more in the direction of Belgium and that the interconnection between the Netherlands and Belgium (Figure 7) was used in a balanced way in both directions.

Figure 6: Utilisation of the capacity on the interconnection between France and Belgium (positive value = export).

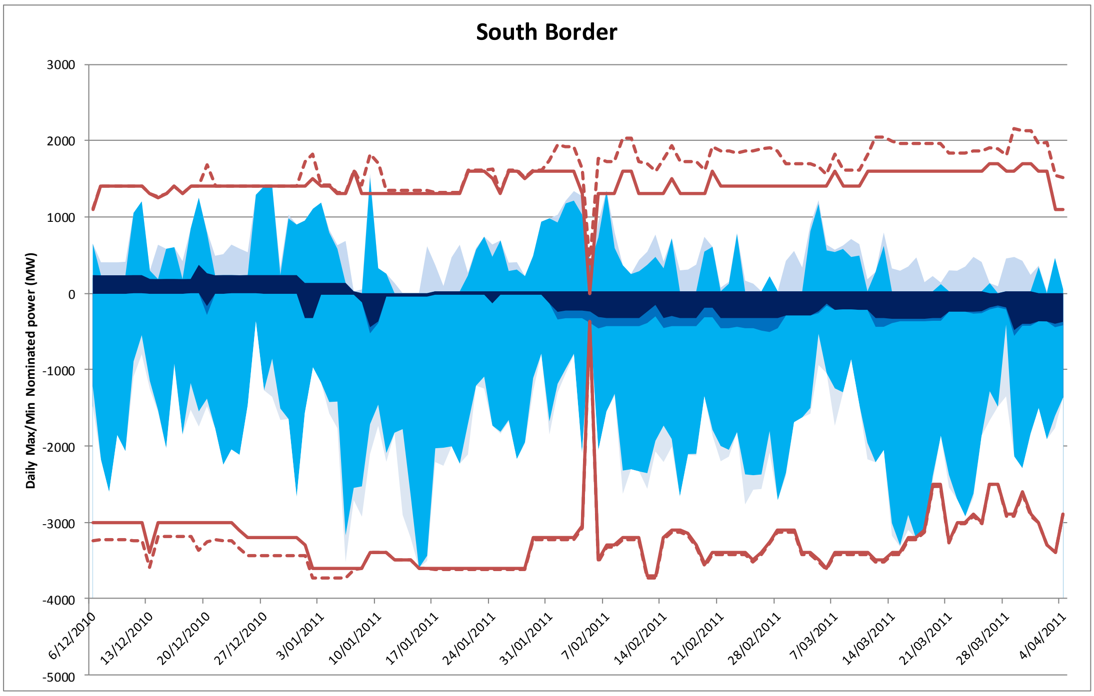
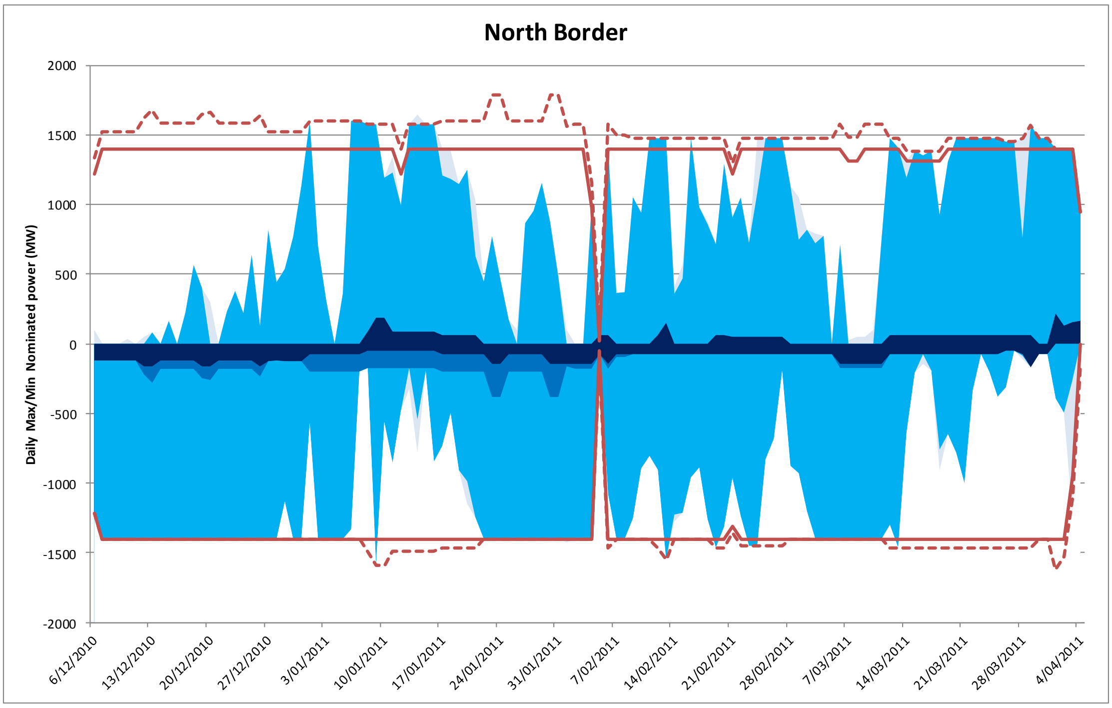


Figure 7: Utilisation of the capacity on the interconnection between the Netherlands and Belgium (positive value = export).



	Year ahead nomination
	Month ahead nomination
	Day ahead nomination
	Intraday nomination
	Day ahead NTC
	Netted day ahead NTC

Lessons learned for winter 2010-2011

The most significant variations between the forecast remaining capacity (evaluation in September 2010) and the observed remaining capacity for the week peaks of winter 2010-2011 were due to unexpected unavailability of generators, delayed commissioning of new plants and changes in the timing and duration of the maintenance of generators. Therefore it was decided to review the assessment methodology for the summer outlook 2011. In this assessment, in normal conditions a derating will be done for the average unforeseen availabilities as well as for the system services. In severe conditions, an additional derating of 5% of the installed capacity is taken into account.

BOSNIA & HERZEGOVINA

During winter 2010-2011 there were no unusual events in the power system of Bosnia and Herzegovina. Electricity consumption was increased compared to winter 2009-2010, because of lower temperatures than the previous winter. In this period we exported energy, mostly towards the Croatian border. Maximum peak load occurred on 31 December 2010 at 18^{00} h, at 2173 MW. This was the biggest maximum for the period in the last 15 years. Maximum peak load in January 2011 was 2083 MW, registered on 5 January at 18^{00} h.

BULGARIA

A slight increase (0.7 %) in consumption was observed for the period December 2010 – March 2011 compared with the same period the previous year. The comparison was made after tuning the corresponding consumption to the normal temperatures of each month). The average monthly temperatures were:

Winter 2010 – 2011 temperatures		Average monthly temperatures	
December 2010	2.2 °C	December	1.8 °C
January 2011	0.4 °C	January	-0.1 °C
February 2011	1.3 °C	February	1.8 °C

There were no stressing periods of the system adequacy during the months of analysis.
The coldest day in Bulgaria in the last winter period was on 26 January 2011. The weighted temperatures of the country were: Tmin = -9.2 °C, Tave = - 6.0 °C, Tmax= -2.2 °C. The average temperature was 4.7 °C below normal. The peak load of the period was observed on 1 February 2011 – 6897 MW (at 18:00 CET). The generation mix at that hour was as follows: nuclear – 2084 MW, thermal – 4237 MW, hydro – 1786 MW, wind – 6 MW. The export was 1396 MW and there were no imports.
There were no significant problems with generation capacity in the period, Failure rates were as expected. Water levels in the big reservoirs were slightly above target levels and hydro plants experienced normal operation in the peak zone of the daily load curve.
Demand in the period was within the confidence interval of the forecast. The load sensitivity to temperature changes was estimated to be 90 MW / C' on a daily average basis (the same sensitivity as the previous year). During the whole period, Bulgaria exported electricity to neighbouring countries. There were no critical outages in the transmission network

CROATIA

During winter 2010-2011 in Croatia air temperatures slightly higher than normal dominated. The exceptions were the middle period of December 2010 and the last weeks in January and February 2011, when the weather was colder. Average consumption was higher than in winter 2009/2010. Maximal hourly consumption of electricity occurred on Thursday 16 December 2010. Its value was 3121 MWh, which was the highest ever hourly consumption in Croatia. The consumption was covered mainly by generation in hydro power plants, but generation in thermal power plant and electricity imports were also very important.
The absence of major accidents in the system and extremely favourable hydrological circumstances made normal supply of Croatian consumers possible.

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CYPRUS

Climatic conditions of winter 2010-2011 in Cyprus were mild, as expected. Cyprus stressed periods for system adequacy occur during the summer. Therefore, no risks are expected. The Cyprus system is an isolated system. No interconnections exist with other countries.

Due to the international economic crisis that also affected Cyprus, the yearly percentage increase in demand of 1.37 % was less than the yearly percentage increase in demand of 2.7 % for the previous year.

Unpredicted instantaneous increases or decreases of wind park generation during night hours create problems for the spinning reserve, especially during the minimum daily load time that occurs usually at around 3 am. If such cases take place, the TSO may be forced to disconnect thermal units.

Wind park operation in small isolated systems is completely different from continental conditions and needs careful observation of its effect on system balancing conditions.

TSO Cyprus is observing on a weekly basis the generation adequacy versus the weekly demand. Such observation is also published on the TSO website. This is done mainly to assist the emergent overhauls and unexpected events. The Transmission System Owner's overhaul schedule for the power units was executed without any significant problems in the operation of the system.

CZECH REPUBLIC

The winter temperatures were average, and no significant temperature variations were recorded. Due to the economic crisis, there is still a notable decline of load and consumption of around 2 % in comparison to levels in 2008. No specific events were recorded.

DENMARK

It was again a cold winter. The winter had already started in November and stayed until January. February and March were warmer than last year. The cold weather did not cause any problems in the transmission network, except for one day with galloping 400 kV lines in DK1. The cold weather raised the prices in the spot market, but not to an abnormally high level. The prices were relatively high in DK2 in November and December, while they remained at a normal level in DK1.

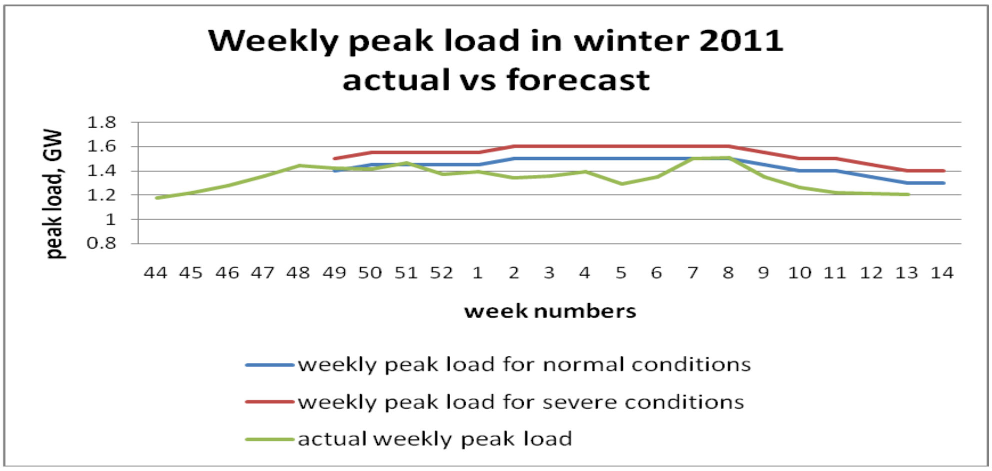
There are some worries about the levels in the water reservoirs in the north and especially in Norway. The level has been very low and still is. The lack of capacity in Norway has caused a cancellation of inspection and maintenance of the Skagerrak interconnection in spring. There has been no lack of capacity in DK1 or DK2.

ESTONIA

The winter of 2010-2011 was extraordinarily snowy – it began to snow in the middle of November and even in April the snow had not yet gone. The average temperature was below zero during all the winter months, and the minimum temperature of the winter was below -30 degrees Celsius. Despite the relatively cold temperatures, the maximum peak load of Estonia was not reached. No extraordinary risks were identified in the Winter Outlook report.

In February a failure occurred with Estlink for 181 hours, which is the longest unplanned outage of Estlink in its history. This had a significant effect also on trading between Estonia and Finland.

The actual weekly peak load was slightly smaller than forecasted. See the graph below for details:



FINLAND

Weather
This was another consecutive long and cold winter in Finland. In most of the country the average temperature in December was from 5 to over 7 degrees lower than the long term average. In January the average temperature was near to normal, while again in February the temperature was 4 to 6 degrees lower than average. In March the temperature was near to normal. Week 7, February 14 to 20, was the coldest of all, and especially the nights were cold. The lowest temperatures were between -30 and -35 degrees even in southern Finland.

Consumption
If temperature variations are taken into account, electricity consumption in December 2010 was a little higher than a year before. In January, February and March the figures were at the same level as a year before. Peak demand in the winter period was preliminarily almost 14 900 MW (one hour average), source Finnish Energy Industries. The peak demand was during the aforementioned cold week in the morning of the coldest night, 18 February, hour 9 to 10 local time, i.e. 8 to 9 CET. The peak was near to the all time high of 14 921 MW in February 2007.

Production
One 'mothballed' coal-fired unit of 230 MW was brought into the market in addition to what was assumed in the Winter Outlook. The reason was the market conditions due to the poor hydro conditions. The generation capacity operated as planned and the reliably available capacity corresponded to the estimated amount. The production capacity based on the Power Reserve Act reserved for securing the power balance during extreme conditions was not needed. The necessary frequency-controlled and fast disturbance reserves were available all the winter.

Interconnections

Most of the time there was electricity export to Sweden, but during the peak load there was import from Sweden. With a few exceptions, the capacity was sufficient for the market needs. Electricity imports from Russia continued with almost full capacity during the whole period. In day-time during the coldest period the Russian SO reduced by a little the export to Finland to maintain security in the Russian system. Import from Estonia continued at full capacity most of the time. The interconnector, EstLink, had a severe fault during the peak load week, resulting in an outage of the interconnection for one week. The price difference between Finland and Estonia indicates that the transmission capacity was not sufficient at all times.

For the whole period there was net import of electricity to Finland.

Transmission network

Fingrid's system worked as planned throughout the winter period and the transmission grid did not experience any significant faults affecting the transmission capacity.

Lessons learned for Winter 2011

Because of reliably operating production capacity and interconnections, as well as availability of capacity in the neighbouring systems, the demand did not cause any problems for power system operation.

Summary

In summary, the system adequacy in Finland was not at risk during the winter period. Production capacity reserves would have been sufficient to cover any single production or interconnection failure. Finland is in any case dependent on imports from neighbouring systems.

FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

Generally, the 2010-2011 winter conditions were very close to the forecast ones from the point of view of temperatures, and the levels of our reservoirs are very high. There was no unexpected situation during the winter period. The operation of the power system was secure and reliable over all the winter period.

The Macedonian electricity system mainly depends on imports of energy to reach adequate balance between consumption and production/import. This year a new gas power plant – TE-TO (250 MW) was put into operation, but it is still in the test period. When this is complete, the imports will decrease.

From the point of view of system adequacy, the generation-load balance was not at risk during the whole of winter 2010-2011 in the Macedonian system.

The Macedonian transmission network has well-developed interconnections with neighbours: two 400 kV tie-lines with Greece and one 400 kV tie-line to Serbia. The new 400 kV interconnection to Bulgaria was commissioned at the end of 2008. Consequently, the operation of the power system is now more secure than before and the energy transit through Macedonia increased. As a result, the security and reliablility in the whole SEE region also increased.

The water reservoirs were at a very high level because of the good hydrological conditions this year, so the HPPs also contributed to the security of the system.

According to all the above, the generation-load balance on the Macedonian system was not at risk during winter 2010-2011.

FRANCE

Winter 2010-2011 temperatures were quite close to the average, except in December. December was characterized by 3 successive cold spells and periods of snow. Indeed, climatic conditions in December were severe:

- With an average temperature more than 3° C below the seasonal norm, December 2011 was the coolest December in the last 40 years
- Such snowfalls in December have not been registered for 30 years, at least in many areas

Except during December, the temperature was close to the seasonal norm:

	Monthly average	Deviation from normal temperature	Deviation from the same month one year before
November	7.7°C	-0.8°C	-2.8 °C
December	2.3 °C	-3.1 °C	-2.7 °C
January	4.8 °C	-0.3 °C	+2.8 °C
February	6.7 °C	0°C	+2.3 °C
March	9.1°C	0.1°C	+1.5 °C

The main risk identified in the Winter Outlook report was the sensitivity of the load to low temperatures. This risk occurred during all the winter due to low temperatures.

During the cold weather observed in December, French consumption reached a peak at 96 710 MW on 15 December 2010 (last winter the peak was 93 080 MW).

No significant situation arose during the peiod.

The national consumption adjusted for meteorological contingencies reached 488.1 TWh in 2010, 1.9 % more than in 2009, after a decrease of 1.6 % the year before. Customers connected to the RTE network and customers supplied by the distribution networks contribute to this increase. Consumption by large scale industry and SMI/SMEs has not yet reached the level it had before the economic crisis, whereas consumption by business and private customers continues to grow.

The trends of the adjusted consumption (adjusted for winter climate conditions) compared with the same months of the previous winter are as follows:

- +0.1 % in November
- +3.2 % in December
- +3.3 % in January
- +1.8 % in February
- -0.7 % in March

RTE’s website encourages customers to take simple steps to moderate their energy demand, especially during peak periods of demand.

No events and stress situation occurred last winter

Generating facilities during 2010:

- Increase in the production capacity connected to the RTE network of about 1430 MW due particularly to the connection of 2 combined cycle gas units, 2 combustion turbines, 1 wind farm at 225 kV, and 3 thermal groups with renewable energy sources at 63 kV ;
- Further important development of wind generation with an increase in installed capacity of about 950 MW.
- Important increase of photovoltaic generation on distribution networks, reaching about 760 MW of installed capacity at the end of the year 2010.

Regarding the load, the main issues were the successive cold spells. Climatic conditions were severe with three cold spells in December.

During the cold weather observed in December, the French consumption reached a peak at 96 710 MW of 15 December 2010 (last winter, the peak reached 93 080 MW).

These levels of consumption caused low voltage problems and induced risk for the security of the system especially in the West and South East regions.

As a consequence, RTE took some measures:

- RTE used a « safety order » to avoid voltage collapse
- RTE used Short Message Service (SMS) and website alerts to encourage people to reduce electricity consumption at peak demand periods in the West and South East regions.

The main transmission reinforcement realised during 2010:

- Strengthening of the 400 kV line of Provence-Alpes-Côte d'Azur region reduced the difficult situation in south-east France.
- 400 kV substation commissioning at Calan (Morbihan) increased power supply capacity in Brittany
- 20 new substations are now connected to the RTE network, including 2 at 400 kV, 9 at 225 kV, 1 at 150 kV, 4 at 90 kV and 4 at 63 kV.

RTE commissioned 656 km of new or refurbished circuits in 2010, while decommissioning and various modifications represent a decrease of 600 km.

From the end of November to mid-December, low voltage constraints occurred during the period of high consumption especially in western and northern France due to cold spells

Several times during winter 2010-2011, interconnection capacities were saturated, especially on the Italian, Swiss and German interconnections.

A better availability of the French generation fleet in comparison with the previous winter 2009-2010 induced higher levels of export compared to the previous winter, except during December (cold spell).The balance of exchanges is positive this winter (i.e. France remained a net exporter), with a higher level compared with the previous winter, except during December because of the cold wave.

	EXPORTS			IMPORTS			CUMULATIVE VOLUME OF EXCHANGES			EXPORT BALANCE *		
	November 2010 (GWh)	Trend / November 2009	Cum. trend since 1st Jan	November 2010 (GWh)	Trend / November 2009	Cum. trend since 1st Jan	November 2010 (GWh)	Trend / November 2009	Cum. trend since 1st Jan	November 2010 (GWh)	Trend / November 2009	Cum. trend since 1st Jan
Belgium	278	111%	18%	404	-22%	-13%	682	5%	-2%	-126	-68%	-51%
Germany	473	7%	36%	1 432	-29%	-17%	1 905	-23%	-2%	-959	-39%	-51%
Switzerland	2 179	2%	-1%	449	32%	-43%	2 628	6%	-13%	1 730	-3%	23%
Italy	1 574	-5%	-8%	174	10%	-10%	1 748	-4%	-8%	1 400	-7%	-8%
Spain	123	-68%	-63%	152	-64%	-8%	275	-66%	-41%	-29	-18%	n.s.***
GB	740	60%	6%	545	-28%	41%	1 285	5%	17%	195	n.s.**	-28%
TOTAL	**5 367**	**3%**	**-2%**	**3 156**	**-25%**	**-16%**	**8 523**	**-10%**	**-8%**	**2 211**	**124%**	**+20%**

* A negative value indicates a net import balance ** In November 2009, a net total of 298 GWh was imported from Great Britain ***In cumulative terms since 1st January 2010, France has imported a net total of 1 229 GWh from Spain (having exported a net total of 1 645 GWh over the same period in 2009).

	EXPORTS			IMPORTS			CUMULATIVE VOLUME OF EXCHANGES			EXPORT BALANCE *		
	December 2010 (GWh)	Trend / December 2009	Cum. trend since 1st Jan	December 2010 (GWh)	Trend / December 2009	Cum. trend since 1st Jan	December 2010 (GWh)	Trend / December 2009	Cum. trend since 1st Jan	December 2010 (GWh)	Trend / December 2009	Cum. trend since 1st Jan
Belgium	548	n.s.**	31%	281	-53%	-18%	829	11%	-1%	267	n.s.**	69%
Germany	229	-55%	30%	1 818	-11%	-16%	2 047	-20%	-4%	-1 589	-4%	44%
Switzerland	2 350	7%	-1%	1 082	126%	-34%	3 432	28%	-10%	1 268	-26%	18%
Italy	1 108	-34%	-10%	361	56%	3%	1 469	-23%	-10%	747	-48%	-11%
Spain	71	-80%	-64%	466	-14%	-9%	537	-40%	-41%	-395	-105%	n.s.***
GB	907	97%	11%	520	-29%	29%	1 427	20%	17%	387	n.s**	-11%
TOTAL	**5 213**	**-2%**	**-2%**	**4 528**	**-2%**	**-15%**	**9 741**	**-2%**	**-7%**	**685**	**-3%**	**+19%**

* A negative value indicates a net import balance ** In December 2009, a net total of 147 GWh was exported to Belgium, while a net total of 454 GW was imported from Belgium, and 269 GW from Great Britain *** In 2010, France imported a net total of 1 625 GWh from Spain (having exported a net total of 1 452 GWh in 2009).

	EXPORTS		IMPORTS		CUMULATIVE VOLUME OF EXCHANGES		EXPORT BALANCE *	
	January 2011 (GWh)	Trend vs. January 2010	January 2011 (GWh)	Trend vs. January 2010	January 2011 (GWh)	Trend vs. January 2010	January 2011 (GWh)	Trend vs. January 2010
Belgium	792	n.s.**	113	-82%	905	21%	679	n.s.**
Germany	618	177%	1 355	-35%	1 973	-14%	-737	60%
Switzerland	2 496	14%	512	-10%	3 008	9%	1 984	23%
Italy	1 534	6%	170	18%	1 704	7%	1 364	5%
Spain	141	161%	367	-11%	508	9%	-226	37%
Great Britain	923	221%	404	-57%	1 327	8%	519	n.s.**
TOTAL	6 504	**51%**	**2 921**	**-39%**	**9 425**	**4%**	**3 583**	**n.s****

* A negative value indicates a net import balance ** In January 2010, exports to Belgium were 103 GWh, and there were net imports of 542 GWh from Belgium and 652 GWh from Great Britain. The overall balance showed total net imports of 489 GWh.

	EXPORTS			IMPORTS			CUMULATIVE VOLUME OF EXCHANGES			EXPORT BALANCE*		
	February 2011 GWh	Trend / Feb 2010	Cumul. trend since Jan 1st	February 2011 GWh	Trend / Feb 2010	Cumul. trend since Jan 1st	February 2011 GWh	Trend/ Feb 2010	Cumul. trend since Jan 1st	February 2011 GWh	Trend / Feb 2010	Cumul. trend since Jan 1st
Belgium	713	n.s**	n.s***	115	-80%	-81%	828	13%	17%	598	n.s**	n.s***
Germany	539	8%	61%	1 010	-37%	-35%	1 549	-26%	-20%	-471	57%	59%
Switzerland	2 278	11%	13%	318	8%	-4%	2 596	11%	10%	1 960	12%	17%
Italy	1 693	0%	3%	62	-4%	11%	1 755	0%	3%	1 631	0%	2%
Spain	33	-14%	89%	225	-40%	-24%	258	-37%	-13%	-192	42%	40%
Great Britain	672	131%	176%	402	-49%	-53%	1 074	0%	4%	270	n.s**	n.s***
TOTAL	**5 928**	**26%**	**38%**	**2 132**	**-42%**	**-40%**	**8 060**	**-4%**	**0%**	**3 796**	**n.s****	**n.s*****

* A negative value indicates a net import balance ** In February 2010, exports to Belgium were 143 GWh; there were net imports of 447 GWh from Belgium, and 496 GWh from Great Britain, the overall balance showed total net exports of 1 008 GWh *** in cumulative terms since January 1st 2011, exports to Belgium total 1 505 GWh, compared with 246 GWh over the same period in 2010; the overall balance shows total net exports to Belgium of 1 276 GWh (compared with net imports of 988 GWh over the same period in 2010), and net exports of 788 GWh to Great Britain (compared with net imports of 1 149 GWh over the same period in 2010); the overall balance shows net exports from France of 7 379 GWh as of the end of February 2011, compared with 519 GWh at the end of February 2010.

	EXPORTS			IMPORTS			CUMULATIVE VOLUME OF EXCHANGES			EXPORT BALANCE*		
	March 2011 GWh	Trend / March 10	Cum. trend since 1st Jan	March 2011 GWh	Trend / March 10	Cum. trend since 1st Jan	March 2011 GWh	Trend/ March 10	Cum. trend since 1st Jan	March 2011 GWh	Trend / March 10	Cum. trend since 1st Jan
Belgium	938	n.s**	n.s***	109	-82%	-82%	1 047	19%	18%	829	n.s**	n.s***
Germany	922	33%	47%	979	-28%	-34%	1 901	-8%	-16%	-57	92%	65%
Switzerland	2 488	10%	12%	262	13%	-1%	2750	11%	10%	2 226	10%	15%
Italy	1 652	-10%	-2%	111	n.s**	36%	1 763	-6%	0%	1 541	-14%	-4%
Spain	102	95%	91%	501	22%	-9%	603	30%	2%	-399	-11%	22%
Great Britain	665	56%	125%	283	-64%	-57%	948	-22%	-5%	382	n.s**	n.s***
TOTAL	**6 767**	**23%**	**32%**	**2 245**	**-35%**	**-39%**	**9 012**	**+0%**	**+0%**	**4 522**	**121%**	**n.s*** **

* A negative value indicates a net import balance** In March 2010, exports to Belgium were 258 GWh, while imports from Italy were 42 GWh; France imported a net total of 361 GWh from Belgium, and 365 GWh from Great Britain. *** in cumulative terms since January 1st 2011, exports to Belgium total 2 442 GWh, compared with 504 GWh over the same period in 2010; the overall balance shows total net exports to Belgium of 2 105 GWh (compared with net imports of 1 349 GWh over the same period in 2010), and net exports of 1 172 GWh to Great Britain (compared with net imports of 1 514 GWh over the same period in 2010); the overall balance shows net exports from France of 11 901 GWh as of the end of March 2011, compared with 2 563 GWh at the end of March 2010.

Germany

EnBW - Control Area:
The congestion management, including the „C function“ implemented on the borders of D-CH and D-F, has proved to be successful.

Amprion – Control Area:
Consumption was at a high level. The financial crisis had no more impact.

TenneT-DE- Control Area:
Both the Krümmel and Brunsbüttel nuclear power plants in Northern Germany remained out of service during the winter months. This situation did not lead to any system adequacy problems.
Due to the high amount of installed wind power generation capacity, several situations with strong winds had to be handled with feed-in management operations.
On 4 and 5 February 2011 the wind feed-in in Northern Germany reached a historical maximum, resulting in nearly 9 000 MW. To avoid N-1 violations on the interconnectors, several different measures had to be taken and the day-ahead trade in the CWE region had to be restricted for the first time.

50Hertz Control Area
On 24 December 2010 long wave oscillations of the overhead transmission line were the reason for an outage of the 380kV Leitung Klostermansfeld – Wolmirstedt line. On 28 December the line was taken back into operation.
On 11 November 2010 the windstorm “Carmen” moved over Germany, which consequently led to wind in-feed of 21 000 MW in Germany (in the 50Hertz control area 9785 MW). To avoid overload of grid elements and because of an N-1 security violation in the 50Hertz control area, the generation of power plants and renewables-based generating units had to be adapted in accordance with Article 13 (2) EnWG.
In the period 11 - 13 December 2010, because of an N-1 security violation in the 50Hertz control area, the generation of power plants and renewable-based generating units had to be adapted in accordance with Article 13 (2) EnWG. Due to the high load on the tie-line with TenneT Germany, it was necessary to apply market related measures.
In the period 4 - 8 February 2011, to avoid an N-1 security violation in the 50Hertz control area, the DC-Loop Flow (clockwise) was arranged. To avoid an N-1 security violation on the tie-line Remptendorf – Redwitz, it was necessary to apply market related measures (redispatch with TenneT Germany).
The Krümmel and Brunsbüttel nuclear power plants remained out of service. The resulting impact on the load flow and the voltage control in the region of Hamburg had to be considered at any time.
The average energy feed-in during the period from November 2010 to March 2011 in the control area of 50Hertz Transmission was 2146 MW. The highest feed-in of wind energy in this period was 9794 MW.

GREAT BRITAIN

December 2010 was the coldest on record and the peak winter demand of 59 700 MW occurred at the half hour ending 17:30 hrs on Tuesday 7 December. This was slightly higher than the forecast 1 in 20 peak demand of 59 000 MW, but corrected to normal weather it was 55 300 MW, just below the forecast based on normal weather. There was sufficient generation available, demand was met in full and no system warnings were issued.

The severe cold weather eased by the end of December. January had temperatures close to normal and February was warmer than average.

The Winter Outlook report indicated that there would be sufficient margin to meet a 1 in 20 demand plus required reserve as long as there were no interconnector exports. In the event, demand was 600 MW higher and there was an export to Northern Ireland of 400 MW, but these were balanced out by imports from France of 1000 MW. The forecast in the Winter Outlook report was conservatively based on units undergoing commissioning not being available, but some of the new CCGTs did in fact make a contribution to the generation at the time of the winter peak demand.

Wind power at the time of the winter peak amounted to 130 MW, or just 0.2 % of the total, which was lower than the 250 MW assumed in the forecast.

During the cold weather in December the increase in gas prices made coal-fired generation more economic than gas-fired generation. As a result, coal took a larger proportion of the total generation. For the rest of the winter, the two fuels were closely aligned in terms of generation cost and had a similar share of the total electricity supplied.

GREECE

At the beginning of the winter Greece experienced more than average storage of water in the hydro reservoirs. This is crucial for the summer season, which is the season with the maximum demand of the year.

In general, the winter did not have severe conditions. The temperatures were in general mild with only a short period of time with low temperatures.

The demand starting from January was lower than expected and even lower than the previous year. The reason for this reduction is that economic conditions have had an effect on the industry production process and led to lower energy consumption.

Wind conditions were on a typical level during this winter. The establishment of new wind parks mainly in the south region reinforced system stability in this area. The maximum wind production was 15 776 MW on 4 February 2011.

The installed generation capacity of wind parks in the interconnected system today is 985 MW. A significant increase in wind production is expected in the years ahead.

At present, the stored energy in the hydro electric power plant reservoirs is at higher than average levels due to good rainfall during the last 3 months.

On the demand side, the following table presents the values of net monthly peak load (forecast and actual).

	Net Monthly Peak Load (Average values per hour in MW)			
	December	January	February	March
Forecast	8600	8270	8020	8800
Actual	8457	8028	8153	8298
Difference	143	242	-133	502

The deviations between forecast and actual values are mainly due to the financial crisis and very mild climatic conditions (especially in temperature).

The peak net electricity demand (excluding pumping loads) for the interconnected system in winter 2010-2011 amounted to 8512 MW on 17 December 2010 at 19:00 hrs (CET).

Additionally, during the winter there was no need to select any resources from the demand side response. During the winter no crucial transmission expansion or reinforcement took place.
The Greek system continuously used all capacity (NTC) from the neighbouring countries in the incoming direction. The NTC was up to 1200 MW due to the operation of the 400 kV OHL between Bulgaria and FYROM. Also this winter we had connection with the Turkish power system through the 400 kV line between Nea Santa and Babaeski substations.
Explicit auctions for the allocation of Physical Transmission Rights (PTRs) were held by HTSO for 50 % of the NTC in the northern Greek interconnections both in the importing and exporting direction from FYROM and Albania and 100 % with Bulgaria (common auction). The auction rules are fully compliant with Regulation 1228. The same is valid for the auction rules for the interconnection with Italy. It is expected that after April 2011 the interconnection with Italy will be incorporated at the CASC auction office, which is responsible for the auctioning of the capacity of the Italian interconnectors.
In the following table the maximum and minimum SMP values are presented.

	Max and Min SMP (prices in € / MWh)			
	December	January	February	March
Max	98 004	102 013	103 003	92 512
Min	0	32 185	33 519	34 752

HTSO and ESO EAD agreed to conduct the allocation of the capacity of the Greece-Bulgaria interconnection line jointly from 1 January 2011. According to this agreement, HTSO conducts the yearly and daily auction and ESO EAD the monthly.
CASC will be responsible for conducting all the auctions of the Greece-Italy interconnection line from 1 April 2011 after a decision by the TSOs of the CSE Region.
During February 2011 there were bilateral exchanges between HTSO and TEIAS for testing purposes on the Greece-Turkey interconnection line. Next May, the ENTSO-E Plenary, taking into account these tests, will decide if the line will be used for commercial exchanges.
During winter 2010-2011 we observed very low load demand due to the economic crisis.
The basic key points for the forthcoming winter will be the consumption of electric energy, especially if the rate of reduction continues. If this happens, it may be useful to review the estimates of future energy needs.
For the Greek energy system, the most critical period for energy is the summer. Therefore, the summer outlook report is more useful.

Hungary

The temperature was slightly higher than that of the last year. The import was lower than the expected. Demand increased by 2 % as a result of the economic conditions. Availability of generation capacity was good throughout the whole winter period. Compared with the last year, demand was higher but not extreme.

Operation of the transmission grid was according to plan, harmonised with the other TSOs in the region. There was practically no limitation for market players.

It is crucial to see trends in the markets, as well as to understand the development of the region and the whole of Europe, so that risks can be better identified.

ICELAND

The installed generation capacity provided acceptable system adequacy during the winter period.

Due to disturbances, a curtailment of primary energy delivery occurred and it was approx. 110 MWh in the winter period. The total yearly energy fed into the transmission system was 16 507 GWh in 2010.

IRELAND

There were no significant issues during winter 2010-2011. The winter peak demand occurred on Tuesday 21 December 2010. The peak was 5090 MW (exported). This was an increase on the previous year's peak of 4950 MW (exported). The wind generation at the time of the peak demand was 51 MW. The predicted winter peak in the Winter Outlook report was 4750 MW* (exported). At the time of writing the Winter Outlook report (June 2010), the year-to-date average demand growth was positive at 0.96%. This trend continued for the rest of the year. For the second winter in a row, extreme cold weather throughout December led to peak loads being significantly higher than expected. The system forced outage rate for December 2010 was 10.6 %, which was in line with the system forced outage rate given in the Winter Outlook report. Notwithstanding the higher peak demands due to the extreme weather conditions, the system remained well within the capacity adequacy standard for the winter period.
**The Winter Outlook report for 2010-2011 was a combined outlook for Ireland and Northern Ireland.*

ITALY

The adequacy evaluations for winter 2010-2011 did not evidence particular risks for capacity adequacy and peak load cover or the national supply systems. The winter season saw temperatures that were essentially steady compared with the previous period, with a very small increase in demand. In addition high hydro conditions marked the first part of the winter period: values above the multi-year average capability factor were recorded, confirming a rainy winter.

On the generation side, there was no remarkable situation for generation availability in respect of the planned maintenance. The installed generating capacity rose with a significant contribution from the wind farms and photovoltaic solar parks, with a total increase of 200 MW.

On the demand side, during the first part of the winter period (October to December 2010), both load and energy requirements were high with respect to the same period of 2009, but still lower than those recorded before the economic crisis. The record power peak normally seen in winter was not exceeded in this period. In the last period of winter (January – March 2011), monthly consumption showed a small decrease.

With reference to transmission infrastructure development, new lines and devices were put in operation, with reinforcement of the transmission network bringing benefits in terms of reducing congestion.

Italy's northern interconnection was characterised, for most of the time, by import conditions from the four neighbouring systems bordering at the northern interconnection.
In terms of physical flows, the interconnection recorded a variable performance of the import/export balance of energy.
The HVDC cable interconnecting Italy with Greece was basically characterised by prevalent import conditions towards the Italian system.

The operation of the new PSTs in Divaca, begun in December 2010, is affecting the flow pattern on the Italy's northern border. Such PSTs contributed to limit loop flows on the I-SI border. Following the agreement between Terna, ELES and Swissgrid on a coordination procedure for the operation of PSTs on the I-SI border, an additional remedial action to the already existing ones is now available to control the distribution of the physical flows on the interconnected grid.

The total net production registered a decreased of 1.0 %, balanced with an increase in the energy exchanged with foreign countries. Furthermore, the monthly hydroelectric capability factor showed a constant increase, with percentage values above the corresponding values recorded in the previous winter. There was essentially the same result for the fullness factor of hydro reservoirs.

LATVIA

The Latvian power system is supported basically by CHP plants; depending on the period and the inflow of the Latvian rivers, these power plants covered up to 80-100 % of the power system energy balance during this winter period. During the peak hours, about 60 % of the peak demand was covered by CHP plants.

For the estimation of electricity demand and supply balance for the Latvian power system during the winter period, several events were considered, related to the restrictions in the cross-border Estonia-Latvia line, and risks to import and export availabilities were in place during this period, caused by congestions in the Estonia-Latvia border. These congestions, due to temperature limits on the lines in Estonia, were small in comparison with summer period congestions.

The transmission capacities in the Latvian-Lithuanian cross-border line in winter 2010-2011 were within the feasible limits, due to sufficient available transmission capacities and no major maintenance on the cross-border lines. There were no significant outages in power transmission lines and generation, or unexpected situations during winter 2010-2011.

The relatively low temperatures during this winter were the main cause of a total electricity consumption increase of 1-2 % compared to the previous year.

LITHUANIA

Winter 2010-2011 was unusual in comparison with the normal climate: November and January were hotter while December, February and March were colder than normal. The expected winter peak demand in the second week of January did not occur. This winter peak demand was observed on December just before the Christmas holidays (1704 MW), and was 0.5 % higher than the previous winter. Highly unstable weather conditions during the period led to higher consumption variation, which resulted in higher system balancing volumes compared to previous periods.

	Normal temperature (°C)	Observed temperature (°C)	Actual peak demand (MW)
November	+2.0	+3.9	1649
December	-2.0	-8.1	1704
January	-5.1	-4.4	1611
February	-4.6	-8.2	1619
March	-0.7	-1.2	1548

The total winter electricity consumption increase was 2.6 % in comparison with the previous year, as expected in the Winter Outlook 2010-2011, mainly because of weather conditions.
In the Winter Outlook, no risks were foreseen and no risks occurred during the winter. There were no unexpected generation and transmission line outages that could have caused system adequacy problems during the period.

During the Christmas holidays, because of the stressed weather conditions, all the wind mills became iced and were turned off for about five days. This was the first time this kind of incident occurred and it had not been forecast or evaluated in the system balance planning process. The emergency reserve was activated to compensate the complete loss of wind power generation. In future winter seasons, attention must be paid to the possible icing of wind mills during stressed weather conditions.

LUXEMBOURG

For the whole of December 2010, Luxembourg, like many other countries, was affected by a huge amount of snow, followed in January 2011 by some floods along the riversides. The temperature conditions were not severe during this period and especially during the whole winter. The security of supply in the grid was not affected.

MONTENEGRO

During the winter there were no unusual or significant system events. At this time of the year, average hydro conditions were registered.

THE NETHERLANDS

Winter 2010-2011 in the Netherlands: mean temperature 2.3° C (long-term mean temperature is 3.3° C). In a total of 52 days the minimum temperature was below 0° C (normally 38 days) and in a total of 13 days the maximum temperature was below 0° C (normally 8 days). For 4 days the minimum temperature was below -10° C. The lowest temperature was measured on 20 December 2009: -16.9° C.
Winter precipitation was at a dry level of 165 mm (long-term mean - 194 mm). Rarer was the number of snowy days: nearly 35 days (long term mean - 13 days). The figure of 183 hours of sunshine was normal (long-term mean - 172 hours), mostly in January.
In the Winter Outlook 2010-2011 no risks were foreseen with regard to the electricity system. Average temperatures were lower than expected, but this did not lead to any excessive situations.
Due to high winds in the north-western part of Europe, there were some stressed periods for the Dutch interconnectors during winter 2010-2011 and this led to an ultimate reduction of the Net Transfer Capacity on 4 February 2010. This reduction was needed to maintain network safety and could be taken within the limits of the regulations. The curtailments could be made within the available capacity and therefore did not lead to extra measurements or problems within the network.
There were no specific fuel, generation, demand or exchange pricing events that caused serious stressed periods.
The average reduction occurred in 18 % of the working days up to maximum curtailment of approximately 1000 MW in respect of a total import capacity of 3850 MW exclusive to the NorNed cable.
The economic effects in 2009 (BBP -3.9 % with respect to 2008) on electricity demand showed a significant decrease (sized -4.8 %) compared with the demand in 2008. In 2010 the electricity demand again decreased: -0.3 % in comparison with 2009, as the economic recession has come to an end. The electricity demand for 2011 will show a small growth with the expected recuperation of the economy figures of 1.3 to 1.5 %.

