European Network of
Transmission System Operators
for Electricity

An Overview of System Adequacy:

Winter Review and Summer Outlook Report 2009

Contents

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1 EXECUTIVE SUMMARY

1.1 Winter Review 2008/09[1]

BALTIC STATES

Estonia, Latvia and Lithuania

Average temperatures were higher than forecast. There were no significant transmission grid outages in the Baltic countries during the winter season.

UKTSOA/ATSOI

Great Britain, Northern Ireland and the Republic of Ireland

Weather conditions were in line with historic averages, and demands were slightly lower than forecast. Generation was able to meet demand at all times, and power exports/imports were supplied as required.

NORDEL

Denmark, Finland, (Iceland), Norway and Sweden

Warm/normal weather conditions and economic recession resulted in lower demands. There were no risks to system adequacy.

NORTH WESTERN UCTE

Austria, Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland

In general, load was lower than expected due to economic conditions (Swiss values will be available in late Summer 2009).

Apart from in Austria, climatic conditions at winter peak period were on the whole unfavourable, especially with a cold spell at the beginning of January and a storm in France on 24 January. Despite this, Switzerland, the Netherlands and Luxembourg report no particular stress on the system.

Austria resorted to higher imports than expected, due to lower generation.

[1] The regions used in this section relate to the former TSO associations in Europe (UCTE, Nordel, Baltso, UKTSOA and ATSOI). The members of these associations have now formed ENTSO-E: the European Network of Transmission System Operators for Electricity. The former regional groupings have been used in the Winter Review for consistency, but future reports will employ the regional structure(s) designed by ENTSO-E.

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In Belgium the reserve level of 1000 MW, corresponding with the assumption of autonomous national power supply, was not available for a period of two weeks. Nevertheless, compliance with security levels was met by the use of import capacity made available by Elia. Week 2 in particular saw simultaneously high demand during the cold spell and unavailability of generating units, so that a combination of measures was necessary, including imports by market players, activation of load shedding contracts, utilization of intra-TSO and other reserves and use of phase-shifters to alleviate the North to South loop-flow.

In the same week, France consumption reached its maximum historical value for three consecutive days and, as forecast in the Winter Outlook Report, up to 3500MW of physical imports were recorded.

No particular problem occurred in Germany; the TSOs only mentioned some periods when network- and market-related measures were necessary as a result of wind energy integration.

Low voltages were measured on the Swiss grid in November, when wind generation was high in Germany.

The commissioning of the second system Slavetice (CZ) -Dürnrohr (AT) in October 2008 solved the congestion experienced in the past on the Czech-Austrian border.

From 1st January 2009, the Swiss control areas were unified to a single control area managed by swissgrid.

NORTH EASTERN UCTE

Czech Republic, Hungary, Poland, Slovak Republic and Ukraine-West

(Ukraine provided no contribution to this report).

Load was lower than expected in every country, due to the economic situation.

The temperature in Hungary was close to that of previous year. In Poland, the winter was longer and colder than the previous one. The Czech Republic and Slovakia both experienced a cold January after mild November and December.

No particular stress was reported by Poland.

Slovakia underlined the shutdown of the second unit of Bohunice nuclear power plant on 31st December 2008, following the commitments negotiated for becoming a Member of the European Union; the corresponding energy was covered by imports.

CEPS (Czech Republic) reported significant stress on their interconnection with Germany and internal transmission grid in November, as wind generation in Germany was very high; Czech generation re-dispatch and change of network topology were necessary.

Gas supply from Russia was interrupted in January in Hungary (for 3 weeks), the Czech Republic and Slovakia (for 2 weeks) as a result of the Russia/Ukraine dispute. Poland

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experienced only a partial loss of supply of Russian gas because their gas system is also connected to Russia via Byelorussia.

No impact on the electricity generation-demand balance was observed in the Czech Republic, the whole domestic gas demand being covered by national storage capacities and a long-term import contract with Norway allowing for quick increase of gas imports.

The interruption of supply had no noticeable impact on the Polish power system either, since only 2.5% of the national generation is gas-fired and gas CHPs burn gas coming from local (Polish) deposit.

Conversely, Slovakia had to rely only on their national gas storage and, according to the Gas Regulation, wholesale gas customers had to reduce their consumption down to the safety level, which resulted especially in reduced activity for the industry. The gas-fired units' capacity was reduced by 45%, as most of the units are not able to run on alternative fuel. Nevertheless, no additional electricity import was observed because the load dropped as a result of economic conditions and reduced industrial activity following the gas consumption limitation.

In Hungary, although 37% of generation capacity is gas-fired, most of the generating units switched to alternative fuel, so that the reduction in electricity generation capacity was only 380MW, which was balanced by increased imports. Gas supply was interrupted to industry, also resulting in lower electricity demand.

SOUTH EASTERN UCTE

Bosnia-Herzegovina, Bulgaria, FYROM, Greece, Montenegro, Romania and Republic of Serbia

(No information was provided by Montenegro and Republic of Serbia)

In general a reduction in demand was registered in most of the countries in comparison to the previous year (Bulgaria, Greece, Romania). No particular stress on the generation-load balance was recorded. During the whole period, Bulgaria and Romania physically exported electricity.

Although the level of water in the Greek reservoirs was at the minimum historical value at the beginning of the winter, the situation became more comfortable at the end of March, due to snow and heavy rains during the winter. (NB: peak load period in Greece occurs during the summer).

Similarly due to snow and rainfall the level of Macedonian reservoirs is very high in comparison to the previous year (when the opposite situation was registered).

In Romania, the decrease of economic activities in certain enterprises, in addition to temperatures slightly higher than normal, led to a low national consumption level at 9% below that recorded in the previous winter. Consequently, national generation was able to meet the internal consumption, system reserves and export requirements.

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The new 400kV tie-line Nadab - Bekescaba between Romania and Hungary was put into operation at the beginning of December.

The most remarkable events in the region during the winter were related to the impact of gas crisis.

Bosnia-Herzegovina, whose generation is not gas-fired, mainly reports an increase of the electricity demand by up to 10%, resulting in overloads on some transformers in the region of Sarajevo.

There was no impact on the Greek power system because gas-fired generation was able to switch to alternative fuel and gas consumption was not reduced due to LNG utilization.

In FYROM, no noticeable impact was observed by the TSO.

Only 30% of gas consumption in Romania is supplied by Russia. The interruption of import was mostly compensated nationally by the utilization of gas storage and increased gas extraction, so that the availability of pure gas-fired generation units was not reduced. In addition, most of the gas-fired generating units switched to alternative fuels.

Having practically no access to alternative gas sources, Bulgaria experienced a severe gas shortage during the Russia/Ukraine dispute. Gas delivery was reduced by 90% to industry and by 20% to domestic consumers, which resulted in higher electricity demand due to additional electric heating. More than 600MW of gas-fired units switched to alternative fuel and gas-fired capacity was reduced by nearly 400MW, which was compensated by domestic generation, including nearly 200MW of mothballed generation which was temporarily put into operation.

CENTRE SOUTH UCTE

Italy, Slovenia and Croatia

On the whole a drop in electricity consumption characterised the winter. A noticeable negative trend of electricity demand was registered in Italy, for instance, where for the first four months of 2009, electricity demand dropped by 9% compared to the same period of the previous year.

In Slovenia the economic conditions and recession also played major part in demand conditions. Although Slovenia had no access to alternative gas sources and gas supply was reduced to industry, the gas crisis had no impact on the power system balance due to the ability of gas-fired units to run on alternative fuel.

No reduction of gas-fired generation availability was recorded in Italy.

Ukraine/Russia gas supply represents only about 1/3 of the national gas demand in Croatia. During the crisis, gas supply to industry was reduced. 100MW of gas-fired generation switched to alternative fuel and all the reduction in gas-fired capacity (225 MW) was fully backed up by domestic generation, especially hydro.

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SOUTH WESTERN UCTE

Portugal and Spain

The demand was lower than expected due to economic conditions. On the whole, the winter was colder than average in Spain and milder in Portugal.

No particular stress occurred on the Iberian system, although the load reached its maximum value in Portugal for three days during a cold spell in January.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania and Cyprus

Albania relies mainly on hydro and imports. No particular event occurred regarding the load-generation balance.

In general, the demand in Cyprus was lower than the forecast values, except for the peak load (31st December) and some days in March. No particular risk was experienced.

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1.2 Summer Outlook 2009

NORTH SEA REGION

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

Under normal conditions, no supply/demand balance problems are foreseen. Nevertheless, high temperatures and drought with impact on both generation and load could lead to stress situations in France in June and especially in July, which is the most critical period. In July, imports up to 2800MW could be necessary to cover the minimum required margin.

German TSOs warn about possible North to South power flows on the transmission grid, depending on the weather and wind conditions; they also underline the risk of limited generation of thermal units in case of a sustained heat wave in July-August. Network and market-related measures would be needed, including support from neighbouring countries.

To meet peak demand, Northern Ireland may be dependent upon imported power, but no major problems are foreseen with import availability.

BALTIC SEA REGION

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

Summer is not forecast as critical period for the Nordic power systems.

Baltic TSOs do not expect any critical situation under normal conditions; they should only increase their reliance on imports from Russia and the Nordic system during the overhaul of Ignalina nuclear power plant, planned for weeks 35-40.

The risks in Germany are mainly linked to the weather and wind conditions; stressed situations on the generation-load balance can be encountered in the event of a heat wave.

The Polish TSO does not expect significant problems in operation next summer. The most critical month is September, as load will increase while Combined Heat and Power units will not yet have been started. In case of tight balance under severe conditions, remedial actions are available.

CONTINENTAL SOUTH WEST REGION

France, Portugal, Spain

The Iberian system expects no particular risk on the generation-demand balance for the coming summer, so that no support from neighbours should be needed, even under severe scenarios for load and generation.

Although the generation and demand balance in France is adequate under normal conditions, some imports may be needed in case of sustained hot and dry weather.

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CONTINENTAL CENTRE SOUTH REGION

Austria, France, Germany, Italy, Slovenia, Switzerland

No particular problem is expected by the TSOs of this region under normal conditions.

The most stressed period is the beginning of summer, especially July in France; July-August in Germany; weeks 27-30 and 35-36 in Italy and September in Slovenia (although Slovenia should rely on imports from July to the end of the summer). Germany, France and Italy could experience stressed situations in the event of a heat wave; France and Italy in particular mention that imports may be needed for some periods. In such a scenario, weeks 28 to 30 are critical for the three countries.

Austria underlines the North to South congestion in the Austrian grid and the difficulty in anticipating stressed situations because of stochastic wind generation and generation driven by market prices which is problematic to forecast.

No problems are expected on the Swiss system even under severe conditions.

CONTINENTAL SOUTH EAST REGION

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

Bulgaria, Bosnia-Herzegovina, Croatia, Romania and the Republic of Serbia do not expect system adequacy problems during the summer.

FYROM should need imports for the whole period but no particular problem is foreseen by the TSO.

Under normal conditions, Slovenia should rely on imports to meet the peak load from the beginning of July.

Hungary shows a need for import even under the normal scenario in September. Under severe conditions, the period of risk extends to the whole summer. However, cross-border capacity is available for imports and contracts have been signed by the TSO for providing reserve generation capacities and emergency energy deliveries.

Although generation and demand in the main Italian system should be balanced under normal conditions, TERNA mentions that the forecast margins are very tight in the main islands. However, in the case of a severe scenario combining high temperatures and increased forced outages of thermal generation, margins would also be reduced also for the mainland and imports would be needed for weeks 28-30 and 35-36.

Tight margins are expected in Greece from weeks 26 to 30. The availability of interconnectors is therefore a critical issue, especially the interconnection with Bulgaria and the sub-sea cable to Italy.

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CONTINENTAL CENTRE EAST REGION

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

The Czech Republic, Romania and Croatia expect no particular risk for the load-generation balance for the coming summer.

The period with more stress is July-August in Germany, weeks 23 & 27 and September in the Slovak Republic and also September in Poland, Slovenia and Hungary.

Imports should be needed at peak hours in Slovenia from the beginning of July.

Slovakian dependence on imports started with the shutdown of J. Bohunice nuclear units. Imports should be needed in September even for the normal scenario.

Under normal conditions, Hungary shows a need for import in September; under unfavourable conditions, the requirement extends to the whole summer.

The Polish TSO does not expect significant problems in operation next summer; however, in case of extremely hot and dry weather, the risk exists that the level of system services reserve available could be lowered. Remedial actions are available in case of tight balance.

German TSOs warn about possible high North to South power flows resulting from particular weather and wind conditions and also the risk in case of sustained heat wave that would limit generation of thermal units. Should critical situations occur, network and market-related measures should be taken, including support from neighbouring countries.

In addition, the Czech TSO underlines the risk of low level of negative reserve or spinning reserve if not enough units capable of providing this type of reserves are in operation, due to the reduced level of load expected for this summer.

ISOLATED SYSTEMS

Cyprus

Under normal conditions, no supply/demand balance problems are foreseen.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania, Ukraine West

Albania should remain an importer country during the summer but the TSO anticipates no particular risk.

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2 INTRODUCTION AND METHODOLOGY

2.1 Scope & Objectives of the Report

2.1.1 Winter Review Report

The ETSO Winter Outlook Report, prepared at a European level, presented a summary of the national power balances between forecast generation and peak load for the winter period. The report for winter 08/09 was published on October 31st 2008 (a summary is provided in the next section).

The objective of this Winter Review is to present what happened during the winter just past regarding: weather conditions and their consequences on the power system (temperatures, hydro and wind conditions); availability of generation units; market conditions, use/availability of interconnections and imported energy etc. These results are then compared with what was predicted in the Winter Outlook Report.

This year, contributing countries were also asked specific questions regarding the effect on electricity security of supply of the Russia/Ukraine gas dispute in January 2009. The questionnaire is included as an appendix to this report.

The contributing organisations also seek to identify any learning points which may assist with similar studies in the future.

2.1.2 Summer Outlook Report

The objective of the ENTSO-E Summer Outlook Report is to present its members TSOs' views as regards any national or regional matters of concern regarding security of supply for the coming summer and possibilities of neighbouring countries to contribute to the generation/demand balance in critical situations. The survey gives them the opportunity to share information and gives impetus to further studies on a bilateral basis.

2.2 Sources of Information & Methodology

2.2.1 Winter Review Report

The report is based on the answers to a questionnaire sent to every European TSO in March (see Appendix 3). The methodology is to develop a qualitative comparison of forecast and actual market conditions and events, based on a narrative description of the winter. TSOs are invited to provide quantitative data where possible to illustrate how the Winter out-turned 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.).

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In respect of the Russia-Ukraine gas supply dispute, TSOs were asked questions relating to its effect on the availability of gas-fired electricity generation and the measures taken to mitigate its impact.

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

2.2.2 Summer Outlook Report

The information is based on the answers to a questionnaire sent to every European TSO in March (see Appendix 3). The questions asked TSOs to identify any potential system problems in the summer, 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.

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

2.3 List of Contributing Countries

This report has been drawn up with the contributions of the countries listed below.

The identification of blocks for the contributing countries under the Winter Review section relates to the former European TSO associations (UCTE, Nordel, Baltso, UKTSOA and ATSOI). These associations have now formed ENTSO-E: the European Network of Transmission System Operators for Electricity. The use of the former regional groups under the Winter Outlook section is a legacy arrangement used for consistency with the previous report. For future reports ENTSO-E has developed a new means of regional organisation, as seen in the Summer Outlook section.

BALTSO COUNTRIES:

- Estonia
- Latvia
- Lithuania

UKTSOA/ATSOI COUNTRIES:

- Great Britain
- Northern Ireland
- Republic of Ireland

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NORDEL COUNTRIES:

- Denmark
- Finland
- Norway
- Sweden

NORTH-WESTERN UCTE:

- Austria
- Belgium
- France
- Germany
- Luxembourg
- The Netherlands
- Switzerland

NORTH-EASTERN UCTE:

- Czech Republic
- Hungary
- Poland
- Slovak Republic
- Ukraine-West

SOUTH-EASTERN UCTE:

- Bosnia & Herzegovina
- Bulgaria
- The Former Yugoslav Republic of Macedonia (FYROM)
- Greece
- Montenegro
- Romania
- Serbia

CENTRE-SOUTH UCTE:

- Croatia
- Italy
- Slovenia

SOUTH-WEST UCTE:

- Portugal
- Spain

ADDITIONAL CONTRIBUTING COUNTRIES:

- Albania
- Cyprus

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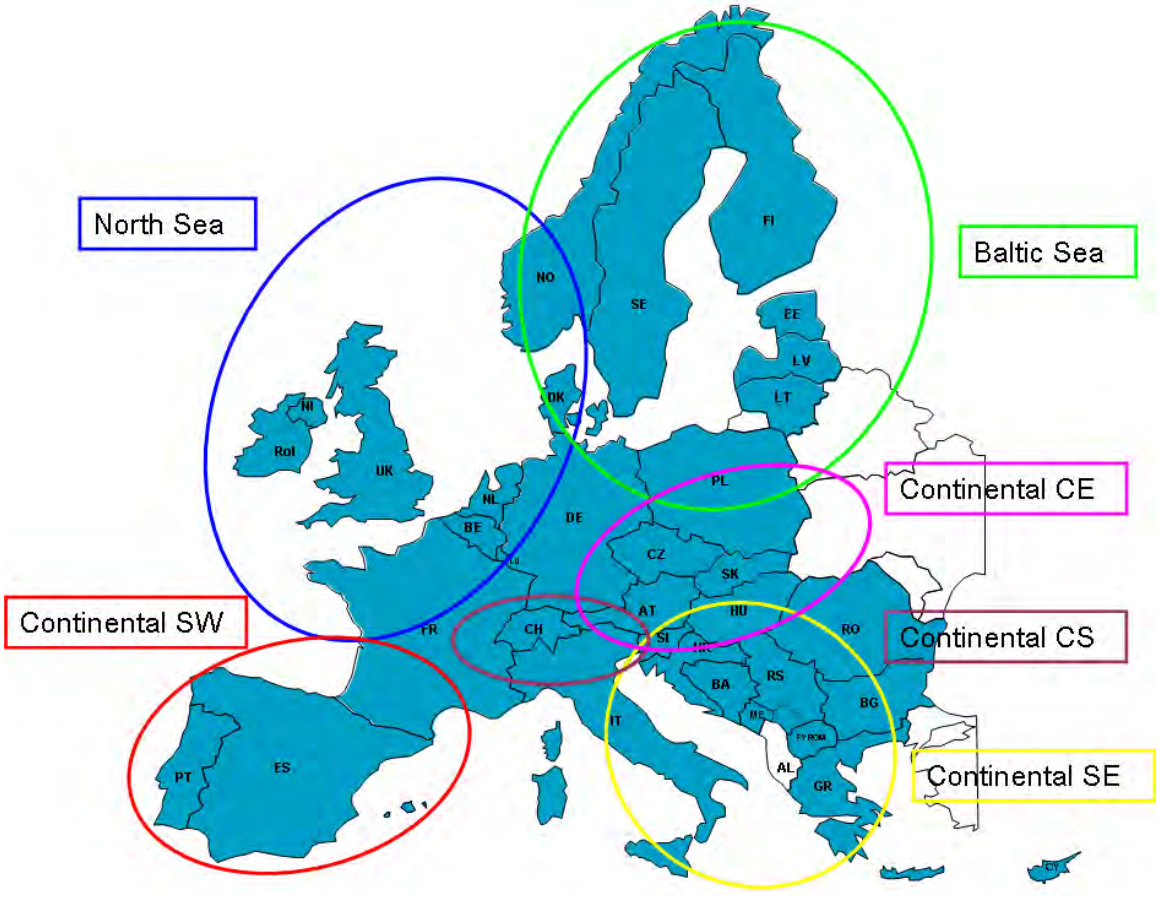
ENTSO-E System Development Regions used for Summer Outlook Reporting:



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3 WINTER REVIEW 2008/09

3.1 Summary of Winter Outlook

The Winter Outlook Report, prepared at European level, predicted that as a whole, no particular risk of power shortage was expected from November 2008 to March 2009 under “normal conditions”, meaning that the generation forecasts (generation capacity, planned outages) are based on the information made available to TSOs and the balance is set to average or typical winter values.

The generation-load balance forecasts in the different regions were generally considered as suitable.

Under normal conditions, a few countries expected to depend on imports from their neighbours in some specific periods: Albania, Former Yugoslav Republic of Macedonia (FYROM) and Serbia would depend on import contracts to meet demand for the winter; Slovenia would require imports to meet peak demand all through the winter; Belgium, Croatia, Latvia and Estonia might require imports to meet winter peak load under severe conditions. Some imports could be needed in France in over 1% of cases at the time of the annual peak load.

Under severe conditions, due mainly to low temperature or unfavourable hydro-conditions, the power systems might be stressed, especially when the same periods are critical for neighbouring countries as well. The most critical period was forecast to be the annual winter peak period (December-January, usually excepting the holiday period) but in some cases may also have extended to February or even the end of March.

Under severe conditions FYROM and Albania would need imports for the whole winter period; Croatia, France, Greece, Serbia and Slovenia had identified specific periods when severe conditions would result in a need for imports.

In such periods, unfavourable conditions could reduce the export capabilities from exporting countries and could lead to tight situations at the regional level in Western Europe (Great-Britain, France) and South Eastern Europe (Former Yugoslav Republic of Macedonia, Greece, Romania). Among the Nordic countries, Finland, Sweden and Eastern Denmark would have a deficit under severe conditions, but the total Nordic generation capability exceeded the simultaneous peak demand.

In addition Spain, Hungary and Italy stressed the risks linked to the gas market.

Lastly, TSOs from Central Western Europe mentioned potential loop-flows, connected in particular with wind generation in the Northern part of the mainland. Countermeasures such as phase shifter operation, generation re-dispatching or Net Transfer Capacity (NTC) reductions might be needed to guarantee the safe operation of the power system.

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3.2 Winter Review by Region

BALTIC STATES

Estonia, Latvia and Lithuania

The average temperatures were higher than forecast. There were no significant transmission grid outages in Baltic countries during the winter season.

UKTSOA/ATSOI

Great Britain, Northern Ireland and the Republic of Ireland

Weather conditions were average, with no significant periods of adverse weather. Demands (peak and average) were generally slightly lower than forecast, as a result of the current economic conditions provoking reduced demand from industrial users.

Great Britain, Northern Ireland and *Republic of Ireland* all experienced some periods of lower than forecast generator availability, but this did not affect the ability of the respective systems to meet demand at all times. The GB system was able to provide the necessary export power to Northern Ireland as required.

The Russia/Ukraine gas dispute had no direct impact on the ability of generation to meet demand. There were no significant periods of risk and no interruptions to gas supply.

NORDEL

Denmark, Finland, (Iceland), Norway and Sweden

The winter was warm or quite normal in the Nordic countries. The climatic conditions together with the economic recession resulted in a substantial reduction of the electricity consumption and peak demand. The monthly consumption in January in *Finland* was 9% lower than the previous year. In *Sweden* the 52-week consumption in February was 2.5% lower than the previous year. In *Denmark*, monthly consumption has decreased during the latter half of the year. A typical monthly decrease was 6%.

The simultaneous Nordic peak demand was about 9000MW lower than that stated in the forecast for cold conditions that will occur once in ten years.

The hydrological situation was quite good in the Nordic countries. The reservoir levels have been slightly lower than normal.

The available generation capacity was lower than normal during some months. The two largest nuclear power units (total capacity 2300MW) in Sweden were out of operation. In addition, the annual overhaul of an 855MW nuclear unit was performed during the same period. In Eastern Denmark three major power plants were out of operation during one day of the winter peak load. Electricity imports from Russia and Estonia to Finland continued with almost full capacity (1750MW) during the weekdays throughout the whole period.

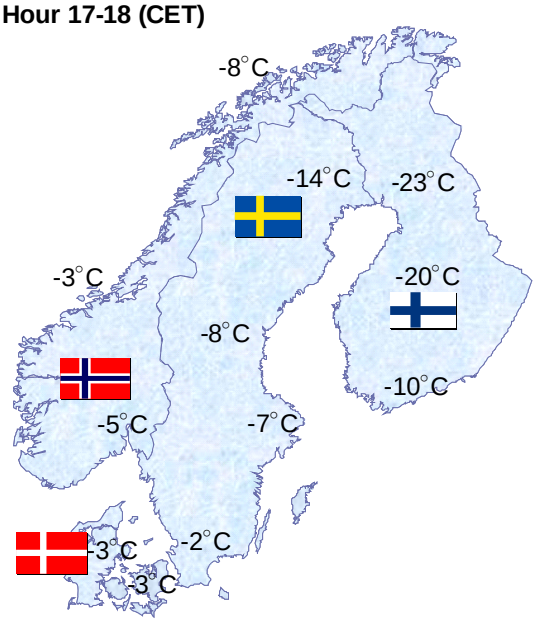
Faults in subsea cables in Norway have restricted the export capacity especially in weekdays during the whole period.

As a summary the system adequacy in the Nordic countries was not at risk during the winter period.

The Nordic countries were not impacted by the dispute between Russia and Ukraine on the gas supply.

PEAK LOAD 2008/2009
In the total Nordel area and in each country

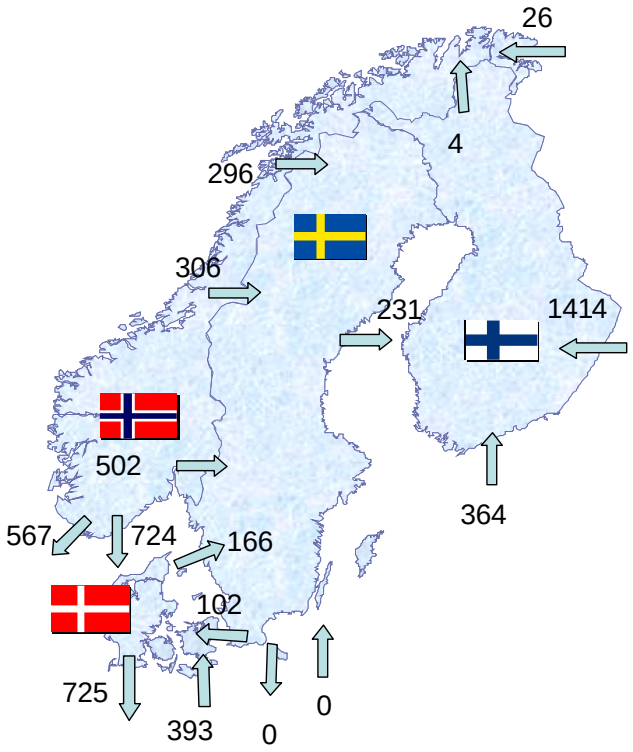
Temperatures on 7.1.2009
Hour 17-18 (CET)



NORDEL	Forecast (10 year winter)	Peak load 7.1.2009 Hour 17-18 (CET)	Margin
CONSUMPTION (C)	73 400	64 310	9 090
PRODUCTION (P)	73 900	63 210	10 690

	Prognosis (10 year winter)	Nordel peak load 7.1.2009 Hour 17-18 (CET)	National peak load (CET)	
Finland				
C	15 100	12 210	13 010	16.1.2009 Hour 7-8
P	13 200	10 230	10 860	
Sweden				
C	28 900	24 800	24 900	16.1.2009 Hour 8-9
P	28 500	23 600	24 400	
Norway				
C	23 800	21 120	21 890	5.1.2009 Hour 8-9
P	24 600	23 510	24 300	
Eastern Denmark				
C	2 950	2 520	2 640	5.1.2009 Hour 17-18
P	2 800	2 030	1 660	
Western Denmark				
C	4 150	3 610	3 670	6.1.2009 Hour 17-18
P	4 500	3 810	5 180	

EXCHANGE AT PEAK LOAD ON 7.1.2009
Hour 17-18 (CET)
[MWh/h]



NORTH WESTERN UCTE

Austria, Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland

The climatic conditions of the winter just past were normal in *Austria*.

Although monthly consumption from November 2008 was lower than the previous year due to the financial crisis, imports were higher due to lower generation.

The congestion on the Czech-Austrian border was solved with the commissioning of the second 380kV system Slavetice-Dürnrohr. Expected North to South congestion on the Austrian network occurred but could be managed by phase shifting transformers.

In general, the system adequacy was positive in *Belgium*, with only two weeks during which the desired safety level of 1000MW, corresponding with the assumption of autonomous national power supply, was not met. Nevertheless, compliance with security levels was met by the use of import capacity made available by Elia. Week 2 in particular saw the combination of high demand due to a cold spell and unexpected unavailability of one nuclear unit and several fossil fuel units. A combination of measures avoided an imbalance of load and generation, namely imports by market players through the intraday market,

activation of load shedding contracts by an Access Responsible Party, utilization of inter-TSO and other reserves and utilization of phase shifters to reduce the loop flow from North to South by 500MW.

Generation availability was sometimes significantly different from forecast but this effect was generally offset by the drop in consumption.

On the whole, interconnections were available as planned.

Week 2 was also hard for *France*, the historical peak load being reached for three consecutive days due to the cold spell. During the same week the balance of physical exchanges was negative and up to 3500MW imports were reached.

The winter just past was recorded as the third coldest over the last twenty years in France. However, once adjusted for climatic conditions, the monthly energy demand was lower by 1.3% - 3.6% than the previous winter. Load forecast is becoming more difficult, due to the difficulty in estimating the impact of the economic crisis.

On 3rd November during a thunderstorm,1500MW (1.5 million customers) were cut off in South-Eastern France due to the simultaneous tripping of the 400kV line between Marseille and Toulon and a 225kV line.

In addition, the 'Klaus' storm hit South-Western France on 24th January, causing 115 lines to trip, including six 400kV lines, and 1.7 million customers to lose supply. During this period the supply of Perpignan area relied on import from Spain for the time taken provisionally repairing the 400 kV line connecting the area to the French main grid.

The cold spell lasted for several weeks in January in *Germany*. Wind generation was temporarily very high. Due to the financial crisis consumption dropped, which resulted in high demand for negative control power. No critical situation regarding the system was recorded apart from some periods in which network- and market-related measures had to be taken as a result of wind energy integration.

In *Luxembourg*, despite more severe climatic conditions in Winter 2008/2009 compared with previous years, the peak load in December 2008 and January and February 2009 was slightly (1.3%) lower. This decrease is probably due to the impact of the financial crisis on industrial production levels.

No particular risk had been identified in the Winter Outlook Report and no special event was reported.

It was the coldest winter in the 12 last years in the *Netherlands*, especially in December and January with an average temperature around 2°C lower than normal. Nevertheless, no particular stress was reported regarding the generation–load balance or in the network condition.

In *Switzerland* starting from 1 January 2009 the Swiss control areas were unified to one single control area which is managed by swissgrid. The beginning of January 2009 was very cold, with the lowest average temperature amounting to ca. -7.0°C. No risk was forecast for the winter. The most remarkable events occurred on November when very low

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voltages were observed on the Swiss Transmission network due to high wind production in Germany (up to 18000MW on 20th November).

NORTH EASTERN UCTE

Czech Republic, Hungary, Poland, Slovak Republic and Ukraine-West

(No information was provided by Ukraine)

In the Czech Republic, the winter started mild and became cold in January and February. No particular stress was recorded on the generation and load balance, especially as the demand was lower than expected due to the economic conditions. Gas supply from Russia was interrupted in January, but with no significant impact, since national storage capacities were able to cover the national demand and long term contracts with Norway allowed quick increase of gas imports. Significant stress on Czech-German interconnection and on the Czech internal network occurred in November, in particular from 17th to 20th November, as wind generation in Germany was very high. The (n-1) criterion was not met for many hours and CEPS had to adapt the network topology and ask for generation re-dispatch.

The winter just past was longer and colder than the previous year in *Poland*, with average temperatures lower by 2°C. On the other hand, as early as October 2008, the Polish TSO had observed a significant decrease of energy consumption and peak load, the actual monthly peak load being on average 5.7% lower than forecast.

No emergency situation was reported for the Polish power system this winter. The interruption of gas supply via Ukraine had no noticeable impact since CHPs use gas coming from Polish deposits.

Slovakia experienced no critical situation in system operation with mild November and December followed by cold January and February. Hydro conditions were unfavourable until the end of February. As expected, the second unit of J. Bohunice nuclear power plant was shut down by 31st December and the corresponding energy was covered by imports. In January, gas supply was interrupted for 3 weeks as a result of Russia/Ukraine dispute (see §3.3 below). Gas-fired generation was reduced by 45% with no significant impact on the generation-load balance since the demand also dropped. Actual peak loads are estimated around 5% lower than forecast (except in February) in particular because of economic conditions. SEPS reports a significant decline of the use of cross-border interconnections (in both directions) for the first four months of the winter.

The main issue in *Hungary* was the interruption of gas import for 3 weeks in January due to the Russia/Ukraine dispute (see §3.3 below); this resulted in a generation reduction of 380MW, which was compensated by additional imports.

Apart from this, availability of generation capacity was good throughout the winter. Although the climatic conditions were the same as the previous winter, the demand was lower by around 5% due to the economic crisis. Most probably due to market conditions, Hungarian electricity balance turned to export in November and December and then to import from January.

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A new 400kV interconnection Békéscsaba-Nadab between Hungary and Romania was put into operation in December.

SOUTH EASTERN UCTE

Bosnia-Herzegovina, Bulgaria, FYROM, Greece, Montenegro, Romania and Republic of Serbia

(No information was provided by FYROM, Montenegro and Republic of Serbia)

In general a reduction in demand was registered in most of the countries in comparison to the previous year (*Bulgaria, Greece, and Romania*). No particular stress on the generation-load balance was recorded. During the whole period, Bulgaria and Romania physically exported electricity. Conversely, FYROM imported energy.

Although the level of water in the Greek reservoirs was at the minimum historical value at the beginning of the winter, the situation became more comfortable at the end of March, due to snow and heavy rains during the winter. (NB: peak load period in Greece is during the summer).

In Romania, the decrease of economic activities in certain enterprises, in addition to temperatures slightly higher than normal, led to a low national consumption level at 9% below that recorded in the previous winter. Consequently, national generation was able to meet the internal consumption, system reserves and export requirements.

The new 400kV tie-line Nadab - Bekescaba between Romania and Hungary was put into operation at the beginning of December.

The most remarkable event which occurred in the region during the winter was related to the impact of the Russia/Ukraine gas crisis (see paragraph 3.3 below).

CENTRE SOUTH UCTE

Croatia, Italy and Slovenia

The winter was mild in Slovenia, with favourable inflows and thermal generation availability as expected. Gas imports were reduced as a result of the Russia/Ukraine dispute, but they did not result in any reduction in available generation capacity because gas-fired units switched to alternative fuel so that, on the whole, no actual impact on the electricity generation-load balance was reported.

Demand was lower than expected, mainly due to impact of the economic crisis on industry. As expected, the electricity exchange balance was in the import direction, nevertheless high loop flows towards Italy were observed.

In Croatia, a decrease in monthly consumption during the winter was recorded, mainly due to the increase of average daily temperature and, to some extent, to warmer temperatures (high temperature in December 2008 and the next three months in 2009). The peak load was recorded the last day of December 2008 (3009MW). During the winter, any unexpected

situations experienced were mainly due to the gas crisis. The reduction in gas supply resulted in a decreased availability of gas-fired generation of 22%. The gas-fired capacity was reduced with 225MW. Capacity of 100MW was switched to alternative fuel (oil). Only the gas supply to big industry was reduced. All the reduction in gas-fired capacity was backed up by domestic generation with no effect on power imports from neighbouring countries. There was no reduction in electricity supply.

In Italy the adequacy evaluations for 2008-2009 winter period did not show particular risks for capacity adequacy and peak load cover nor with the national supply systems. A winter season with temperatures below the average values marked the first part of the period with noticeable decreasing demand due to the economic situation. In addition favourable hydro conditions marked this part of the year: values above the multi-year average capability factor were recorded. The hydro production reached a very high level of growth with a significant contribution to the national demand cover.

SOUTH WESTERN UCTE

Portugal and Spain

General weather conditions for the winter just past were worse than expected in *Spain*; in particular low temperatures were observed in December and January. Water inflows in reservoirs were also lower than average, especially in December and January (around 70-75% of average). On the other hand, despite the climatic conditions, the actual load was around 5% lower than expected, due to the decrease in economic activity. On the whole, no particular stress on the system was reported.

A 5-day cold spell was observed in *Portugal* between 8th and 12th January, so that the maximum historical winter peak load value was registered (3.5% above the forecast value included in the Winter Outlook Report). The record was beaten consecutively three times in this period. Although the wind energy was as low as 2.5% during one of these days, the system was not in a critical situation.

Temperature was above average for the rest of the period, March being the hottest and driest March in eleven years. On the whole, the comfortable margins identified in the Winter Outlook Report were confirmed, especially as economic and climatic conditions both encouraged lower demands.

No particular event affected transmission infrastructure.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania, Cyprus

See individual responses in Appendix 1

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3.3 Summary of the Effects of the Russia-Ukraine Gas Dispute

The Russia-Ukraine gas dispute lasted from 6th-25th January 2009. The following is a summary of the effects felt in the Winter Outlook reporting regions

BALTIC STATES

Estonia, Latvia and Lithuania

Negligible impact/no reported effect.

UKTSOA/ATSOI

Great Britain, Northern Ireland and the Republic of Ireland

Negligible impact/no reported effect.

NORDEL

Denmark, Finland, (Iceland), Norway and Sweden

Negligible impact/no reported effect.

NORTH WESTERN UCTE

Austria, Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland

(No information provided by Austria)

Generally negligible impact/no reported effect.

According to GTS (Gas Transport Services) the "Russia/Ukraine Gas Dispute" had no effect in the *Netherlands*. The only effect was a larger export of gas. This was also caused by the availability of more gas because of less domestic demand. It also had no influence on the prices.

NORTH EASTERN UCTE

Czech Republic, Hungary, Poland, Slovak Republic and Ukraine-West

(No information reported by Ukraine West).

The interruption of gas supply coming via Ukraine had no impact on the *Polish* power system since i) gas fired generation represents around 2.5% only of the national generation capacity; ii) gas CHPs burn gas coming from local (Polish) deposits and iii) the Polish gas system is connected to Russia via not only Ukraine, but also Byelorussia.

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Gas-fired units represent about 5% of the installed generation capacity of the *Czech Republic*. CEPS does not have detailed information about alternative fuel possibilities of every unit, but the 2 biggest Combined Cycle Gas Turbines (200MW each) can – and do - use both natural gas and coal-gas (which is produced nearby) at the same time.

The gas imports from Russia were fully stopped in January but without any significant impacts on power generation, industry and householders (no reduction of gas supply to consumers). In the Czech Republic there are quite large underground gas storages capable of covering the consumption of gas for one winter month. Thanks to existing long-term contracts with Norway, Czech Republic was also able to increase its imports of gas from this country in a very short time.

37% of Hungarian generation capacity is gas-fired, 90% of which is capable of running on alternative fuel. Russian gas import – which is by far the main supply - was interrupted for 3 weeks and Hungary had to rely on its own storage capacities. Gas demand was lower, due to the economic crisis, and gas supply was interrupted for industrial customers, which resulted in lower electricity demand. Thanks to the capability to run on alternative fuel, the generation of gas-fired units was reduced by only 380MW during the 3 weeks, which resulted in increased imports. Prices remained low (due to economic conditions).

Measures to mitigate the risk are: more intensive communication with market players and decision makers; more frequent re-evaluation of the situation as well as risk management, if necessary e.g. additional reserve requirements on ancillary service markets. Anticipation of regional markets' behaviour and good cooperation with the gas system is needed.

In Slovakia, 12% of generation capacity is gas-fired with only 5.5% being capable of running on alternative fuel. Gas supply was interrupted from 6th to 20th January and Slovakia had to rely only on their national storage. According to the Slovakian regulation, wholesale customers had to reduce their consumption down to the minimum safety level. As a consequence, gas-fired generation capacity was reduced by 45% (no switch to alternative fuel). Reduced gas generation capacities were balanced by lower demand in electricity (the load dropped by 6.8% in January, due to the economic crisis and probable impact of reduced industrial activity resulting from gas supply reduction). No additional import seems to have been needed.

