An Overview of System Adequacy:

Winter Outlook Report 2012/2013 and Summer Review 2012

Friday, 30th November 2012

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1 INTRODUCTION

ENTSO-E adopts and publishes on an annual basis the "**Summer Review and Winter Outlook Report**" which assesses the adequacy of the power system for the winter period and provides an overview of the main events occurred during the previous summer.

This report is adopted as required by art. 8 of the EC Regulation n. 714/2009 and is drawn up by the ENTSO-E "WG System Adequacy and Market Modelling" under the System Development Committee with the contributions of all TSOs belonging to ENTSO-E. Further, as of July 2011, an additional cooperation between TSOs started within ENTSO-E via an ad hoc coordination team between System Development Committee and System Operation Committee in order to develop a consolidated methodology for the ENTSO-E short-run system adequacy reports. Based on this, the preparation of the current Winter Outlook 2012-2013 also takes into account the application of a new methodology, which is reflected in the questionnaire and excel sheet used for the preparation of the report.

For the winter period 2012-2013, an early Winter Outlook report, the "ENTSO-E Preliminary report for the winter" was also prepared by ENTSO-E and presented to the High level electricity coordination group meeting held on the 4th October. The purpose of this was to provide EC and EU Member State representatives with a preliminary overview of the adequacy of the power system in Europe for the upcoming winter and possible risks taking into account the impact of the Nuclear Phase Out in Germany which started in March 2011.

The Summer Review report outlines the main events which occurred during the summer time, according to the TSOs, with reference to security of electricity supply (i.e. weather conditions, power system conditions, as well as availability of interconnections). The Summer Review covers the period spanning from the 6th June to the 25th September 2012. The objective is to present the main happenings during the summer of 2011 in comparison to the forecasts presented in the ENTSO-E Summer Outlook report 2012, published in June 2012.

The Winter Outlook reports the outlook of the national and regional power balances between forecast generation and peak demand on a weekly basis for the upcoming winter period, from the 5th December 2012 (week 49) to the 31st March 2013 (week 13).

The purpose is to present TSOs' views on any matters concerning security of supply for the coming winter period. In addition, it also aims to identify risks and countermeasures planned by the TSOs in cooperation with the neighbours and the possibility for neighbouring countries to contribute to the generation/demand balance in case of needs.

Additional extensions have been included in order to increase the clarity and detail of the report. The weekly stress assessment, which takes into account the interconnection capacity, has been extended so as to provide a general overview of the winter under both normal and severe conditions. Specific regional analyses focused particularly on groups of neighbouring countries which may simultaneously require imports. In order to facilitate comparability across countries, the individual country analysis also now presents the remaining capacity indicators in relative terms (percentage of the peak load).

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2 EXECUTIVE SUMMARY

The ENTSO-E Winter Outlook Report 2012-2013, focusing on short-run adequacy, complements the ENTSO-E Preliminary report for the winter submitted to the EC and the Electricity Cross Border Committee in order to raise awareness with regard to system adequacy and security of supply issues.

The ENTSO-E Winter Outlook report shows that, on the whole, under the defined normal and severe conditions, the European power system as a has adequate power to meet demand.

The key factors which are likely to affect the balance between demand and supply include in particular the temperatures, which influence the level of the load directly and on the generation side.

Due to the unavailability of approximately 2000 MW nuclear capacity in Belgium at least until January 2013, likely during the entire winter period, BE will remain structurally dependent on imports.

The effect of the Nuclear Phase Out in Germany still has an impact on power system adequacy during this winter period, not only at the national, but also at the regional ENTSO-E level. Germany may require imports during certain weeks of the winter, being able to maintain adequacy. **Additional countermeasures have been planned in cooperation with neighbouring TSOs to manage the risks.**

The probability of undergoing extreme and extended winter conditions (as experienced e.g. in February 2012) or elevated generation unavailability is lower than the one in ten years, which defines 'severe conditions'. However, the additional unavailability of 2 Belgian nuclear units means that the risk of an energy shortage in import-dependent western European countries becomes non-negligible for the coming winter, despite that this risk corresponds to events the historical probability of which is lower than one in ten years.

Denmark, Sweden, Finland and Latvia also require imports during certain weeks of the winter so as they can maintain adequacy.

Poland cannot ensure adequacy under severe conditions during the coming winter.

High usage of the Denmark-Sweden and Sweden-Poland interconnectors compromises the availability of grid related remedial actions used on the German-Polish border for alleviating congestions.

In South East Europe, it is expected that adequacy will be maintained with the existing reservoir levels, although energy constraints may arise in cases where unfavourable hydrologic conditions persist.

The balance between generation and demand is generally expected to be maintained during the winter period in case of normal conditions. Belgium, Germany, Serbia, Finland, Denmark and Latvia may well need to rely on imports in order to meet demand and reserve

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requirements during some weeks of the winter period. The analysis shows that, based on the data provided by TSOs, there are no issues under normal conditions because cross border transfer capacities are sufficient to provide imports to those countries and regions which require it.

In the case of severe conditions, mainly due to extreme weather conditions like cold spells, reliability margins are reduced and imports are required in some countries and regions. This is particularly the case for Finland, Belgium and Latvia, which will rely upon imports at least during certain periods of the winter should such a situation occur.

Other countries, such as France and Germany will need to rely on imports to maintain the national balance between demand and supply for at least one week, whereas countries such as Denmark or Great Britain may require imports to maintain reserves (i.e. demand would still be met in full without imports).

In case of severe conditions, risks have been identified at both the national and regional level, whilst close coordination between TSOs will be required to maximise cross border transfer capacities in order to minimise the mentioned risks.

The analysis of such severe conditions shows that weeks 4 and 5/2013 are expected to be the most critical, when cross-border flows necessary to maintain system security are likely to reach their maximum values.

The Summer Review outlines what happened in Europe in comparison with the forecasts presented in the summer outlook report 2012. It shows that no major severe weather conditions affecting the balance between generation and supply took place, and thus there were no risks in terms of security of electricity supply in the different ENTSO-E regions. It also shows that, similar to last year, several additional countermeasures were implemented.

In the Baltic countries, congestion occurred on the Latvia –Estonia/Russia interconnection during large parts of the summer. The reason for this congestion was that there is a large electricity deficit in Latvia and Lithuania, whilst most of the time there was also transit flow from Russia to Lithuania.

The shutdown of the German nuclear power plants in 2011 is still causing a shortage of available active and especially reactive power. This has led to voltage problems during the summer.

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3 METHODOLOGY

3.1 SOURCE OF INFORMATION AND METHODOLOGY

The Summer Review Report is compiled using information provided by ENTSO-E members, through a questionnaire, in order to present the most important events which occurred during the summer period in comparison to the forecasts and risks reported in the last Summer Outlook. The TSOs mainly report any important or unusual events or conditions experienced by their power system during the summer time, as well as the causes and the remedial actions taken.

The Winter Outlook Report is based on information provided by ENTSO-E members on a qualitative and quantitative basis. The information provided in the Winter Outlook Report refers to the answers submitted by every TSO until the beginning of October in response to a questionnaire. The questionnaire has been modified in order to increase the level of detail in the analysis performed, thus respecting the questionnaires from previous years. The questionnaire allows TSOs to present views regarding any national or regional matters of concern, security of supply for the coming winter, and the possibility of neighbouring countries supporting the generation/demand balance of each respective ENTSO-E member in critical situations. The questions mainly refer to practices as well as qualitative data sent by TSOs in order to allow the country forecasts to be presented consistently and on a common basis.

For the Winter Outlook 2012-2013 an extensive regional analysis was added to the well-known per-country analysis which has been performed in previous years. The goal of this investigation is to assess whether the country based adequacy remains fulfilled when the larger, European scale is taken into account. In other words, it assesses whether the electrical energy will be available at certain points in time to allow the countries with a generation deficit to import the electric power needed from neighbouring countries.

In comparison to previous Winter Outlooks, the methodology for the quantitative analysis for this Winter Outlook has been significantly enhanced so as to provide an European overview of adequacy. Additional data was requested from all member TSOs. Some basic principles were also adapted to allow the regional analysis to yield representative results.

To carry out a regional analysis, a synchronous point in time is used for all countries. This is why the data collection requested load and production values for Wednesdays at 19:00. This point in time should be close to the winter daily peak load for most participating countries. It should however be kept in mind that a certain margin to peak load will apply for all countries, thus decreasing their remaining capacity and aggravating the situation.

For the regional analysis, the only values which are actually used from the data collection spreadsheet are:

- The Remaining Capacity for **normal** and **severe** conditions.
- Simultaneous importing and exporting capacity.

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- NTC values towards individual neighbouring countries.

In addition, across the period of assessment for the next winter, any European “downward regulation” issues are also highlighted, where excess inflexible generators output exceeds overnight minimum demands. Similar to the peak demand analysis, it provides a level of confidence that countries require exports to manage inflexible generation. Indeed, this involved an analysis of their ability to export these to neighbouring regions who are not in a similar situation. The reason for this analysis pertained to the fact that a number of TSOs had expressed concern that this issue is a growing problem for system operation due to the increase of intermittent generation on the system (wind and solar). This is a significant change from previous summer outlook reports in terms of analysis of the submitted returns. Based on the analysis, it is envisaged that these improvements will be embedded into all of summer and winter outlook reports.

To carry out a regional downward analysis, a synchronous point in time was used for all countries. The data was requested for a synchronous time each Sunday (03:00 CET) in order to allow for meaningful analysis when determining cross border flows. Although it is recognised that this may not be the minimum demand in every region in the winter, 03:00 was selected in order to allow for consistent analysis.

For the regional downward analysis, the values which were actually used from the data collection spreadsheet can be summarised as:

- The minimum demand at 04:00.
- Sum of the inflexible and must run generation.
- Simultaneous importing and exporting capacity.
- The best estimate of the available NTC values towards individual neighbouring countries.

The analysis then assumed wind output based on the best estimate of TSOs for the maximum simultaneous wind load factor (65% as default if no other data provided). This allows for the country to calculate total generation which it then compares to total demand, pumped storage and downward regulating reserve requirement.

3.2 AIMS AND METHODOLOGY

The methodology consists of identifying the ability of generation to meet demand by calculating the so-called “remaining capacity” for both normal and severe conditions.

The methodology is shown in the figure below:

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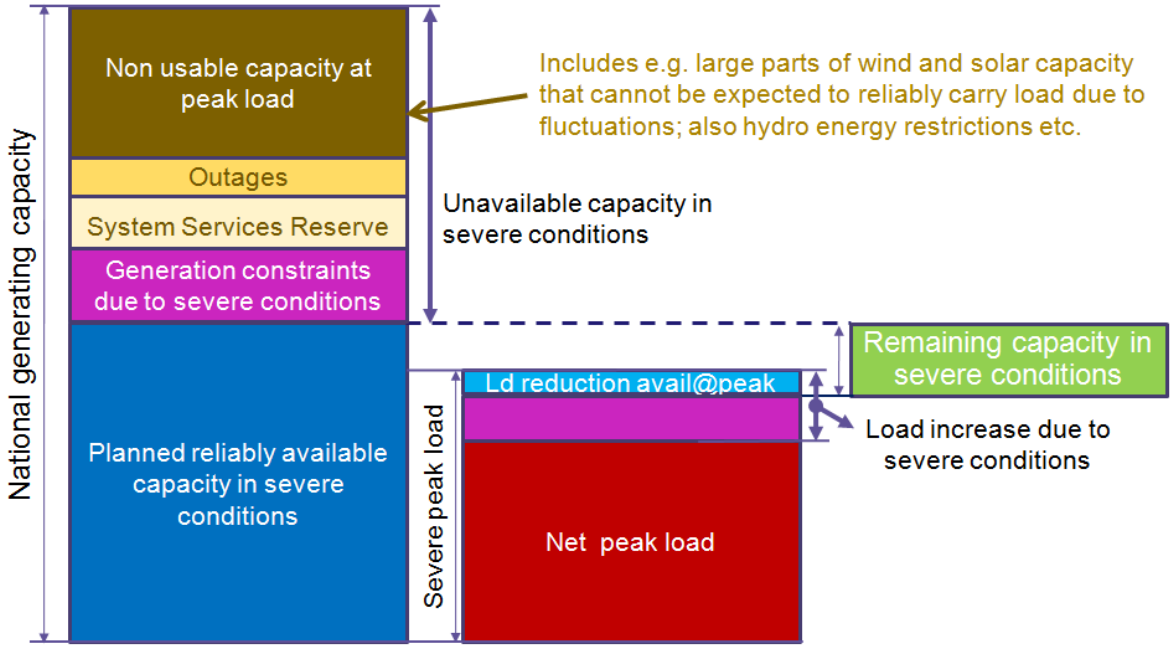

FIGURE 1: OVERVIEW OF ADEQUACY INDICATORS

The basis of the analysis is the situation known as “normal conditions”. Normal conditions are defined as conditions which correspond to normal demands on the system (i.e. normal weather conditions resulting in normal wind or hydro output and normal outages). A severe scenario was also built in order to show the sensitivity of the generation-load balance to low temperature and extreme weather conditions. The definition adopted for severe conditions correspond to a scenario with 1 in 10 probability (1 in 10 years), with effects on demand and supply. In addition, ENTSO-E TSOs have the possibility to use other justified criteria for the severe case. These different conditions can be detailed in the chapter with the specific national situations.

The figures of the individual country responses show the “National Generating Capacity”, the “Reliably Available Capacity” and the “peak load” under normal and severe conditions. The remaining capacity is calculated for normal conditions. The remaining capacity is also evaluated with firm import / export contracts and for severe conditions.

For the Regional analysis, the choice can be made to use the Remaining Capacity before or after inclusion of firm contracts. The right method to use depends on how the Net Transfer Capacity (NTC) values are defined. When the maximal total commercial exchange between two countries equals the NTC + firm contracts, the Remaining Capacity after inclusion of firm contracts should be used. If the maximal total commercial exchange is limited to the NTC value, the Remaining Capacity before inclusion of firm contracts should be used. There were various countries which gave data on firm contracts. NTC values are used to limit commercial exchanges between neighbouring countries. All participants were asked to provide the best estimate of the available NTC values so as a worst-case analysis could be conducted. When two participants provided different NTC values on the same border, the minimum value was taken.

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The basis of the regional analysis is a constrained linear optimisation problem. The target is to detect if problems can arise on a pan-European scale due to a lack of available capacity. No market simulation or grid model simulation whatsoever is taken into account. Therefore, the analysis will only show if there is a shortage on the European level, and will not specify which countries will have a generation deficit as this depends on the actual market price in all connected countries. The goal is to provide a level of confidence whereby countries requiring imports are able to source these across neighbouring regions under both normal and severe conditions.

The first element to be assessed is whether, in a “copperplate” scenario, there is sufficient power capacity to cover the demand. Here, all remaining capacity is simply added, and when the result is greater than zero, theoretically enough capacity is available in Europe to cover everyone’s needs. No problems were detected using this approach, neither for normal conditions nor for severe conditions. As this method does not take into account the limited exchange capacity between countries, it is too optimistic to draw final conclusions based on it.

As a consequence of this, a second, more precise approach was taken. The problem was modelled as a linear optimisation with the following constraints:

- Bilateral exchanges between countries should be lower or equal to the given NTC values.
- Total simultaneous imports and exports should be lower or equal to the given limits

Based on this methodology, calculations were made as to which countries would have a generation deficit for a certain week due to saturated cross-border exchanges.

As there was no available information regarding non ENTSO-E systems such as RU, BY, UA, Burshtyn Island (part of Ukrainian system operates synchronously with Continental Europe) and MA, TR, the following values were taken for these systems for analysis:

- The balance (remaining capacity) of these systems was set for 0 MW.
- Best estimate of the available NTC came from neighbouring systems belonging to ENTSO-E.

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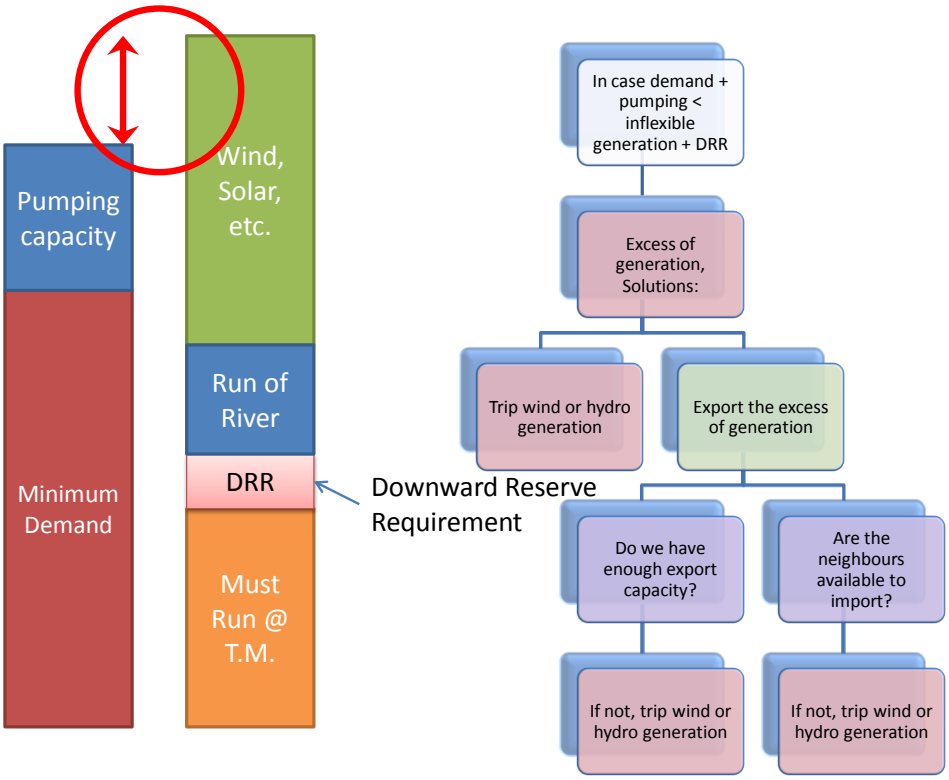

FIGURE 2: OVERVIEW DOWNWARD ADEQUACY METHODOLOGY

With regards to the new downward regulation analysis, it is appreciated that downward regulation may not be a focus for many TSOs at present and hence a short explanation of the potential issue is provided in the diagram above.

Under minimum demand conditions, there is a potential for countries to have an excess of generation running. Every TSO is likely to have varying levels of “must run” generation. This may be CHP or generators which are required to run to maintain dynamic voltage support etc. In addition, there will be renewable generation such as run of river and wind, whose output is inflexible and variable. At times of high renewable output e.g. wind, the combination can result in generation exceeding demand and the pumped storage capacity of the country. In that case, the “excess” generation is either exported to a neighbouring region or curtailed.

The analysis takes the data submitted by TSOs for the assumption of maximum simultaneous wind in-feed (with 65% of built-in capacity taken as default if no other data submitted). For countries which have an excess of generation, the optimisation looks to exports to neighbouring regions based on the best estimate of the available NTC values submitted via linear optimisation.

The analysis highlights periods where countries cannot export all of their excess generation. It should be stressed that this analysis is not a market simulation. Rather, it highlights countries which may be required to curtail excess generation due to limited cross border export capacity.

4 SUMMER REVIEW

BALTIC SEA REGION

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

System operation and system adequacy have functioned without any significant problems for both the Nordic and the Baltic countries in the summer of 2012.

Denmark had a normal summer without any major problems. The Danish power balance was good with virtually no situations resulting in a poor power balance.

In Finland Import from Russia was remarkably lower than before due to a capacity tariff on their market. At the same time, import from Scandinavia was very high due to low prices in the market caused by good hydro conditions in Scandinavia.

In Norway the system operation and system adequacy also functioned without any major problems in the summer of 2012. Due to heavy rain and high reservoir levels, Norway was exporting through the whole summer.

In Sweden the main direction of power flow, during the summer period was import from Norway (to Sweden) and export (from Sweden) to Finland, Denmark, Germany, and Poland. On the 12th of August there was a cable fault on Baltic Cable (which interconnects Sweden and Germany) meaning that the interconnector was out of service until the damages could be repaired.

In the Baltic countries congestion occurred on the Latvia –Estonia/Russia interconnection during large parts of the summer. The reason for this congestion was a large electricity deficit in Latvia and Lithuania, whilst most of the time there was transit flow from Russia to Lithuania.

In Poland the most stressed event during Summer 2012 took place on 22nd August, when Polish power system was affected by extremely high unplanned transit flows through the Polish control area from the west to the south. All standard emergency measures were taken, however proved to be less than satisfactory. To fulfill n-1 criteria in the Polish power system, PSE Operator activated an extraordinary measure, the multilateral re-dispatch (MRA). More precise information concerning this situation is in national summer comments paragraph.

An update on Germany is covered in the North Sea region.

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NORTH SEA REGION

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

Elia stated that no specific situations endangering Security of Supply were experienced during the past summer. However, incompressibility issues were experienced on specific and isolated days during summer. The effect however was limited thanks to the correct functioning of the incentive mechanisms for the market, combined with all of the other preventive actions which were taken by Elia.

The summer in Denmark was normal without any major difficulties. The transmission capacity on the border to Germany (TTG) was increased from 950MW to 1500MW in the direction from Germany to Denmark as of September 1st. On October 1st, the transmission capacity from Denmark to Germany will be increased from 1500MW to 1780MW.

The shutdown of the German nuclear power plants in 2011 still causes a shortage of available active and especially reactive power. This has led to voltage problems during the summer. During the last summer, the installed capacity of PV plants increased further to a value of about 30 GW. The German government decided to stop subsidies for new PV plants when an installed capacity of 52 GW was reached. In June, a temporary massive under-coverage of the German Control Areas occurred due to problems with PV feed-in. One issue related to forecast errors which predicted a higher PV-feed-in. As balancing power was insufficient, emergency reserves had to be activated. Further problems for the forecast occurred due to incomplete knowledge about the installed capacity of PV-generators.

EirGrid (Ireland) experienced a double generation trip resulting in the loss of 475MW whilst the system frequency went to 48.83 Hz. 185MW of customer load was shed in order to recover frequency into its normal operational range. Investigations are currently underway with the generators to determine the cause of the double trip, and the way to prevent it from happening in the future.

High wind feed-in during the minimum demand conditions was also problematic for EirGrid and resulted in the curtailment of wind power plants. EirGrid continues to develop the necessary power system tools so as to ensure system limits are not breached.

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CONTINENTAL SOUTH WEST

Portugal, Spain, France

The hydro generation situation in Portugal, since the beginning of 2012, is currently occupying its second lowest ranking for 40 years. This deficit on hydro generation was compensated mainly resorting to imports; however this was essentially motivated by market conditions, as thermal generators were used at only 38% of their capacity.

System operation and system adequacy in Spain have functioned without any larger problems in the summer of 2012. At minimum demand conditions, renewable production curtailment eventually took place, as expected.