NORTHERN IRELAND

The winter 2010-11 period in Northern Ireland was one of the coldest on record, with December 2010 being the coldest December on record and also the coldest month recorded in the last 100 years with a mean temperature of -0.6° Celsius. A record low temperature of -18.7° Celsius was recorded on 23 December 2010. Some inland areas experienced the longest uninterrupted sub-zero spell since January 1881.
There were exceptionally heavy winter snowfalls in November with a harsher and longer lasting snowfall from 17 December through to 26 December 2010. The snowfalls caused severe disruption to the transport networks, with the road system being disrupted and significant numbers of flights being cancelled with the closure of both the main airports.
As the thaw arrived around 26 December, further problems for water supplies occurred with immeasurable burst pipes in the water mains system, businesses and private dwellings leading to an extreme shortage of fresh water supplies throughout the country.
The winter peak demand occurred on 22 December 2010 which was an all-time record peak of 1777 MW (exported). This is more than the predicted winter peak in the Winter Outlook which was 1660 MW (exported). However, this was due to the unexpected severe weather conditions. The wind generation at the time of the peak demand was 5 MW out of a total connected wind capacity of 341 MW.
Despite the higher than predicted peak demands due to the extreme cold weather and snowy conditions, the transmission network experienced no major ice accretion, storm damage or

faults. The system also remained within the capacity adequacy standard for the duration of the winter period.
All interconnection and tie-lines were available as and when required and SONI experienced no shortfalls in generation. The overall demand growth from 2009 to 2010 was found to be +2.71 %, with this being largely due to the extreme weather that was experienced both at the start and end of 2010.

NORWAY

The cold weather, lower precipitation than normal and extremely low reservoir situation have resulted in an energy situation alert in Norway. Southern Norway has been in the worst situation. The low reservoirs are the result of the second dry year in a row. Five areas in Norway are separated into discrete price areas to ensure high imports. Statnett is following the power and energy situation especially closely.

The months from November to March were colder than normal. Due to the low temperatures, demand was higher than expected. Actual peak demand in winter 2010-2011 was 23.3 GW. This occurred on 3 December, hour 9.

Due to the low reservoir situation, production has been lower than normal. This has also led to large imports. Norway has imported from all the neighbouring countries (Netherlands, Denmark, Sweden, Finland, Russia) all winter.

POLAND

Basic data concerning winter 2010-2011

Month	December	January	February	March
	Winter 2010-2011 in relation to Winter 2009-2010			
Change in average temperature	-4.5 °C	+6.6 °C	-1.6 °C	+0.1 °C
	Relation of Winter 2010-2011 to Winter 2009-2010			
Peak load	+2.3 %	-5.6 %	+3.7 %	+2.8 %
Energy consumption	+6.5 %	-0.8 %	+3.3 %	+2.4 %
Energy export	-2.4 %	-15.7 %	-9.5 %	+25.4 %
Energy import	-90.3 %	-152.6 %	-39.5 %	-112.5 %
	Values for Winter 2010-2011			
Balance (import-export)	- 219 GWh	-415 GWh	-420 GWh	-775 GWh

Significant events in the Polish power system
In December 2010 a very high level of outages and non-usable capacity periodically caused a lower than required level of system services reserve. The Polish TSO registered unprecedented high energy prices on the balance market.

Emergency situation in the system on 3-5 February 2011:
On 3 February 2011 evening, due to a forecast increase of wind farm generation in the northern part of Germany and the expected increase of unplanned load flows from 50HzT to the Polish power system (due to results of DACF merged models), the PSE Operator discontinued (for 3 days) planned maintenance of the 400 kV line in the north-western part of Poland. For the same reason, and due to fact that N-1 criteria were not fulfilled the for PL-DE 220 kV double circuit Krajnik-Vierraden line, one unit in Dolna Odra PP was kept in operation in must-run mode (scheduled to switch off). Units in Dolna Odra PP are connected to Krajnik SS.
For this emergency situation, 50HzT in cooperation with Polish TSO took the following remedial action:

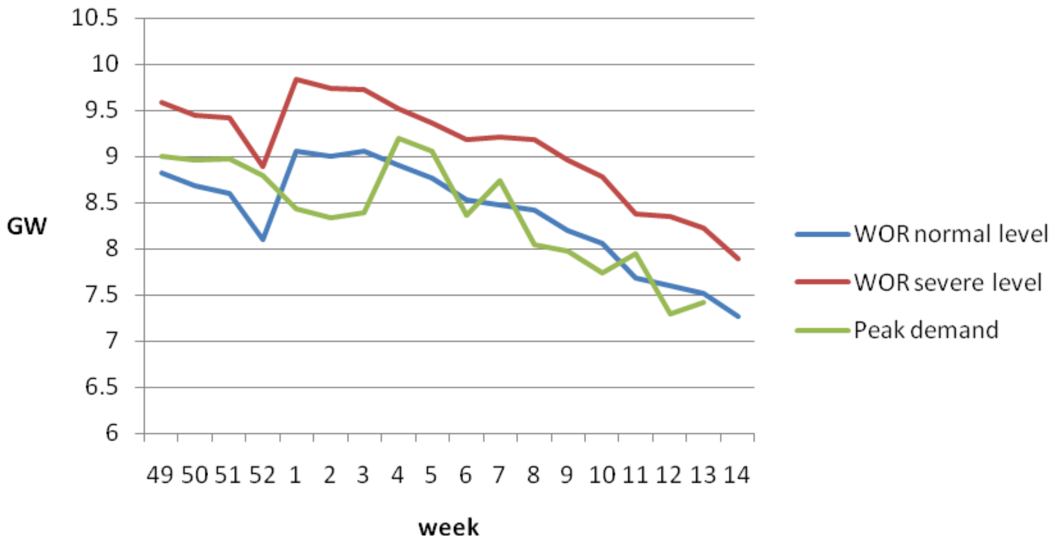
1. On 4 February at 00:00 DC Loop Flow started between 50HzT->EnDk->SvK->PSE Operator->50HzT. This DC Loop Flow was extended several times and finally ended on 5 February at 19:00
2. On 4 February at 21:00 (for 3 hours) Cross Border Redispatching started (direction PSE Operator->50HzT)

Moreover, on 5 February 2011 the PSE Operator, due to periodically not fulfilling N-1 criteria, ordered several times an increase of the generation level in Dolna Odra PP.
Also, extra generation of hydro pump-storage power plants in Żarnowiec and Żydowo (localized in the northern part of Poland) was used on both days (4 and 5 Feb).
On 5 February at 10:00 in Krajnik SS (PL) a broken insulator on one circuit of the 220 kV line to Vierraden SS (DE) was noticed. 50HzT was informed. At 11:11 there was some internal change of grid configuration in Mikułowa SS (second SS connected with 50HzT system) due to an expected high increase of load flow from 50HzT caused by potential automatical switching off of both circuits of the Krajnik-Vierraden line. At 15:39 the PSE Operator in cooperation with 50HzT decided to switch off this line and replace the insulator (the line was switched on at 18:13 the same day).
In this period, the Polish TSO turned on the yellow alert light in the RAAS system.

PORTUGAL

This winter was characterised by heterogeneous climatic conditions: there were a few sequences of days in December and January where temperatures were significantly below the average, but during February temperatures were, in general, relatively high. Electricity demand recovered during 2010 but, in the second half of the winter season, it remained below the previous year's values. Winter peak demand occurred in January, but remained 2.1 % below the all-time high record set in 2010.

Weekly peak demand was, in general, around the values estimated for the normal scenario. In WOR a possible critical period was identified in weeks 2 and 3, if severe conditions were met, but these did not materialise.



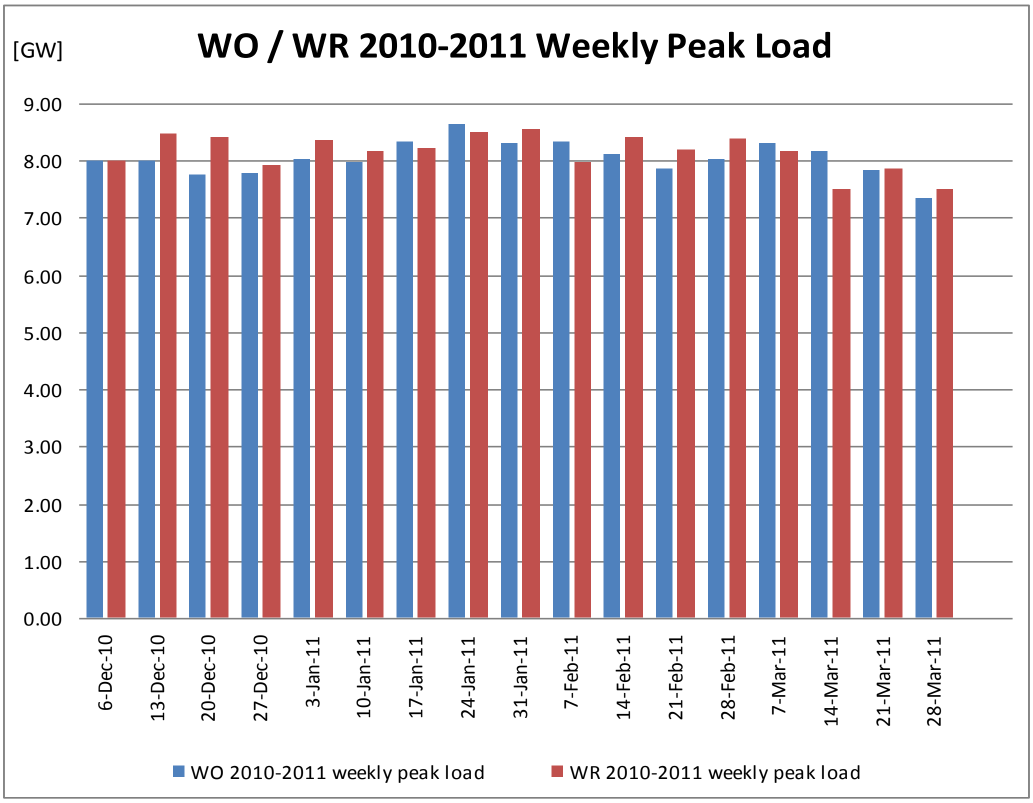
The demand growth in December was 5.1 % from December 2009 levels. Corrected for the temperature effect and number of working days, this value is reduced to 1.9 %. In 2011 we are witnessing a demand contraction. We estimate about 1.5 % is due to the economic crisis.

REPUBLIC OF SERBIA

Planned maintenance of generation capacities was successfully completed before the cold snap so the Serbian power system passed through the winter period without huge problems. Import contracts from neighbouring systems were realized in December, January and February with the beginning of low temperatures, as planned

ROMANIA

During winter 2010-2011, precipitation amounts were largely normal but there were periods with higher or lower temperatures than the monthly averages. On certain days the positive or negative temperature deviations were important, but even the very low temperatures did not affect the power system adequacy.
Even though the planned and unplanned outages were not identical to those considered in the Winter Outlook, the remaining capacity was enough to take over the deviations.
In the period December 2010 - February 2011 the national consumption increased by about 5-6 % over the same period of winter 2009-2010. Concerning the recorded weekly peak load versus forecast weekly peak load, there were certain small deviations, as shown in the diagram below, without affecting the system adequacy



Also, Transelectrica provided emergency help for certain hourly intervals to some neighbouring TSOs during December 2010.
On 17 December 2010, refurbishment of the 400 kV sub-station at Gadalin (near to the North border of Romania) was completed. Consequently, the aggregated NTC values for import on the Romanian border increased from 600 MW to 1200 MW. The NTC values for export were not reduced during the refurbishment of this sub-station.

SLOVAK REPUBLIC

During the whole winter period, no critical situation or unusual event in the power system of Slovakia occurred. The operation was secure and reliable. The months of December and February were colder than in the winter before and in January and March the weather was warmer. Overall, the weather conditions were similar to the winter before, and the average temperature from December to March was 0.8 °C (1.2 °C the winter before).

Consumption in December 2010 increased greatly (+8.6 %) compared to December 2009. In total, consumption for the whole winter period increased (+3.95 %). Also, production rose (about +10 %) highly, compared with the previous winter period.

A revival of industry in Slovakia, which has a strong effect on demand, was also visible on peak loads. In the winter period there was a peak load of 4342 MW in the 52nd week of 2010 (predicted monthly peak 4290 MW), which was 5.8 % higher than in December 2009. Neither the weather nor the increased consumption had any impact on the reliability of the power system operation.

A new combined cycle power plant (operated by E.ON Elektrárne Ltd.) entered commercial operation on 1 January 2011. This plant is located in the south-west of Slovakia (near the village of Malženice), installed capacity is 430 MW and it is connected into the sub-station at Križovany at a voltage level of 400 kV.

SLOVENIA

December was the coldest month in winter 2010-2011 and also colder than the average. No risk or unexpected event with effect on the power system occurred during the period.

On the generation side, hydro production was higher than estimated. On 23 March, an outage of the NPP Krsko occurred, but it was back in regular operation on 30 March.
On the demand side, better economic conditions and low temperatures resulted in higher demand. Consumption in winter 2010-2011 was higher than estimated in the Winter Outlook 2010-2011. Consumption by industrial consumers was higher by about 10.6 % and consumption by distribution companies was higher by about 1.7 %. The total consumption of electrical energy on transmission network in winter 2010-2011 was 2.9 % higher than estimated.
With reference to transmission infrastructure, in December 2010 PST in SS Divaca was installed on the 400 kV interconnection OHL Divaca-Redipuglia.
In terms of import and export, the numbers in the table below show that Slovenia was a constant net exporter in the observed period (49th week 2010 - 8th week 2011), exporting 242 MW on average per hour. The net balance of Slovenia varied from max 89.7 GWh (export of energy) to min 6.9 GWh (export of energy) on the weekly level.
From 1 January 2011, Slovenia and Italy started bilateral market coupling on their border. One of the positive effects of this project - besides more efficient allocation of cross-border capacities - is a big increase in traded volume on Slovenian PX (BSP), which in recent months has been close to 10 % of the Slovenian consumption. This means that a transparent and reliable day-ahead price index for Slovenian electricity market is now formed on the daily level, giving new opportunities to all the market participants willing to enter or be active on the Slovenian market.

		SI-IT		SI-AT		SI-HR	
Year	Week	Imp [GWh]	Exp [GWh]	Imp [GWh]	Exp [GWh]	Imp [GWh]	Exp [GWh]
2010	49	1.14	125.04	0.98	81.44	167.65	16.90
2010	50	0.08	159.75	0.91	56.69	183.50	17.54
2010	51	0.30	141.89	0.78	66.96	161.63	20.43
2010	52	0.33	128.22	0.17	79.63	143.00	25.31
2011	1	0.11	92.65	0.11	65.02	138.61	20.48
2011	2	0.02	123.96	2.88	44.27	142.17	29.63
2011	3	0.00	151.23	5.98	25.72	153.58	30.94
2011	4	0.05	113.12	16.36	11.04	119.26	43.99
2011	5	0.32	114.79	39.23	2.68	117.79	47.83
2011	6	0.43	113.47	19.73	8.51	115.99	45.21
2011	7	0.23	105.48	21.66	5.72	121.81	39.40
2011	8	1.26	97.78	29.00	9.66	108.68	45.29

SPAIN

General weather conditions have been as usual during this period. Month by month:

<u>December 2010:</u>
Temperatures were warmer than average. The effect on demand was a decrease of 3.8 %.
Water inflows in reservoirs were much higher than average (158 %).
There was almost the same specific wind production as in December 2010

<u>January 2011:</u>
Temperatures were colder than average. The effect on demand was an increase of 3.4 %.
Water inflows in reservoirs were higher than average (149 %).
There was slightly lower specific wind production than in January 2010 (decrease of 2.8 %)

<u>February 2011:</u>
Temperatures were colder than average. The effect on demand was an increase of 1.7 %.
Water inflows in reservoirs were lower than average (84 %).
There was lower specific wind production than in February 2010 (decrease of 11 %).

<u>March 2011:</u>
Temperatures were near the average. There was no remarkable effect on demand. There was higher specific wind production than in March 2010 (increase of 10.7%).
Demand values remained at the same levels as last year in general terms.
There was no significant stress level for the system adequacy.

Actual demand was slightly higher than expected for December 2010, and slightly lower than expected for January and February 2011. The winter peak demand was reached in the second half of January 2010 (44 107 MW), due to the low temperatures in that period. However, this winter peak demand was lower than the historical peak demand (44 900 MW in winter 2007).
Interconnection capacity use during the winter 2010-2011 showed some changes regarding previous winters. Major changes were in the export use (S=>F, S=>P and S=>M) whereas the import use kept its values without important variations:

- In the Spanish (S) - French (F) interconnection, the reduction of the Spanish-French spot market price differentials and some outages caused a reduction in the S=>F capacity use.

- The utilization level also decreased in the S=>P direction because the NTC values at the end of the year 2010 increased after the connection of a new 400 kV line.

- The utilization level decreased in the S=>P direction because a new 400 kV line was put into operation.

- Finally, the use of the Spanish (S) – Moroccan (M) interconnection, in the S=>M direction, rose compared with the unusual low values the previous winter.

SWEDEN

Just as during winter 2009-2010, the Swedish area prices on the Nordic electricity market during winter 2010/2011 were very high, compared to previous winters. Unavailable capacity of the nuclear power plants due to problems with efficiency upgrades and prolonged revision periods, combined with high loads due to cold weather, caused prices to rise. In addition, hydropower generation was limited by the low levels in the Swedish hydropower reservoirs during the whole winter. Even though the inflow during winter is usually low, the historically low level of the inflows to the Swedish reservoirs during December contributed to the low reservoir levels. It should also be mentioned that the extremely low reservoir levels in Norway were limiting the Norwegian hydropower generation. Thereby, the possibility of importing from Norway was limited.

The price peak of winter 2010-2011 for the Swedish area price occurred in the hour 18:00-19:00 on 14 December. The price was then 252.35 €/MWh. 14 December showed the highest average daily price of the winter period, 145.48 €/MWh.

For every winter Svenska Kraftnät purchases load that can be disconnected (load management) and generation that can be activated at short notice, called the *effect reserve*. The effect reserve was activated in the beginning and middle of December, when the loads were at their highest.

<u>Detailed Review of the Most Stressed Periods</u>

As mentioned, the prices were very high this winter due to cold weather. Many places in the south and middle of Sweden (Svealand and Götaland) experienced the coldest December documented since SMHI’s records began. However, in January the weather was milder. In many places the temperature was above average. The cold weather returned in February but the coldness was not as extreme as in December. The average temperature for winter 2010-2011 in Stockholm was -4.3 °C, compared with -2.3 °C in an average winter.

As mentioned, the Swedish hydropower reservoir levels were low during the whole winter.

During the period 13-15 December the average area price in Sweden was 131.19 €/MWh. High loads due to cold weather combined with unavailable nuclear power capacity caused the high prices. The *effect reserve* was activated for a couple of hours on 13 December.

On 21-22 December the average area price in Sweden was over 100 €/MWh. Both days were very cold and, as mentioned, Malmö in the south of Sweden experienced the lowest temperature in the area since 1958 on 22 December. The loads were high due to the severe cold. All ten nuclear reactors were in operation during the period 21-22 December.

On 21 December the transmission was very high on cross-section 2 during the peak load in the evening. The gas turbine in Karlshamn tripped and a gas turbine in Halmstad was in operation to compensate the loss. A transformer in Häradsbo was out of operation. Svenska Kraftnät asked Fingrid to increase the transmission on Fenno-Skan to reduce the north-to-south flow through Sweden and to manage the operation during 16:00-19:00. This manoeuvre made the transmission in the Swedish cross-sections OK.

The load was less than expected despite the extremely cold weather on 22 December. Nevertheless, the peak load in winter 2010-2011 occurred on this day at 17:00-18:00. The load was then 26.690 MW.

SWITZERLAND

December 2010 registered relatively low temperatures and a lot of precipitation. In January 2011, February 2011 and March 2011 there were relatively high temperatures and relatively little precipitation.

No risk was identified in the Winter Outlook Report.

Dependence on the data of the Swiss Federal Office of Energy does not allow the TSO to deliver more specific reports.

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6.2 Appendix 2: Individual Country Responses to Summer Outlook 2011

ALBANIA

AUSTRIA

BELGIUM

BOSNIA & HERZEGOVINA

BULGARIA

CROATIA

CYPRUS

CZECH REPUBLIC

DENMARK

ESTONIA

FINLAND

FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

FRANCE

GERMANY

GREAT BRITAIN

GREECE

HUNGARY

ICELAND

IRELAND

ITALY

LATVIA

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LITHUANIA

LUXEMBOURG

MONTENEGRO

NETHERLANDS

NORTHERN IRELAND

NORWAY

POLAND

PORTUGAL

REPUBLIC OF SERBIA

ROMANIA

SLOVAK REPUBLIC

SLOVENIA

SPAIN

SWEDEN

SWITZERLAND

UKRAINE-WEST

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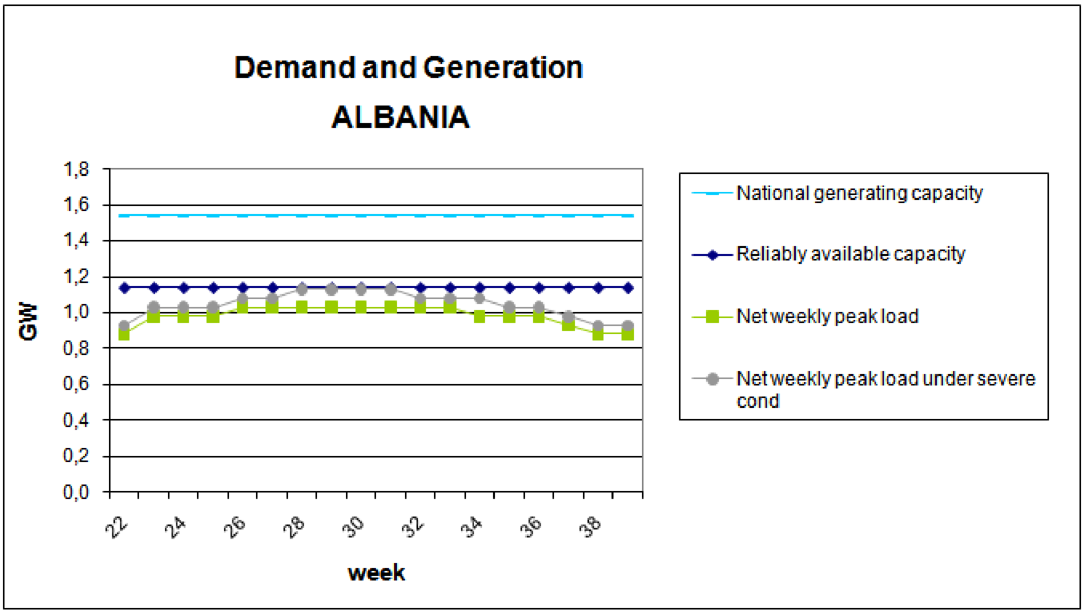
ALBANIA


Demand and Generation
ALBANIA
GW
1,8
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
22
24
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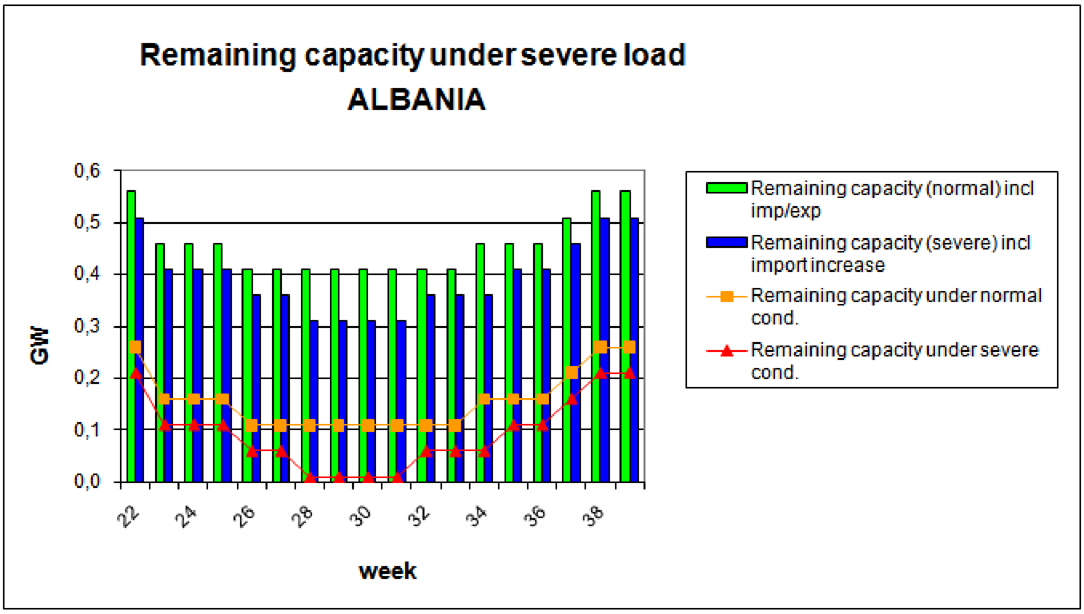
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
ALBANIA
GW
0,6
0,5
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0,1
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22
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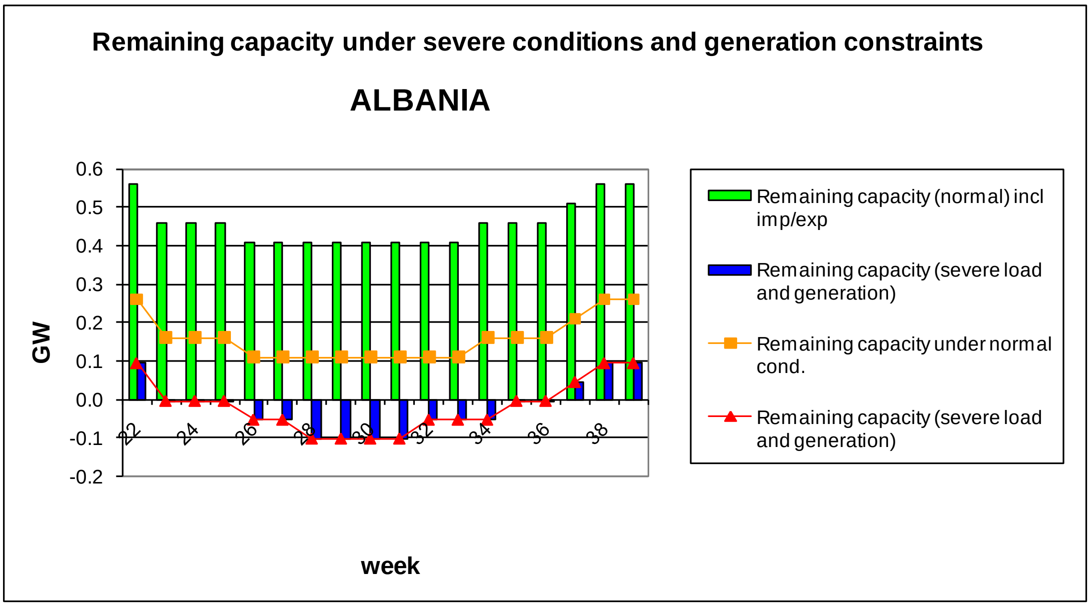
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



The Albanian power system, due to a significant share of hydro power plants, mainly depends on hydrological circumstances of the region. The differences between the production of hydro power plants in extremely dry or extremely wet periods, fluctuate for approximately 30 % of the average production with HPP.
For the upcoming summer period, it is considered that the adequacy and security of the Albanian power system is not threatened in normal weather conditions, considering the planned availability of production and transmission facilities, the available importable capacity of interconnections, and strengthening of northern interconnections with new 400 kV interconnection line with Montenegro that will be put into operation at the end of April 2011. It is expected that the new tie-line will have a positive effect on the facilitation of energy exchanges in the region.
We do not anticipate any balance problem in the Albanian power system during the upcoming summer period, even in potentially severe conditions. The most critical period remains July and August. The monthly peak load is calculated both for normal and severe conditions. The severe load scenario is built considering a temperature higher by 5° C than the season normal temperature. A statistical approach is followed based on recorded hourly load and temperature data covering the period of the last 10 years. The dependency of the load on the temperature, for the winter period, averages 10 MW/°C.
No addition of new generation capacity is expected for the coming summer.

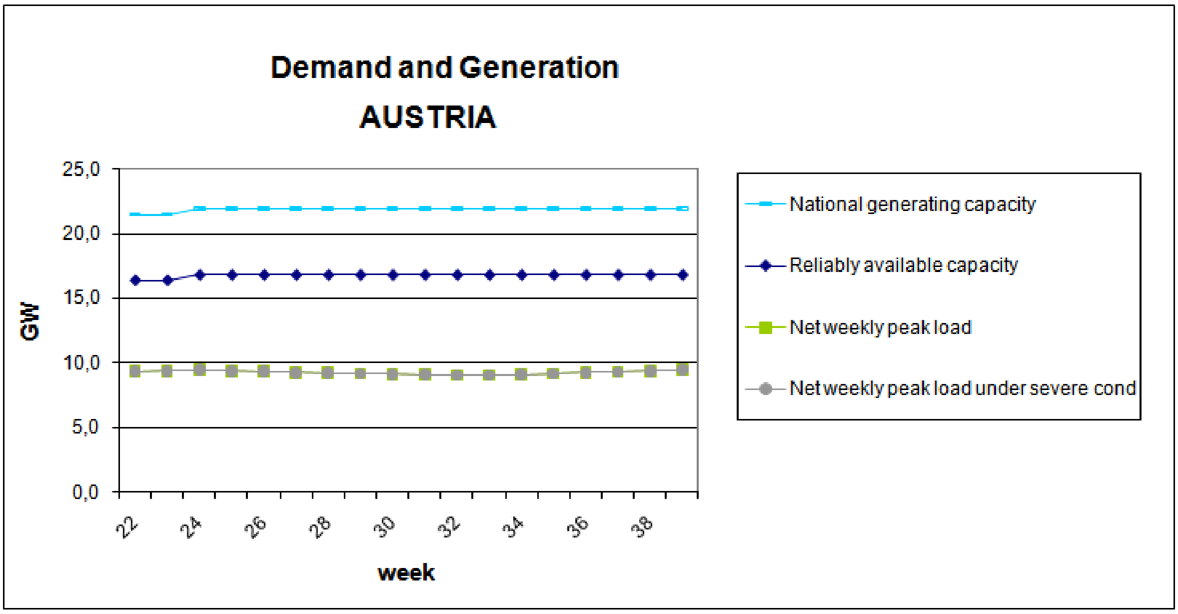
The level of remaining capacity considered necessary in order to ensure a secure operation for the next summer is 120 MW (equal to the power of the biggest unit). In this assessment, the thermal power of 90 MW is put at non-usable capacity due to information from generation company KESH-Gen, which intends to use it only in case of a very dry period.

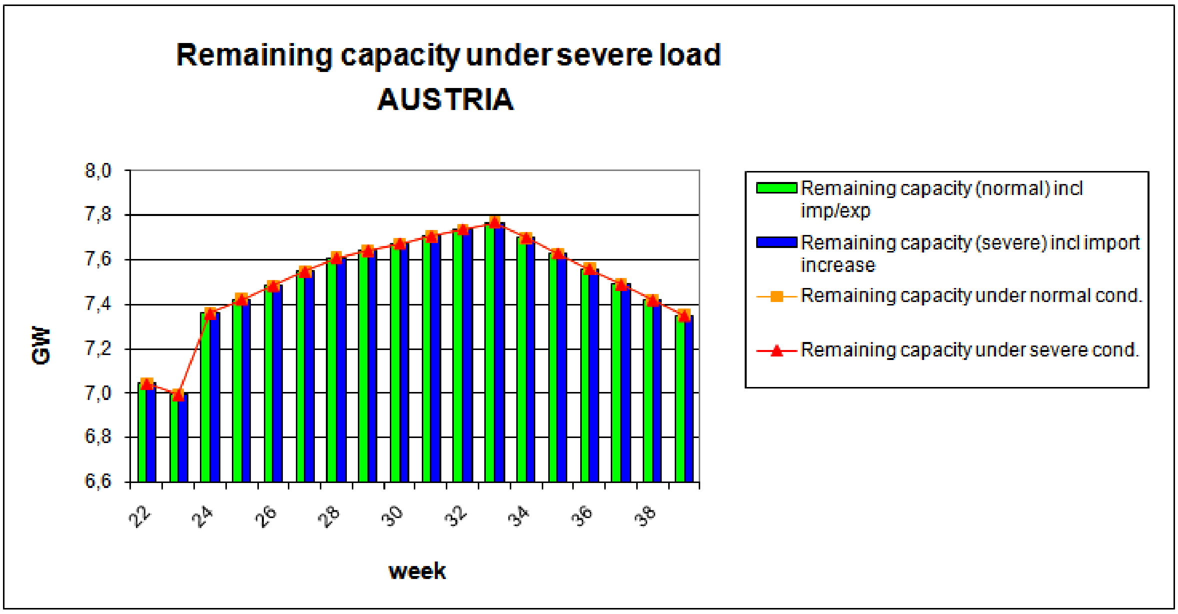
The maintenance schedule of the generating units and transmission lines is set to the minimum. Most of the maintenance on these elements is planned to be done during the spring and autumn
Import contracts till the end of September are concluded already by DSO (300 MW) and by qualified suppliers also.
In case of severe conditions, additional import quantities will be procured using the available import capacity of the interconnections.
Available cross-border capacity allows compensation of eventual energy deficit and transit of energy for successful functioning of the electricity market.
Generally, load reduction is available upon the decision of the Ministry of Energy and the Regulatory Authority for Energy.
Under these conditions all criteria for the system adequacy will be met.

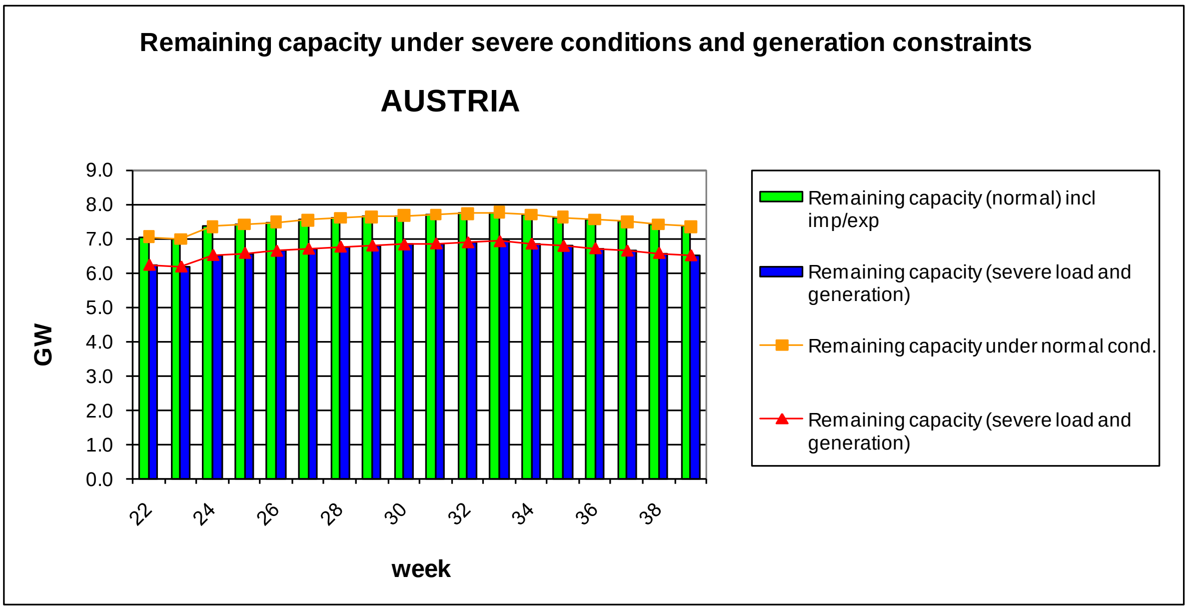
Considering the significant share of hydro power plants in Albania, a reduction of the planned reliably available generation capacity would be at maximum 10% in case of a very dry period.

AUSTRIA

For the coming summer period an increase of load compared to the previous year is expected as the economic situation seems to change for the better. Due to the shutdown of nuclear power plants in Germany, higher generation of Austrian thermal power plants is expected for this summer.





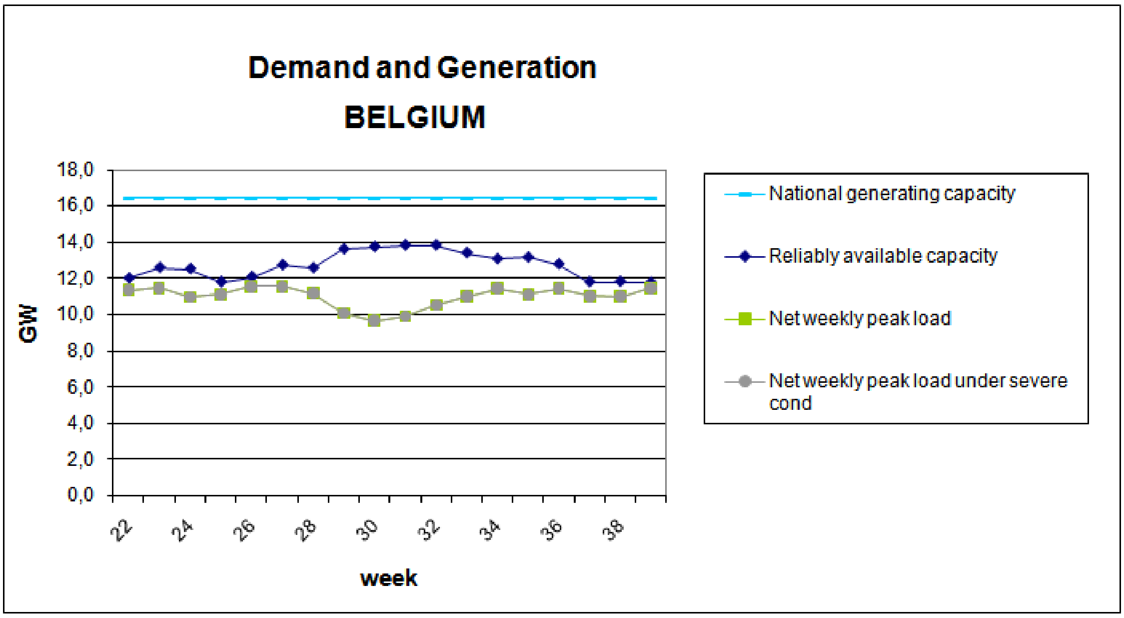


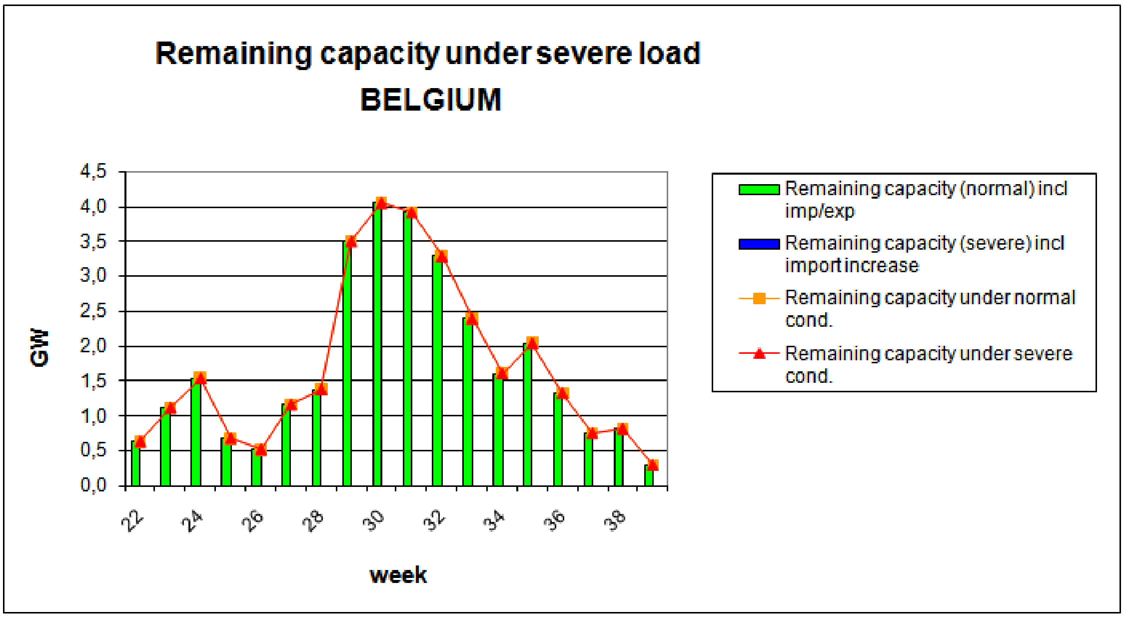
Congestions

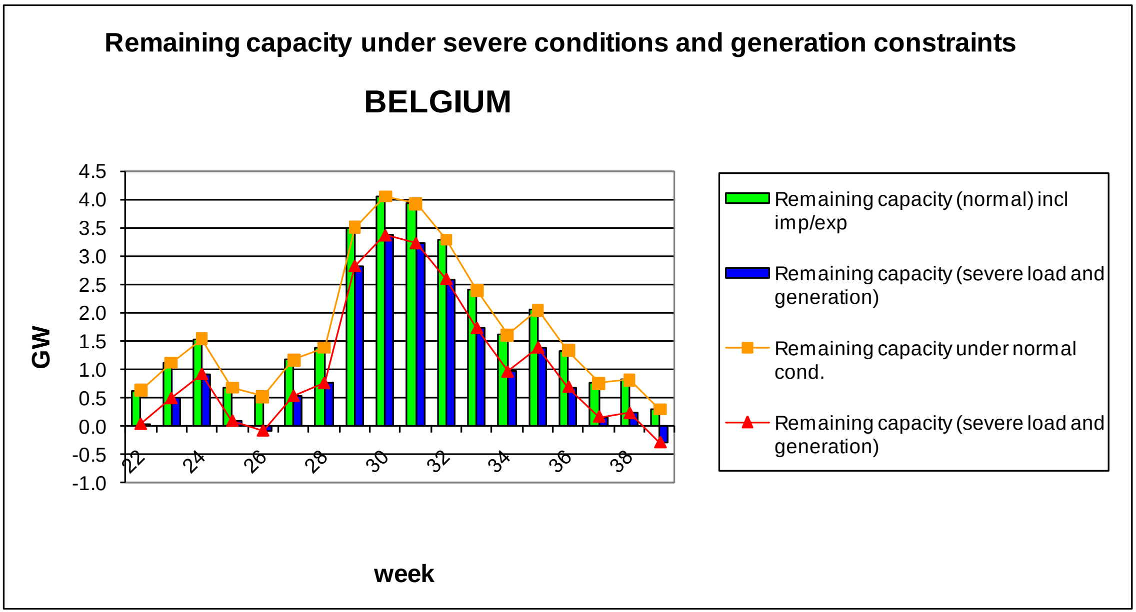
Due to the shutdown of nuclear power plants, higher exports to Germany are expected this summer. As a consequence, an increase of load flows on the lines from St. Peter (AT) to Germany is expected.