For both Hungary and Slovakia, the recovery towards normal conditions was quick after Russian gas import was restored.

SOUTH EASTERN UCTE

Bosnia-Herzegovina, Bulgaria, FYROM, Greece, Montenegro, Romania and Republic of Serbia.

(No information reported by TSO: Republic of Serbia, Montenegro).

In Bosnia-Herzegovina the national installed generation capacity is not gas-fired. During the interruption of gas supply, the electricity demand increased by up to 10%, and there were some overloads on the local transformer stations 110/x in the region of Sarajevo.

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The gas crisis did not affect the power system in FYROM because the main sources of generation are fossil fuel thermal plants and hydro plants.

In Bulgaria a total of 1023MW of the national installed capacity is gas-fired (about 8.3%). Bulgaria experienced severe gas shortage during the gas dispute between Russia and Ukraine. The reason for that is that Bulgaria currently has no access to alternative sources of gas (excluding minor deliveries from 2 local gas fields)

The availability of gas-fired plant was reduced by 58%. The gas-fired capacity was reduced with 387MW. Capacity of 636MW was switched to alternative fuel. The gas supply to industry was reduced by more than 90%. The reduction for domestic customers was les than 20% (only a small part of the population is gas supplied). Due to problems with the central heating systems during the conversion period from gas to other fuels, many customers in the big cities with central heating systems had to use additional electric heating for reaching comfortable levels of indoor temperature. The increase of the electricity demand for this reason is estimated to be in the range 10–12% for a period of 3-5 days. Mothballed capacity of 190MW was put temporarily into operation during the gas dispute period. The firm contracted export of electricity for January 2009 amounted 370GWh. All the reduction in gas-fired capacity was backed up by domestic generation. There was no reduction in electricity supply. The government has started projects for providing alternative sources of gas supply.

Greece experienced no critical problem in gas supply because LNG covered the gas demand during the gas import interruption. In addition, some generating units switched to alternative fuel for some days.

In Romania the installed generating capacity for pure gas-fired units represents 10.8% of the national net installed generation capacity. Another 30.3% from national net installed generating capacity can run on mixed fuel either oil or gas. During the gas dispute the import, representing about 30% from the national gas consumption, was interrupted due to Russia/Ukraine dispute. The import was almost totally replaced by using of the gas from the storage reservoirs and the increasing of national gas extraction level as well. The replenished time of the stores is not available. Anyway the reduction in gas supply did not result in a reduction of availability of gas fired generation. The lack of the import was covered both by internal sources and by switching of mixed fuel units to oil running. The pure gas-fired generation capacity was not reduced. The gas supply reduction provide the following effects on market prices: during the gas crisis the Romanian government gave the possibility to the producers to negotiate directly with suppliers, without auctions, for the acquisition of coal and oil fuel. Taking into account that on the day-ahead market there was an energy surplus on each day and other prices were firm due to the use of centralized bilateral contracts market, the gas supply reduction did not have a visible effect on market prices. The following actions were taken in order to mitigate the effects:

Depending to level of the gas reduction or its duration, alternative measures were taken into consideration in order to limit or even to eliminate the consequences. About 70% of Romanian gas consumption is provided by domestic sources. A lack of a gas import was managed by using internal gas reserves and switching generating units to alternative fuel (oil); diminishing gas industrial consumption was considered as a reserve measure.

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CENTRE SOUTH UCTE

Italy, Slovenia and Croatia

In Slovenia 13% of generation capacity is gas-fired, with the capability to run on alternative fuel. Gas Import from Russia was reduced and the other source was not available (exhausted by other countries). Gas supply was reduced to industry, but no to domestic customers. Gas–fired units switched to alternative fuel as a result of fuel market prices. During the gas reduction the gas prices increased in average by 30% on daily market.

In Italy more than 50% of the national installed generation capacity is gas-fired. Approximately 5% is capable of running on an alternative fuel. During the winter, Italy experienced reduced gas imports in January as a result of the Russia/Ukraine dispute. Reduction in gas supply did not result in a reduction in availability of gas-fired generation. Gas supplies were not interrupted. During the gas crisis Terna frequently updated forecast of gas consumption in thermoelectric sector and jointly co-operated with other company and Institution for an increased monitoring of gas system.

In Croatia a total of 1036MW of the national installed capacity is gas-fired. Of this, 734MW is capable of running on an alternative fuel (oil) - about 43% of total fossil fuels source. Every year in winter power plants receive the minimum amount of gas needed (which is only 13% of the maximum amount for other periods in the year, according to the contract with the gas TSO). All gas consumption in Croatia was covered by 2/3 owner sources and 1/3 from import gas from Russia/Ukraine. Gas distribution consumption was not reduced during the crisis. The availability of gas-fired plant decreased by 22%. The gas-fired capacity was reduced by 225MW. Capacity of 100MW was switched to alternative fuel (oil). Only the gas supply to big industry was reduced. No mothballed plants were temporarily put in operation during the gas supply crisis period. There were no effects on power imports from neighbouring countries, and all the reduction in gas-fired capacity was backed up by domestic generation. Furthermore, no effect of the gas supply reduction was recorded on electricity market prices because back-up domestic electricity generation was used, especially hydro power. As a follow-up to this gas crisis the Government initiated facilitation of projects for new gas underground storage and new gas interconnections, as well as for building LNG.

SOUTH WESTERN UCTE

Portugal and Spain

Negligible impact/no reported effect.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania and Cyprus

Negligible impact/no reported effect.

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3.4 Summary of Other Factors Affecting Supply/Demand

There are a number of factors likely to affect the balance of demand and supply which are routinely considered by TSOs when preparing seasonal outlook reports. These include issues such as the impact of weather conditions on demand and generation (cold temperatures producing increased demand, precipitation levels affecting hydro generation availability, loop flows as a result of high wind generation etc.), the unexpected unavailability of generation units due to breakdowns, and transmission circuit outages (planned or unexpected).

In this year's winter review questionnaire, as well as the impact of the gas dispute between Russia and Ukraine, contributing TSOs were asked to comment on any other factors which they considered to have had an impact on supply and/or demand.

By far the most commented-upon issue were the impacts of the ongoing global economic recession: more than half (24) of the responding TSOs referred to lower-than-expected demand as a result of a reduction in economic activity. Several TSOs were able to provide detailed, quantified analysis of the drop in consumption which in many cases occurred despite a colder-than-average winter (or a colder than expected week or month during the season). The drop in domestic consumption ranged between 1% and 12% per period, whilst the reported drops in industrial demand reached as high as 40%.

There are very limited historical precedents for the current economic situation, and many TSOs referred to the difficulty of producing accurate forecasts of demand in these conditions. A number of TSOs also referred to associated difficulties in system operation, caused by a lack of availability of ancillary services when generating units which would normally provide these services are not in operation due to the low demands.

Other factors which were mentioned as having an effect on demand or supply included:

- End-user efficiency savings – which were referred to in Great Britain and France, although it is too early to quantify the effects accurately;
- Low oil price – which was referred to by Cyprus as a reason for reduced demand for electricity since households switched to oil for their domestic heating;
- Common mode failure – which was experienced on nuclear generation in Sweden and France.

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4 SUMMER OUTLOOK 2009

NORTH SEA REGION

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

In general, no particular demand/generation balance problems are foreseen in the North Sea Region under normal conditions.

Great Britain, Northern Ireland and *Republic of Ireland* do not foresee any problems under normal conditions. Even under severe conditions (e.g. prolonged hot weather), Great Britain and Republic of Ireland should have adequate generation margins. To meet peak demand, Northern Ireland may be dependent upon imported power, but no major problems are foreseen with import availability.

No particular problem is foreseen in *France* under normal conditions. However, in case of high temperatures and drought, with impact on both generation and load, margins would be reduced and the situation could be stressed at the beginning of the period. The most critical period is July, when imports up to 2800MW might be necessary to cover the minimum required margin. In case of extreme heat-wave and thermal constraints on the power plants in Northern France, import capabilities from Belgium could be slightly reduced, due to network constraints.

No particular problem regarding the load/generation balance is foreseen in *Germany* under normal conditions. Nevertheless, the TSOs stress the difficulty in obtaining reliable data, due to the increasing number of market players, especially small embedded generation companies. In addition, depending on the weather and wind conditions, high flows may be observed in the North to South direction, so that network and market-related measures could be necessary to avoid congestion. Furthermore, Germany mentions possible limitation on generation due to problems of cooling water in case of sustained heat wave. Should critical unexpected situations occur, network and market-related measures should be taken by the German TSOs, including support from neighbouring TSOs. Network topology should be agreed with the neighbouring TSOs. Here again the critical period is July-August.

No particular critical situation is foreseen in *Belgium* for the summer months**.** 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 the continental Europe synchronous block.

The Netherlands do not regard this summer as a high risk period because i) hydro electricity has negligible impact on the Dutch generation; ii) summer peak loads on the High Voltage network are lower than winter peak loads; and iii) most part of generation plants being located on the sea-side, few generation reductions due to cooling problems are expected, even in case of drought and high temperatures. Nevertheless, should generation scarcity situation occur, good response is expected from the market and emergency

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reserves are available for the TSO (300MW domestic and, depending on availability, up to additional 500MW under contract of mutual assistance with a neighbouring TSO).

Luxembourg does not expect to have any problem in meeting the load for summer 2009. Although the country relies on import, network capacity is sufficient and contractual agreements have been made with the neighbouring countries to ensure energy delivery.

BALTIC SEA REGION

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

Summer is not forecast as a critical period on the *Nordic* power systems. The typical summer load in the Nordic power system is around one third lower than the winter load in normal temperatures. Even though overhauls of thermal generation units are scheduled for the summer period, the remaining margin is much higher in the summer period.

Baltic TSOs do not expect generation-load balance problems for the summer under normal conditions thanks to the availability of excess generation capacity in the Baltic and neighbouring power systems, as well as adequate transmission capacity.

In the upcoming 2009 summer season planned maintenance of Ignalina NPP in Lithuania and its shutdown during the August/September period (weeks 35-40) is the highest risk period, when there will be increased reliance on imports from Russia and the Nordic system.

As already mentioned, *Germany* expects no particular problem regarding the load/generation balance under normal conditions. However, depending on the weather and wind conditions, high flows may be observed in the North to South direction, so that network and market-related measures could be necessary to avoid congestion. In addition, in case of sustained heat wave in July-August, some limitation may occur on generation due to problems with cooling water. In case of critical unexpected situations, the German TSOs should take network and market–related measures, including support from neighbouring TSOs. Network topology should be agreed with the neighbouring TSOs.

The *Polish* TSO does not expect significant problems in operation this summer, mainly due to the observed load decrease that has resulted from the financial and economic crisis. The most critical month is September due to increasing load at the end of the summer while generation overhauls are still in progress and Combined Heat and Power plants will not yet have been started. In order to balance the system in tight margin situation, it is possible to take remedial actions like delaying overhauls and maintenance of generating units or network elements, the unavailability of which limits generation or imports. Should emergency situations occur, PSE Operator S.A. could resort to operation of “cross border rescheduling” (DC loop flow) using HVDC links under the Baltic Sea. Agreements have also been concluded with neighbouring TSOs for energy delivery in emergency situations.

CONTINENTAL SOUTH WEST REGION

France, Portugal, Spain

The situation of the *Spanish* peninsular system comes out as not critical for the next summer, even in the event of very low wind generation, very dry hydro conditions and a very high thermal forced outage rate. At the time of writing, the water level in the reservoirs is at average levels and water inflows from snow melting are expected to be high, whereas the forecast load is lower than last year.

Portugal expects no particular risks for the coming summer. Even if low hydro inflows and poor wind generation availability came in addition to a high level of demand due to high temperature, import should not be needed.

No particular problem is foreseen in *France* under normal conditions. However, in case of high temperatures and drought, with impact on both generation and load, margins would be reduced and the situation could be stressed at the beginning of the summer, especially in July, when imports up to 2800MW would be necessary to cover the minimum required margin. NTC from France to Spain could be reduced down to zero in case of heat wave.

CONTINENTAL CENTRE SOUTH REGION

Austria, France, Germany, Italy, Slovenia, Switzerland

No particular problem is expected by the TSOs of this region under normal conditions.

The most stressed period is the beginning of the summer and especially July in *France*; July-August in *Germany*; and September in *Slovenia* (due to overhauls and low hydro inflows). In Italy, forecast margins for the main islands are very tight.

Under normal conditions, traditional North to South congestion on the *Austrian* grid should be mitigated by available countermeasures like Phase Shifting transformer operations, re-dispatching of generation (including restriction on pumping) and special switching in network operation. The alleviation of this congestion needs a structural reinforcement of the 380kV network, with the new lines Südburgenland-Kainachtal to be commissioned in Summer 2009, and St. Peter-Tauern, planned. Special events (e.g. outages) or long-lasting drought could increase North to South congestion on the Austrian grid. Moreover, as the generation pattern highly depends on market prices on EEX and wind generation, which are hard to forecast, grid management is difficult to anticipate in special situations.

Depending on the weather and wind conditions, high flows may also be observed in *Germany* in the North to South direction, so that network and market-related measures could be necessary to avoid congestion. Germany mentions possible limitation on generation due to problems of cooling water in case of sustained heat wave. Should critical unexpected situation occur, network and market-related measures should be taken by the German TSOs, including support from neighbouring TSOs. Network topology should be agreed with the neighbouring TSOs. Here the critical period is July-August.

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In case of high temperatures and drought, with impact on both generation and load, margins would be reduced in *France***.** In July, imports up to 2800MW would be necessary to cover the minimum required margin.

In case of exceptional severe weather conditions in term of high temperatures and reductions in generation, *Italy* would need imports for weeks 28 to 30 and 35-36.

Although *Slovenia* should rely on imports to meet the peak load from the beginning of July, no critical situation is foreseen by the TSO under normal conditions. Temperature has a minor effect on the load in Slovenia, thus the main factor that could influence the generation and load balance is the possible limitation on generation, in particular if low hydrology comes in addition to heat. Imports from neighbours (most likely Austria and Croatia) should be needed. The period of risk is most part of the summer and especially September.

Even in the severe scenario, no problem is foreseen in *Switzerland*.

CONTINENTAL SOUTH EAST REGION

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

(No information was provided by Montenegro).

Bulgaria, Bosnia-Herzegovina, Croatia, Romania and *Republic of Serbia* do not expect system adequacy problems during the summer.

Hungary shows a need for import even under the normal scenario in September. Under severe conditions, the period of risk extends to the whole summer. Cross-border capacity is sufficient to allow for the required level of imports and MAVIR has contracted “market maker”-type contracts (i.e. yearly contracts for obligatory daily bids) for provision of reserve generation capacities, even from abroad. At the last resort, inter-TSO emergency energy deliveries are also contracted.

Slovenia should rely on imports to meet the peak load from the beginning of July, but no critical situation is foreseen by the TSO under normal conditions. Temperature has a minor effect on the load in Slovenia, thus the main factor that could influence the generation and load balance is the possible limitation on generation, in particular if low hydrology comes in addition to hot weather. Imports (usually from Austria or Croatia) should be needed. The period of risk is most part of the summer and especially September.

FYROM relies upon imports of energy to reach adequate balance between consumption and production/import. This year the import is lower than previous year, because the demand of eligible customers is lower than the previous year (because of the economic situation). In the case of risk, arrangements with neighbouring countries will be used for emergency help (market mechanisms such as balancing market, system reserve, and so on).

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In *Greece*, high load (demand) is expected during the summer and particularly between 20 June and 25 August, because of the high temperatures.

On the other hand the capacity of North Interconnections has been increased 400MW due to a new transmission line between Bulgaria and FYROM, which led to a great NTC increase in the whole Balkan area. In case of risk, the following mechanism will be activated:

Incentives to interruptible customers to reduce their consumption during peak hours and,

Maximization of our north import capacity in collaboration with our neighbouring TSOs.

The high risk periods are the second half of June, July and the first half of August

The most critical interconnectors to rely on for imports are the interconnection with Bulgaria and the HVDC cable with Italy. The countries to rely upon in order to provide exports are Bulgaria, Italy and Romania. Availability of imports is mainly affected by the reliability of assets.

In *Italy*, Terna does not expect to face particular problems on the Italian power system under normal conditions with the exception of the main islands where the forecast margins are very tight.

In case of severe climate conditions (high temperatures, shortening of hydro resources) that can lead to an increase of demand and to a large reduction of production of some thermal power plants due to cooling systems problems, margins would also be reduced in the mainland.

In order to cope with unexpected events the following countermeasures are usually taken by Terna, hereafter mentioned according to their priority, without triggering the interruptible loads disconnection or the load shedding:

- monitoring of hydro reservoirs, jointly performed with the other involved authorities, to prevent any possible hydro shortage;
- activation of special devices to allow the production of some generating units affected by cooling system difficulties due to low levels of the rivers;
- modification of the planned maintenance of grid elements and power plants;
- activation of the emergency contracts with the neighbouring TSOs;
- Commitment of power plants whose production is allowed under special conditions due to environmental limits established by national decrees.

In case of exceptional weather conditions in terms of high temperatures and unforeseen outages of relevant thermal power plants there will be need of imports from week 28 to 30 and from week 35 to 36. In general all the interconnectors belonging to the neighbouring power systems (France, Switzerland, Austria, Slovenia, Greece) are necessary to provide imports. Special reliance is given to the northern interconnection. Availability of imports can

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affect the load and generation patterns in Europe particularly due to weather conditions in the summer.

CONTINENTAL CENTRE EAST

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

As mentioned above, under normal conditions, traditional North to South congestion on the *Austrian* grid should be mitigated by available countermeasures. Certain events (e.g. outages) or long-lasting drought could increase this congestion. However, anticipatory grid management is difficult, the generation pattern being hard to forecast since it depends on market prices and wind availability. Congestion observed in the past on the Czech-Austrian border is now resolved, due to the commissioning of the 2nd system Slavetice - Dürnrohr.

No significant problem is expected in the *Czech Republic* for the summer. Nevertheless, CEPS underlines the risk that the drop in consumption following the economic crisis could result in insufficient negative power reserves and also possibly spinning reserves, since not enough units capable of providing negative reserve may be running.

No particular problem regarding the load/generation balance is foreseen in *Germany* under normal conditions. Nevertheless, the TSOs stress the difficulty in obtaining reliable data, due to the increasing number of market players, especially small embedded generation companies. In addition, depending on the weather and wind conditions, high flows may be observed in the North to South direction, so that network and market-related measures could be necessary to avoid congestion. Germany also mentions possible limitation on generation due to problems of cooling water in case of sustained heat wave. Should critical unexpected situation occur, network and market-related measures should be taken by the German TSOs, including support from neighbouring TSOs. Network topology should be agreed with the neighbouring TSOs. Here again the critical period is July-August.

As already mentioned, the *Polish* TSO does not expect significant problems in operation this summer, mainly due to the observed load decrease that results from the financial and economic crisis. The most critical month is September due to increasing load at the end of the summer while generation overhauls are still in progress and Combined Heat and Power plants will not yet have been started. In order to balance the system in a tight margin situation, it is possible to take remedial actions like delaying overhauls and maintenance of generating units or network elements, the unavailability of which limits generation or imports. Should emergency situations occur, PSE Operator S.A. could resort to operation of “cross border rescheduling” (DC loop flow) using HVDC links under the Baltic Sea. Agreements have also been concluded with neighbouring TSOs for energy delivery in emergency situations.

Slovakian dependence on imports started in 2007 with the shutdown of the first nuclear unit of J. Bohonice and increased from December 2008 with the shutdown of the second unit. The most stressed periods are weeks 23 and 27 and especially September, which shows negative national balances even under the normal scenario. Imports are expected from the *Czech Republic*.

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Hungary shows a need for import even under the normal scenario in September. Under severe conditions, the period of risk extends to the whole summer. Cross-border capacity is sufficient to allow for the required level of imports and MAVIR has contracted “market maker”-type contracts (i.e. yearly contracts for obligatory daily bids) for provision of reserve generation capacities, even from abroad. At the last resort, inter-TSO emergency energy deliveries are also contracted.

Croatia and *Romania* expect no particular problem for the next summer.

Slovenia should rely on imports to meet the peak load from the beginning of July, but no critical situation is foreseen by the TSO under normal conditions. Temperature has a minor effect on the load in Slovenia, thus the main factor that could influence the generation and load balance is the possible limitation on generation, in particular if low hydrology comes in addition to heat. Imports from neighbours (most likely Austria and Croatia) should be needed. The period of risk is most part of the summer and especially September.

ISOLATED SYSTEMS

Cyprus

No major problems are foreseen in Cyprus for this summer. The highest risk period has been identified as weeks 25 and 26.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

The TSO does not expect any problems in the system regarding system adequacy this summer. Albania will remain an importer country during the summer.

Ukraine West

(No information provided by the TSO)

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5 LESSONS LEARNT

In order to improve on the forecasting process the main learning points experienced via ENTSO-E reporting can be summarized as:

- Particular attention must be paid to the economic conditions, as they have a significant impact on the load; nearly all TSOs underline the difficulty of making accurate forecasts in the current circumstances.

- The negative trend of electricity consumption may necessitate the introduction of regulatory mitigation mechanisms through which the impact on transmission businesses is limited in order to not affect planned investments in network development.

- Attention shall be given on the availability of fossil-fuel generation units which are affected by the emission trading schemes and directives 2001/80/EC and 2001/81/EC.

- Efficient coordination with gas operators and market players is needed (especially in case of stress on gas supply).

- Better coordination of TSOs is needed in “special cases” (e.g. high wind generation in Germany) as network and market-related mitigation measures may be needed. In addition, 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 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 on 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 wave.

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6 APPENDICES

6.1.1 Appendix 1: Individual Country Responses to Winter Review

6.1.2 Appendix 2: Individual Country Responses to Summer Outlook

6.1.3 Appendix 3: Summer Outlook/Winter Review Questionnaire

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6.1 Appendix 1: Individual Country Responses to Winter Review

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BALTIC STATES

Estonia

2008 ended with December being warmer and milder then predicted with an average temperature 0.4ºC (normal -2.8ºC, lowest -11.7ºC) and precipitation levels within normal limits. 2009 started out as forecast with low January temperatures which reached a minimum on 7th January. However, the average temperature and precipitation level in January was higher than normal: average temperature was -1.9ºC (normal -5.5ºC, lowest -22.3ºC); precipitation level was 28–58 mm (average 28–49 mm). February weather conditions were in normal limits with an average temperature -4.3ºC (normal -5.7ºC, lowest -23.1ºC). March was quite cold with a high level of precipitation. The average temperature in March was -0.7ºC (normal -2.1ºC, lowest -17.9ºC), precipitation level 29–63 mm (average 23–38 mm).

Estonia did not expect any risks under normal conditions, and domestic generation capacity was sufficient to cover peak loads during the winter season 2008-2009.

Economic recession, decreasing of production volume and economic policy caused a reduction of approximately 2% in electricity consumption compared with the same period of the last year. Taking into account the quite cold and long winter time the real reduction of electricity consumption will be more significant. The most appreciable difference between expected and actual values occurred in February. The peak loads in winter months were as follows:

December forecast:	1450MW;	actual: 1457MW
January forecast:	1570MW;	actual: 1535MW
February forecast:	1550MW;	actual: 1424MW
March forecast:	1400MW;	actual: 1315MW.

No unplanned overhauls or maintenance works occurred on the generation side. The peak load of the winter season was 1535 MW which was 2% less than the forecast value. Interconnectors were mostly used for export. Estonia did not experience any gas supply interruptions.

Latvia

Climatic conditions in the 2008/2009 winter period were comparable with historical averages. Average ambient temperature was 3-4°C lower than in 2008 winter period. Electrical energy consumption was about 7-8% less when compared with 2008.

Transmission lines and HV equipment outages in winter period were around 1-2% per km per year. Power station equipment outages were 0.5-1% in winter period. The power transmission network capacity was not substantially reduced or increased.

Extraordinary factors which have affected power system operation are the deterioration of the general economic situation and a decrease in consumption. According to the energy

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forecast report of Latvia's Economic Ministry, energy consumption will not increase before 2011.

Although Latvia is wholly dependent upon Russia for its gas supply, the Russian gas supply to Latvian consumers was not interrupted over the winter, because there is a direct gas line between Latvia and Russia with underground gas storage. There are no alternative routes for gas supply.

Lithuania

The winter situation in Lithuania has been quite normal. The average temperature was higher than normal winter temperature in Lithuania and there were no stressed periods for system adequacy during the winter. There were no significant generation or transmission outages during the winter season and peak demands periods were recorded during the 2nd week of January 2009.

	December, 2008	January, 2009	February, 2009	March, 2009
Average temp.	0.6ºC	-1.9^{0}C	-2.5^{0}C	1.3^{0}C
Normal temp.	-2^{0}C	-5.1^{0}C	-4.6^{0}C	-0.7^{0}C

Strong winds (15-20 m/s) were observed only in December. During January, February and March wind speed did not exceed 15 m/s.

Lithuania did not experience any gas supply reduction during the winter, although there are no other alternative sources of gas.

Kaunas hydro power plant was constantly operated with two units at the total capacity of 50 MW due to the reconstruction works on the other two units.

The decreased demand resulted in stable production prices.

UKTSOA/ATSOI

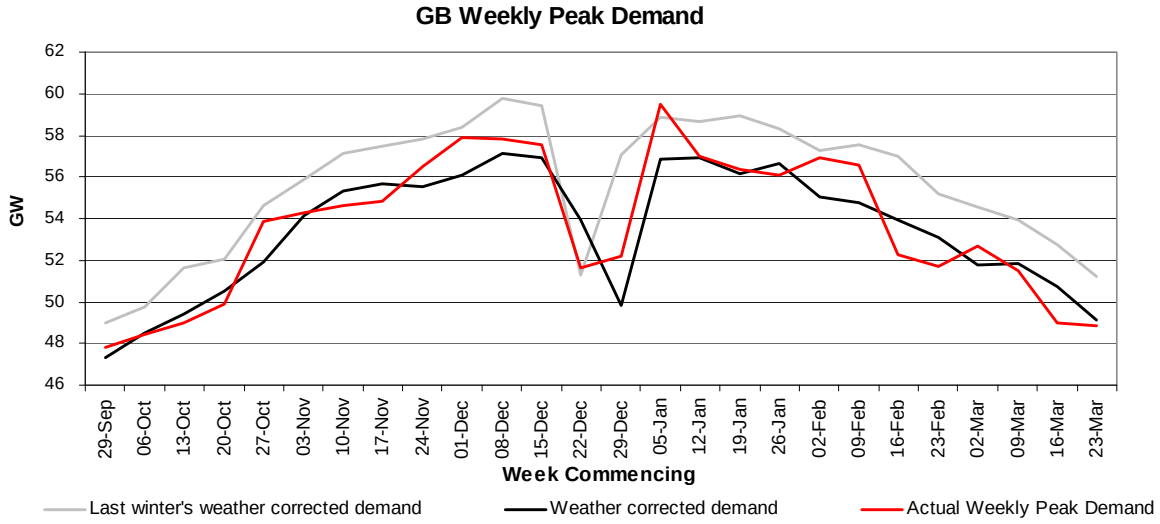
Great Britain

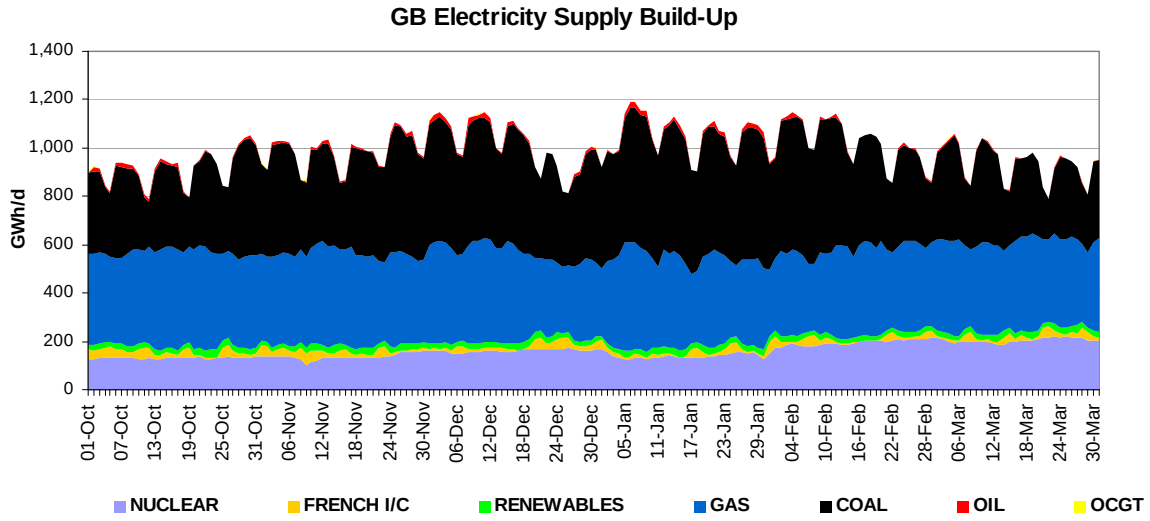
The 2008/9 winter was colder than all but 3 of the years used to calculate the 17-year average. The peak winter demand of 59151MW occurred on 6th January. This was close to the ACS (Average Cold Spell) forecast of 59200MW, but average demand was around 2GW lower than for the previous winter with weather-corrected week-on-week reductions in

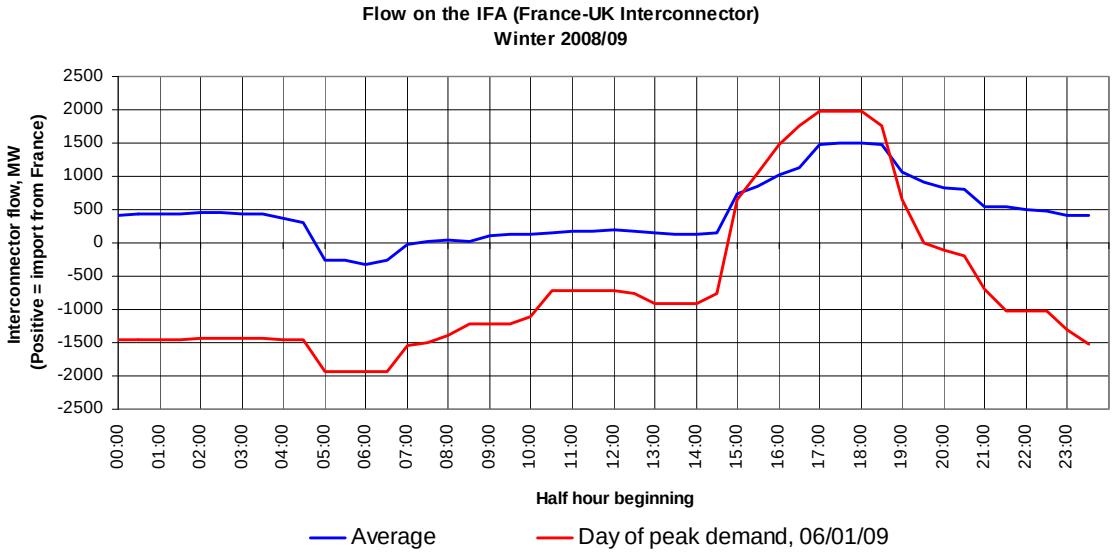
energy terms reaching nearly 6%. This reduction in demand is consistent with negative growth in the British economy, end-user efficiency savings and lower consumption by users in response to high prices.

The most stressed periods on the system were early December and early January, and although there was low nuclear plant availability which had been identified as a risk in the Winter Outlook Report, this did not affect the ability of the system to meet demand at all times.

There were no unexpected events, and the GB system was not affected by the Russia-Ukraine gas dispute.







Northern Ireland

During the winter period of 2008/09, Northern Ireland experienced no significant cold spells with no major ice accretion or storm damage to the transmission network. There was a three week period covering the end of October through the beginning of November when there was a reduction in generator availability. This resulted in higher cost imports from Scotland. There were no other significant periods of risk and no interruptions to the gas supply. The winter peak demand was at a lower level than forecast, primarily as a result of the ongoing world economic downturn. Imports on the interconnections were obtained as required.

Republic of Ireland

As with winter 2007-2008, there were no significant issues during the winter 2008-2009 period. The winter peak demand occurred on Monday 15th December. The peak was 5053MW (generated), which equated to 4878MW (exported). This was a slight decrease on the previous year's peak of 5085MW (generated). The wind generation at the time of the peak demand was 285MW. The predicted winter peak in the Winter Outlook was 5125MW (exported). At the time of writing the Winter Outlook report the year to date average demand growth was strong at nearly 3%. From August onwards demand growth slowed substantially resulting in a difference of nearly 250MW (5%) between the actual and predicted peak. By year end the year to date average demand growth had dropped to 1.9%.

During December 2008, there was forced outage rate for generation of 15.3% for the system which is higher than the 11.5% forced outage rate used in the Winter Outlook report. However, given the lower than anticipated peak demand and higher than anticipated wind generation, the system remained well within the capacity adequacy standard for the

winter period. In 2009, there has been a marked decrease in the forced outage rate of the system and this has led to improved capacity margins.

NORDEL

Finland

General Comment on Winter Conditions:

The winter was warmer than normal at the beginning, and around average level at the end of the winter period. The hydro situation was very good at the end of 2008 i.e. the total reservoir content about 90% of maximum and remained good during the whole period. Nuclear production operated with full output without any disturbances.

The production capacity in Finland is a mixture of hydro, nuclear, CHP industrial, CHP district heating and condensing power, each representing approximately 20-25%.

Review of the Situation by Monthly Period:

Economic recession caused historic decrease in electricity consumption during the winter. In January 2009 total consumption was about 9 % lower compared with last January. The reduction in industrial electricity usage was nearly 17% and two percent in other consumption.

During the whole winter period the electricity transmission was mainly export from Finland to Sweden. The maximum export capacity from Finland to Sweden is 1650 MW, which was fully utilized typically during the nights. In February and March there were maintenance works on one cross-border line causing capacity reduction and congestion for the electricity market.

The Estlink 350MW interconnection between Estonia and Finland was used for importing electricity into Finland. During nights and weekends the import volumes were lower.

The Russian interconnection was used for electricity import from Russia to Finland nearly continuously with full capacity during the whole winter. Maximum import capacity from Russia to Finland through 400kV connections is 1400MW.

Due to economic recession and quite mild winter temperatures the electricity peak consumption in Finland was only 13000MW, which is more than 700MW lower than the peak of the previous winter and 1900MW lower than the all time high two years ago. There were no start-ups of the production capacity based on the Power Reserve Act, which is reserved for securing the power balance during extremely cold periods.

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

Lessons Learned for Winter 2009/10:

Economic recession had a large impact on total demand, which was difficult to forecast, but because of load reduction this did not cause any problems for power system operation.

Finnish power balance still relies heavily on imports from Russia, Estonia and Nordic countries. In the coming winters with possible lower temperatures this may create a potential risk for strained power balance situations, if disturbances or capacity reductions should occur simultaneously. The periodic arrangement i.e. Power Reserve Act will help securing the power balance before commissioning of the new nuclear unit in Olkiluoto.

Norway

General Comment on Winter Conditions:

The winter situation in Norway has been quite normal. The average temperatures have been higher than forecast, and the peak load has been lower than expected. The reservoir levels have been slightly lower than normal. Norway has been exporting energy to the Netherlands, Denmark and Sweden this winter.

Review of the Situation by Monthly Period:

In spring 2008 a fault on one of three major subsea cables in south-east Norway occurred. Just a few weeks later another fault, independent of the first, was detected on a second subsea cable. With two of the three subsea cables out of order, the capacity between Norway and Sweden was substantially reduced. The fault-localization and repair was challenging and has taken longer than expected. In late November 2008, one of the cables was put back into operation so the capacity could be raised somewhat. However, the capacity between Norway and Sweden has been highly dependent on load flow conditions in the network, and the exchange on the HVDC links to the Netherlands and Denmark. The last cable is expected back in operation on June 1st.

To maintain system security in Southern Norway, the export capacity to the Netherlands and Denmark had to be restricted on some winter workdays, down to min. 550MW (normally 700) to the Netherlands, and min. 750MW (normally 1000) to Denmark. Both volume and duration of the limitation varied, depending on the load situation. Reduction of export capacity also occurred during weekends when cold weather conditions were expected.

The 700MW HVDC subsea cable between Norway and the Netherlands was out of service due to a fault from February 6 to February 25.

Lessons Learned for Winter 2009/10:

The availability of subsea cables is a key point for the system operation.

Denmark

General Comment on Winter Conditions:

The winter was calm and 1°C warmer than normal. No extreme weather conditions occurred. For this reason the peak loads have been lower than expected. In addition to this the monthly consumption has for the last half year decreased dramatically (e.g. 6% for October) compared to the same months the year before due to the economic crisis.

The generation capacity in Denmark is predominantly thermal with some wind.

Review of the Situation by Monthly Period:

The HVDC-connections to Norway, Sweden and Germany showed stable operations.

From Denmark West to Germany the electricity transmission was mostly in southward direction. On the connections from Denmark West to Norway and Sweden and from Denmark East to Germany the electricity transmission was roughly in southward direction during day time of workdays and in northward direction during nights and weekends.

During parts of 5th January (which was also the day of winter peak load) 3 major power plants in Denmark East were out of operation due to failures and repairs. The situation was handled by activation of reserves and increased imports.

No peak load arrangements were entered into.

Peak load for the winter was 3674MWh/h in Denmark West and occurred on 6th January in hour 17-18. In Denmark East it was 2636MWh/h on 5th January in hour 17-18. The temperatures were respectively 0.4°C and -6.3°C.

Lessons Learned for Winter 2009/10:

The handling of outages and of high production from the wind power plants requires good flexibility in regulating reserves, and strong connections (also with flexibility) to neighbouring areas also especially in Nordel.

Sweden

General Comment on Winter Conditions:

In the beginning of autumn 2008 the running 52-week value of demand in Sweden started to decrease. In February 2009 the reduction was approximately 2.5% compared with the previous year.

The temperatures were above normal during the whole winter with the exception of northern Sweden in February. Northern Sweden was a few degrees colder than normal. On the other hand only a fifth of the Swedish demand is in the north.

The reservoir levels in the Elspot area were a little less than normal in mid November. But in Sweden the levels were about ten percent lower than normal.

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Review of the Situation by Monthly Period:

The two largest nuclear units in Sweden were out of operation from October 2008 until the beginning of 2009. They were both having problems with the control rods in the nuclear reactors. This is an example of Common Mode Failure. Difficulties in acquiring new control rods prolonged the outage. The normal power capacity of the units is 2300MW. During the same period a third unit of 855MW was out of operation due to annual maintenance.

The uncertainty of when the nuclear units could be back in operation and that the net transfer capacity from southern Norway was restricted made it necessary for Svenska Kraftnät to revise the forecast of the power balance for the coming winter period.

The production outages also affected the transmission capacity in cut 2 and cut 4 in Sweden during periods with colder weather. In mid February the Baltic Link between Sweden and Germany was damaged for the rest of the winter period. Except for that the transmission capacity in the Swedish grid has been normal.

The peak load in Sweden during the winter 2008-2009 was 24900MW on January 16th 2009 between 20:00 and 21:00hrs. The temperatures were a little above normal winter minimum temperatures. There was no need to activate the contracted power reserves.

Lessons Learned for Winter 2009/10:

The long period of reduced nuclear capacity in the beginning of the winter 2008-2009 caused by a Common Mode Failure makes it necessary to analyze such scenarios. Such scenarios will be included in the power system analysis of peak load conditions.

NORTH WESTERN UCTE

Austria

Compared to the long-term average climate conditions, winter 2008-2009 was a regular one. No extraordinary peaks occurred.

Two major risks were mentioned in the last Winter Outlook Report. North-South congestion on the weak 220kV lines from North to South of Austria and congestion on the Czech-Austrian tie lines. The problem on the Czech-Austrian tie lines has been solved with the commissioning of the 380kV second system Slavetice-Dürnrohr in November 2008. The North-south risk still exists but because of the special situation of consumption and generation no serious problem occurred which could not be managed by phase shifting transformers.