Minor difficulties in France caused by delayed maintenance of power plants and temporary losses of the 3 IFA dipoles had no consequence on adequacy and load-demand balance respectively. Energy demand dropped by approximately 3% from last year's levels as a consequence of economic crisis.

No specific occurrences of regional significance have been reported on Summer 2012 from Continental Central East, Continental Central South and Continental South East regions. Country specific occurrences are covered in the relevant chapter.

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5 WINTER OUTLOOK

5.1 GENERAL OVERVIEW

The coordination team which developed the regional analysis methodology is comprised of very experienced experts from various TSOs across Europe. The data submitted has been inspected by team members with a focus on the regions of which they have extensive knowledge and have determined that the main conclusions from the analysis are valid.

It should be noted that the analysis was based on data submitted by each TSO. A synchronious point in time was requested for all data in order to allow for a comparision between regions. Indeed, this in turn made it possible to determine that there is enough generation to meet demand under both normal and severe scenarios.

Based on the data submitted by each TSO, Europe as a whole should have over 95GW of spare capacity to meet demand and reserve under normal conditions in the ideal case of unlimited interconnection capacity. However, the analysis is forecasting a surplus of 28GW under severe conditions under the same assumption (1 in 10 years), during the week which is expected to be the most stressed (5/2013).

Taking into account the cross border capacities, the analysis indicated that there is sufficient interconnection capacity between countries when it came to taking advantage of a part of this excess of generaton capacity. However, the limited cross border capacity between countries makes it impossible to take full advantage of this excess capacity and cover the demand. This in turn results in stressed periods for the regions detailed further in the report. The analysis highlighted which weeks and which border interconnections are likely to be heavily used under severe conditions.

For this Winter Outlook report, an analysis for downward regulation across overnight minimum demand periods has also been included. It indicated that in general, there is sufficient interconnection capacity to transport all of the excess generation to neighbouring regions.

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5.2 WEEKLY COUNTRY PERSPECTIVE ANALYSIS

Based on normal conditions for load and demand, the majority of countries do not require imports as shown pictorially in Table 1.

Where a country is coloured green, it has enough capacity to meet demand and reserve. The countries which are coloured in orange can cover the imbalance with imports, whereas the countries which are in red cannot cover the imbalance with imports.

Week	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13
AL																	
AT																	
BA																	
BE																	
BG																	
CH																	
CZ																	
DE																	
DK																	
EE																	
ES																	
FI																	
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TABLE 1: WEEKLY STRESS ASSESSMENT UNDER NORMAL CONDITIONS

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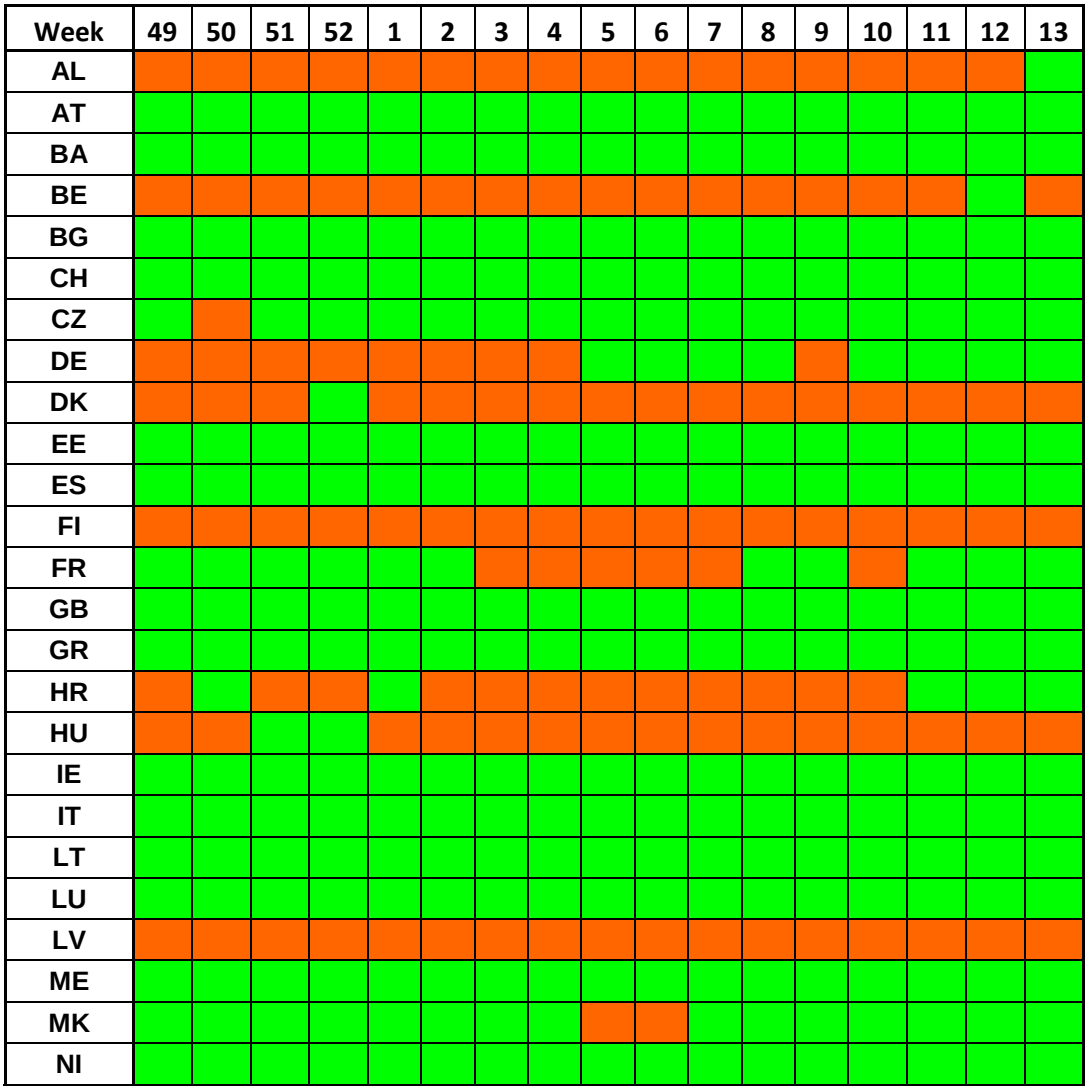
While the majority of regions do not require imports for security, markets will determine the economic energy transfer based on the respective price differentials between regions, and hence various borders will be transmitting power at their maximum capacity. As indicated in the description of the methodology, this analysis is not a market simulation and hence real physical flows resulting from commercial exchanges are not indicated. Although some regions do require imports for generation adequacy reasons, there is ample interconnector capacity from neighbouring regions to cover their demand

Under severe conditions (defined as 1 in every 10 years), the picture is significantly different: Each individual country's demand increases, whilst for certain countries which have predominantly electric heating, the increase is noteworthy. This is particularly noticeable in France. The analysis indicated that even under severe conditions (approached as ones expected to occur once in every 10 years – not capturing situations like those experienced e.g. during February 2012) across all of Europe, demand is met and reserves are maintained. However, the transmission of power through the cross border Interconnectors becomes more vital for system security.



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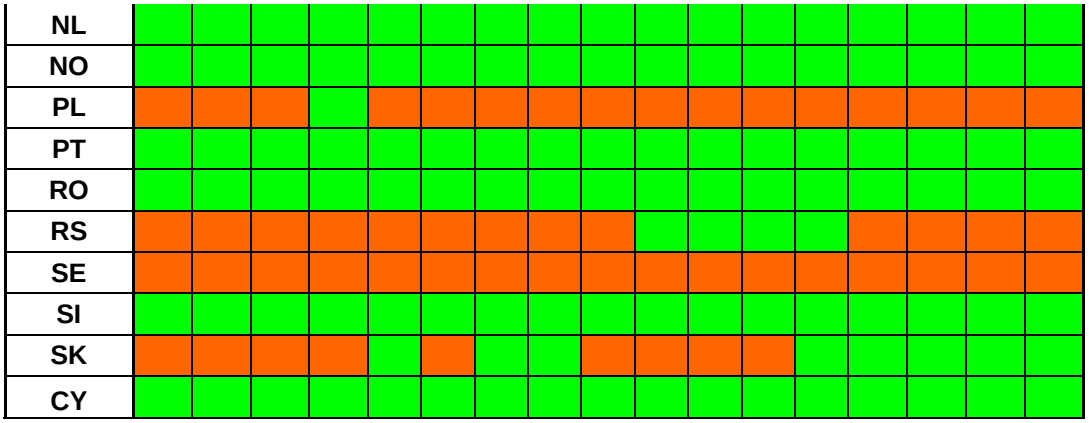

TABLE 2: WEEKLY STRESS ASSESSMENT UNDER SEVERE CONDITIONS

An important possibly stressed period identified by the analysis is the first 2 weeks of December when generator maintenance in certain countries is still being undertaken.

However, the key weeks for Europe will most likely be weeks 4 and 5/2013, where both France and Belgium (and Germany in week 4) simultaneously require peak imports for the winter period under severe conditions. A significant change from previous years is the assessment for Belgium, which will structurally require imports for generation adequacy reasons across almost the entire winter period, due to the unavailability of two nuclear generating units, amounting to approximately 2 GW.

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5.3 IMPORT/EXPORT CONTRIBUTION AND REGIONAL OVERVIEW

The analysis in the previous section highlighted weeks 4 and 5 as a key period for Europe. The assessment focused on these weeks to highlight the main risks for the incoming winter period under severe conditions. It should be stressed that, for these scenarios to materialise, severe weather conditions (defined as 1 in every ten years) will be required. Indeed, otherwise, under normal conditions the situation is comfortable as highlighted	**49**	**50**	**51**	**52**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

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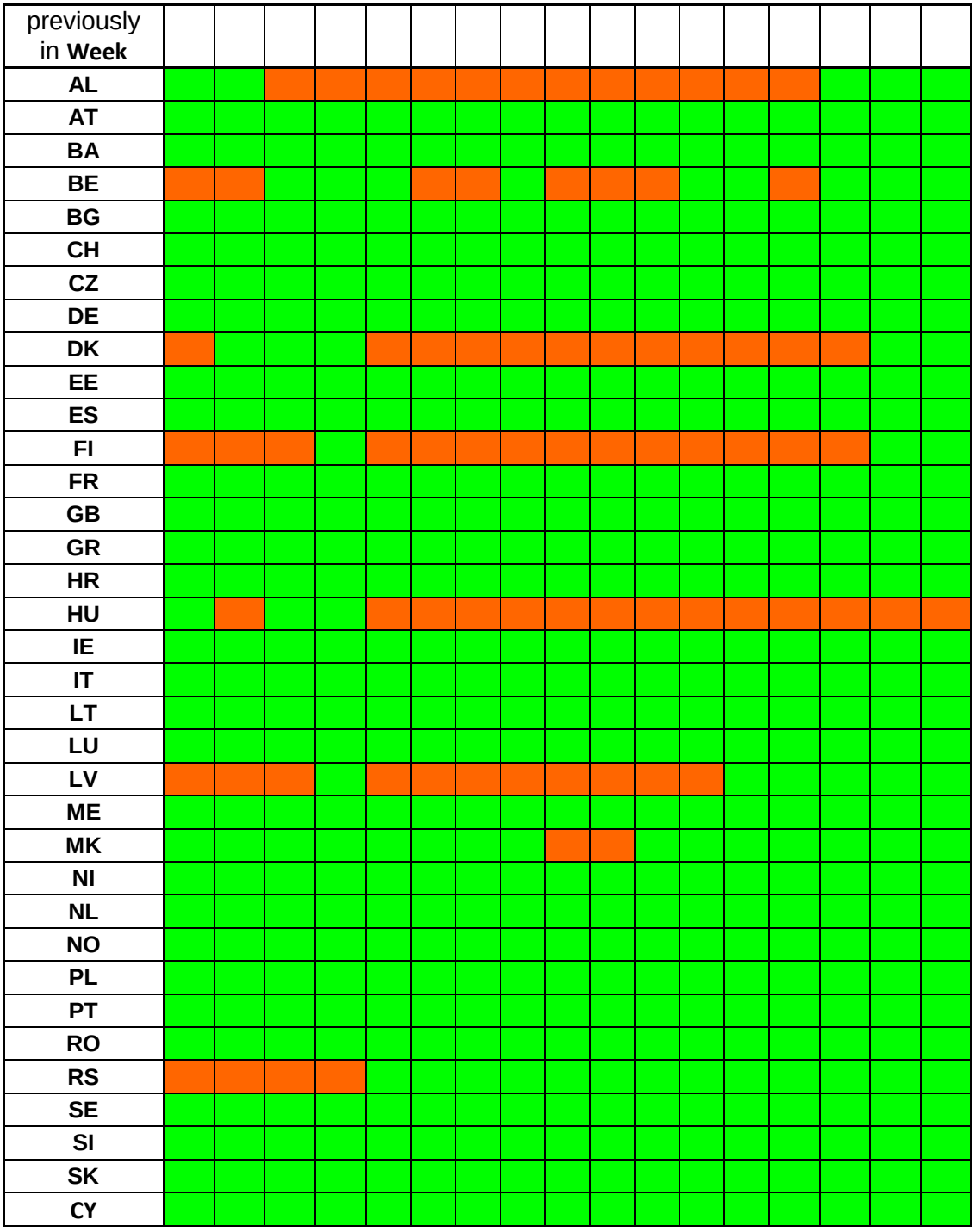

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While the analysis is not a market simulation, it does highlight which border interconnections would be used in order to maintain system security. For week 4 (Wednesday 23 January), the analysis is as shown below in Figure 3;

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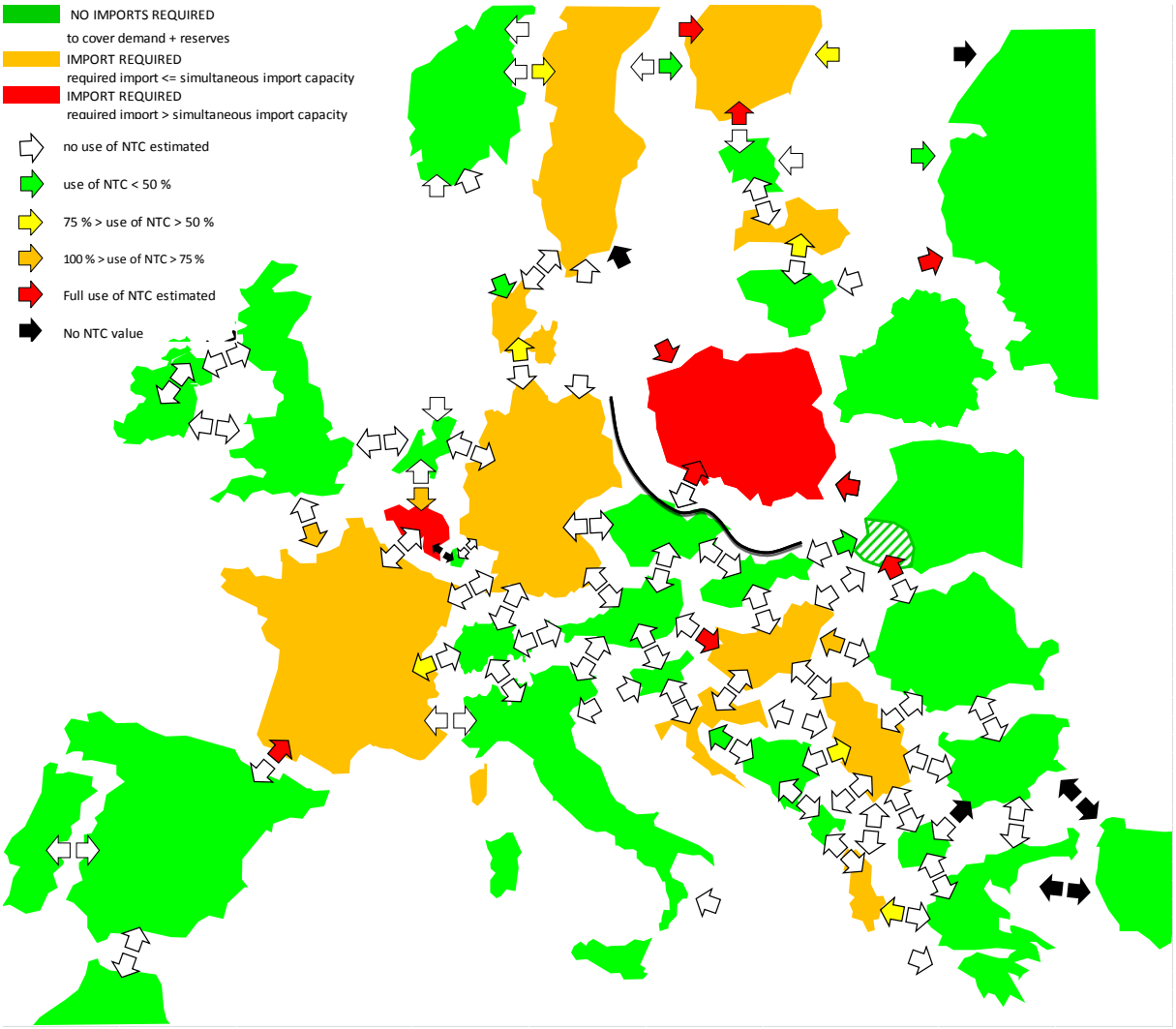

FIGURE 3: WEEK 4 UNDER SEVERE CONDITIONS (1 IN EVERY 10 YEARS)

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The main points to highlight for this week are:

- With Germany, France and Belgium requiring imports for generation adequacy reasons under severe conditions (defined as 1 in every 10 years), high power transfers are expected through the interconnectors from the neighbouring regions to support these countries.
- Due to the unavailability of approximately 2000 MW nuclear capacity in Belgium at least until January 2013, Belgium will remain structurally dependent on imports for generation adequacy reasons during this week.
- In case of high simultaneous importing needs for Belgium, France and Germany, the risk of non-manageable physical flows on the Belgian grid becomes significant, leading to additional – possibly demand-limiting – actions to be taken.
- It should be noted that Germany could still be required to export power to France (via flows from Austria and Czech Republic possibly). This analysis does not include a grid model but it is believed that reactive voltage support in southern Germany will be key to ensuring that this amount of transfers can be managed in operation.
- Italy and Spain have a significant excess of capacity across this period and maximising exports from these countries is important. However, the transfer capacity from Spain to France is limited to 800 MW.
- It should be noted that Poland has declared a common border with zero import NTC for this week, although in severe conditions energy imports of up to 1000 MW may be possible on the actual day, depending on detailed grid analysis (see also paragraph “Regional Focus”).
- Power coming from Norway and Germany towards Denmark is required to maintain the generation adequacy.
- DK, SE, FI, LV require imports during certain weeks of the winter, so as they are able to maintain adequacy.
- Due to the closure of some Danish thermal power plants, the remaining capacity in Denmark is even more negative, starting from week 1/2013. In cold periods, the Danish security of supply therefore depends on a very high usage of the import capacity.
- In South East Europe, adequacy is expected to be maintained with the existing reservoir levels, although energy constraints may arise in Weeks 4 and 5, in case of unfavourable hydrologic conditions persisting.

Coordination across all TSOs will be vital during this week if severe conditions materialise. Indeed, this is essential in order to maximise cross border transfer capabilities i.e. re-dispatching generation, optimising of Transmission system configuration etc.

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As highlighted previously, the analysis is not a market simulation and hence the flows shown on this map do not reflect physical flows resulting from commercial exchanges.

Based on the data submitted, week 5 (Wednesday 30 January) is also a key week. Indeed, the analysis indicates that Belgium requires maximum imports, while France simultaneously requires some imports under severe conditions (defined as 1 in every 10 years), thus meaning that the two countries are unable to assist each other. In conditions even more extreme than those expected once every 10 years (lower temperatures and/or lower wind in-feed) - as was experienced in February 2012 - and due to the effect of the additional unavailability of 2 nuclear units in Belgium, the risk of experiencing an energy shortage in Belgium and the surrounding region becomes non-negligible for the coming winter.

The results of the analysis are shown pictorially below in Figure 4:

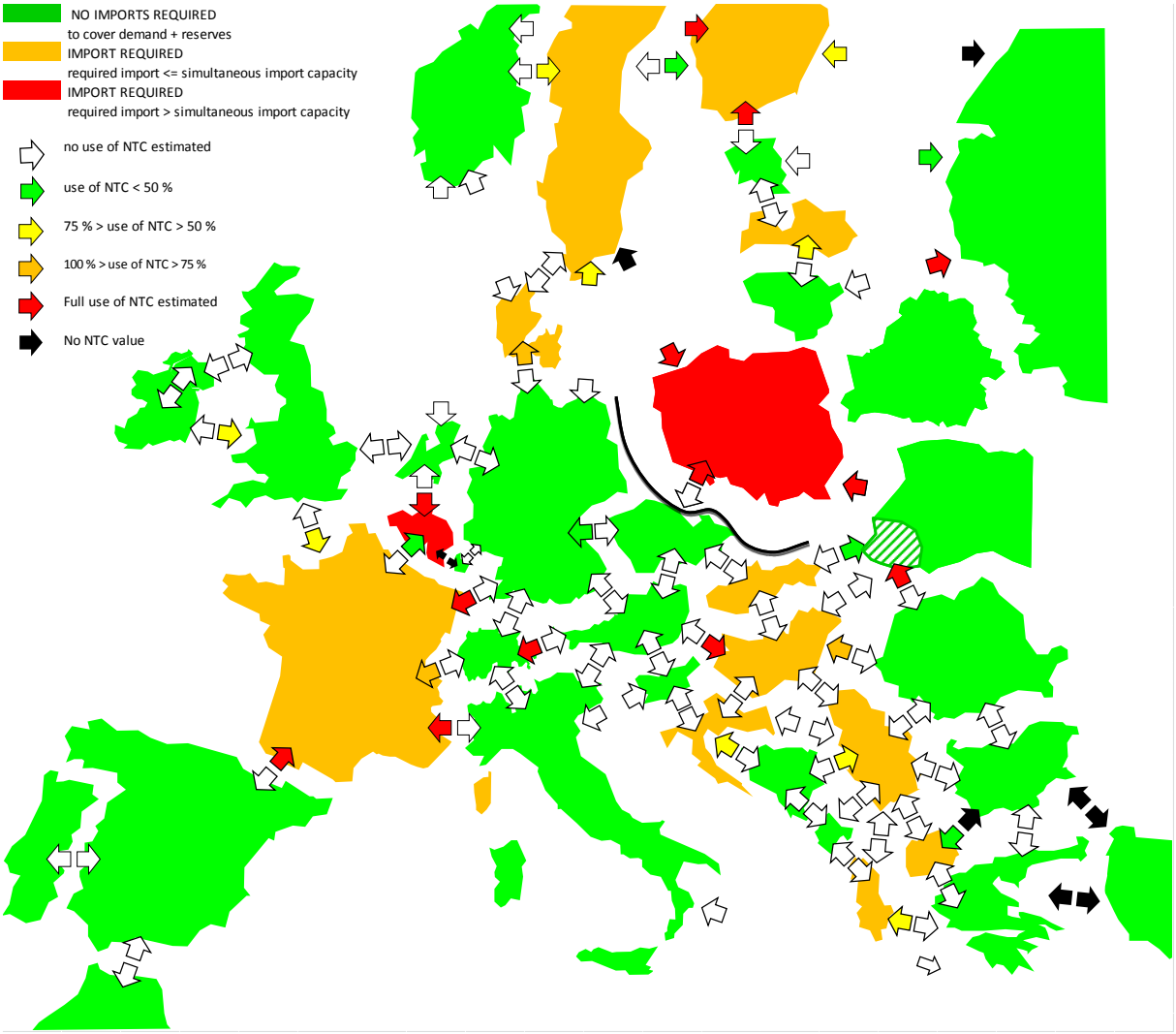

FIGURE 4: WEEK 5 UNDER SEVERE CONDITIONS (1 IN EVERY 10 YEARS)

The main points to highlight for this week are quite similar to the previous ones:

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- Under severe temperature conditions demand in France and Belgium will peak, resulting in major needs for import for generation adequacy reasons. This will lead to high power transfers on the interconnectors with neighbouring regions. Import capacities seem to be almost exhausted. The remaining margin in import capacity for Belgium and France is approximately 650 MW, while the sensitivity of load to temperature for France is 2300 MW/Celsius). Any occurrence of an **even more extreme** situation to that expected once every 10 years would lead to an energy shortage in the area due to a lack of import capacity. However, low wind conditions may at the same time relieve stress on the German network, thus increasing export capacities to France with about 1800 MW.