With the commissioning of new lines, the congestions on the 220 kV north south lines – except the Salzburg – Tauern line – are now released in a sustainable way. To solve the congestion on this line, APG plans to erect a 380 kV line between Salzburg and Tauern (Salzburgleitung II).

BELGIUM


Demand and Generation
BELGIUM
GW
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
BELGIUM
GW
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



The adequacy forecast study for summer 2011 is carried out for the Elia control area, which comprises Belgium (the generation embedded in distribution is netted from the observed load) and the SOTEL area (a part of the G-D of Luxembourg). The desired safety level in standard conditions for the generation-load balance is reached during the whole summer period, for the peaks of weeks 22 to 39 of 2011. Nevertheless, the weather conditions of summer 2006 revealed that a long period of dry and hot weather can reduce significantly the available generation capacity. If these circumstances occur, the safety level might be affected.

The lowest remaining capacity level in normal conditions is foreseen for the peak of week 39 of 2011, namely a remaining capacity of 285 MW. This assessment takes into account the actual announced overhaul and an estimation of the average outage schedules of the generator units connected to the Elia grid known by the TSO at the time of the assessment, namely end March 2011. If an additional variation of 5 % of the net generation capacity is taken into account to cope with severe variations of load and generation, net imports may be needed in weeks 22, 25, 26 and 37 to 39 of 2011. No reduction of the installed generation capacity was taken into account for the upcoming nuclear stress tests, since their impact, duration and timing are not yet known.

In case of extreme weather conditions, Elia has the option to reschedule planned outages of the 380 kV international lines. In case of shortage of reserves, Elia can also activate international emergency reserve contracts with TenneT and RTE and load-shedding contracts with industrial customers.

The daily peak load values of the Elia control area are foreseen to increase by 0 % compared to the peak load values measured in 2010.

The average simultaneous import capacity for the coming summer is approximately 3080 MW, whereas the average simultaneous export capacity is approximately 2180 MW.
The first analysis of the system adequacy for the coming summer 2011 is positive.
The main risk factors for the Elia grid that may jeopardize the current positive summer adequacy assessment are (1) a long period of dry and hot weather, which would reduce the flow of cooling water from the rivers and therefore the available generation capacity and (2) a generation-demand imbalance for the whole of ENTSO-E North Sea and Continental Centre South Region.

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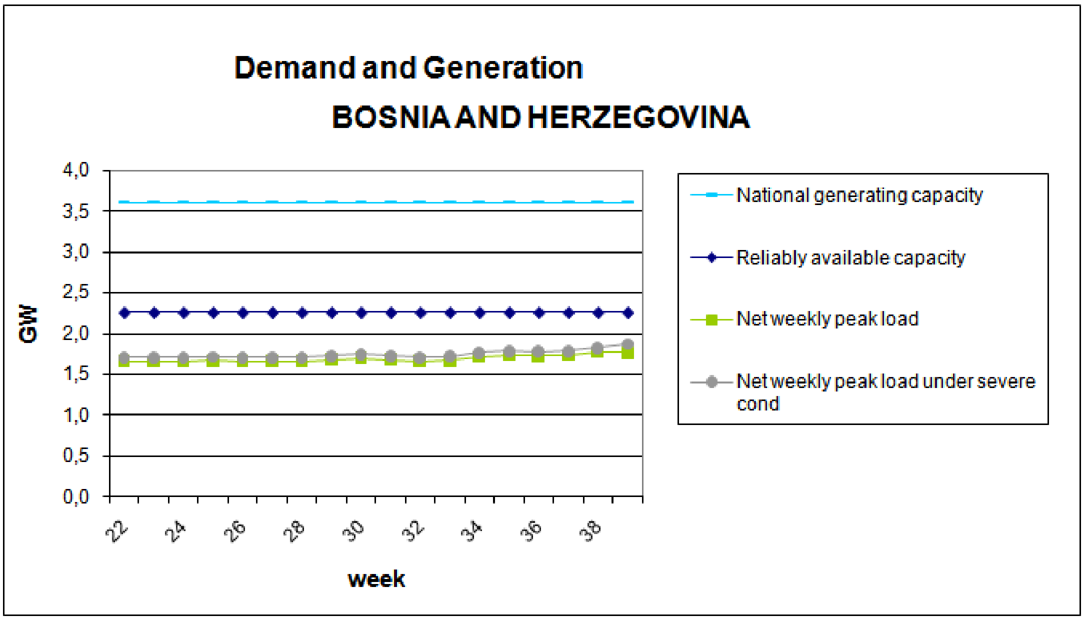
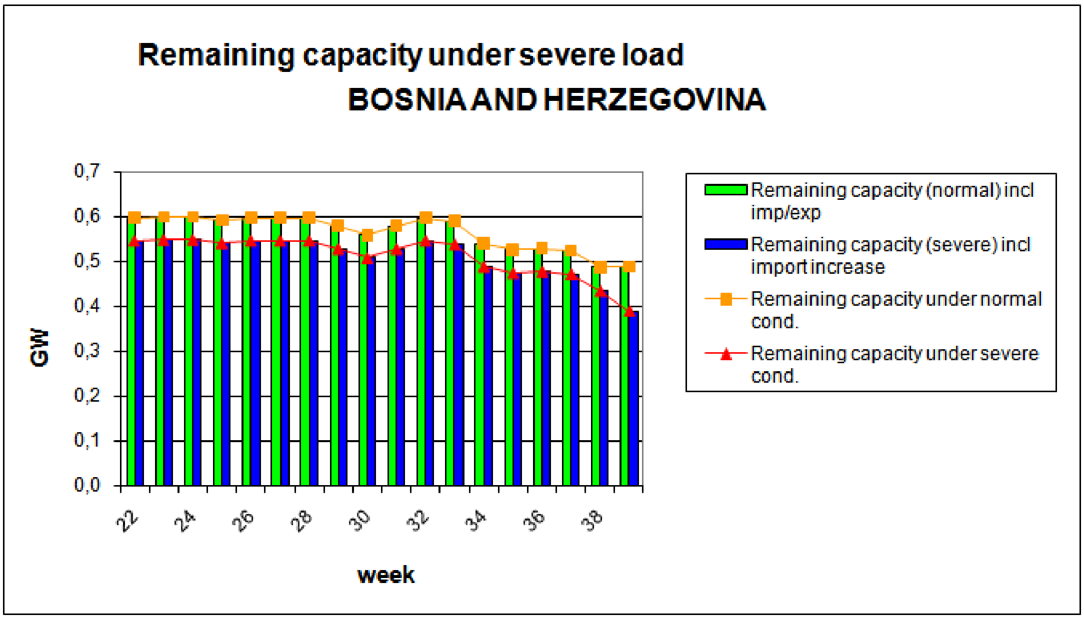
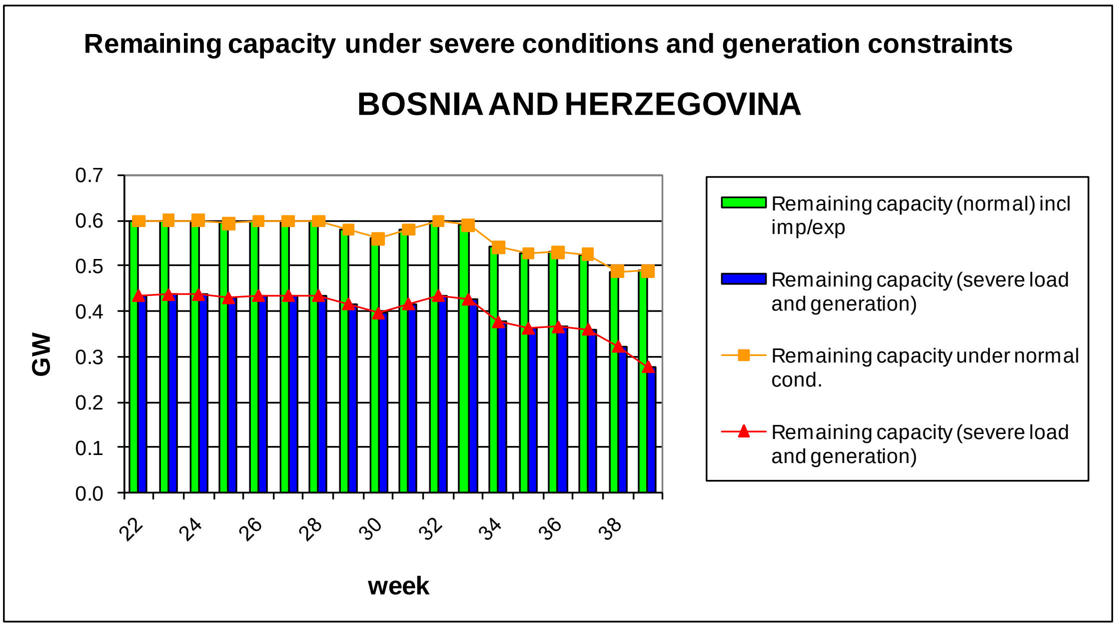
BOSNIA-HERZEGOVINA

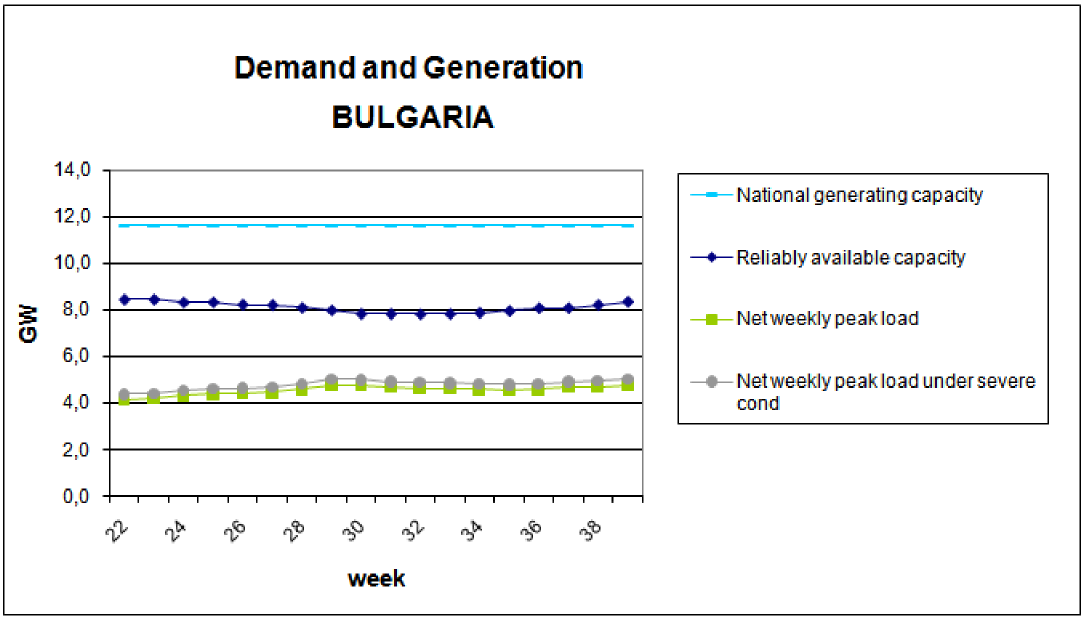


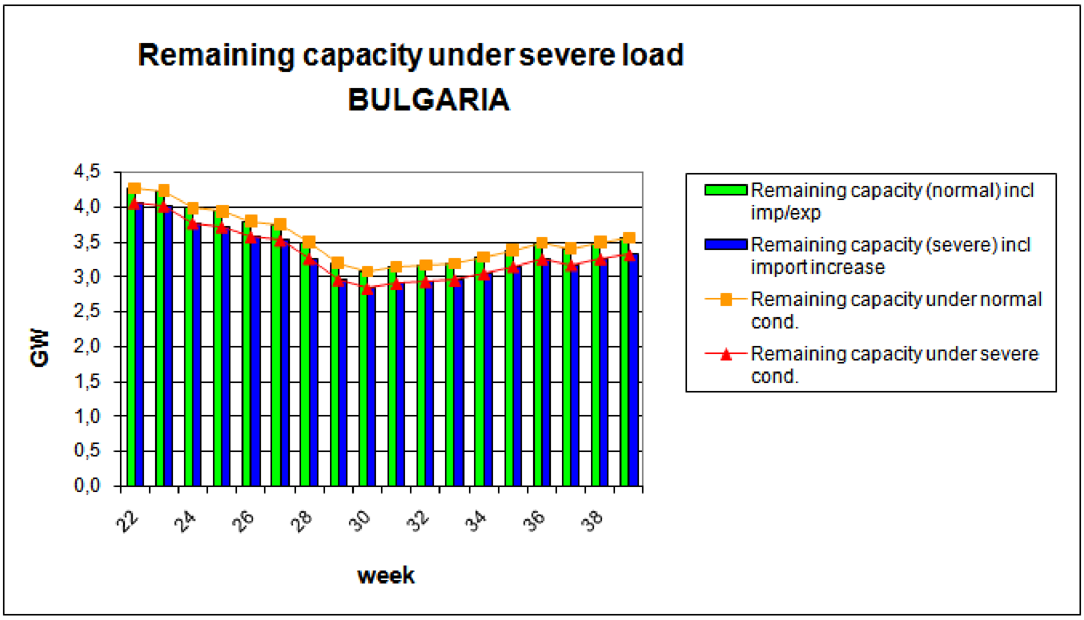


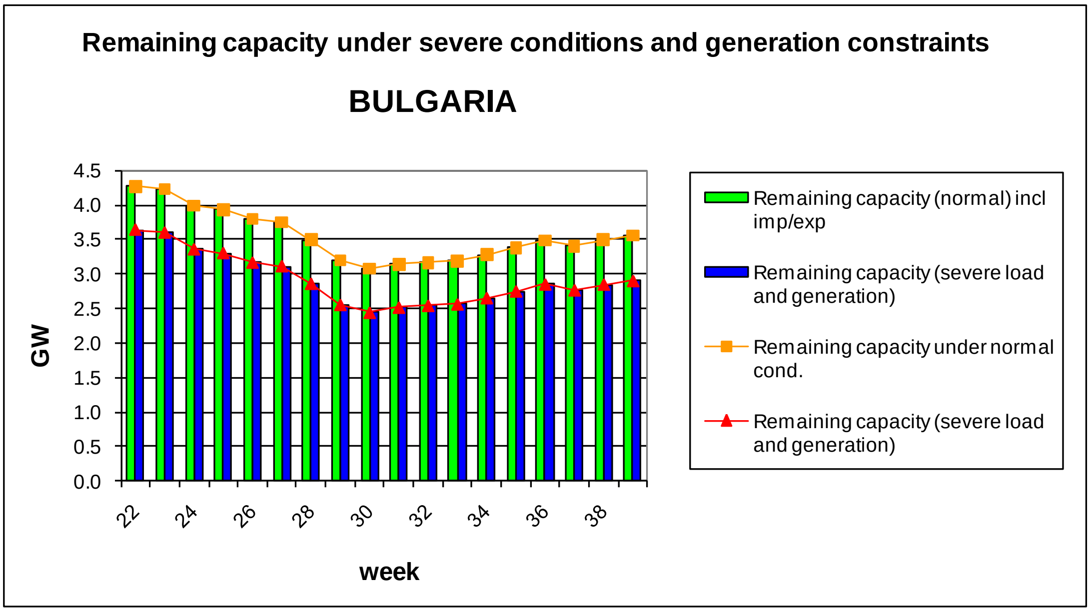


In the Bosnia and Herzegovina power system we do not expect any problems regarding the system adequacy for summer 2011.
There is no planned maintenance of thermal power plants in this period and the power balance is expected to be positive. Maximum predicted peak load is 1771 MW, for September 2011.

BULGARIA

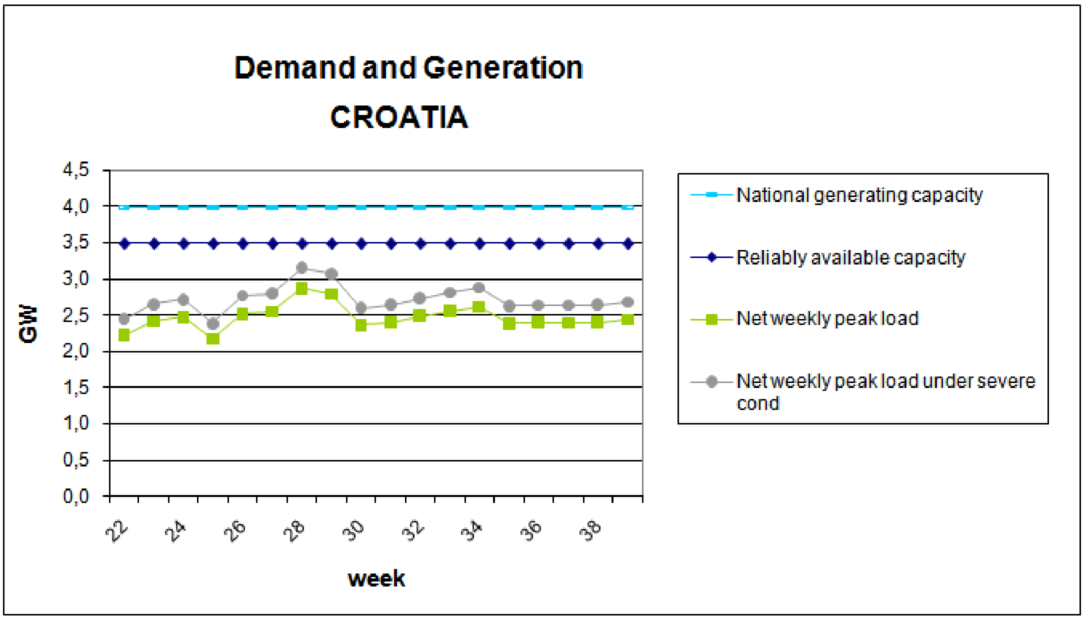

Demand and Generation
BULGARIA
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
GW
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

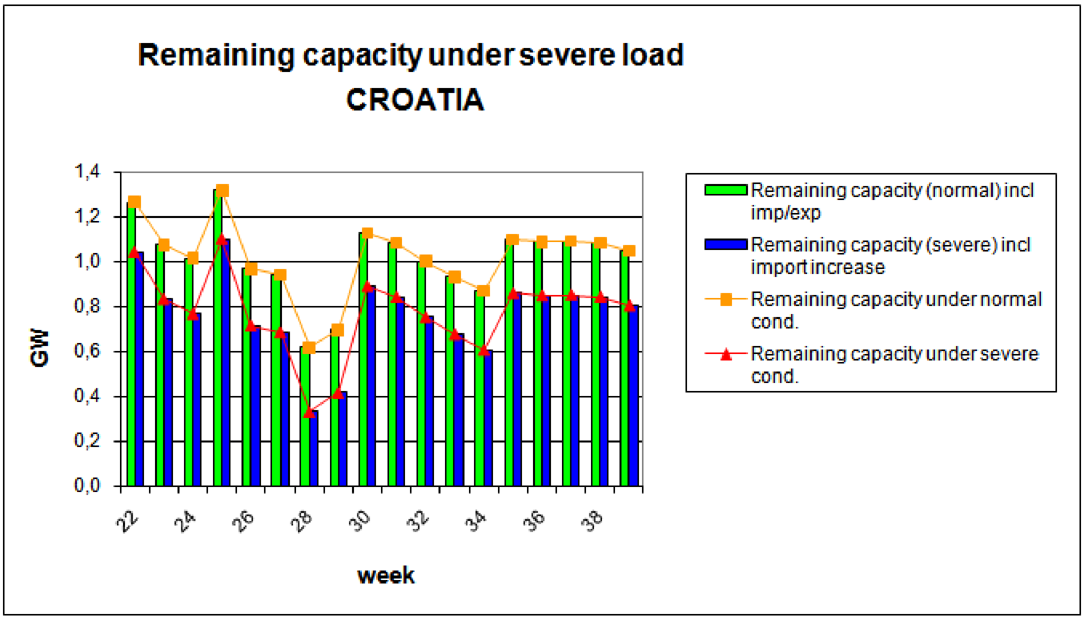

Remaining capacity under severe load
BULGARIA
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
GW
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

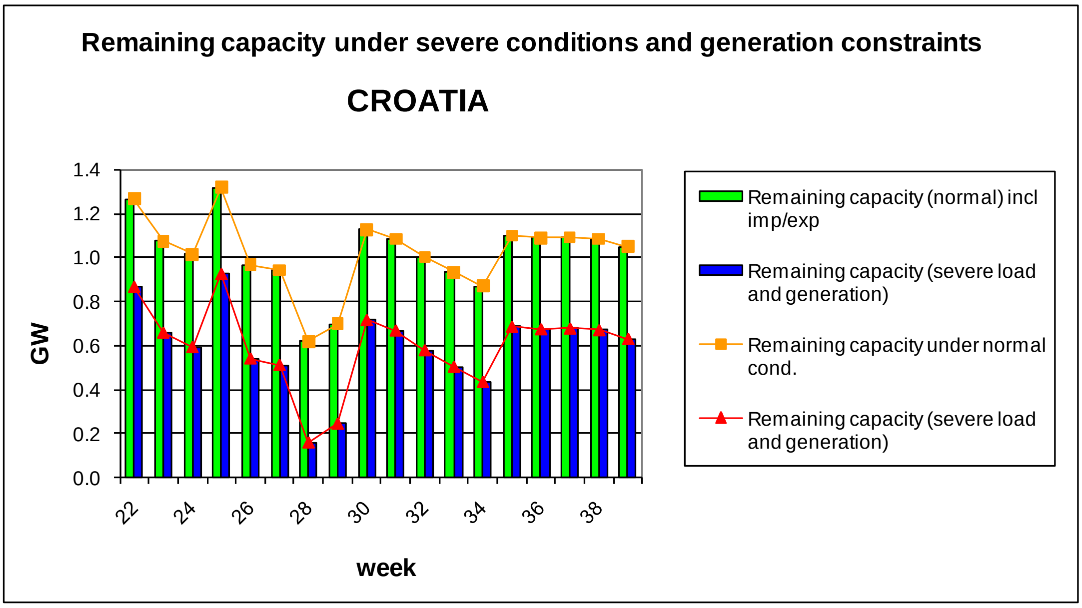


No problems concerning generation adequacy in the summer period are expected. There is a slight possibility of rolling blackouts in the eastern coastal area in case of severe heat waves. The reason for this is the insufficient transmission capacity in the region and the extremely high electricity demand of the seaside resorts which accommodate more than half a million tourists during the peak summer season. This part of the network is currently undergoing rehabilitation and we expect that the problem will be solved by the beginning of the summer.

CROATIA

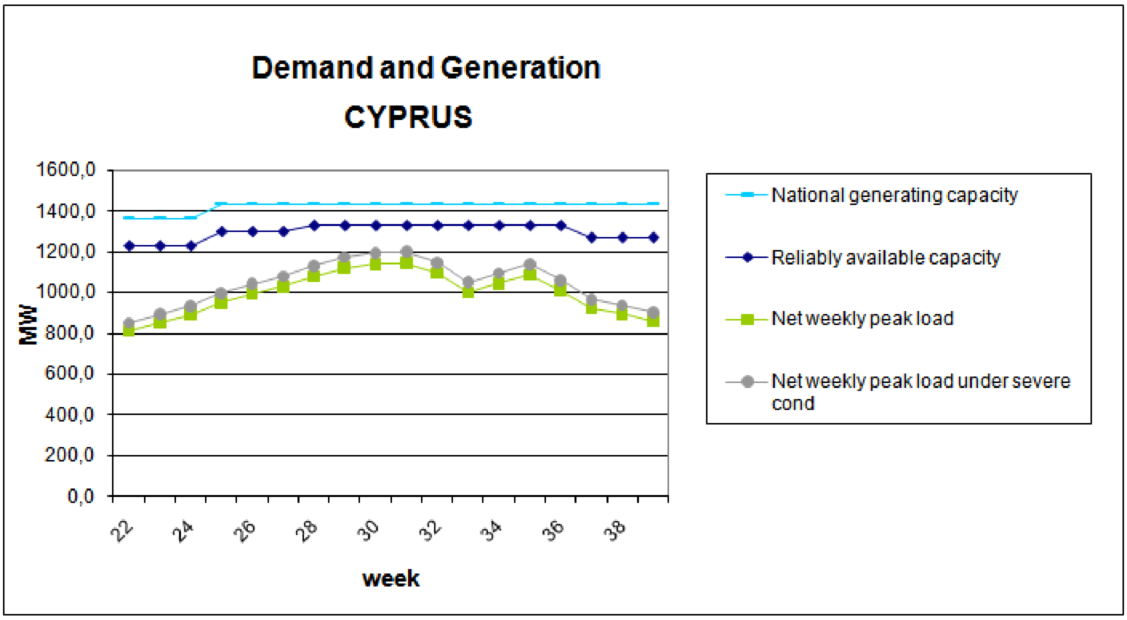


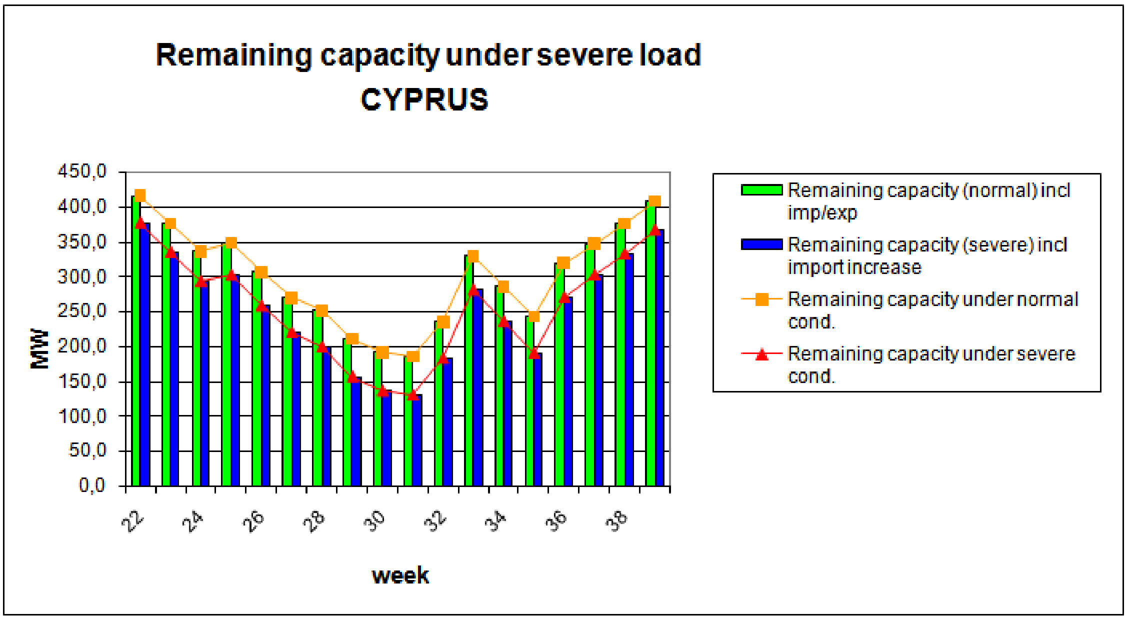


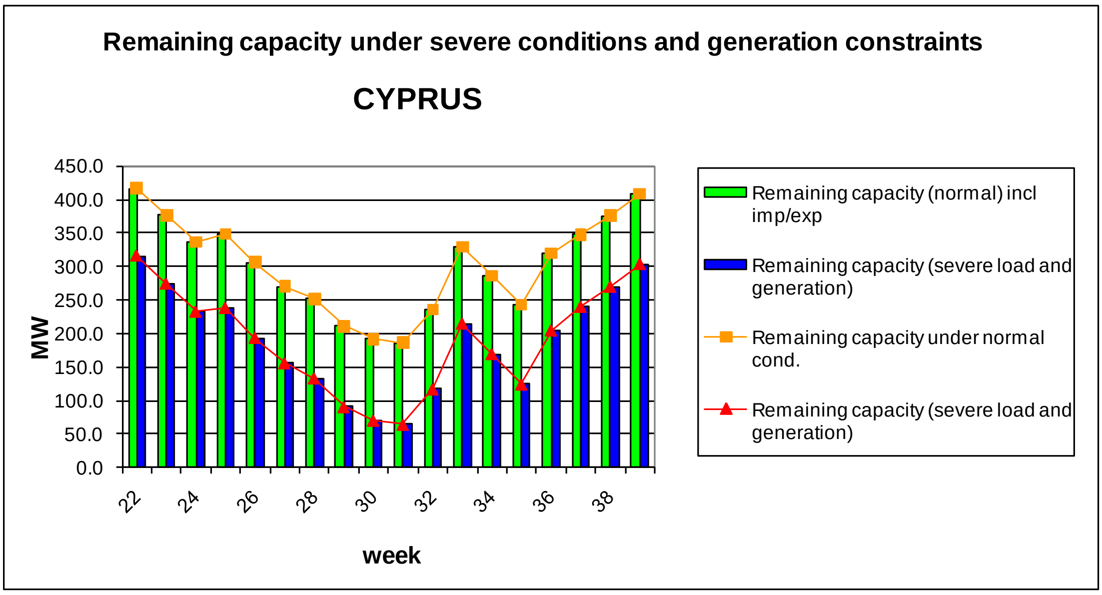


HEP-OPS does not expect any significant problems on the Croatian power system during summer 2011.
If needed, HEP-OPS can ask neighbouring TSOs for emergency help.
HEP-OPS expects increased consumption during periods of hotter weather, but available generating capacities and cross-border connections should be sufficient to meet demand.
The Croatian power system is dependent upon imports of electricity from neighbouring countries. The imports are realized by the interconnections with Bosnia and Herzegovina, Hungary and Serbia. The capacities of the tie-lines are enough to meet the demand of the Croatian system and also to to perform planned transits. Besides of the higher consumption, the main reasons for electricity imports are hydro accumulations savings and market conditions in the region.

Cyprus


Demand and Generation
CYPRUS
1600,0
1400,0
1200,0
1000,0
800,0
600,0
400,0
200,0
0,0
MW
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
CYPRUS
450,0
400,0
350,0
300,0
250,0
200,0
150,0
100,0
50,0
0,0
MW
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



At Moni Power Station only 3 thermal units will be available during the summer period, thus reducing the National Generating Capacity by 90 MW.

It is expected to have a 72.5 MW gas turbine, which is part of Unit 5 at the Combined Cycle in Vasilikos Power Station, in operation by the beginning of July. If the commissioning of the new 72.5 MW gas turbine does not meet the above deadline, then, in the event of a loss of the largest generator of the system (130 MW), the available capacity will be less than the peak load prediction for severe weather conditions.

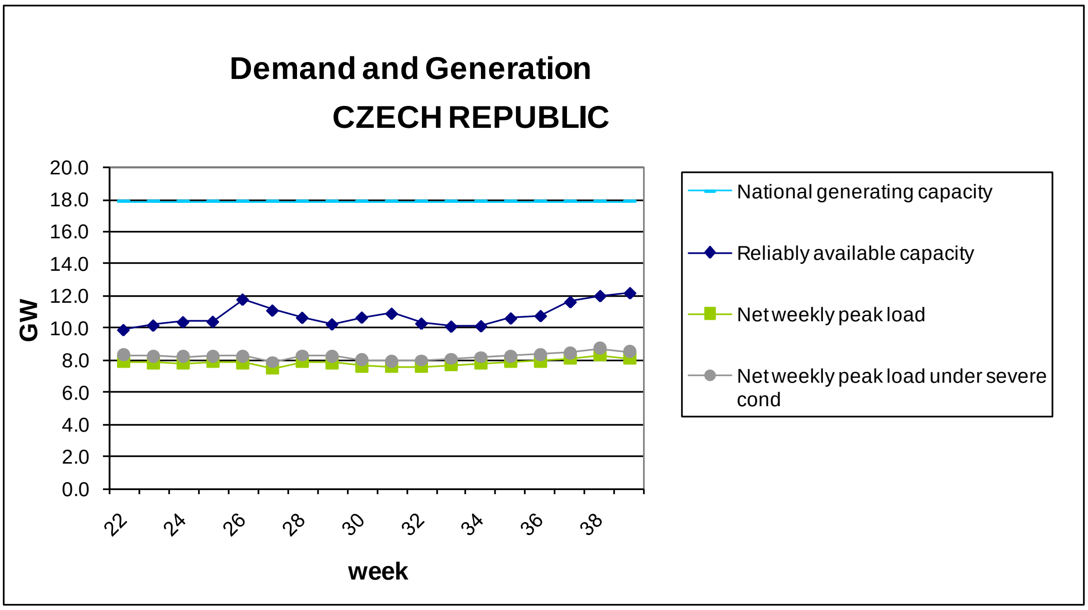
Mechanism 1: TSO Cyprus will take all necessary action to ensure that the Generator will have the 72.5 MW gas turbine available for generation on time at the beginning of July.

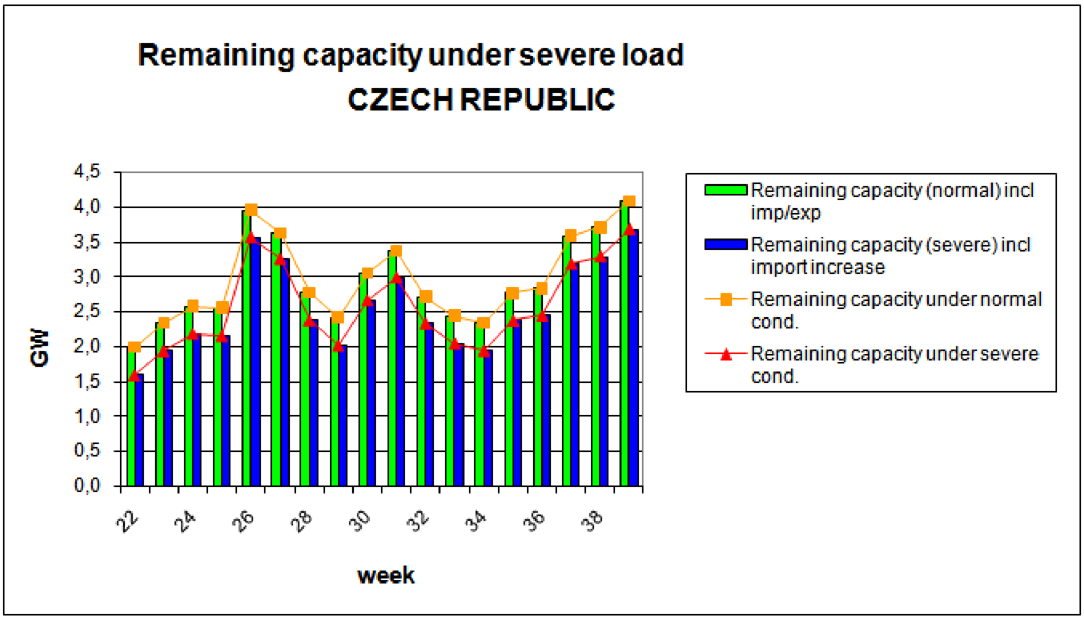
Mechanism 2: An action plan for a load rejection roster in case of emergency is applicable during the summer period.

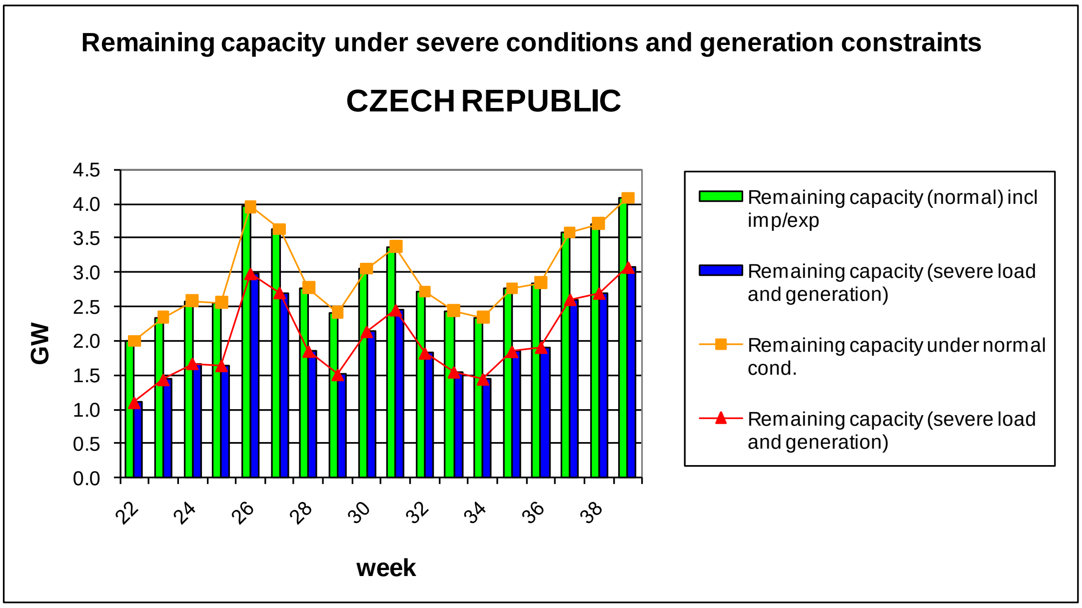
Mechanism 3: An under-frequency load-shedding scheme is in full operation so as to avoid any imbalance occurring in the system.

If the above mechanisms are applied, there is no high risk period for the summer of 2011. The Cyprus Transmission System does not depend upon imports, as it is an isolated system.

CZECH REPUBLIC



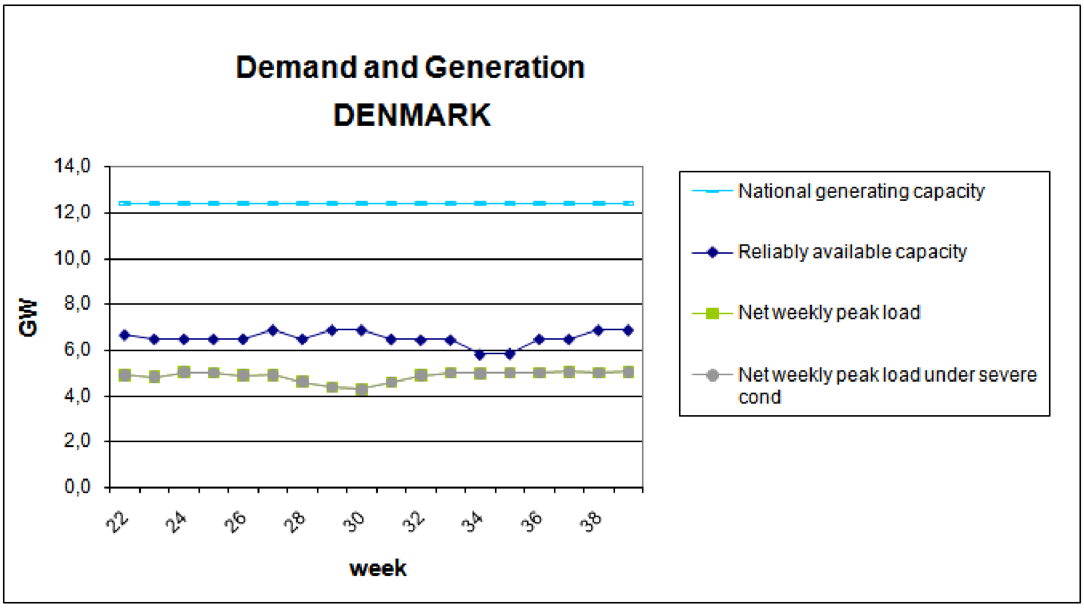


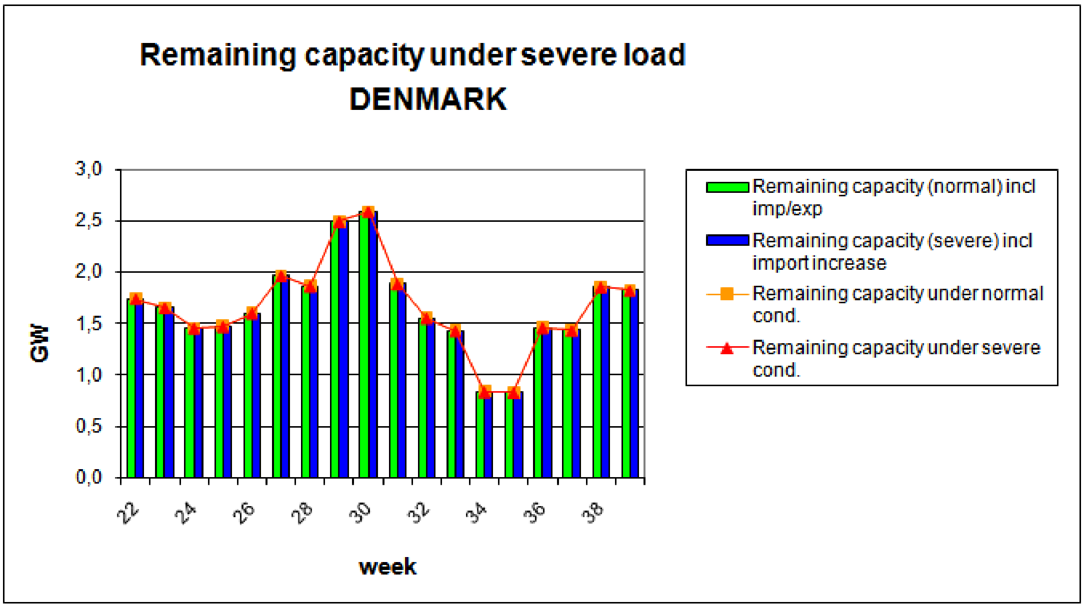


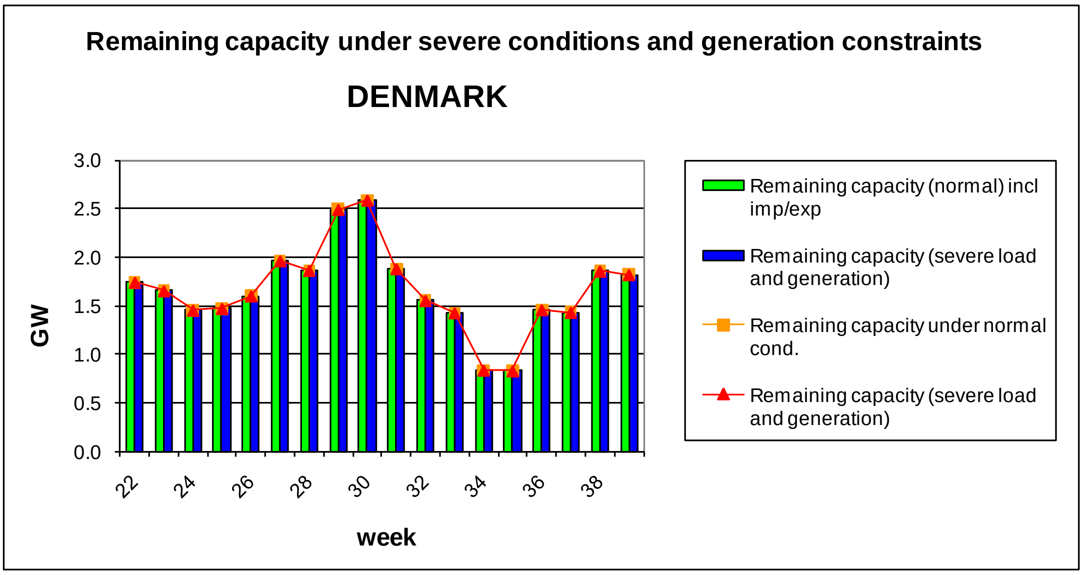
Due to the vast annual increase of installed capacity in renewable energy sources (RES), we expect slight problems regarding the balance between consumption and production caused by characteristic production of RES, especially photovoltaic generation. The mechanism put in place to avoid imbalances between consumption and production is to increase ancillary services.