In the substation Meiningen a second 220kV busbar has been put into operation which allows a better balanced distribution of the load flows at the border of Switzerland.

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Monthly consumption has decreased since November 2008 because of the financial crisis. However imports in winter 2008/2009 increased compared to last winter which is explained by lower generation.

Belgium

General comment on winter conditions

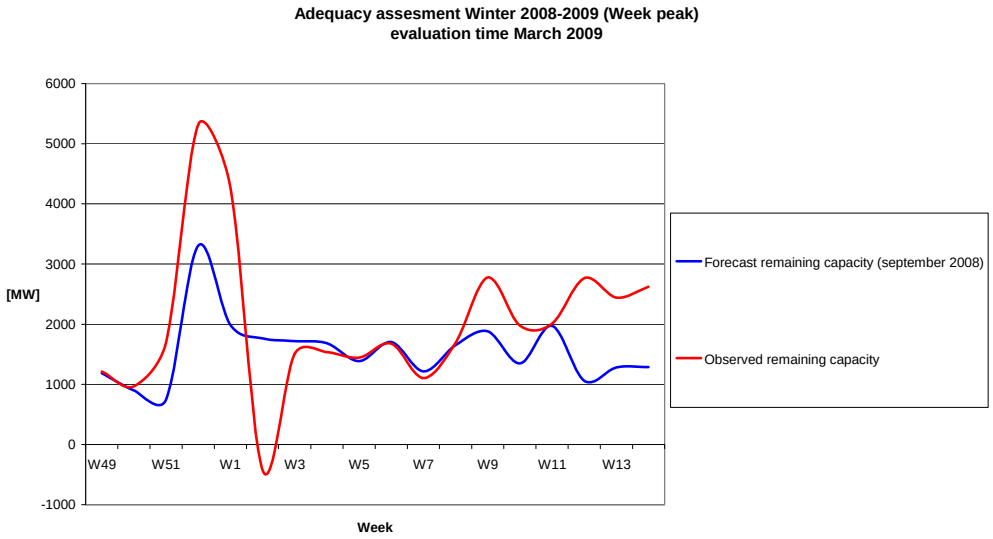
The adequacy forecast study “winter 2008-2009” carried out in September 2008 for the Elia control area, which comprises Belgium and the SOTEL area (a part of the G-D of Luxembourg), revealed that the desired safety level of 1000MW for the generation-load balance would not be reached during the peaks of weeks 50 and 51 of 2008. It was assumed that system adequacy would be respected if the available import capacity was taken into account. In order to ensure a maximum level of available import capacity, only the 380kV international line Achêne (BE)-Lonny (FR) was taken out of service in week 14 of 2009. This reduced the simultaneous import capacity by approximately 350MW. However, this outage would be cancelled when required for the security of the system. The first analysis of the system adequacy for winter 2008-2009 was positive, assuming a net import during periods with a generation-load imbalance.

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 UCTE-main block;
- unplanned outages at the main generation plants in Belgium.

In reality, the desired safety level of 1000MW for the generation-load balance, corresponding with the assumption of autonomous national power supply, was not attained during the peak of week 50 of 2008 and the peak of week 2 of 2009. Nevertheless, compliance with security levels was met by the use of import capacity made available by Elia. The report was prepared in September 2008 before the outbreak of the financial and economic crisis. This crisis resulted in an unforeseen decrease of the load during winter 2008-2009. Hence unforeseen unavailability of power units were compensated by a load much lower than expected. A very critical situation occurred in week 2 of 2009. The deviation from the predicted situation during the peak of week 2 of 2009 was caused by a cold spell that resulted in the highest loads measured during winter 2008-2009 but also in the simultaneous unforeseen unavailability of several generators.

The figure below gives an overview of forecast remaining capacity (evaluation time Sept. 2008) and the observed remaining capacity for the week peaks of winter 2008-2009.



As indicated in the winter outlook, in the weeks during which the desired safety level (corresponding with the assumption of autonomous national power supply) was not obtained, the Elia control area structurally depended on import within the UCTE-main block in order to obtain the desired safety level of 1000MW. Elia did not expect any congestion problems on its grid for winter 2008-2009 due to the minimization of planned outages of international lines during critical winter periods. Furthermore atypical winter loop flows from the South to the North causing congestion problems in the Elia grid are less problematic since the commissioning of a phase shifter in the Zandvliet substation and two phase shifters in the Van Eyck substation as they allow a better management of this type of loop flows.

In general, the system adequacy for winter 2008-2009 was positive, as unforeseen unavailabilities of power units were compensated by much lower loads than expected due to the outbreak of the financial and economic crisis. A very critical situation occurred during 6 and 7 January 2009. A cold spell caused the highest loads measured during winter 2008-2009. At the same time an unforeseen unavailability of a nuclear unit occurred simultaneously with the unexpected absence of several fossil fuel units caused by the cold spell. This resulted in an unavailable capacity that largely exceeded the remaining capacity that is used to assess if the remaining capacity is sufficient in normal conditions (assuming autonomous national power supply), namely the impact of the loss of the biggest generating unit (1050MW). A combination of measures avoided an imbalance of load and generation, namely (1) import by market players through the intraday market; (2) activation of load shedding contracts by an ARP[1] (3) utilization of inter-TSO reserves and other reserves and (4) utilization of phase shifters to reduce the loop flows from the North to the South by 500MW.

[1] Access Responsible Party

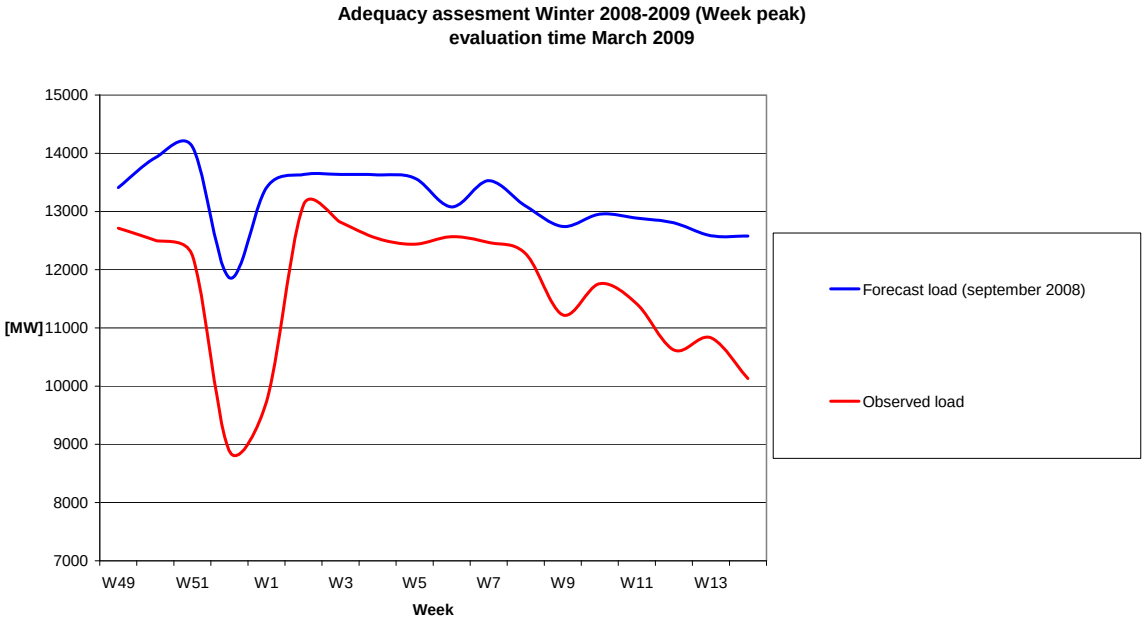
Impact of the interruption of the Russian gas supply

The dispute between Russia and Ukraine had no influence on the Belgian gas supply. Furthermore the main gas infrastructure in Belgium is bidirectional. Hence if one gas source is not available, it is easy to switch to another gas source even if it is located somewhere else.

Review of the main features

- demand:

  The forecast demand levels took into account normal temperature conditions. The average temperature during winter 2008-2009 was on average 2.1°C lower than the decennial average winter temperature (1999-2008). If the economic and financial crisis had not occurred, the actual demand levels would have been higher than the forecast demand levels. However, the economic and financial crisis resulted in demand levels lower than forecast demand levels (see figure below)



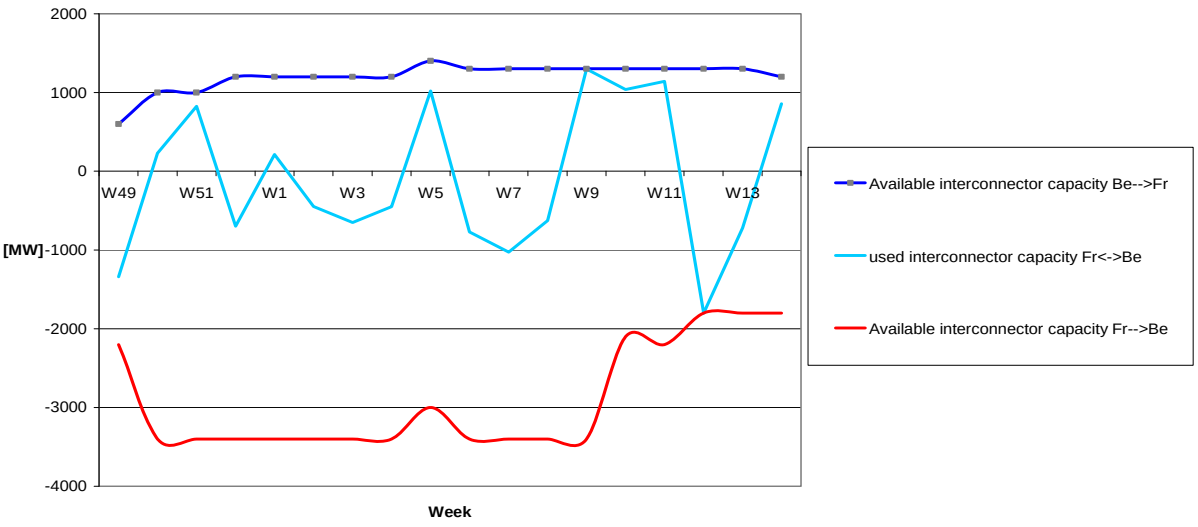
- Transmission infrastructures

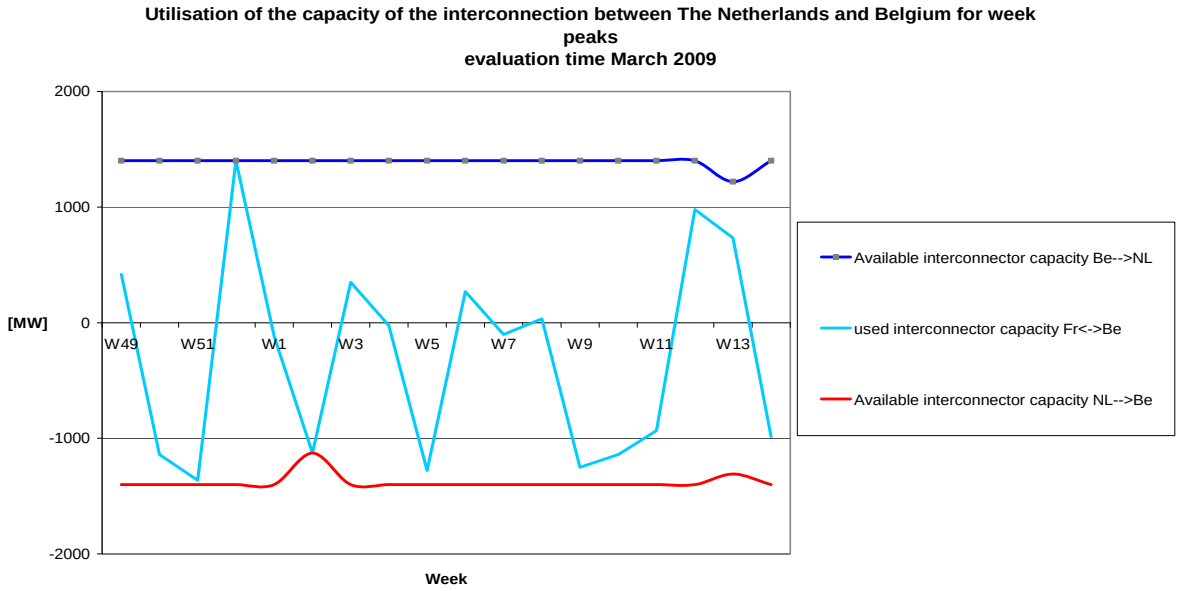
  In line with planning, only the 380kV international line Achêne (BE)-Lonny (FR) was taken out of service in week 14 of 2009. This reduced the simultaneous import capacity with approximately 350 MW. As from 2nd March 2009 the available interconnection capacity between France and Belgium has been reduced due to problems in the internal grid in France.

- Use of interconnections:

  The charts below give an indication of the utilisation of the capacity of the interconnection between France and Belgium and between the Netherlands and Belgium during winter 2008-2009. In order to assess the utilisation of an interconnection the day-ahead available interconnection capacity is compared to the day-ahead nominated interconnection capacity. The diagrams below illustrate that during winter 2008-2009 the interconnection between France and Belgium was less used in the direction of Belgium than in previous winters and that the interconnector between the Netherlands and Belgium was more used in the direction towards Belgium than previous winters.

Utilisation of the capacity of the interconnection between France and Belgium for week peaks evaluation time March 2009





- Summary of market conditions:

  As of from November 2008, fuel prices fell to record lows, resulting in lower power prices. Even some cold winter temperature peaks in the course of January 2009 did not reverse this. Prices remained stable throughout January in comparison to December, driven by remaining low primary energy sources and a quite stable supply-demand balance. Electricity prices on the spot market dropped even further to 48.98 €/MWh in February, following a general trend in gas, CO_2 emission rights and coal markets, triggered by bad economic foresights. Industrial demand remained quite low, failing to provide any support to the declining prices.

Lessons learned for winter 2009-2010

The most significant variations between the forecast remaining capacity (evaluation in September 2008) and the observed remaining capacity for the week peaks of winter 2008-2009 were due to unexpected unavailability of generators and changes in the timing and duration of the maintenance of generators. However, these were offset by a lower than expected demand due to the financial and economic crisis.

The commissioning of the first additional generator of significant impact is scheduled for the coming winter 2009-2010. This will have a positive influence on the system adequacy. However, the Elia control area will also rely on the ability to import during winter 2009-2010 in order to obtain a positive system adequacy analysis.

France

General commentary on Winter Conditions

Climatic conditions have been hard with:

- A cold spell during the second week of January
- 'Klaus' storm which hit South-West France on 23 and 24 January

Generally, temperature was always lower than average temperature:

	Monthly average	Deviation from normal temperature	Deviation from the same month one year before
November	8.2°C	-0.3°C	+0.9°C
December	4.2°C	-1.2°C	-0.5°C
January	2.7°C	-2.4°C	-4.1°C
February	4.9°C	-1.8°C	-2.2°C
March	8.1°C	-0.8°C	+0.3°C

Last winter was the third coldest one over the last twenty years.

The main risk factor identified in the Winter Outlook report was the sensitivity of the load to low temperatures. This risk occurred during all the winter because of the low temperatures. A cold spell occurred exactly during the second week of January, so that the French consumption reached a new peak at 92400MW, with a temperature a lot colder than normal.

The significant events concerning lack of margin (margin in real time < 1500MW) increased compared to winter 2007-2008, especially in February.

In addition, some unexpected situations arose during this winter:

- November 3: the tripping of the 400kV line between Marseille and Toulon plus the simultaneous tripping of a 225kV line (due to thunder) caused a big power cut in Southern France (about 1500MW, 1.5 million customers).

- January 24: 'Klaus' storm caused many lines to trip in South-Western France, resulting in loss of supply for 1.7 million customers including Perpignan area, and a request to reduce exchanges on the interconnection with Spain.

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- In February: The simultaneous breakdown of 4 nuclear power units on the same site on February 12 caused a large drop of frequency and tight margins were faced during the following days.

Economic crisis caused unexpected reduction of demand so that the forecast was too high at weekly peak demand.

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

-2.2% in November;
-1.4% in December;
-2.4% in January;
-1.3% in February;
-3.6% in March.

The forecast of French consumption is now more difficult to perform due to the economic crisis.

Energy efficiency initiatives have started in France but they cannot be quantified for the moment. RTE's website encourages customers to save energy.

As identified in the Winter Outlook report, January and February have been the most stressed periods for system adequacy, mainly due to hard climatic conditions and high level of consumption.

Impact of Interruption of Gas Supply

Generation availability in France has not been impacted by gas supply reduction due to the dispute between Russia and Ukraine.

Gas-fired units (Combined Cycle Gas Turbines and Combined Heat and Power Units) represent about 5% of the national generation capacity.

Conversely, due to economic crisis, the gas industry demand decreased, so that market prices also decreased.

Detailed Review of the Most Stressed Periods

The generation overhauls were globally realised as planned.

Average wind average was in line with forecast.

The general level of unplanned overhauls and outages was consistent with forecast values.

- The most remarkable event concerning generation was the simultaneous breakdown of 4 nuclear power plants of the same site (common mode failure) that caused margin problems on February 12 and 25. In order to mitigate them, RTE used the balancing mechanism (improving generation and reducing exchanges) and activated mutual backup contracts signed with neighbouring European TSOs.

Regarding the load, the main issue was the cold spell of the second week of January: three new peaks of consumption have been successively reached, with a maximum at 92400MW (the 7th). This peak was lower than forecast in the winter outlook for the severe scenario (temperature lower by 5°C than normal conditions), because of the drop of consumption due to economic crisis.

Nevertheless, these levels of consumption caused low voltages problem and induced risk for the security of the system especially in Western France. As a consequence, RTE has taken some measures:

- RTE used « safety order » to avoid voltage collapse in Western France.
- For the first time, RTE used SMS alert and website alert to encourage people to reduce its consumption at peak of demand in Western and Southern France.

During this week, the balance of physical exchanges was negative; -3500 MW were reached on January 6. Export capacities were not reduced.

Regarding the transmission infrastructure, the main event was 'Klaus' storm, on 24 January: 115 lines tripped, of which 6 lines of the 400kV network and 10 lines of the 225kV network. The outage of some 400kV lines in South-West France caused import from Spain. During a few days, export capacities to Spain were reduced.

On January 4: the outage of one 400kV line in South-Eastern France caused exchanges reduction with Italy.

On January 15 and February 2: the outage of one IFA bipole reduced the exchange capacity with Great-Britain.

In December: the 400kV line Vigy-Marlenheim between Metz and Strasbourg was commissioned.

Regarding congestion, as already mentioned, low voltage constraints occurred in Western France during the period of high consumption in January.

Local congestion occurred in March in the Alps due to the breakdown of La Praz Phase Shift Transformer while export exchanges to UCTE were high.

On March 3, a problem of low voltage in West-Southern France caused a reduction of exchanges from France to Spain.

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Use of interconnections:

EXPORTS	November 2008 (GWh)	Trend compared with the same period in 2007	
		November	Since 1st January
Belgium	440	↘ -22%	↘ -3%
Germany	391	↗ 55%	↘ -22%
Switzerland	2 103	↘ -2%	↘ -1%
Italy	1 776	↗ 14%	↘ -7%
Spain	468	↗ 81%	↘ -23%
Great Britain	794	↗ 129%	↗ 41%
Total	**5 972**	**↗ 16%**	**↘ -2%**

IMPORTS	November 2008 (GWh)	Trend compared with the same period in 2007	
		November	Since 1st January
Belgium	286	↗ 12%	↗ 2%
Germany	1 318	↘ -48%	↗ 30%
Switzerland	414	↘ -36%	↗ 89%
Italy (1)	112	↘ -24%	↗ n.s.*
Spain	283	↘ -6%	↗ 61%
Great Britain	263	↘ -62%	↘ -59%
Total	**2 676**	**↘ -42%**	**↗ 36%**

EXPORTS	December 2008 (GWh)	Trend compared with the same period in 2007	
		December	Since 1st January
Belgium	224	↘ -73%	↘ -7%
Germany	267	↗ 51%	↘ -20%
Switzerland	2 384	↗ 6%	≈ 0%
Italy	1 886	↗ 12%	↘ -5%
Spain	495	↘ -2%	↘ -21%
Great Britain	580	↗ 25%	↗ 40%
Total	**5 836**	**↘ -1%**	**↘ -2%**

IMPORTS	December 2008 (GWh)	Trend compared with the same period in 2007	
		December	Since 1st January
Belgium	357	↗ 187%	↗ 16%
Germany	1 574	↘ -44%	↗ 17%
Switzerland	389	↘ -21%	↗ 77%
Italy (1)	134	↗ 51%	↗ n.s.*
Spain	293	↗ 24%	↗ 57%
Great Britain	370	↘ -39%	↘ -55%
Total	**3 117**	**↘ -28%**	**↗ 26%**

EXPORTS	January 2009 (GWh)	Trend compared with January 2008
Belgium	373	↘ -67%
Germany	524	↗ 124%
Switzerland	2,448	↗ 9%
Italy	1,804	↘ -3%
Spain	332	↘ -52%
Great Britain	568	↘ -47%
Total	**6,049**	**↘ -16%**

IMPORTS	January 2009 (GWh)	Trend compared with January 2008
Belgium	505	↗ n.s.*
Germany	1,477	↘ -36%
Switzerland	478	↗ 50%
Italy	72	↘ -29%
Spain	442	↗ 155%
Great Britain	479	↗ n.s.*
Total	**3,453**	**↗ 13%**

EXPORTS	February 2009 (GWh)	Trend compared with the same period in 2008	
		February	Since 1st January
Belgium	432	↘ -63%	↘ -65%
Germany	569	↗ 63%	↗ 87%
Switzerland	2 257	↗ 13%	↗ 11%
Italy	1 747	↗ 1%	↘ -1%
Spain	280	↘ -54%	↘ -53%
Great Britain	468	↘ -47%	↘ -47%
Total	**5 753**	**↘ -15%**	**↘ -16%**

IMPORTS	February 2009 (GWh)	Trend compared with the same period in 2008	
		February	Since 1st January
Belgium	344	↗ n.s.*	↗ n.s.*
Germany	1 306	↘ -36%	↘ -36%
Switzerland	223	↗ 70%	↗ 56%
Italy (1)	11	↘ -87%	↘ -56%
Spain	394	↗ n.s.*	↗ 191%
Great Britain	247	↗ 145%	↗ 218%
Total	**2 525**	**↘ -1%**	**↗ 7%**

EXPORTS	March 2009 (GWh)	Trend compared with the same period in 2008	
		March	Since 1st January
Belgium	420	↘ -68%	↘ -66%
Germany	795	↗ n.s.*	↗ 150%
Switzerland	2 336	↗ 12%	↗ 11%
Italy	1 932	↗ 15%	↗ 4%
Spain	530	↗ 23%	↘ -34%
Great Britain	620	↘ -27%	↘ -41%
Total	**6 633**	**↗ 1%**	**↘ -10%**

IMPORTS	March 2009 (GWh)	Trend compared with the same period in 2008	
		March	Since 1st January
Belgium	403	↗ n.s.*	↗ n.s.*
Germany	1 149	↘ -58%	↘ -45%
Switzerland	145	↘ -53%	↗ 11%
Italy	10	↘ -92%	↘ -71%
Spain	272	↘ -2%	↗ 95%
Great Britain	278	↗ 151%	↗ 196%
Total	**2 257**	**↘ -38%**	**↘ -11%**

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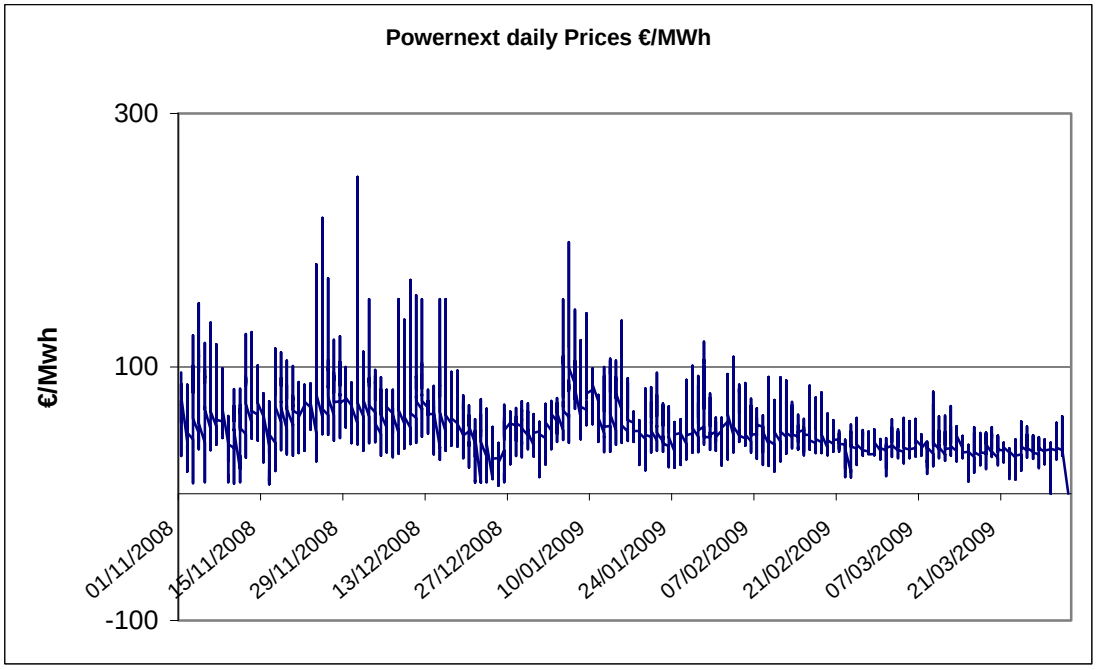
Summary of Market Conditions:

The monthly average market price was:

- 69.3 €/MWh in November,
- 61.7 €/MWh in December,
- 63.2 €/MWh in January,
- 49.3 €/MWh in February,
- 37.3 €/MWh in March.

Globally, these prices are lower than last year. The maximum day-ahead hourly peak prices were registered on 1st December (250 €/MWh) and 6th January during the cold spell with tight margins (198 €/MWh).



Lessons learned for Winter 2009-2010

Consumption forecasts have to take account of the impact of the economic crisis which is difficult to forecast.

Attention should be paid to the availability of fossil generation units (oil and coal fired) which are submitted to the Directives 2001/80/EC and 2001/81/EC.

Attention should be paid to the risk of simultaneous breakdown of nuclear power plants at the same location.

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Germany

General comment on winter conditions

The winter 2008/2009 was characterized by a cold spell of several weeks in January 2009. As in past years, generation from renewables-based plants was temporarily very high due to the strong wind conditions. As compared to the same period of the preceding year, there were fewer days with particularly high wind speeds (squalls of ≥ 10.8m/s). During almost all months, there occurred periods with extreme wind peaks. Further risks were not recorded.

Due to the financial crisis, consumption dropped. Therefore many balance groups were imbalanced. This led to a high demand of negative control power.

The interruption of gas supply due to Russia/Ukraine dispute had no impact in Germany.

Review of the Most Stressed Periods

The network conditions forecast for the winter 2008/2009 occurred to a large extent as anticipated. There were certain periods during which (due to the weather conditions) network and market-related measures had to be taken as a result of wind-energy integration. In addition, specific topological conditions within VE-T's own system and in adjacent transmission systems led to a temporary aggravation of the situation.

Between November 2008 and March 2009, transmission system operators participating in the CEE System Monitor received warning messages six times from VE Transmission (by changeover of the VE Transmission lights) due to critical network conditions.

During high wind power feed-in, a negative vertical network load was observed in VE-T's transmission system particularly during periods of low load. In addition, the horizontal balancing of wind energy in Germany (HOBA process) represents an increasing strain to the transmission system. It adds to the physical load flow on interconnections and, in most cases, means a significant increase of VE-T's export load. Concerning the power flow on the transmission system, the two phenomena (negative vertical network load and horizontal balancing of wind energy) lead increasingly to problems in terms of system security.

Special remarks for the control area of VE-T

The *Brunsbüttel* and *Krümmel* nuclear power stations are still out of service. As a result, changes are observed in the Hamburg region regarding power flows and the provision of reactive power required for voltage control.

Average energy feed-in during the period from November to March based on extrapolation: approx. 2110MW (same period of 2007/08: approx. 2670MW; 2006/2007: approx. 1240MW).

The highest feed-in of wind energy totalling 8257MW occurred on 20 November 2008.

With the exception of the Kontek link, interconnections with the neighbouring TSOs were predominantly used in physical terms in an export direction. As compared with the same period of the preceding year, higher power flows were observed in the direction towards

PSE-O (Poland). A permanently high loading was recorded for the connection with E.ON Netz (Remptendorf – Redwitz).

During the period of construction measures carried out in the Czech transmission system (CEPS), high loading occurred on several interconnections particularly during the windy November 2008. The interconnections towards Poland (Vierraden – Krajnik), the interconnection with E.ON Netz (Remptendorf – Redwithz) and the interconnection with CEPS (Röhrsdorf – Hradec) were particularly affected.

Increased electricity prices occurred temporarily on the EEX spot market in November and during the first half of December 2008 as well as in mid-January 2009. Average current day prices were in a few cases above 100 €/MWh. This was, however, to be expected in comparison with last year's peak prices (average daily prices of up to €158). In March 2009, prices on the EEX spot market were clearly below those of the preceding year. During this period, particularly low prices were recorded on 08 March 2009 (average daily value of 13 €/MWh). High negative electricity prices occurred during different hours. Further particular occurrences have not been observed to date.

Measures concerning demand-side management were not required. In winter 2008/09, there were no major disturbances recorded in VE-T's transmission system.

Lessons learnt for Winter 2009-2010

The volume of wind energy feed-in to be coped with is likely to be of continued great importance during the next winter. Further particular findings in this respect are not available yet.

The challenges of the wind issue are part of the day-to-day business
The congestion management introduced has proved to be successful.

Luxembourg

Despite more severe climatic conditions in Winter 2008/2009 compared to the previous years, the peak load in December 2008 and January and February 2009 was slightly (1.3%) lower. Cegedel Net usually notices an annual growth of about 2.5%. This decrease is probably due to the impact of the financial crisis on the industrial production level. In the past, a constant ratio was observed between Gross Domestic Product and Total Electricity Demand.

No risk had been identified in the winter outlook report 2008/2009 and no unexpected situation occurred.

The Russian/Ukrainian embargo on gas had no impact on electricity delivery in Luxembourg.

Despite colder weather conditions in the months of December, January and first half of February, we had no remarkable events in the grid and there was no new power peak measured.

No special situation was registered regarding generation, transmission infrastructure or interconnection capacity. Imports from neighbouring countries were available.

Historical peak load was not reached. Energy consumption in winter 2008/2009 was stable compared to the past years.

Market prices were as of the German Market. There are no individual market prices in Luxembourg.

Netherlands

This was the coldest winter in 12 years. The average temperature in December was 2.4°C - normal is 4.0°C; for January it was 0.8°C - normal average is 2.8°C; and for February it was almost normal at 3.3°C. There is also a trend showing growing export, not only to Belgium but also to Germany. Although different from last year's, the peak load this winter happened in January.

No unexpected situations occurred.

It is not yet possible to identify the effects of the economic crisis on the demand. It is most likely that there is an effect but it will show more clearly during the course of this year.

70% of the Dutch installed generation capacity is gas-fired. TenneT TSO has no information on the capability of the units to run on alternative fuel. According to GTS (Gas Transport Services), the Russia/Ukraine gas supply dispute had no impact in the Netherlands. The only effect was a larger export of gas, which was also made possible because of lower domestic demand. There was no effect on power imports nor on gas market prices.

Switzerland

<u>General Comments on Winter Conditions</u>

The beginning of January 2009 was very cold. The lowest average temperature amounted to ca. -7.0°C.

No risk was forecast in the winter outlook report for the winter and no unexpected situation occurred.

In order to identify and possibly quantify the effects of external factors on demand (such as demand reduction as a result of economic conditions etc) it is necessary to consider the statistics for the whole winter which will be available only in late summer 2009. Therefore the impact of the economic crisis cannot be evaluated yet. Stressed periods for system adequacy were not encountered.

Impact of Interruption of Gas Supply

Less than 1% of the Swiss national generation capacity is gas-fired. Therefore, the disruption of gas fired generation capacity as a result of the dispute between Russia and Ukraine was irrelevant.

Detailed Review of the Most Stressed Periods

In November 2009 very low voltages were observed in the Swiss transmission network due to high wind production in Germany (up to 18000 MW on the 20th November).

On 4th December 2008 a short circuit on a bus-bar in the 380kV station Laufenburg (with no further consequences).

On 1st January 2009 the Swiss control areas were unified to one single control area which is managed by swissgrid.

The most remarkable event was the activation of the trilateral (France, Switzerland, Italy) and pentalateral procedure (France, Switzerland, Italy, Austria, and Slovenia) on the 18 March 2009, because of possible overloads of transmission lines in Switzerland (region Geneva/Lausanne) and in neighbouring parts of the French transmission system in n-1 situations during a high export from France to Italy.

According to our information the generation conditions were on a normal level.

The data concerning the demand during the last winter will be delivered by the Swiss Federal Office of Energy only in spring/summer 2009. From the position of swissgrid (the Swiss TSO) the whole Swiss load is not seen, because there is a lot of hydro production at the lower voltage levels (up to 40% on working days). Nevertheless, swissgrid thought that the load was not extraordinarily high. As stated in the Winter Outlook Report, swissgrid expected severe load conditions only in very low temperatures. This was the case to some extent in January 2009. Nevertheless, no extraordinary situation was observed.

No significant events in the use of interconnections were recorded

As the Swiss electricity market has been liberalized only since 01.01.2009, no specific remark on market prices and market conditions occurred.

Lessons Learned for Winter 2009-2010

The Swiss TSO thinks that this report comes 3 or 4 months too early. The TSO dependence on the data of the Swiss Federal Office of Energy, which we always receive with such a high delay, prevents us delivering a higher quality report.

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NORTH EASTERN UCTE

Czech Republic

General Commentary on Winter Conditions

Both November and December were quite mild months. The average temperature was about 2°C higher than the long-term average. On the other hand, January and partly also February were very cold. The January the average temperature was –3.4°C which is about 2.7°C lower than the long-term average. The February the average temperature was –0.3°C, which is about 0.7°C lower than the long-term average.

The risks identified in the Winter Outlook Report did not occur because of the economic situation, which caused an unexpected reduction of load forecast at the weekly peaks. Therefore the real values of remaining capacity were much higher than the originally forecast ones. As from November ČEPS has observed significant decrease of consumption of about 8%. The only exception of this situation is the consumption in January where the decrease was only about 1% due to relatively cold weather.

Impact of Interruption of Gas Supply

The gas-fired units represent about 5% of the national installed generation capacity of the Czech Republic. CEPS does not have detailed information about alternative fuel possibilities of every unit, but the 2 biggest CCGT units (200MW each) can use and use both natural gas and coal-gas (which is produced near by) at the same time.

The gas imports from Russia were fully stopped in January but without any significant impacts on power generation, industry and householders. In the Czech Republic there are quite large underground gas storage facilities capable of covering the consumption of gas for one winter month. Thanks to existing long-term contracts with Norway, Czech Republic was also able to increase its imports of gas from this country in a very short time.

Detailed Review of the most Stressed Periods

During November (especially from 17th to 20th November), the Czech transmission grid did not fulfil the “N-1” criteria for many hours. The main reason was the overloading of lines caused by high production in wind mills in Germany especially in VE-T area. The most affected lines were as follows: V445, V446 (both tie-lines Hradec CZ – Röhrsdorf VE-T) and V412 (internal line Hradec – Řeporyje). To reduce possible problems ČEPS had to use the existing re-dispatching agreement which allows changing production diagrams of ČEZ (genco) units in cases of emergency. ČEPS also had to change the grid topology.

Lessons learned for the forthcoming Winter

- Due to the current economic situation, the possibility of accurate load and consumption forecasts for the next months is very limited.
- There is urgent need of even closer cooperation (joint actions) among TSOs in cases such as high winds on 17th to 20th November.

Hungary

General Commentary on Winter Conditions

In November and December, a considerable decrease of import had been realised. The key issue was to have enough import available for the market in January and February. In order to handle the growing risks, the yearly tender for provision of ancillary services also resulted in “market maker”-type contracts (i.e. yearly contracts for obligatory daily bids) for the standard levels of reserve power. This solution has proved to be successful.

The temperatures in winter 2008/09 were similar to the previous year’s. The demand was lower than last year. The drop due to the economic situation may be estimated at around 5%.

Aside from the gas supply interruption (see below), the risks identified in the Winter Outlook Report did not happen.

Most probably due to market reasons, Hungarian electricity balance changed from import to export in November and December.

Impact of Interruption of Gas Supply

The gas-fired capacity is 37% of the total installed capacity, of which more than 90% has alternative fuel.

Hungary relies mainly on Russian gas import. Storage capacity is considerable, but has to be further developed. Import was interrupted, but stored reserves remained available. Alternative gas sources are very much limited (Austria). Also gas demand was lower due to the financial situation, so Hungary could manage the three weeks of zero import, and could return to normal operation at once afterwards, and had a chance to provide gas export to the South-East European region.

The reduction in gas supply resulted in a reduction of availability of gas-fired generation, mainly during transition to alternative fuel

The reduced gas-fired generation was 380MW in the first three weeks of January. The rest switched to alternative fuel.

Only gas supply for large industrial customers was interrupted. There was no considerable impact on electricity demand, only reduction due to interrupted activities.

No alternative generation capacity was made available (e.g. mothballed plant returned to service; cancelled maintenance outage on other plant).

The reduction in generation due to the interruption of gas supply mainly resulted in import increase. Demand reduction was not used.

Prices remained low due to the financial crisis.

In order to deal with the increased risk, the TSO implements more intensive communication with market players and decision makers, more frequent re-evaluation of the situation as well as risk management, if necessary – e.g. additional reserve requirements on ancillary service markets.

Review of the Most Stressed Periods

As a result of interruption in import, gas supply was reduced for 3 weeks in January.

Availability of generation capacity was good throughout the whole winter period. There were only a few, short spikes – the largest in the middle of December. Fortunately, gas supply was reliable until January, and in February-March.

Demand was on the low extreme most of the time, but from January it was within expectations. At the same time, import was changed to export at the end of 2008, then back to import from 2009.

A new 400kV interconnection Békéscsaba-Nadab between Hungary and Romania was put into operation in December.

On 6th November a tower of the 400kV transmission line Albertirsa-Békéscsaba was broken by an agricultural machine. The line was switched back on 13th November after replacement of the broken tower. The 400kV tie-line Hévíz-Zerjavinec II between Hungary and Croatia was out of service on 28th January due to broken ground wire, and again on 4-5 February for final repair. Reliability of supply was not endangered.

Export-import activity of the market players is mainly a price issue. Physical availability of cross-border capacities has always been ensured. However, depending on differences of energy prices in the region, some borders (especially the SK-HU border) are usually congested.

Lessons Learned for Winter 2009/10

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

Good cooperation with gas system is crucial.

Poland

Winter conditions in 2008/2009 in Poland lasted quite a long time in comparison with winter 2007/2008. Average temperature for the period from 1st December to 31st March was lower by 2 degrees than during previous winter.

The Polish part of the Winter Outlook Report was prepared in September 2008 before the beginning of the financial and economic crisis, so the data did not take into consideration the possibility of the decrease of energy consumption as well as peak load.

In recent years in Poland one could observe high economic growth, which caused the increase of peak load as well as energy consumption. For example, the recorded peak load

during the winter 2007/2008 was higher by at about 2% than forecast peak load in normal conditions (but not higher than forecast peak load in severe conditions).