- High usage of the DK-SE and SE-PL interconnectors compromises the availability of grid related remedial actions used on the German-Polish border for alleviating congestions.

If severe conditions materialise, coordination across all TSOs will be vital during this week in order to maximise interconnector capacities, i.e. optimise transmission system configuration and re-dispatching generation, etc.

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5.4 RELATIVE INDICATOR REMAINING CAPACITY VS PEAK LOAD

The map below shows the remaining capacity divided by the load for week 5 under severe conditions.

It must be noted that due to the very large differences between countries in terms of level of interconnections with neighbours, this indicator is not a general indicator of adequacy; it only shows the remaining capacities if all countries would solely have to rely on their own generation resources.

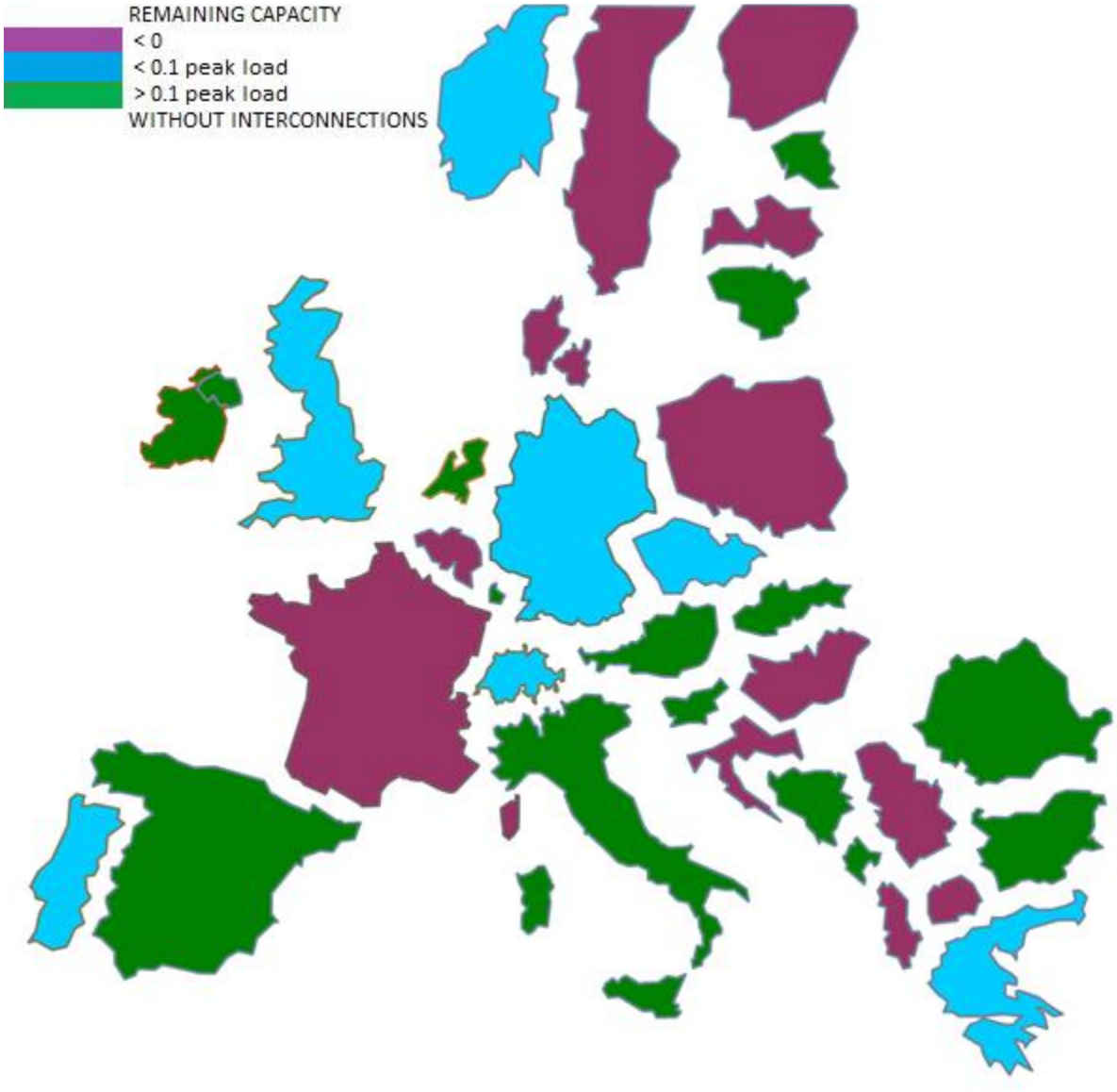

FIGURE 5: RELATIVE INDICATOR - REMAINING CAPACITY VS LOAD (WITHOUT INTERCONNECTIONS)

When a country is in violet, it has a negative remaining capacity (not taking into account interconnections), whilst it is blue if the remaining capacity is less than 10% of peak load, and green if it is higher.

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5.5 REGIONAL FOCUS OF COUNTRIES REQUIRING SIMULTANEOUS IMPORTS

Denmark, Sweden, Finland, Latvia and Poland

Denmark, Sweden, Finland, Latvia and Poland all appear as non-green as they rely on imports to meet the demand during severe conditions. The deficit in each country is driven by increased electricity demand as the temperature is decreasing while we move from a scenario with normal to severe winter conditions, and not by any significant reduction of available generation capacity.

The deficit in Denmark is expected to be met by import. Due to the closure of some Danish thermal power plants, the remaining capacity in Denmark is more negative from week 1-2013. In cold periods, the Danish security of supply is therefore dependent on a very high usage of the import capacity. The TSO of Denmark expects the import capacity to be at its maximum as there are only a few maintenances and overhauls planned.

For Sweden, the NPP availability will be of great importance when it comes to the need for import. However, this need for import is however expected to be delivered, especially from the western interconnectors as Norway has a large surplus even during severe winter conditions.

Furthermore, Finland and Latvia will also rely on import during these conditions. In case it should be required, Finland has contracted an extra peak load reserve consisting of 600 MW of generation capacity (of usually mothballed units) which can be activated in case balance is not achieved between electricity bids and offers on the market. There is some uncertainty regarding the amount of import possibilities from Russia compared to previous years due to capacity tariffs in the Russian market. The TSO of Latvia expects that the deficit can be covered from Russia, Estonia and Lithuania.

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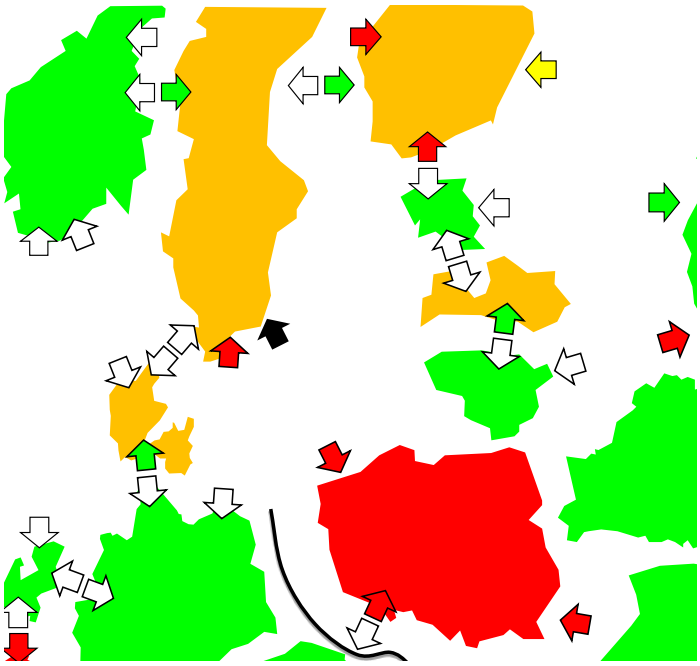

FIGURE 6: SIMULTANEOUS IMPORTS IN BALTIC AREA

For this week under severe conditions, the negative balance in Poland has not been covered using the simultaneously importable capacity provided to the report, which is planned in yearly horizon for normal conditions. Extremely severe balancing conditions in the winter period may take place in case of cold spells, when the risk of unplanned flows through the Polish system, resulting from the wind generation in North Germany, is low. In such a situation, the import of energy up to 1000 MW will be possible on the synchronous profile (in normal conditions there is no import capacity available). Additionally, there could be the option to make use of units up to 300 MW capacity, which in the yearly planning are classified as non-usable capacity. For more information please read the Polish national responses.

Belgium-France-Germany

The European analysis using the quantitative data provided by the TSOs revealed that, for Belgium and France, week 5 of 2013 is expected to be the most constrained week. Figure 7 depicts the situation for this week. Regarding the national adequacy, Belgium and France have an energy deficit of 6750 MW in total under severe conditions (1 in every 10 years), and therefore require this amount of imports from other countries. While the margin in Germany is very low, The Netherlands has a large amount of surplus energy that could be exported. The result of this regional analysis is that adequacy can be maintained in the region when cross-border exchanges are taken into account.

However, the margin that is still left on the total import capacity into Belgium and France becomes rather limited. Therefore, it is deemed necessary to further investigate the sensitivity of this adequacy situation in the area to changes in the forecasted wind infeed and/or temperature.

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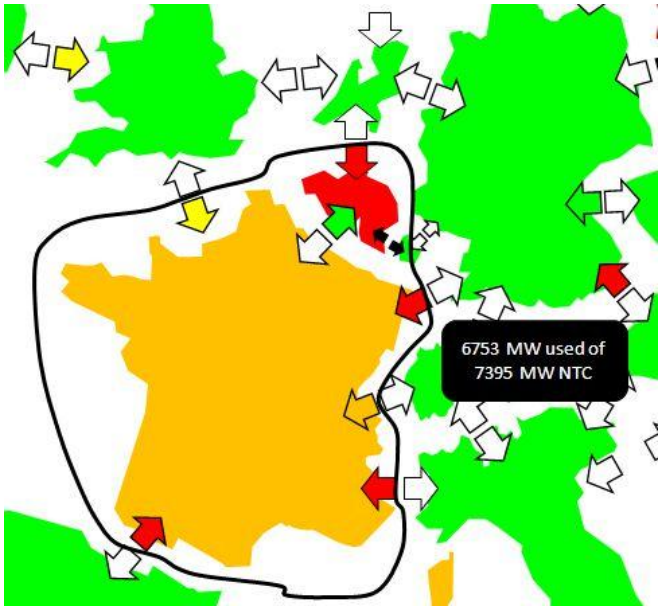

FIGURE 7: CWE SITUATION FOR WEEK 5 UNDER SEVERE CONDITIONS

Table 3 depicts the generation adequacy situation for the complete winter period, focused on CWE and for severe conditions (defined as 1 in every 10 years). Green squares refer to a surplus of energy, orange squares refer to a national deficit that can be mitigated by importing energy. This table shows that Belgium structurally depends on imports for generation adequacy reasons for almost the whole winter period. Germany and France also have to rely on imports for extended periods. In The Netherlands an energy surplus is available for the complete winter period. For all investigated time points, when cross-border exchanges are taken into account, no adequacy issues arise under severe conditions defined as 1 in every 10 years.

Severe	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13
BE																	
DE																	
FR																	
NL																	

TABLE 3: OVERVIEW OF THE ADEQUACY INCLUDING CROSS-BORDER EXCHANGES FOR THE CWE REGION

Sensitivity to wind infeed:

Further to normal conditions sensitivity analyses to wind in-feed have been performed, considering normal and severe conditions encompass representative winter wind conditions including a 10% availability for wind in Germany and 30% in France, which benefits from several wind regimes some of which are not all correlated to the one in North Germany. Although lower availability for wind is always possible, the probability of lower wind in-feed all over the region is quite low.

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Moreover, historical data show no specific wind conditions correlated to low temperatures in France, which are correlated to low wind in-feed in France. The probability of lower than 10% wind availability in Germany and lower than 1 in 10 temperatures in France is very low yet always possible indeed. Furthermore, in these conditions, the German export capacity to France would increase from 1.2 GW to 3 GW making possible for additional thermal capacities in Germany to take part to the security of supply in both France and Belgium.

Sensitivity to temperature:

In winter, when temperatures drop, generally the consumption increases. The amount of consumption increase depends on the specific temperatures and use of electric heating in the concerned country. For example in France a high temperature dependency of about 2300 MW per degree on the peak is to be expected. In Belgium the load variation on the peak is about 100 MW per degree.

For severe conditions the consumption in Belgium and France was estimated on the basis of a temperature of about 6-8 degrees Celsius below the seasonal average. For France this corresponds to the situation experienced during the cold spell in February 2012, which had a historical probability lower than 1 in 20 years. Although even lower temperatures in France are possible, the probability of such an event is quite low, making the severe conditions relevant enough for the winter outlook assessment.

South Eastern Europe:

Due to the significant share of hydropower plants in the generation mix, the load/generation balance in South East Europe is strictly linked with hydrological levels.

This year the hydro reservoirs in the regions show rather low elevations due to the very high temperatures and low precipitation which characterised the weather conditions during the last summer.

In both normal and severe conditions, with the actual reservoir levels, the use of available interconnection capacity could maintain the adequacy in each country of the area during the entire winter period.

However, in case of persisting unfavourable hydrologic conditions, energy constraints may arise in high consumption situations.

In this case the most stressful period is expected to be during weeks 5 and 8.

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5.6 WEEKLY COUNTRY PERSPECTIVE ANALYSIS – DOWNWARD ADEQUACY

This is the second occasion on which ENTSO-E analyses the downward adequacy situation in Europe within the Outlook reports. It is recognised that downward adequacy may not be a focus for many TSOs at present and hence a short explanation of the potential issue is provided in Figure 8 below.

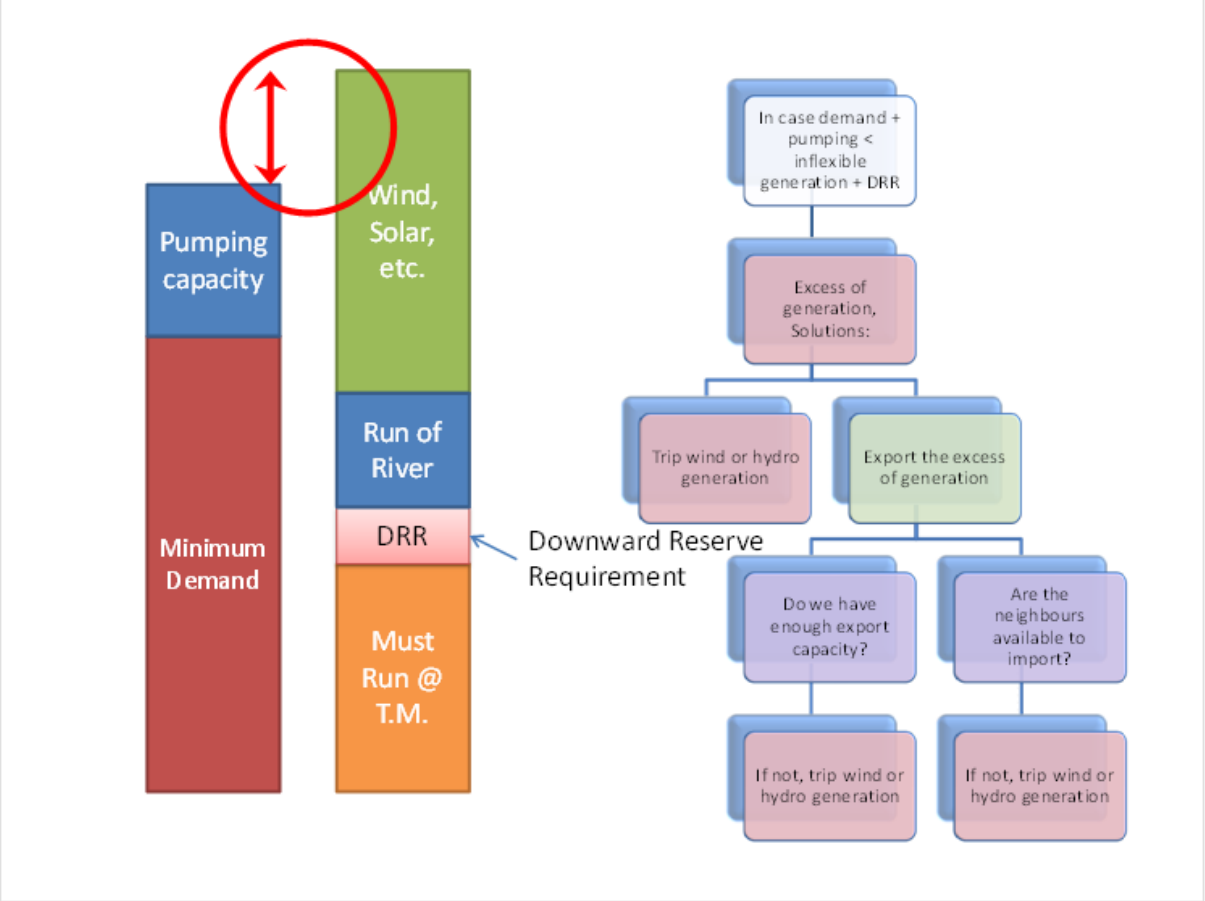

FIGURE 8: DOWNWARD REGULATION REQUIREMENT

Under minimum demand conditions, there is a potential for countries to have an excess of generation running. Every TSO is likely to have varying levels of "must run" generation. This may involve CHP or generators which are required to run to maintain dynamic voltage support etc. In addition, there will be renewable generation such as run of river and wind whose output is inflexible and variable. At times of high renewable output, the combination can result in generation exceeding demand and the pumped storage capacity of the country. In that case, the "excess" generation is either exported to a neighbouring region or curtailed.

The new analysis on downward adequacy looks at this situation to determine whether or not neighbouring regions can indeed import the excess generation by submitting the best

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estimate of the minimum NTC. The analysis is based on submitted TSO data on overnight demands (04:00 am synchronous time) and must run generation. It then sets wind at 65% output across the whole of the ENTSO-E region and calculates if there is enough interconnector capacity to take the excess generation to neighbouring regions. This analysis has been carried out as various TSOs have indicated that, as renewable generation (and in particular wind) grow in capacity, there may be occasions when it is necessary to curtail excess generation due to insufficient export capability to neighbouring regions.

This overnight scenario does not cover the situation where excess generation is also due to high solar in-feed during windy low load holidays and weekends.

With increasing renewable generation in Europe, the output of the analysis is shown below in Table 4. Countries which are green have no requirement to export excess generation under high renewable output. Countries in yellow have at least 1 week where they will be required to export and countries in red will be required to export all weeks under high renewable/inflexible generation at low overnight demand periods.

It can be observed that with the estimated maximum wind output across the ENTSO-E region, there are various countries which would be required to export excess generation under minimum overnight demands to neighbouring regions, all of whom are able to export the excess production during minimum overnight demand levels to their neighbours.

Week	49	50	51	52	1	2	3	4	5	6	7	8	9	10	11	12	13
AL																	
AT																	
BA																	
BE																	
BG																	
BY																	
CH																	
CZ																	
DE																	
DK																	
EE																	
ES																	
FI																	
FR																	
GB																	
GR																	
HR																	
HU																	
IE																	
IT																	
LT																	

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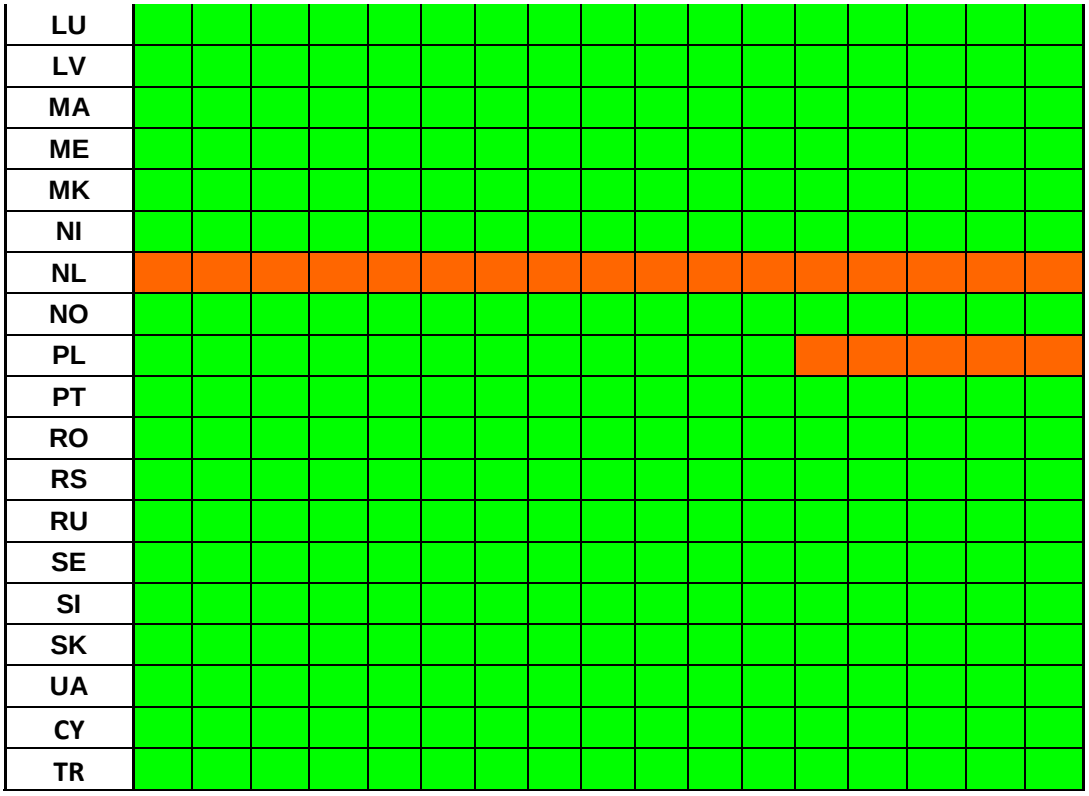

TABLE 4: WEEKLY STRESS ASSESSMENT FOR DOWNWARD ADEQUACY

The analysis suggests that there could be periods after the end of the winter, where high renewable and/or inflexible generation during minimum overnight demands would stress cross border flows, especially on the 31st of March.