The above-mentioned problems have no specific time-frame since they are caused by prediction errors which can occur during a whole day period. The most affected weeks are those with the longest sunshine duration. Our country balance does not rely on imports but exports. We do not expect any problems concerning imports or exports.

DENMARK





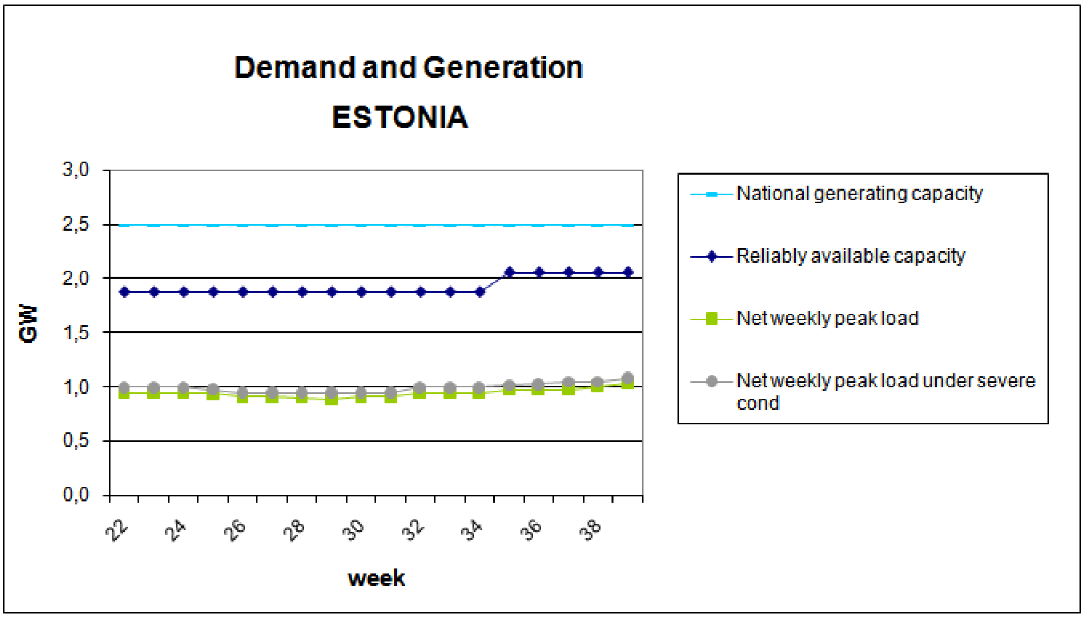


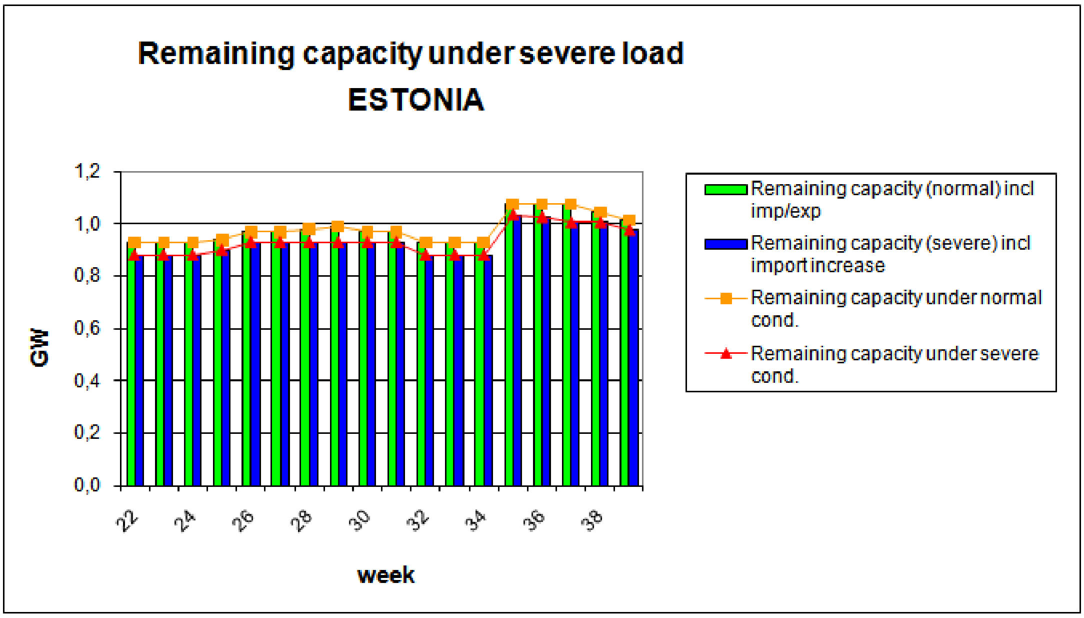
The summer is expected to be a normal summer, although a lot of inspection and maintenance is scheduled, especially on the 400 kV lines, which will cause constraints on the interconnection lines. One particular overhaul will be given a lot of attention: in May both 400 kV connections on the Danish-German border will be disconnected. Regarding the system reliability, this will cause constraints on all the Danish interconnection lines, and production by some central power plants will be reduced.

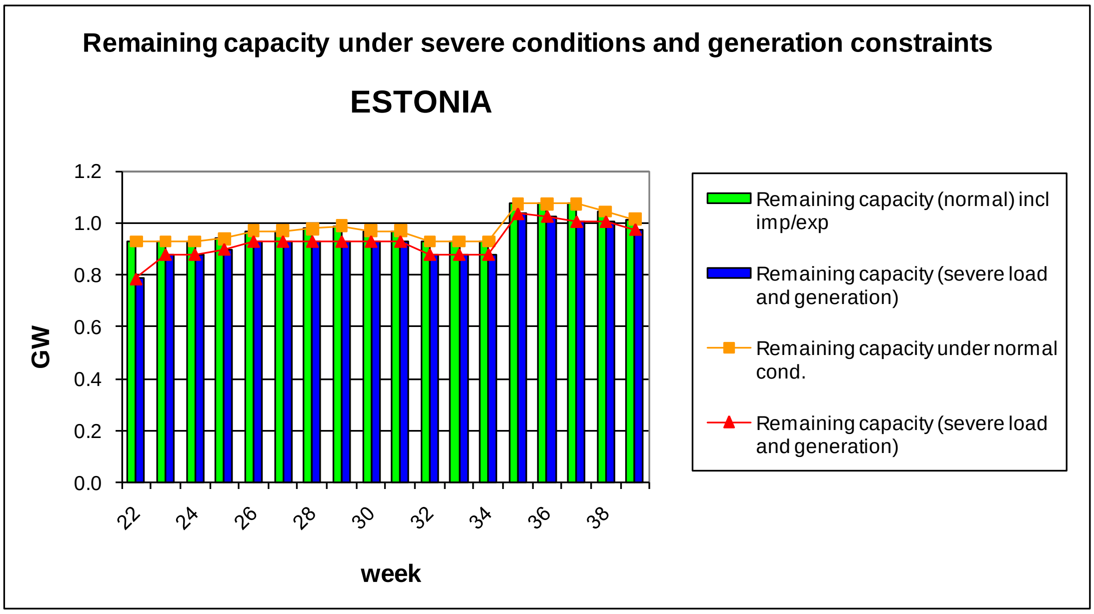
We do not expect any problems with the power balance during the summer, even though there are a number of overhauls for some of the power plants.

The most critical week, in both normal and severe conditions, will be week 35, with a remaining capacity of 830 MW. However, these numbers are calculated by ignoring all possible wind power and import possibilities. Taking this into consideration, no special actions are planned or required for these weeks.

ESTONIA


Demand and Generation
ESTONIA
GW
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
ESTONIA
GW
1,2
1,0
0,8
0,6
0,4
0,2
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

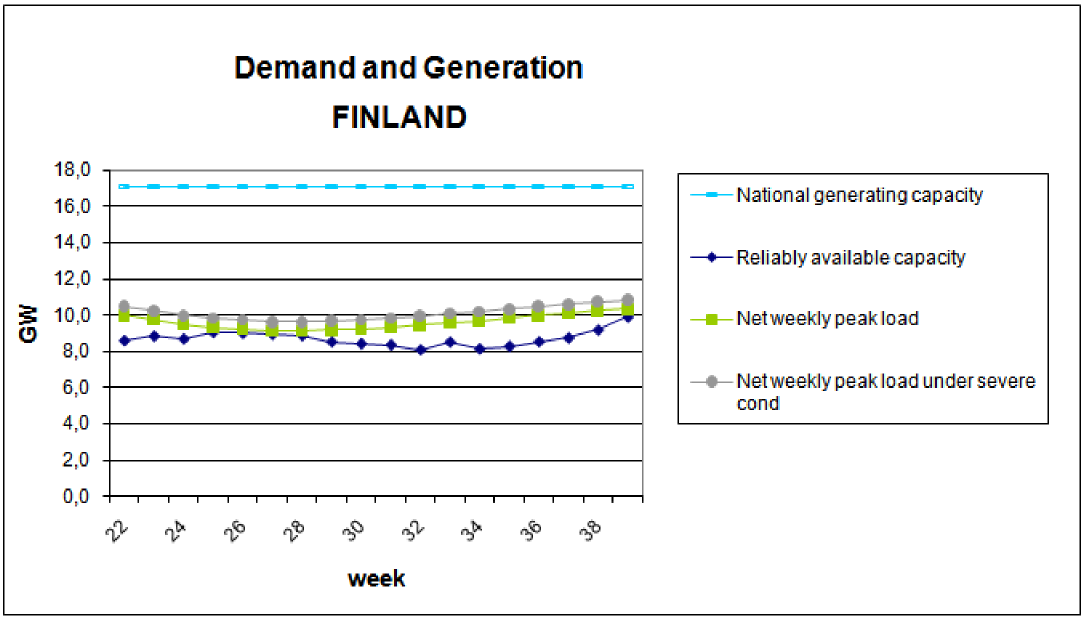


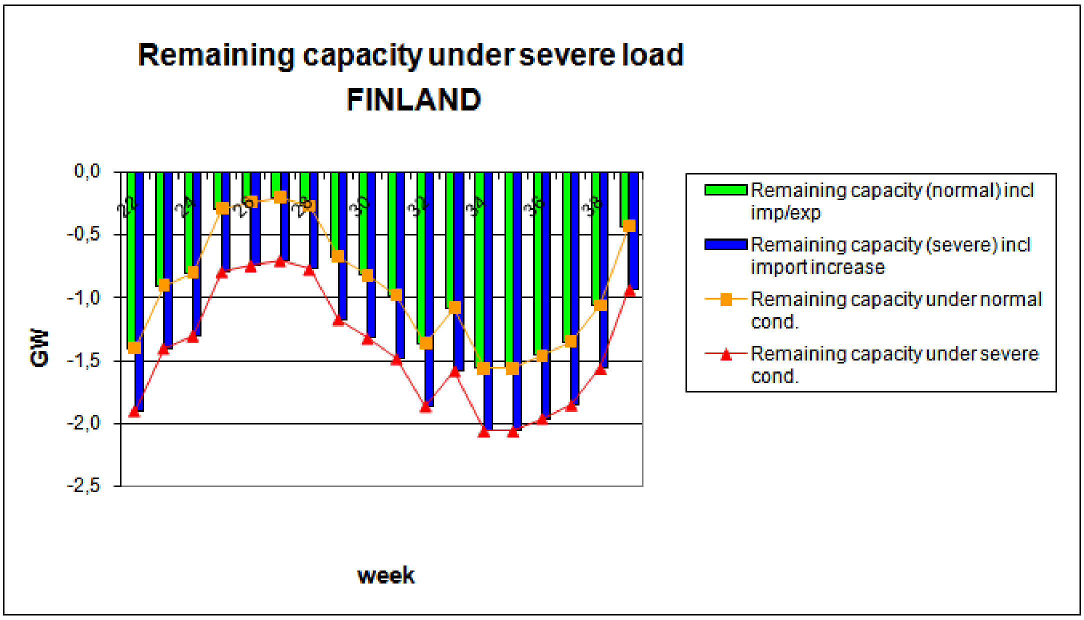
The estimation of electricity demand and supply balance for the Estonian power system does not consider probable extraordinary events. We are expecting some transmission capacity restrictions between Estonia-Latvia and Estonia-Finland due to maintenance on the 330 kV network in the Estonian system and in neighbouring systems.

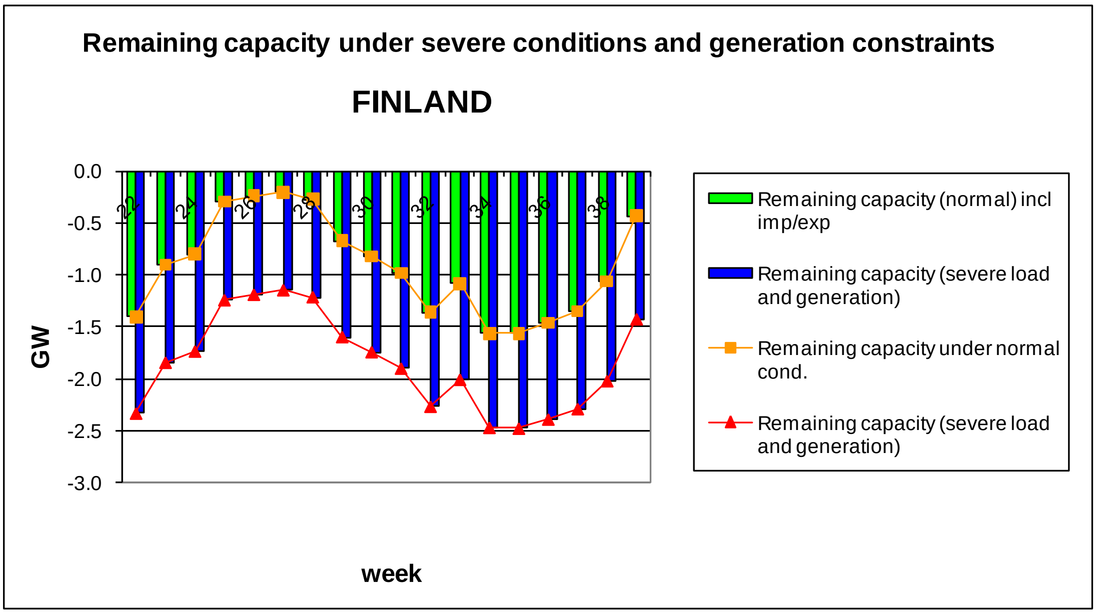
To handle inadequate generation/demand balances, Elering has agreements with local power stations and neighbouring system operators for manual regulation. 20 % of the transmission capacity between Estonia and Latvia is allocated through weekly explicit auctions. The rest of the transmission capacity between Estonia and Latvia, and all the capacity between Estonia and Finland, is allocated on the Elspot market.

No periods with high risk are expected. Estonia will most likely be an exporting country in the summer of 2011.

FINLAND


Demand and Generation
FINLAND
GW
18,0
16,0
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
FINLAND
GW
0,0
-0,5
-1,0
-1,5
-2,0
-2,5
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



Summer is not forecast as a critical period for the Finnish power system. The typical peak load in summer is 60 to 70 % of the corresponding winter peak. On the other hand, combined power and heat power plants (CHP), especially for district heating but also for industry, produce remarkably less electricity than in winter. Furthermore, overhauls of thermal generation units are scheduled for the summer period.

The remaining capacity is negative through all the summer during high demand hours. The deficit is met with imports from neighbouring systems.

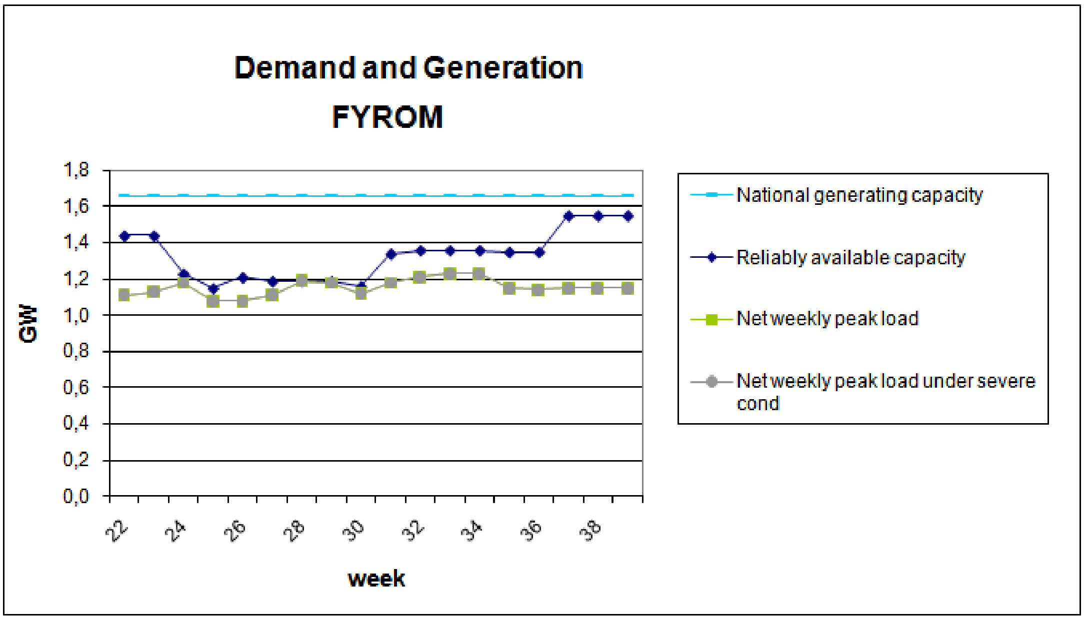
Interconnections with Sweden and Estonia will export or import electricity depending on markets. Imports from Russia are expected to continue during the summer season, with the amount defined by the prices. Total import capacity is sufficient to meet the needs. Maintenance periods will result in capacity limitations in interconnections with Estonia, Sweden and Russia. The limitations will not risk the system adequacy.

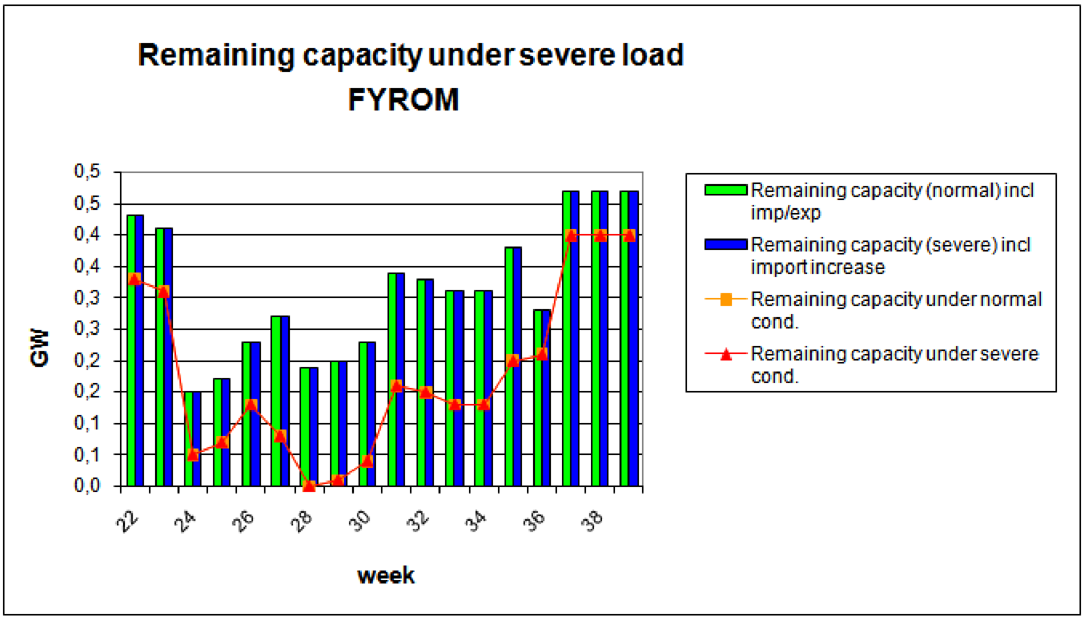
As a consequence of the nuclear accident in Japan, Finland’s Radiation and Nuclear Safety Authority (STUK) is to prepare a report on how nuclear power plants in the country are prepared for the effects of floods and other extreme natural phenomena.

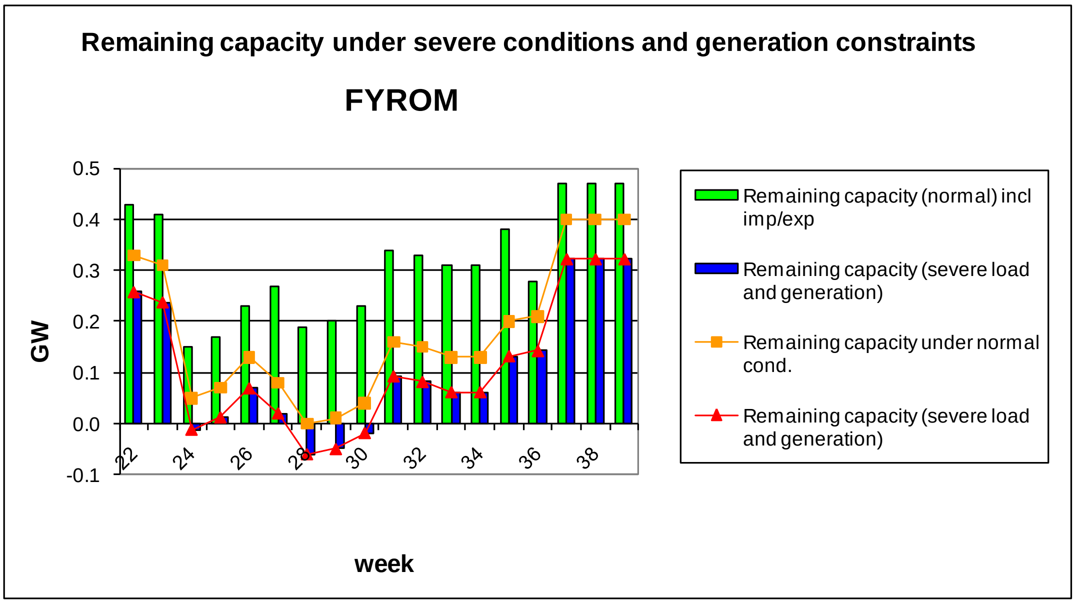
The report will pay particular attention to how the external and internal power supply of nuclear power plants is provided for if incidents or accidents occur, and how the continuity of power supply to the systems is secured in case no external power sources are available.

It is believed that the case will have no impact on the operation of nuclear power in Finland during the coming summer.

Former Yugoslav Republic of Macedonia (FYROM)







The operation of the power system is expected to be secure and reliable over all the summer period.

Until this year, the Macedonian electricity system has mainly depended on imports of energy to reach an adequate balance between consumption and production/import. A new gas power plant –TE-TO (250 MW) - was put into operation in 2010, but it is still in the test period.
The data for imports for 2011 are given in the tables. (These contracts are between eligible customers and traders).

From the point of view of system adequacy, the generation-load balance will not be at risk during summer 2011 in the Macedonian system

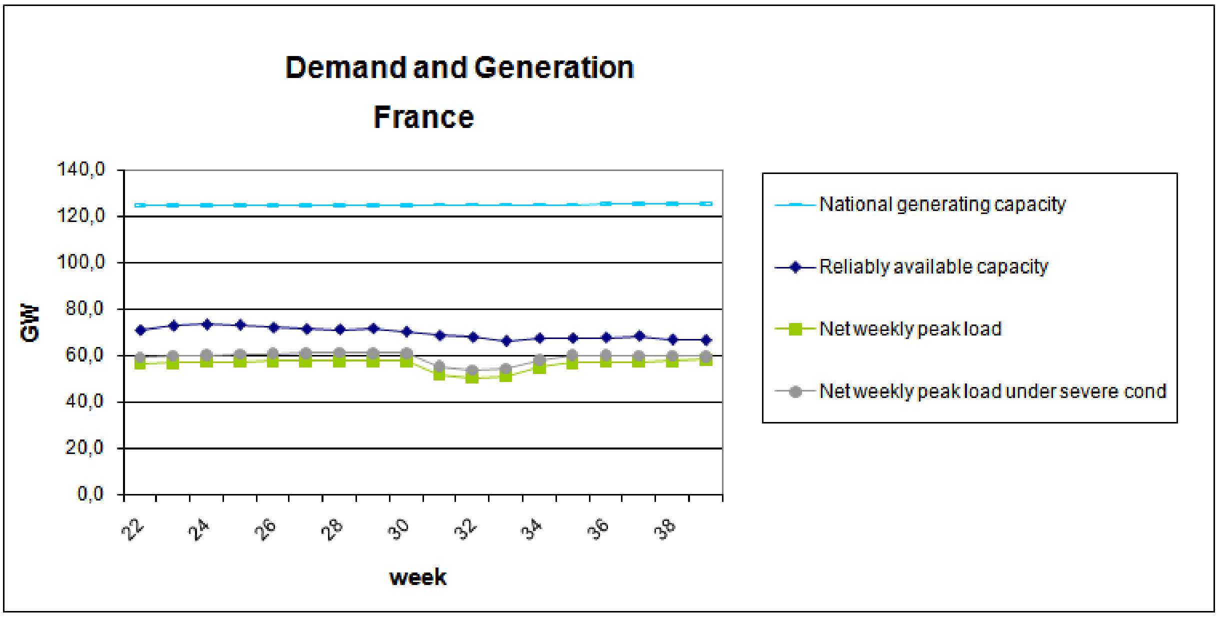
The Macedonian transmission network has well-developed interconnections with neighbours: two 400 kV tie-lines with Greece and one 400 kV tie-line to Serbia. The new 400 kV interconnection to Bulgaria was commissioned at the end of 2008. So, the operation of the power system is now more secure than before and the transit through Macedonia increased; consequently, the security and reliability of the whole SEE region has increased.

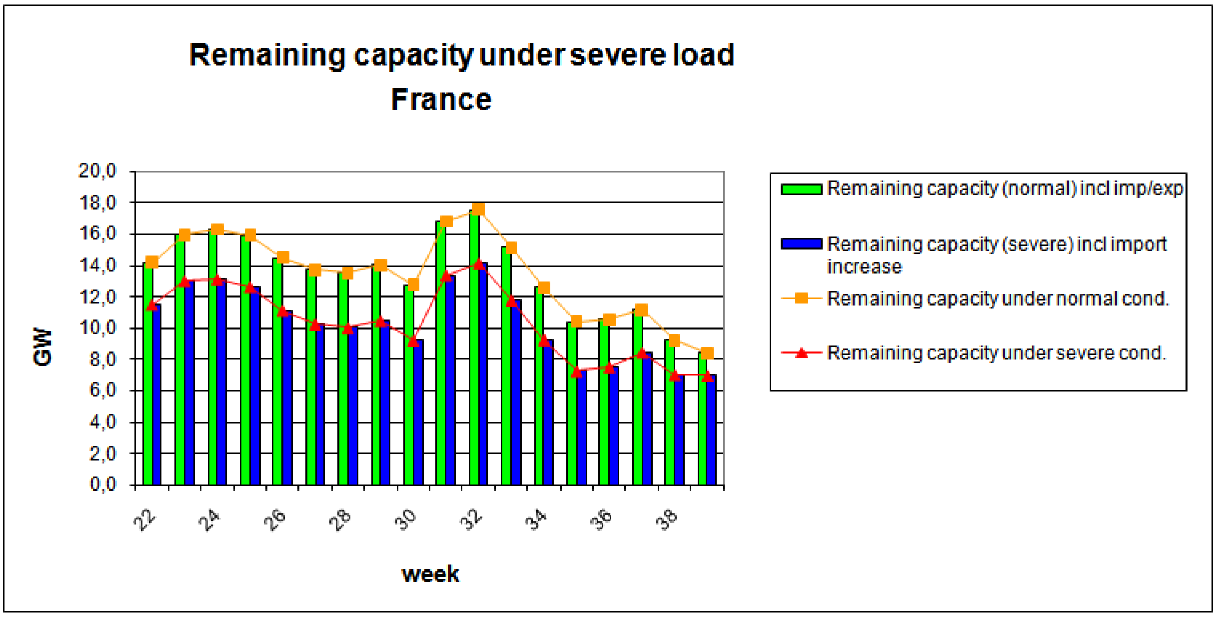
Overhauls of the interconnections and power plants will be according to plans which were coordinated with the other countries in the SEE region.

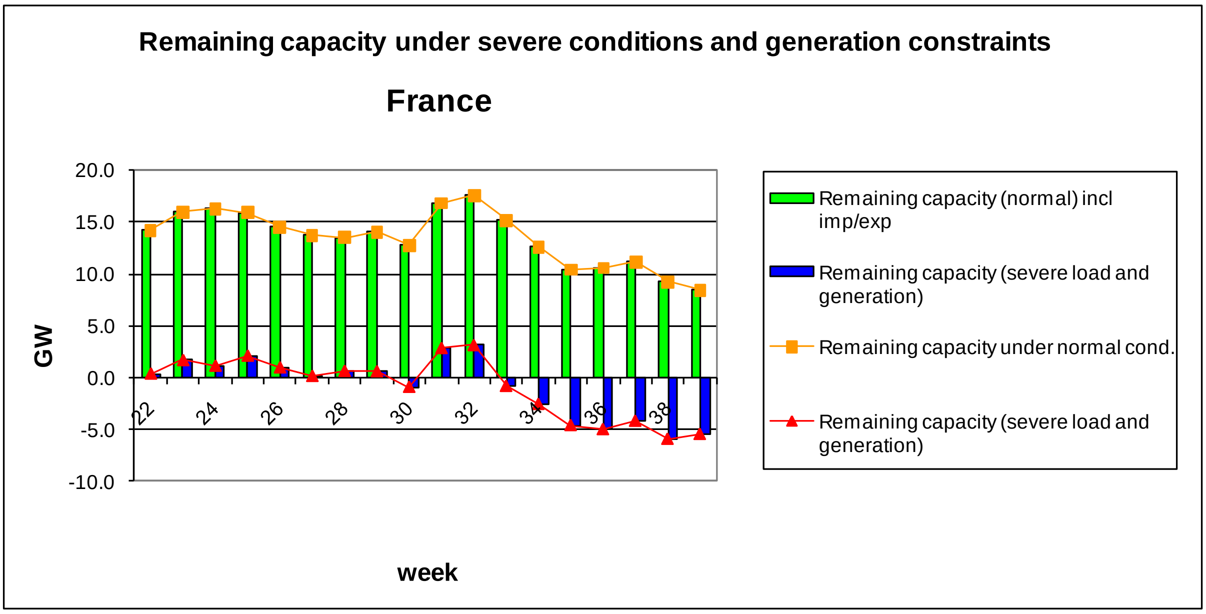
The water reservoirs are at a very high level because of the good hydrological conditions this year, so the HPPs also contribute to the security of the system.

According to all the above, the generation-load balance on the Macedonian system will not be considered at risk during summer 2011.

FRANCE


Demand and Generation
France
140,0
120,0
100,0
80,0
60,0
40,0
20,0
0,0
GW
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
France
20,0
18,0
16,0
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
GW
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



RTE has conducted a prospective study of the supply-demand balance in mainland France for the coming summer period.

RTE studies a scenario with high temperatures affecting demand and generating facilities, as happened during heat waves in August 2003 and July 2006.

The studied phenomena are as follows:

- An increase in consumption (due to air-conditioning), which is calculated at +7°C above reference temperatures.
- Many generation reductions on nuclear or fossil power units in order to comply with environmental requirements (to respect temperature limits in the rivers, for example). These generation reductions come from information provided by the power suppliers.
- Reduction in available capacity of hydro-electric units (drought) and reduction in wind generation.

No particular problem is expected in normal conditions. However, in case of high temperatures or a heat wave, margins would be reduced and the situation could be stressed during the end of summer. In September, imports close to 6000 MW could be necessary to cover the minimum required margin.

In addition to specific measures like temporary overloading of certain generating units and voltage reduction, exceptional mechanisms can be activated by RTE to face extreme events without shading consumption:

- Modification of the power plants maintenance schedule,
- Activation of emergency reserves contracted with neighbouring system operators,
- Use of the conditions allowed in exceptional situations by existing ministerial decrees concerning environment-related limits
- Request for exemption from certain tourism-related limits affecting hydro power plant generation.

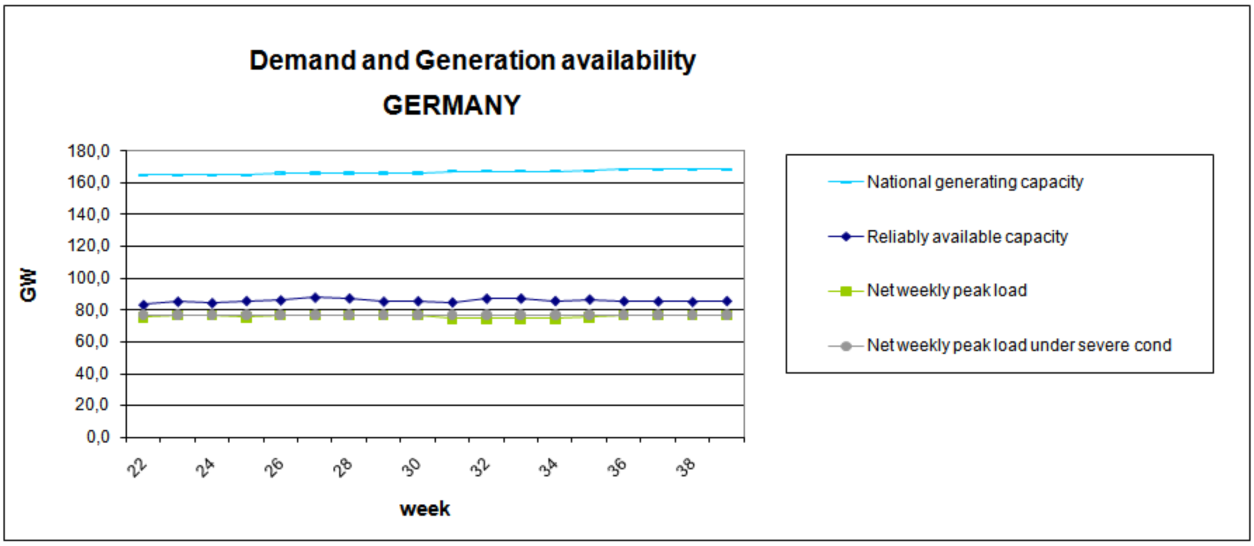
Before taking these exceptional measures, RTE could also activate demand response offers made by French consumers or by international consumers via the balancing mechanism.

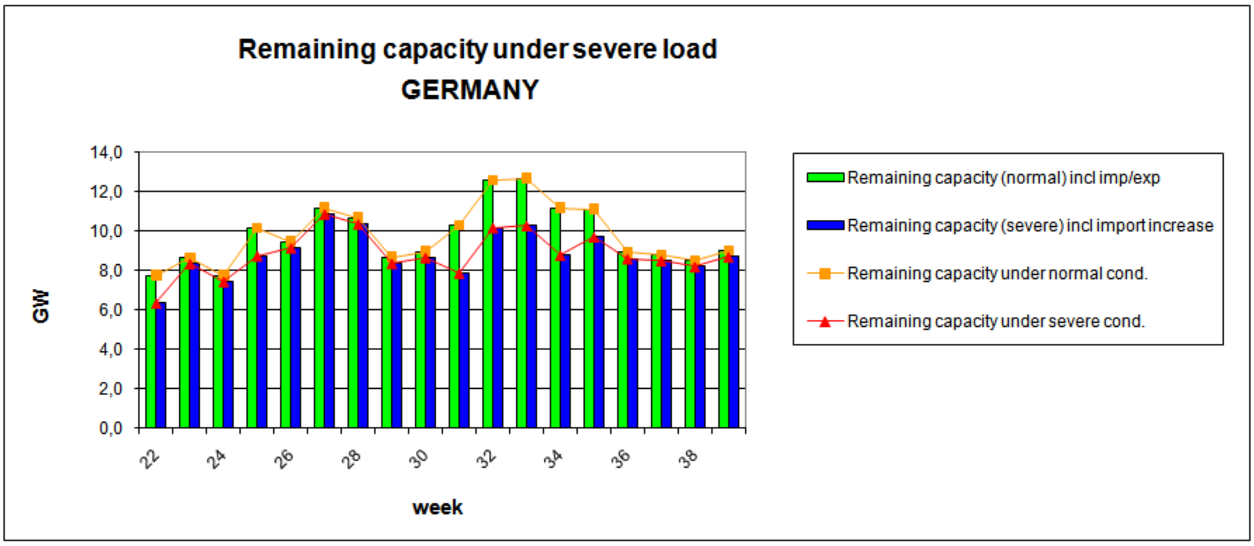
All tie-lines may be affected by the need for imports, except during the following outages:

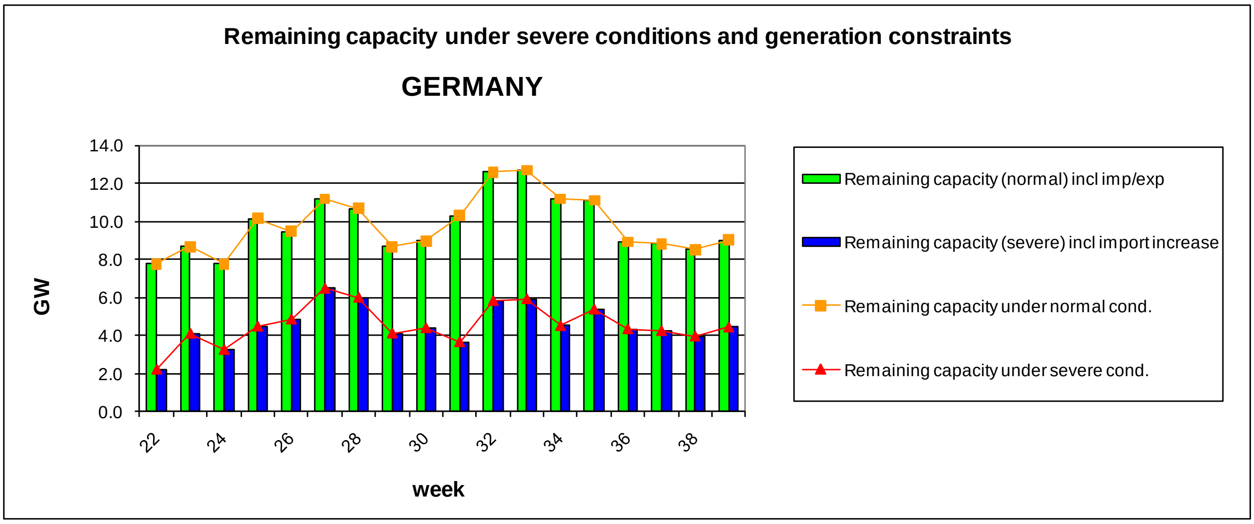
- Bassecourt (CH) – Sierentz (FR) from 30 May until 10 June
- Asphard (CH) – Sierents (FR) from 1-12 July
- Avelgem (BE) – Mastaing (FR) from 25-29 July
- Lonny (FR) – Achêne (BE) from 27-30 September
- Venaus (IT) – Villarodin (FR) from 5-15 July
- Venaus (IT) – Piossasco (IT) from 23 July until 21 August
- Endorf (DE) – Vigy 2 (FR) from 2-3 July and from 21- 24 September
- Endorf (DE) – Vigy 1 (FR) from 13-15 September

All neighbouring countries (UK, Belgium, Germany, Spain, Italy and Switzerland) may be concerned by RTE's potential need for imports. There should not be any issue likely to affect the ability to import. However, in case of an extreme heat wave and thermal constraints on the power plants in Northern France, imports to Belgium and Germany could be slightly reduced.

GERMANY


Demand and Generation availability
GERMANY
GW
180,0
160,0
140,0
120,0
100,0
80,0
60,0
40,0
20,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
GERMANY
GW
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



Introduction and disclaimer

It has to be pointed out that, due to the current legal rules, German TSOs are not responsible for provision of investigations about national demand and generation. Furthermore, market participants are not obliged to provide detailed information contributing to the calculation of a national power balance to the German TSOs. Hence a lot of the data required for the summer outlook are estimations and approximations gained from experiences in the past before the liberalization of the electricity market (e.g. some elements of unavailable capacity, some parts of generating capacity, especially embedded generation).

Regarding the tables, the following issues are important when analysing the data:

- 94 % of the installed wind power (between 28.8 GW and 29.3 GW installed in Germany) has been estimated as non-usable capacity.
- 90 % of the installed solar power (between 19 GW and 23 GW installed in Germany) has been estimated as non-usable capacity.
- For consideration of heat and dry spells, refer to the assessment of sensitivity of generation constraints and load under severe conditions.
- 8.3 GW (net) of nuclear power capacity are considered as non-usable for the whole summer outlook period because of the moratorium.
- Due to the methodology, approx. 3 GW of installed pump storage capacity, which are integrated in the German market, are not included in the German data collection.