As early as October 2008 the Polish TSO observed significant decrease of energy consumption and peak load. The calculated difference between forecast peak load and recorded peak load this winter was at about 5.7%.

There was no emergency situation in Polish power system this winter. The interruption of gas supply coming via Ukraine had no impact on the Polish power system since i) gas fired generation represents around 2.5% only of the national generation capacity; ii) gas CHPs burn gas coming from local (Polish) deposits and iii) the Polish gas system is connected to Russia via not only Ukraine, but also Byelorussia.

Slovak Republic

Reliable and secure operation was foreseen in the winter forecast. The operation of the Slovakia power system confirmed that expectation.

Weather conditions (temperature)

The table below shows average temperatures (°C).

	long-term	2007/2008	2008/2009
November	5.0	1.0	6.5
December	-0.4	-1.0	2.4
January	-1.2	1.3	-2.1
February	0.5	3.1	0.7
March	4.4	5.2	4.5

November and December were very mild months without snow. In January the temperature fell and hydro conditions did not improve (dry winter). March was the month with good snow (hydro) conditions that affected hydro production.

Generation

Generation recorded an increase in November (+7.5%) and small decrease in December (-1.5%).

As of December 31, one nuclear unit (440MW) in J. Bohunice was shut down due to the fulfilment of an obligation that Slovak Republic adopted in the process of access negotiations in EU. This had significant impact on production in the first quarter 2009 (-15 %). In spite of that fact 50% of production was from nuclear power plants. The lack of domestic production in 2009 was covered by import.

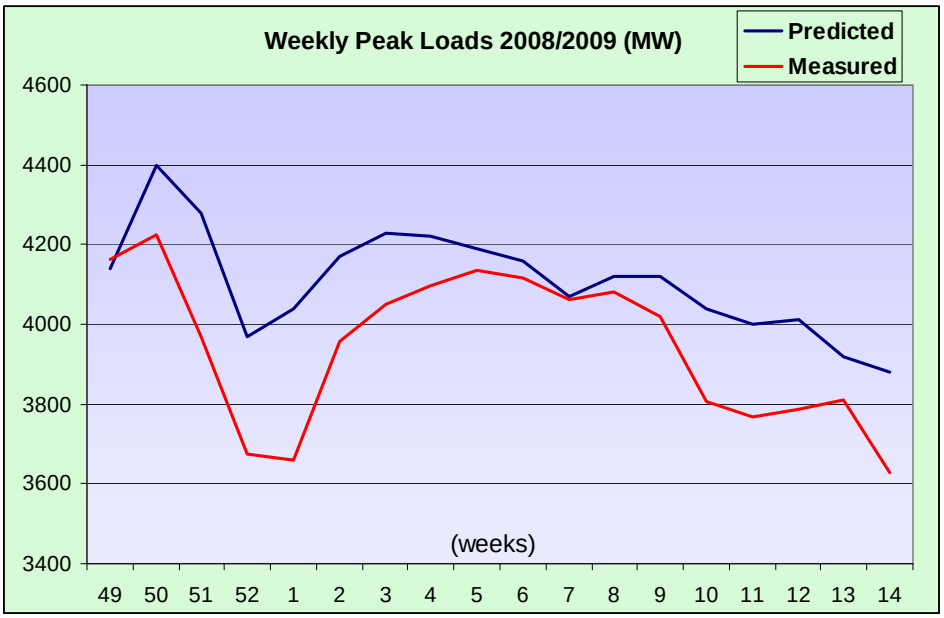
Good hydro conditions from hydro power plants were recorded in March (+7%).

In January 12, fire destroyed a coal conveyer in a conventional thermal power plant, resulting in lost capacity of 2x100MW. The destroyed conveyer was replaced within a week. It was the only one significant outage in the system. Missing capacity was covered by other domestic power plants.

Consumption and Peak Loads

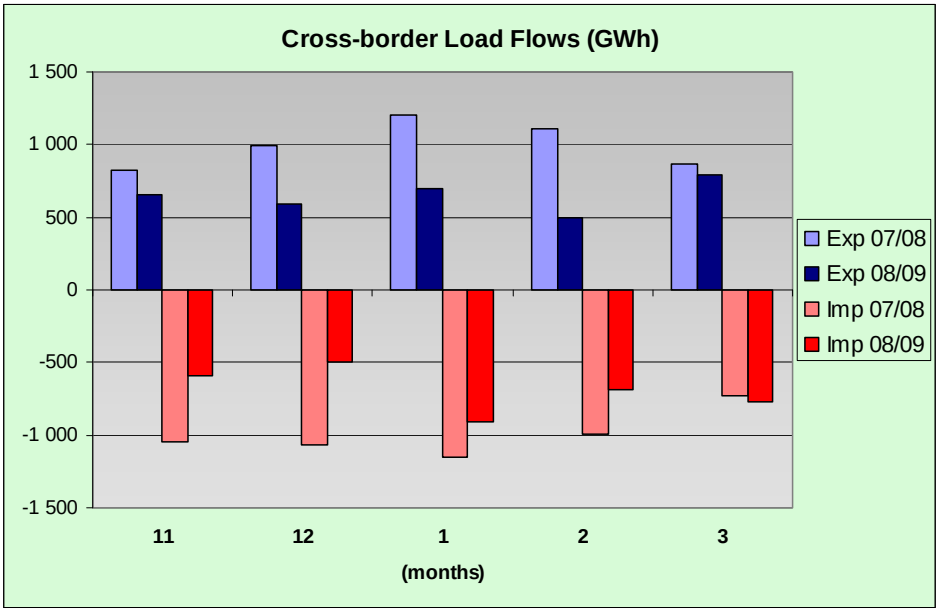
Economic crisis influenced consumption in November (-4.4%) and December (-7.7%). Interruption of the gas supply from Ukraine (Russia) prompted decreasing consumption also in January (-6.8%). The trend of declining consumption continued in February (-4.0%) and March (-6.6%). The lowest monthly consumptions for several years were recorded this winter (at least ten years back).

The chart below shows predicted and measured peak loads. The real peak loads were approximately 5% lower than predicted, except February (-1%). Higher prediction of peak loads was caused by unpredicted economic crises and interruption of gas supply in time of winter outlook preparation.



Use of interconnections

The chart below shows monthly cross-border load flows over transmission tie-lines of two winter periods (2007/2008 and 2008/2009). The utilization of tie-lines declined significantly from the previous winter period from November to February (approximately by 40%).



Lessons Learned for Winter 2009-2010

No serious problems occurred in the power system operation. Significant decline of consumption and gas crisis in January showed importance of ancillary services. It would be good if the procedure of intraday purchase of reserve capacities (ancillary services) could be developed.

Impact of Interruption of Gas Supply

Installed capacity of gas fired power plants amounts to 12% of total installed capacity. Approximately 5.5% of them are capable of running on alternative fuel.

Problems of gas import to Slovakia began on January 6, when there was 70% decrease of import at 3:00am. Import of gas to Slovakia was fully stopped from Ukraine in the evening on January 7. The import started again at noon on January 20, 2009.

In the territory of Slovak Republic underground storage of gas exists. During the interruption of import the gas was released from the underground stores to manage the gas consumption in Slovakia. The underground gas stores have been replenished following the end of gas crisis. The situation of gas supplies was returned to normal conditions in the evening hours on January 20.

On January 7, in the morning the gas consumption in Slovakia was limited by applying the regulation for such a situation. Consumers with yearly consumption more than 60000m3

had to reduce their consumption to the minimum safety level. It affected also gas fired power plants' production.

The capacity of running gas turbines was reduced by about 45% for the whole period of the gas crisis (7 - 20 January). There was no switch of gas power production to alternative fuel.

Within Slovakia, there was no interruption of gas supply. By applying the regulation, wholesale consumers reduced their consumption of gas to the minimum safety level. It affected industry and a part of power generation. Supplies for households, schools, hospitals and public services were not reduced at all.

The index of electricity consumption in January decreased at 93.2%. As mentioned above gas supplies to household were not limited and industry limited its production due to gas regulation. It resulted in the fact that an increase of electricity demand was not observed.

No alternative capacities had to be made available because there was drop of electricity demand.

Slovakia has become importer of electricity after decommissioning of the first nuclear unit (440MW) in December 2006. In January the import was increased due to decommissioning of the second nuclear unit in J. Bohunice (440MW) as of December 31, 2008. Due to lower electricity demand there is very high probability that gas crisis had no effect on import.

Reduced capacities of gas power generation were balanced by lower demand of electricity consumption.

There was no utilization of demand reduction.

At the end of gas crisis further reserve capacities were purchased to balance possible fast increase of electricity demand. But they were not used because electricity demand was rising slowly (day by day) and it was covered by contracted power generation.

Ukraine-West

(No information provided by the TSO)

SOUTH EASTERN UCTE

Bosnia- Herzegovina

Impact of Interruption of Gas Supply

No gas fired generation capacity is present. There are gas supplies to the industrial and residential sector. During the interruption of gas supply, the electricity demand increased up to 10%, and there were some overload on the local transformer stations 110/x in the region of Sarajevo. However, existing generation capacity could cover demand and no demand reduction was used.

Bulgaria

General Comment on winter conditions:

Compared with 2008 the decrease of the temperature-adjusted monthly consumptions for January, February and March 2009 were as follows: January: -1.8%; February: -6.0%; March: -1.6% The decrease in December 2008 compared to December 2007 was -2.6%. The monthly peak loads in the period were as follows: December 2008: 7002MW; January 2009: 7188MW; February 2009: 6690MW; March 2009: 6064MW. All values are within the confidence intervals of the forecasts presented in the winter outlook report in October 2008 for normal and extreme weather conditions. The average monthly temperatures were: December 2008: +4.2°C; January 2009: +0.8°C; February 2009: +2.7°C; March 2009: +6.4°C, while the normal average temperatures for the same month are: December: +1.8°C; January: -0.1°C; February: +2.3°C; March: +6.5°C. Due to the global financial and economic situation and the resulting impact to Bulgaria the electricity demand in the country started to decrease from October 2008 with clearly defined negative trend with average rate of 2 %.

Impact of gas supply interruption:

Totally 1023MW of the national installed capacity is gas-fired (about 8.3%). Bulgaria experienced severe gas shortage during the so called gas-crisis due to the dispute between Russia and Ukraine. The reason for that is that Bulgaria currently has no access to alternative sources of gas (excluding minor deliveries from 2 local gas fields)

The availability of gas-fired plant reduced by 58%. The gas-fired capacity was reduced by 387MW. Capacity of 636MW was switched to alternative fuel. The gas supply to industry was reduced by more than 90%. The reduction for domestic customers was les than 20% (only a small part of the population is gas supplied). Due to problems with the central heating systems during the conversion period from gas to other fuels, many customers in the big cities with central heating systems had to use additional electric heating for reaching comfortable levels of indoor temperature. This increase of the electricity demand for this reason is estimated to be in the range 10–12% for a period of 3-5 days. Mothballed capacity of 190MW was put temporarily into operation during the gas supply crisis period (7–25 January 2009). The firm contracted export of electricity for January 2009 amounted to 370GWh. All the reduction in gas-fired capacity was backed up by domestic generation. There was no reduction in electricity supply. The government has started projects for providing alternative sources of gas supply.

Review of the winter:

The coldest day in Bulgaria in the last winter period was 13 January 2009 (Tuesday). The weighted temperatures of the country were as follows: Tmin =-10.1°C; Tave =-6.8°C; Tmax=-3.1°C. The average temperature was 6.7°C below normal. On the same day the peak load of the period was observed: 7188MW. The generation mix at that hour was as follows: Nuclear: 2073MW; Thermal: 4438MW; Hydro: 1298MW. The export was 621MW.

Generation: There were no significant problems with generation capacities 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 peak zone of the daily load curve.

Demand: The demand in the period was within the confidence interval of the forecast. The load sensitivity to temperature changes is estimated to be 90MW/°C on daily average basis. This is a slight increase compared with the same period of previous year. The reason for that is the percentage increase of residential demand due to decrease in the industrial and commercial services demand due to the economic crisis. During the whole period Bulgaria exported electricity to neighbouring countries.

Transmission infrastructure: There were no critical outages in the transmission network.

Use of interconnections: During the whole period Bulgaria exported electricity to neighbouring countries. There were no unplanned outages of all interconnection lines.

Former Yugoslav Republic of Macedonia (FYROM)

General comment on winter conditions

Macedonian electricity system depends upon imports of energy to reach an adequate balance between consumption and production/import.

Economic conditions resulted in lower demands, but there was no risk to system adequacy. During the whole period Macedonia was an importing energy country.

Due to snow and rainfall during the winter period, the level of Macedonian reservoirs is very high (in comparison to last year when the situation was opposite).

Impact of Interruption of Gas Supply

The main sources of energy are thermal and hydro Power plants (and imports), so the gas crisis did not have any effect.

Transmission Infrastructures

Macedonian transmission network has well developed interconnections with its neighbours: two 400kV tie-lines with Greece and one 400kV tie-line to Serbia. The new 400kV interconnection to Bulgaria (Stip - Cervena Mogila) was put into operation in October 2008, and it has a great role in the stability of the system and in avoiding congestion of the lines. So, the operation of power system was secure and reliable over all the period.

Greece

General comment on winter conditions

At the beginning of the winter (October 2008) Greece experienced the minimum storage of the water in the hydro reservoirs. However, there was a lot of snow and rain during the winter, and the hydro reservoirs have been raised to very high level. 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. During the Christmas holidays there was a lot of snow and cold weather all over the country. Then, until the end of March, there were severe rainfalls.

The demand starting from January has been 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. In particular, the consumption of high voltage consumers is about 20% lower than the previous year.

Impact of Interruption of Gas Supply

The percentage of gas fired units amounts to 24.5% of the total capacity (excluding RES) and 33% of thermal units, taking into account the new power station which is under commissioning operation. In January we had a gas import interruption as a result of the Russia/Ukraine dispute. During that period the LNG station was in full operational availability, as major supply of gas, and there were a lot of orders with LNG to replenish the stores. Another action during that period was the switch to alternative fuel (i.e. oil) in some units for some days. Consequently, there was no problem in gas supply during that crucial period.

Review of the situation

On the generation side, concerning unit productions, two major outages have occurred. The first concerns a gas unit with production capacity equal to 390MW, and the second concerns a new gas unit 330MW during commissioning operations.

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 618MW on the 5th March 2009.

The installed generation capacity of wind parks in the Interconnected System today is 844MW (March 2009). A significant increase of wind production is expected in the following years.

At present, the stored energy in the hydro electric power plant reservoirs is at very high levels, due to the severe rainfalls (extremely wet period) during the last 3 months.

On the demand side, in the following Table the values of net monthly peak load (forecast and actual) are presented.

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	NET MONTHLY PEAK LOAD (Average values per hour in MW)			
	DECEMBER	JANUARY	FEBRUARY	MARCH
Forecast	9200	9000	9000	8300
Actual	9067	8333	8354	7771
Difference	-133	-667	-646	-529

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 the winter 2008-2009 amounted to 9067MW, on Thursday 31-Dec at 19:00 (CET). The peak demand is the same as in the previous year.

Additionally, during the winter there was no need to select any resources from the demand side response.

Transmission infrastructures outages, realised reinforcements.

During the winter no crucial transmission expansion or reinforcement took place.

Use of interconnections:

The Greek system continuously used all capacity (NTC) from the neighbouring countries in the incoming direction. The NTC has increased up to 1200MW due to the operation of a new 400KV OHL between Bulgaria and FYROM.

Summary of market conditions

Explicit auctions for the allocation of Physical Transmission Rights (PTRs) were held by HTSO for 50% of the NTC in the northern Greek interconnections in the importing direction. In the exporting direction, HTSO held explicit auctions for the 100% of the NTC, taking into account the excess production capacity of the Greek production system. The Auction Rules are fully compliant with the Regulation 1228. The same is valid for the Auction Rules for the interconnection with Italy.

In the following table the maximum and minimum SMP values are presented.

	MAX and MIN SMP (prices in € / MWh)			
	DECEMBER	JANUARY	FEBRUARY	MARCH
Max	139.51	92.42	93.05	96.52
Min	30.38	28.72	28.65	27.16

Description of remarkable events

During the winter 2008-09 we observed very low demands. It is notable that the SMP was lower during the past four months due to very low oil and gas prices and due to low consumption.

Lessons learned for winter 2009-2010

The basic key points for the forthcoming winter will be the consumption of electric energy especially if the rate of reduction should continue for a second year. If this happens, it may be useful to review the estimations about the needs for energy in the future.

For the Greek energy system, the most critical period about the energy is the summer. Therefore, the summer outlook report is more useful for the summer period.

Montenegro

(No information provided by the TSO).

Romania

General Comment on Winter Conditions

In December 2008, the climatic conditions were very close to the forecast ones as concerns temperatures. The monthly average temperature was +2.2^{o}C while the regular average temperature is -1^{o}C for December. Therefore, precipitation was mainly in the form of rain.

In January 2009, the climatic conditions were also close to the forecasts. The monthly average temperature was –1.2^{o}C, while the regular average temperature is -3^{o}C for January.

In February 2009, the temperature values were very close to forecasts and regular values. The monthly average temperature was +1^{o}C. In the second half of the month the precipitation was mainly snowfalls.

In March 2009, the temperature values were close to the regular ones. The average temperature was +4.4 ^{o}C

The forecast power balance prepared for the whole cold season did not identify any risk situation likely to occur during the winter 2008-2009. In fact, the recorded temperature values were slightly higher than normal and, together with reduced economic activities in certain enterprises, these led to a low national consumption level (9% lower than that recorded in winter 2007-2008 (December-March interval)). Consequently the national generating capacity in Romanian Power System was able to meet internal consumption, system reserves and export requirements.

Impact of Interruption of Gas Supply

The installed generating capacity of purely gas fired units represents 10.8% of the national net installed generation capacity. Another 30.3 % of the national net installed generating capacity can run on mixed fuel either oil or gas.

During the gas crisis the import, representing about 30% from the national gas consumption, was interrupted due to Russia/Ukraine dispute. The import was almost totally replaced by use of the gas from storage reservoirs and also by the increase of national gas extraction level. The replenished time of the stores is not available.

The gas supply crisis did not result in a reduced availability of gas fired generation. The lack of the import was covered both by internal sources and by switching of mixed fuel units to oil running. Pure gas-fired generation capacity was not reduced and it was not necessary to request power import from neighbouring countries.

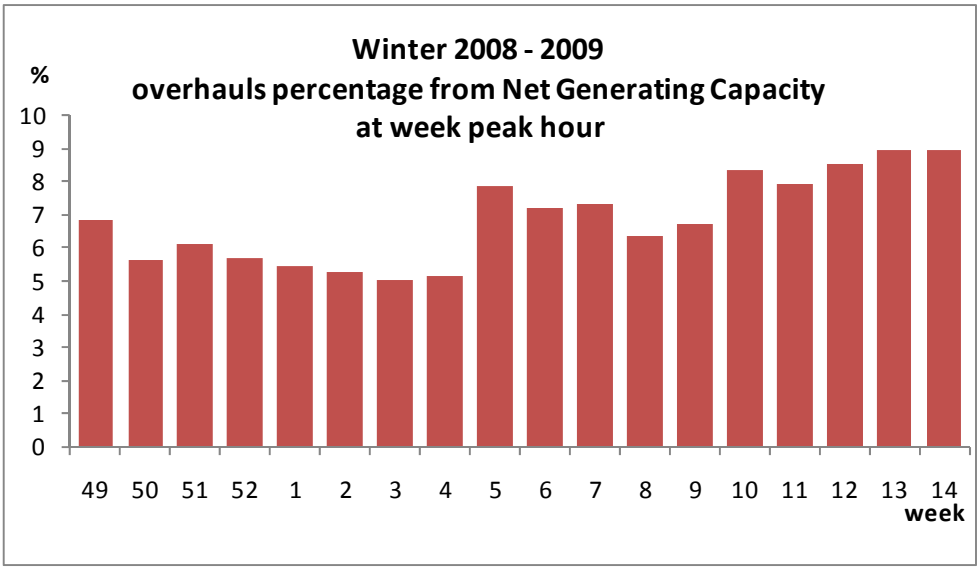
During the gas crisis the Romanian government gave the possibility to the producers to negotiate directly with suppliers, without auctions, for the acquisition of coal and oil fuel. Taking into account that on the day-ahead market there was a daily energy surplus, and other prices were firm due to the use of centralized bilateral contracts market, the gas supply reduction did not have a visible effect on market prices.

Depending on the level of the gas reduction or the duration of this, there are different graded measures in order to limit or even to eliminate the consequences. About 70% of Romanian gas consumption is provided by domestic sources. A lack of gas imports can be managed firstly by using internal gas reserves and secondly by reducing industrial gas consumption. The national power system is not affected because there is a high level of capability of generating units to run on alternative fuel (oil).

Description of remarkable events

There were no remarkable events or causes of system stress.

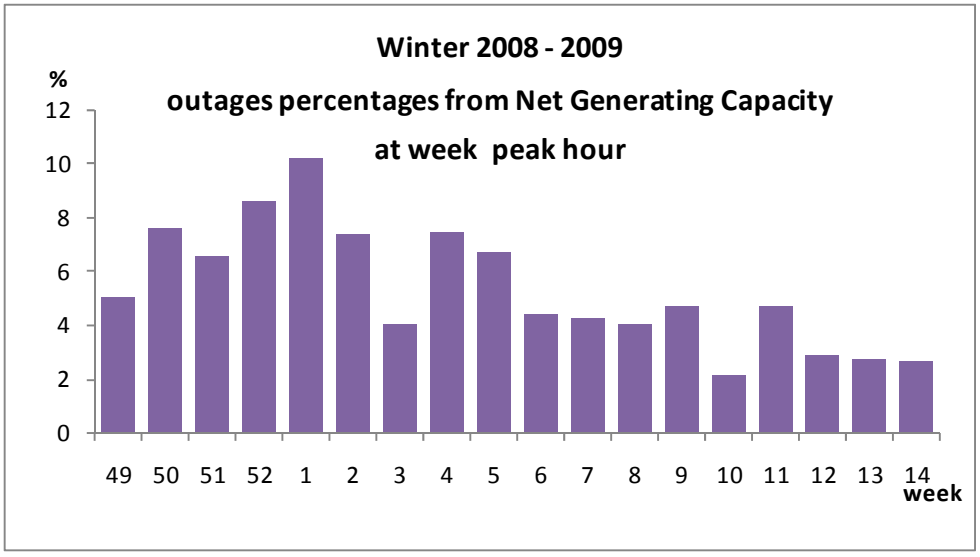
On the generation side, according to operational rules the approval of generation overhauls was done on monthly basis taking into account both the updated forecasts and the unit outages. The overhauls and outages did not influence the coverage of internal consumption, system reserves or even the export requirements taking into account the reliable NTC values.

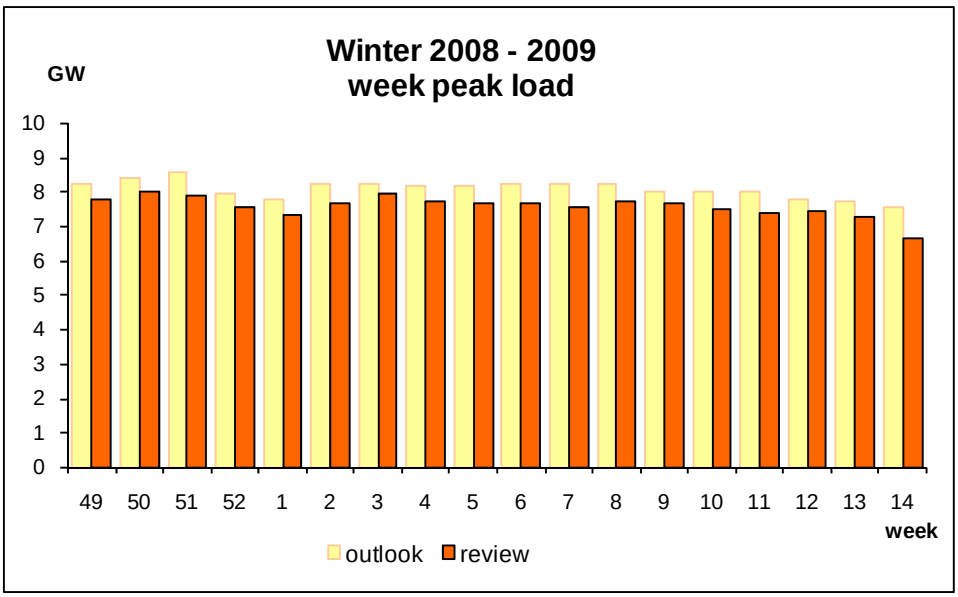


On the demand side, during winter 2008-2009 there were no critical intervals that could have required demand reduction.

The week peak load values recorded during the 2008-2009 winter represented 90% - 96% of the forecast values.

The winter 2008-2009 peak 8045MW value was recorded on 10th of December 2008 at 17:00 CET.

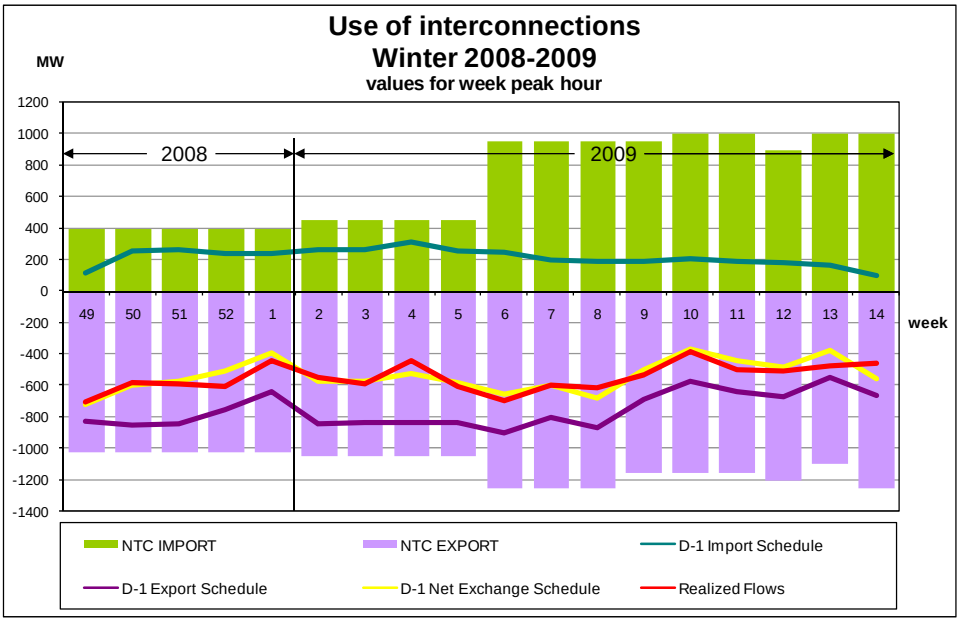




Transmission infrastructure

On 10-December 2008, the new 400kV tie-line Nadab-Bekescsaba between Romania and Hungary was put into operation.

Use of interconnections



Starting with February the export/import NTC values increased after a unit transformer near the Romanian–Ukrainian border became available and the limit on 400kV tie-line Portile de Fier-Djerdap increased on Serbian side.

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The physical power flows reflect a permanent use of Romanian export capacities for trading. At the same time there was not a great interest for import activities; the graph shows that Wednesday import schedules at 11:00 CET were smaller than the import NTC.

During the week 12 the 400kV Rosiori-Mukachevo (Romania-Ukraine) was out of operation in accordance with the yearly regional maintenance plan, otherwise all Romanian interconnections were available during the rest of winter time interval.

During the winter period (November 2008 – February 2009) the market share of the Balancing Market reached an average value of 5.9% of the total consumption, higher by 0.5% than the value registered in the previous winter period. The highest volume of traded energy on the Balancing Market was in January 2009, due to relatively high imbalance between physical notifications and consumption.

During the whole winter period there was no traded energy for congestion management, except a small amount on December 2008.

The settlement rules in Balancing Market for upward and downward regulation are the same as in 2007, based on both individual bid prices (pay as bid, in case of tertiary regulation) and marginal price (in case of secondary regulation). We are still applying price caps, but following a different rule, which the Regulatory Authority imposed in October 2008: the maximum price for UP regulation is 400 Lei/MWh (93 €/MWh) and the difference between the maximum and minimum price offered daily by a dispatchable unit cannot be higher than 100 Lei/MWh (23 €/MWh). This rule had not solved the difference of prices on secondary regulation, the marginal prices for downward being considerably smaller than for upward regulation. The imbalance prices (surplus price and deficit price) had no important variations compared to last winter, although the average of surplus price has increased due to the new rule on one hand, and to a higher quantity of balancing energy selected for tertiary downward regulation compared to the energy selected for secondary downward regulation on the other hand.

On the Ancillary Services Market, reserves were ensured both through regulated contracts and monthly auctions. In order to cover as much as possible the necessary volume of reserves in the hourly intervals with an increased level of demand, the different quantities are contracted on peak/base hours.

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Republic of Serbia

(No information provided by the TSO).

CENTRE SOUTH UCTE

Croatia

General Commentary on Winter Conditions

Compared with Yearly 2008/2009 Planning Balance, the monthly consumptions show a decrease. This is the result of an increase of average daily temperature according to multiannual average daily temperature.

In the Winter Outlook Report no risks were identified

There were some minor balance problems during the gas supply crisis in January. Reduced demand as a result of climate change (high temperature in December 2008 and next three months in 2009) was identified.

There were no stressing periods of the system adequacy during the months of analysis

Impact of Interruption of Gas Supply

A total of 1036MW of the national installed capacity is gas-fired. Of this 734MW is capable of running on an alternative fuel (only: oil); (about 43% of total fossil fuels source).

Every year in winter power plants receive the minimum amount of gas needed (which is only 13% of the maximum amount for other periods in the year, according to the contract with the gas TSO). Generally gas consumption in Croatia is covered with 2/3 own resources and with 1/3 from import gas from Russia/Ukraine.

Distribution consumptions were not reduced during the crisis.

The availability of gas-fired plant reduced by 22%.

The gas-fired capacity was reduced by 225MW. Capacity of 100MW was switched to alternative fuel – oil.

Only the gas supply to big industry was reduced.

Mothballed plant was not temporarily put in operation during the gas supply crisis period (7 – 25 January 2009).

No effect on power imports from neighbouring countries was recorded, and there was no reduction in electricity supply.

All the reduction in gas-fired capacity was backed up by domestic generation. Anyway there was no reduction in electricity supply.

No effects of the gas supply reduction were recorded on electricity market prices because domestic generation, especially hydro power, was used.

As a follow-up to this gas crisis the Government initiated facilitation of projects for new gas underground storage and new gas interconnections, as well as for building LNG.

Detailed Review of the Most Stressed Periods

The peak load of the period was observed: 3009MW at 6p.m. in the last day in December 2008. The generation mix at that hour was as follows: Thermal: 540MW, Hydro: 1465MW. The import was 1004MW.

There were no significant problems with generation capacities in the period, Failure rates were as expected. Water levels in the big reservoirs were double above target levels and hydro plants experienced normal operation in peak zone of the daily load curve.

The demand in the period was within the confidence interval of the forecast. The load sensitivity to temperature changes is estimated to be 40MW/^{0}C on daily average basis. During the whole period Croatia imported electricity from neighbouring countries.

There were no critical outages in the transmission network.

During the whole period Croatia algebraic imported electricity from neighbouring countries. There were planned outages (maintenance) on the tie line between Croatia and Serbia (400kV Ernestinovo S.Mitrovica during the period 09-Sep to 28-Sep 2009). During this period NTC between Croatia and Serbia was zero.

No commercial data is available.

Italy

General Commentary on Winter Conditions

The adequacy evaluations for 2008-2009 winter period did not show particular risks for capacity adequacy and peak load cover nor with the national supply system. A winter season with temperatures below the average values marked the first part of the period with noticeable decreasing of the demand also due to the effects of the economic crisis. In addition high hydro conditions marked this part of the year: values above the multi-year average capability factor were recorded, confirming a winter full of rainfall.

Impact of Interruption of Gas Supply

More than 50% of our national installed generation capacity is gas-fired. Approximately 5% is capable of running on an alternative fuel.

Reduced gas imports were experienced on January as a result of the Russia/Ukraine dispute. The Italian system has access to both LNG and storage but the Italian TSO is unable to provide detailed information about the storage use and situation.

Anyway reduction in gas supply did not result in a reduction of availability of gas fired generation. Gas supplies have not been interrupted and no additional capacity has been made available. No evidence for effects on power imports have been noticed during the crisis. No demand reduction has been used.

No evidence for effects on power prices has been noticed during the crisis.

Terna frequently updated forecasts of gas consumption in thermoelectric sector and jointly co-operated with other companies and institutions for an increased monitoring of gas system.

Review of the Most Stressed Periods

On the demand side both load and energy requirements were low. Record power peak normally observed in winter was not exceeded in this period. Over this period the monthly consumption as compared to the same period of the last winter decreased noticeably. Moreover the increase in production (more than 1900MW of wind power generation and thermal plants) ensured supply covered the demand.

Transmission infrastructures

New lines and devices were put in service with reinforcement of the transmission network resulting in reduced congestions.

Use of interconnections

In terms of physical flows the interconnection recorded a variable monthly performance of import/export balance of energy but significantly under the limit value of the maximum transfer on the interconnected system (NTC). Interconnections are used for maintaining system security and sharing reserves with neighbouring countries.

Description of remarkable events

Copious rainfall characterized this period. The monthly hydroelectric capability factor has showed a fairly constant increase with percentage values above the corresponding values recorded in the previous winter. The hydro production reached a very high level of growth with a significant contribution to the national demand cover.

Slovenia

NB: Winter overview data are currently available only till February 2009 (data for March 2009 are not yet available).

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General Commentary on Winter Conditions

Average winter temperature (period December-February) was +0.9°C (lowest detected temperature in current winter was -8.3°C) and was approximately +0.8°C higher than historical winter average. The total winter amount of precipitation (period December-February) was 417mm, average daily amount 4.6mm, max daily amount 38mm. The precipitation was approximately 90% above historical winter average.

No particular risks had been identified in the Winter Outlook 2008-2009 and no unexpected situation came up.

Economic conditions and recession played a major part in demand conditions. The demand in the winter out-turned much lower than estimated in the winter outlook 2008/2009 forecast. Because of poor economic aspects and crisis the consumption of distribution companies dropped by about 7% (approx. 260GWh) and the consumption of industrial consumers by about 41% (approx. 270GWh). The total consumption of electrical energy on the transmission network in winter 2008/2009 was about 12% (530GWh) below forecast and also approx. 11.5% lower than 2007/2008 winter demand realisation.

Impact of Interruption of Gas Supply

13% of all installed production in Slovenia is gas powered. All of it is also able to run on alternative fuel.

The import of gas was reduced as a result of Russia/Ukraine dispute. Generally, there is another source available, but during the gas reduction it was already exhausted by other countries.

During the reduction the prices of alternative fuel were lower than price of gas, so generating units switched to alternative fuel and there was no need to reduce gas-fired production.

There was an interruption of gas supply to industry but no reduction to domestic demand due to the national reserves of gas.

No significant effect on electricity imports was detected and no electricity demand reduction was used. Nevertheless, during the gas reduction the gas prices on daily market increased by about 30% on average.

Detailed Review of the Most Stressed Periods

No remarkable events were encountered. There were 4 planned generation overhauls in winter 2008/2009 but they concerned only installations smaller than 100MW and connected to the 110kV network. Some outages of generators occurred on the 110kV network for installations below 100MW with no impact on system operation.

No wind turbines are installed in Slovenia. Gas turbines are mainly installed as reserves and are occasionally used to cover peak loads. All gas production units can use alternative fuel.

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Favourable hydrological conditions resulted in hydro production in winter 2008/2009 which was higher than expected.

Due to lower consumption as a result of economic crisis the winter peak was lower than forecast. The winter peak consumption occurred in the 3rd week of the year 2009 and reached 1900MW i.e. lower than expected (the winter peak was 285MW below highest peak forecast in winter outlook report). The main periods of peak demands were in January mainly due to low temperatures. No load reduction, disconnection or any other special measure was necessary.

High loop flows towards Italy were observed.

The table below shows that Slovenia was a constant net importer for the observed period, importing 38MWh on average per hour. The balance of Slovenia varied from -40.0GWh (import of energy) to +13.9GWh (export of energy) per week. For the time being, there is no transparent price index on Slovenian market; therefore, the only data that can be relied on are the prices from monthly and daily cross-border capacity auctions. Those prices are very much related on one side to the energy situation in South Eastern Europe, which depends mainly on hydrology, and on the other side to the situation on the Italian and German market. This is also the reason for changes of Slovenian balance practically from one week to another.

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		SLO-I		SLO-A		SLO-CRO	
Year	Week	Imp [MWh]	Exp [MWh]	Imp [MWh]	Exp [MWh]	Imp [MWh]	Exp [MWh]
2008	49	152	65966	40704	58460	83469	1433
2008	50	50	68853	37918	46070	84308	1972
2008	51	0	69640	24806	49168	87755	1541
2008	52	0	68522	39708	23216	75218	7183
2009	1	0	69035	65280	27191	61751	16548
2009	2	0	68946	73516	19571	56484	15914
2009	3	280	69177	84737	21042	61978	16681
2009	4	48	69503	62531	53919	70437	13465
2009	5	10	69670	55987	54158	79962	8891
2009	6	0	69650	51857	60761	90506	8585
2009	7	225	69695	42733	57774	77978	7415
2009	8	0	69444	50485	45714	79955	7933
2009	9	0	69676	59822	38392	72021	6110
2009	10	0	69668	69284	50197	60430	11530
2009	11	30	69601	69234	47944	71173	9154
2009	12	360	69508	77440	32682	41226	15004
2009	13	0	65460	82688	23196	28787	16393
2009	14	0	69525	69201	56601	56578	10957

Lessons Learned for Winter 2009-2010

During the economic crisis period, which may last until the year 2010, it is hard to forecast the overall generation/demand and import/export pattern.

The Winter Outlook Report was found to be useful in the process of more effective power system provision, operation and control in ELES.

The format and content of the Winter Outlook Report both satisfy ELES needs.

SOUTH WESTERN UCTE

Portugal

General commentary on Winter Conditions

This winter the temperature remained above average for the most of the time, particularly during March. This year saw the hottest and driest March in eleven years. Contrary to this main trend, a particular severe weather scenario occurred during a five day period in January.

In general, the comfortable margins identified in the Winter Outlook Report were further eased by climatic conditions and demand reduction due to economic environment.

There were no unexpected situations which had an impact on the power system's normal operation.

Global economic crisis and weather variables both served to produce a demand contraction. The impact of the economic environment could be estimated as a reduction by 1.6% in electricity demand.

Although the Winter Outlook identified weeks 51 and 52 as the most difficult for system adequacy, the extreme weather conditions from 8th January to 12th January produced the most stressed period of the Winter.

Impact of Interruption of Gas Supply

The gas-fired generation is about 16% of total installed capacity in Portugal. About 51% of this capacity is capable of running on an alternative fuel.

Natural gas is fed into the national gas transmission network through three entry points: an LNG terminal, which receives shipments of LNG from all over the world, and two interconnections with Spanish transmission network, enabling indirect access to Maghreb's pipeline. This confers a natural immunity to the Russia/Ukraine dispute. The national natural gas system also includes underground storage facilities, which help to minimize supply shortage impacts.

The Russia/Ukraine dispute had no visible effects on Iberian electricity market prices.

Despite the immunity to the Russia/Ukraine dispute, the national natural gas system operator is implementing high investment in LNG terminals and in the expansion of underground storage capacity.

Review of the most Stressed Periods

The Portuguese system registered a new maximum historical winter peak load of 9219MW on January 12th, during a five-day period of severe weather conditions. In this period, the record was beaten three times in succession, with peaks above 9200MW. On one of those days, wind power generation availability was only 2.5% of the installed capacity. On another, the imports were only 175MW.