5.7 IMPORT/EXPORT CONTRIBUTION AND REGIONAL OVERVIEW – DOWNWARD ADEQUACY

The analysis has been run for every week and indicates that there are periods when there will be an excess of generation which cannot be exported to neighbouring regions, but which is not required for adequacy purposes.

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As an example, the flows based on week 52 are shown below in Figure 9.

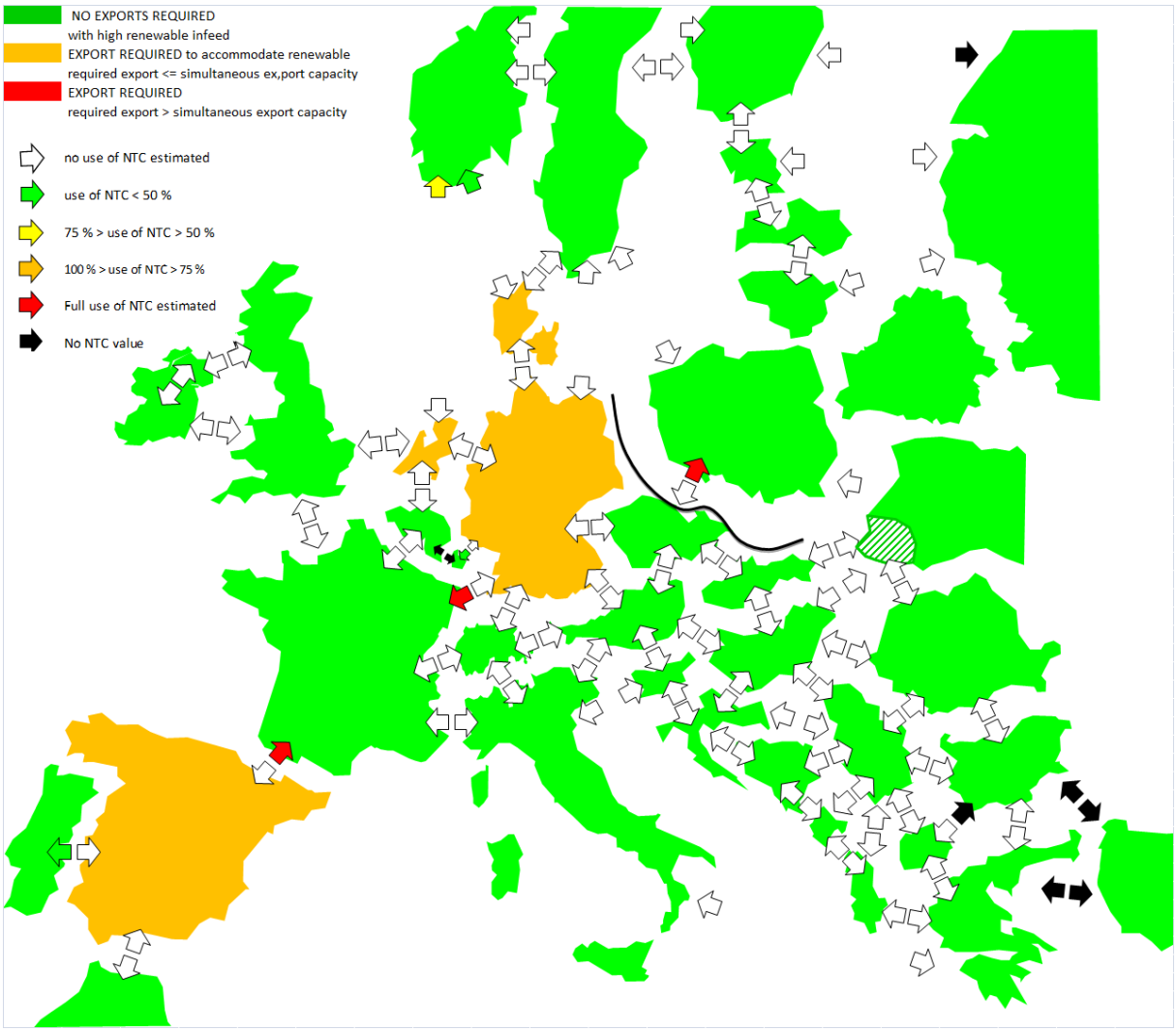

FIGURE 9: WEEK 52/2012, DOWNWARD ADEQUACY

It can be observed that the combination of high renewables in-feed and inflexible generation in Denmark, Germany and The Netherlands is being exported to all surrounding countries.

The interconnection between Spain and France remains vital to export the excess generation in the Iberian Peninsula while Germany is restricting export to France.

As previously indicated, this is not a market simulation. Rather, it is an indication of the levels of cross border flows to determine a solution to excess generation in countries with overnight minimum demands.

6 COUNTRY LEVEL

6.1 INDIVIDUAL COUNTRY RESPONSES TO THE WINTER OUTLOOK

Albania

Austria

Belgium

Bosnia & Herzegovina

Bulgaria

Croatia

Cyprus

Czech Republic

Denmark

Estonia

Finland

Former Yugoslav Republic Of Macedonia (FYROM)

France

Germany

Great Britain

Greece

Hungary

Ireland

Italy

Latvia

Lithuania

Luxembourg

Montenegro

Netherlands

Northern Ireland

Norway

Poland

Portugal

Republic Of Serbia

Romania

Slovak Republic

Slovenia

Spain

Sweden

Switzerland

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ALBANIA

The Albanian Power System, due to the significant share of hydro power plants, mainly depends on the hydrological circumstances of the region. We do not expect any significant change in the generation capacity for the next winter 2012/2013, in respect to the previous winter period. Having said this however, a new HPP called 'Ashta' will be in full operation with approximately 50 MW within this year.

For the upcoming winter period, considering the firm import contracts, the adequacy and security of the Albanian Power System will not be threatened, also taking into account the state of hydro power plant reservoir basins' levels of Drini Cascade. Indeed, at the beginning of the considered period, planned availability of production and transmission facilities, and the availability of importable capacity of interconnections.

The most critical period remains during the second part of December and January, depending on weather conditions and temperature.

It has already been proven that in general the interconnections are sufficient for the import/export of electricity.

In case of any problems for the coming winter, it is planned to manage the risk as much as possible by using market mechanisms etc. In addition, load reduction is also available if the decision is made by the Ministry of Energy and the Regulatory Authority for Energy.

Considering the new generation capacity and import contracts, OST does not anticipate significant balance problems in the Albanian Power System during the upcoming winter period. The most critical period remains during the second part of December and January.

The level of remaining capacity considered as necessary in order to ensure a secure operation for the next winter is 120 MW. In Albania there are not yet intermittent energy sources like wind or solar, to be taken into account in our assessment.

The maintenance schedule of the generating units is set to minimum. No problems in the transmission network are expected as most of the maintenance work has been accomplished during the summer and fall period of the year.

Import Contracts until the end of this year have already been concluded by market participants, whilst the others, covering the first quarter of next year, are under way.

In case of severe conditions it will be requested to increase the import with at least 100 MW. Under these conditions all criteria for the system adequacy will be met.

According to the Grid Code, OST's regular operation planning horizons are: year (Annual Operation Study, AOS), month, week and day. The AOS is based on a model combining stochastic and deterministic approaches, and making use of information provided by grid users. In the medium and short term, OST conducts studies concerning the Generation Adequacy Assessment. The studies include load forecasts and multiple scenarios on energy management using probabilistic and deterministic methods. The energy management studies

aim to assess the actual energy situation and the level of hydro reserves. These studies are regularly revised to primarily include variations in the load and/or the availability of the power plants.

Albania will also continue to be dependent on imports for the next winter period. It is estimated that for several weeks, mostly during January, the remaining capacity for normal conditions will be approximately -100 MW, and -180 MW for severe conditions. In the case of deficiency of generation (low hydrology, loss of major units) or unavailability of imports from neighbouring countries, and if the system reserves cannot cover the lack of energy, a last measure load reduction is possible according to the national defence scheme. We do not expect any problems related to shortages of transmission capacity or low generation availability, and all maintenance works will be performed during October of this year.

The monthly peak load is calculated both for normal and severe conditions. The severe load scenario is built considering a temperature which is 5°C lower than the season's normal temperature.

The Albanian Power System, due to the significant share of hydro power plants, mainly depends on hydrological circumstances of the region. The differences between the productions of hydro power plants in extremely dry or extremely wet periods, fluctuate for approximately 50% of the average production with HPP.

In this assessment, the thermal power of 90 MW, is put at non-usable capacity due to information from generation company KESH-Gen, who intend to use it only in cases of a very dry period. With the exception of HPP Ashta, no addition of new generation capacity is expected for the coming winter.

The firm maintenance program of the generation units for next year is normally issued in October. Nevertheless, the maintenance schedule of the generating units is set to minimum, as most maintenance works have been accomplished during the summer period of the year.

We already have a plan for the maintenance, overhauls and outages, whilst valuable information about the treatment and number of mothballed power plants is also in hand.

We have no concerns regarding the amount of generation capacity required by us (TSO) to provide operating response/reserves. It is made available by public generation company KESH-Gen in accordance with the terms of our Grid Code.

Our system is usually dependent upon imports of electricity from neighbouring countries, and will also be dependent upon imports for the coming winter period 2012/2013. Physical imports are expected on the Greece and Montenegrin border, whilst exports are expected to the Serbian control area (Kosovo region). Due to high transfer capacities (two interconnectors 400 kV and two 220 kV), no problems are expected with congestions due to transit flows or security of supply.

In general, the interconnections are sufficient for the import/export of electricity.

The average simultaneous import capacity for the coming winter is approximately 600 MW, whereas the average simultaneous export capacity is approximately 400 MW. The simultaneous import and export capacity was obtained by adding the average NTC-values of all borders and multiplying this sum with a simultaneous coefficient of 0.7.

Available cross border capacity allows compensation of eventual energy deficit and transit of energy for the successful functioning of the electrical market.

We rely upon imports due to both security of electricity supply reasons and market conditions between our system and the neighbouring countries.

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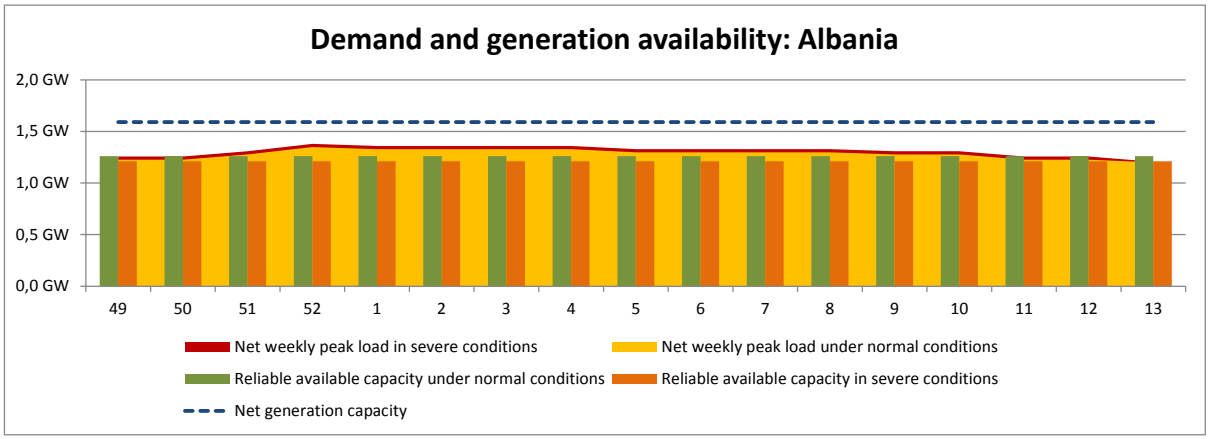
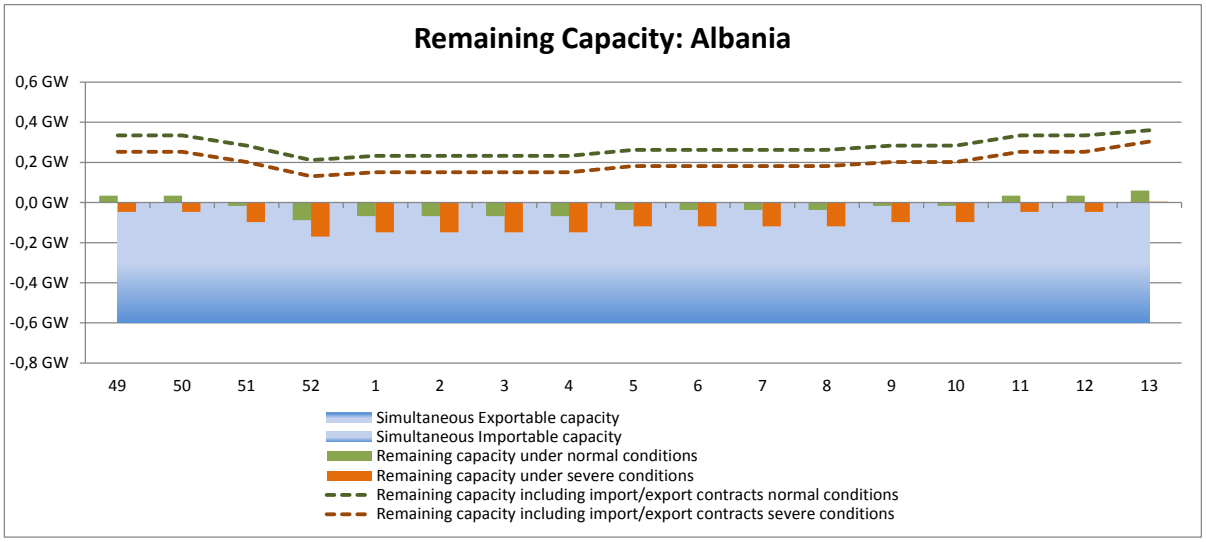
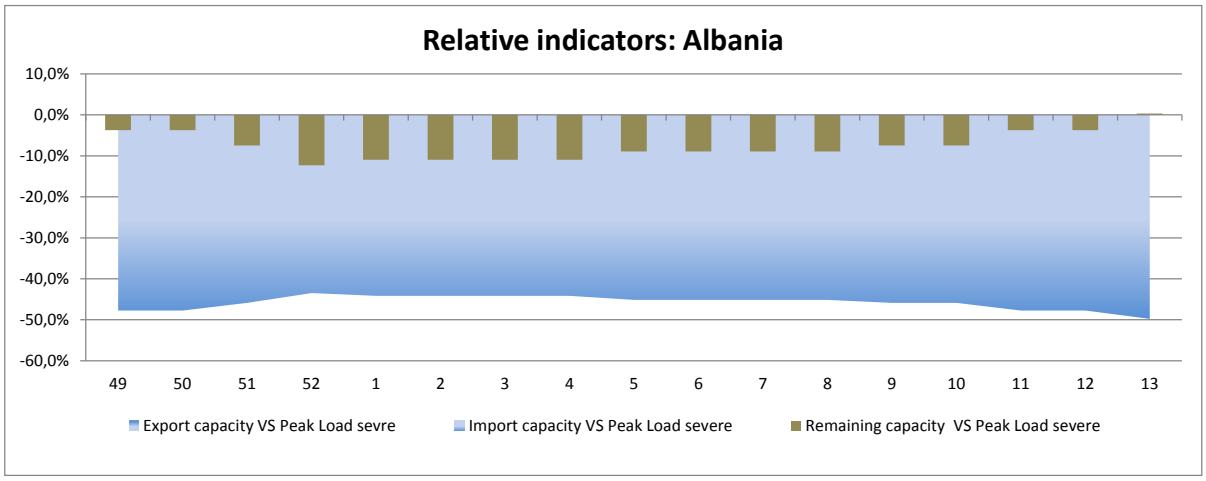

Demand and generation availability: Albania
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Albania
0,6 GW
0,4 GW
0,2 GW
0,0 GW
-0,2 GW
-0,4 GW
-0,6 GW
-0,8 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Albania
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
-50,0%
-60,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

AUSTRIA

General Comments

APG established a close cooperation with the four German TSOs in order to assess the security of electricity supply for the upcoming winter period. For instance, APG provided relevant data for a study performed by the German TSOs.

Generation- Demand Balance

Under normal conditions no problems with regards to load generation balance are expected in Austria for winter 2012/2013. There is only a very small risk in case of very high load (due to a long lasting period with extreme low temperatures) in combination with reduced generation (due to dryness and lack of primary energy sources like natural gas).

Role of Interconnections

With regards to the grid situation, there is only a potential risk of higher load flows from Austria (APG) to Germany (TENNET) on the 220kV tie line between St. Peter (APG) and Germany. This is a consequence of the shutdown of nuclear power plants. However, under normal conditions these situations can be handled with countermeasures.

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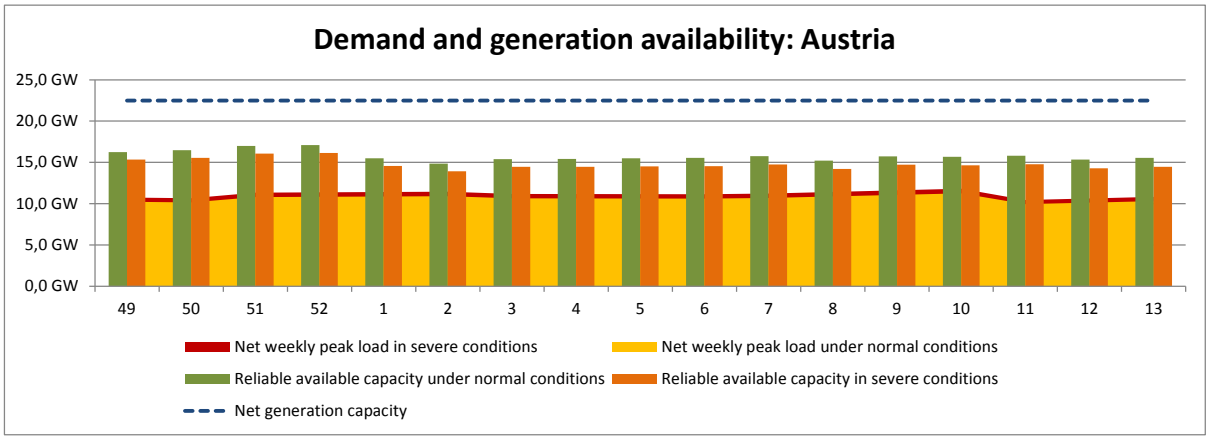
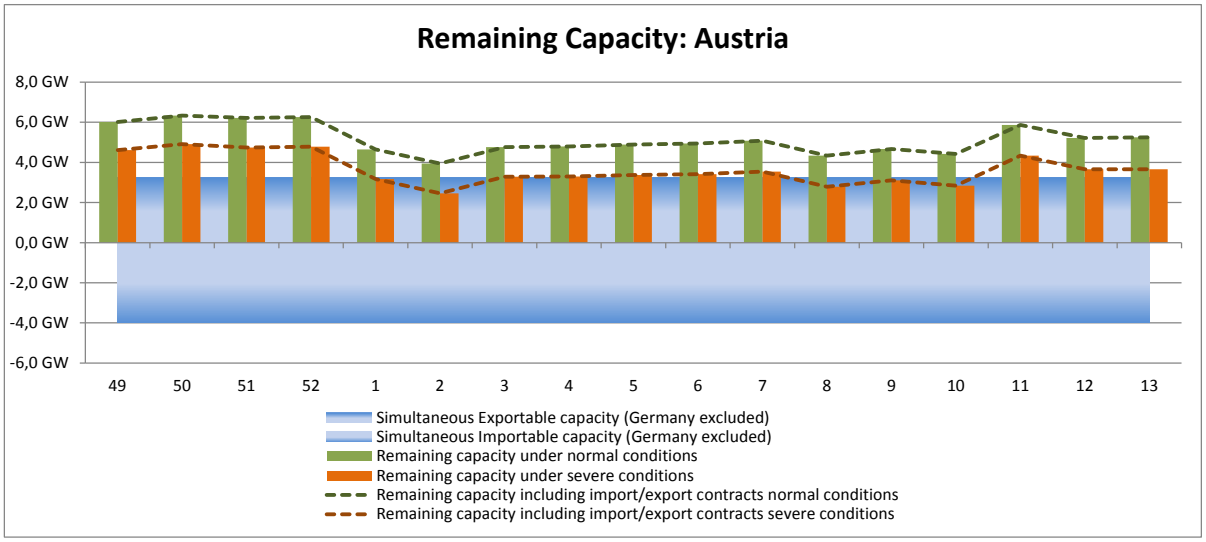
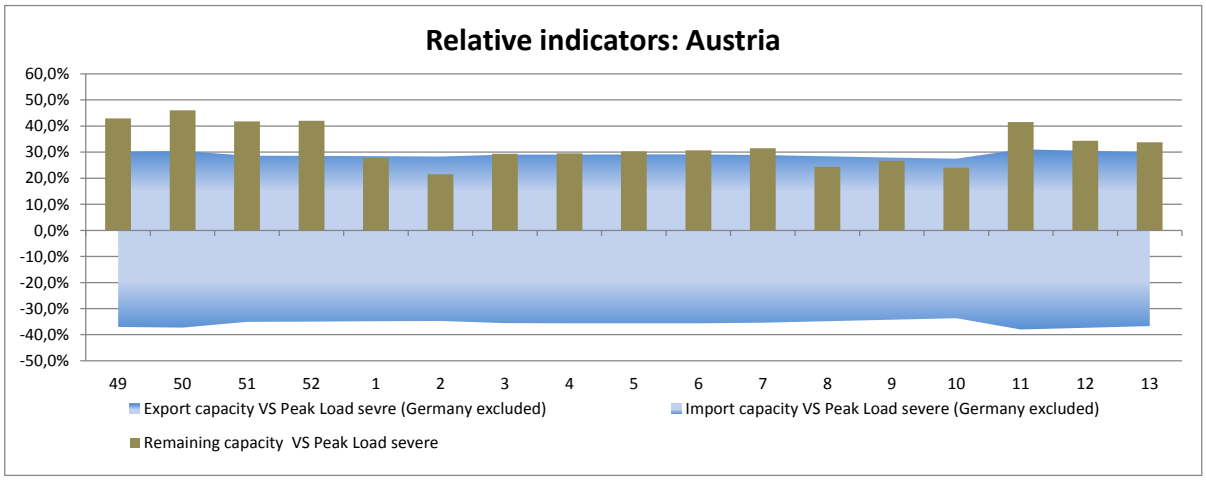

Demand and generation availability: Austria
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Austria
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
-6,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity (Germany excluded)
Simultaneous Importable capacity (Germany excluded)
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Austria
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
-50,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre (Germany excluded)
Import capacity VS Peak Load severe (Germany excluded)
Remaining capacity VS Peak Load severe

BELGIUM

As a result of measurements carried out in June and July 2012, potential problems were detected with the reactor vessel of one of the nuclear power plants on the site of Doel. Similar problems were also detected during the revision of a similar nuclear power plant at the Tihange site. For the moment, both units (adding up to more than 2000 MW) are shut down, and decisions regarding whether to re-start the power plants or permanently put them out of service are not expected before the end of December at the earliest.