Impact of the forced outage of 8 nuclear power stations

In mid-March 2011 the German Federal Government decided to temporarily shut down 8 nuclear power stations (installed capacity of 8.3 GW) for three months (mid-March to mid-June) following the events in Fukushima/Japan. Those nuclear power plants in service stopped operation around 18 March. 5 of the 8 nuclear power plants affected by temporary forced shutdown are located in the southern part of Germany in the vicinity of the load centres in the Rhine/Main area, Rhine/Neckar area and Munich.

German TSOs expect the interconnected system to be significantly affected. According to initial estimations, the shutdown of nuclear generation capacity can basically be compensated by imports and feed-in of available non-nuclear generation units throughout the German system during the summer months. Hence the German system will be characterised by decreased export and **increased import** compared to previous years.

Renewable energy sources can contribute to cover the demand depending only on the occurrence of appropriate weather conditions. Thus they appear to be highly volatile. In the 2011 summer outlook period, the amount of wind generation installed in Germany will total 28.8 GW to 29.3 GW. The photovoltaic generation installed will be between 19 GW and 23 GW. Due to the high volatility of the renewable energy sources, the installed RES-power does not serve to cover demand on a reliable basis (see introduction and disclaimer).

At the same time, the missing nuclear generation will lead to additional load flows through the German grid to serve the demand of the load centres in the southern part of Germany. In times of high renewable in-feed in the northern part of Germany this could lead to high flows in the German grid in the north-south direction.

The simultaneous scheduled maintenance of 6 additional nuclear power plants in the southern part of Germany and in the adjacent foreign grids in the second half of May puts additional stress onto the system even though demand is expected to be covered by the generation capacity still available as well as imports from neighbouring countries.

As a consequence, German TSOs expect to be confronted with two general phenomena leading to an increased number of interventions in the system necessary to maintain system security.

- In case of high load flows an increased number of N-1 violations is expected to occur especially on the interconnectors between the grids of TenneT D and 50HzT. In addition, problems maintaining a sufficient voltage level in the south are expected due to missing generation in-feed.
- In times of low load and simultaneous lack of renewable energy sources in-feed in the north, problems preventing excessive voltages might occur especially for the grid area around Hamburg.

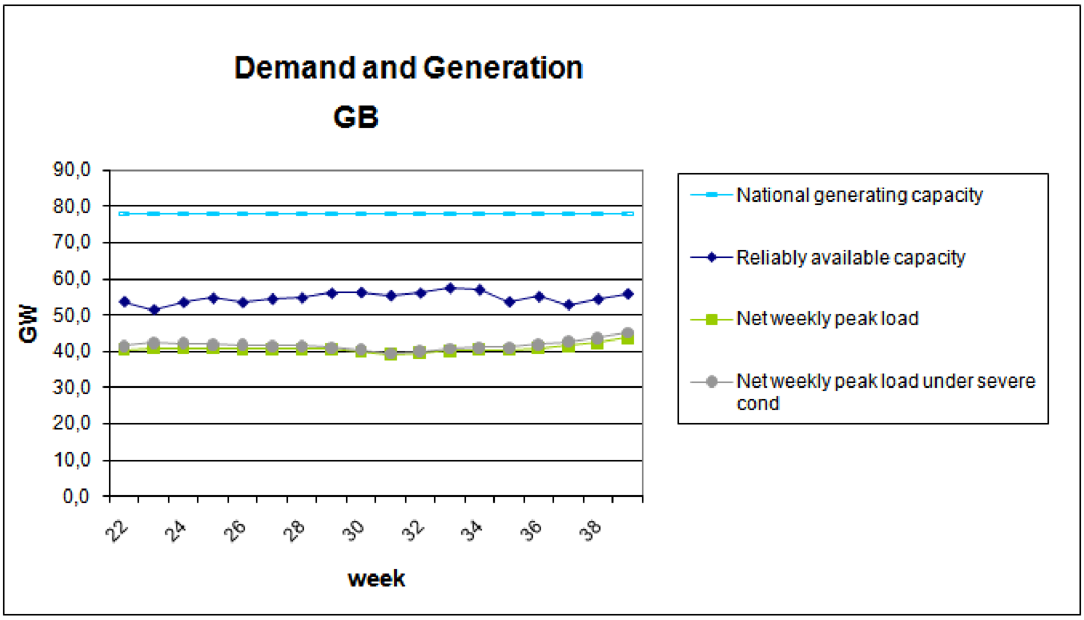
At the same time, works to enforce and maintain the grid already started or planned for the near future might be stopped or delayed.

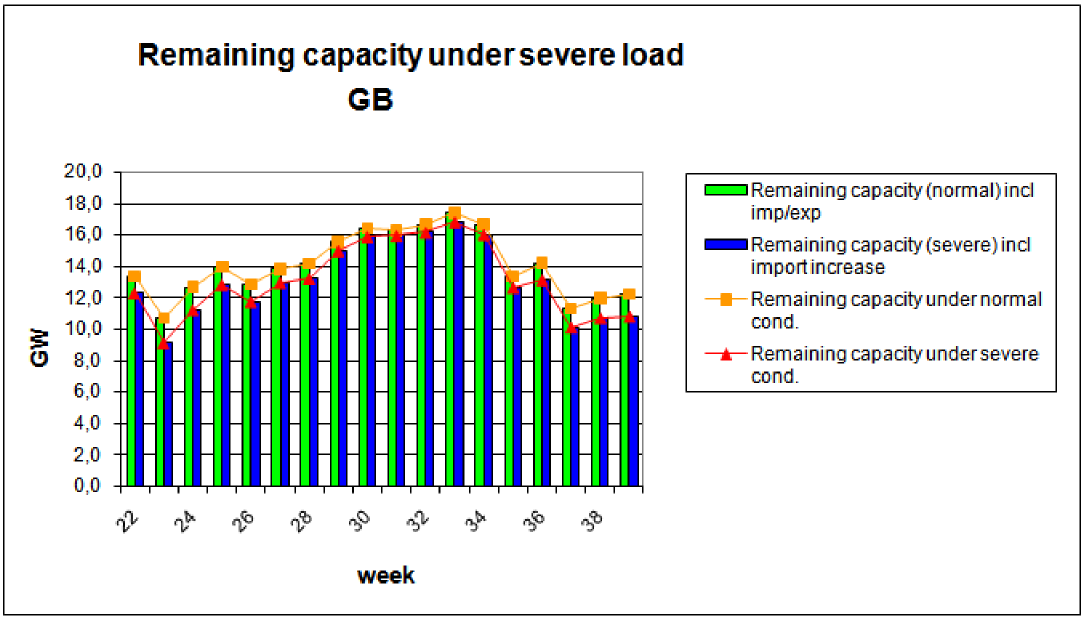
Currently investigations are ongoing regarding the forecast grid situation while the temporary shutdown of the nuclear power plants continues.

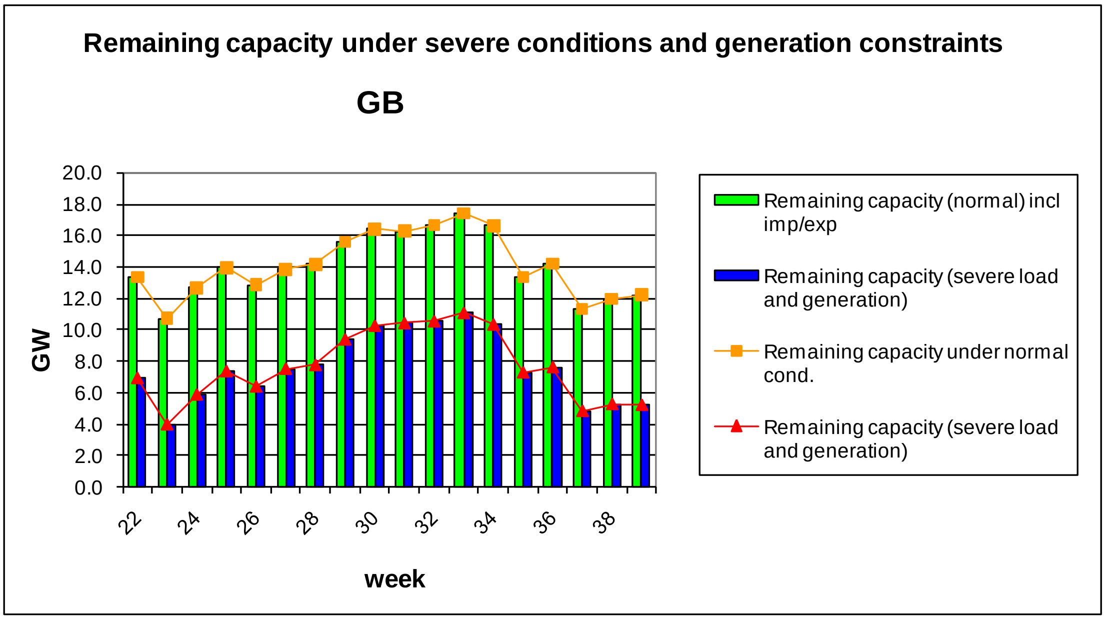
Heat/dry spells

In case of long periods of high temperatures, sustained heat and dry spells could lead to problems with cooling water at the major power plants within Germany, mainly affecting the EnBW TNG grid. To manage the risks arising from a hot spell, EnBW TNG and the Ministry for the Environment of the federal state of Baden-Württemberg have prepared appropriate measures to ensure system security by operation of a minimum set of power plants connected to the EHV grid. The implications of the forced outage of the nuclear power plants have already been considered.

GREAT BRITAIN





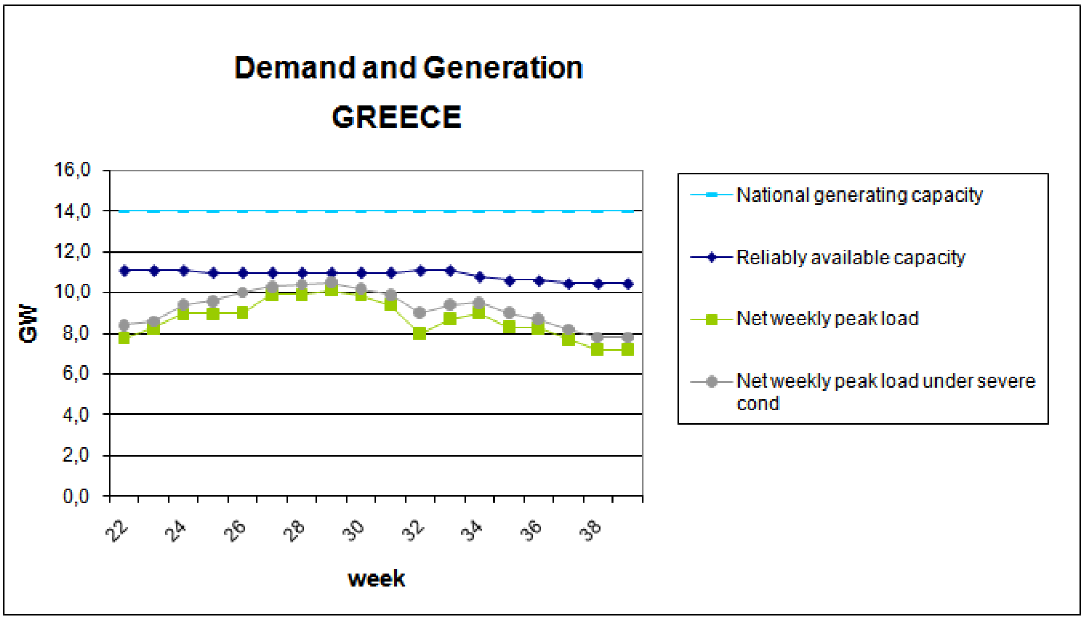


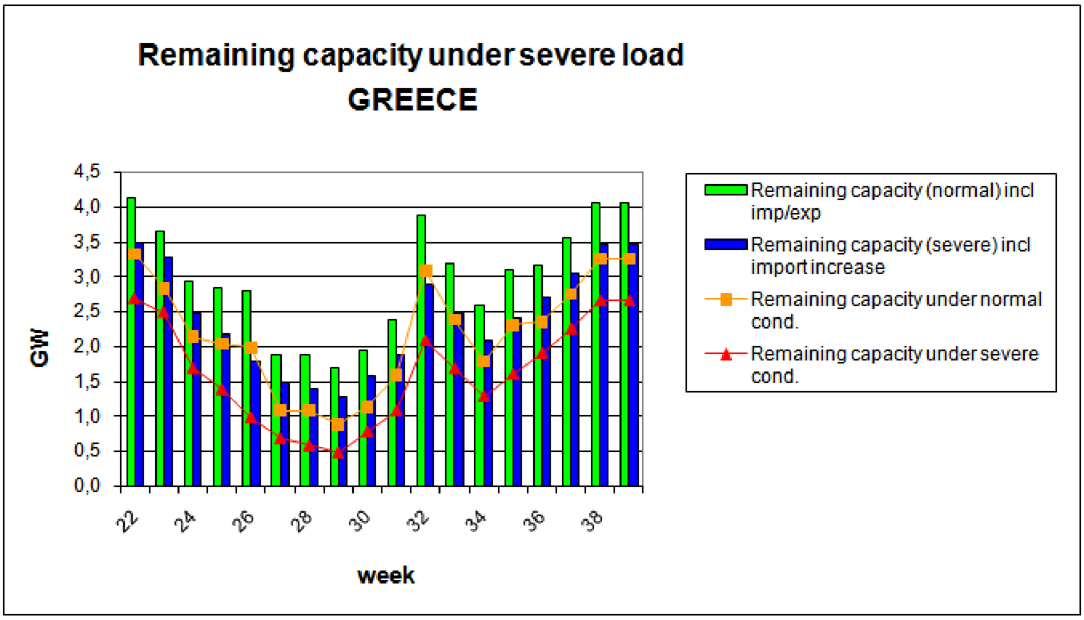
No problems are expected this summer. GB will not be dependent on imports during the next summer.

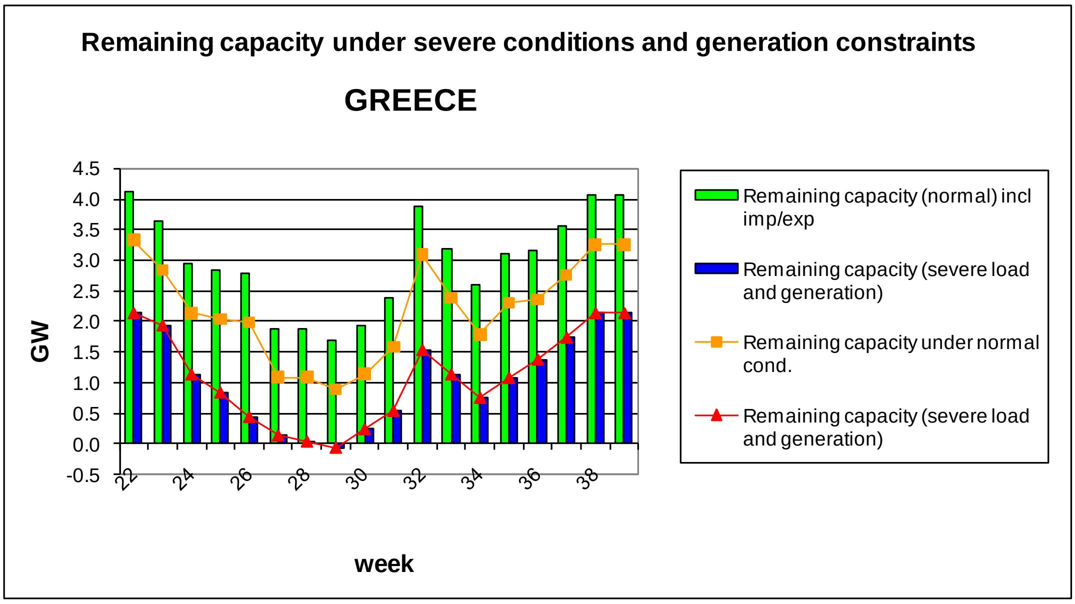
There is no predictable impact on nuclear generation following the incident at the Fukushima plant in Japan.

In the event of exceptionally high temperatures for the UK (35 °C), the output of the CCGTs would be reduced by 9 %. If drought conditions severely reduced river flow rates, the amount of cooling water that could be abstracted by inland coal stations to make up the losses from the cooling towers would be restricted and in the worst case, based on experience from extreme conditions in the past, could limit a station's output to around 50 %. The nuclear stations are not affected, as all are sea-water cooled in Great Britain. Based on the declared availability of generation plant for this summer, we estimate the maximum reduction in available capacity due to the combined effects of exceptionally hot weather and drought conditions could be in the region of 10 %.

GREECE


Demand and Generation
GREECE
GW
16,0
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
GREECE
GW
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

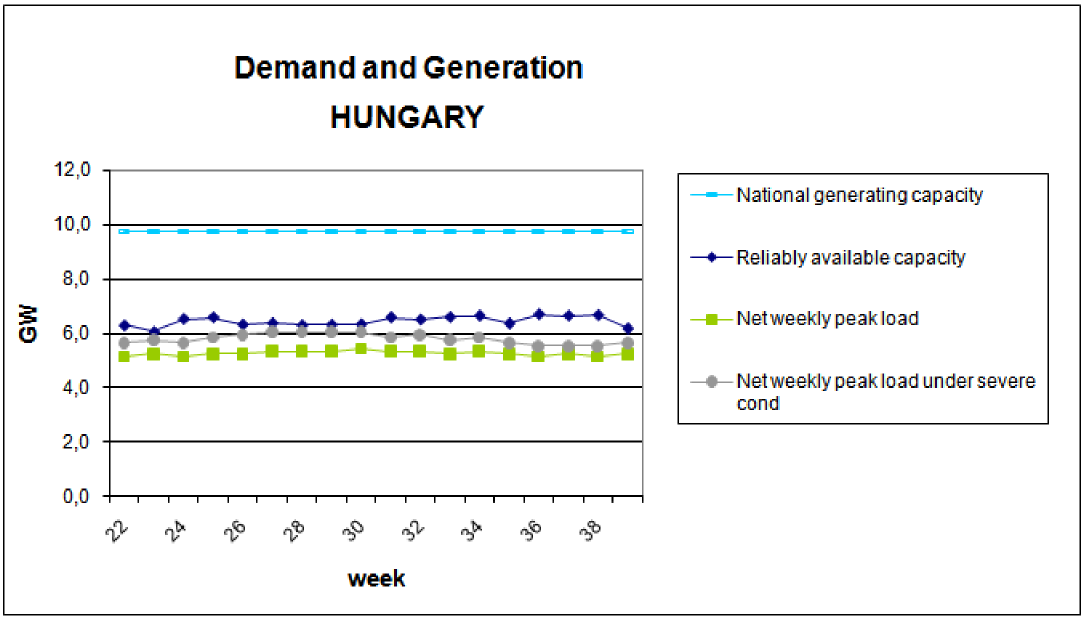


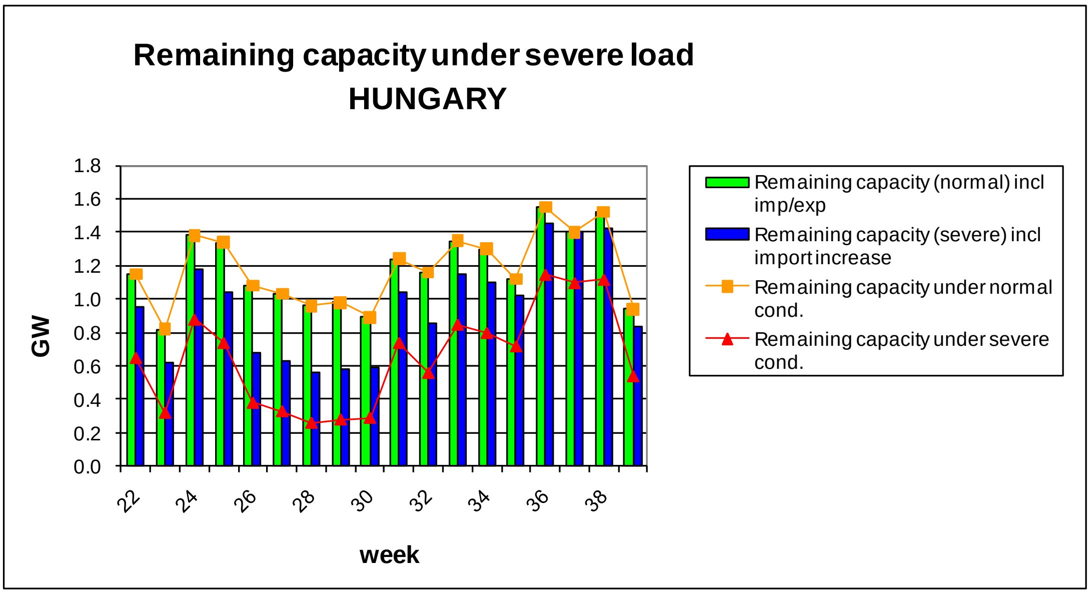
As usual, the Greek TSO expects high load (demand) during the summer and particularly between 20 June and 25 August, because of the high temperatures.
This year the water levels in the hydro reservoirs are high, although not as high as last year, which will increase the hydro generators' capacity for the summer. In addition, during the summer months forest fires can affect the availability of transmission lines.

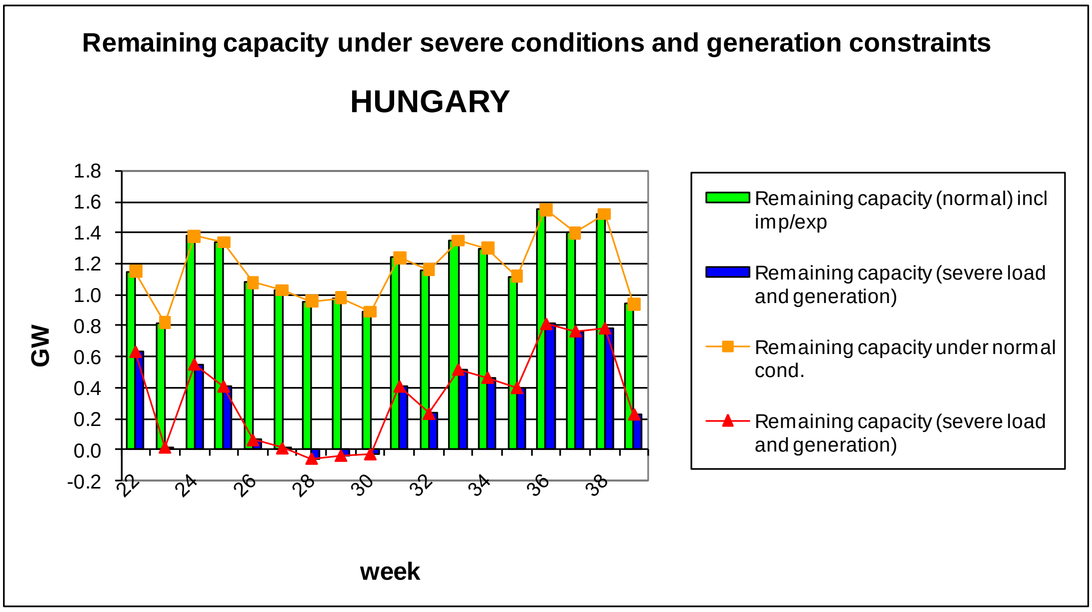
In case of any risk the mechanisms in place are: incentives to interruptible customers to reduce their consumption during peak hours, and maximization of our northern import capacity in collaboration with our neighbouring TSOs.

High risk periods are forecast for the second half of June, July and the first half of August.
In terms of interconnections, the most critical are the interconnection with Bulgaria and the HVDC cable with Italy.
The reliability of assets could affect the availability of imports.

HUNGARY


Demand and Generation
HUNGARY
GW
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
HUNGARY
GW
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



Positive remaining capacity during the whole summer period of 2011 is expected. However, a long-lasting heat wave may make the remaining capacity temporarily negative. This can be managed by using higher imports; Hungary is traditionally an import-dependent area. However, we do not expect any serious problem. Concerning a stress test of the nuclear power plant in this period, the load-demand situation can be managed by harmonisation with planned maintenances and additional import.

There are enough cross-border capacities available on monthly and daily capacity auctions for market participants.

The Hungarian TSO (MAVIR) has concluded market maker contracts for provision of reserve generation capacities even from abroad. Therefore the necessary balance energy must be available if market players – for any reason – do not fulfil their obligations.

As a last resort, inter-TSO emergency energy deliveries are also contracted.

A procedure exists for risk management: when, following the development of events, the TSO realises the necessity, relevant market players and the regulator are involved to define special actions – either market-based, or additional to normal market operations.

We do not foresee high risk periods. Even in severe conditions the remaining capacity can be increased with a small amount of imports to a safe range.

Import is a market issue, depending on many parameters e.g. generation maintenance, price, hydrology, wind, etc. But the Ukrainian Burshtyn-island is a pure export market.

ICELAND

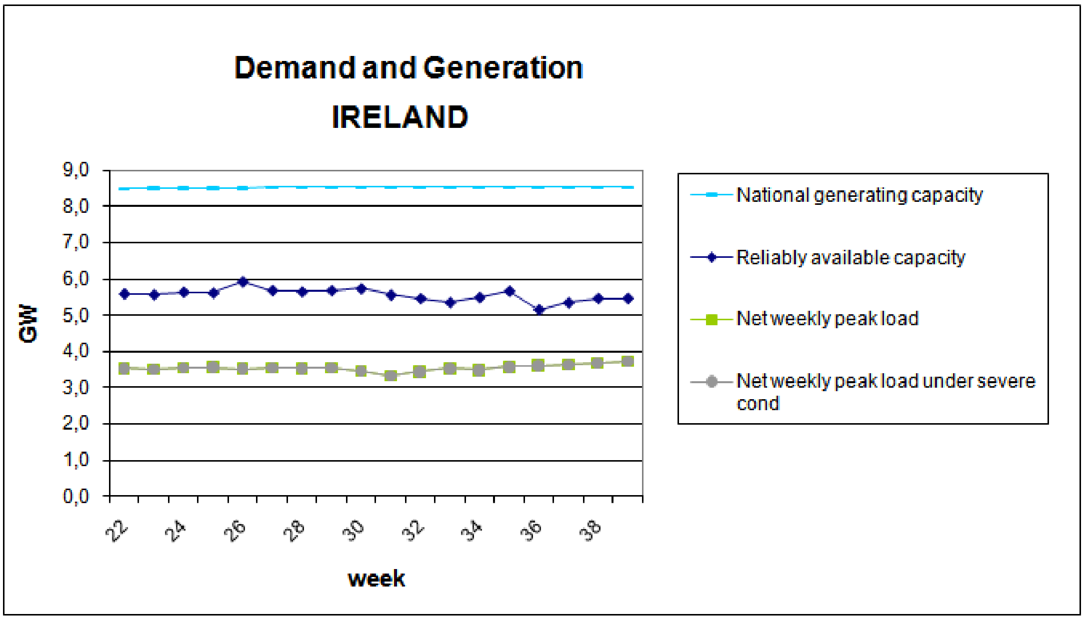
The generation capacity in Iceland is expected to be sufficient to meet peak demand this summer under normal as well as severe conditions. Landsnet does not anticipate any particular problems in the isolated Icelandic power system.

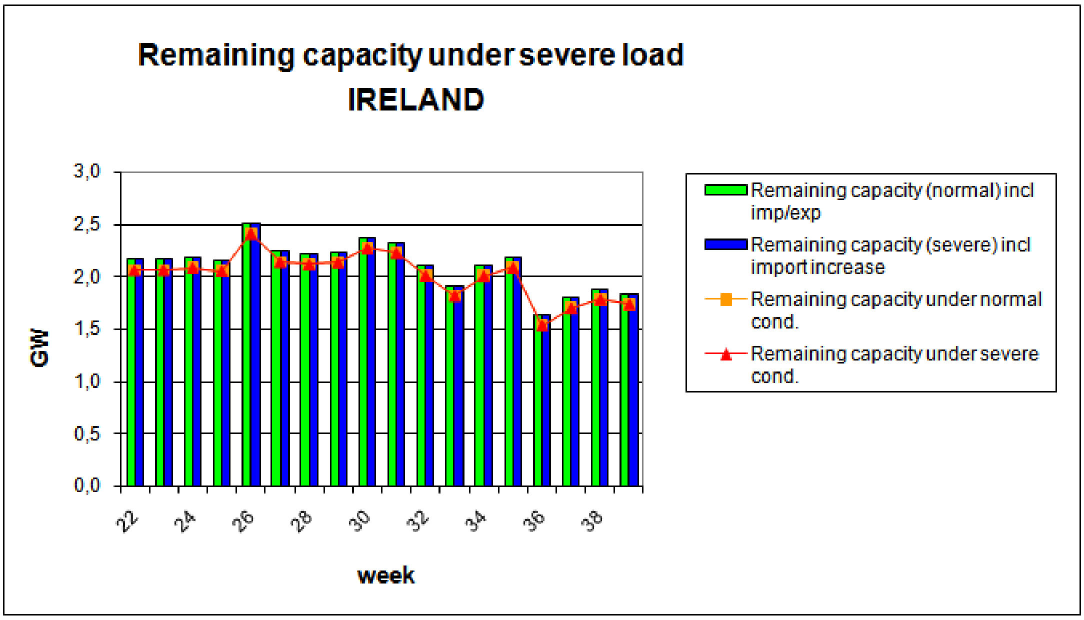
The summer period is used for scheduled maintenance on the generating units. The maintenance is generally scheduled such that it does not jeopardize the power and energy balances.

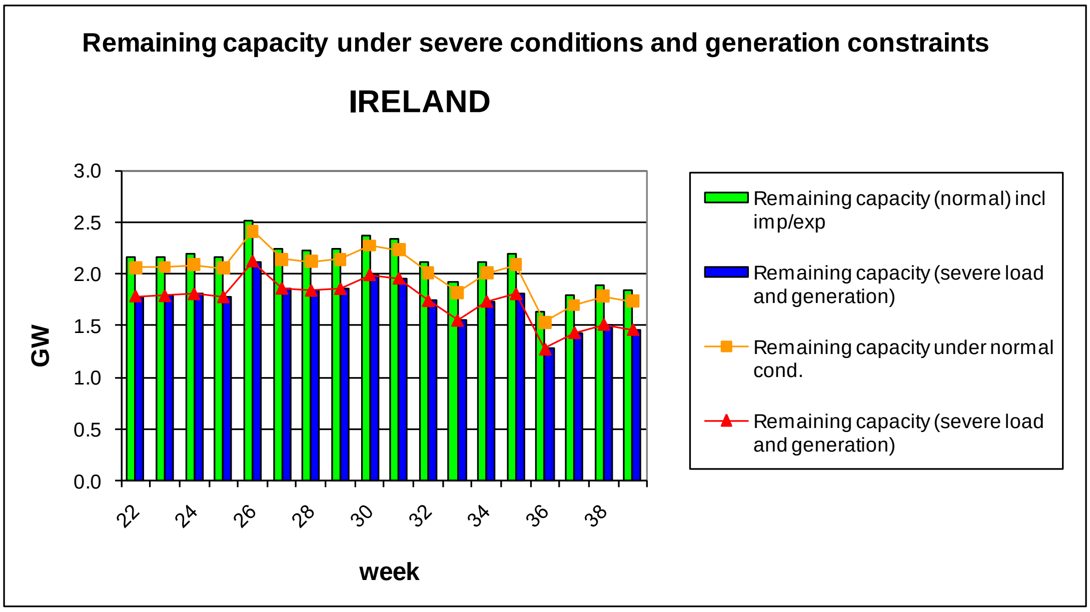
The installed generation capacity connected to the Icelandic transmission system is 2.4 GW, of which 77 % is hydro based and 23 % based on geothermal energy. No new generating capacity is planned this summer.

A long-term generation capacity assessment and load forecast for the Icelandic power system are made by Landsnet every year and reported in the Transmission System Development Plan and Energy and Power Balance report. For short-term assessment, studies are made by Landsnet on a weekly basis for generation capacity, reserves and load forecast.

IRELAND


Demand and Generation
IRELAND
GW
9,0
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

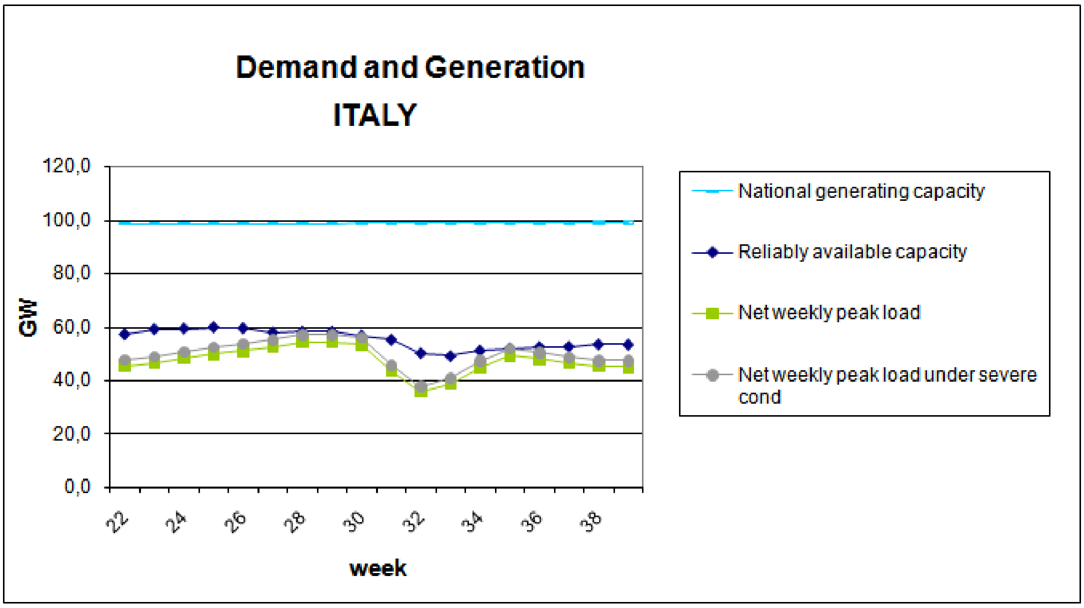

Remaining capacity under severe load
IRELAND
GW
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

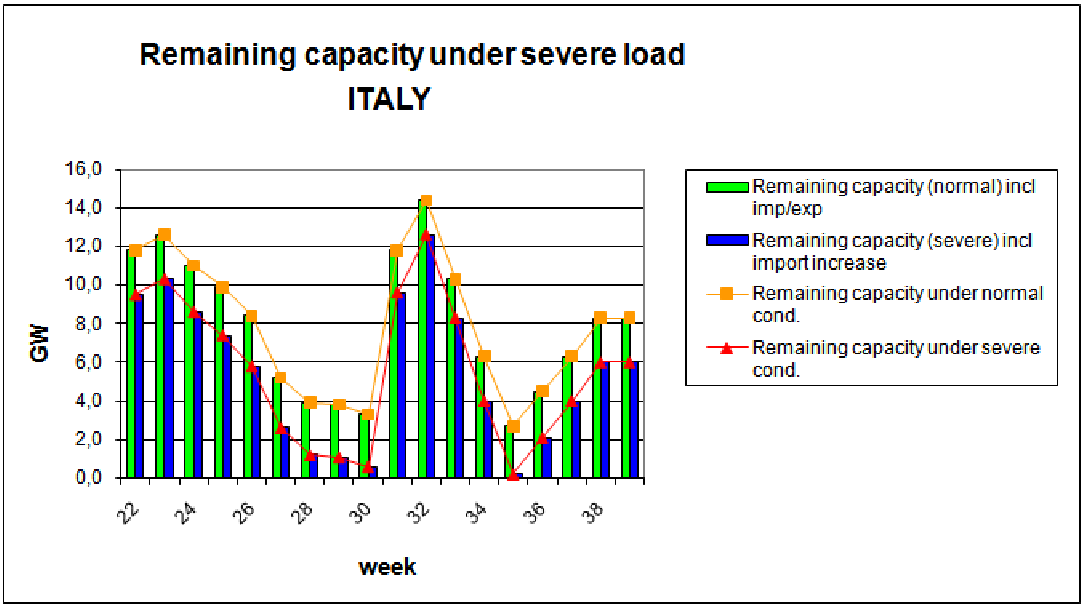


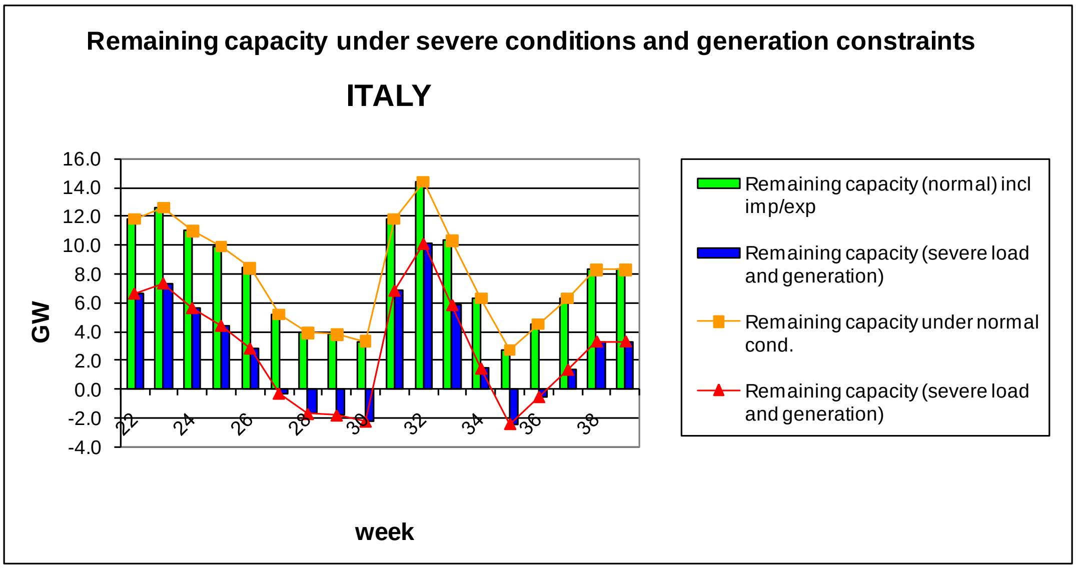
EirGrid does not expect any capacity or demand issues on the Irish system this summer. According to the latest analysis, there will be sufficient capacity to meet the demand over the entire summer period. Demand growth is slightly positive at present and this is expected to continue for the rest of the year. While there are some significant scheduled and known forced outages on the system this year, there is sufficient spare capacity to deal with unexpected forced outages.

As Ireland does not have any reliance on hydro generation (due to its small contribution), no reduction of the planned reliably available generation capacity during the summer period due to the stressed situation is expected. The summer in Ireland is the lowest load period.

ITALY


Demand and Generation
ITALY
GW
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
ITALY
GW
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



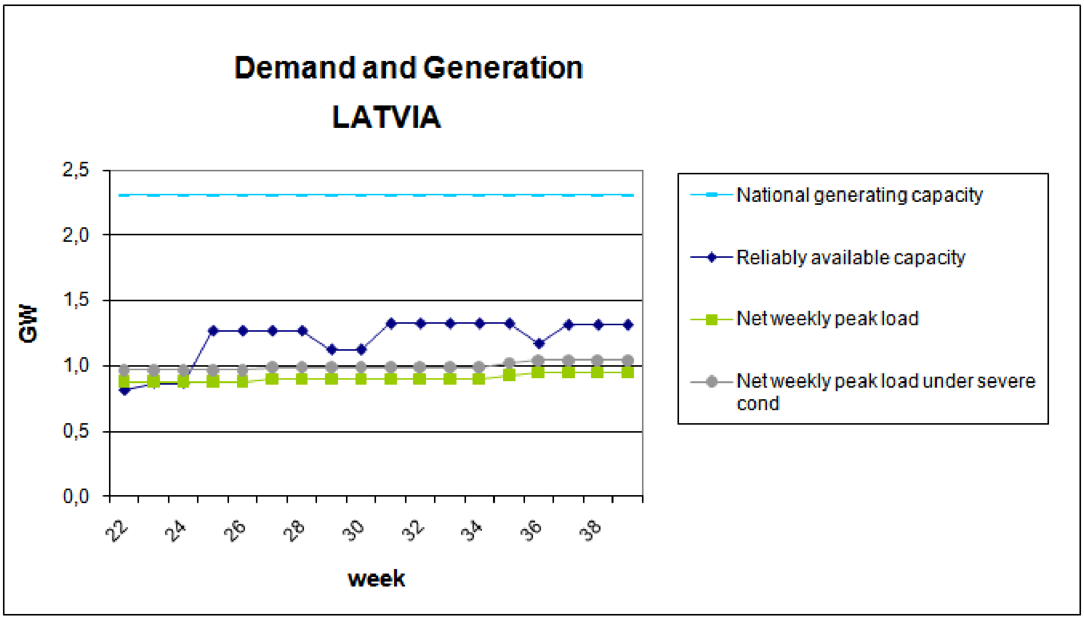
General Comments

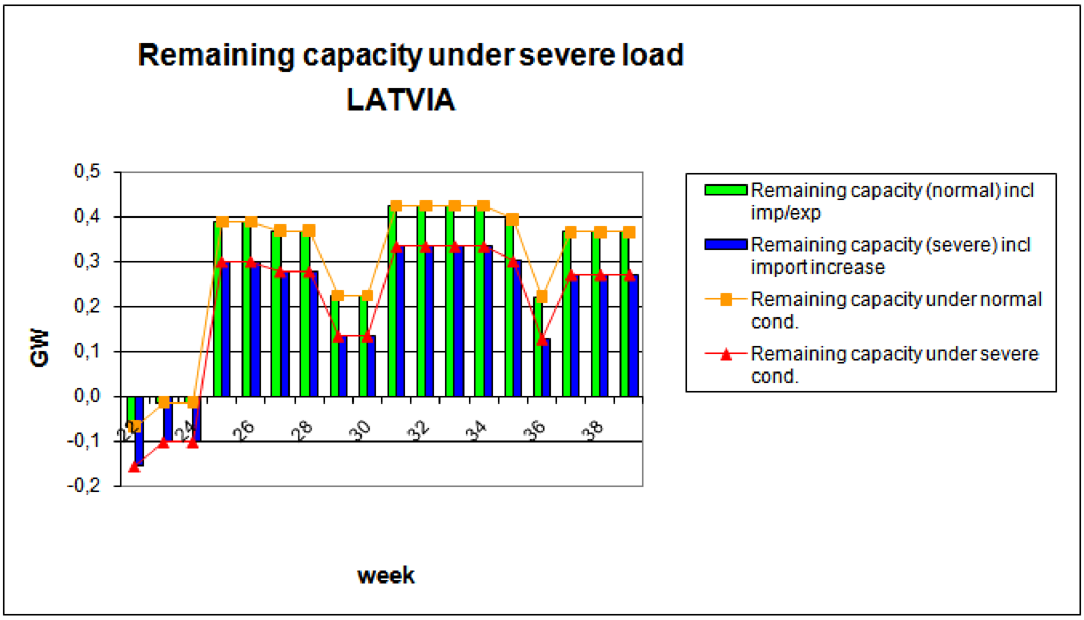
In normal conditions, the general situation expected for the coming summer is not considered critical. This is due to both moderate peak load forecasts and a huge capacity (mainly CCGT) increase during recent years.
Some consideration is required for the situation in Sicily where the forecast margins are still tight.