Over the winter period, hydro inflows varied from 51% of the average values in December, to 1% above the average in February. In January, wind production was 14% above the average. In the remaining months the values were in line with the expectations. As wind power generation keeps growing its share in the production mix, a reduction in thermal generation can be observed.

> In week 2, the most stressed period, peak load was 3.5% above the expected value. In every other week the actual demand was, on average, 4.1% below the value indicated for normal conditions in the Winter Outlook Report.

There was no particular event regarding transmission infrastructure.

In the period from January to March, imports were reduced to about 50% of the level of the previous year, being the lowest values since the start up of MIBEL, the Iberian electricity market, in July 2007.

Spain

General Commentary on Winter Conditions

General weather conditions have been worse than expected for this period. Snow precipitations have been higher than average.

Month by month:

December 2008:

- Temperatures have been colder than average. Effect on demand: increase of 2.7%
- Water inflows in reservoirs lower than average (75% of average).

January 2009:

- Temperatures have been slightly colder than average. Effect on demand: increase of 1.2%
- Water inflows in reservoirs were lower than average (71% of average).

February 2009:

- Temperatures have been similar to average.
- Water inflows in reservoirs were quite similar to average (96% of average).

March 2009:

- Temperatures have been warmer than average. Effect on demand: decrease of -1.6%.

- Water inflows in reservoirs were lower than average (89%).

Actual demand was around 5% lower than expected for the period from December 2008 to March 2009 due to a decrease in economic activity even though colder weather and lower temperatures have had the effect of a 2.1% increase in demand.

No particular risk or unexpected situation occurred. Generation maintenance was as expected and no particular event was observed regarding transmission infrastructure.

Impact of Interruption of Gas Supply

30% (27610MW) of the total installed capacity in Spain is gas fired. That includes:

- 21200MW of natural gas CCGT plants.
- Most of them can use diesel-oil as an alternative fuel for short periods of time (From 8 hours to 5 days several times in a year).
- 1660MW of conventional gas fired plants.
- 670MW of them can use fuel-oil as an alternative.
- 4750MW of CHP plants using natural gas.

No information is available to REE about alternative fuels.
The Spanish-French gas interconnection has a very small capacity and few transactions. Imports consist mainly of shipped LNG (liquid natural gas) and natural gas pumped through the GME pipeline from the Maghreb.

Supplies come mainly from Algeria (through pipeline and LNG), Egypt, Nigeria, Trinidad &Tobago and Emirates (all these imports are LNG). No supply comes from Russia.

Spanish gas imports were not affected by the Russia/Ukraine dispute.

The Spanish gas-fired generation capacity was not affected.

ADDITIONAL CONTRIBUTING COUNTRIES

Albania

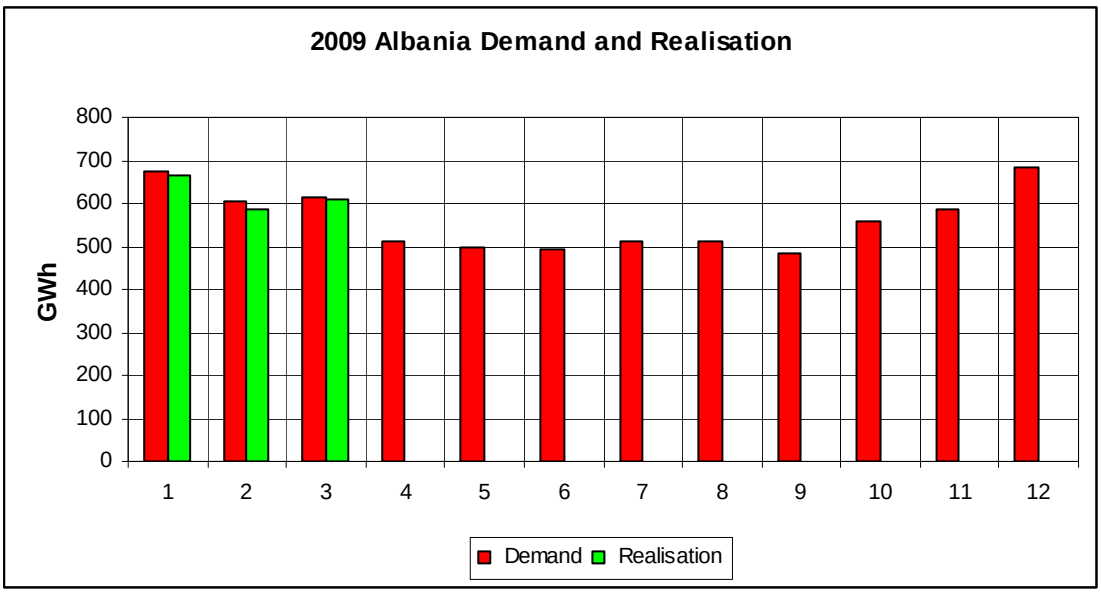
Albania Energy Balance substantially depends on hydro generation and imports over interconnections to UCTE and:

- The available production capacity was 1450MW during the last year.
- Stored energy in the reservoirs is quite high.
- Import capacity is limited due to the restrictions of the NTC values, which are expected to be improved after putting in operation 400 kV line Tirana2 - Podgorica.

During the last year there was no load shedding

The year 2009 started with a good energy situation. Reservoir level at Fierza HPP was near the maximum allowed level, and using the historic data and stochastic planning method, the following figures in GWh have been calculated and expected to be fulfilled.

Big HHP Cascade Production	**3.78 GWh**
Small HHP Production	**0.37 GWh**
TPP Production	**0.38 GWh**
Total Production	**4.53 GWh**
Total Import	**2.20 GWh**
Albania Demand	**6.73 GWh**



Cyprus

In general, demands over the winter were lower than forecast except for peak demand (31-Dec) and some days in March when demand was close to or even higher than that expected under severe conditions. The lower than average demand can most likely be attributed to the decrease in oil price meaning that oil, rather than electricity, could be used for heating.

At the time of peak demand (896MW) on 31-Dec, the operating margin was 182MW which would have been large enough to cater for the loss of the largest steam generating unit (130MW).

There were no unexpected risks, no remarkable events and Cyprus was not affected by the gas dispute between Russia and Ukraine.

On 30-Jan, the Cyprus TSO published new Trading and Settlement Rules marking the opening of the Cyprus electricity market. A bilateral market model has been adopted, but no IPPs have entered the market as yet.

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6.2 Appendix 2: Individual Country Responses to Summer Outlook

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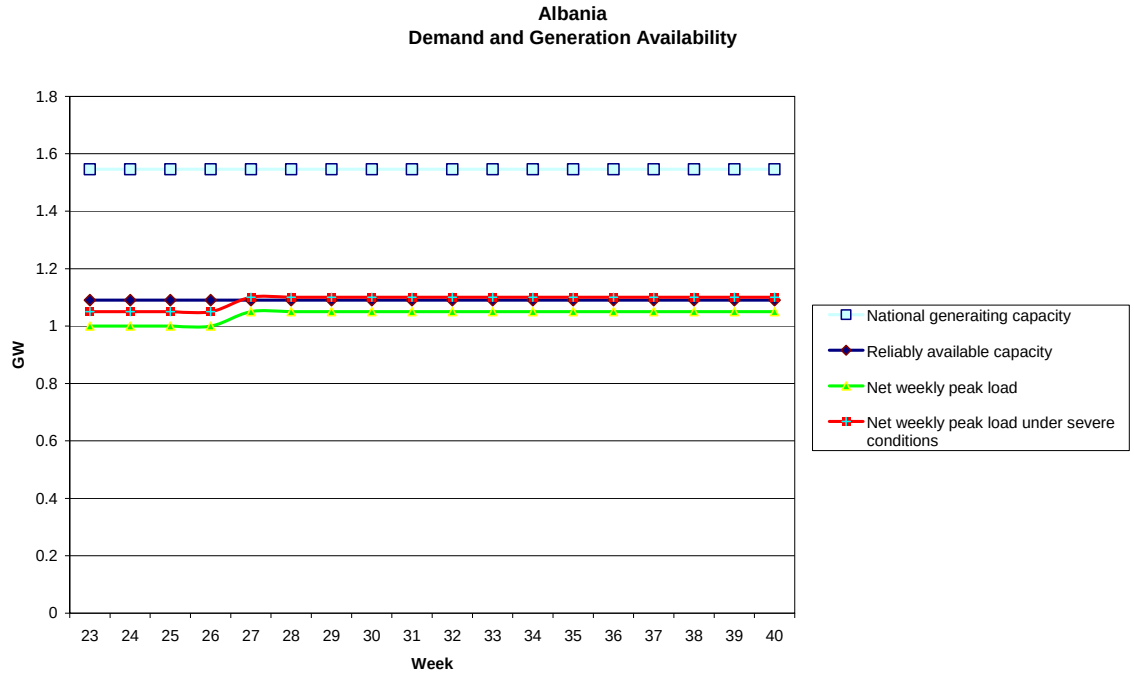
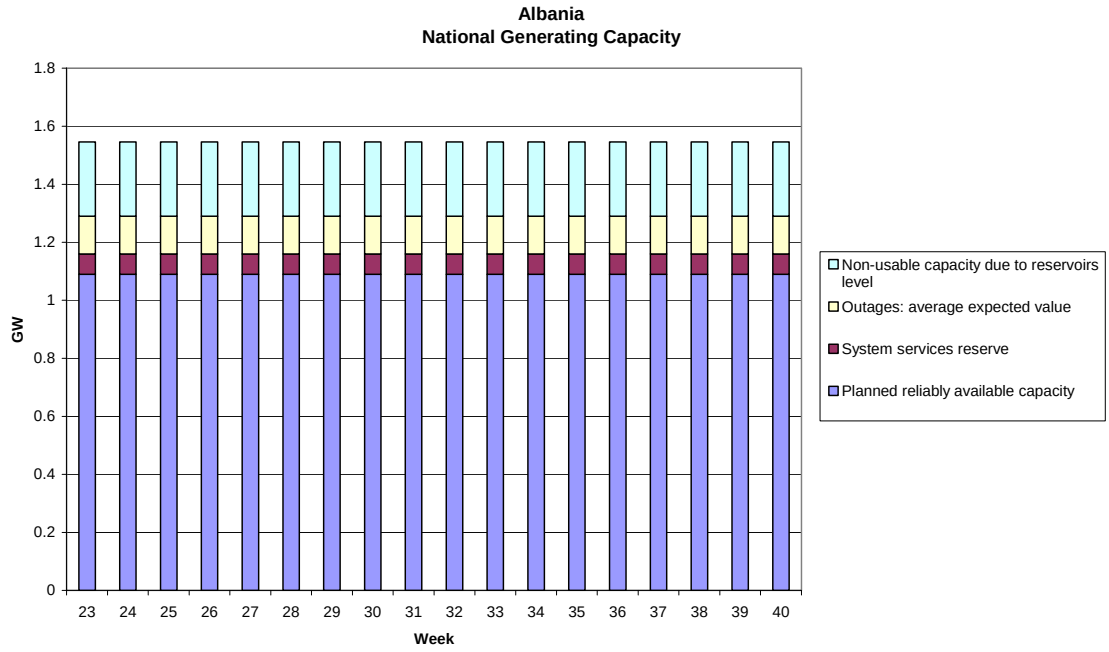
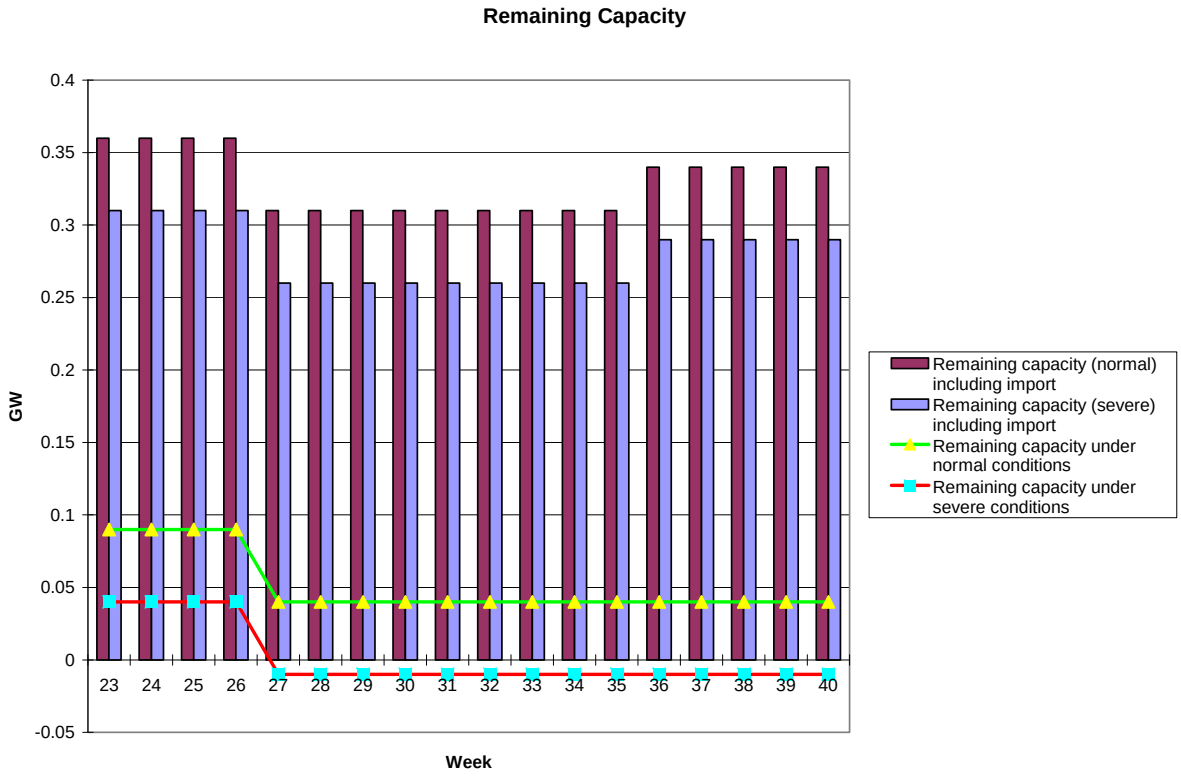
Albania

The TSO does not expect any problems in the system regarding the system adequacy this summer. Albania will remain an importer country during the summer.
This year the import is lower than in the previous year, because of very good hydrological situation and putting in operation of a new TPP with combined cycle.







Austria

In previous reports two main problems concerning the Austrian system were described. The first problem – North-South congestion – is still present. The second problem – Congestion on Czech-Austrian tie lines – is resolved now, as a second system Slavetice-Dürnrohr was put into operation in November 2008.

North-South congestions

Since 2001 severe congestions have occurred on the weak 220kV lines from the north to the south of Austria. In general the problem about North-South congestion is more severe in wintertime. In summer this problem may affect the Austrian system in case of special events (e.g. outages) or long-lasting dryness.

For permanent improvement of these structural congestions, a new 380kV line (Südburgenland –Kainachtal) will be put into operation in Summer 2009. The line is one step forward to close the Austrian 380kV circuit which will improve the overall situation. To close this circuit a new 380kV line (St. Peter – Tauern) is planned to be build.

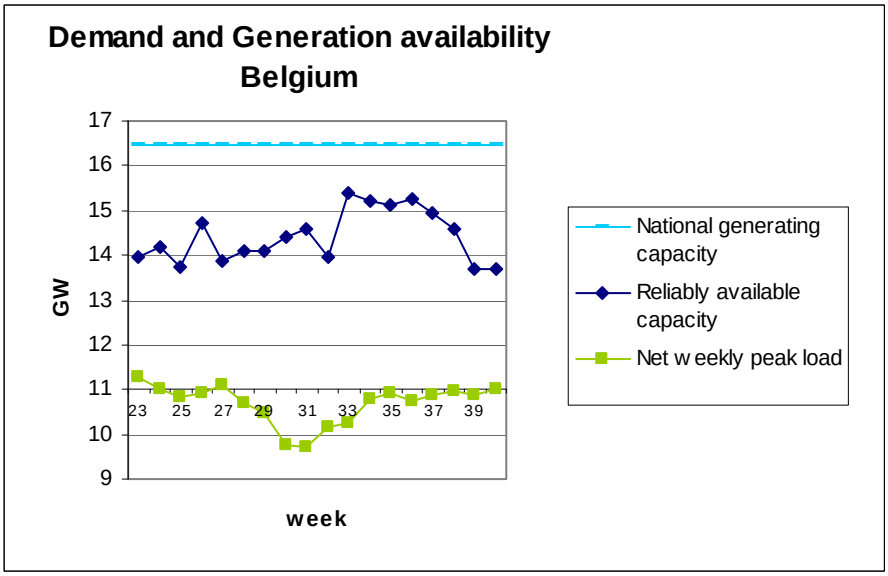
Until then APG is prepared to take countermeasures in order to reduce these congestions. This can be done by Phase Shifting Transformers (PST) in combination with re-dispatching of power plants (including restriction of pumping) and special switching in network operation. In particular the PSTs allow for a better balanced distribution of load flows and thus higher utilization of the existing three 220kV north to south double circuit lines.

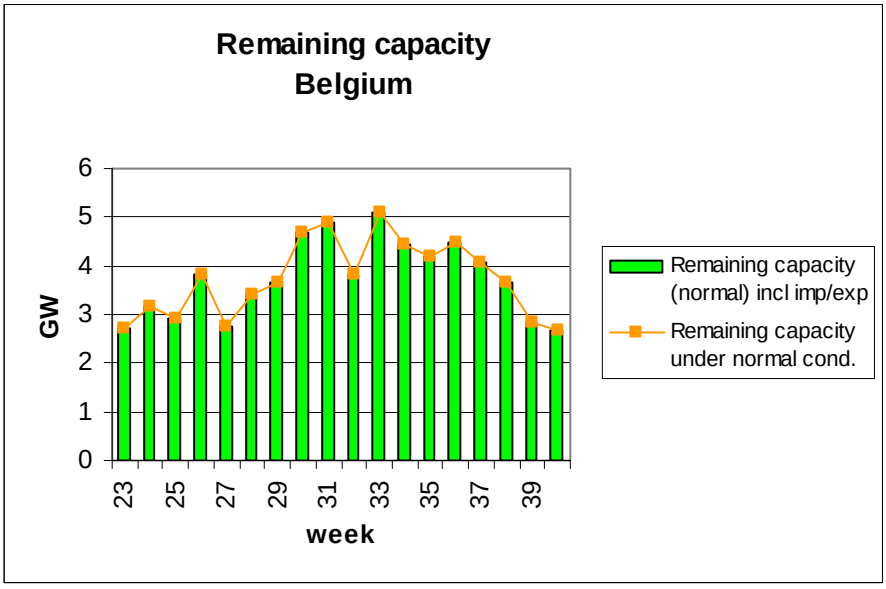
Mechanism to manage risks

The generation of power plants is driven by the power market (EEX) and the availability of renewable energy sources (especially wind). As both of them are difficult to forecast, the anticipatory management of the power grid also remains difficult under certain conditions.

But under normal conditions in general APG does not expect serious problems which could not be handled with the available congestion management measures.

Belgium





The adequacy forecast study for the summer 2009 is carried out for the Elia control area, which comprises Belgium and the SOTEL area (a part of the G-D of Luxembourg). The

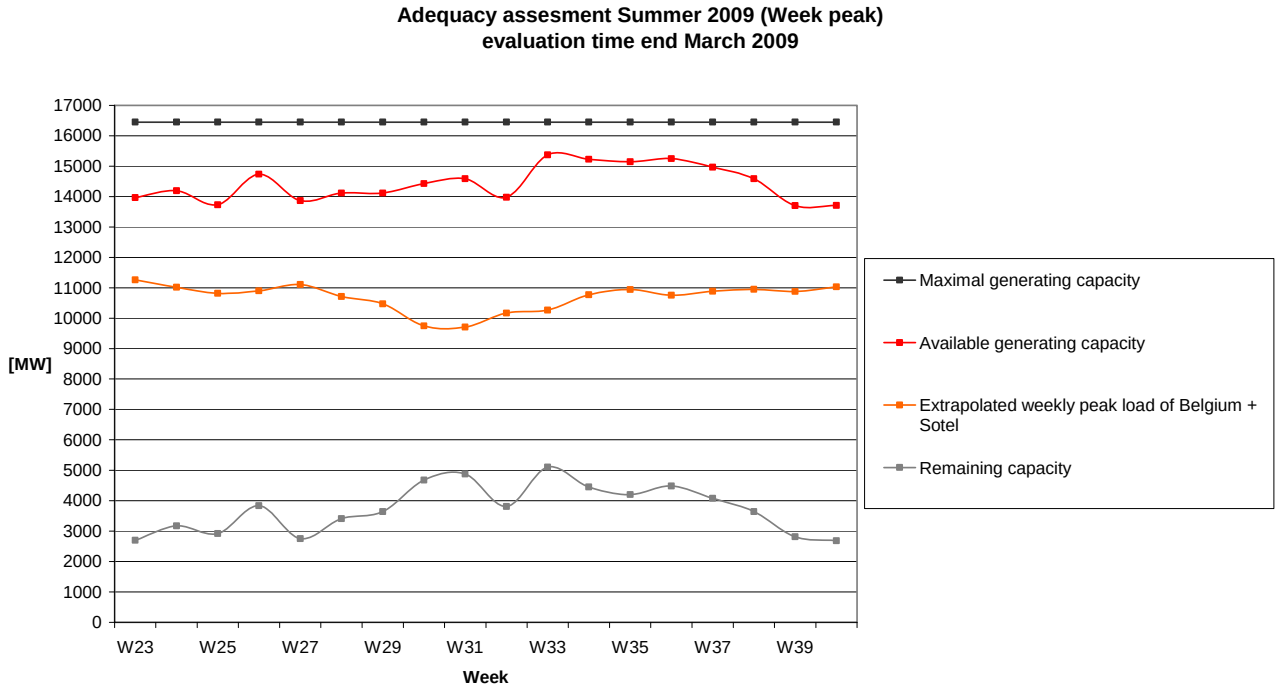
desired safety level of 1000MW for the generation-load balance, corresponding with the assumption of autonomous national power supply, is reached during the whole summer period, for the peaks of weeks 23 to 40 of 2009. Nevertheless, the weather conditions of the summer 2006 revealed that a long period of dry and hot weather can reduce significantly the available generation capacity. If these circumstances occur, the autonomous national safety level might be affected.

The lowest remaining capacity level in normal conditions is foreseen for the peak of week 40 of 2009, namely a remaining capacity of 2683MW.

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

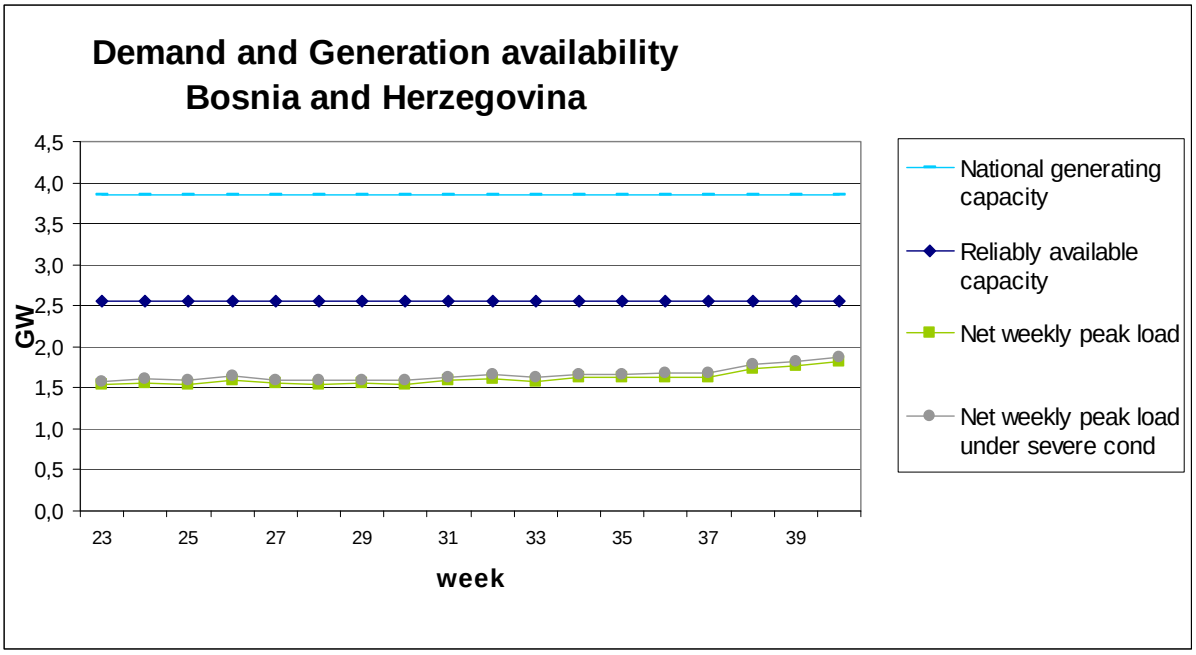
The first analysis of the system adequacy for the coming summer 2009 is positive.

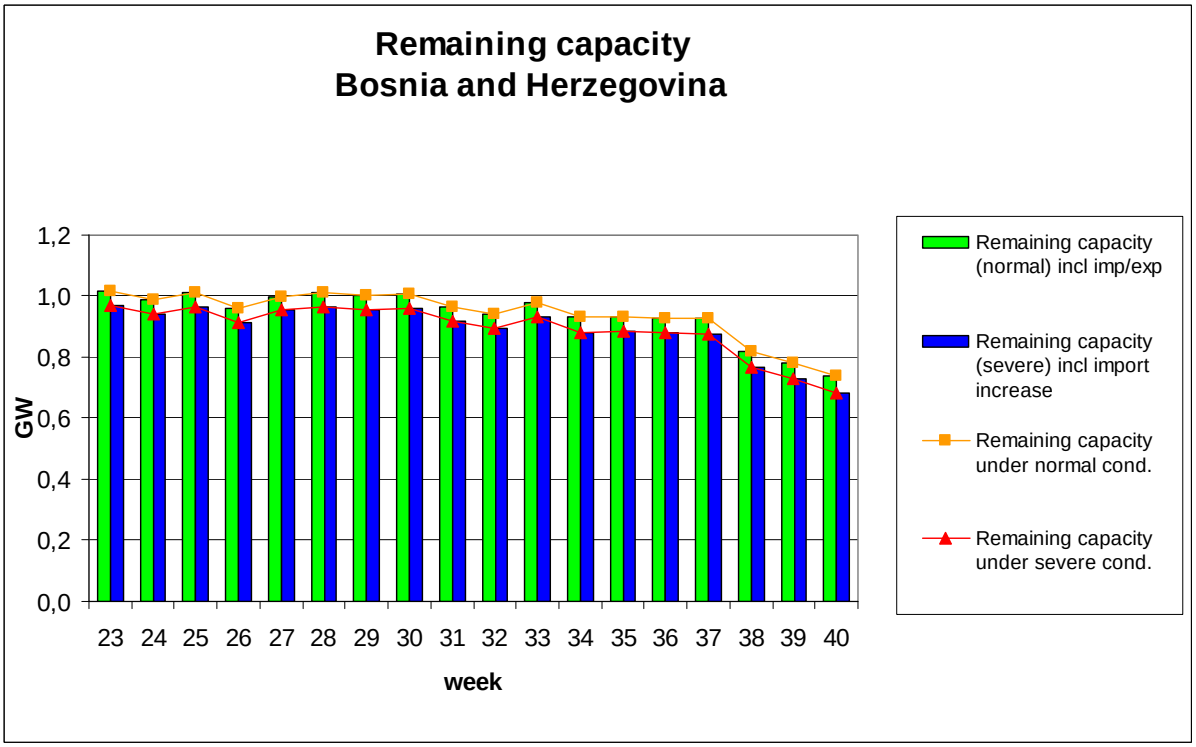
The main risk factors for the Elia grid that may jeopardize the current positive summer adequacy assessment are (1) a long period of dry and hot weather, which would reduce the flow of cooling water from the rivers and therefore the available generation capacity and (2) a generation-demand imbalance for the whole of the UCTE-main block.



Bosnia-Herzegovina

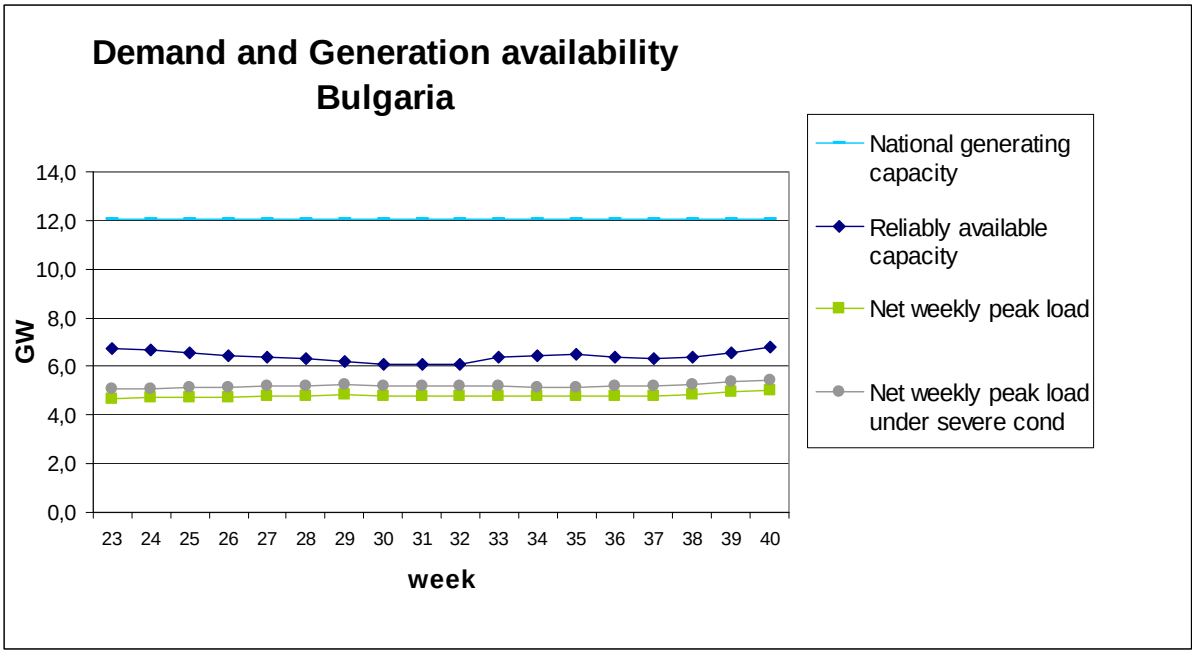
The TSO does not expect any problems in the system, regarding the system adequacy this summer.

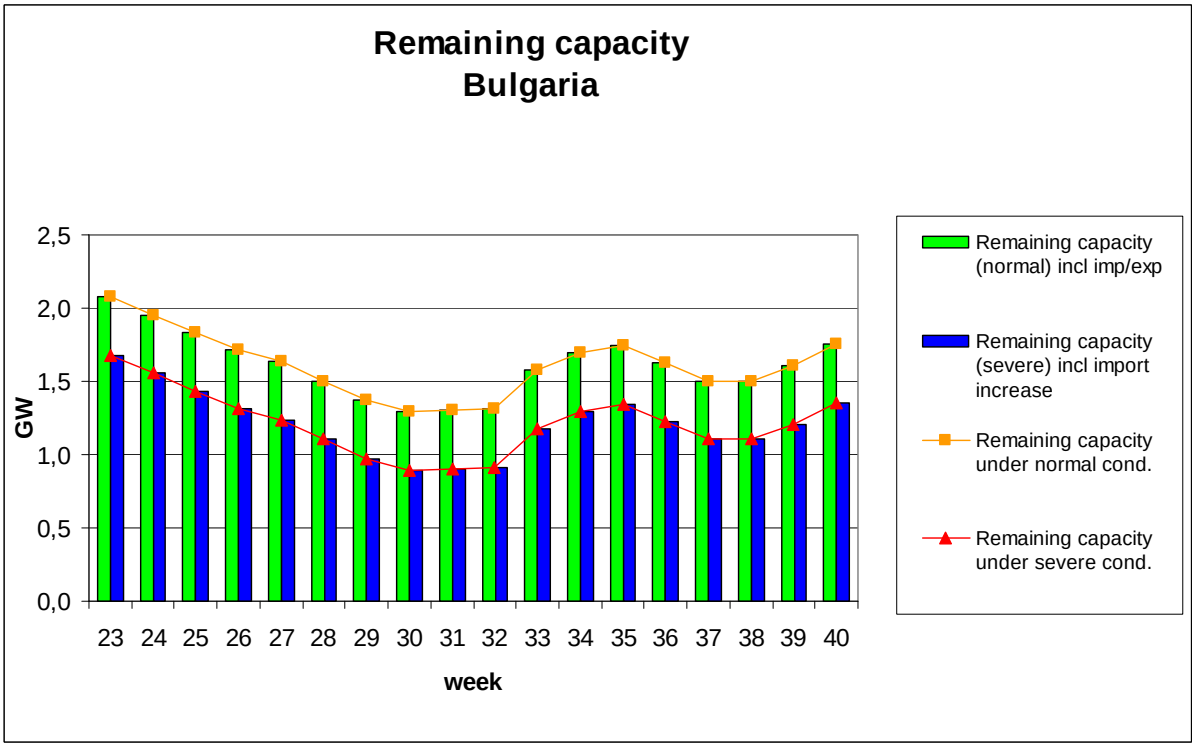




Bulgaria

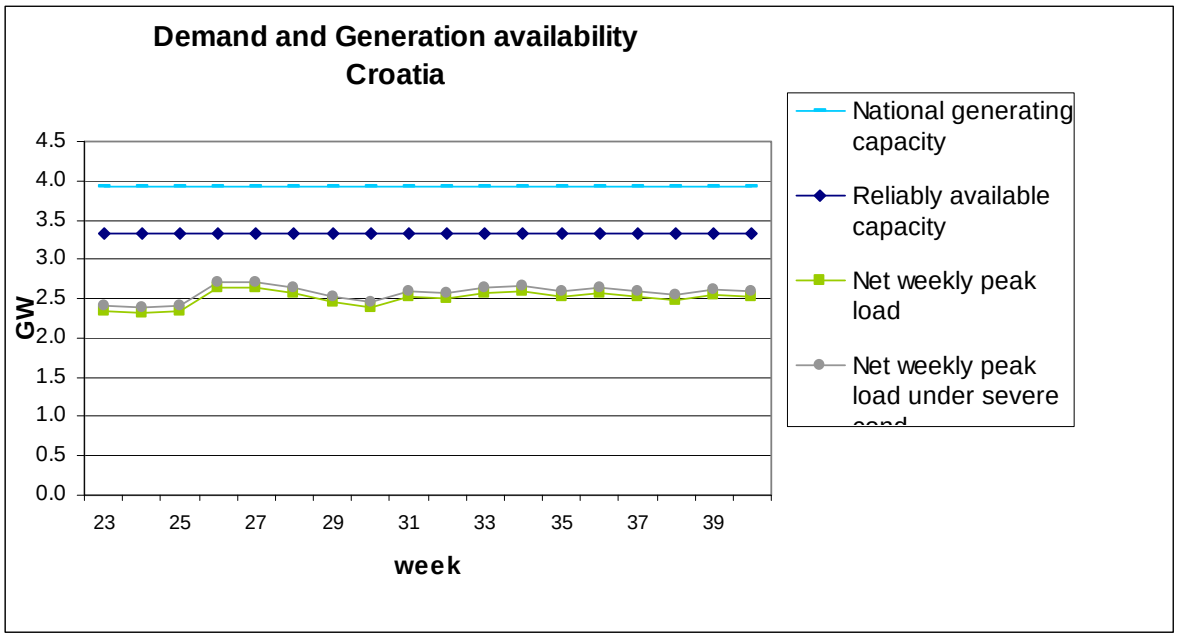
The TSO does not expect any problems concerning system adequacy in the summer period.

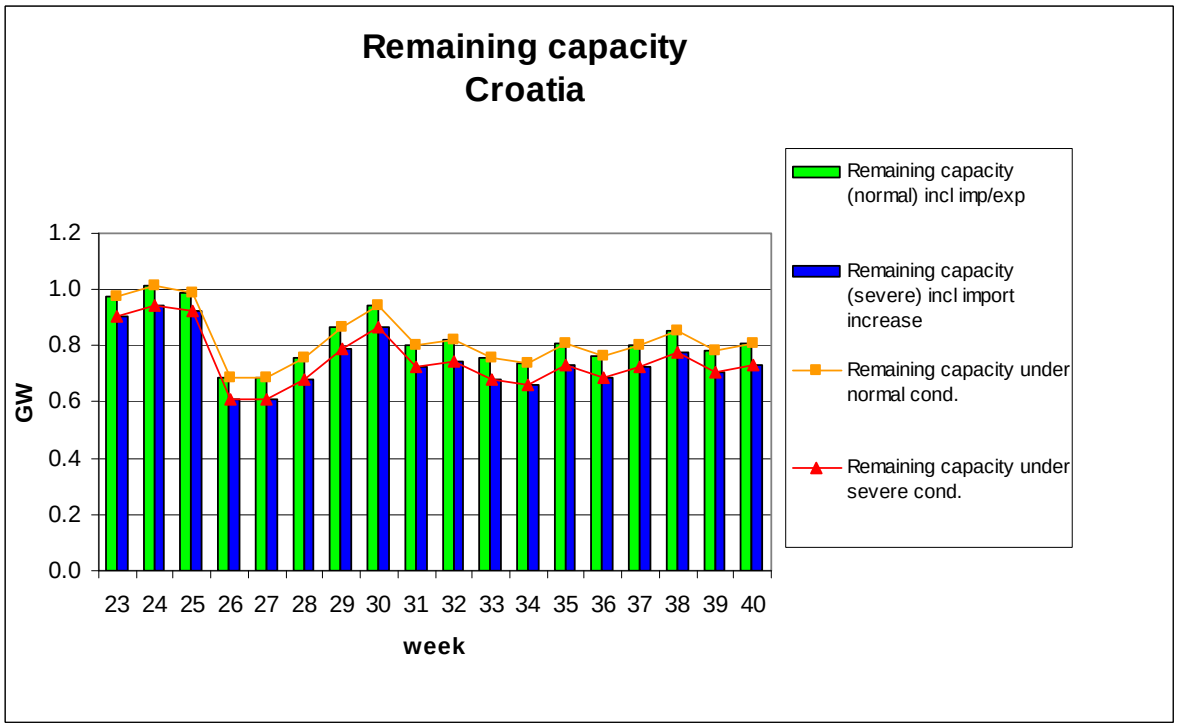




Croatia

The TSO does not expect any problems concerning system adequacy in the summer period.