A statistical study performed by Elia indeed identified increased risks for the Belgian grid. In case both nuclear power plants are not available during winter, system adequacy could only be fulfilled under the following prerequisites:

- Cancel the recent planned permanent shutdown of ~1000 MW of old thermal plants
- Have **3500 MW interconnection capacity available for imports into the Belgian grid (supposing that excess generation is available in other CWE countries)**
- Average temperatures for the coming winter and limited growth of the peak loads

This assessment takes into account the actual, announced overhaul and an estimation of the average outages and non-usability factors of the generator units connected to the Elia grid and the DSO grids. The average outage rates of generation units were estimated based on historical data for the Belgian production park. Elia has the possibility to reduce the offtake of some large industrial customers on the basis of interruptible load contracts, but as these are part of the tertiary reserves, they are not used as a preventive measure to ensure system adequacy in the quantitative analysis.

With regards to the forecast load, a structural increase of 0.43% between 2011 and 2012 is assumed. Between 2012 and 2013, this increase rises to 0.61%. No major thermal generation units are being commissioned in the coming winter.

Under normal circumstances (average temperatures and average renewables in-feed), a moderate level of imports is needed during most of the winter period to assure the adequacy of the Belgian system. For a limited period in December, more imports are necessary due to some generation units still being shut down for maintenance.

However, for severe conditions with cold temperatures (P95: 19 in 20 days were warmer since 1994) and low wind in-feed (10%), between 2000 and 3000 MW of imports are needed to cover the Belgian load.

To prepare for the coming winter, a winter action plan will be put into place by Elia. This plan will encompass several actions to detect possible issues and to mitigate these problems as much as possible using the measurements mentioned above and by:

- sensitising and balancing responsible parties and the regulator
- updating procedures and action plans in case of an energy shortage

As a conclusion, when the two large nuclear power plants remain shut down for the winter period, Elia states that an increased Belgian dependency on imports is to be expected. As a consequence, the generation/load adequacy cannot be ensured at national level, even under normal conditions. Taking into account severe conditions aggravates the situation considerably. Therefore, Belgium will be dependent on the availability of energy in the CWE region, and in case of scarcity additional demand limiting measures will probably have to be taken.

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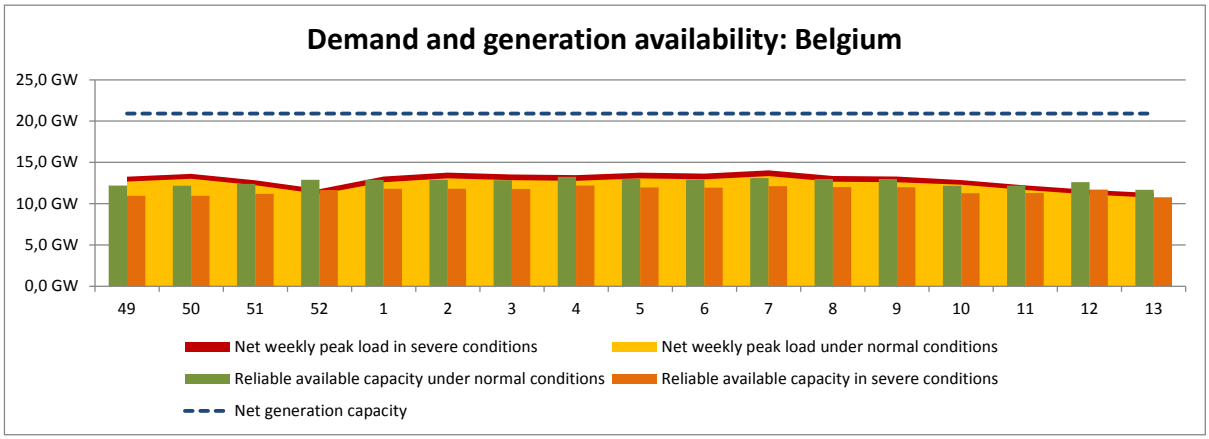
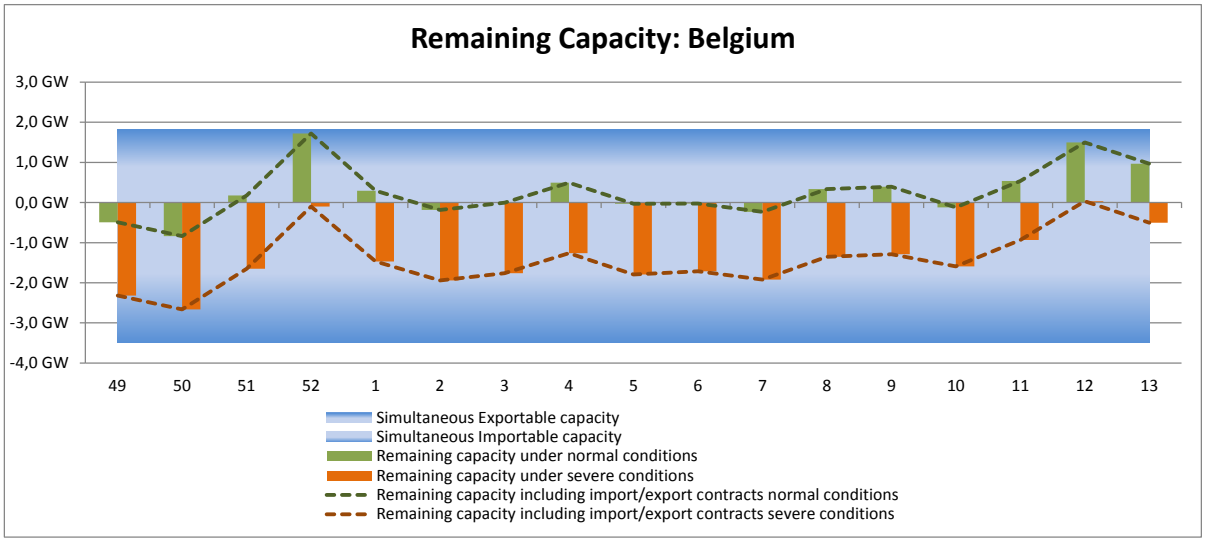
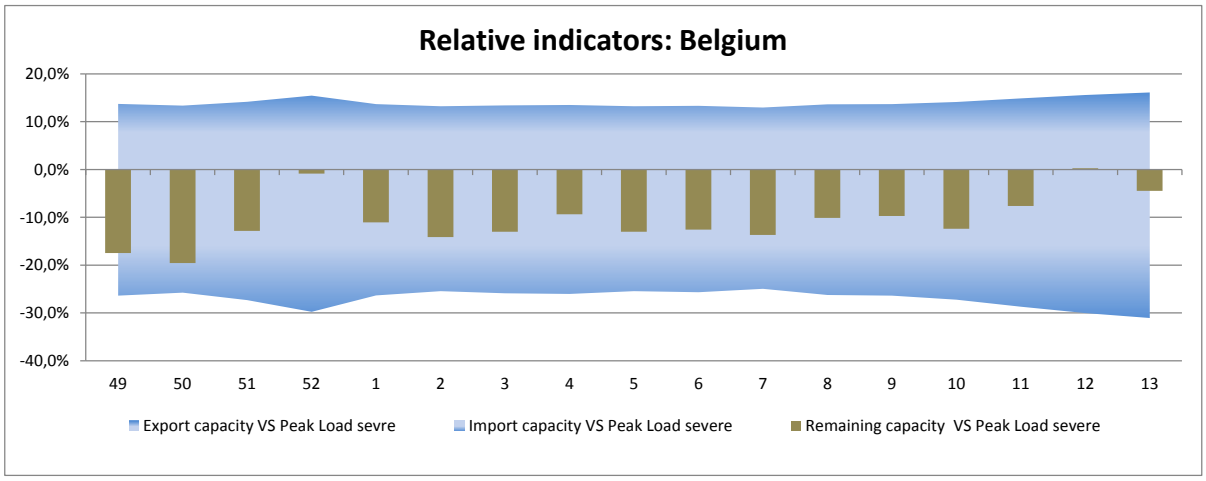
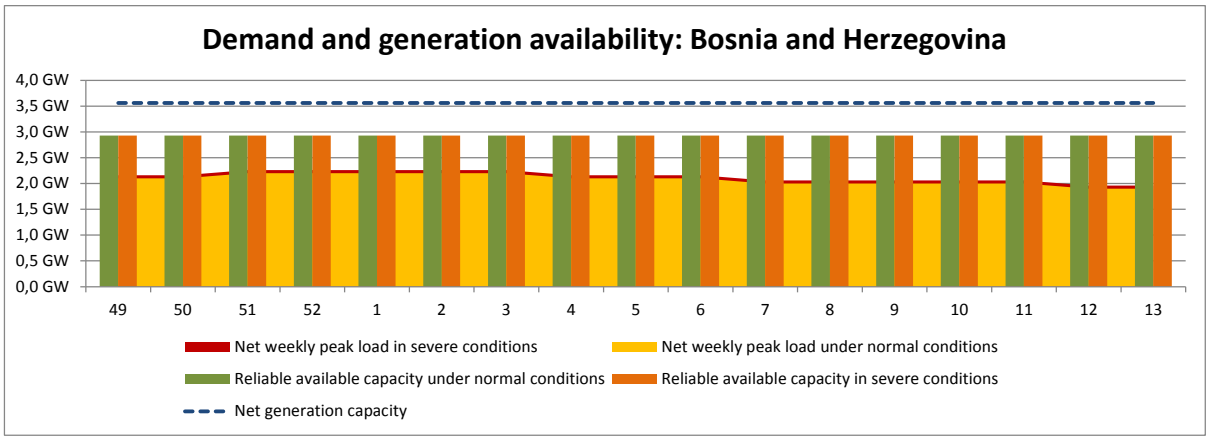
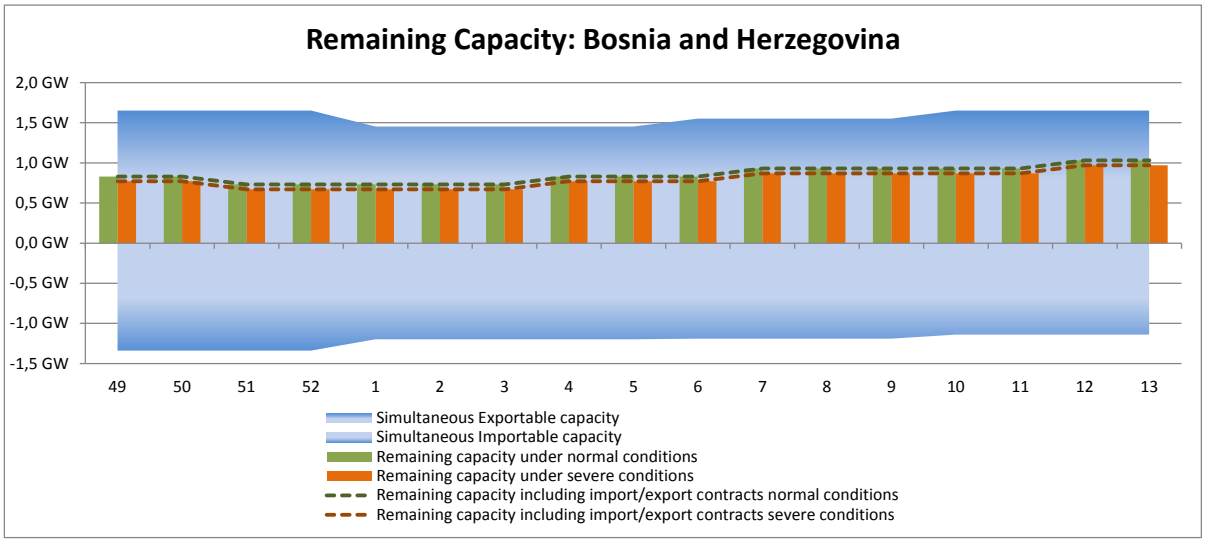

Demand and generation availability: Belgium
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity

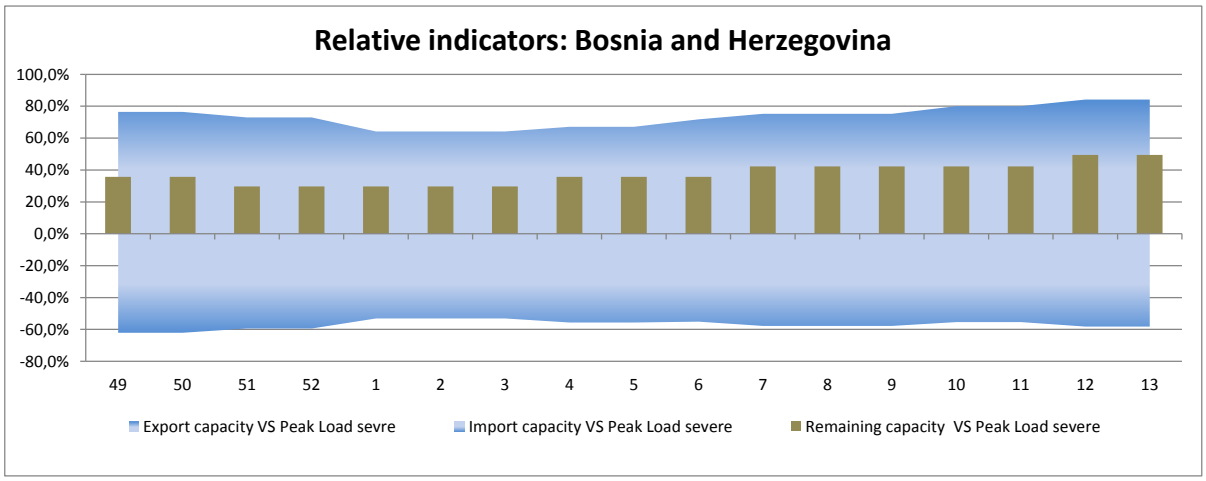

Remaining Capacity: Belgium
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
-4,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Belgium
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

BOSNIA & HERZEGOVINA







BULGARIA

Regardless of whether conditions are normal or severe, we do not expect adequacy problems for the upcoming winter season. The maintenance schedule of all major generating units is strictly followed and will be finished by mid-October. Accompanying measures designed to keep the forced outage rates at the lowest possible levels will also be taken.

The current target levels of the big reservoirs are met and we expect reliable operation and predictable contribution of all storage and pump storage hydro plants to the power balance.

No problems in the transmission network are expected because of major maintenance works over the summer period.

The wind generation penetration is still not critical for the system, and this is why we do not expect any problems concerning combinations of high wind and high level of must run generation during night hours of low demand.

For our power system, severe winter conditions are considered periods during which the average daily temperature is more than 10 degrees lower than the normal value for the same period. The load sensitivity to temperature for the assessed period is as follows: December and January -95 MW/˚C, February -100 MW/ ˚C and March -90 MW/ ˚C. This results in an increase of the load on an average basis of 1000 MW during severe cold waves.

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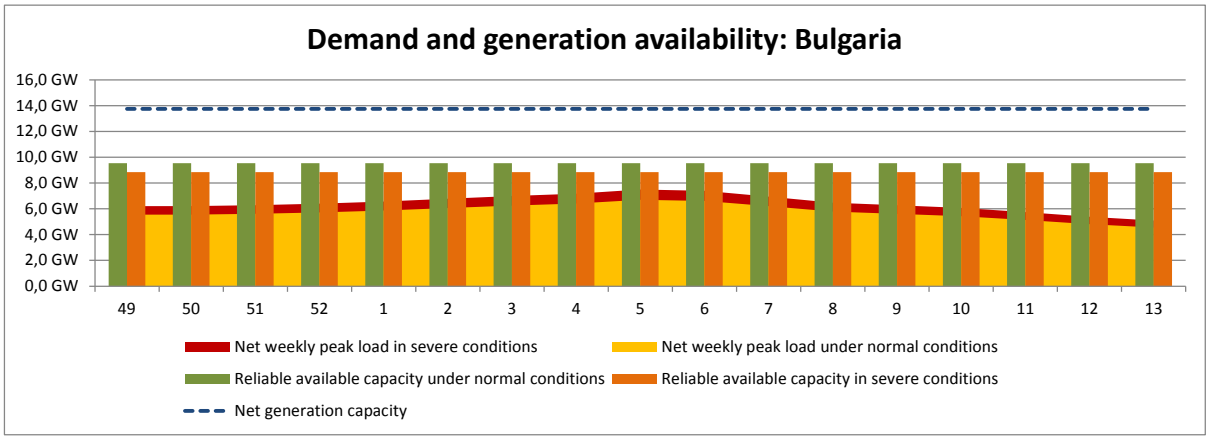
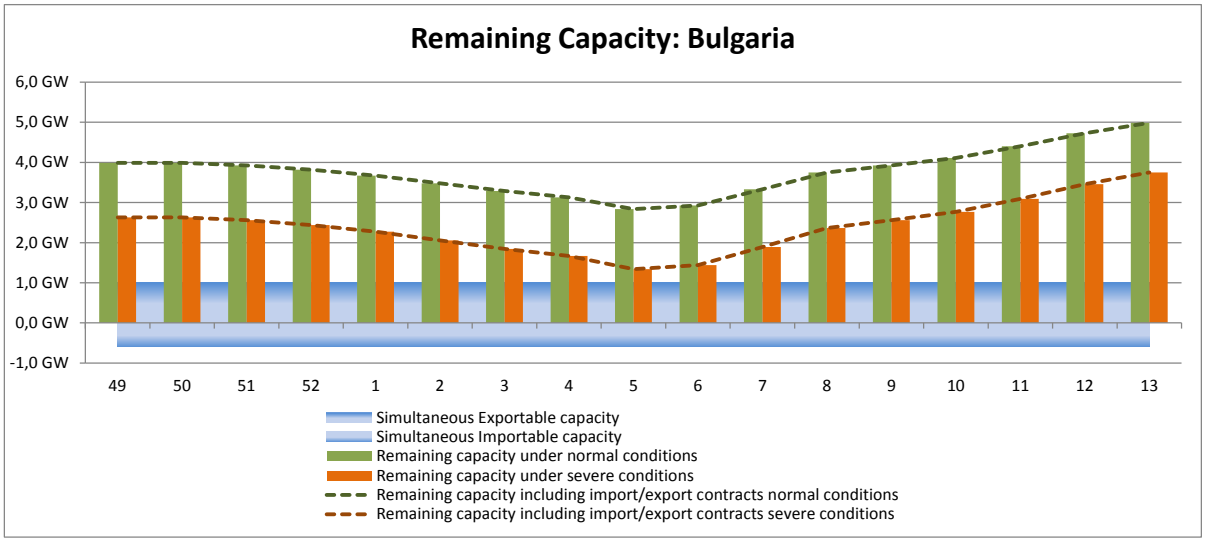
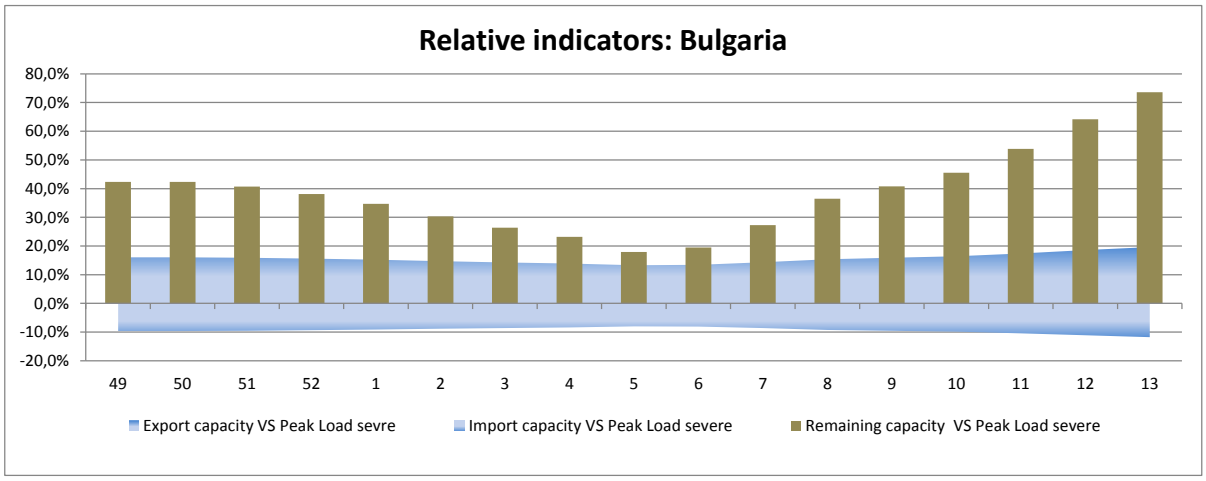

Demand and generation availability: Bulgaria
16,0 GW
14,0 GW
12,0 GW
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Bulgaria
6,0 GW
5,0 GW
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Bulgaria
80,0%
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

CROATIA

1. *Contribution to the main report*

   The Croatian power system relies upon electricity generation from hydro power plants. Due to drought, the hydro accumulations of the Croatian power system have rather low elevations this year. Consequently, the generation from hydro power plants is not satisfactory. The lack of electricity is compensated mainly by the increased imports. The problems can be expected if the trend of dry weather continues and the consumption reaches high values.

   HEP OPS does not expect any significant increase of load in comparison with the previous winter. The high loads occur at low air temperatures.
   Indeed, no specific event is expected during the winter which could impact the load significantly.

   The generation capacity of the Croatian power system will not change. It is not expected that new units will be put into operation nor will it be necessary to decommission any existing units.