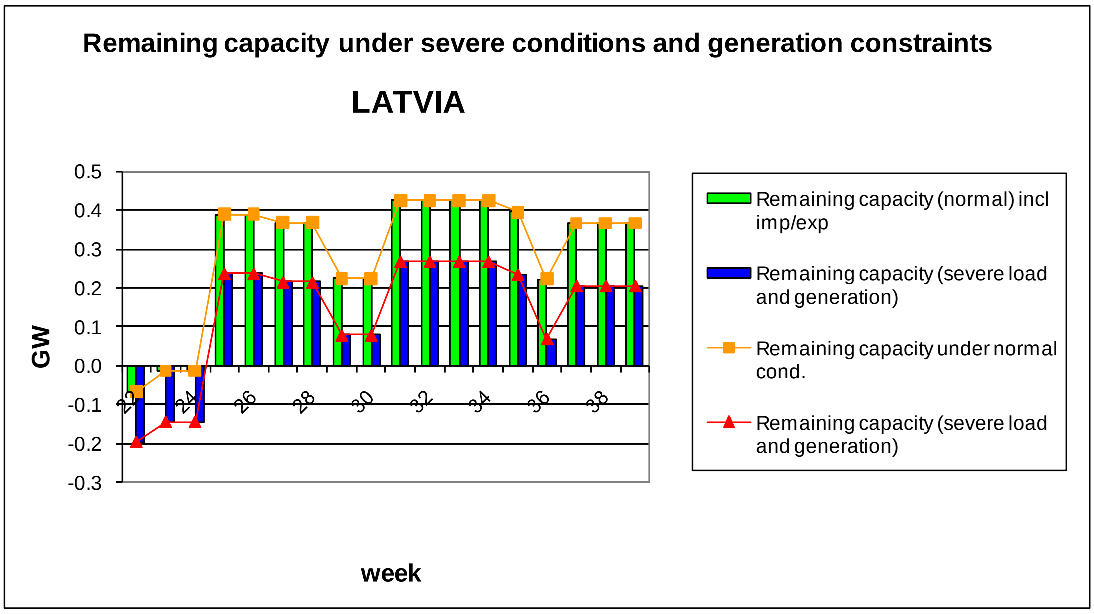
In Sardinia forecast margins are bigger than in the previous years and a more comfortable adequacy level will be reached during June when the second of the two new 500 MW HVDC undersea links with the Italian peninsula (SAPEI) enters operation.
It should be noted that extreme and unexpected events (i.e. very high temperatures, severe reduction of hydro resources or concurrent outages of several grid elements) may lead to critical periods.

This is particularly the case if severe climate conditions (high temperatures, shortening of hydro resources) lead to an increase in the load demand and to a huge reduction of production of some thermal power plants, due to cooling systems problems. In this case margins would be reduced also in the mainland. Nevertheless, suitable countermeasures are already foreseen.
Week 35 is expected to be the most critical (in any case in severe conditions the remaining margin is expected to be 5 % of peak load vs 1 % of peak load for the same week of the summer 2010).

LATVIA


Demand and Generation
LATVIA
GW
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
LATVIA
GW
0,5
0,4
0,3
0,2
0,1
0,0
-0,1
-0,2
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



It is expected that the Latvian power system in the summer period will be a net importer, because base power will be from CHP plants, which cover about 40 % of peak demand. Because CHP plants undergo maintenance in the summer, and due to low heat consumption in the summer period, CHP plants cannot operate at full power.

Despite sufficient installed capacity on the hydro power plants, shortage of inflow waters is the main limiting factor for generation availability. Therefore, a low inflow scenario was chosen for this summer to address a probable energy deficit.

Therefore Latvia plans to be dependent on energy imports from neighbouring countries during the summer, and the Latvian power system will be a net importer from neighbouring countries in this period.

Starting from the week 15, due to the spring high water inflow period, the Latvian power system will become a surplus generating system, providing energy exports to neighbouring power systems. The high inflow period usually lasts until the beginning of May, after which Latvia reverts to a deficit power system again. The low water inflow level will start in June-July.

It is expected that very high air temperatures this summer will be the main factor for total electricity consumption during the summer period, increasing by 2-3 % compared to previous years.

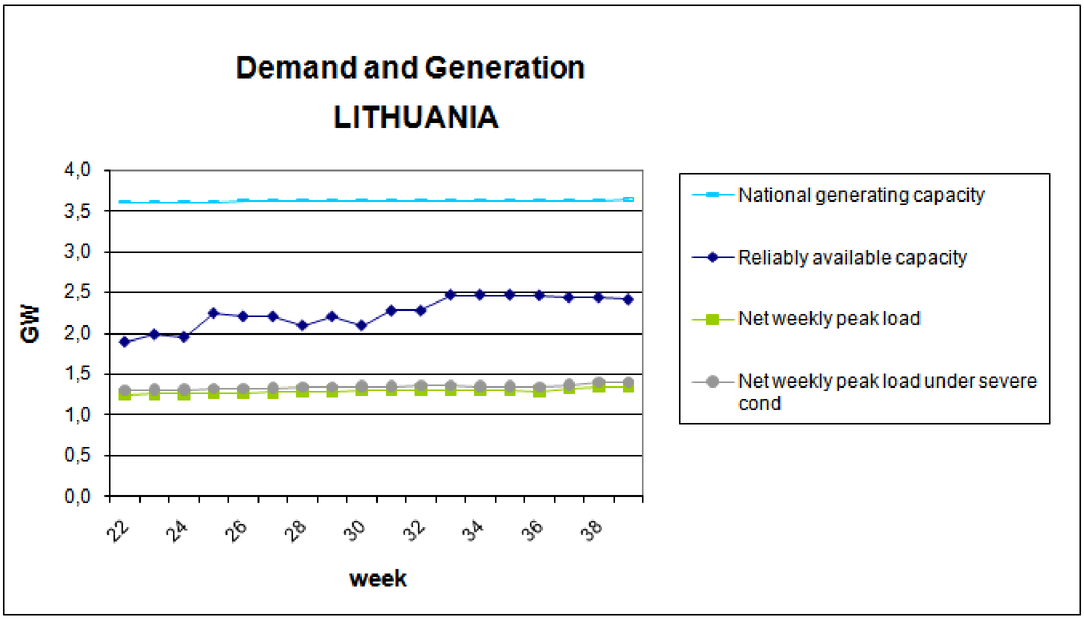
No stressed periods for system adequacy during summer 2011 are expected.

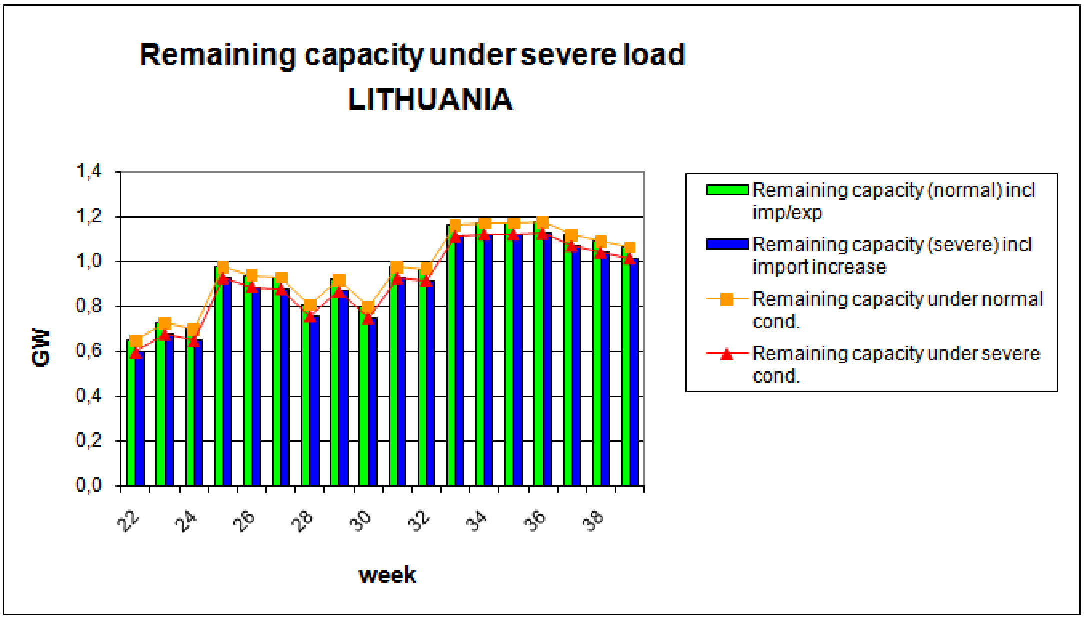
In the estimation of electricity demand and supply balance for the Latvian power system in the summer period, extraordinary events, due to high risk periods of electricity demand and supply guarantee, are considered probable from June to September 2011, related to restrictions in the cross-border Estonia, and Russia-Latvia lines. Restrictions are related to very high air temperature, wire heating and overloads, and may result in cross-border transmission congestion. Planned transmission line repairs are not planned in this cross-border area in the summer, but in emergency situations this cross-border will be congested.

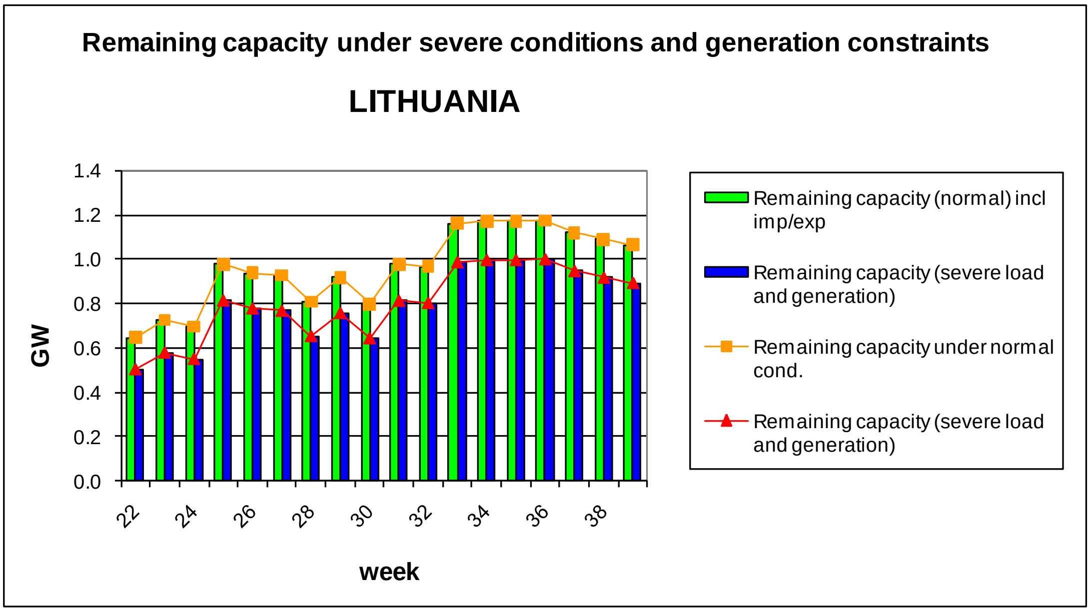
Risks with transmission capacities in Latvian-Lithuanian cross-border are not expected in the 2011 summer period.

Risks of import and export availabilities exist during this summer period, due to restrictions on the Estonia and Russia-Latvia cross-border lines.

LITHUANIA


Demand and Generation
LITHUANIA
GW
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

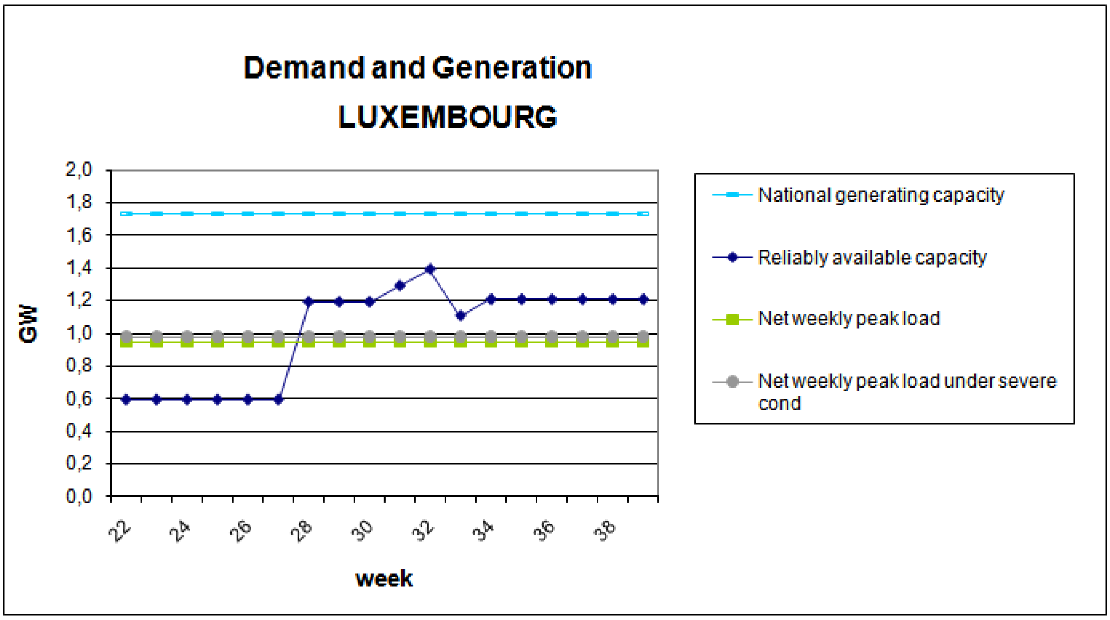

Remaining capacity under severe load
LITHUANIA
GW
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

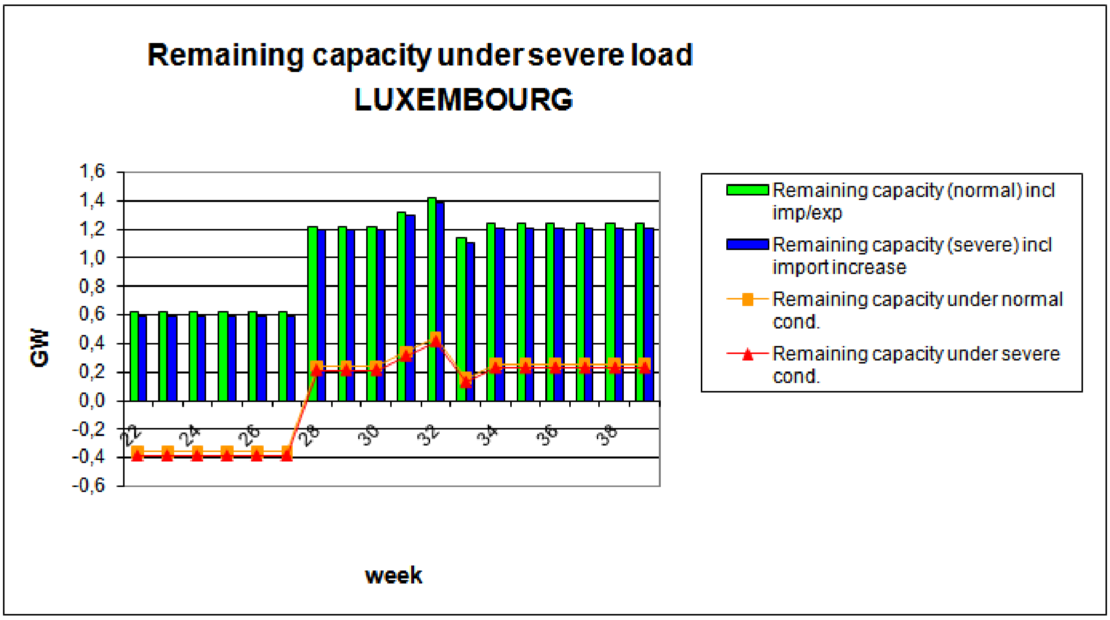


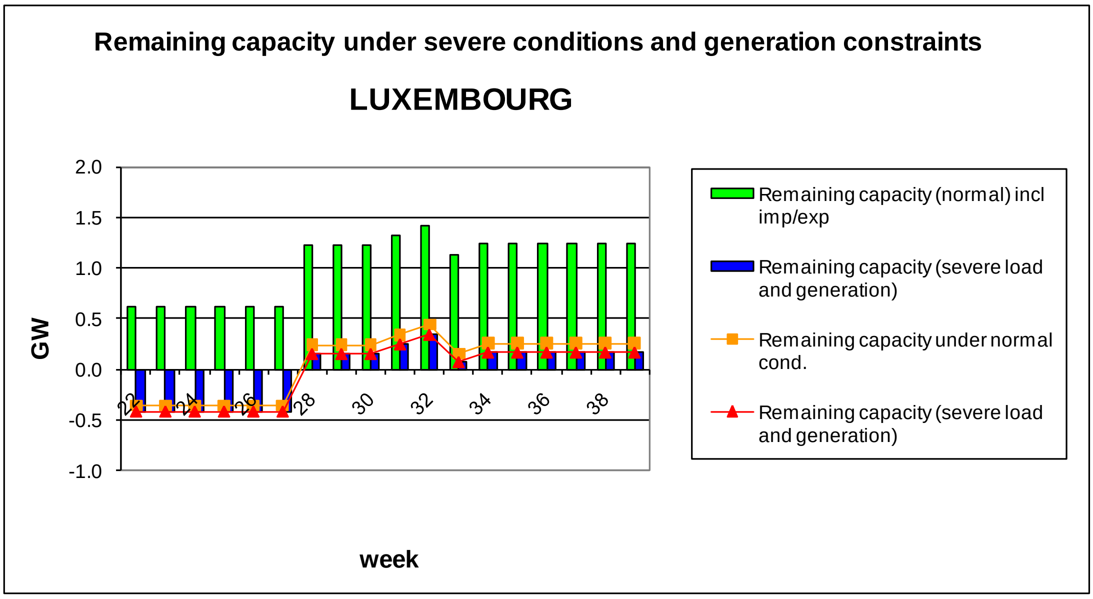
No problems are expected in summer 2011 in normal conditions. The generation capacities and available transmission capacities for imports will be sufficient to cover increasing electricity consumption in Lithuania and the Baltic region.

The system balance is expected to be in deficit due to electricity price differences in the neighbouring countries. The import of electricity from neighbouring countries will rely on cross-border links with Belorussia, Latvia and the Kaliningrad area. The availability of imports mainly depends on the generation/demand balances in neighbouring countries and also on available cross-border transmission capacities. None of these factors are considered as high risk this summer.

LUXEMBOURG


Demand and Generation
LUXEMBOURG
GW
2,0
1,8
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

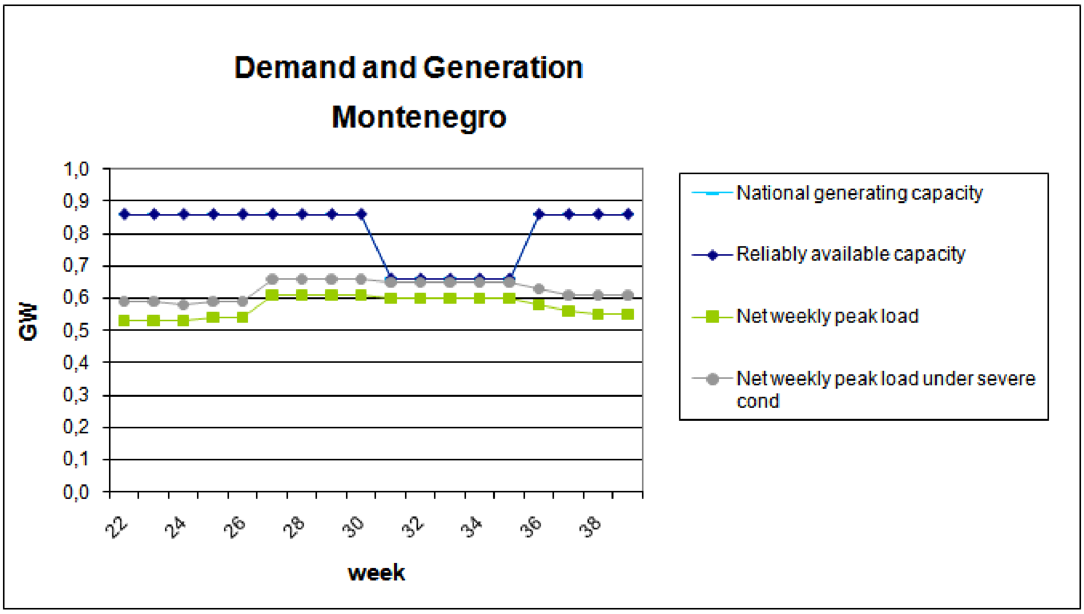

Remaining capacity under severe load
LUXEMBOURG
GW
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
-0,2
-0,4
-0,6
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

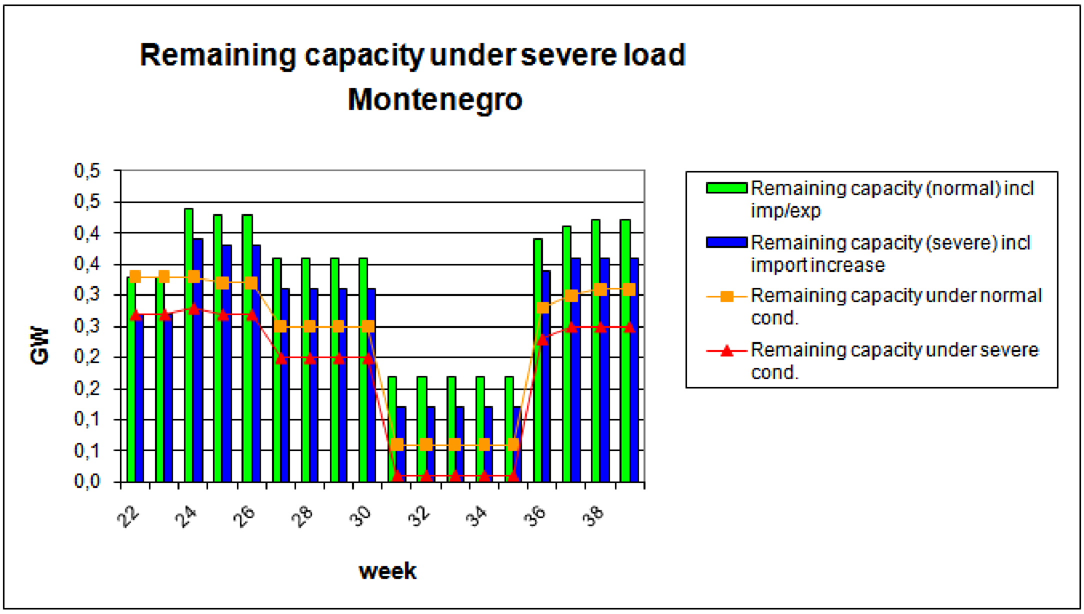


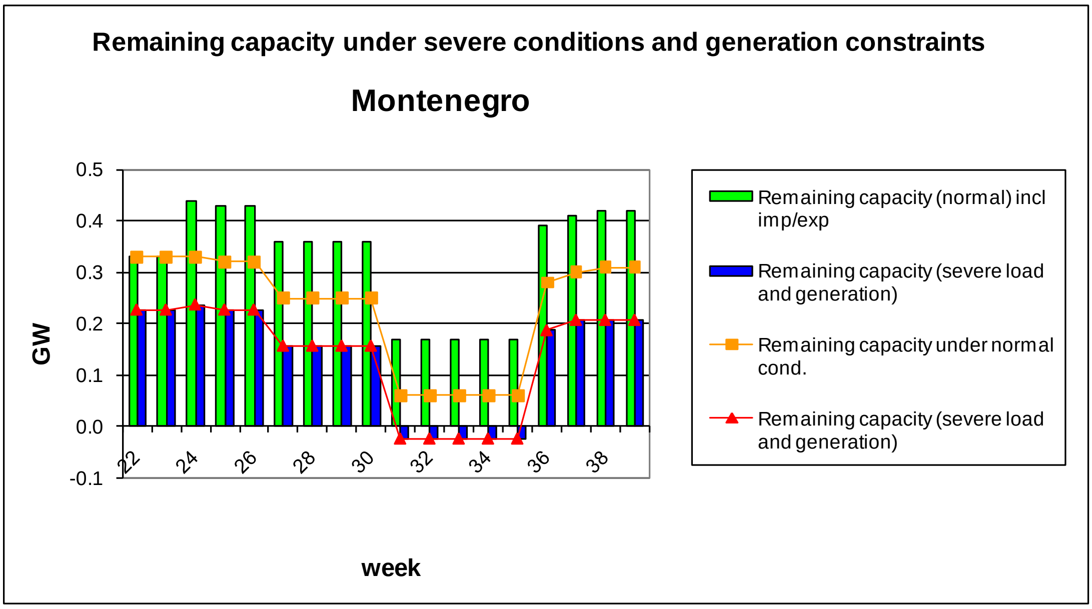
Several overhauls and shutdowns are foreseen during the summer period for upgrading the pump storage power plant. As this energy is normally exported directly to Germany, the grid security in Luxemburg will not be affected. The export flow will be reduced. We do not expect any problems on our system this summer.

Overall generation capacity in Luxembourg (including pump storage power) is higher than consumption. Due to the grid structure, all the energy is first exported and partially re-imported again to be used by the public grid. Creos is still a net importer of about 85 % of electric energy. All the existing interconnectors are needed for normal operation. The N-2 criterion is always used for defining necessary interconnection capacity for the public grid. As no planned outages of lines are foreseen, the capacity of the interconnection lines will be sufficient at all times to cover the national load.

MONTENEGRO


Demand and Generation
Montenegro
GW
1,0
0,9
0,8
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

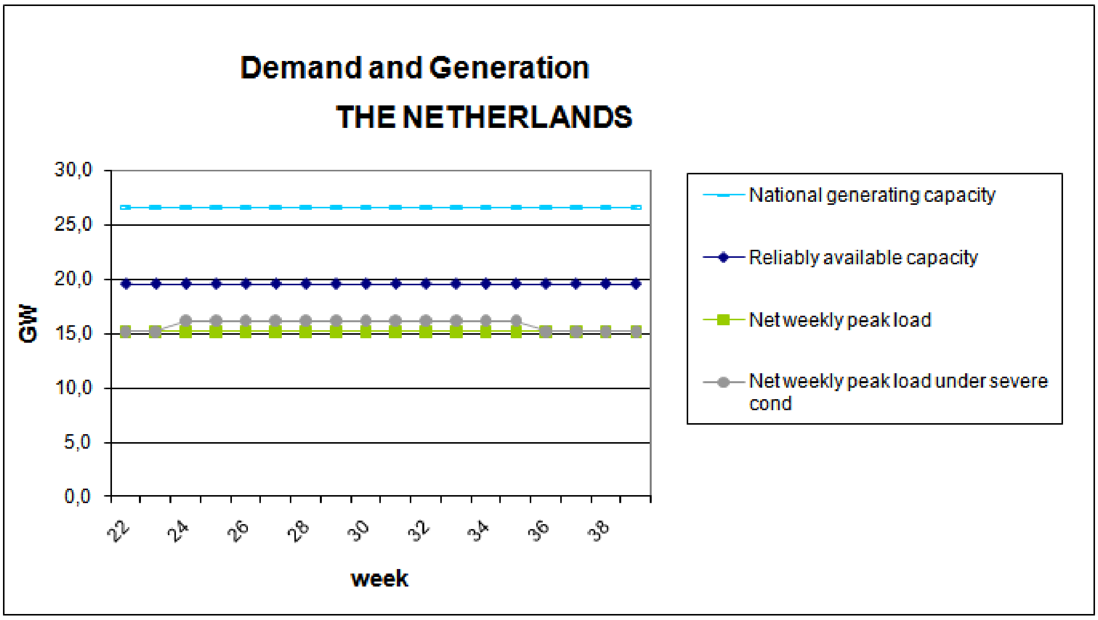

Remaining capacity under severe load
Montenegro
GW
0,5
0,5
0,4
0,4
0,3
0,3
0,2
0,2
0,1
0,1
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

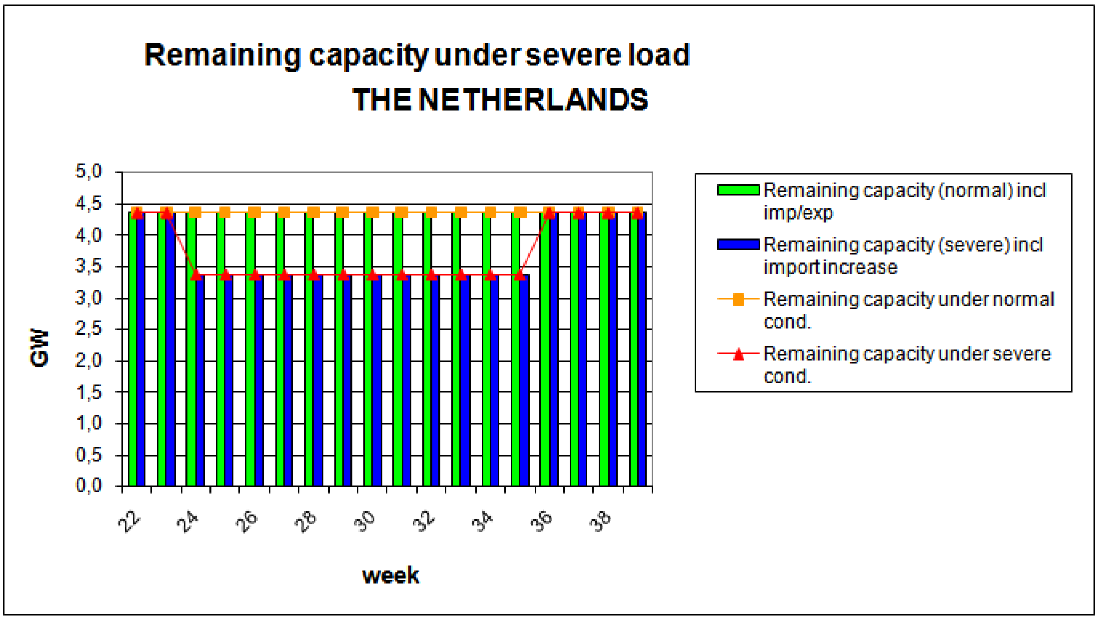


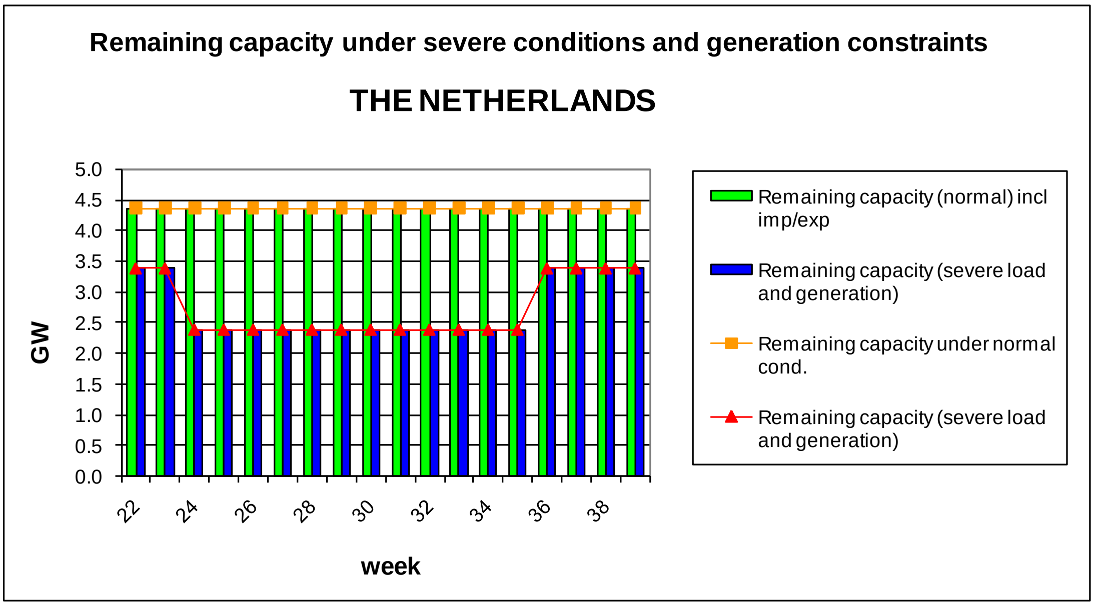
The Montenegrin TSO does not expect any problems in the system during summer in normal conditions.

In case of exceptional severe weather conditions in terms of high temperatures and reductions in generation, Montenegro would need imports in weeks 31 to 35.

NETHERLANDS







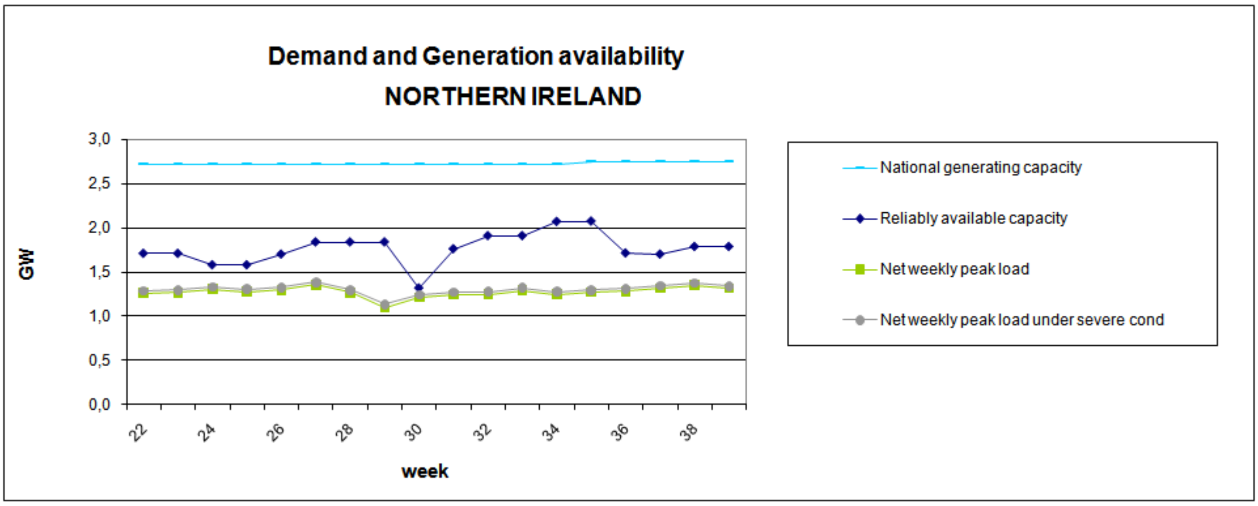
Note on the graph: For the Netherlands, no specific summer or winter adequacy forecast has been made so far. Long-term adequacy assessments will be done by TenneT on a legal basis every year 15 years ahead (Monitoring Security of Supply). As a grid manager, TenneT also publishes a 7 years ahead capacity plan (Quality and Capacity Plan) in order to provide an inside view on how to create a well-functioning electricity transport high voltage grid for all suppliers and market players concerned. TenneT also published a vision document (Visie 2030) with a much broader horizon of TenneT's vision on how and why to design an adequate grid.
In the short term, TenneT has to balance the total system of supply and demand. Therefore this balance will be calculated just before the actual period, not as a summer or winter outlook, but when adequate measures can be met based on actual events.

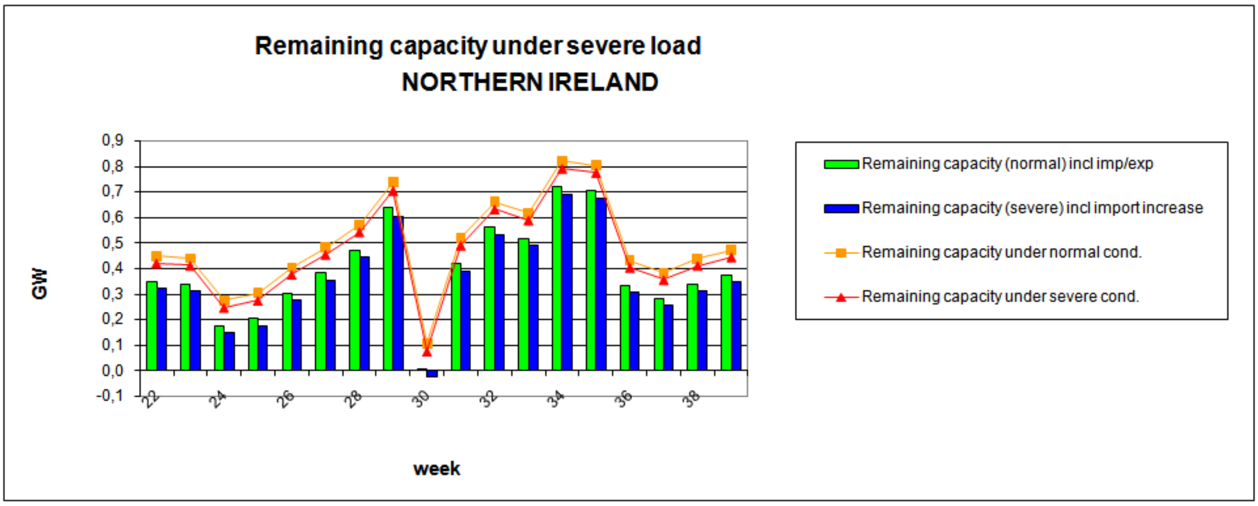
TenneT TSO B.V. does foresee some problems within the national system of the Netherlands in the coming summer which will be managed using the congestion management process within the network.
There is a fair chance of cooling water restrictions for river-located plants after longer periods of reduced precipitation and high summer temperatures. Their maximum output capacity could then be reduced by restricted condenser outlet temperatures. This affects only a reduced part of larger plants, because most of them are in coastal locations, where until now there have been no cooling water restrictions. Due to learning effects, the market now schedules maintenance of these generators in off-summer periods. Since last summer the cooling water restriction policy has changed to a decentralized approach, with less expected reduction of affected generation capacity.

New interconnector

A new bipolar interconnector has been built between Great Britain and the Netherlands, the BritNed cable. It consists of two bundled high-voltage cables and will have a capacity of 1000 MW and a total length of 260 kilometres. The high voltage cables transport electricity in both directions. The cable has been laid beneath the North Sea and will run from a converter station at the Isle of Grain, located on the south-eastern coast of Great Britain, to a converter station at the Maasvlakte near Rotterdam in The Netherlands. BritNed is a joint venture between National Grid and TenneT.

NORTHERN IRELAND





Current SONI plans anticipate no significant problems on the system this summer. At present there are no events envisaged that could be regarded to represent a high risk period to SONI.

To ensure that peak demand is met in Northern Ireland, SONI may be dependent upon imports on the Moyle interconnector and/or the North-South tie line. This dependency would impact upon Great Britain via the Moyle interconnector and the Republic of Ireland via the North-South tie line.

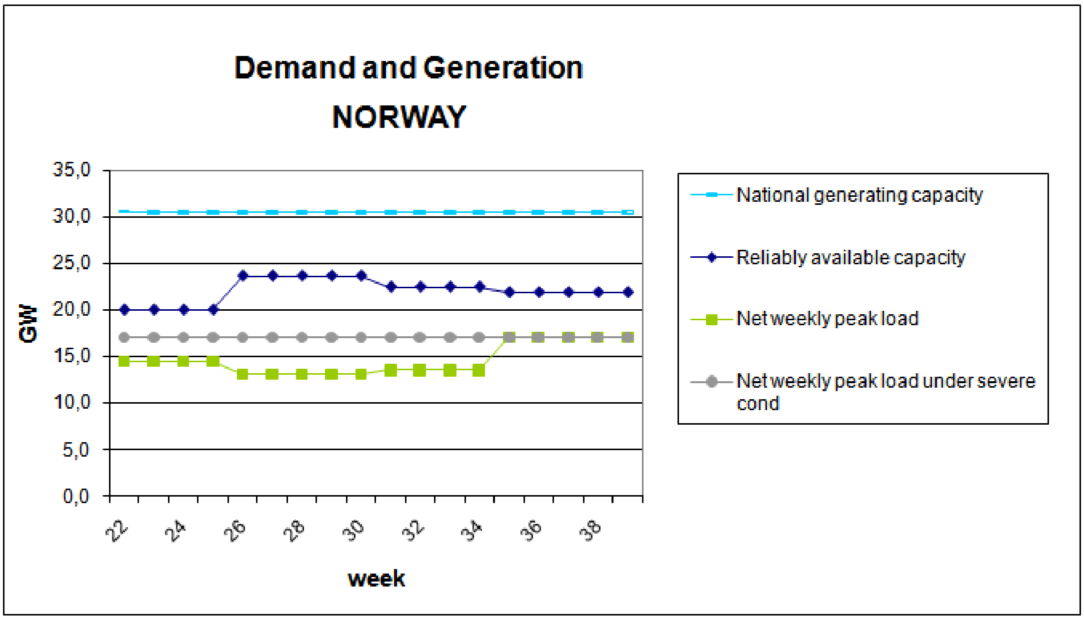
An outage on one of the two circuits on the Moyle Interconnector is planned to take place in August and a single circuit outage of the double circuit is planned for July on the North-South tie line. However, SONI have contingencies in place to cover these.