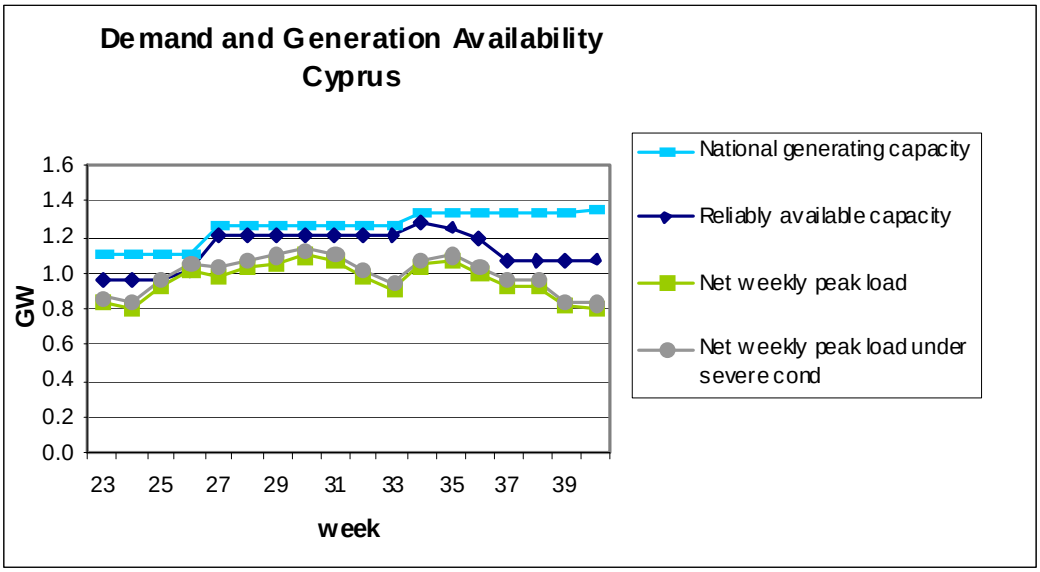
Cyprus

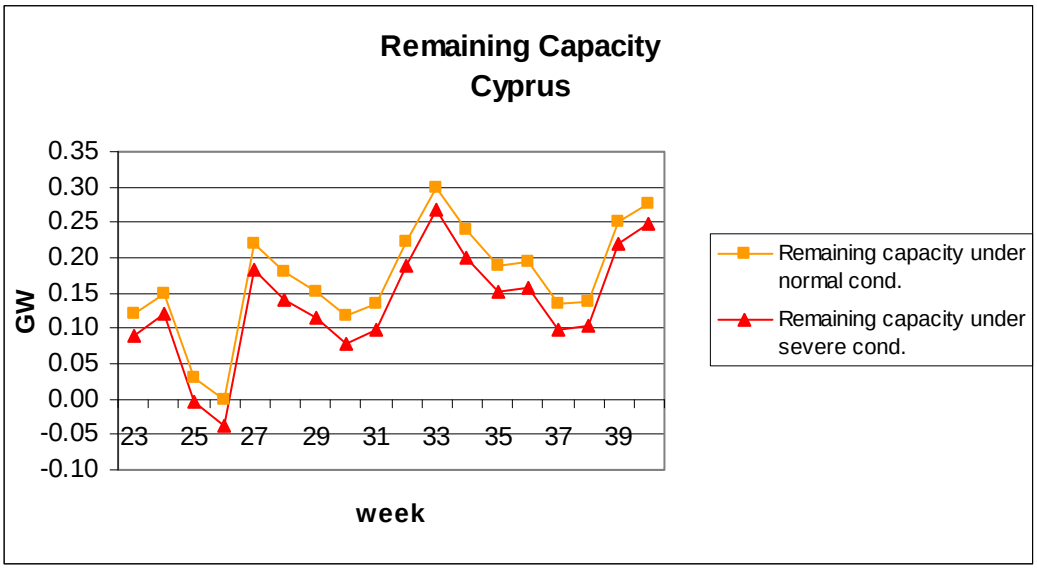
No major problems are foreseen for this summer.

By week 35, installed capacity in Cyprus will reach 1342MW as a result of increases in installed capacity at Dhekelia and Vassilikos power stations and operation of the Vassilikos 220MW combined cycle unit. Demand is forecast to reach a maximum of 1095MW under normal conditions and 1135MW in the case of an extended heatwave, resulting in operating margins of 177MW and 137MW respectively, which would cater for the loss of the largest steam unit of 130MW.

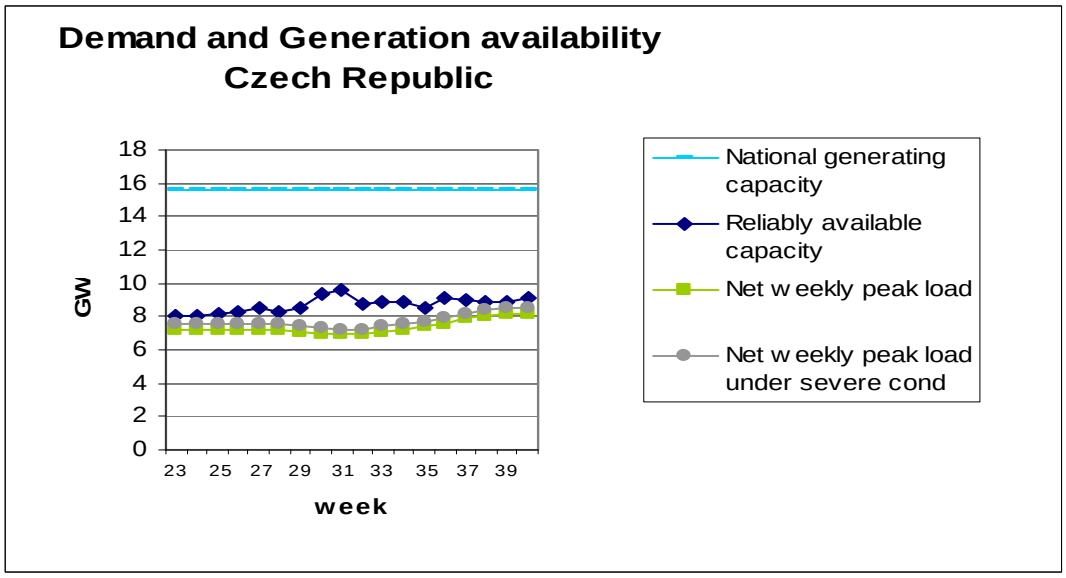
The highest risk period has been identified as weeks 25 and 26 when the forecast operating margin is less than the capacity of the largest unit, but this is dependent upon weather forecasts. Load shedding schemes are available to manage demand if necessary.

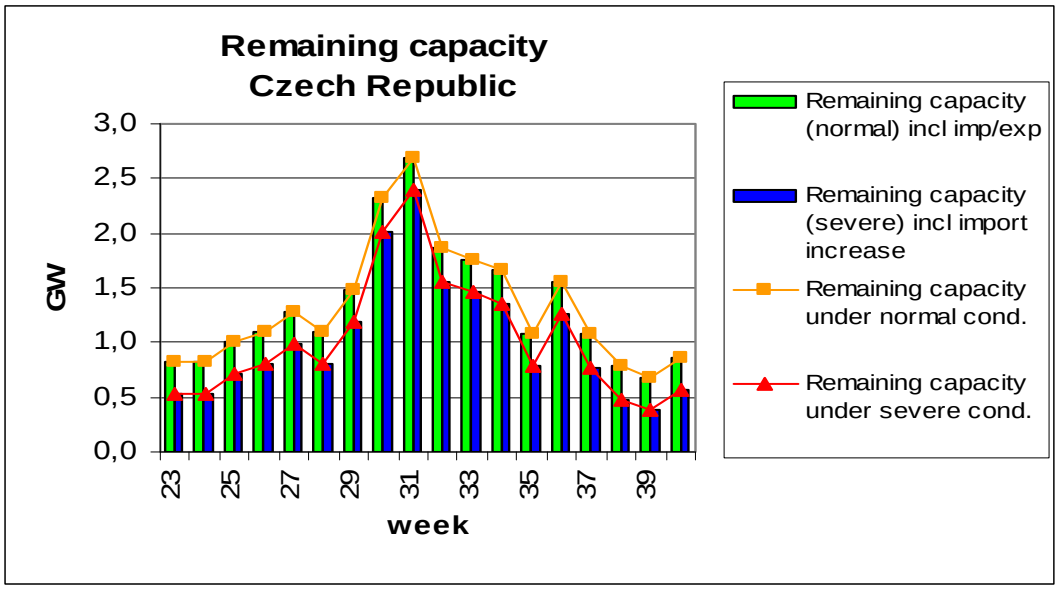
Cyprus is an isolated system with no interconnections to other electricity transmission networks.





Czech Republic





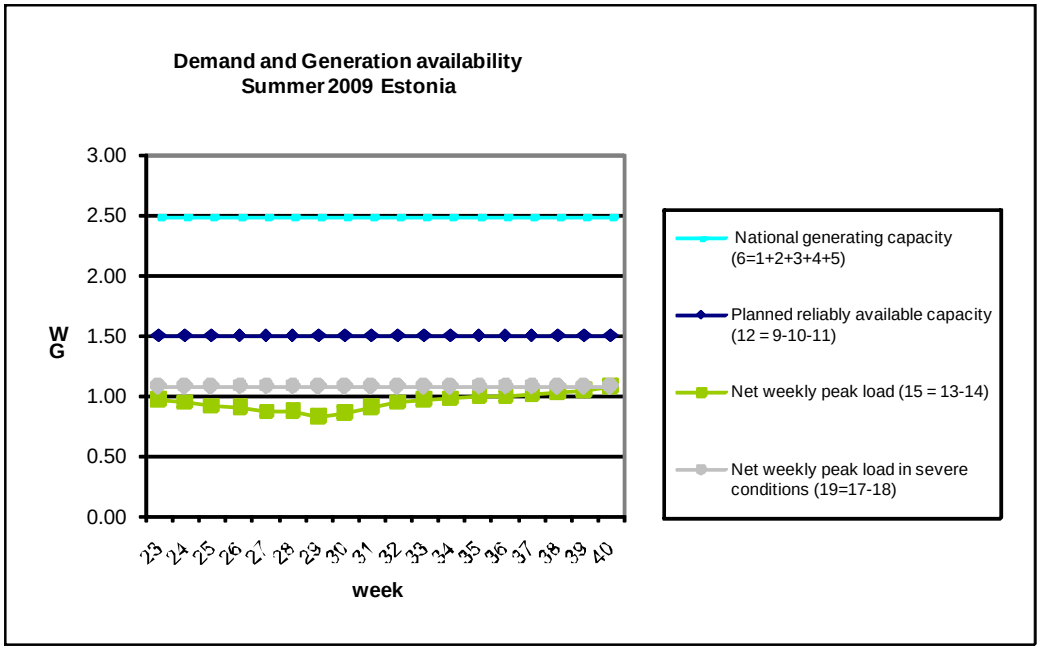
Due to the economic crisis, electricity consumption dropped significantly. This trend is expected to last for the rest of the year 2009. The main drawback of the consumption drop is a higher risk of unavailability of negative power reserves and also possibly spinning reserves - the reason being that, due to low demand, there will be too few units dispatched with the ability/potential to provide negative power reserves.

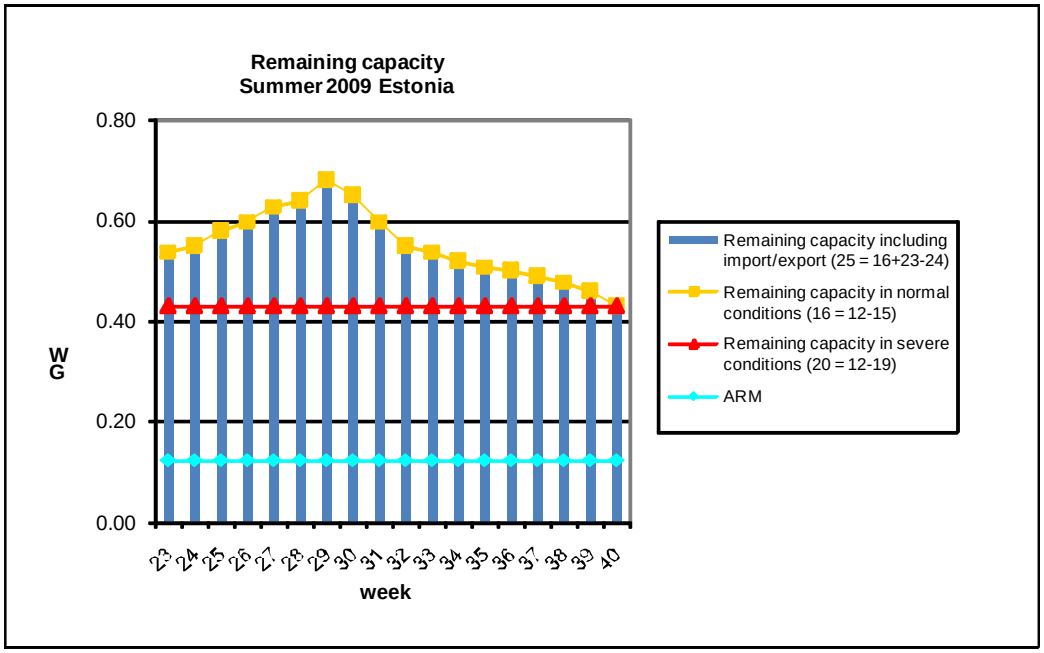
Denmark

Summer is not forecast as a critical period for the Nordic power systems.

Estonia

Estonian demand and generation availability in the summer 2009 and Estonian remaining capacity in the summer 2009 are presented below.





During summer 2009, the closure of the Ignalina NPP in Lithuania could cause several problems in the Estonian power system as a part of the BRELL (Belarus-Russia-Estonia-Latvia-Lithuania) Ring. Repair works and preventative maintenance in power system will be limited, and if necessary exports will be limited as well.

The main problem period has been identified as between 28-Aug - 26-Sep 2009 (weeks 35-39).

Finland

Summer is not forecast as a critical period for the Nordic power systems.

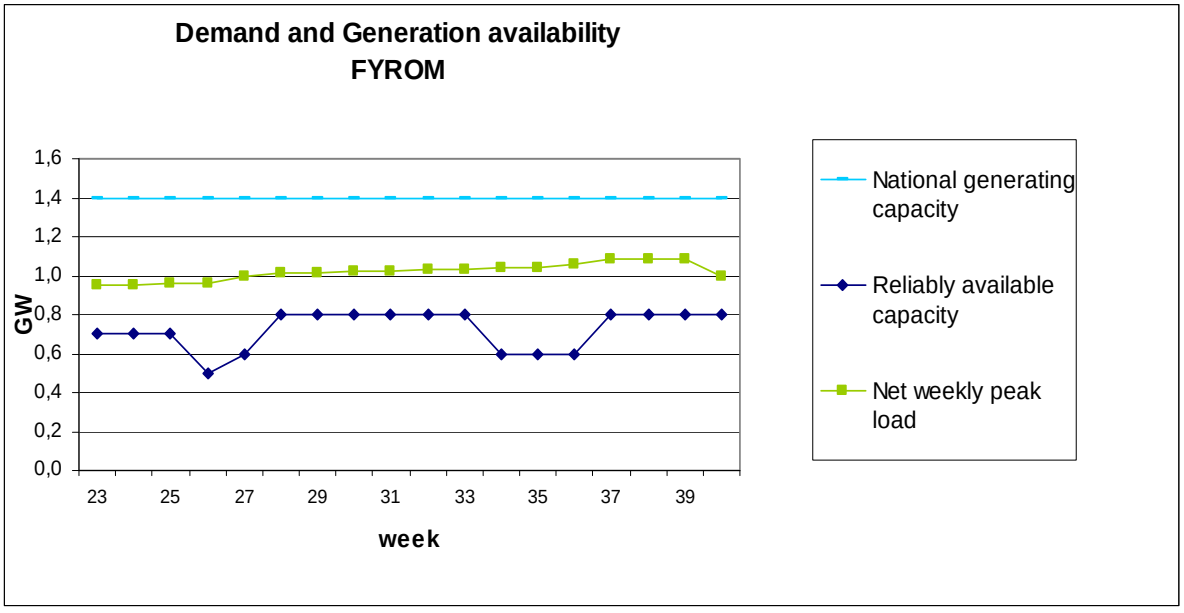
Former Yugoslav Republic of Macedonia (FYROM)

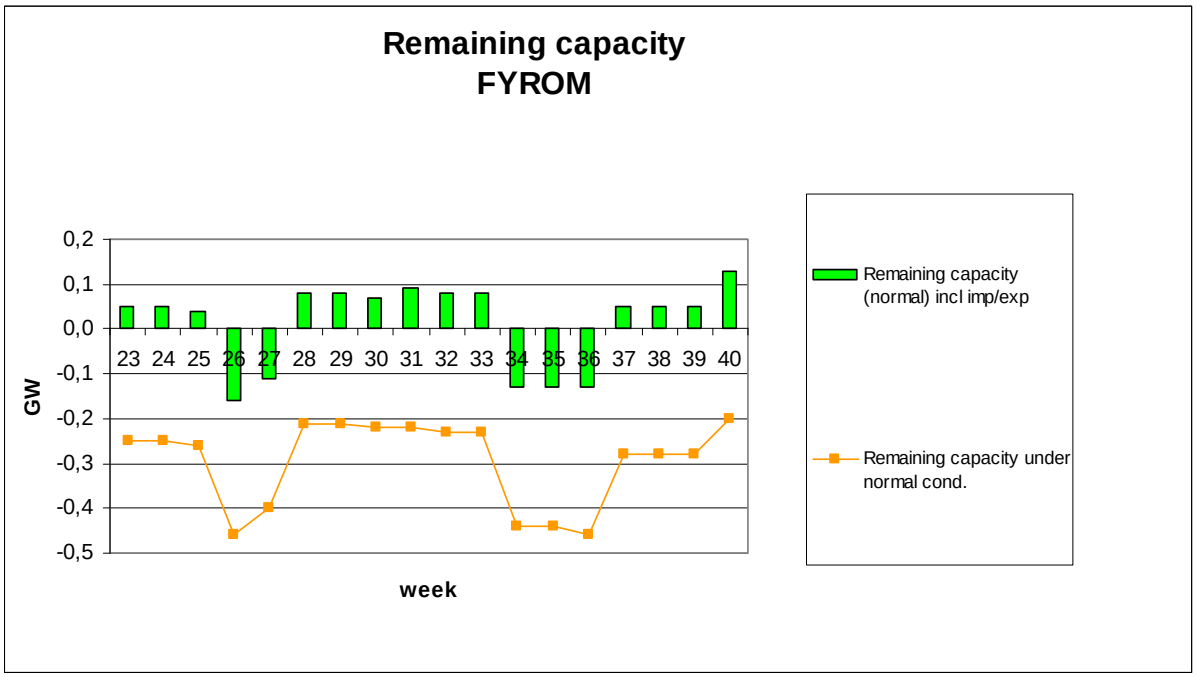
MEPSO does not expect any problems this summer. FYROM depends upon imports of energy to reach adequate balance between consumption and production/import.

This year the import is lower than previous year, because the demand of eligible customers is lower than the previous year (because of the global economic crisis).

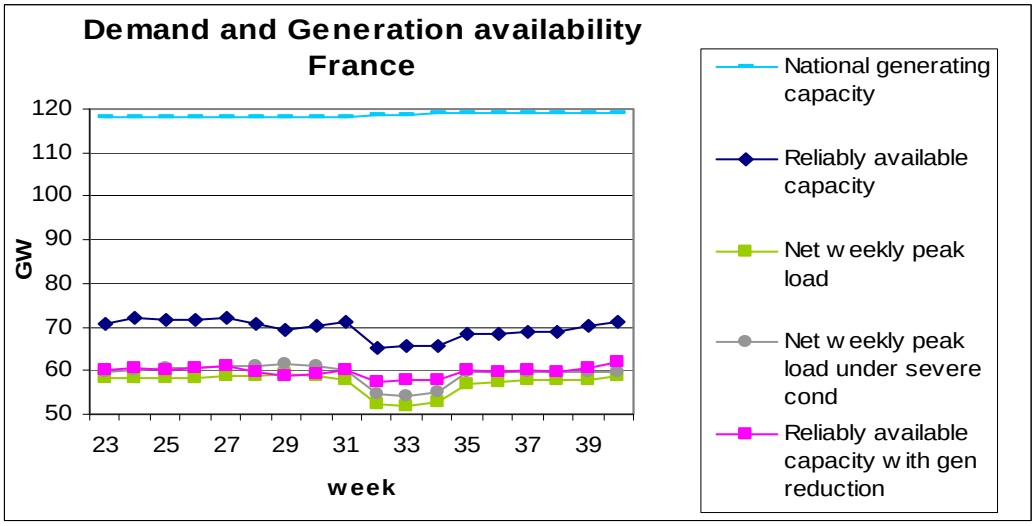
We do not expect any problems, but in the case of risk we have arrangements with neighbouring countries for emergency help, market mechanisms such as balancing market, system reserve, and so on.

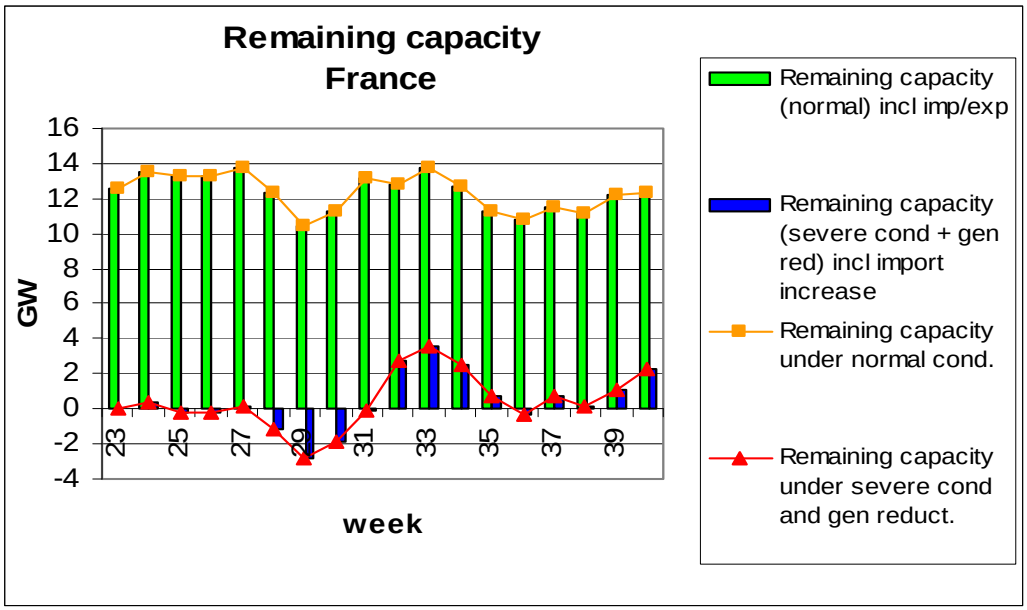
The generation-load balance on the Macedonian system is not considered at risk for the coming summer.




Remaining capacity
FYROM
0,2
0,1
0,0
-0,1
-0,2
-0,3
-0,4
-0,5
GW
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
week
Remaining capacity (normal) incl imp/exp
Remaining capacity under normal cond.

France


Demand and Generation availability
France
120
110
100
90
80
70
60
50
GW
23 25 27 29 31 33 35 37 39
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond
Reliably available capacity with gen reduction



In its studies for the coming summer, RTE takes into account the experience of two years of high temperatures in France: 2003 and 2006.

The consequences of high temperature are:

An increase of consumption (because of air-conditioning), which is calculated at +7°C above normal temperatures.

Many generation reductions due to environmental constraints on nuclear or fossil generation units (in order to respect maximum temperature in the rivers for example)

Hydraulic and wind generation reductions are also taken into account in case of drought.

No particular problem is foreseen under normal conditions.

However, in case of high temperatures or heat wave, with the impact on generation and load mentioned above, margins would be reduced and the situation could be stressed at the beginning of the period. In July, which is the most critical month, imports up to 2800MW would be necessary to cover the minimum required margin.

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

Modification of the planning of power plants outages,

Activation of emergency reserves contracted with neighbouring system operators,

Use of the conditions allowed in exceptional situation by existing ministerial decrees concerning the environment-related limits

Demand of exemption of certain tourism-related limits affecting hydro-power plants generation.

RTE's potential need for imports may affect all neighbouring countries (UK, Belgium, Germany, Spain, Italy and Switzerland).

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

Vigy (FR) – Uchtelfangen (DE) 1 from 4th July until 18th July

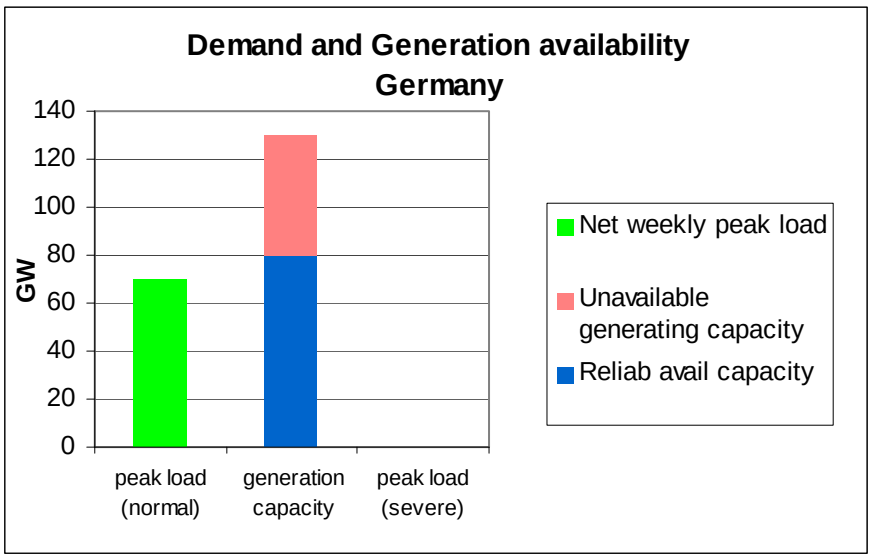
Vigy (FR) - Uchtelfangen (DE) 2 from 19th July until 2nd August and 30th August

Venaus (IT) -Villarodin (FR) from 3rd August to 11th September.

There should not be any issue likely to affect the availability of imports. However, in case of extreme heat-wave and thermal constraints on the power plants in Northern France, the imports could be slightly reduced from Belgium.

Furthermore, in case of heat wave, the NTC from France to Spain could be reduced down to zero.

Germany



Remarks

The German contribution to the ENTSO-E Summer Outlook Report 09 has been prepared on the basis of the 3rd Wednesday figures of July 2009 which have been delivered to UCTE in the framework of the inquiry for the UCTE System Adequacy Forecast 2009-2020 (according to the UCTE Methodology). The result is that the peak load is expected to be 70GW (i.e. peak load at reference time + margin against peak load). Taking the different elements of the Power Balance Forecast into account, this will result in a so-called "Remaining Capacity" of around 10 GW which means that the "Adequacy Reference Margin" will be met. Concerning the other summer months, the experience is that the situation is most severe in July and August and that the figures for July can be applied to August too. The remaining months of June and September are usually not critical, as explained in the comments below.

Generally, it has to be pointed out that due to unbundling detailed generation data have not been available to the German TSOs and thus a great many of the data required for the Power Balance are estimations and approximations. However, as there are a very large number of players in the market, the situation is getting more and more difficult every year. As compared to the last decades there is an increasing number of generators and especially embedded and renewable generation (more than 40GW and 20% of energy generation). We are not sure about the quality of the data concerning the large number of small generation companies. Consequently, it is almost impossible to make a weekly assessment.

General comments

Depending on the weather conditions, problems in terms of increased load flows in the transmission system of VE-T are likely to occur during certain periods in summer 2009. Due to the high generation installed in wind power plants, the latter will be considerably influenced by wind conditions. With a view to fully integrating wind energy and avoiding congestion, network and market-related measures will have to be taken, where applicable, both inside and outside the control areas.

High transfers attributable to wind power feed-in from the North and high power flows towards France / Switzerland

“Heat crisis“, i.e. problems with cooling water may occur in the event of sustained hot spells. Such heat crisis likely may occur in July/August.

Should any unexpected problems occur, network and market-related measures, including support from neighbouring TSOs, would be used in the light of system responsibility. The topological measures applied in this context need to be agreed with the neighbouring TSOs. Market-related measures are particularly measures of counter-trading, interference for security reasons, re-dispatch and suspension of intra-day trading. The aforementioned measures are based on Article 13(1) of the German Energy Industry Act. Should these measures not be sufficient, adaptations will be carried out in accordance with the German energy law (Article 13(2) of the Energy Industry Act).

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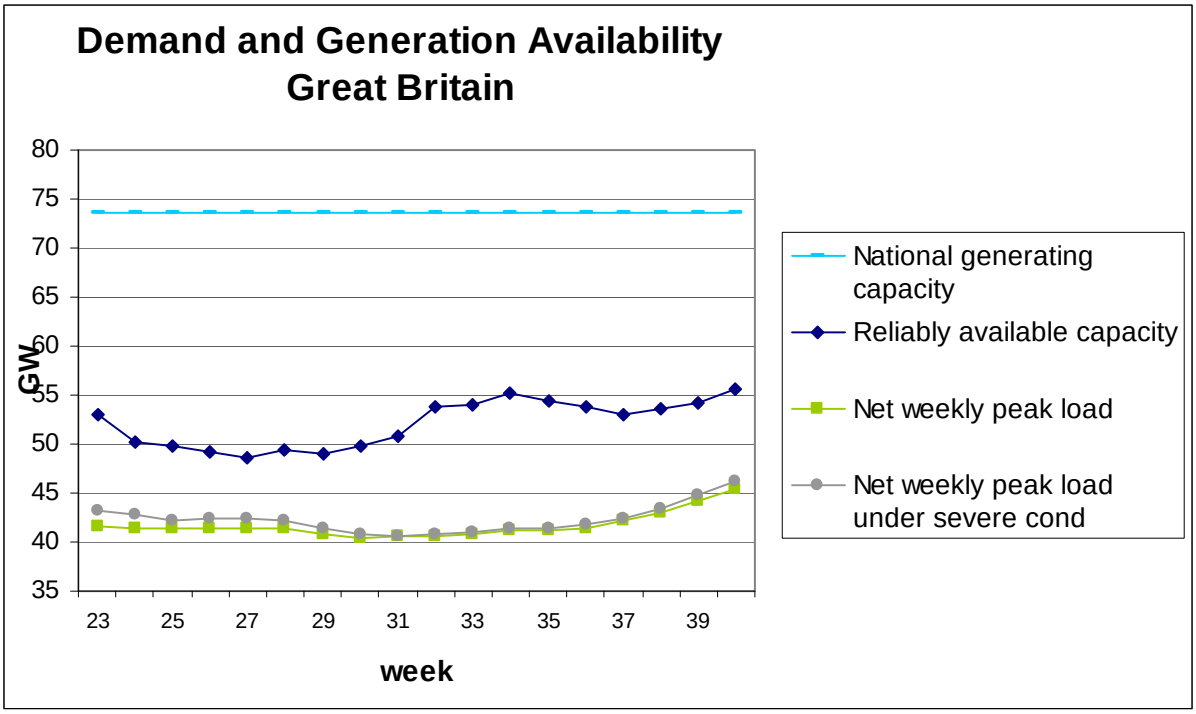
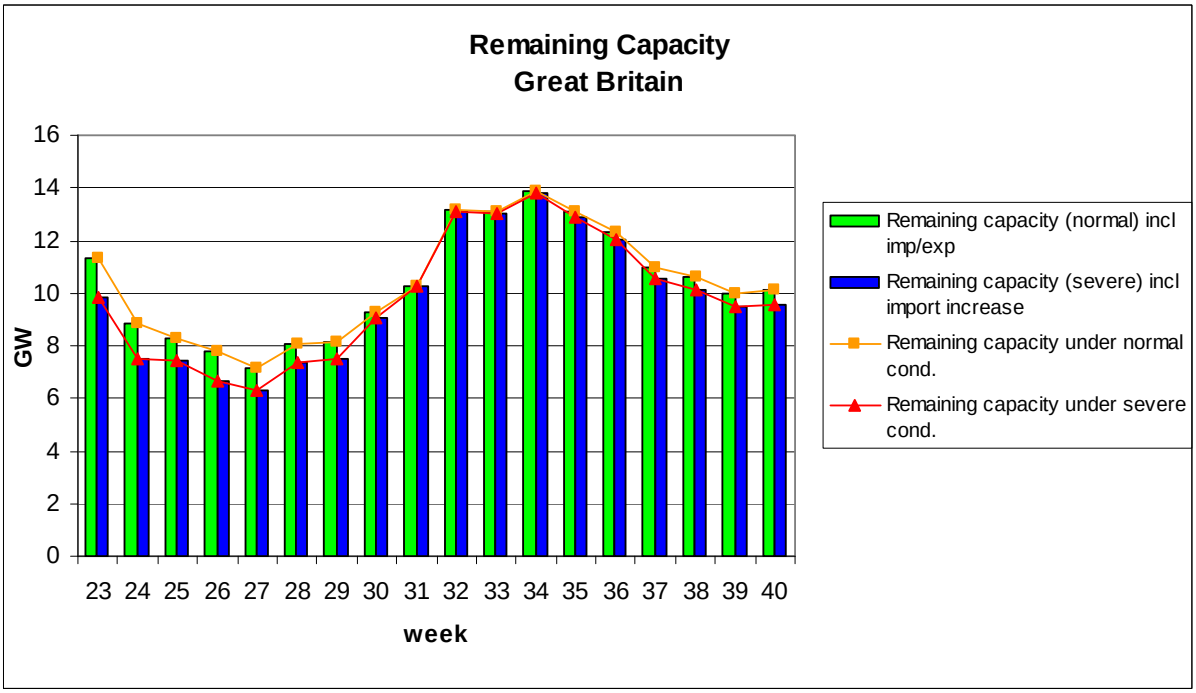
Great Britain

No major problems are foreseen for the summer. The GB system is not expected to be dependent upon imports.





Greece

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.

However the capacity of North Interconnections has been increased 400MW due to a new transmission line between Bulgaria and FYROM, which led to a great NTC increase in the whole Balkan area.

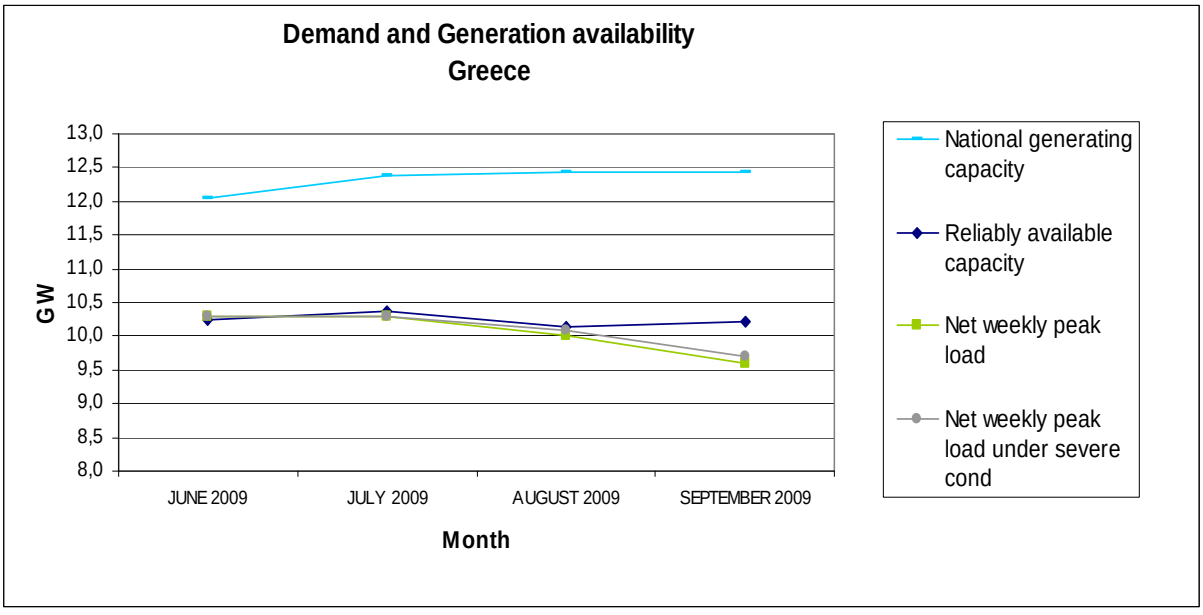
In case of any risk the mechanisms in place are:

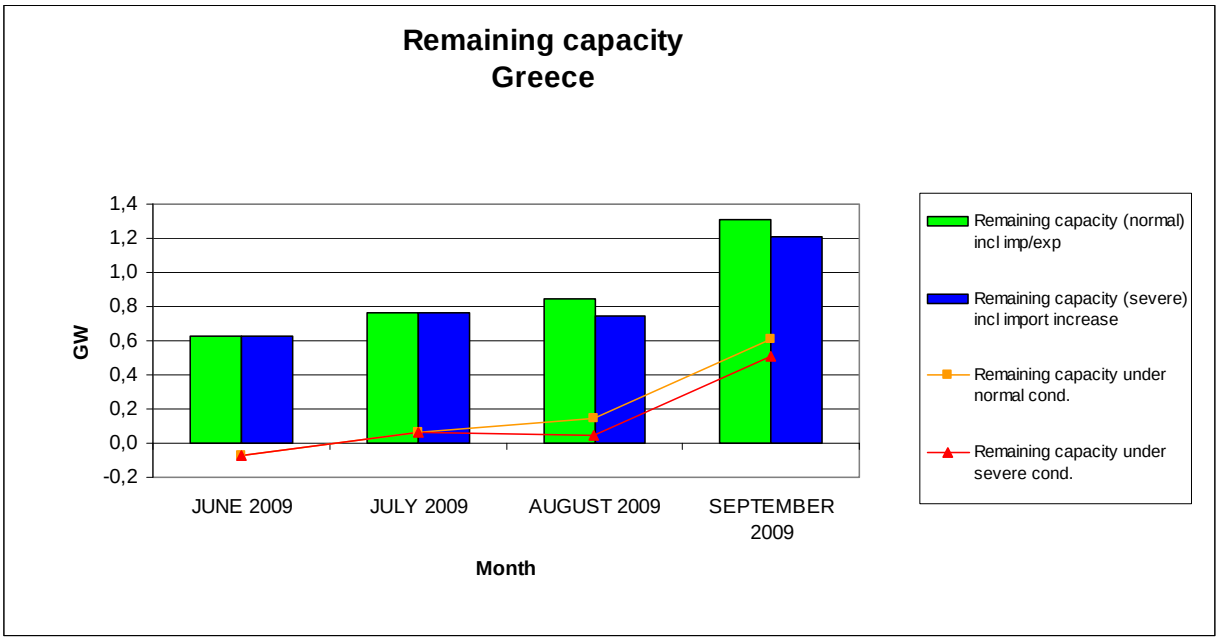
- Incentives to interruptible customers to reduce their consumption during peak hours and,
- Maximization of our north import capacity in collaboration with our neighbouring TSOs

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 countries relied upon to provide exports are Bulgaria, Italy and Romania. The reliability of assets could affect the availability of imports.





Hungary

Remaining capacity of the available domestic generation in Hungary is negative in September under normal conditions, and nearly all over the summer period under severe weather conditions – i.e. long-lasting heat wave. Demand can only be reliably supplied by imports.

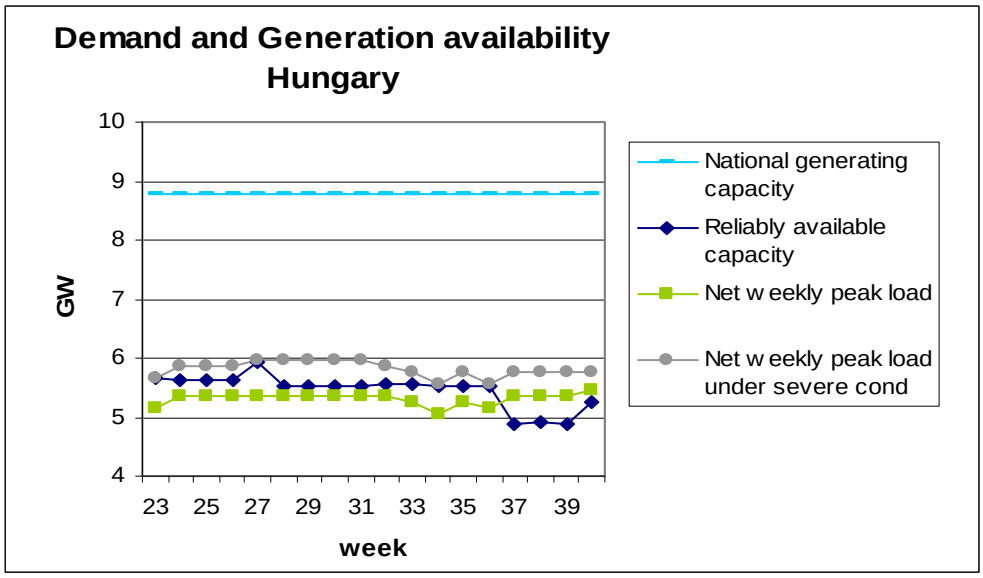
There are enough cross-border capacities available on fair monthly and daily capacity auctions for market participants.