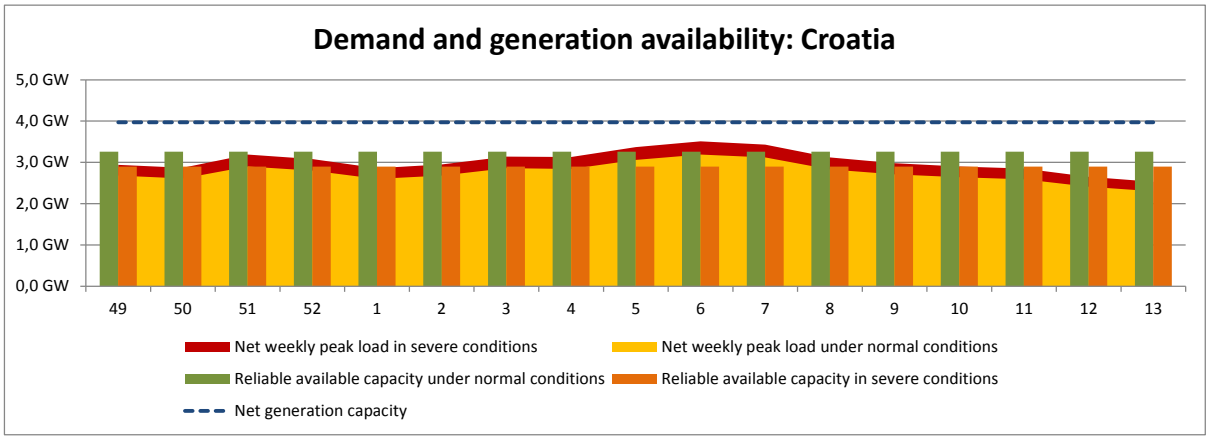
   The Croatian power system is dependent upon import of electricity. Most of the import is realised using the tie-lines on the Hungary-Croatia border. The tie-lines on other borders (Serbia, Slovenia, Bosnia and Herzegovina) are also important, although they also have an important role in export.
   As one security measure, HEP OPS has emergency contracts arranged with operators MAVIR (Hungary) and EMS (Serbia).

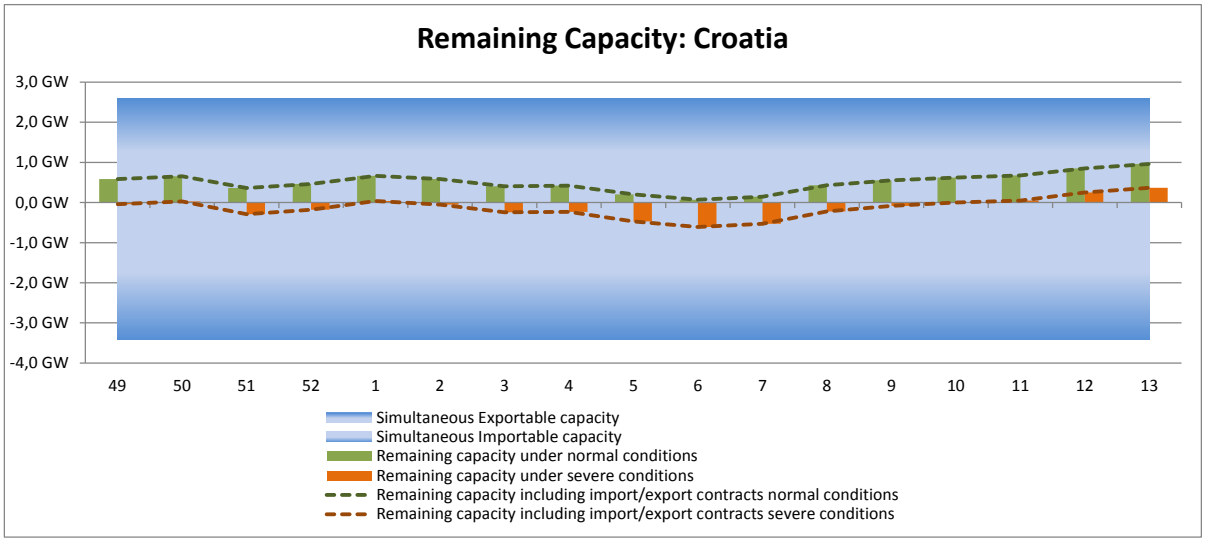
2. *Synopsis*

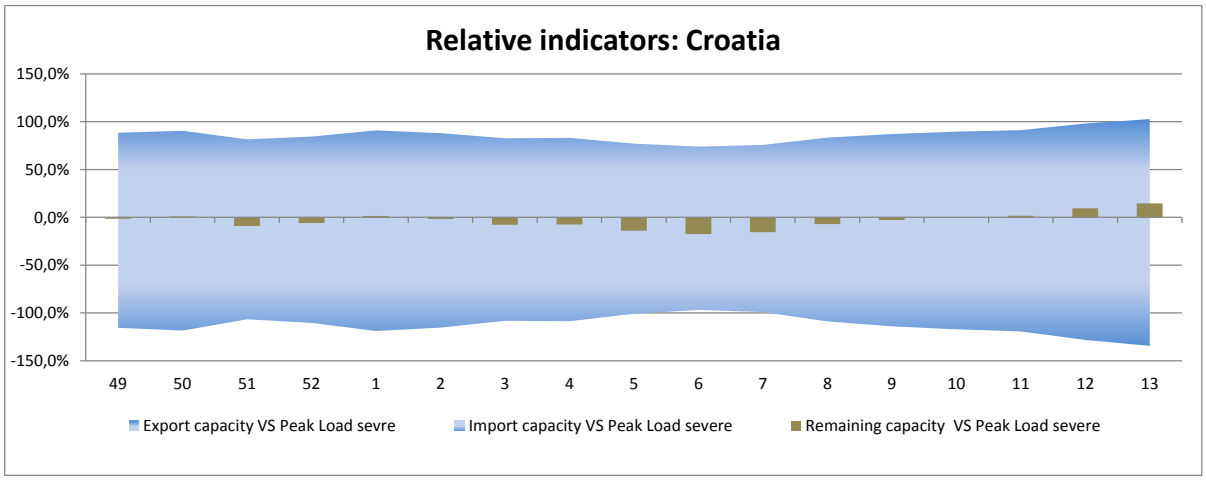
   As can be seen from the Excel spreadsheet, the remaining capacity for Croatia in some periods of time for the severe conditions has negative values. It was assumed that severe conditions are characterised by a load which is approximately 10% higher than the previous year, decreased generation of hydro power plants, and the unavailability of some other domestic energy sources. Imports are not taken into account, but can be enabled because of the satisfying NTC values on each border.

Short explanation of the framework and the method used when compiling the winter adequacy assessment

All of the assessments are carried out taking into account the data from HEP OPS's database. These data refer to the hourly load, generation of the great majority of Croatian power plants and available reserves. The NTC values are estimated using the archive data which are also announced on the internet.


Demand and generation availability: Croatia
5,0 GW
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Croatia
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
-4,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Croatia
150,0%
100,0%
50,0%
0,0%
-50,0%
-100,0%
-150,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

CYPRUS

One year after the complete destruction of the “Vasilikos” Power Station, plant restoration was on schedule. The economic crisis has resulted in lower system load demand (-15%) during the summer period and reduced load demand is also expected during the winter period. Therefore, no adequacy problems will emerge.

Observing the Load predictions versus additional capacity to be installed, the following remarks can be made:

a) The combined cycle (CCPP 5) of “Vasilikos” Power Station when restored will increase the installed capacity of the system by 220 MW.

b) All portable Internal Combustion Engines, with a total capacity of 285 MW, and which had been temporarily installed on the island, were disconnected and removed from the system on 15/9/2012. Consequently, the temporary increase in the price of electricity which was set last year at 6.96% is reduced to 5.75%.

c) The combined cycle (CCPP 4) of “Vasilikos” Power Station will be restored at the end of 2012, increasing the installed capacity of the system by another 220 MW.

Additionally, due to the international economic crisis which has also affected Cyprus, it is observed that the load demand is expected to be 15% less than the predicted ones at the beginning of 2012. Peak winter demand is expected to be 890 MW whilst installed capacity will be 1200 MW.

Consequently, no adequacy problems are expected to be observed during the winter period of 2012-2013.

The most critical periods are expected to take place during weeks 1-8 of 2013, without any adequacy problems.

Generation from Renewable Energy Sources constitutes around 5% of total generation. This figure is not expected to decrease during 2013. On the contrary, it is expected to increase due to extensive Photovoltaic installations. The RES generation is not included in the net generating capacity.

A gas crisis is not expected to affect the Cyprus generation system as all units run on heavy fuel oil and diesel oil transported by sea.

The load prediction is made with an assumption of 15% reduction. This is due to results of the energy crisis. National generation adequacy is reviewed on a weekly basis by taking into consideration the unit availability and the approved maintenance programme.

At present, the wind generation forecasts submitted by Generators are inaccurate.

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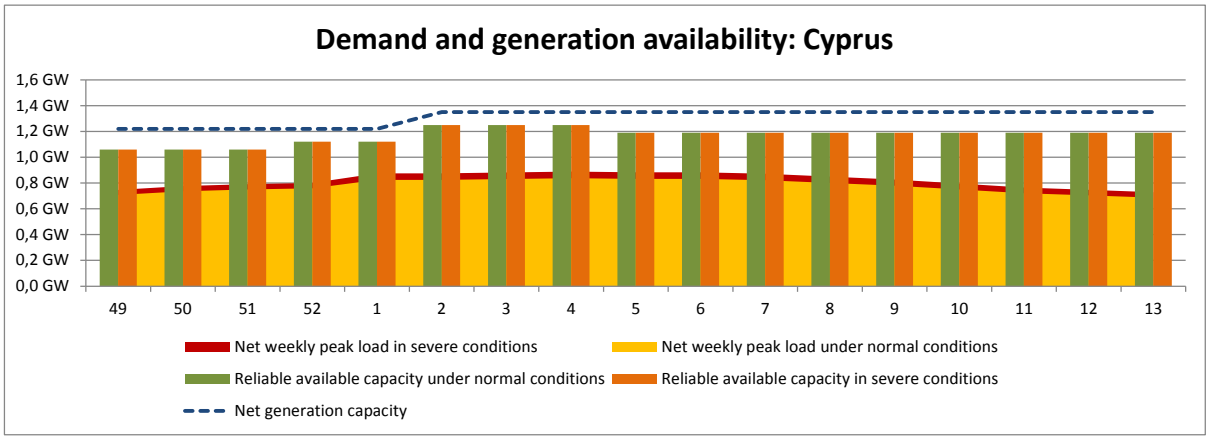
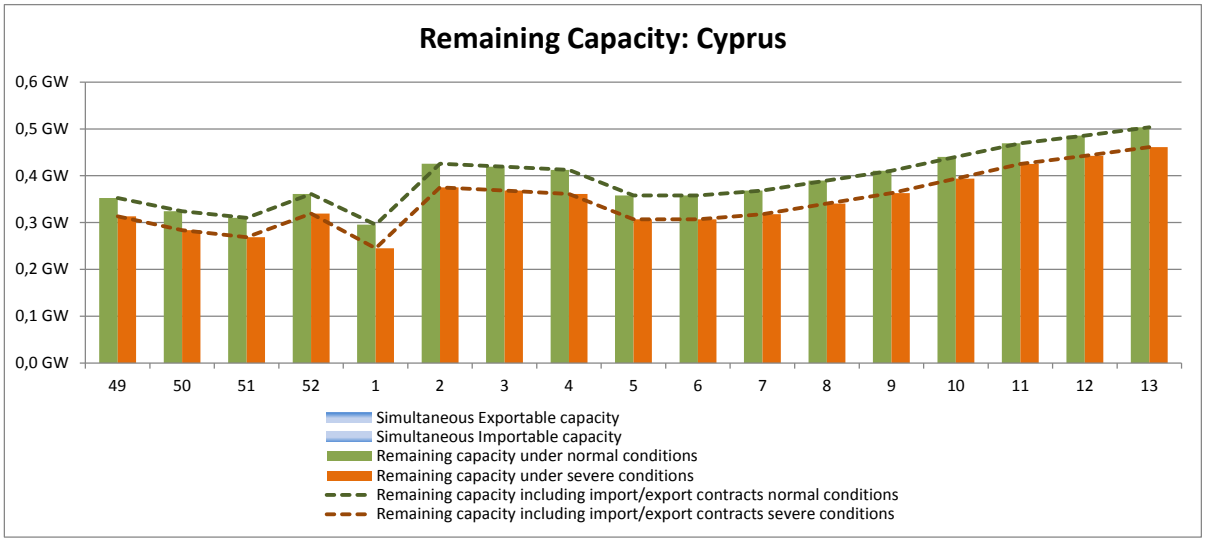
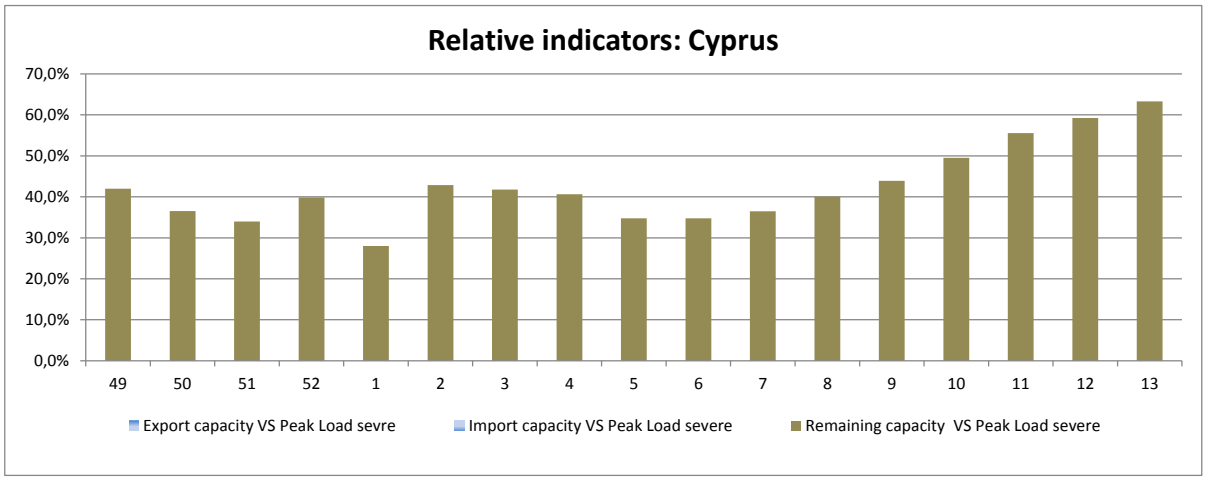

Demand and generation availability: Cyprus
1,6 GW
1,4 GW
1,2 GW
1,0 GW
0,8 GW
0,6 GW
0,4 GW
0,2 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Cyprus
0,6 GW
0,5 GW
0,4 GW
0,3 GW
0,2 GW
0,1 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Cyprus
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

CZECH REPUBLIC

For the upcoming winter, no issues are expected concerning the generation-load balance for CEPS under normal or severe weather conditions. This is also because of an increment in power production from CCGT unit of approx. 800MW. Interconnection capacity is sufficient to export spare generation capacity in normal operational conditions. There are no significant planned outages of interconnectors or other related lines during the winter period. The CEPS system can be hit by transiting power flows resulting from the high north-south market flows.

The results are based on studies performed in the framework of operational plans with the inclusion of power balances reports and load flow calculations concerning international cooperation in the scope of yearly adequacy operational forecast. These studies are made on a yearly basis using in-house developed tools, to assess the expected behaviour of load-generation balance. The method uses a stochastic probabilistic approach.

There are negligible changes from the previously submitted Preliminary Report. Forecast demand will be met with sufficient available capacity including reserve at any time over the winter. The weeks with the lowest margins are expected in the middle of January, although the remaining capacity is still sufficient. System adequacy relies on only a small contribution from renewable generation.

CEPS does not calculate outage rates by fuel category. We perform reliability studies concerning the outage model based on certain power levels, and therefore only aggregated values are provided. There is only one value for each time moment since historical data on outages are very sparse, hence data indication, at this moment, could be misleading.

With regards to submitted NTC values, no long-term calculation for the upcoming time period were carried out, and hence NTC figures are assumed to remain the same from previous WOR.

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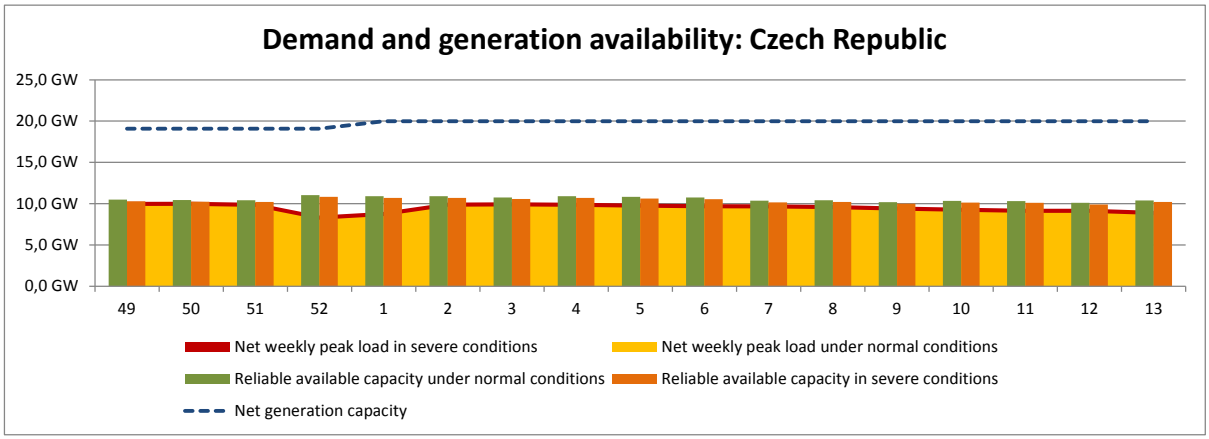
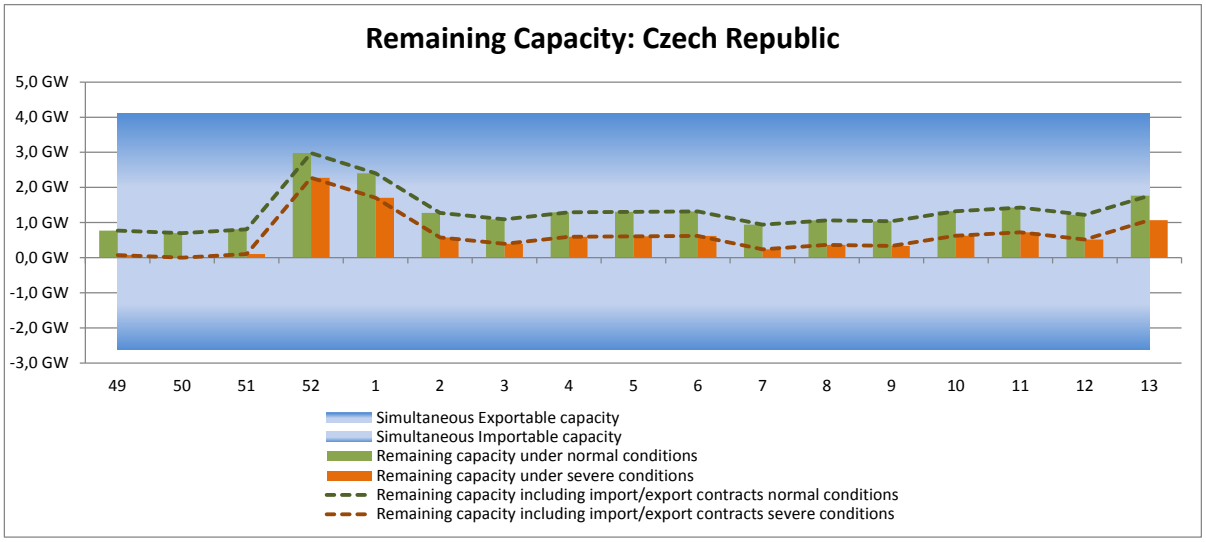
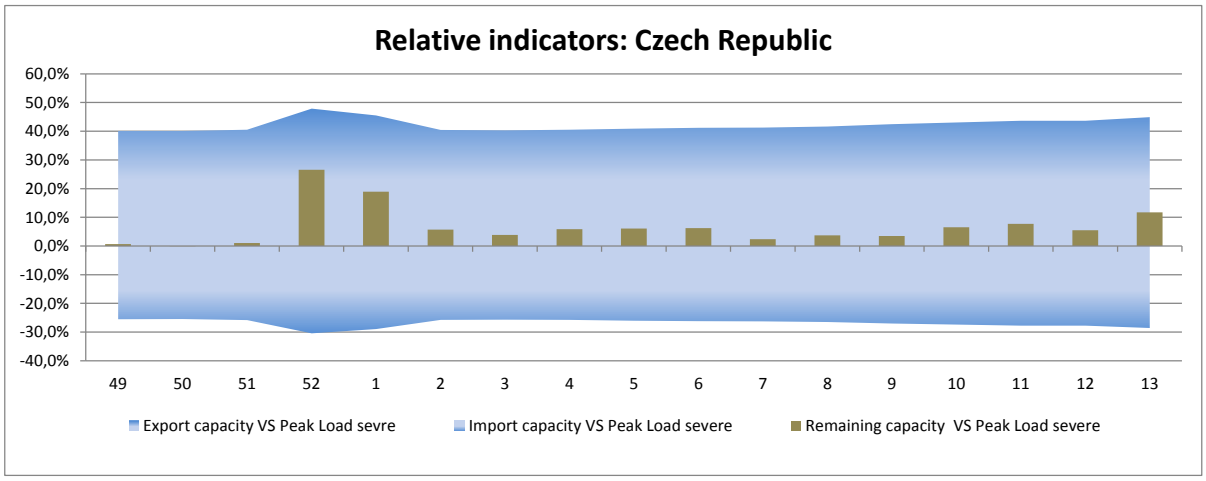

Demand and generation availability: Czech Republic
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Czech Republic
5,0 GW
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Czech Republic
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

DENMARK

The winter is expected to be quiet. Based on prior experience, there will only be very few overhauls and for that reason there will be full access to the interconnectors to our neighbouring countries throughout the winter period.

None of the mothballed plants are expected to be available. There will be no overhauls and several plants will be running due to district bonds.

As previously mentioned, the conditions in the Norwegian water reservoirs are very positive, meaning that there will be plenty of power from there. The power situation in Sweden looks equally positive and thus no shortage of power is expected either in DK1 nor DK2. On January 31st, block 3 of the plant in Ensted with 660MW is expected to be mothballed. However, this is not expected to give rise to any major difficulties.