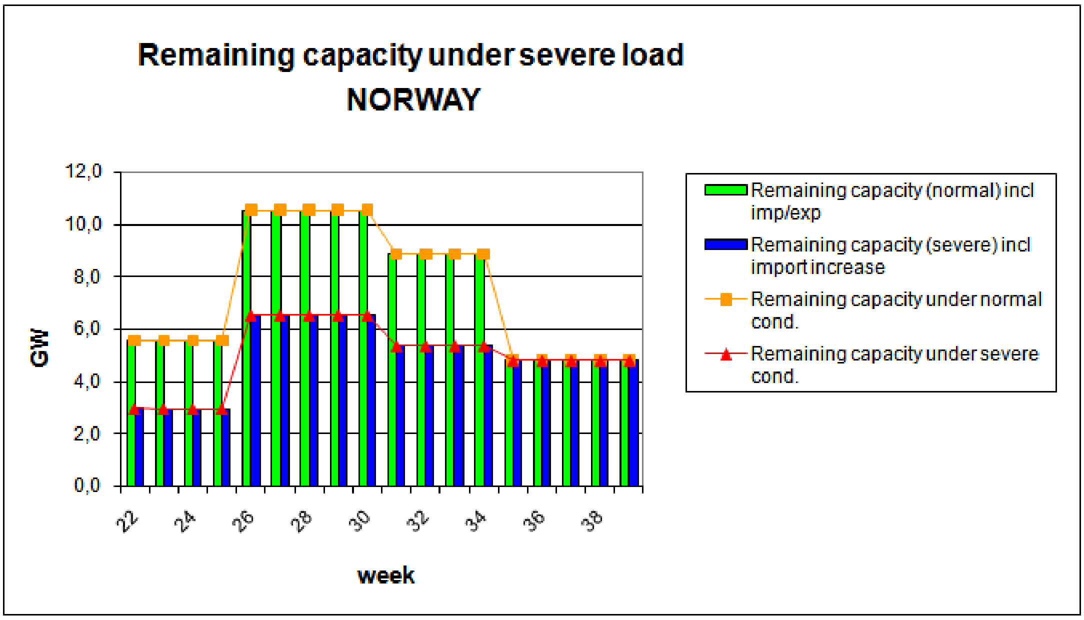
While there are a number of outages of generation units this year, there is sufficient spare capacity to deal with unexpected forced outages.

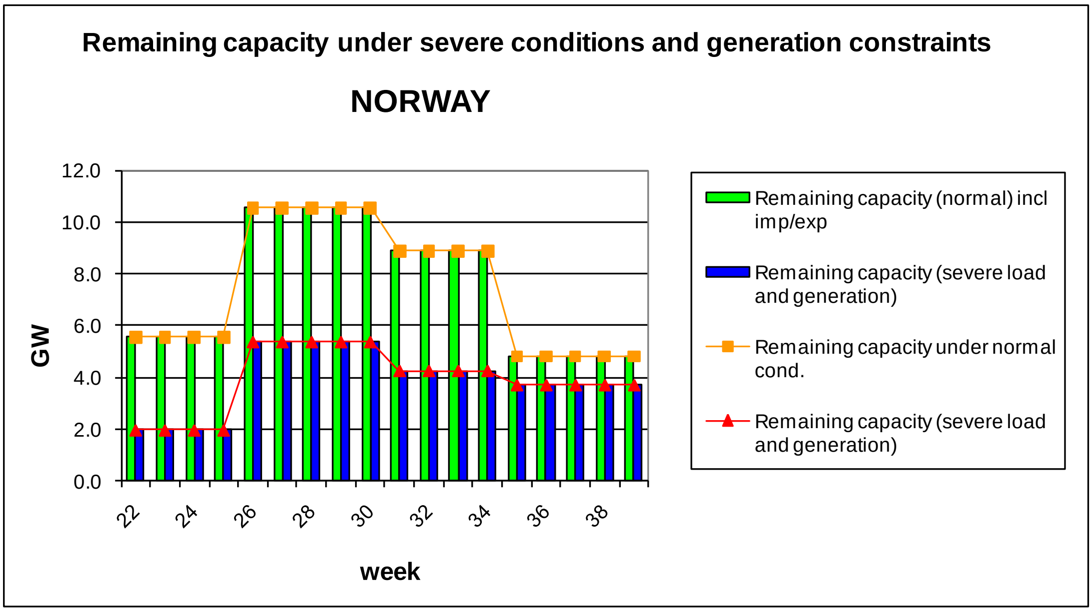
Due to the ongoing implementation of government austerity measures and spending cuts, the electricity demand for the summer period in 2011 is not anticipated to exceed the levels experienced during the summer period in 2010 given the continuing uncertainty in the growth of the economy.

As Northern Ireland does not have large-scale hydro generation, no reduction of the planned reliably available generation capacity during the summer period is expected.

Norway

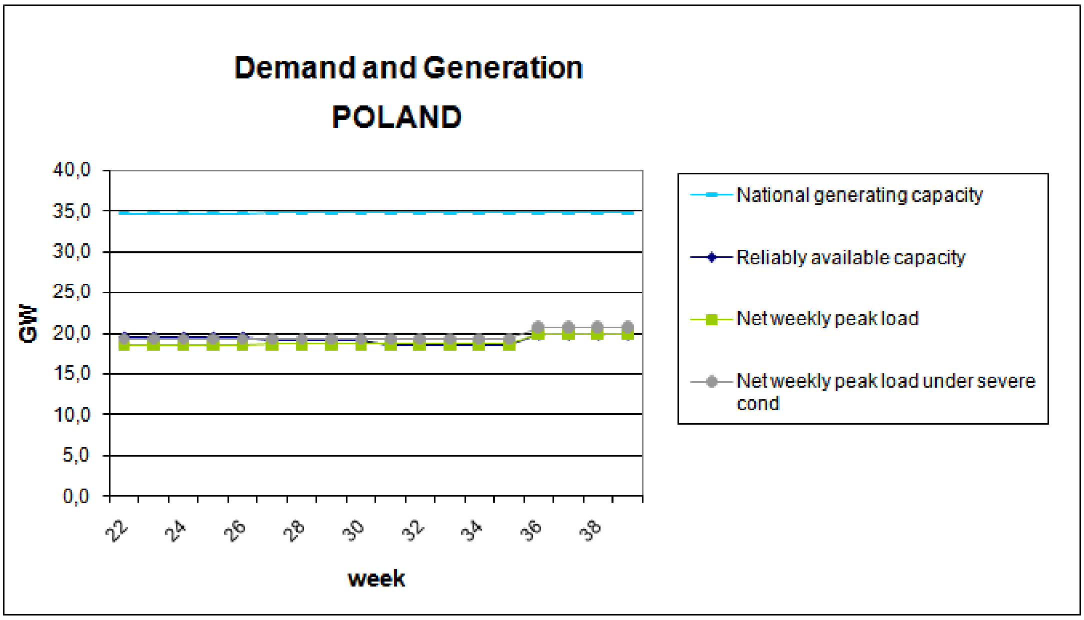

Demand and Generation
NORWAY
GW
35,0
30,0
25,0
20,0
15,0
10,0
5,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

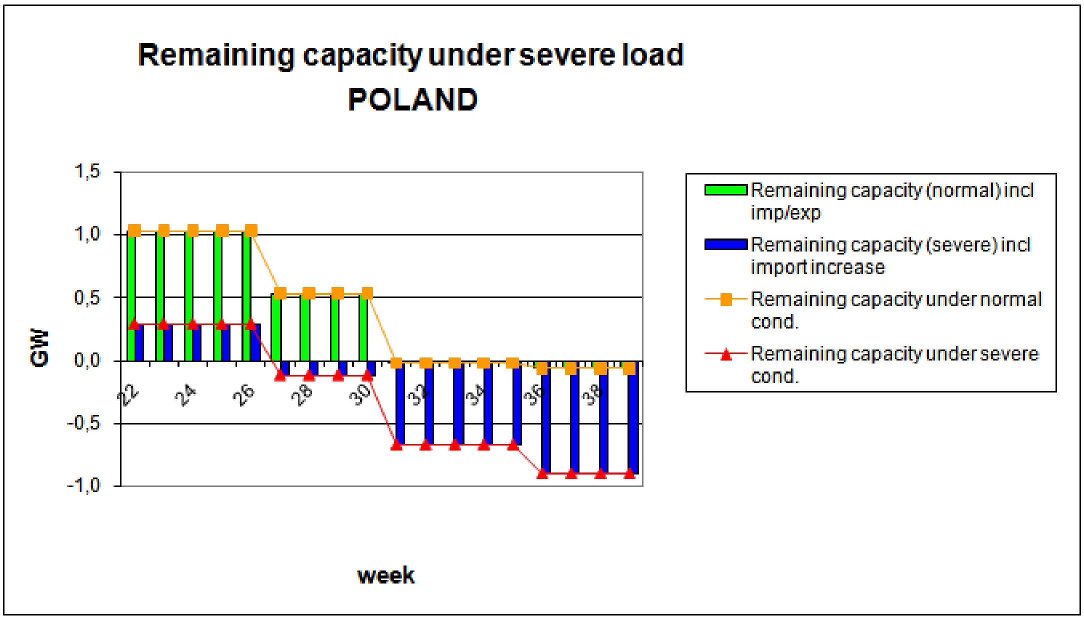

Remaining capacity under severe load
NORWAY
GW
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

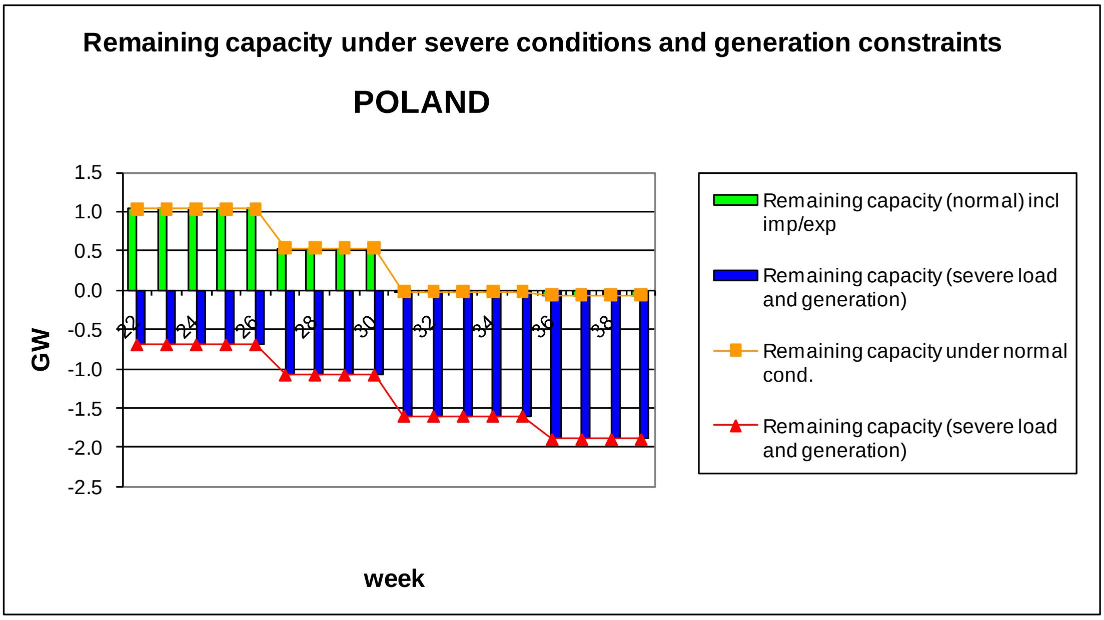


Norway is normally self-supplied during the summer. However, due to an extremely low hydro-reservoir situation, imports from neighbouring countries are expected during the summer. The power balance is very positive. Also, for the next winter a large import during the summer and the autumn will probably be necessary to secure an adequate winter energy balance.

POLAND


Demand and Generation
POLAND
GW
40,0
35,0
30,0
25,0
20,0
15,0
10,0
5,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
POLAND
GW
1,5
1,0
0,5
0,0
-0,5
-1,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



<u>Short explanation of the framework and the method used for making the summer adequacy assessment</u>

In Poland no special assessments for summer are made. Forecast plans (yearly[2] coordination plans) are done for the whole year on a monthly basis (average values from working days at peak time), until 30 November every year. Data provided for this report are based on February's updating of the yearly coordination plan 2011.
On 26th every month Polish TSO publishes monthly[2] coordination plans, which include the precise information on peak time for all days of the next month. Further specification takes place in the operational planning.
The Polish TSO presents values divided into weeks; however, the weekly data for each month are the same (except for interconnection capacity – weekly data are provided):

- For June – weeks 22 to 26
- For July – weeks 27 to 30
- For February – weeks 31 to 35
- For March – weeks 36 to 39

<u>Generation – Demand Balance</u>

During summer 2011, in normal conditions, the Polish TSO does not expect significant problems in operation and is able to balance the system by itself without electricity import. The imbalance seen on the graph during August and September is the result of the increased peak load at the end of the summer (lower temperature, peak load in the evening) and the fact that overhauls are continuing and Combined Heat & Power plants have not started yet. However, in late August and September, the evening peak period is very short and the PSE Operator can use the intervention reserve in pumped-storage hydropower stations to cover the peak demand. This intervention reserve is part of the system services reserve, which the Polish TSO has at his full disposal.

Severe conditions, mainly in June and July, that are extremely high temperature and dry weather, may cause not only an increase in the forecast load (see demand under severe

[2] System balance plans (published on PSE Operator S.A. web site)

summer conditions on the graph above) but also a higher level of unavailability of units caused by:

- restrictions in operation due to a too high cooling water temperature in certain thermal power plants (i.e. an increase in the non-usable capacity) as well as a low level of natural sources of cooling water,
- limitations due to transmission network constraints (i.e. increase in non-usable capacity).

In case of the forecast problem with balancing the system, the PSE Operator, as the owner of the grid, can postpone (at the planning stage) or discontinue (operational) the grid overhauls which decrease transmission capacity (result: decrease of non-usable capacity).

In case of an emergency situation, there are agreements concluded between the PSE Operator S.A. and neighbouring TSOs for emergency energy delivery.

<u>Role of interconnections</u>

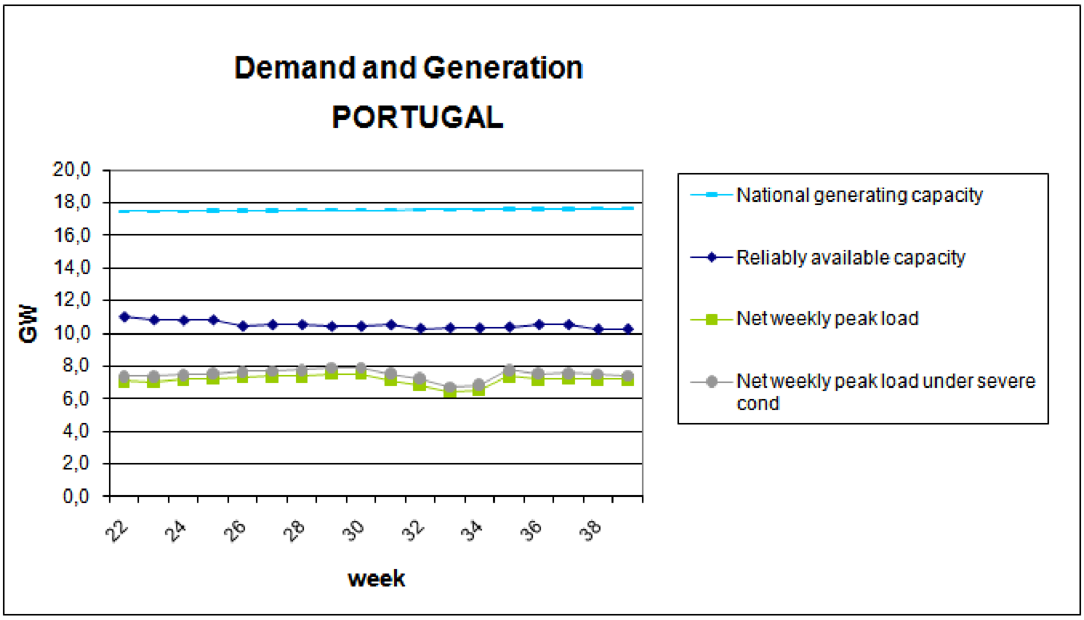
Interconnection Capacity

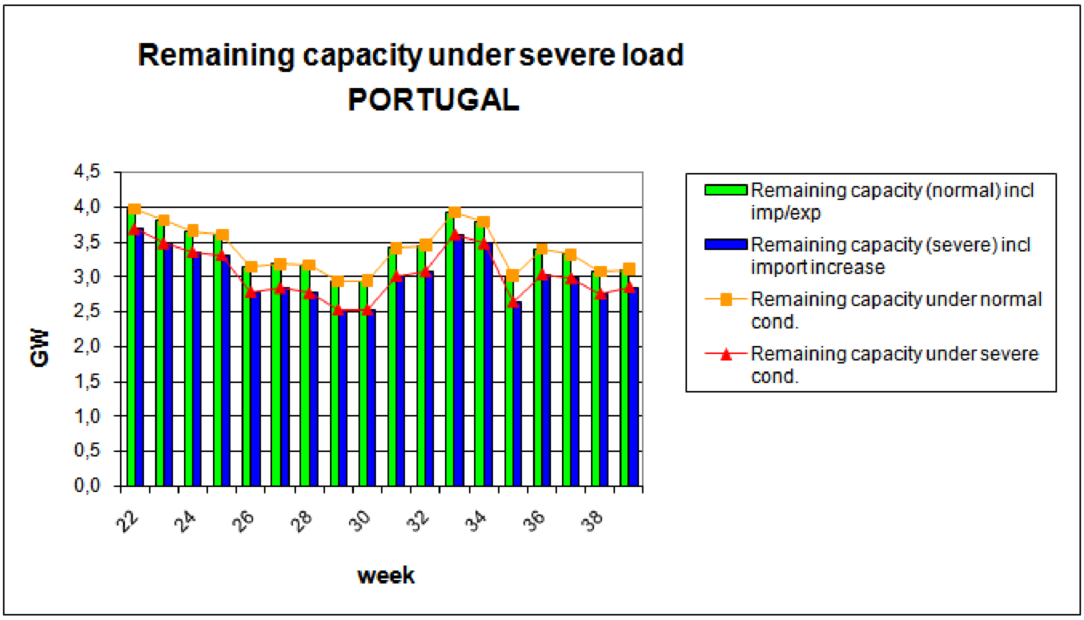
PSE Operator S.A. provides aggregated NTC data for the whole 220/400 kV synchronous PL - DE/CZ/SK profile. Import and export capacities include also the capacities of the 220 kV line PL-UA (radial operation) and the PL-SE DC link (commercial interconnection).

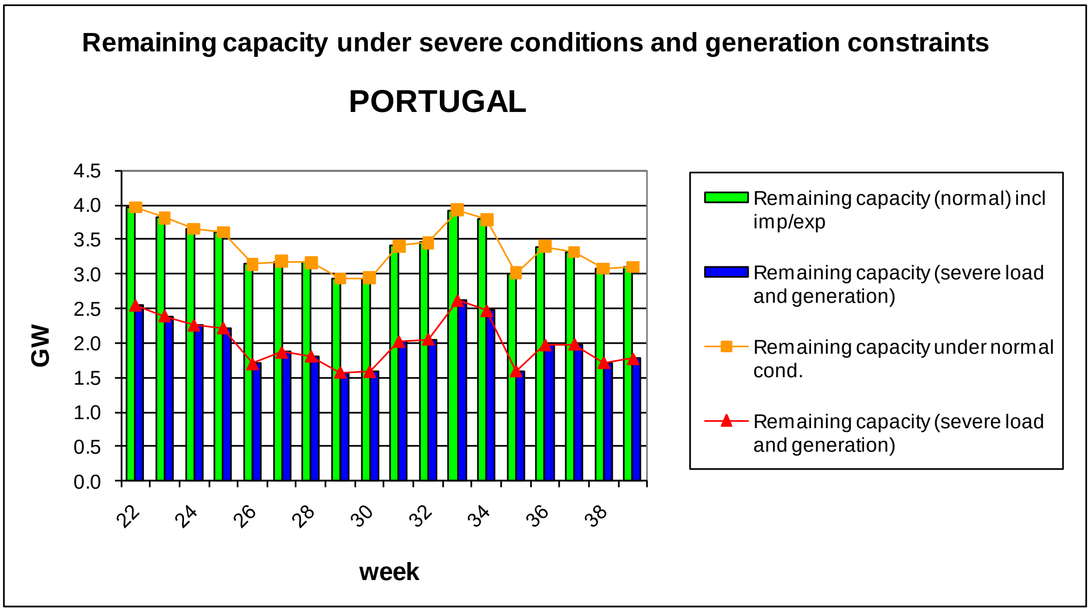
Directions / weeks	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
DE/CZ/SK → PL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PL → DE/CZ/SK	700	700	1100	1000	1100	1100	1100	300	300	300	300	900	900	900	1100	300	300	900
UA → PL	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220	220
PL → UA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SE → PL	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	0	0	0
PL → SE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum of PL import	820	820	820	820	820	820	820	820	820	820	820	820	820	820	820	220	220	220
Sum of PL export	700	700	1100	1000	1100	1100	1100	300	300	300	300	900	900	900	1100	300	300	900

The values (in MW) presented in the table above are based on the yearly forecast by NTC, prepared every year up to the end of November. These values take into account network constraints caused by planned switching off of the internal/international lines (or other elements), which limit technical capacity on the Polish profile. Data for the synchronous profile are published on the PSE Operator website.

PORTUGAL


Demand and Generation
PORTUGAL
GW
20,0
18,0
16,0
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

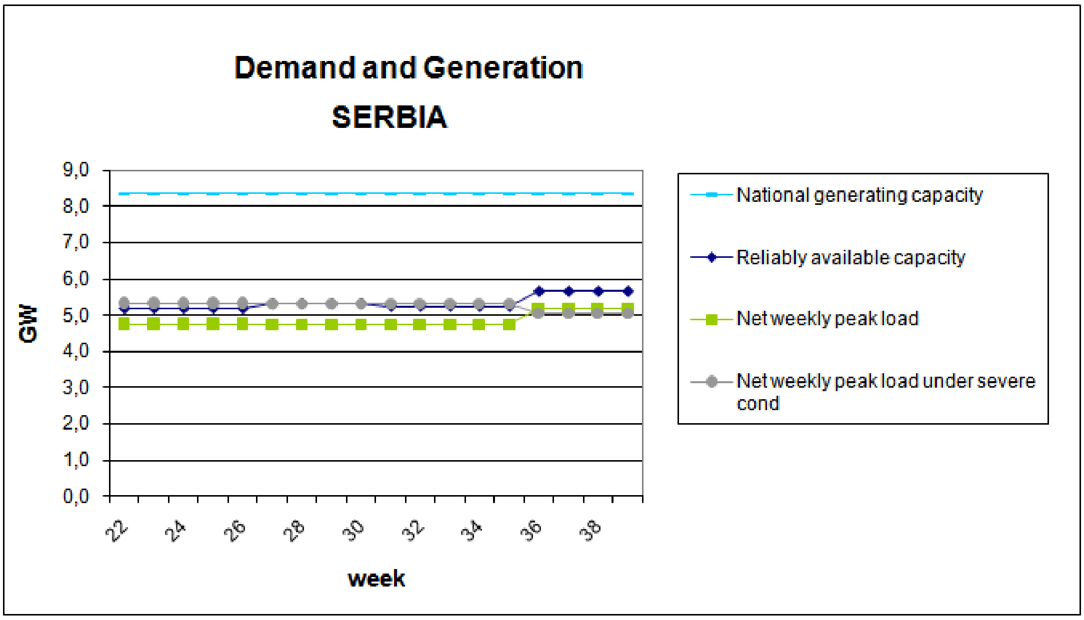

Remaining capacity under severe load
PORTUGAL
GW
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

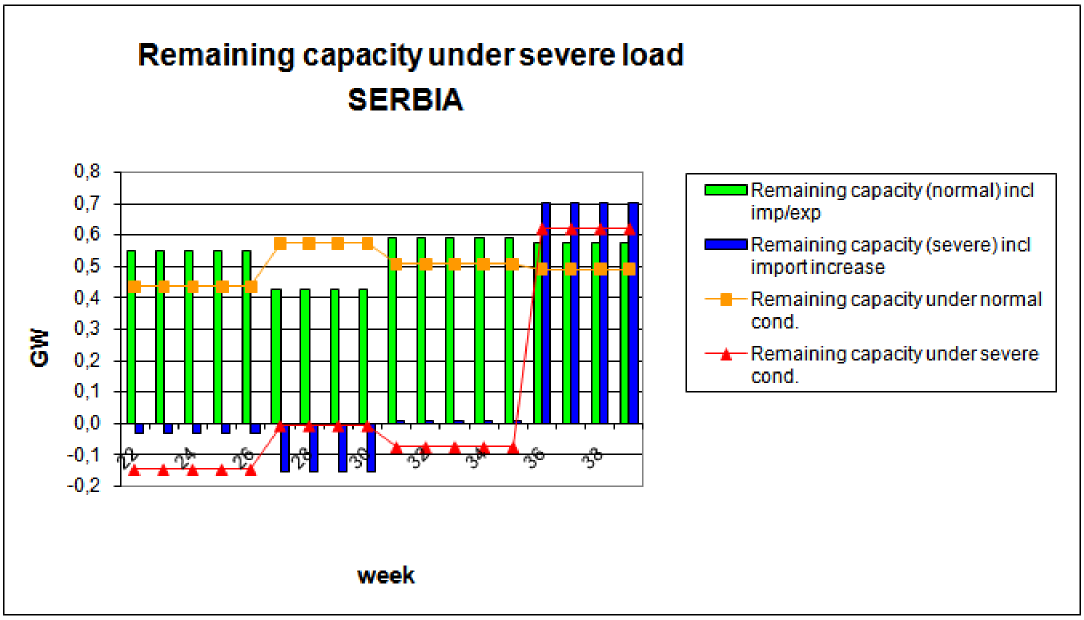


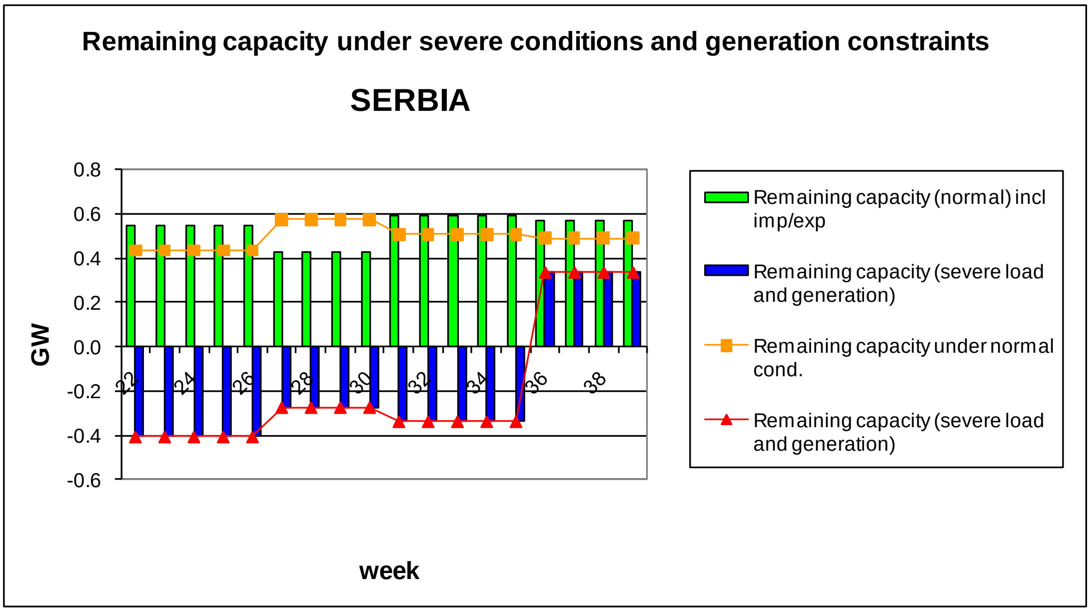
No difficulties are expected to occur on the system's operation this summer. Considering an extreme load scenario, remaining capacity has a minimum of 14 % in weeks 30 and 31. Under normal conditions the margin is 19% on average over the summer period. As Portugal has no nuclear installed capacity, stress tests are not relevant.

All our studies have been made without including the importable capacity, so the availability and reliability of neighbouring sources, in particular nuclear sources, have no impact on system adequacy.

Republic of Serbia





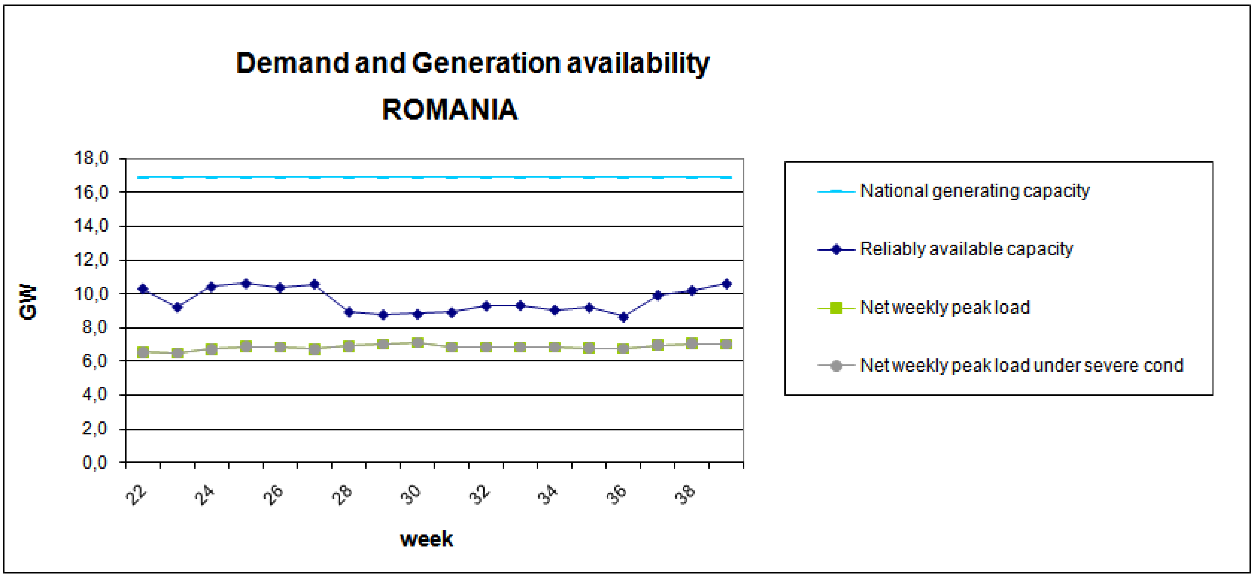


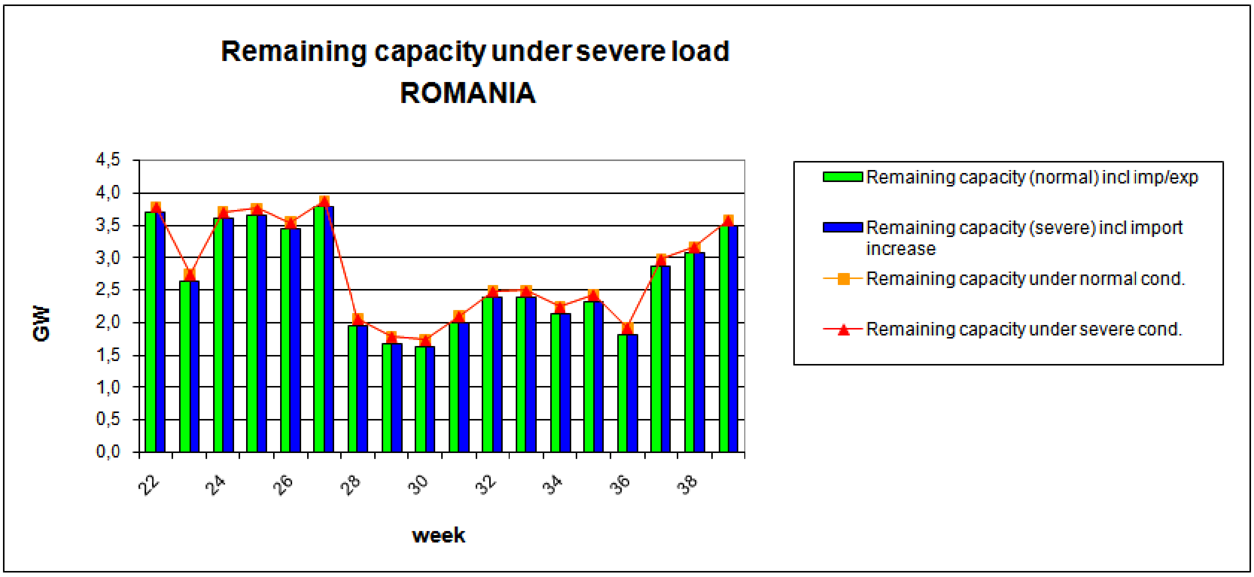
Past experience shows that demand is always covered during the summer period so the TSO does not expect any significant problems in the Serbian power system. Even in severe weather conditions, the TSO will be able to deal with the situation.

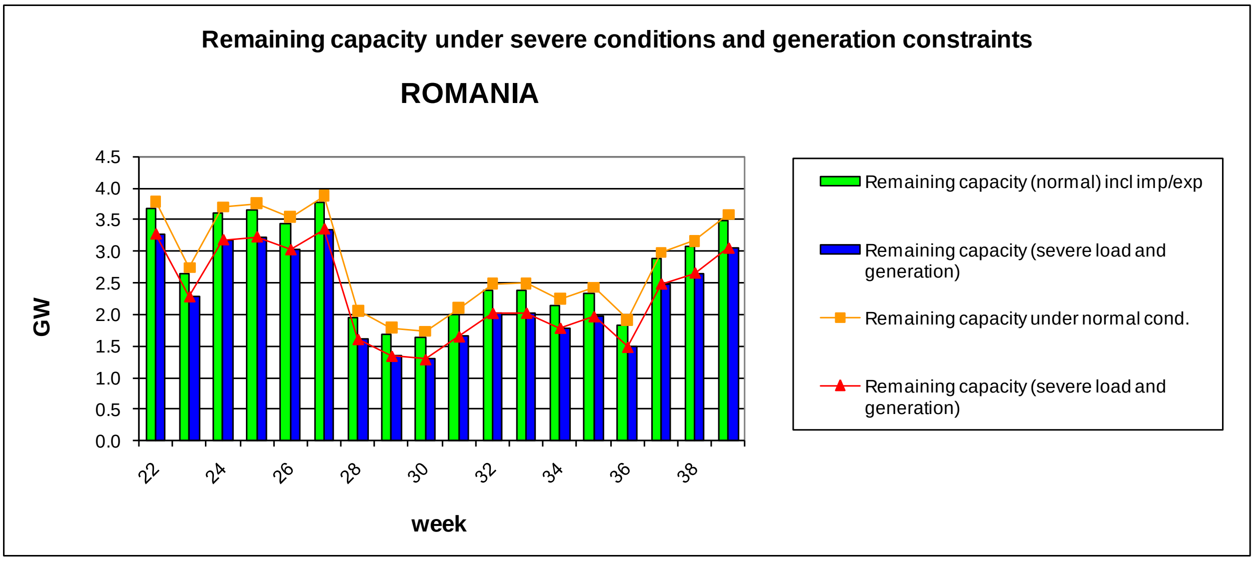
The long-term contract between the Serbian generation company EPS and the Montenegrin generation company EPCG, which covers the neighbouring control area of Montenegro which includes use of the Piva hydro power plant, is still in force.

According to this contract, energy is exported from the Serbian control area to the Montenegro control area and in exchange EPS has the right to use the Piva hydro power plant.

Romania


Demand and Generation availability
ROMANIA
GW
18,0
16,0
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond

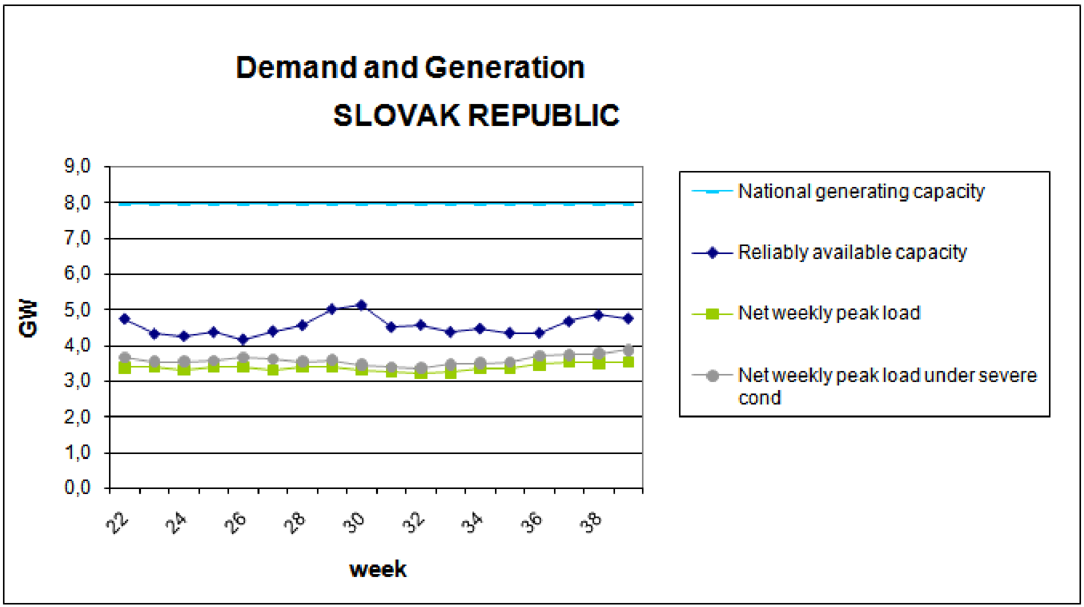

Remaining capacity under severe load
ROMANIA
GW
4,5
4,0
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

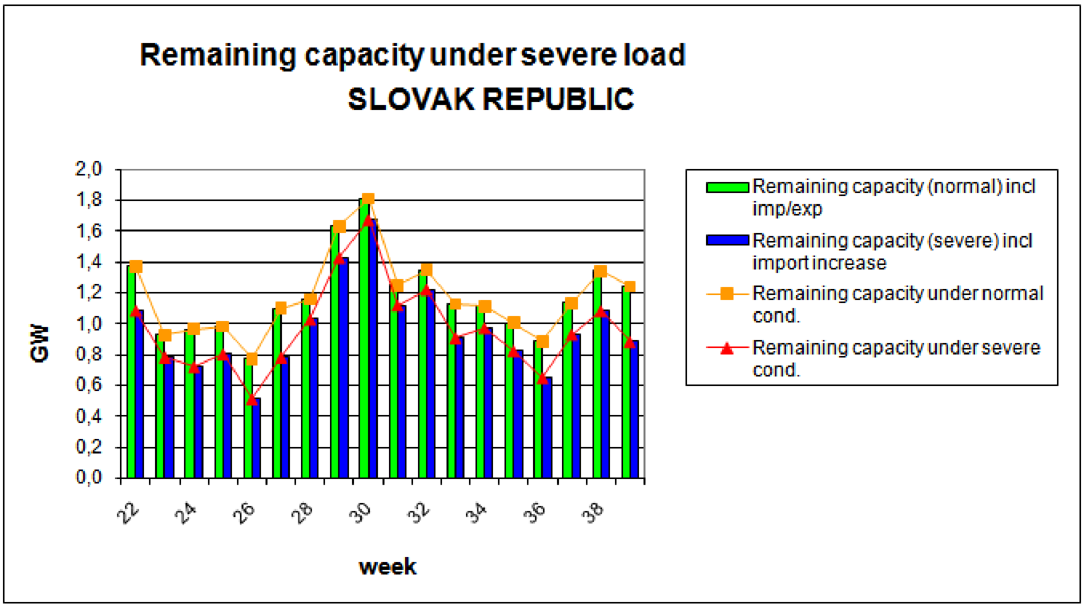

Remaining capacity under severe conditions and generation constraints
ROMANIA
GW
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe load and generation)
Remaining capacity under normal cond.
Remaining capacity (severe load and generation)

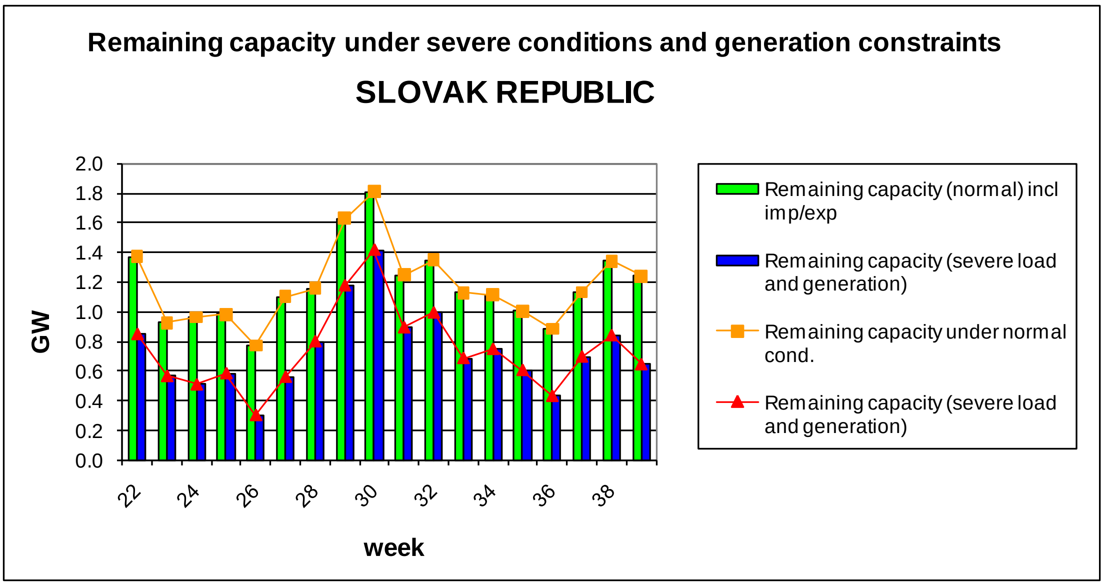
The forecast for summer 2011 does not indicate any problem which could affect the Romanian power system adequacy.

There are agreements with neighbouring TSOs to provide emergency help to the amount of 100 MW, each to the other.