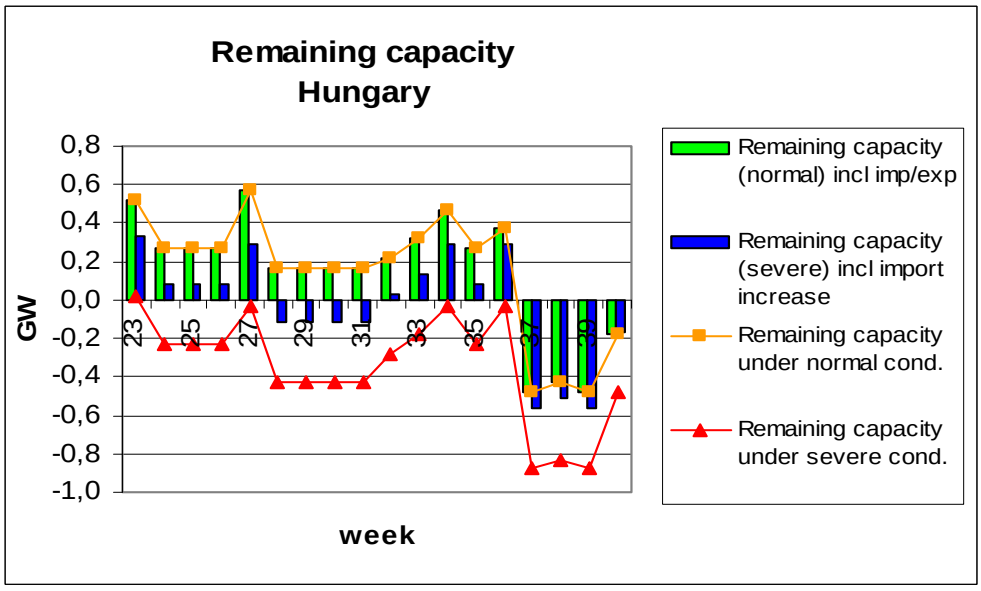
The TSO (MAVIR) has concluded “market maker”-type contracts (i.e. yearly contracts for obligatory daily bids) for provision of reserve generation capacities even from abroad. Therefore the necessary balancing energy is available, if markets players – for any reason – do not fulfil their obligations.

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 operation.

The countries that are relied upon to provide export is a market issue, depending on many parameters: e.g. generation maintenance, price, hydrology, but the Ukrainian Burshtyn-island is a pure export market. Hence, the interconnectors that are relied upon to provide imports are also a market issue. However, energy flows normally from North-East to South in the Continental Central East Region.


Demand and Generation availability
Hungary
10
9
8
7
6
5
4
GW
23
25
27
29
31
33
35
37
39
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond


Remaining capacity
Hungary
0,8
0,6
0,4
0,2
0,0
-0,2
-0,4
-0,6
-0,8
-1,0
GW
23
25
27
29
31
33
35
37
39
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

Italy

Terna does not expect to face particular problems on the Italian power system under normal conditions with the exception of the main islands where forecast margins are very tight.

However, in case of severe climate conditions (high temperatures, shortening of hydro resources) that can lead to an increase of the load demand and to a huge reduction of production of some thermal power plants, due to the cooling systems problems, margins would be reduced also in the mainland.

In order to cope with unexpected events the following countermeasures are usually taken by Terna, hereafter mentioned according to their priority, without triggering the interruptible loads disconnection or the load shedding:

- monitoring of hydro reservoirs, jointly performed with the other involved authorities, to prevent any possible hydro shortage;
- activation of special devices to allow the production of some generating units affected by cooling system difficulties due to low levels of the rivers;
- modification of the planned maintenance of grid elements and power plants;
- activation of the emergency contracts with the neighbouring TSOs;
- commitment of power plants whose production is allowed under special conditions due to environmental limits established by national decrees.

In case of exceptional weather conditions in terms of high temperatures and unforeseen outages of relevant thermal power plants there will be need of imports from week 28 to 30 and from week 35 to 36.

In general all the interconnectors belonging to the neighbouring power systems (France, Switzerland, Austria, Slovenia, Greece) could be relied upon. Special reliance is given to the northern interconnection.

The load and generation patterns in Europe can affect the availability of imports, particularly due to weather conditions in the summer.

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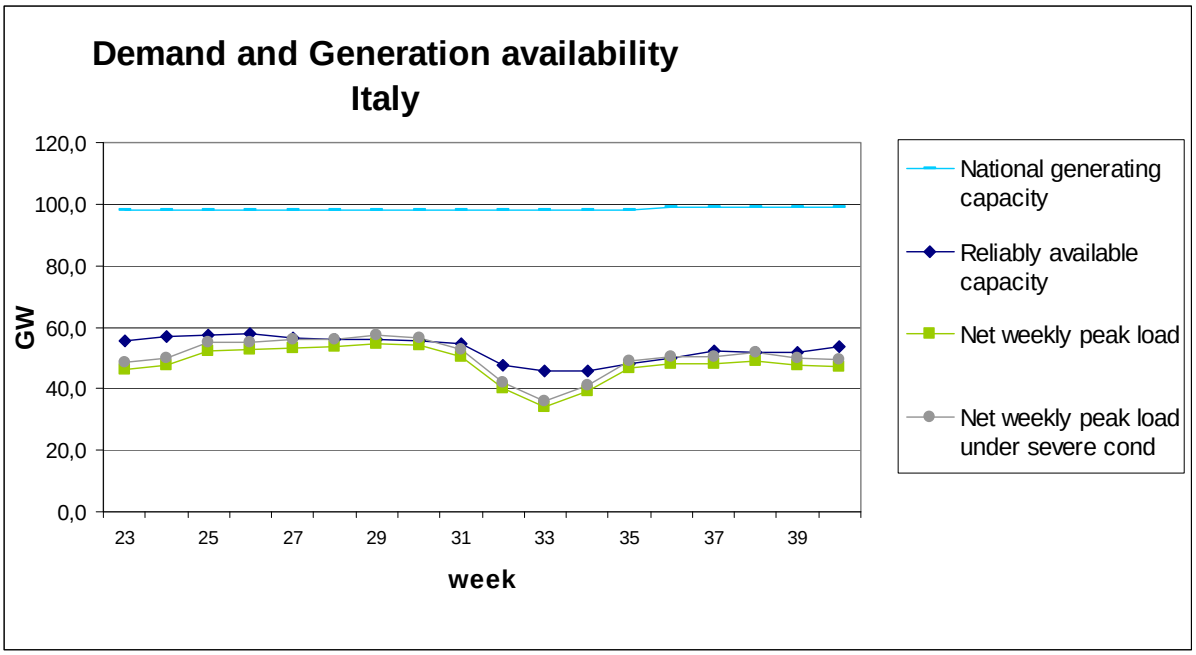
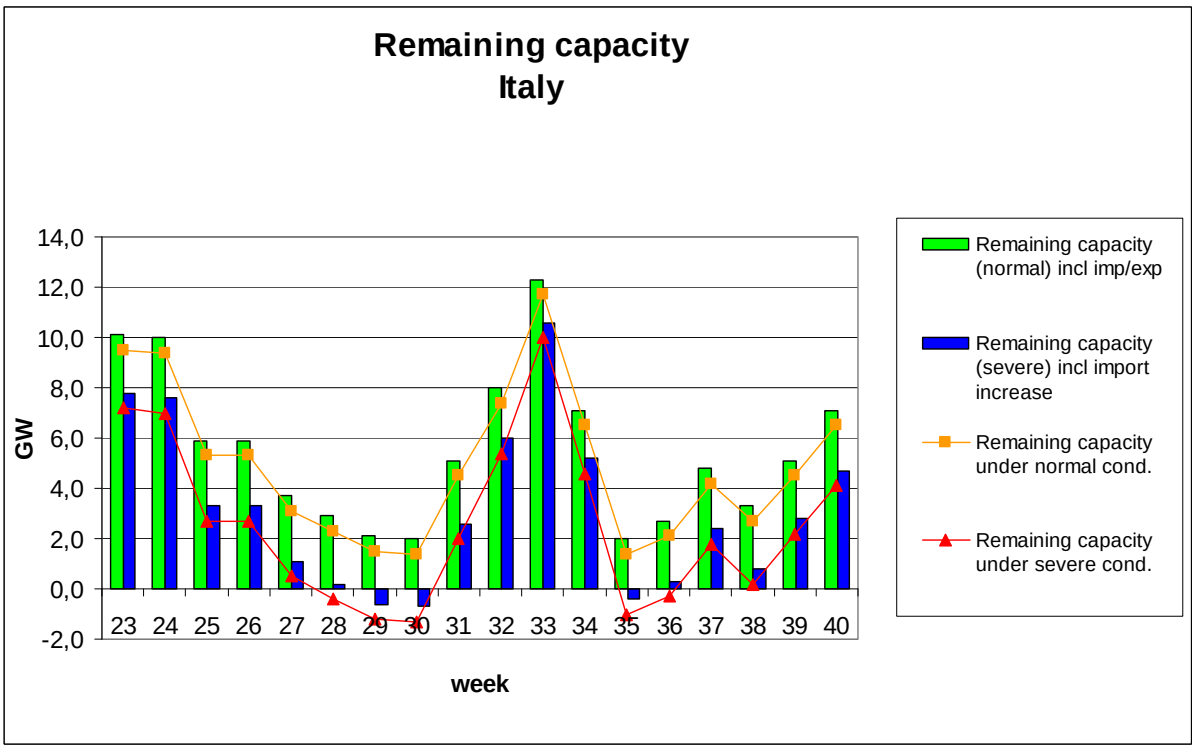
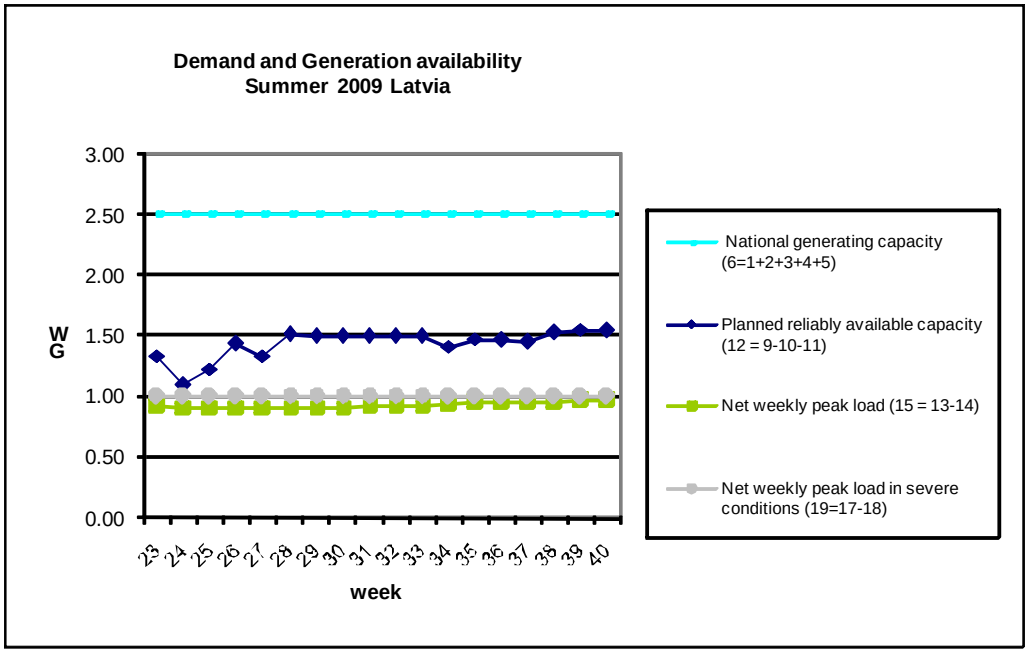
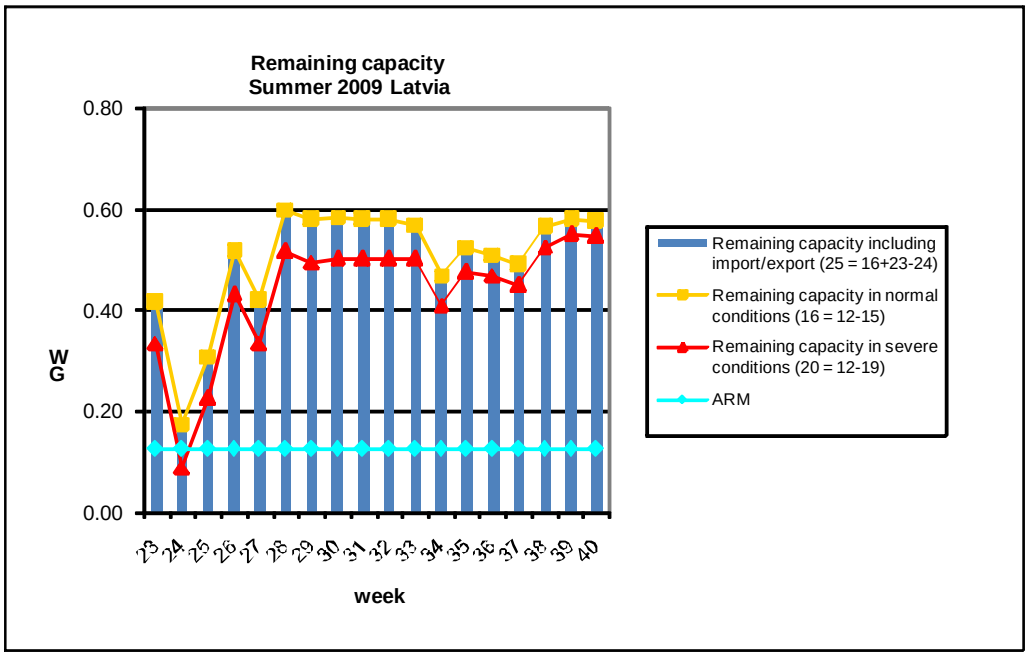

Demand and Generation availability
Italy
120,0
100,0
80,0
60,0
40,0
20,0
0,0
GW
23
25
27
29
31
33
35
37
39
week
National generating capacity
Reliably available capacity
Net weekly peak load
Net weekly peak load under severe cond


Remaining capacity
Italy
14,0
12,0
10,0
8,0
6,0
4,0
2,0
0,0
-2,0
GW
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

Latvia

Latvian demand and generation availability in the summer 2009 and the remaining capacity during summer 2009 are shown below.





In the summer period Latvia has to import about 40-50% of its electricity requirements and cannot use its combined heat & power plants (CHPs) to maximum capacity. In the summer period the hydro-power plants (HPPs) on the Daugava river experience reduced energy production as a result of insufficient water inflow in the river. Usually all repairs and maintenances in hydro and cogenerations power plants are planned in summer period.

The forced outage rate of CHP plants might be around 0.5-1%, and of hydro power plants might be around 3-5%. However, installed generation capacity in Latvia has increased following the commissioning of a new 400MW CHP.

Due to the current economic situation, electricity demand is decreasing as well. At present electricity consumption shows a 7-8% decrease compared with the same time period of 2008.

The Latvian transmission network has sufficient transfer capacity to deliver the required import volumes. Problems can arise when Ignalina NPP is on annual maintenance. One of main network maintenance outages is the Valmiera substation reconstruction which will be completed by end-2009.

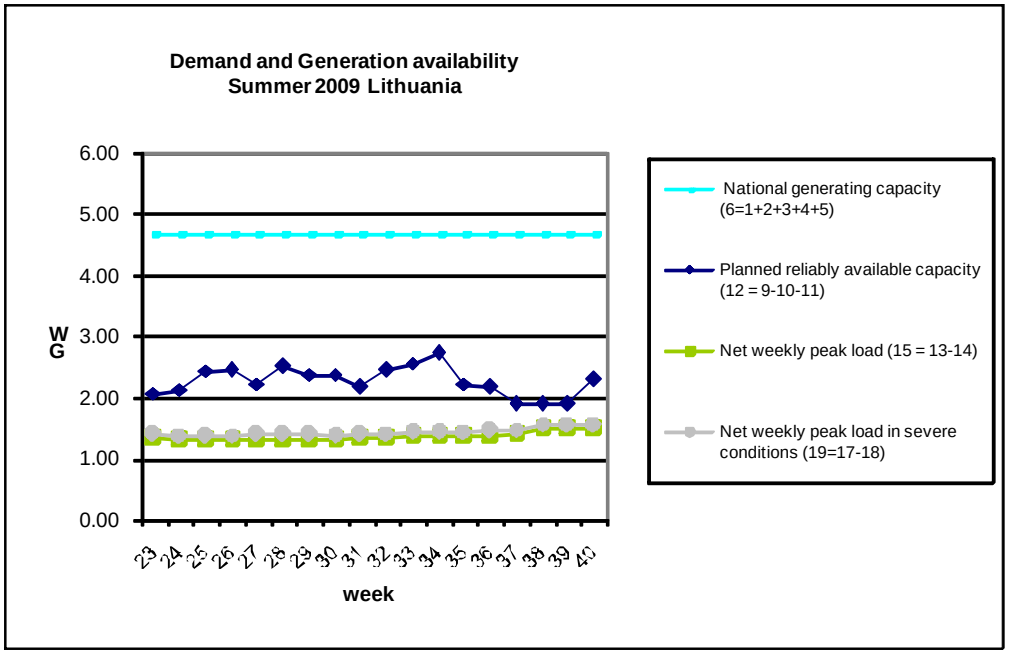
Load minimum in 2009 is forecast for 24th June.

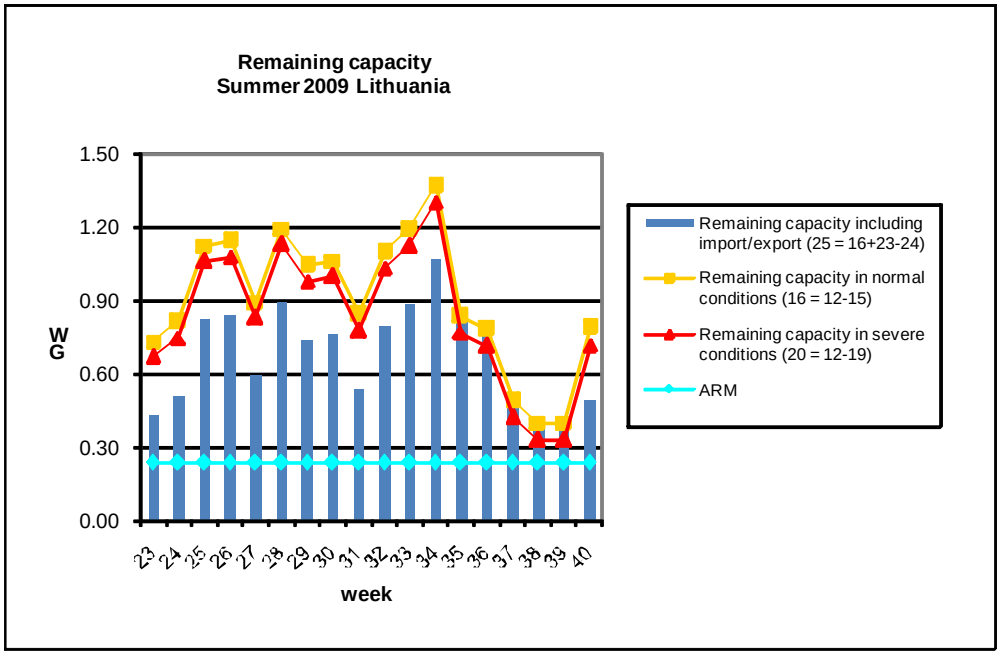
Risk factors identified for the summer period are high ambient temperature (which reduces power line capacity), power network repairs (which reduce power network transfer capability) and low water inflow in the Daugava river. Due to the annual maintenance shutdown of the Ignalina NPP, the specific period regarded as high risk over the summer is weeks 35-40. During this period Lithuania will import electricity from Russia, and Latvian energy import from Russia could be reduced.

Primary Frequency regulation for the Baltic power system is provided by the Russian power system. Secondary and tertiary reserve is provided from Latvia if necessary.

Lithuania

Lithuanian demand and generation availability in the summer 2009 and remaining capacity are shown below.



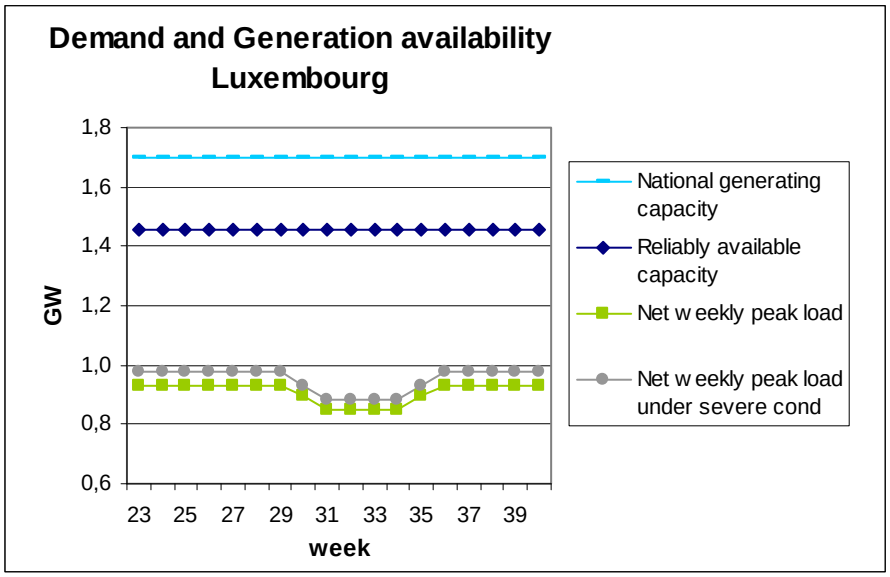


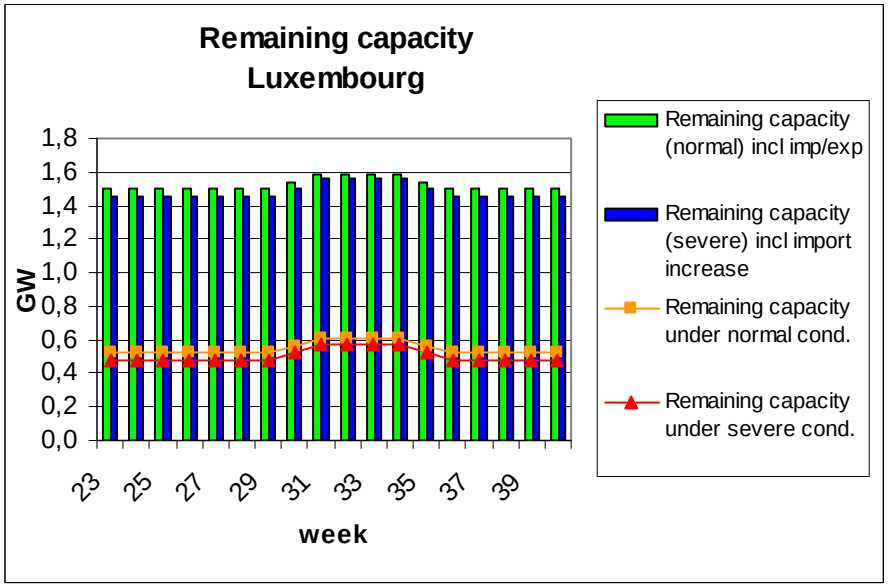
No specific problems are expected this summer, because demand will be decreasing and overall electricity consumption will be less than previous summer due to the economic recession. The second unit of Ignalina NPP is going to be decommissioned by the end of the year. Annual maintenance of Ignalina NPP is scheduled for 6 weeks in August/September (weeks 35-40). During that period the major part of electricity demand will be covered by local power plants and import from Russia, Estonia and Scandinavia.

No generation-load balance problems are expected under normal conditions in the Lithuanian power system during summer time 2009 and the annual maintenance of Ignalina NPP. The reserve procurement framework has been in operation for 9 years and bilateral contracts for ensuring electrical import requirements from other power systems and available interconnection capacities are confirmed by the TSO for the specified period.

None of the individual interconnections is going to be exclusively significant during weeks 35-40. Russia is the main export provider to be relied upon during weeks 35-40 and the Belarus–Russia interconnection will be the main issue that could affect the available amount of electricity imports from Russia.

Luxembourg


Demand and Generation availability
Luxembourg
GW
1,8
1,6
1,4
1,2
1,0
0,8
0,6
23 25 27 29 31 33 35 37 39
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond


Remaining capacity
Luxembourg
GW
1,8
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
23 25 27 29 31 33 35 37 39
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.

Luxembourg does not expect to have any problem for the summer 2009.

All the time, Luxembourg is highly dependent on electricity imports from neighbouring countries. Local production in the public grid is only for 10 to 15 % of consumption.

The public grid of Cegedel Net is connected by four 220kV circuits to the German grid of RWE TSO. Taking into account the n-1 criterion and n-2 criterion (tower failure with loss of two systems) all the existing interconnection lines are needed for normal operation. N-2 criterion is always used for defining necessary interconnection capacity for the public grid.

The large pumped storage power plant is connected via two dedicated double-lines also to the grid of RWE TSO and is n-1 secure.

The industrial grid is connected via two 220kV and two 150kV circuits to the Belgium grid of ELIA and is n-1 secure

The public grid of Cegedel Net is interconnected via two double lines to the German grid of RWE TSO. Transmission capacity is sufficient even in n-2 case. Energy delivery is assured on contractual basis.

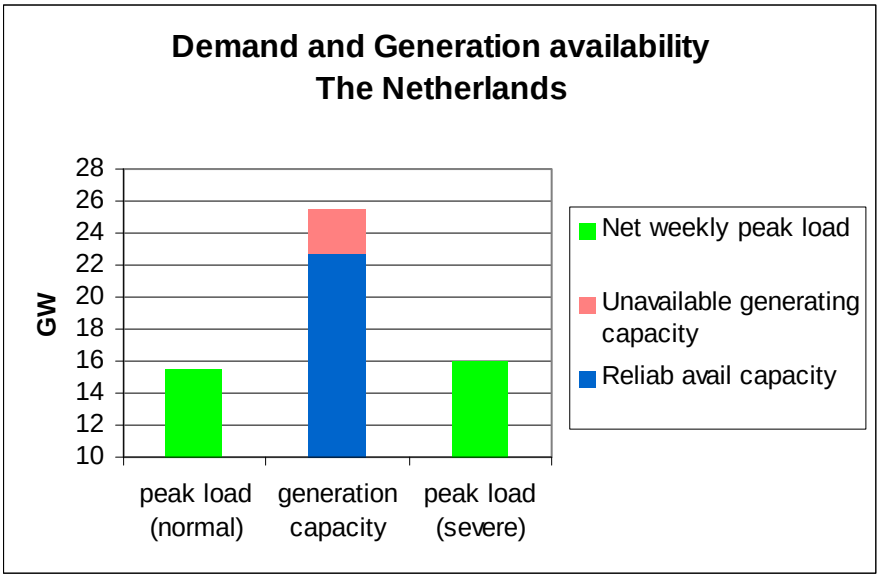
The industrial grid in the southern part of Luxembourg and the CCGT power plant are operated in radial with the Belgium grid of ELIA and capacity of the lines is sufficient for energy transportation. Energy delivery is assured on contractual basis.

No higher risk is expected for the summer 2009 regarding dependency of availability of imports.

Montenegro

(No information provided by the TSO).

Netherlands



TenneT TSO B.V. does not expect any problem within the national system of the Netherlands for the coming summer, for the following reasons.

- There is nearly no hydraulic generation in the Netherlands and in consequence there is no problem with hydro availability even when there is low precipitation.

- The summer peak loads are still lower than the winter peak loads, although there is a tendency that they are growing due to the increasing use of air-conditioning equipment. On the other hand there is an increasing amount of CHP generation by green-house farmers, which in summer could appear as a lower load of the High Voltage-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 on coastal locations, where until now there were 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.

Although no problems are expected and thus no special mechanisms are in place for the upcoming summer the following mechanisms are active to handle stressed balance situations in general

- the Netherlands' market has shown good response in situations of scarcity. Supported by a well functioning and incentive compatible imbalance pricing system, supply and demand side of the market both react well to extreme prices as the experience of the 2003 summer situation with a long period of low precipitation and high temperatures has shown.

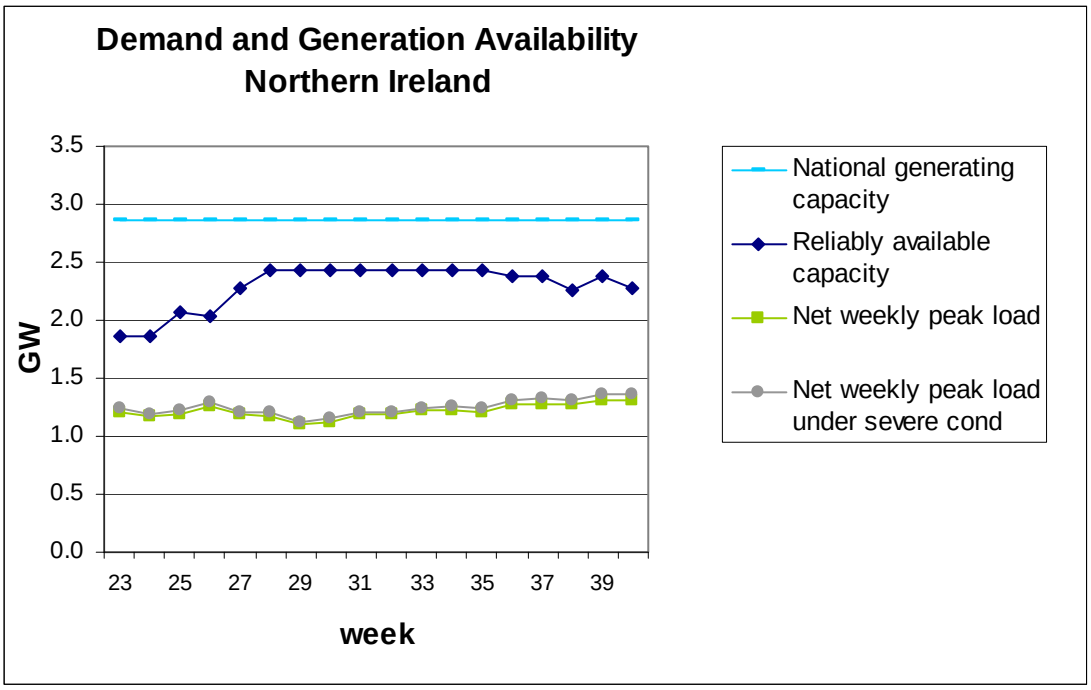
- for emergency situations TenneT TSO generally has available 300MW of domestic emergency reserves and, depending on availability, up to 500MW of foreign emergency reserves under contract of mutual assistance with a neighbouring TSO.

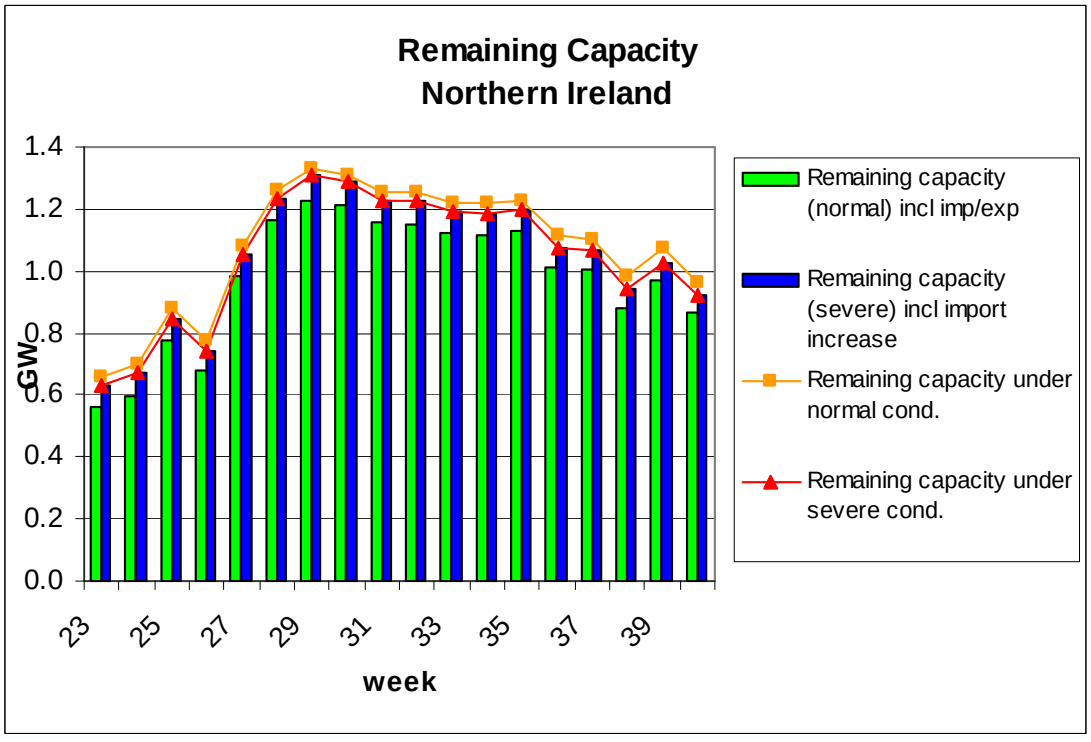
No specific weeks/time periods have been forecast as high risk. The Netherlands should not depend on imports for the summer.

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. There is a maintenance outage planned for the Moyle interconnector for the last week September through to the second week October. There are outages planned on the North-South tie lines for June through to August which may leave a possible shortfall risk in availability to SONI under certain outage scenarios. However, there are contingency plans in place to cover the periods should a problem arise. It is to be noted

that due to the ongoing economic situation it is anticipated that the demand in Northern Ireland over the summer period will continue to decrease.

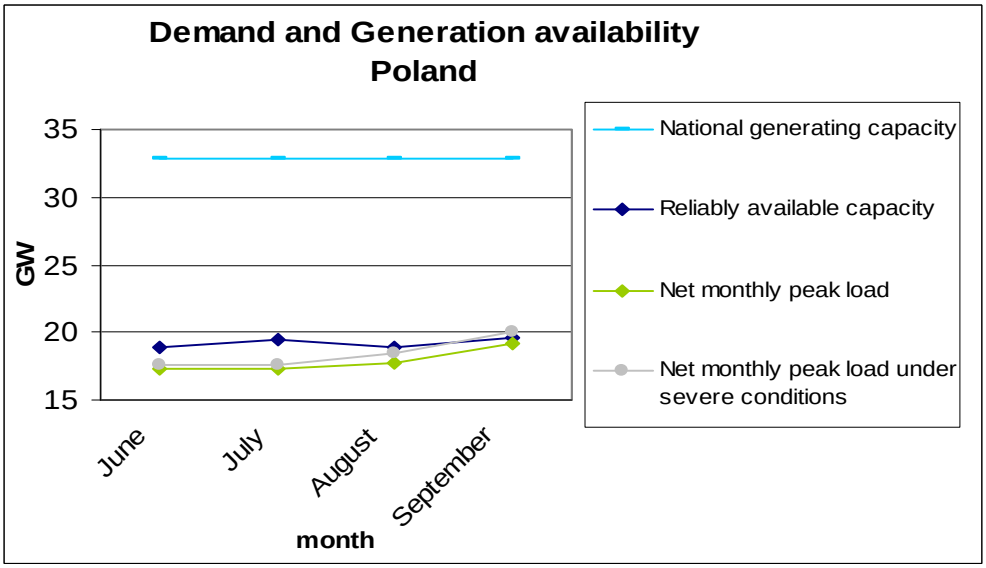


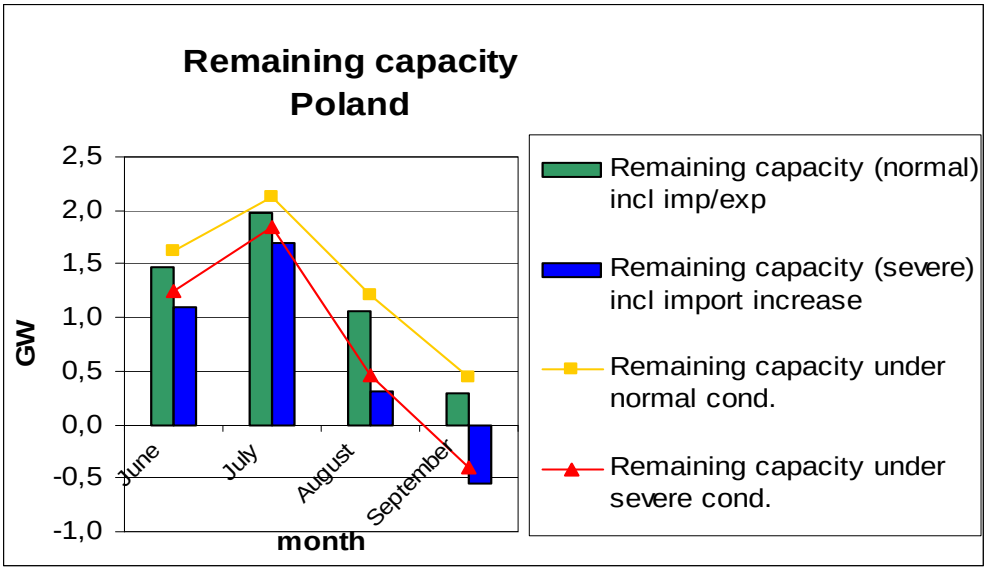


Norway

Summer is not forecast as a critical period for the Nordic power systems.

Poland





The Polish TSO does not expect significant problems in operation this summer, mainly due to observed load decrease, which is the result of the financial and economic crisis. Since November 2008, the monthly peak load has been lower by about 4% than the year before and PSE Operator S.A. forecasts a decrease of the monthly peak load by 3-4% for the forthcoming summer.

Severe conditions, i.e. extremely high temperature and dry weather, may cause not only the increase of forecast load (see demand under severe summer conditions on the graph just above) but also higher level of unavailability of units caused by:

- restrictions in operation due to cooling water temperature in certain thermal power plants (i.e. increase of the non-usable capacity),
- limitations due to transmission network constraints (i.e. increase of the non-usable capacity),
- higher level of forced outages (i.e. increase of unavailable generation due to outages).

In the short term coordinated plans (monthly, daily forecasts), to balance the system in case of tight balance situation, the following remedial actions could be undertaken by the Polish TSO:

- postponing the start of some Overhauls and Maintenances (M&O) (this leads to decrease of M&O).
- delaying the start of some network maintenances – less network constraints which can limit production (this results in decreasing the non-usable capacity).

Additionally, Polish TSO can change the maintenance plans of network elements which limit the level of simultaneous importable capacity.

The Polish TSO is able to balance the system by itself without electricity import, however under severe summer condition the risk exists that the level of the system services reserve available for TSO can be lower.

There are agreements concluded between PSE Operator S.A. and neighbouring TSOs for energy delivery in case of emergency situation. Moreover, since autumn 2008 Polish TSO could use “Cross Border Rescheduling” (DC Loop flow) using HVDC links under the Baltic Sea. The clockwise DC loop flow, for example, allows relief of network constraints occurring on the Polish – German border in case of high wind conditions in northern Germany (by decreasing the physical flow from Germany to Poland).

The DC loop flow and other above-mentioned measures are only remedial actions in emergency situations in the Polish power system and they are not taken into account when simultaneous transportable capacities are calculated.

In normal conditions as well as in severe conditions September is identified as the most critical month from the point of view of generation/load balance in Poland. This is the result of significant increase of peak load at the end of the summer period (lower temperature, peak load in the evening) and the fact that overhauls are still in progress and Combined Heat & Power plants have not started yet.