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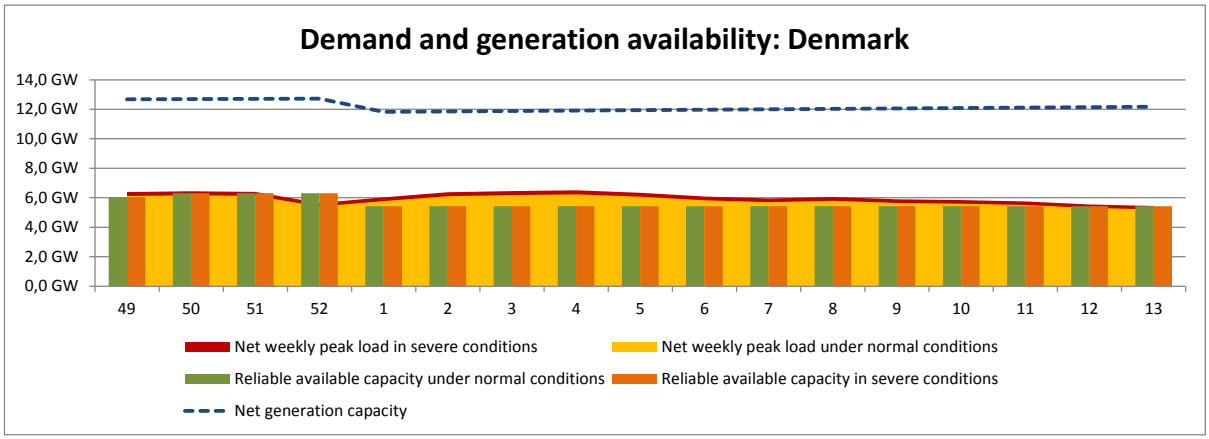
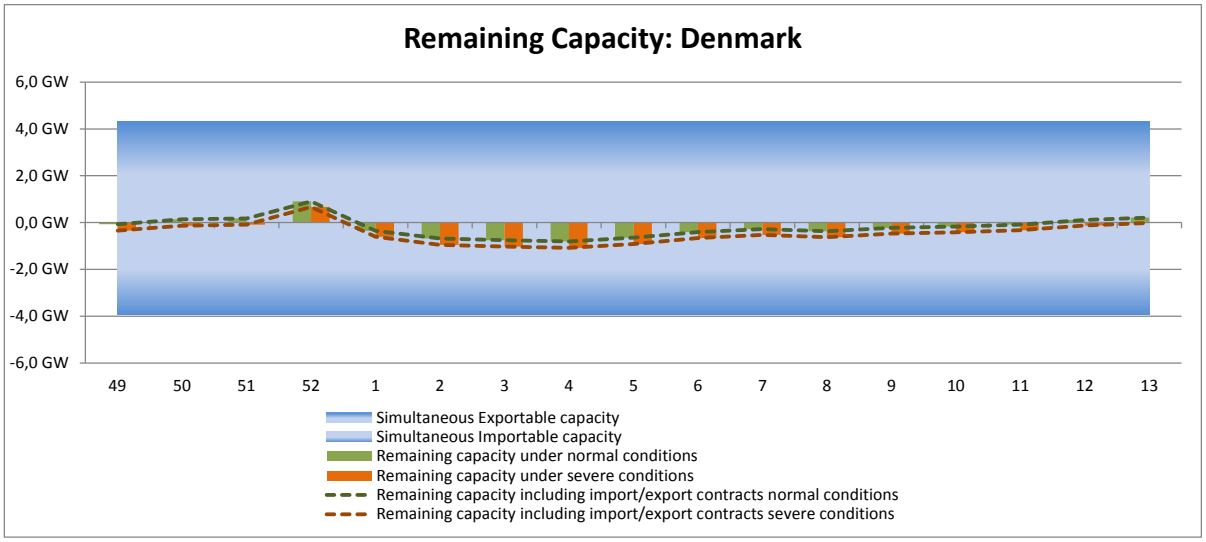
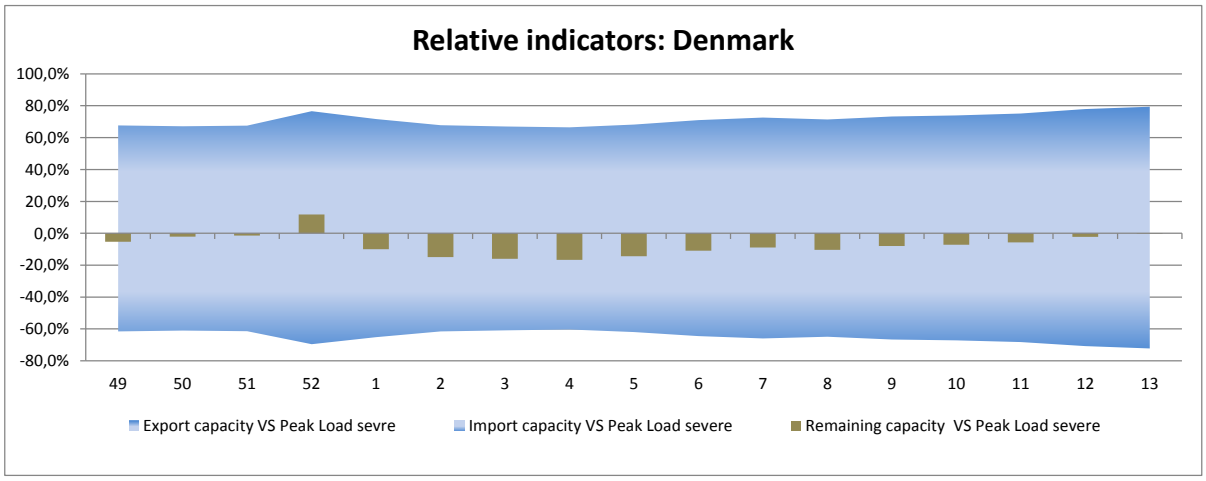

Demand and generation availability: Denmark
14,0 GW
12,0 GW
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Denmark
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
-6,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Denmark
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
-20,0%
-40,0%
-60,0%
-80,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

ESTONIA

The upcoming winter is expected to be normal with no extraordinary circumstances. Generation capacity in Estonia is considered sufficient to cover peak loads during the winter season and the power balance is expected to be positive even during severe conditions.

According to the statistics of previous years, the main period for high demand is from the beginning of January to mid-February (weeks 1 to 7), although we do expect to have enough available generation or transmission capacity for this period.

Considering the peak load of last winter as well as the statistics, the expected peak load for the approaching winter season is around 1600 MW.

Estonia does not expect to be dependent upon imports for the coming winter period.

Estonia expects that there will be a power flow from Estonia to Latvia, as Estonia has enough production capability to export to Latvia and to Lithuania.

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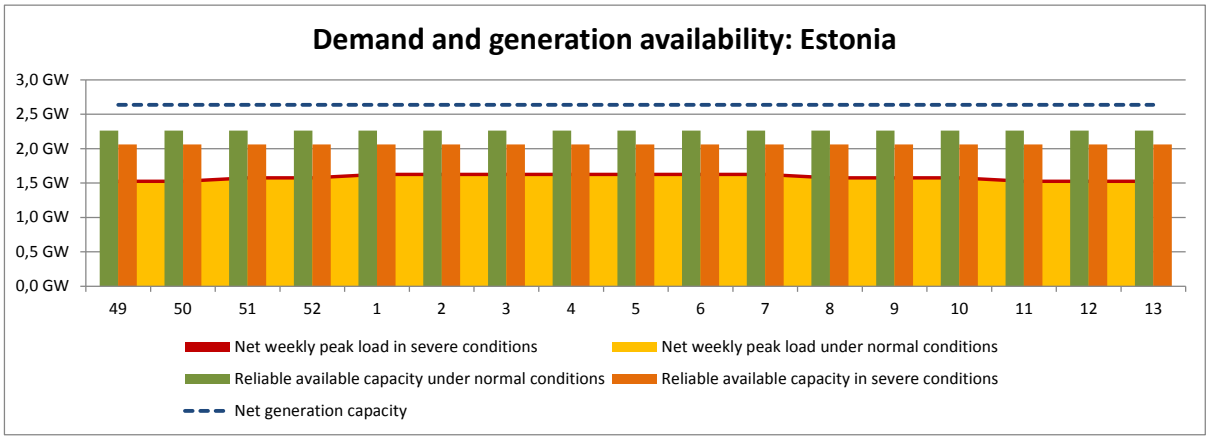
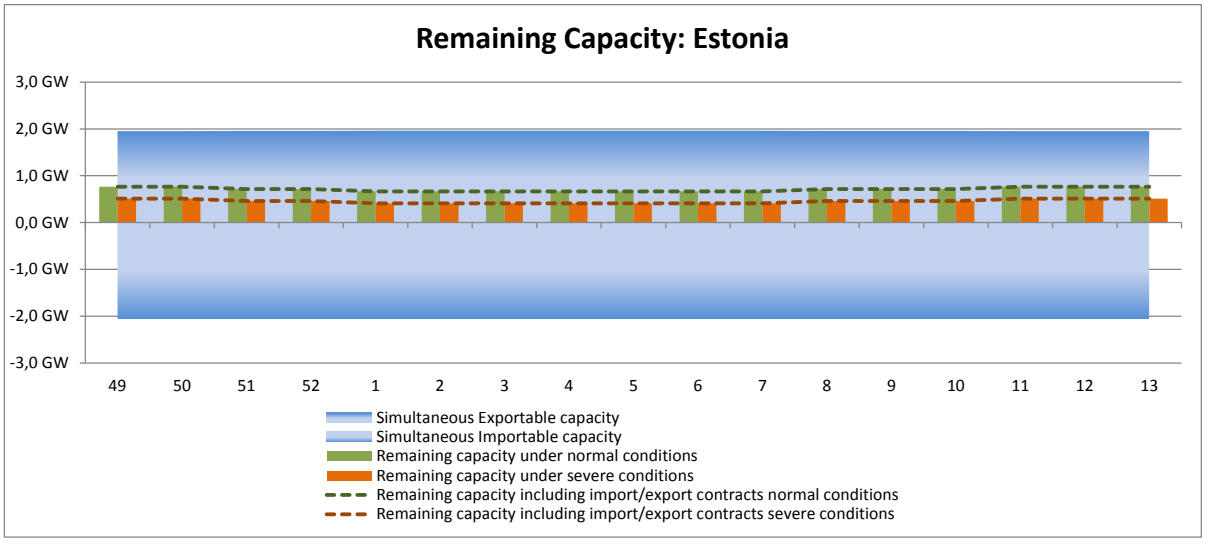
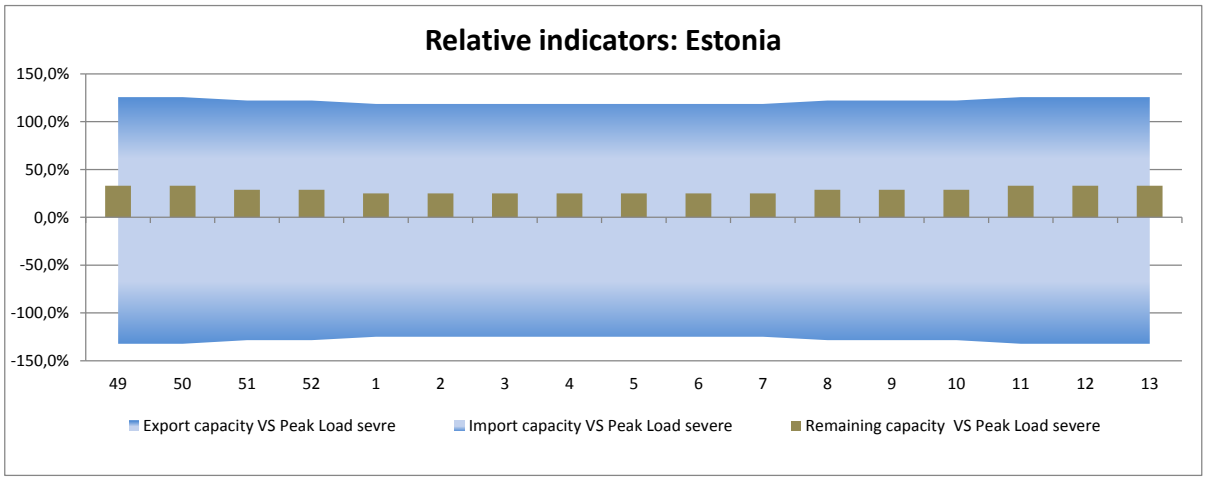

Demand and generation availability: Estonia
3,0 GW
2,5 GW
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Estonia
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Estonia
150,0%
100,0%
50,0%
0,0%
-50,0%
-100,0%
-150,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

FINLAND

'Finland is a deficit area in the power balance during peak hours. The balance is expected to be met with import from neighbouring systems. However, some uncertainty has arisen regarding the amount of imports from Russia due to capacity tariff on their market. During this year, import from Russia has been very limited.

In conclusion, the situation during the coming winter is expected to be very similar to the previous winter. The system adequacy during winter 2011-2012 was maintained without any difficulties.

In 2012 there are no remarkable changes in demand. Just a little additional generation capacity is coming on-line, with the exception of reserve power and wind power which do not increase reliably available capacity. The new reserve power plant in Forssa will increase 15 min reserves by 300 MW.

Finland is a deficit area in the power balance and hence dependent on power import during peak hours even in normal temperature conditions. Cold weather increases the deficit. Some uncertainty has arisen regarding the amount of import from Russia due to capacity tariff on their market. During this year import from Russia has been very limited. Finland is expected to manage the balance with the import possibilities from neighbouring systems.

Available capacity

In summary, available capacity is the TSO's estimate on the capacity which is available to the market during peak demand.

An estimate regarding non-usable capacity is based on public information from producers and on the TSO's own experience. The same data is used both for normal and severe conditions. Outage rates are not known by the TSO, although the number of mothballed units is known. It is very improbable that any of the mothballed units are put into operation and even if this were the case, it would take several weeks or even months. Otherwise the non-usable capacity is estimated based on the TSO's experience. The non-usable capacity includes estimated reductions because of very different reasons; hydraulic and icing conditions in hydro power, the electrical output of CHP plants is reduced in cold conditions as more heat is needed, outages, etc.

Special peak load reserve-management includes 600 MW of generation capacity. This capacity is reserved to be activated in case balance is not achieved between electricity bids and offers on the market. According to the management, this capacity is available from the beginning of December to the end of February. After this period the capacity is included in mothballed plants.

Yearly overhauls are carried out outside the winter season. Outages are not estimated separately but are included in the overall non-usable capacity.

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Role of interconnections

During peak hours, power balance in Finland is dependent on import. The interconnection capacity is sufficient to meet the power deficit.

All the existing transmission capacity between Finland and Sweden is foreseen to be available during the coming winter season. Export from Sweden to Finland could be reduced because of faults in the internal transmission connections or in the interconnections.

Some uncertainty has arisen regarding the amount of imports from Russia due to a capacity tariff on their market. During this year, import from Russia has been very limited. If the import from Russia remains very low there may well also be some scarcity in procurement of frequency controlled reserves. In addition to faults in the interconnection itself, severe faults in the generation or transmission connections in North-Western Russia might also cause restrictions on import.

The HVDC-link between Finland and Estonia, Estlink, is used for power exchange between the Baltic and the Nordic regions. No reductions are expected in the capacity. However, faults both in the link itself and in the transmission system could limit the transmission.

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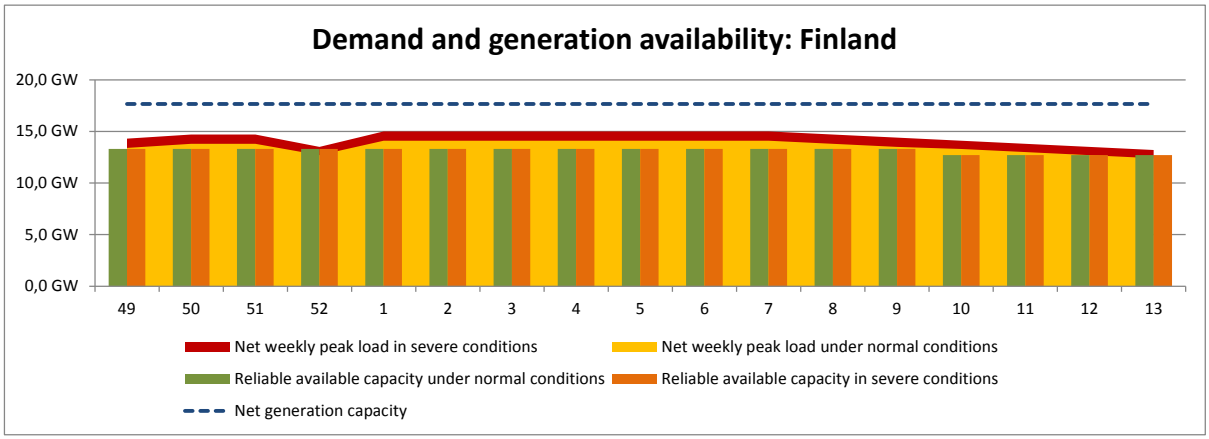
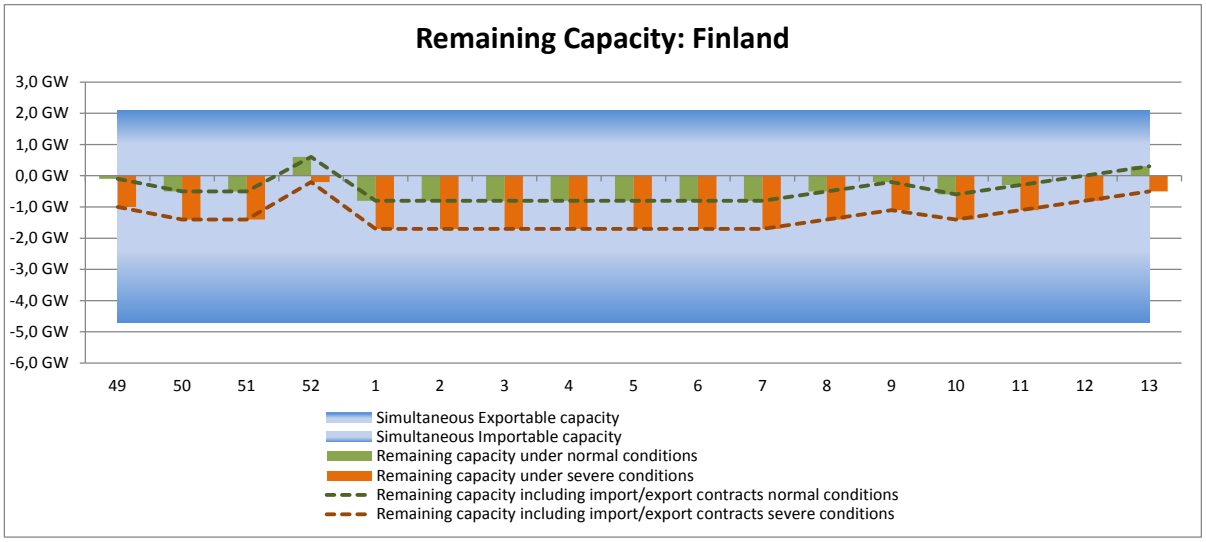
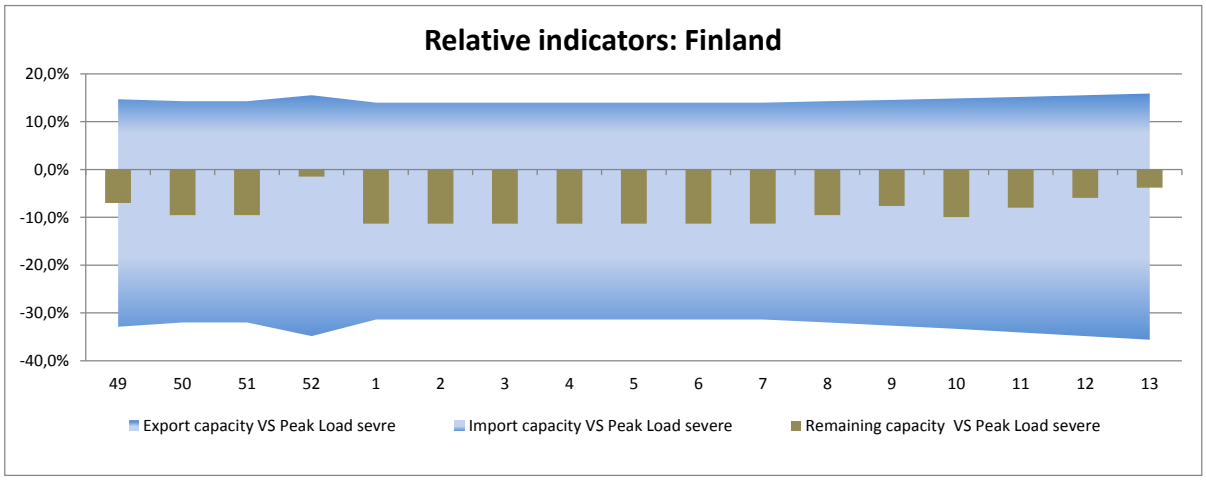
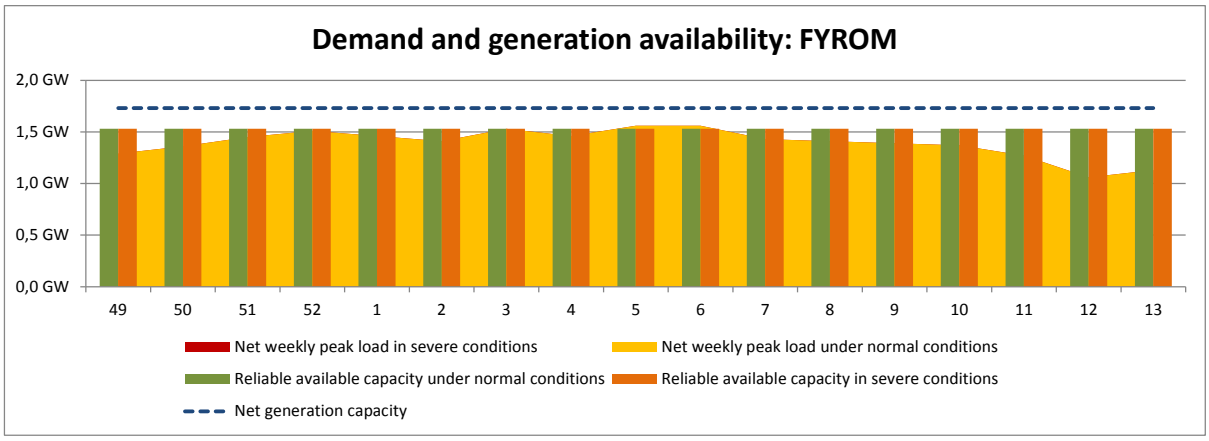
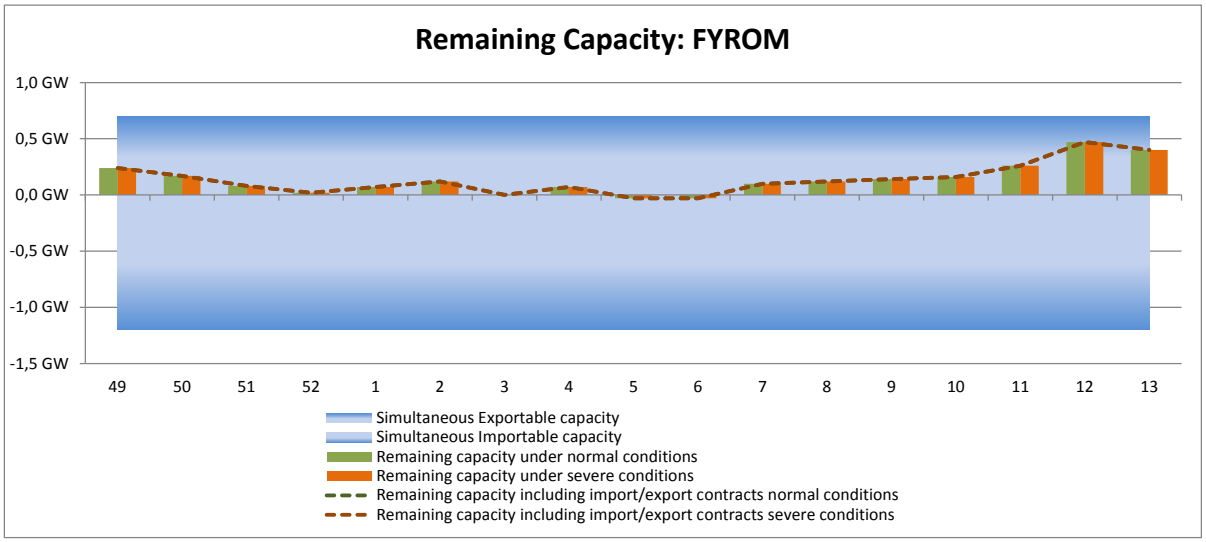