SLOVAK REPUBLIC





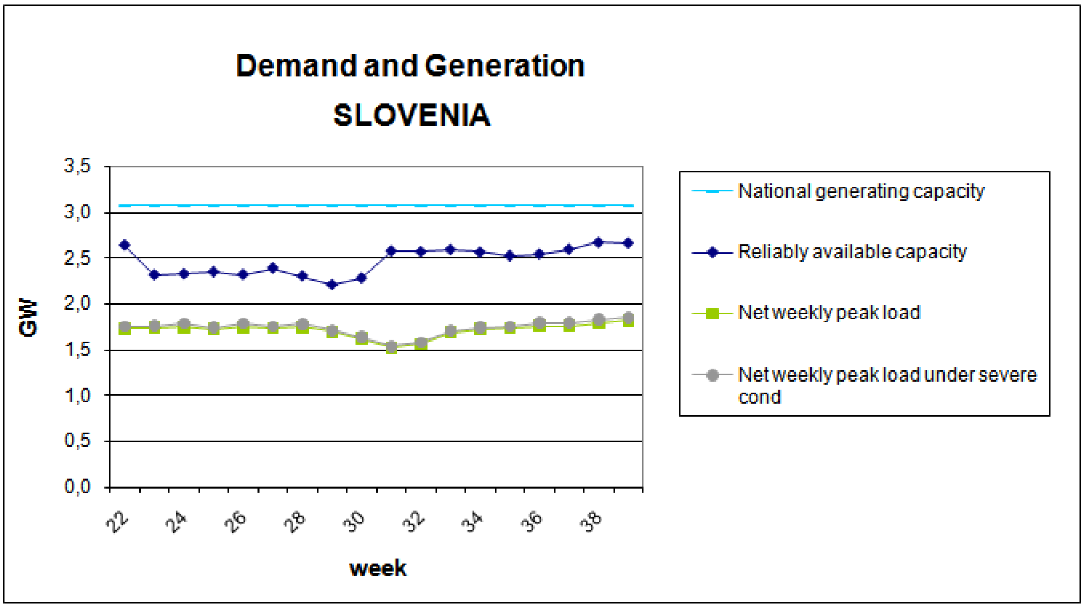


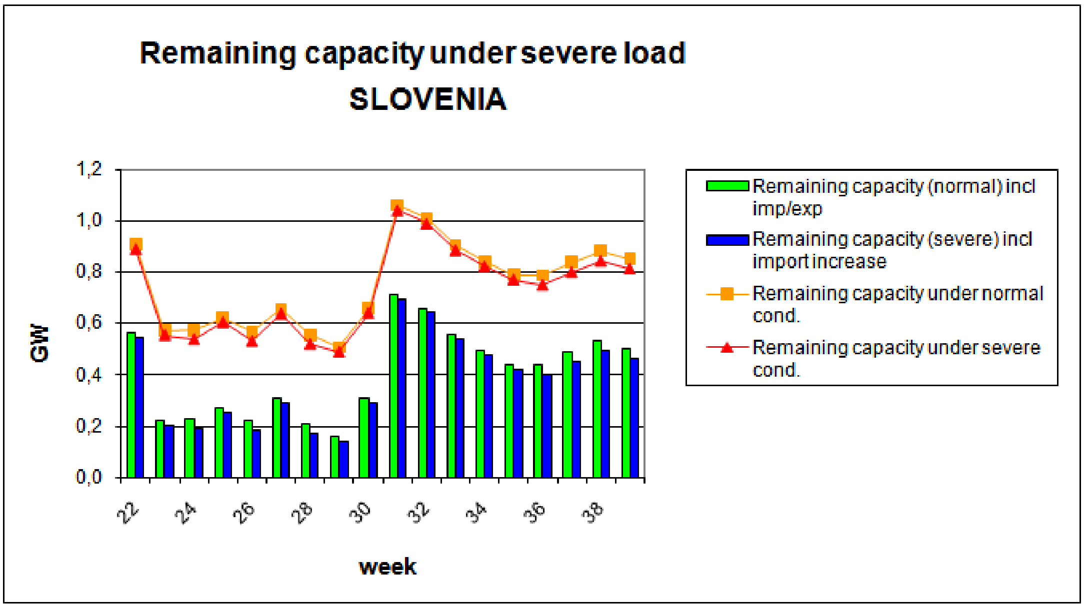
No particular problems regarding the load/generation balance are expected in the power system of Slovakia in summer 2011. Critical periods in the coming summer are not expected either in normal or severe weather conditions.

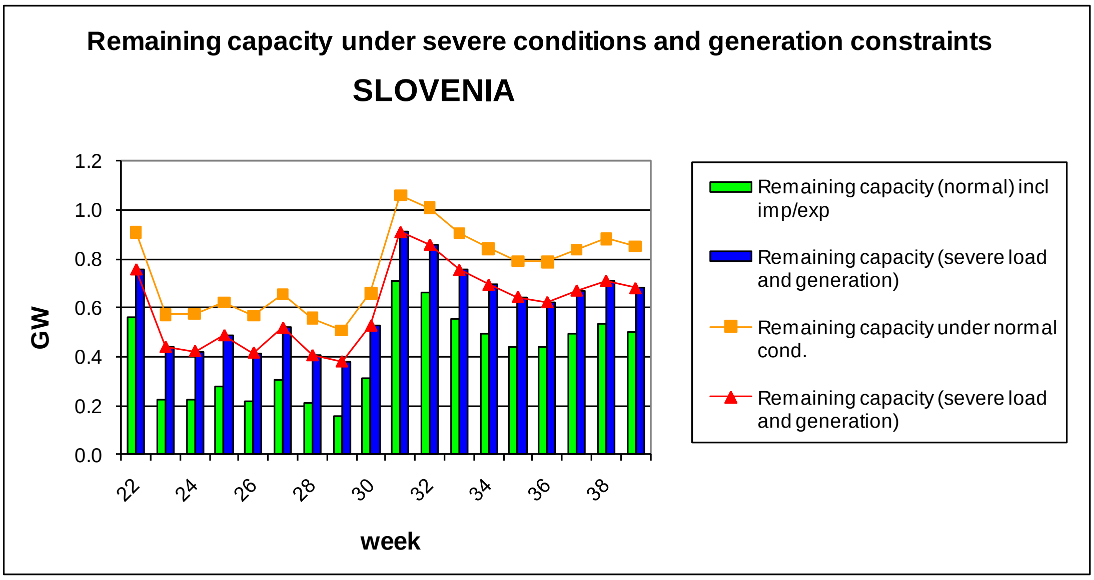
The summer load in normal conditions for this outlook is foreseen as higher (+4 %) than in 2010. The scenario in severe conditions was also analysed. In a normal scenario (normal climate conditions) and also in severe climate conditions the generation capacities are sufficient for all weeks.

Last year the Slovak Republic was an importer of electricity, 3.62 % of total consumption (in the summer it was 1.7 % of total consumption). This summer, higher electricity imports are expected mainly during July and August, when overhauls of units in nuclear power stations are planned. Despite the RAC parameter (reliably available capacity), the Slovak transmission system is expected to be sufficient for this period in 2011, and imports of electricity are anticipated most probably due to the long-term import contracts. Cross-border capacities are sufficient for this purpose, also for export. No changes concerning the volume of cross-border capacities are planned (e.g. new tie-lines or decommissioning of interconnection lines).

SLOVENIA


Demand and Generation
SLOVENIA
GW
3,5
3,0
2,5
2,0
1,5
1,0
0,5
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
SLOVENIA
GW
1,2
1,0
0,8
0,6
0,4
0,2
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



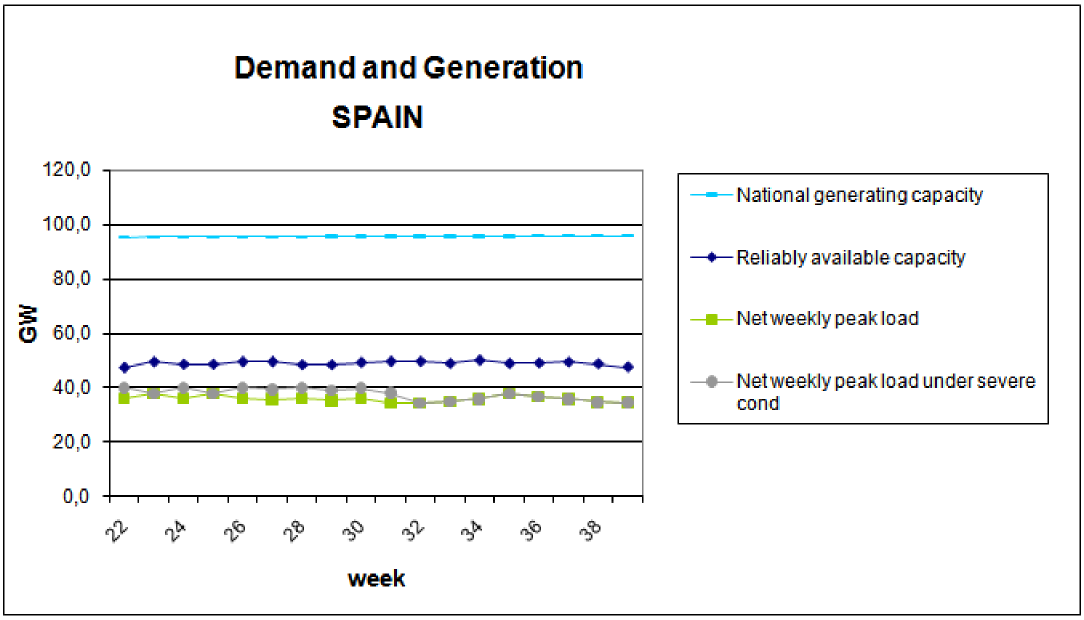
No problems are expected in normal conditions. Higher imports are expected in case of extreme low hydrology and high air temperatures in the summer.

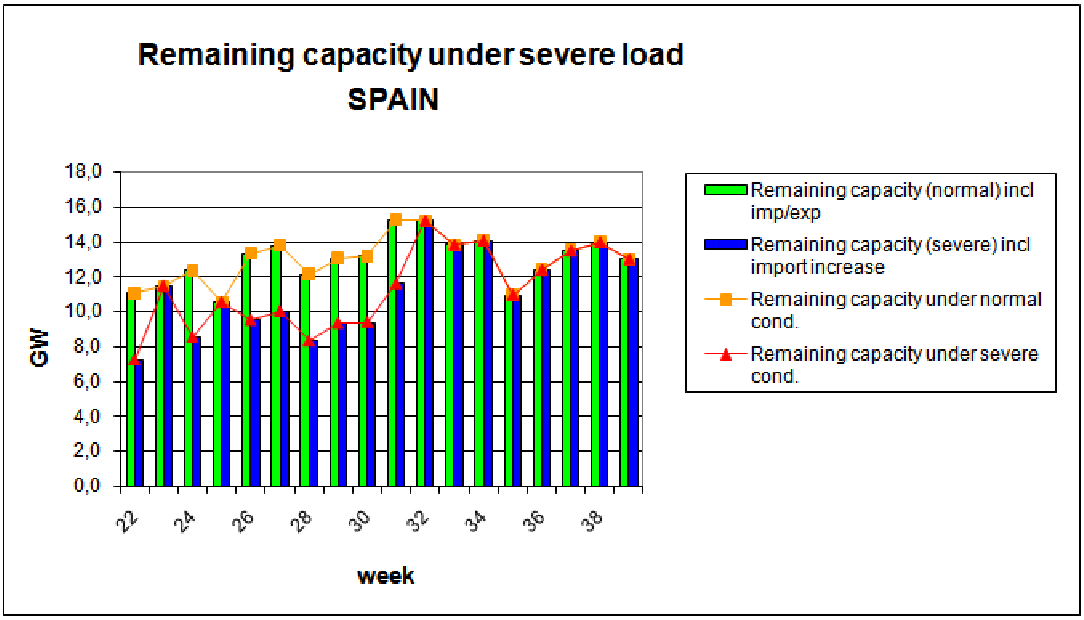
Firm export contracts represent half of the generation in the nuclear power plant at Krško. Its ownership is equally divided between Slovenia and Croatia, so half of its generation is delivered to Croatia in accordance with the bilateral agreement.

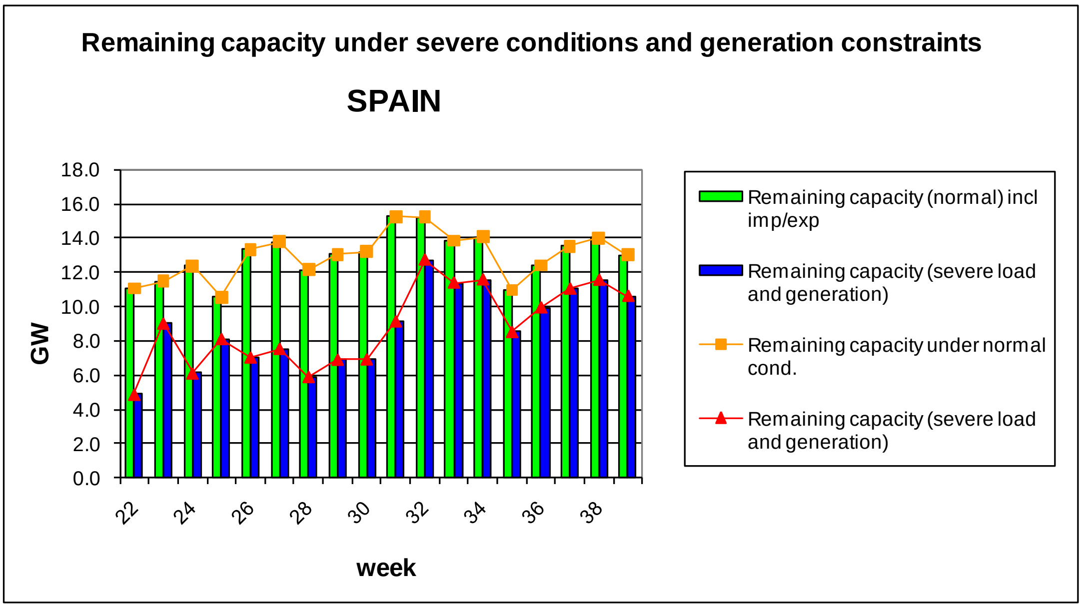
On the statistics data basis, imports usually take place on the Austrian and Croatian border. In extreme drought over a wide European region, power flows can reverse and imports from Italy are possible.

All maintenance work on network elements was scheduled on the basis of past experience. In normal operation conditions, no problems are anticipated on the network level during summer 2011.

SPAIN





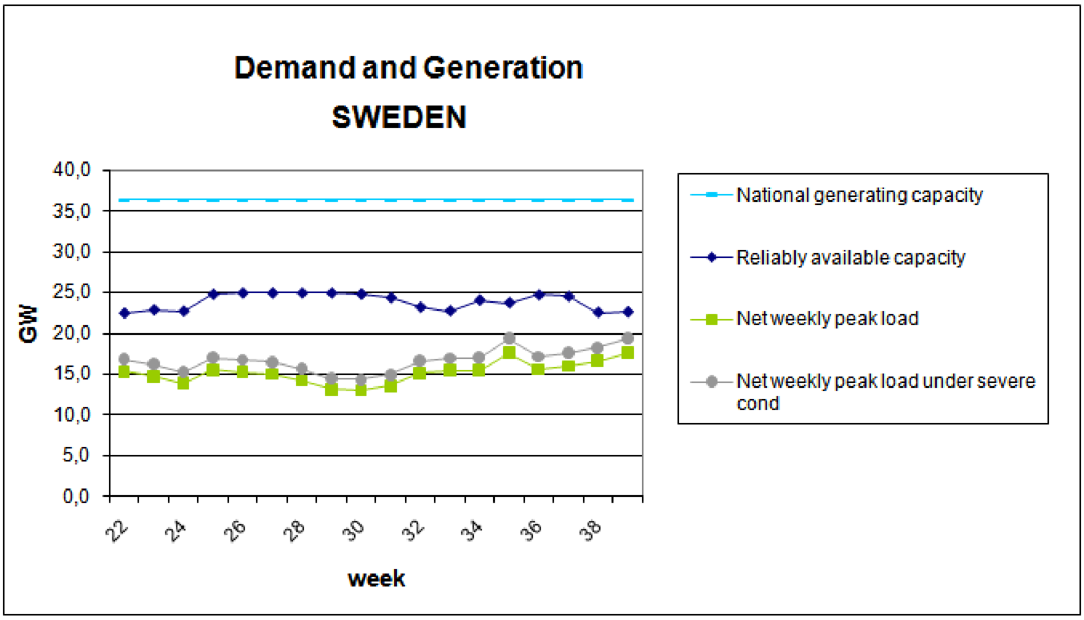


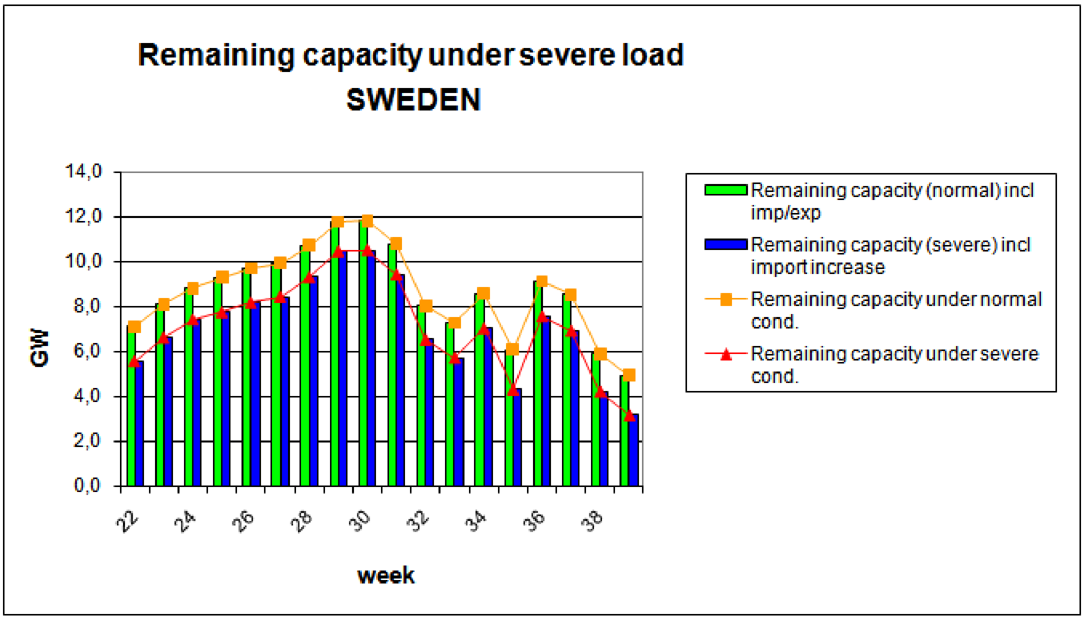
From the point of view of generation adequacy, the situation in the Spanish peninsular system is not critical for the coming summer, even considering very low wind generation (95 % probability), severe drought conditions and a very high thermal forced outage rate.

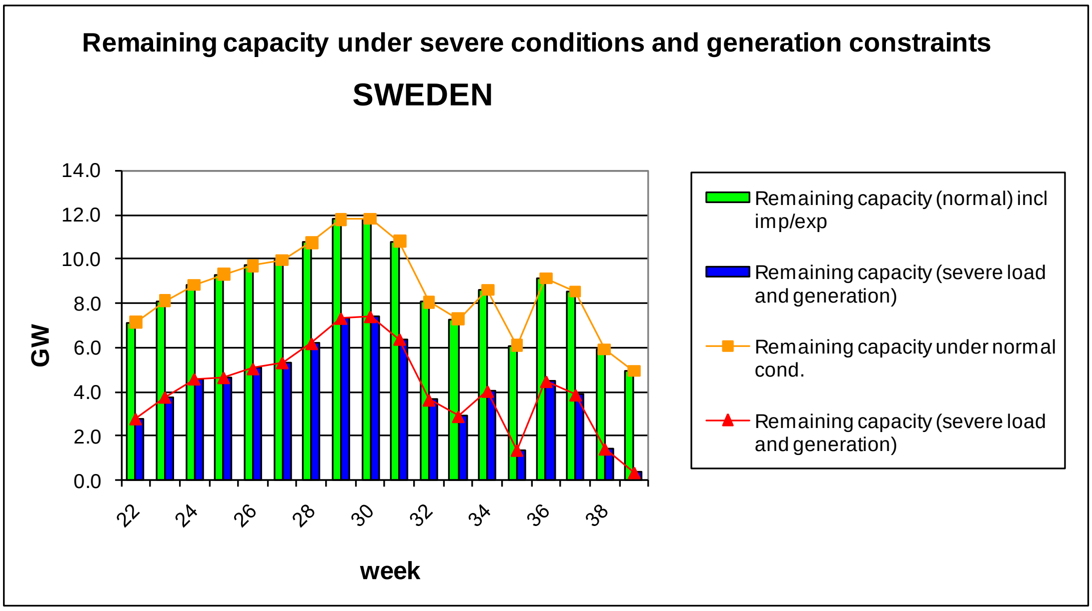
Even in extreme conditions, problems meeting load are very unlikely to happen in any week of the period. The expected demand is similar to the previous summer. Besides, less than three months ahead of summer, the hydro reserves are much higher than the average level and water inflows from melting snow are expected to be high.

Good generation/demand adequacy can be expected regardless of imports from neighbouring countries.

SWEDEN


Demand and Generation
SWEDEN
GW
40,0
35,0
30,0
25,0
20,0
15,0
10,0
5,0
0,0
22
24
26
28
30
32
34
36
38
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity under severe load
SWEDEN
GW
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.



In Sweden the highest loads occur during the cold winter. Therefore, maintenance of power plants is often done during summer. This means that the available capacity is lower during the summer than during winter. Nevertheless, the available generation capacity is usually much higher than the load during summer.

Svenska Kraftnät schedule planned outages during the summer to avoid system transmission constraints. No critical situation is expected to occur this summer. However, a couple of planned outages may be worth mentioning, as they will significantly reduce the capacities in the Swedish cross-sections.

Week 24

A new substation in Hurva will be built within the South-West Link project. During week 24 (18 June) two power lines will be out of operation, resulting in a narrow margin in the regional power balance in the southernmost part of Sweden. The import and export will be limited to and from Denmark, Germany and Poland.

Week 30 – 32

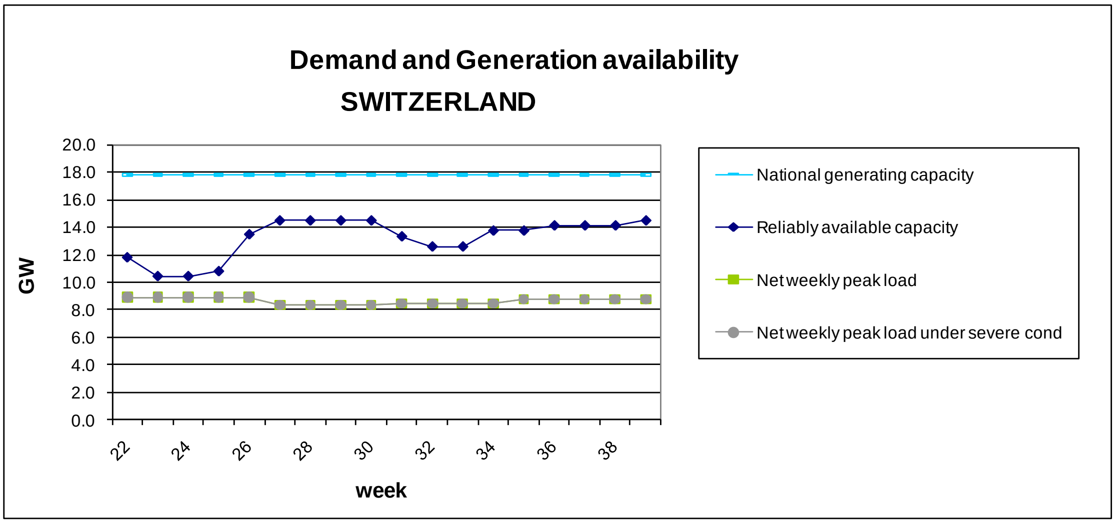
During weeks 30-32, outages of different 400 kV lines along the Swedish west coast will reduce the capacity in the West Coast Corridor. The transmission capacity for transit from Denmark, Germany and Poland to southern Norway will also be limited. In addition the possible transmission capacity on cross-section 4 will be limited.

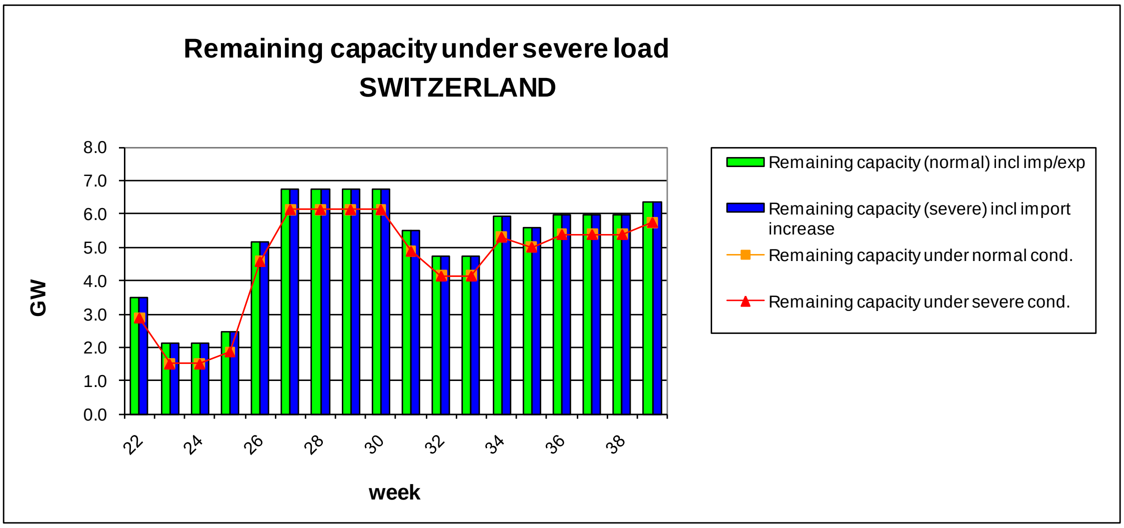
Week 39

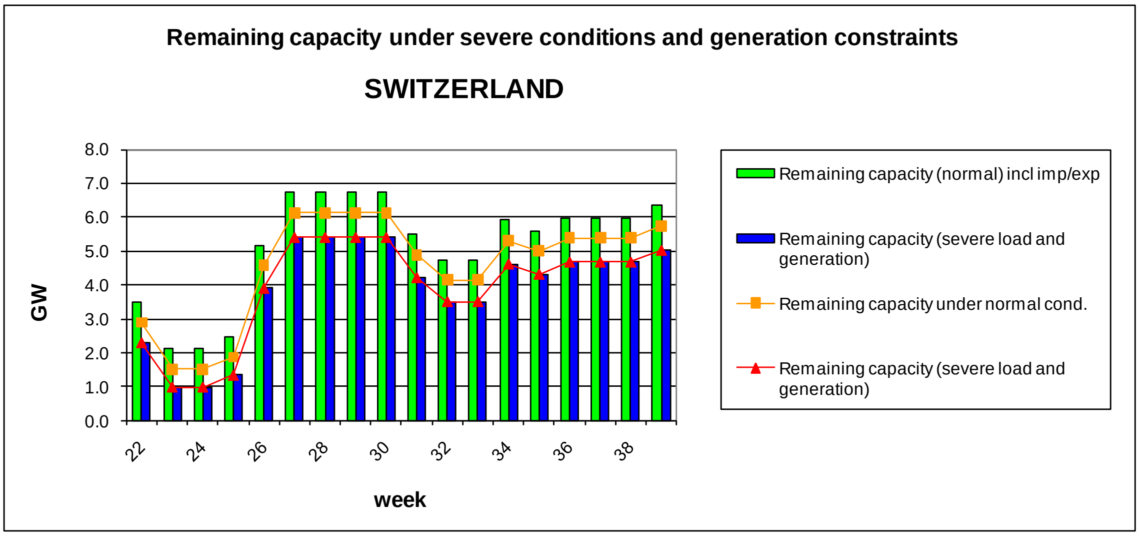
The operation of the new cable between Sweden and Finland, Fenno-Skan 2, will be tested during a period starting on 15 August.

In addition to the above-mentioned situations, maintenance of power lines and substations will result in limitations of the possible transmission capacity on the interconnections to the neighbouring countries. This is coordinated through regular meetings and the limitations will not affect the system adequacy.

SWITZERLAND

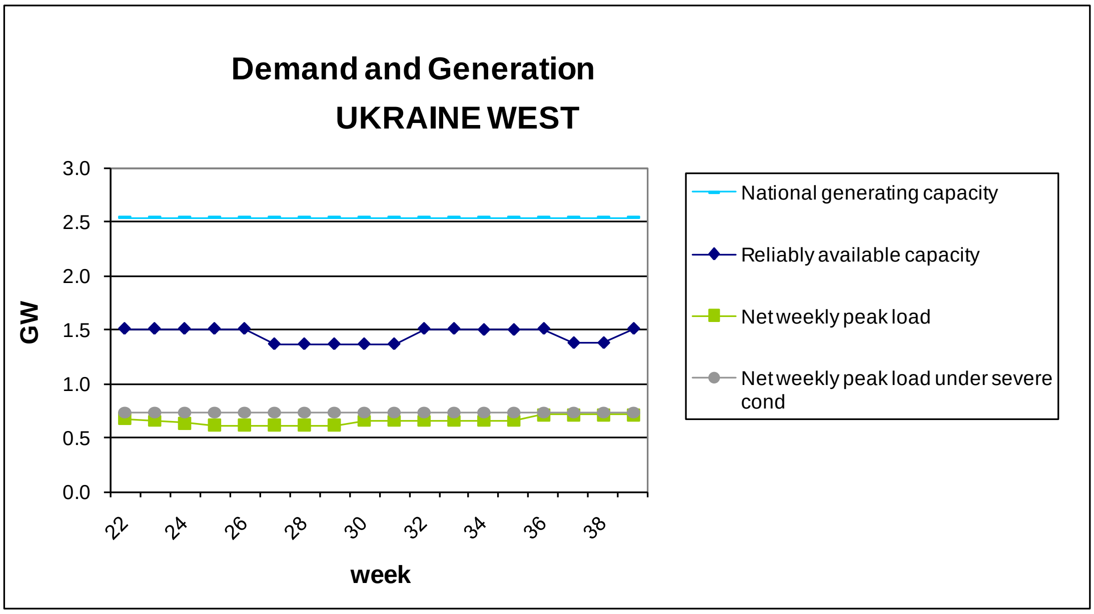


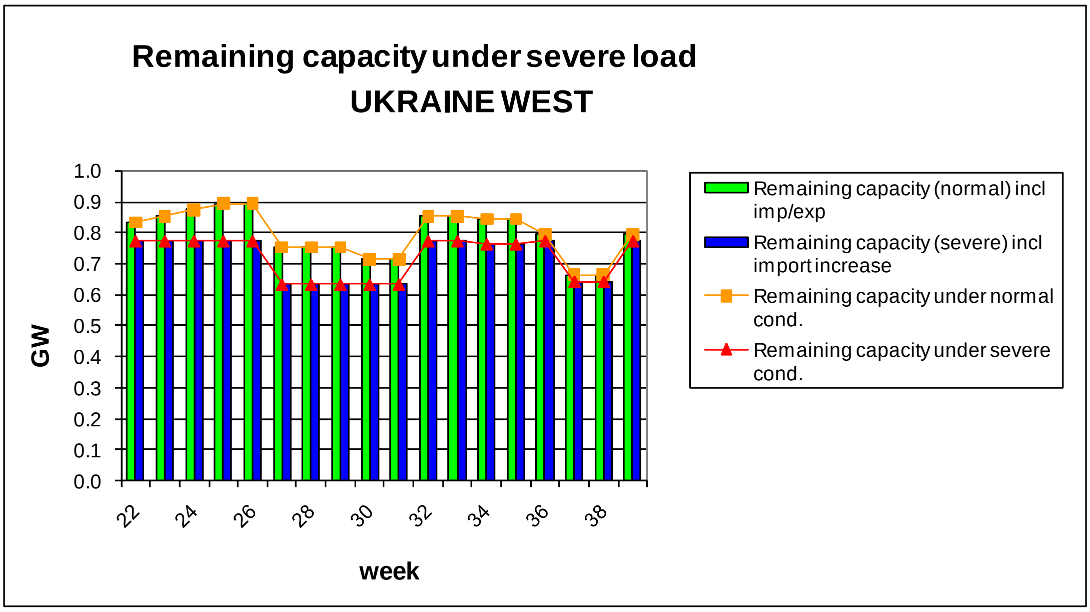


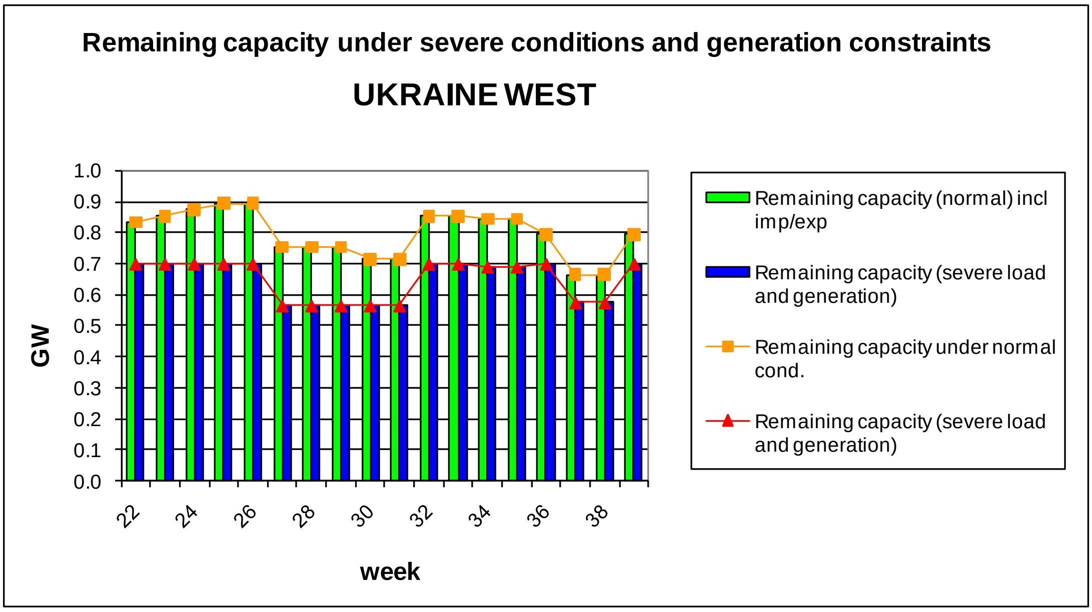


No problem concerning generation adequacy is expected in summer 2011 by the Swiss TSO.

UKRAINE WEST






Remaining capacity under severe conditions and generation constraints
UKRAINE WEST
GW
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
22
24
26
28
30
32
34
36
38
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe load and generation)
Remaining capacity under normal cond.
Remaining capacity (severe load and generation)

6.3 Appendix 3: Questionnaire and SOR 2010 Excel data Sheet

ENTSO-E
Winter Review and Summer Outlook Report 2011

Deadline for submitting answers to these questionnaires and data in the Excel file sheet is Friday, 1 April 2011.

Summer Outlook Report 2011 Questionnaire

Each year ENTSO-E reports on any matters of concern in relation to the security of the European electricity grids for the summer.

Therefore we would be grateful if you could answer the following questions regarding the summer period, which covers 31 May (week 22) to 30 September 2011 (week 39). It would be much appreciated if you could provide this information by **Friday, 1 April 2011**.

Please indicate if any of your answers should be regarded as confidential and/or commercially sensitive so that this information can be aggregated or withheld from publication.

1. Do you expect any problems (inadequate generation/demand balances, shortages of transmission capacity, very high demands etc.) on your system this summer?

2. If you expect problems, what mechanisms are in place to manage the risk (e.g. arrangements with neighbouring TSOs, market mechanisms etc.)?

3. If you expect problems, can you identify any specific weeks/time periods which are regarded as high risk?

   A spreadsheet is provided below and it would be helpful if you could use this to indicate forecast quantitative demand/generation capacities for these weeks/periods. For convenience, you may wish only to indicate TOTAL values of generating capacity instead of separating them into different forms.

4. If you will be, or may be, dependent upon imports of electricity from neighbouring countries:
   - Can you confirm which interconnector assets/circuits are going to be relied upon?
   - Can you confirm whether there are any issues likely to affect the availability of imports (asset reliability, thermal constraints, commercial or any other issues)?

Summer Outlook Report 2011 Excel data sheet

The Excel data sheet table is aimed to provide quantitative elements with a common format In order to determine if this balance is considered at risk for the system. This table will not be published in the report; the data will be used to build the graphs attached in the appendix to the Report and illustrate the summer outlook for the country.

Please use the associated definitions in order to complete the associated Excel-table.

According to their availability, please provide these quantitative data for each week of the considered period.

Generation Available (lines 1 to 12):

The total generation capacity notified to the TSO as being planned to be available each week for the same period.

This available generation capacity could be computed according to a methodology directly inspired by the one used for the former ETSO system adequacy forecast report and within the former UCTE for generation adequacy assessment.

The following data are requested if possible:

- National generating capacity (line 1 to 6):
- Non-usable capacity at peak load (line 7): resulting from lack of primary sources (hydro, wind), insufficient fuel availability due to actual contracts, mothballed plants not in operation during the winter, with detailed values for mothballed plants and wind power.
- Overhauls (line 8): notified by generators to TSOs
- Planned available capacity (line 9) : corresponds to the generating capacity declared available by producers
- Outages (line 10): corresponds to the average statistical data resulting from short notice breakdown according to TSO experiences
- System services reserves (line 11): amount of capacity required by the TSO to provide operating response/reserves ; it corresponds to the level required one hour before real time (additional short notice breakdowns are already considered in the amount of outages).
- Reliably available capacity (line 12): result of the above data but it is possible for TSOs to only fill in this line. It corresponds to the average generating capacity which should be available for the current week to meet the load.

Additional relevant variations to the generation capacity can be mentioned so that a range of possible outcomes can be seen corresponding, for example, to scenarios covering lower availability of generating units.

Demand (lines 13-15):

- Weekly peak demands (excluding any demands on interconnectors and net of any demand management/demand price response) in normal weather conditions for the period (line 13)
- Possible load reductions in normal conditions should be mentioned (line 14).

This results in the net weekly peak load (line 15)

Remaining capacity in normal conditions (line 16):

This corresponds to the generating capacity available above net demand; it is the basis of the TSO appreciation of the generation adequacy for the current week.

Severe load conditions (lines 17 – 20):

Additional relevant variations to the demand levels are to be shown for each week so that a range of possible outcomes can been seen rather than a single forecast: it is possible to describe a scenario resulting from specified extreme weather conditions; the probability and characteristics of such a scenario should be indicated.

Role of interconnection

Specific information is collected in order to highlight the potential role of interconnection in the power balance and the possible contribution of each national system to the generation balance of the other countries.

For that purpose the following items should be covered:

- Interconnection capacity with other national systems expected to be available each week and a range of possible outcomes for interconnection power flow (line 21 - 22).

- Firm import/export contracts (line 23-26): for countries where firm import/export contracts are notified to the TSO, their influence on the remaining capacity should be mentioned.

- Information on the possibility of export reduction or import increases will give a more complete view of the situation.

- Comments on expected additional loads of interconnections due to transit-flows which affect the import/export capacity

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Winter Review 2010-2011 Introduction and Questionnaire

Following the publication of the ENTSO-E Winter Outlook report, it will be publishing a Winter Review Report.

The objective of the report is to present what happened during this winter as regards weather conditions and other factors and their consequences on the power system (temperatures, hydro and wind conditions), availability of generating units, market conditions, use/availability of interconnections and imported energy, and to compare what happened in reality with the risks identified in the Winter Outlook.

The report will be based on **narrative**; however, quantitative data to illustrate how the winter turned out against what was forecast would be appreciated (e.g. actual peak load and difference compared with forecast in normal and extreme conditions, major disturbances and their effect on generation or transmission capability, etc.). For a synchronized view of the European system, any information on the critical periods would be appreciated.

Please indicate if any of your answers should be regarded as confidential and/or commercially sensitive so that this information can be aggregated or withheld from publication.

If you are unable to provide quantitative data, then it would be very helpful if you could still provide some commentary in answer to the questions. It is understood that not all TSOs will have access to all the requested information.

It is intended to publish the report in June 2011. The enquiry should be returned to the regional co-ordinators by **Friday 1 April.**

The Winter Outlook Report (published in December 2010) is available to view at:

https://www.entsoe.eu/fileadmin/user_upload/_library/publications/entsoe/outlookreports/WO_2010-2011_SR_2010.pdf

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Questionnaire on Winter Review 2010-2011

1. General Commentary on Winter Conditions

Recalling main features and risk factors of the Winter Outlook Report, please provide a brief overview of Winter 2010-2011:

- General comments on the main trends and climatic conditions (temperatures (average and lowest compared with forecast), precipitation, floods/snow/ice).
- Did the risks identified in the Winter Outlook Report actually occur?
- Did unexpected situations arise during the winter which had an effect on the power system (generation/demand balance; transmission capacity; interconnection capacity; availability of imported energy etc.)?
- Is it possible to identify (and quantify) the effects of external factors on demand (e.g. demand reduction as a result of economic conditions; climate change; energy efficiency initiatives etc.)?
- An indication of the most stressed periods for system adequacy.

2. Specific Events that Occurred during Winter 2010-2011

Please report on specific events that occurred during the last winter period (i.e experience on gas imports reductions, others)

3. Detailed Review of the Most Stressed Periods

Describe the actual versus expected and average conditions for the most stressed periods of the winter (November to March). For each statement please specify the period considered (month(s), week(s) or even day(s), whichever is easiest – if possible, please use the spreadsheet provided to provide week-by-week quantitative details on generation conditions and demand at weekly peak):

- Description of remarkable event(s)/cause(s) of system stress (e.g. colder than expected weather conditions, low/high wind in-feed, etc.) and the duration of the situation
- Generation conditions: generation overhaul (planned, unplanned), gas/oil/availability, hydro output, wind conditions (above or below expectations, extended periods of calm weather), specific events or most remarkable conditions (please specify dates)
- Demand: actual versus expectations, peak periods, summary of any demand side response used by TSOs, reduction/disconnections/other special measures e.g. use of emergency assistance, higher than expected imports from neighbouring states
- Transmission infrastructure: outages (planned/unplanned), reinforcement realised, notable network conditions (local congestion, loop flows etc.)
- Use of interconnections: import/export level, reliance on imports from neighbouring countries to meet demand (you can refer to http://www.entsoe.net/); commentary on interconnector availability and utilisation.

4. Lessons Learned for Winter 2011

- Relevant key points for the forthcoming Winter.
- Feedback on the use of the Winter Outlook Report.
- Feedback on format and content of this report.