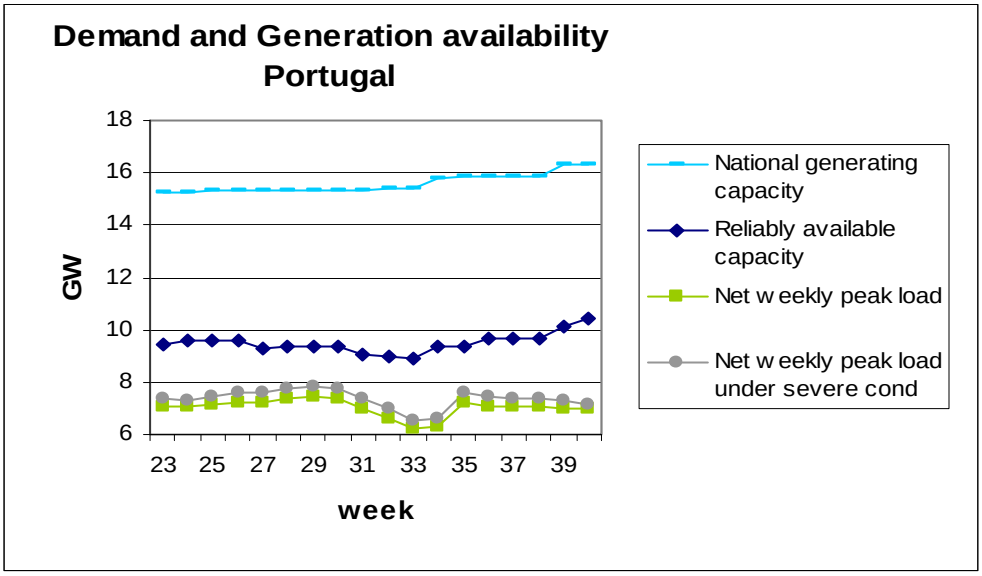
The Polish TSO is not dependent upon imports of electricity from neighbouring countries. PSE-Operator S.A. provides aggregated data of NTC for the whole 220/400 kV synchronous PL - DE/CZ/SK profile. Import and export capacities include also capacities of 220kV line PL-UA (radial operation) and of PL-SE DC link (commercial interconnection).

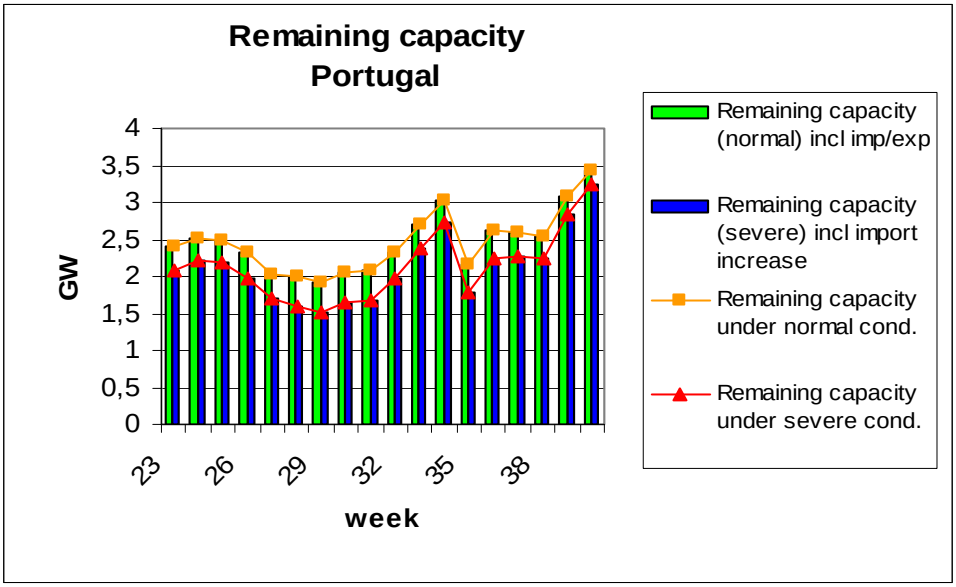
These values are the minimum forecast capacities as the result of limitations due to network constraints (planned switching off of international as well as internal HV lines).

Import/export firm contracts concern non-parallel interconnections (several PL-CZ 110 kV lines). They are connected to Polish power system, but on the Czech side they are working in island operation.

Portugal

REN expects no particular risks to occur during this summer. In average conditions demand should not exceed last year levels and, from the supply side, there are also no stressing factors, like significant overhauls or transmission capacity constraints. As a consequence, the margins should remain on a secure level. In addition to the curves shown below, REN has also simulated the system in an extreme conditions scenario with high demand, low hydro inflows and low wind power generation availability but, even so, the generation/demand balance has been met without needing to resort to imports.





Republic of Ireland

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 negative at present and there is no expectation that demand growth will increase for the rest of this year. While there are a number of major outages of large units this year, there is sufficient spare capacity to deal with unexpected forced outages.

Republic of Serbia

The TSO does not expect any problems during summer 2009. Recent history has shown that Serbian power system manages the summer period without significant problems.

The Serbian generation company Electric Power Industry of Serbia (EPS) has a long term contract with the Montenegrin generation company EPCG (which acts in the neighbouring control area of Montenegro) which includes use of hydro power plant Piva. According to this contract, previously agreed band energy is exported from the Serbian control area to the Montenegro control area, and in exchange EPS has a right to use hydro power plant Piva.

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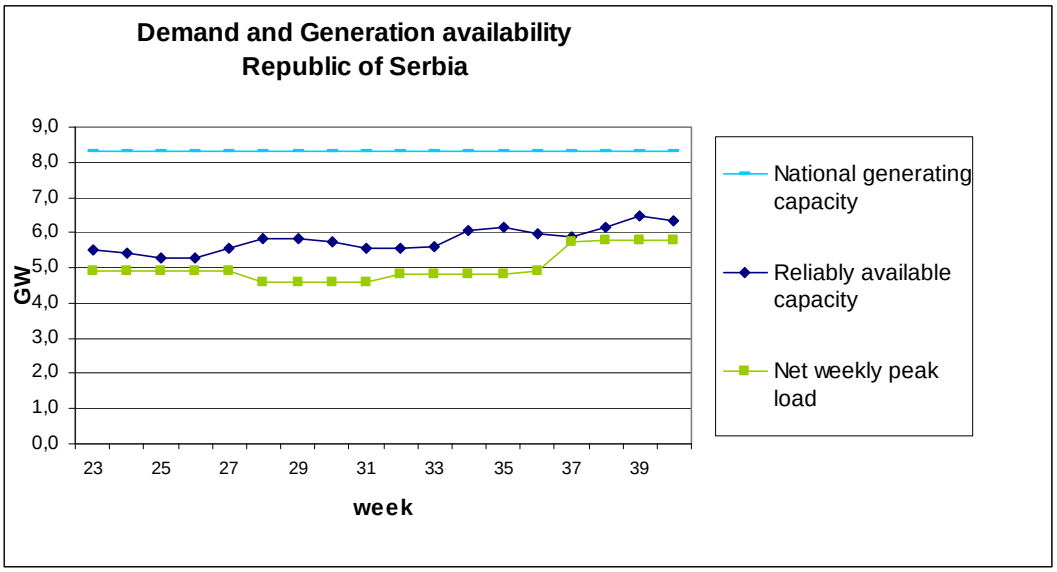
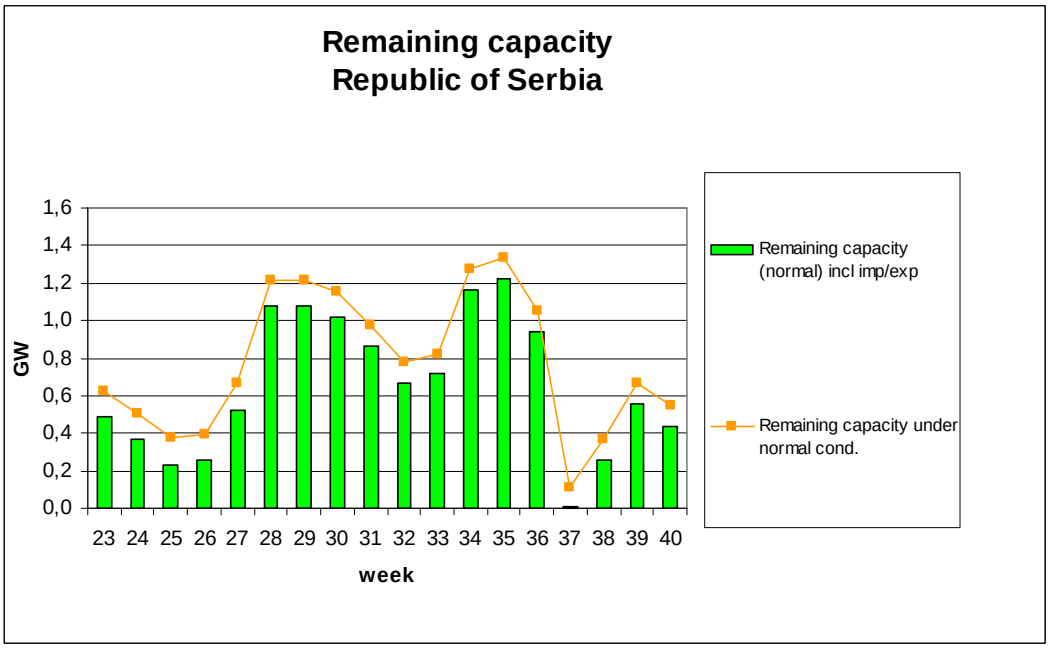
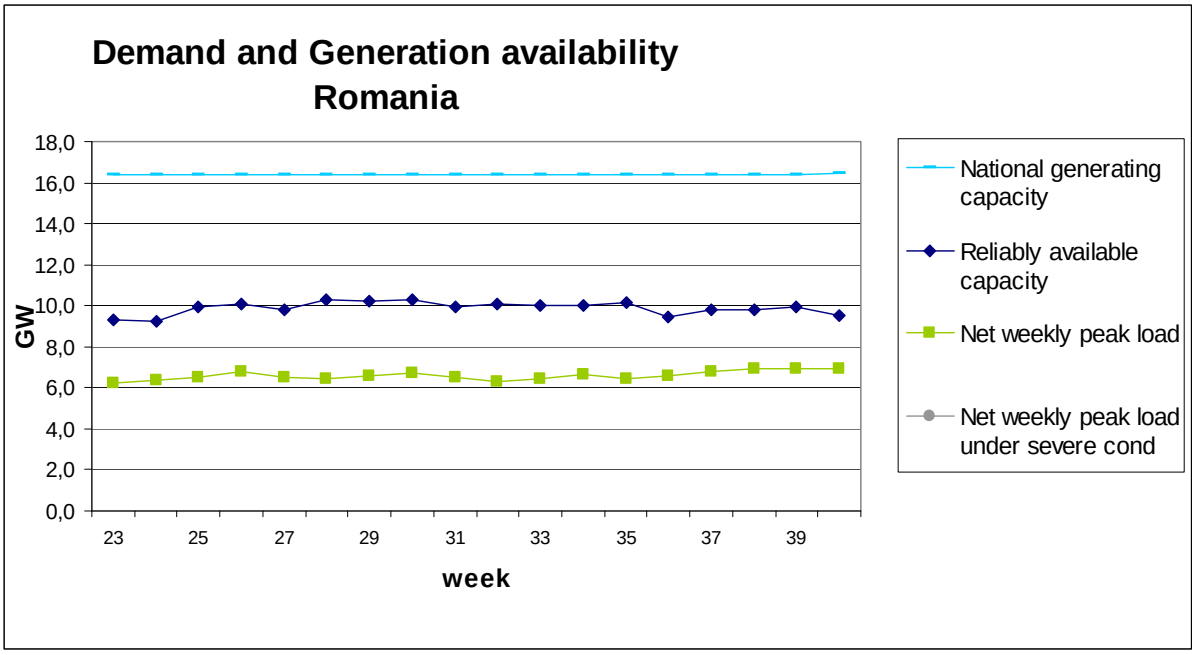
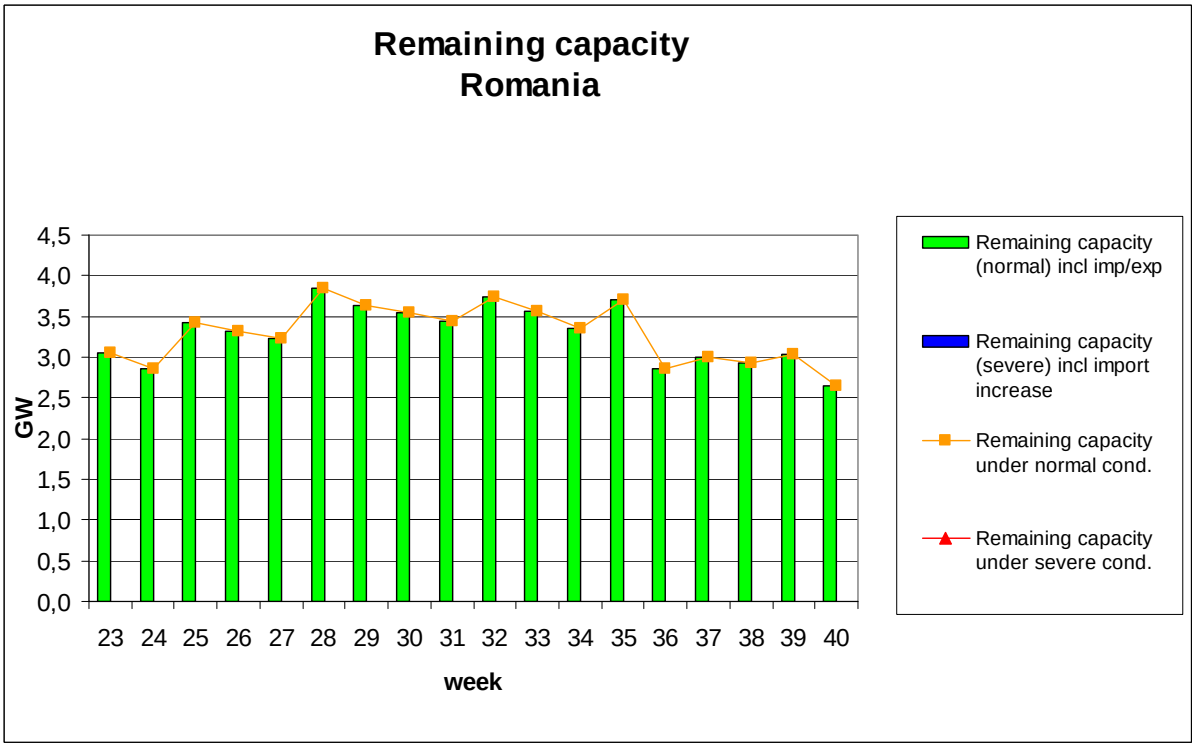

Demand and Generation availability
Republic of Serbia
9,0
8,0
7,0
6,0
5,0
4,0
3,0
2,0
1,0
0,0
GW
23
25
27
29
31
33
35
37
39
week
National generating capacity
Reliably available capacity
Net weekly peak load


Remaining capacity
Republic of Serbia
1,6
1,4
1,2
1,0
0,8
0,6
0,4
0,2
0,0
GW
23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
week
Remaining capacity (normal) incl imp/exp
Remaining capacity under normal cond.

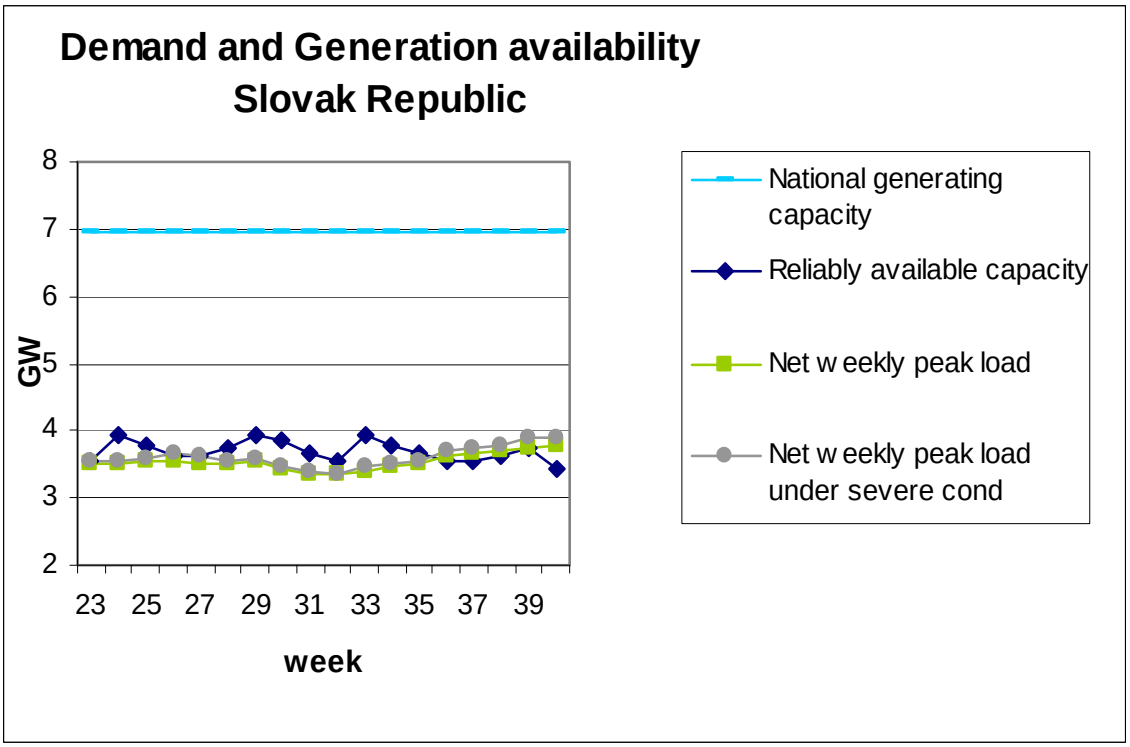
Romania

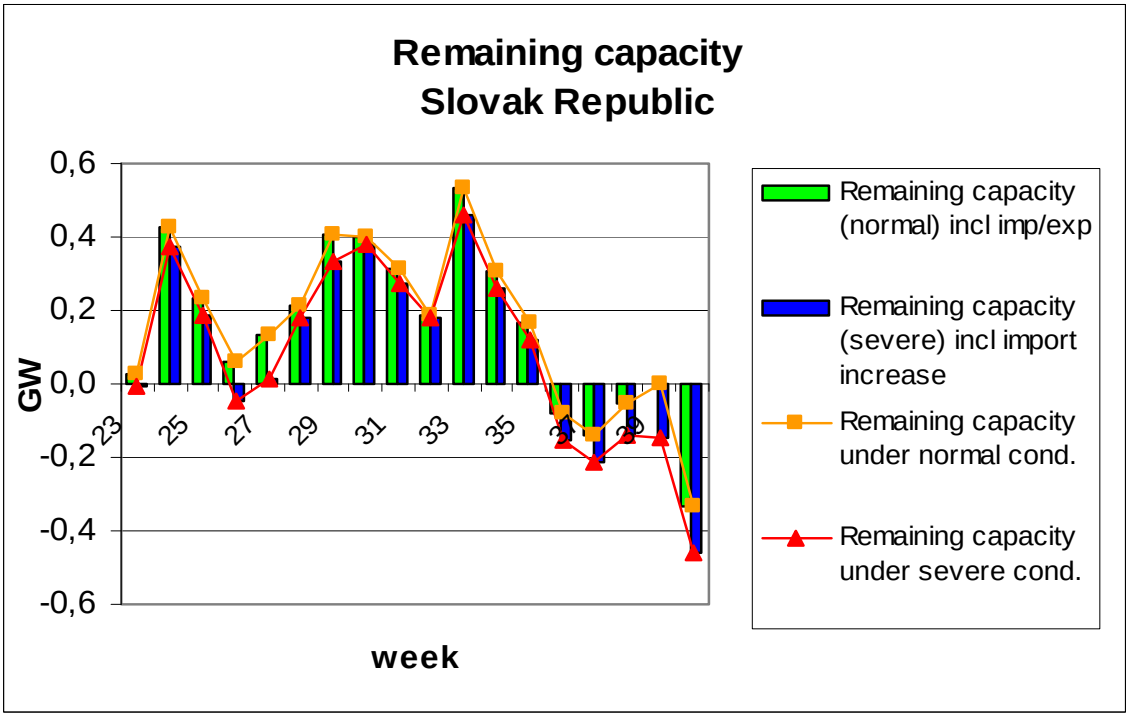
Transelectrica does not expect any problems in the operation of the Romanian Power System during the coming summer.





Slovak Republic

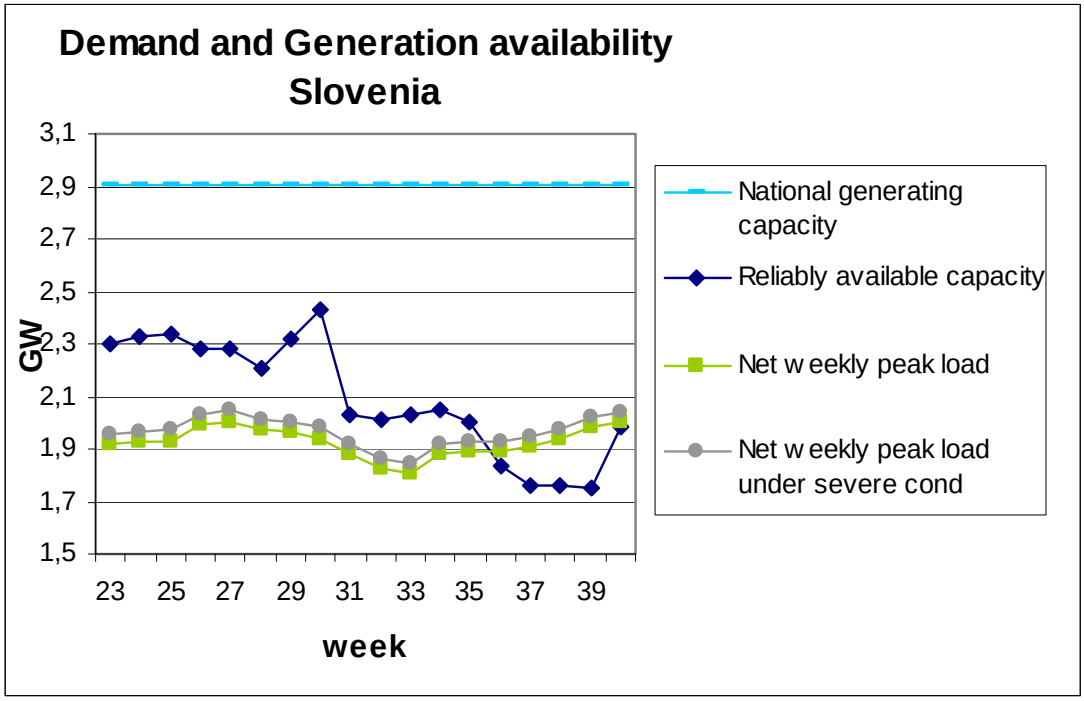


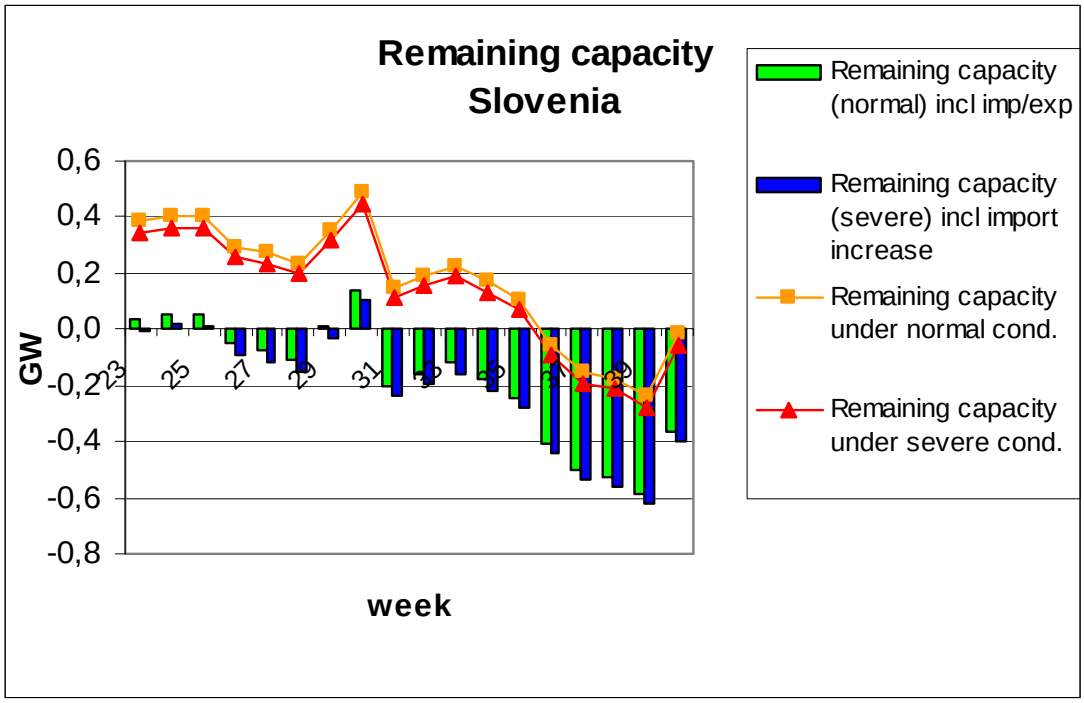


Dependence on import of electricity in Slovakia began in 2007 after decommissioning of the first nuclear unit in J. Bohonice (440MW) (import was 6.3% of consumption). It continued in smaller amounts in 2008 (import was 1.9% of consumption). The second nuclear unit in J. Bohunice (also 440MW) was decommissioned in December 2008. Therefore Slovakia will be dependent on imports also this year. Most of the import comes from Czech Republic. The capacities of tie-lines are sufficient to import the required volume of electricity.

No other risk is expected in summer 2009.

Slovenia





No problems are expected under normal conditions. In case of extreme low hydrology and reduction of interconnection capacities by neighbouring TSOs, problems could be expected at peak-load. Due to the effects of the economic crisis on electricity demand, extremely high load is not expected.

If serious lack of energy and unavailability of imports occur in extreme conditions (very low hydrology, high temperatures) all purchased reserves will be used, load reduction is also possible.

The lowest Remaining Capacity appears in September due to overhauls of some thermal units and low hydrology. Although this period is not regarded as high risk period, the lack of energy will be covered with imports.

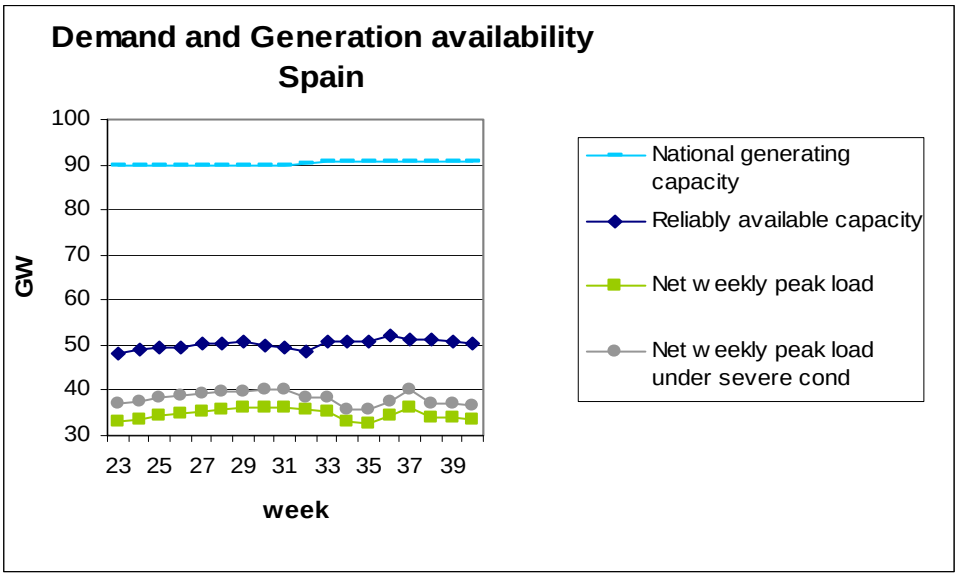
Firm export contracts represents half of the generation in nuclear power plant Krško. Its ownership is equally divided between Slovenia and Croatia, thus half of its generation is delivered to Croatia in accordance with the international agreement.

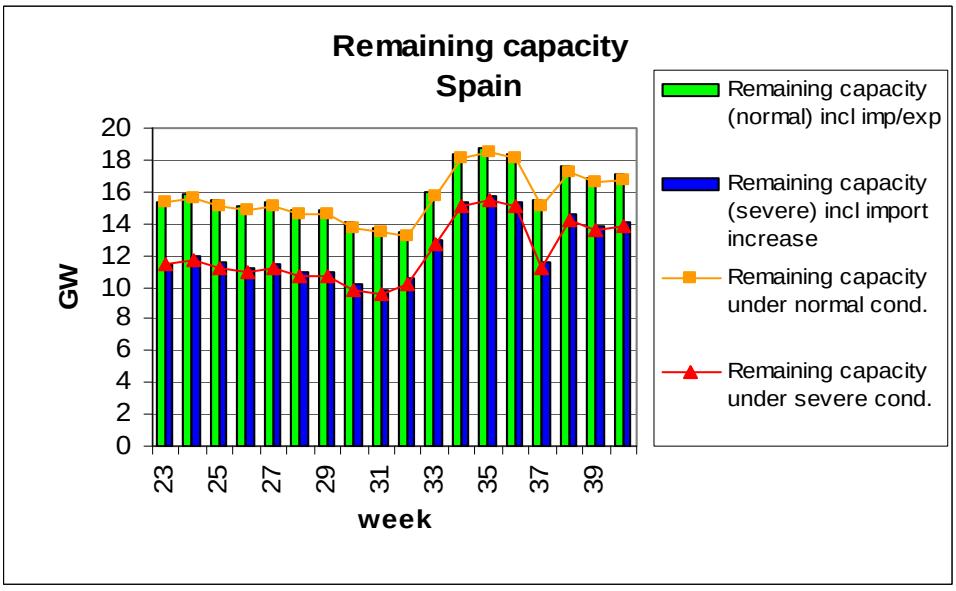
On statistical data basis, the import usually takes place on Austrian and Croatian borders. In extreme drought in wide Europe region, power flows can reverse and import from Italy is possible.

The commercial flows reflect market conditions in the different regions. The TSO manages only real-time imbalances on the energy market, hence it is not possible to tell which countries are being relied upon to provide exports.

All maintenance works on network elements were scheduled on the basis of past experience. In case of normal operation conditions no problems are anticipated on network level during the summer 2009.

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 in meeting the load are very unlikely to happen during any week of the period.

The expected demand is lower than that in the previous summer. Therefore, less than three months ahead of summer the Hydro reserves are at the average level and water inflows from snow melting are expected to be high.

Good generation/demand adequacy is expected regardless imports from neighbouring countries.

Sweden

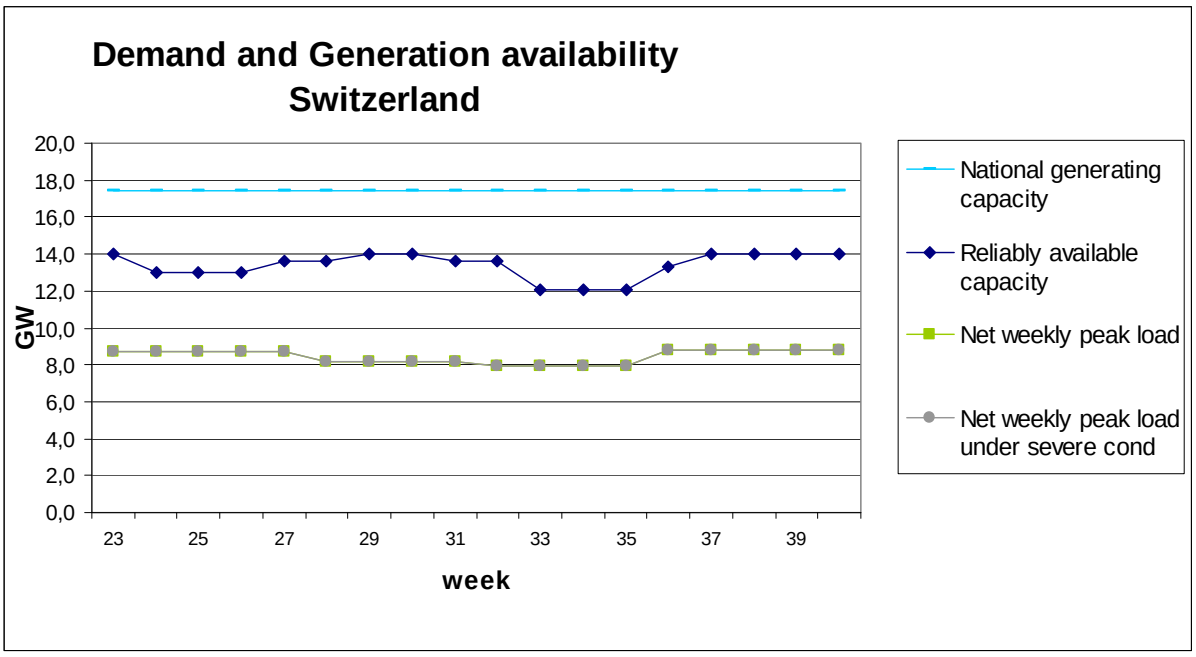
Summer is not forecast as a critical period for the Nordic power systems.

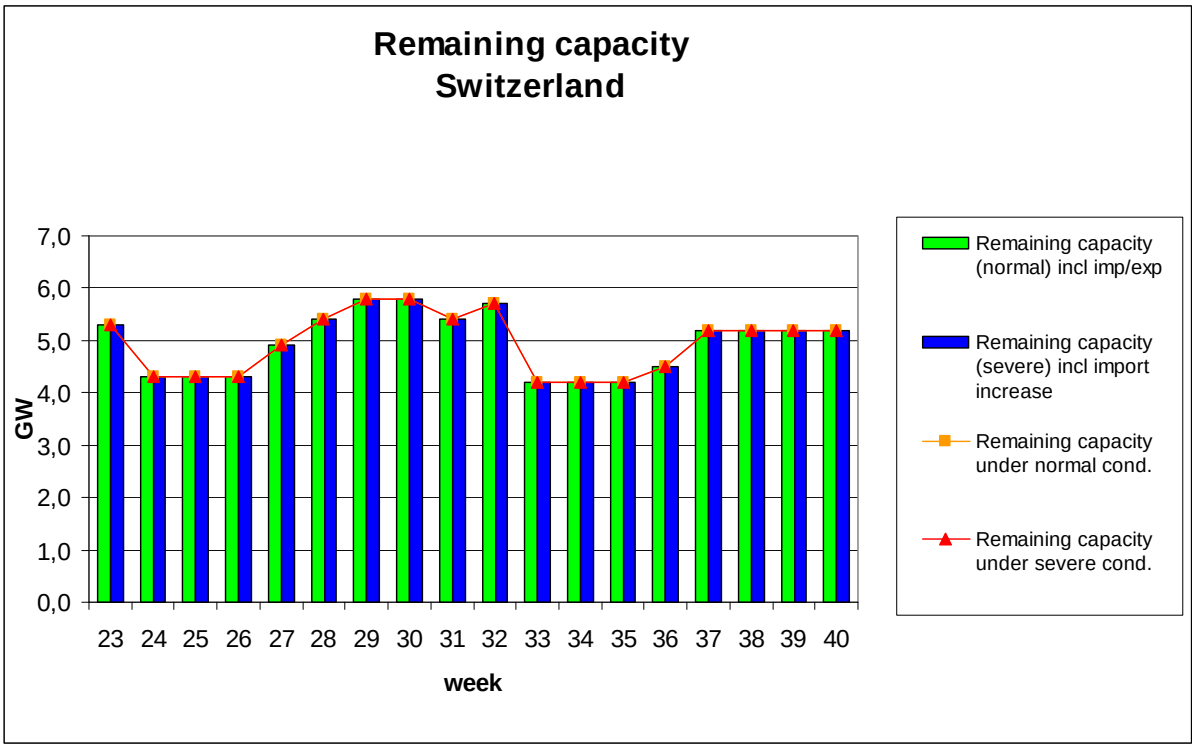
Switzerland

The TSO does not expect any particular problem during the summer.

No week during the summer is regarded as a period of high risk.

In terms of imports from neighbouring countries, Switzerland is not dependent on imports.





Ukraine West

(No information provided by the TSO).

6.3 Appendix 3: Summer Outlook/Winter Review Questionnaire

ETSO/ENTSO-E Summer Outlook Report 2009

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

Therefore we would be grateful if you could answer the following questions regarding the summer (weeks 23 to 40). It would be much appreciated if you could provide this information by **Thursday 9th April**.

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:

   a. Can you confirm which interconnector assets/circuits are going to be relied upon?;

   b. Can you confirm which countries are being relied upon to provide exports?;

   c. Can you confirm whether there are any issues likely to affect the availability of imports (asset reliability, thermal constraints, commercial or any other issues)?

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ETSO/ENTSO-E Winter 2008-2009 Review

Introduction and Questionnaire

Introduction

Following the publication of the Winter Outlook, ETSO/ENTSO-E 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 out-turned 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 2009. The enquiry should be returned to the regional co-ordinators by **Thursday 9th April**.

The Winter Outlook Report (published on 31st October 2008) is available to view at:

http://www.etso-net.org/upload/documents/WOR0809_Final_311008.pdf

Last year's Winter Review Report (and Summer Outlook) is available to view at:

http://www.etso-net.org/upload/documents/ETSO_WRRSOR_2008_060608.pdf

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Questionnaire on Winter 2008-2009 Review

1. General Commentary on Winter Conditions

Recalling main features and risks factors of the Winter Outlook Report, please provide a brief overview of Winter 2008/09:

- General comments (month-by-month if possible) 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. Impact of Interruption of Gas Supply

There were widespread reports of disruption to gas-fired generation capacity as a result of the dispute between Russia and Ukraine. We would like to be able to assess the impact of this so that recommendations to enhance future security of supply can be considered.

- What percentage of your national installed generation capacity is gas-fired? Of this, what capacity is capable of running on an alternative fuel (e.g. distillate)?
- Did you experience reduced gas imports as a result of the Russia/Ukraine dispute, or due to other factors? Do you have access to alternative sources of gas (e.g. storage, LNG)? Was gas released from storage in order to manage the situation? If so, have stores been replenished and how long did it take to return to normal conditions?
- Did any reduction in gas supply result in a reduction in availability of gas-fired generation?
- By how much was gas-fired generation capacity reduced? Over what period? Did the gas generation switch to the alternative fuel sources identified in the earlier question?

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- Were gas supplies to sectors other than power generation (e.g. industry, domestic) interrupted? Is it possible to assess the impact of the interruption on demand for electricity (e.g. did demand increase due to use of electric heating)?
- Was alternative generation capacity made available (e.g. mothballed plant returned to service; cancelled maintenance outage on other plant)? How much capacity?
- What was the effect on power imports from neighbouring countries? Was availability reduced, or were additional imports sourced/offered?
- How much of the reduction in capacity was resolved using domestic generation and how much by using increased imports?
- Was demand reduction used? What volume?
- If possible, please comment on the effect of the gas supply reduction on market prices.
- What actions are you taking as result of the interruption in gas supply, or as a result of a gas reduction?

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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 the dates)
- demand: actual versus expectations, peak periods, summary of any demand side response used, 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 ETSO Vista); commentary on interconnector availability and utilisation
- Summary of market conditions: low/high power market prices in specific periods in the context of the above conditions; summarise where there were tight margins in the context of what was forecast in the Winter Outlook Report ; any specific remarks on market prices

4. Lessons Learned for Winter 2009-2010

- Relevant key points for the forthcoming Winter (2009/10)
- Feedback on the use of the Winter Outlook Report
- Feedback on format and content of this report

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