Demand and generation availability: Finland
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity

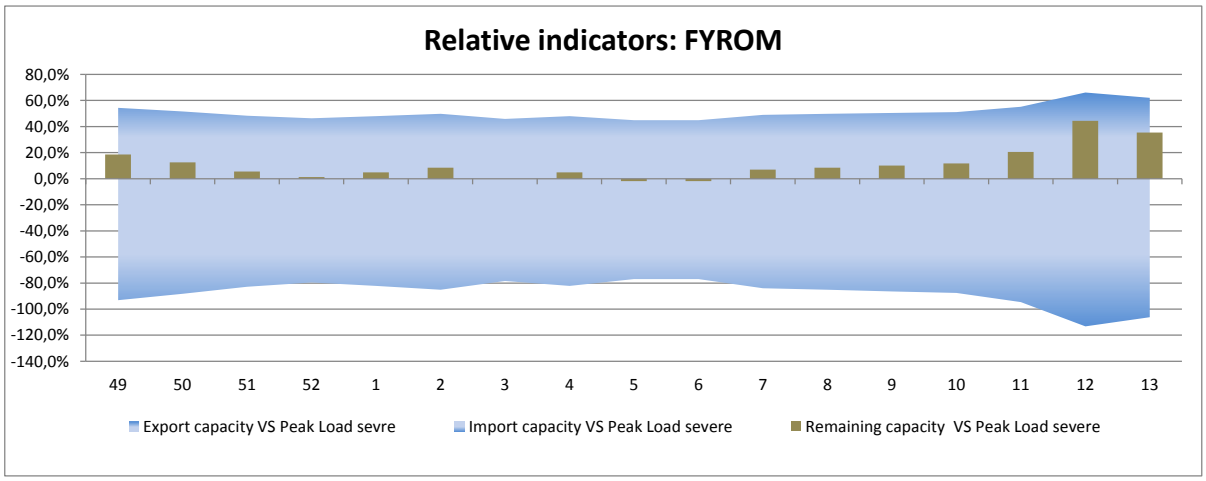

Remaining Capacity: Finland
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
-4,0 GW
-5,0 GW
-6,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Finland
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)







FRANCE

General Comments

An adequacy forecast study (probabilistic approach to simulate random situations of load and generation) is carried out each year for the November-March period, covering the whole of mainland France. It is published on the RTE website. For the coming winter, the main risk factors are the sensitivity of the load to low temperatures and unplanned outages of generating units. For France, severe conditions mean severe cold weather (high load sensitivity to temperature). The outage rates are calculated with the different data sent by the power suppliers. The values are the same for both Normal and Severe conditions.

Generation-Demand Balance

The generation – load balance on the French system should be maintained for the coming winter. The risk related to security of supply is mainly low, with a few periods (from the middle of January to the beginning of February) susceptible to moderate risks.

The weekly peak load is assessed for normal and severe weather conditions, whilst the weekly peak load takes into account load restrictions corresponding to the statistical value of load reduction available for customers with special contracts. It does not take into account the customers' offers on the Balancing Mechanism.

Demand under normal weather conditions:

- Demand forecast takes into account consumption trends (especially decrease of consumption in the energy sector), assuming temperatures are in line with seasonal norms.
- Maximum demand forecast is estimated at around 84,5 GW (unrestricted)

Demand under severe weather conditions (cold snap):

- A decrease in temperature of 1°C causes demand to rise by approximately 2 300 MW
- Maximum demand forecast is estimated at around 105 GW (unrestricted)

Generation under normal and severe conditions:

- The installed generating capacity increases thanks to more gas power plants and more wind generation.
- The overall availability of generating facilities is expected to be higher until the end of December, compared to the last winter.
- No reduction of generation in severe conditions.

Wind generation is estimated:

- thanks to average generation observed during last winters.
- taking into account new wind generation units.

RTE does not take into account solar generation for winter studies (peak load during winter occurred at around 7 pm). Hydro level and inflows are supposed at their historical average value. Outages capacity is calculated for each week considering the unavailability rates of thermal units. Overhauls are consistent with the last schedule given by the Producers to RTE (beginning of September). A sensitivity analysis can be carried out if needed.

Under severe conditions, some imports up to 5000MW could be needed in the middle of January.

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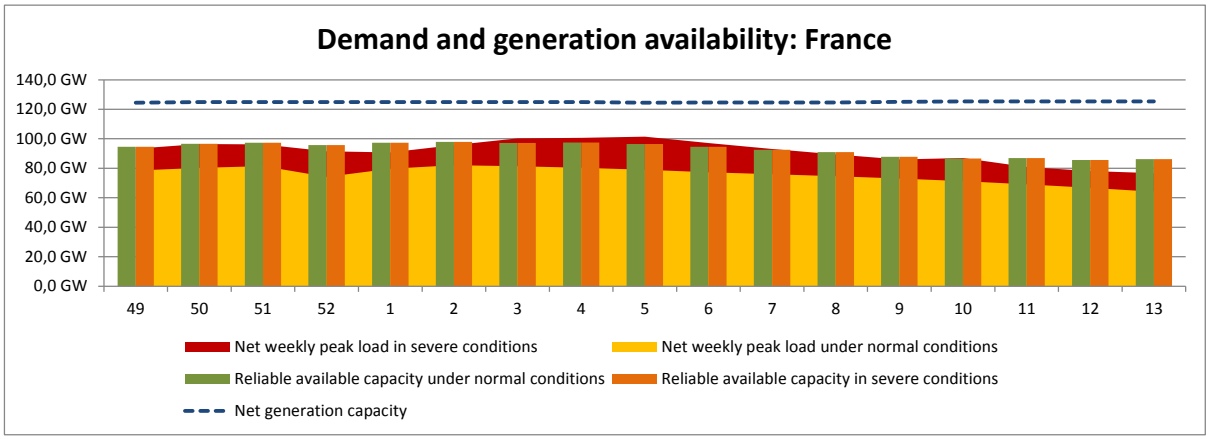
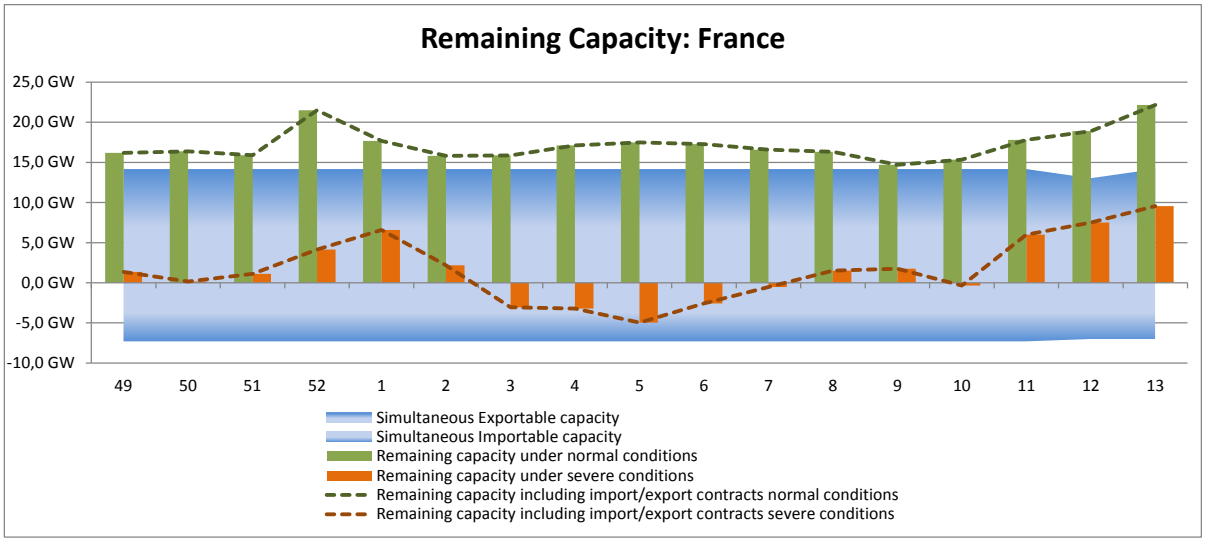
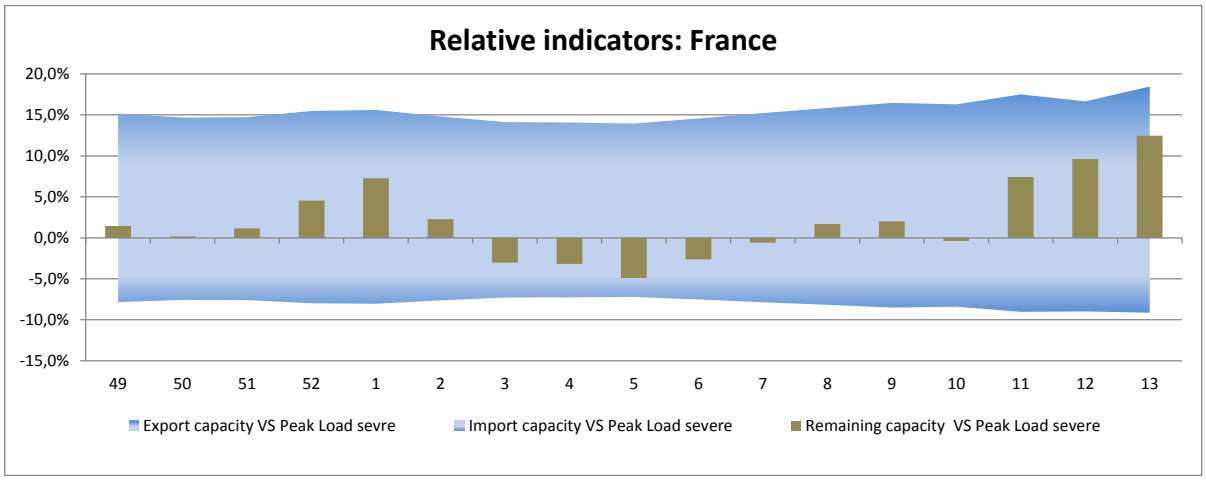

Demand and generation availability: France
140,0 GW
120,0 GW
100,0 GW
80,0 GW
60,0 GW
40,0 GW
20,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: France
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
-5,0 GW
-10,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: France
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
-15,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

GERMANY

General Comments

Compared to previous outlook reports, the data basis for German adequacy evaluations has been expanded through the incorporation of available distribution system operator data. This leads to an increase in both installed generation capacity and load as demonstrated in the data table. Hence, these values are not directly comparable to previous data.

Nonetheless, there is still a lack of data meaning that further improvements to the database are necessary. In combination with the utilised estimations necessary e.g. for outages, this means that possible sources of errors are present in the current data.

Generation-Demand Balance

After the first step of the Nuclear Phase Out in Germany last year and a resulting stressed winter period in 2011/2012, German TSOs are still facing a situation characterised by the enduring regional lack of conventional generation, primarily in Southern Germany. At the same time, the commissioning of important conventional power plants in Germany has been further delayed.

Learning from last winter, a situation with high load, low RES feed-in, high exports to support the neighbouring countries and an additional gas shortage has to be considered. In such cases of reduced availability of gas power plants, according to the current state of knowledge regarding TSOs in Germany, approximately 4-5 GW of installed capacity could drop out due to interruptible gas supply contracts. This may, in the context of the power balance, further reduce the remaining capacity in Germany. A substantial reduction of available gas power plants can affect system security. Gas-fired units, especially those located in Southern Germany, would no longer be usable for the German TSOs when it comes to re-dispatching purposes and coping with the once again expected high North-South flows. To limit the resulting risks, the most important gas power plants shall be equipped with non-interruptible gas supply contracts.

RES are continuously installed at breakneck speed. For southern Germany, this is attributed largely to distributed PV generation. At the end of the year 2012, the installed capacity of PV generation in Germany is expected to reach approximately 33 GW. This means an increase of around 9 GW in this year. The German government has cut down the financial subsidies for photovoltaic power plants; nevertheless, a notable reduction in the fast increase of installed PV capacity is not expected soon. The installed capacity of wind power plants is expected to increase by approximately 3 GW reaching 31 GW. However, for the winter period with load maximum in the evening, PV generation does not contribute to the coverage of demand while wind feed-in is not guaranteed.

It is possible that for high load and low RES feed-in, the system adequacy might not be fulfilled for the upcoming winter and Germany could depend on imports. Being faced with these risks to security of supply, the German TSOs are again preparing a high number of grid- and market-related measures e.g. re-dispatching with an increased amount of power to be shifted between control areas. To cover the once again anticipated very high re-dispatch demand. Indeed, for the last winter, the German TSOs planned to contract an additional reserve generation capacity of approximately 2 GW located in Southern Germany and in Austria for the winter of 2012/2013.

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Role of interconnectors

Furthermore, in the winter period the German TSOs may be faced again with problems to meet (n-1)-security rules, especially in situations with high wind feed-in in the North and high load in the South of Germany. In these situations, an excess of transmission capacities of network elements in the important transmission axes from North to South has to be expected.

On the other hand, the retrofitting of the NPP Biblis A into a rotating phase-shifter and the commissioning of the capacitors in Bürstadt approximately at the beginning of the upcoming winter period improves the situation for voltage control in the area of South-Hessen/Northern Baden-Württemberg. The commissioning of a Görries-Krümmel tie-line in the middle of December 2012 will lead to an increase in the transport capacity between 50HzT and TenneT and will significantly improve the voltage situation in the Hamburg area.

Compared to the conditions in the winter of 2010 / 2011 before the Fukushima catastrophe, grid security margins are expected to be substantially lower and comparable to the situation in the last winter season. Indeed, German TSOs expect the amount of interventions required to maintain system security to be on a similarly high level compared to the winter of 2011/2012.

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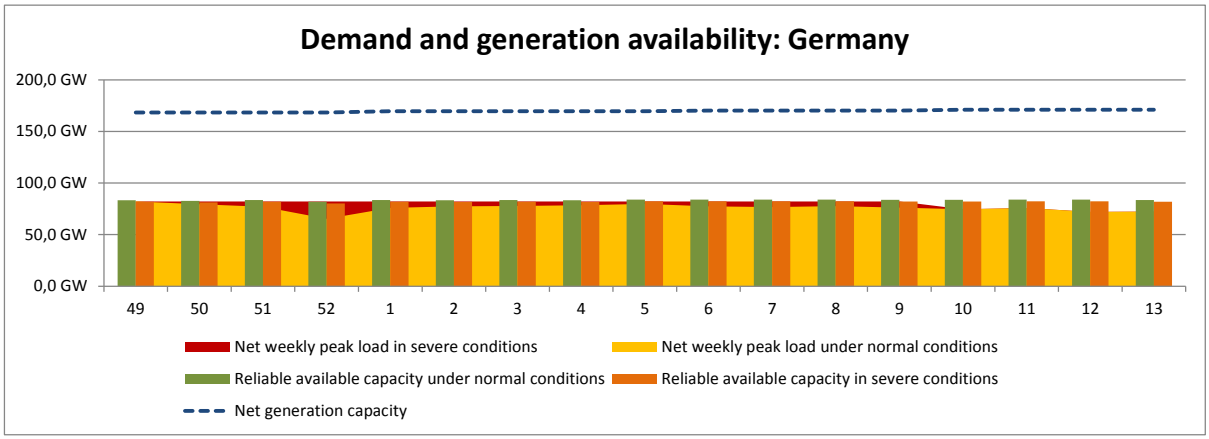
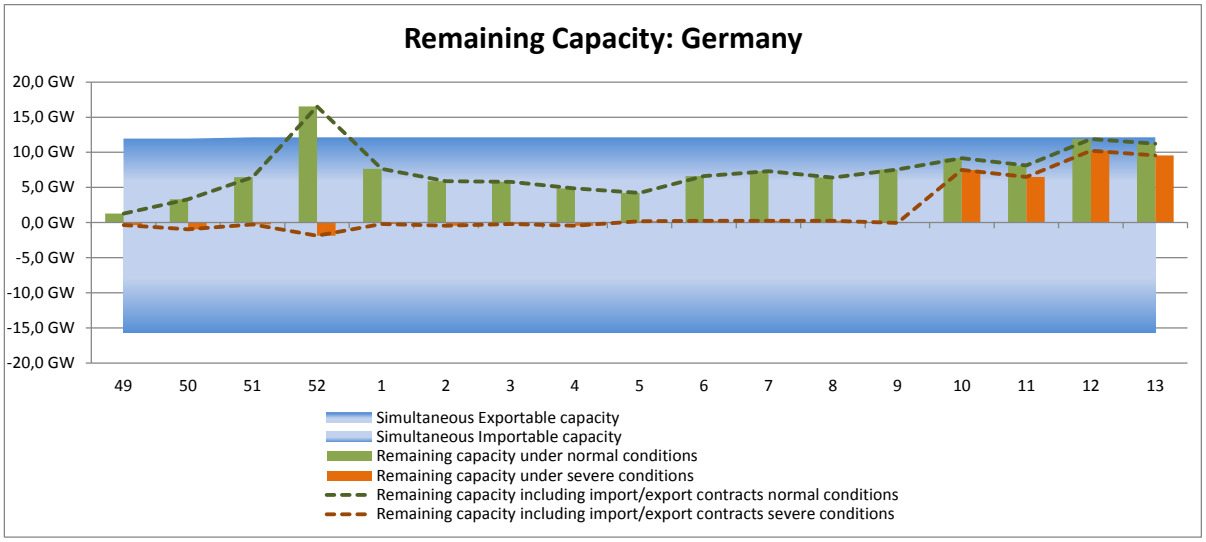
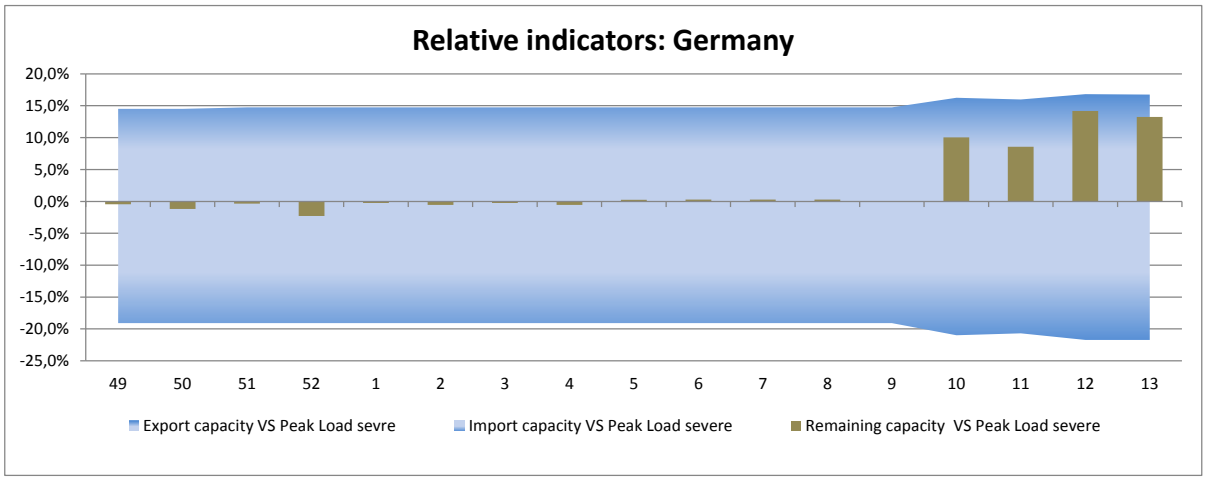

Demand and generation availability: Germany
200,0 GW
150,0 GW
100,0 GW
50,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Germany
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
-5,0 GW
-10,0 GW
-15,0 GW
-20,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Germany
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
-15,0%
-20,0%
-25,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

GREAT BRITAIN

General comments

The margin between generation and demand is expected to be comfortable based on normal temperatures and expected levels of generation availability. Under severe weather conditions (1 in 20 cold temperatures), forecast demand including reserve would still be met as long as there were no interconnector exports. Interconnector flows to France and the Netherlands are expected to continue to be closely correlated with price spreads, with both exports and imports likely. Even with maximum interconnector exports, demand could still be met in full during severe (1 in 20) weather conditions, although there would be an erosion of reserve levels at the time of the daily peak. Margins are forecast to be broadly similar throughout the winter, with a slight increase possible towards the end of winter.

Generation-Demand Balance

No credible risks which would threaten system adequacy have been identified. The system does not rely on any significant contribution from renewable sources. Forward prices strongly favour coal ahead of gas burn for electricity generation; as such, should there be very cold weather there should be adequate gas storage to meet the increased demand.

Based on assumed generation outage rates;

- Sufficient capacity will be available to meet forecast normal demand and full interconnector exports and reserve requirements.
- Sufficient capacity will be available to meet forecast 1 in 20 demand and full interconnector exports, although in this scenario reserve levels are likely to be eroded at the time of the daily peak.

Generation outage rates used in the analysis behind the summary above are based on historic averages for winter weekday peaks, whilst the same rates have been used for both normal and severe conditions as there is nothing to suggest any deterioration under severe conditions. Mothballed plants have not been shown as these units have already been accounted for in the net generating capacity figures.

The contribution from wind powered generation has been assumed to be 10% of the currently installed capacity based on historic levels of wind generation at the time of previous winter peaks. This amounts to 0.5 GW and is therefore not significant. Generation from run of river hydro plants is also uncertain as it is dependent on levels of rainfall. Availability is assumed to be 75%, which amounts to 0.8 GW, and has been estimated in line with the average from previous winters. Due to a transmission capacity limit between Scotland and England, there is a risk that some generation in Scotland may be sterilised as mentioned above, particularly during periods of high wind generation, although this has been accounted for in the reserve requirements.

No problems are expected with inflexible generation during overnight minimum demand periods during the winter.

Role of interconnectors

The capacities of the interconnectors are the forecasts submitted by the operators. Power taken by the Northern Ireland interconnector from Scotland has no effect on the generation – demand balance, as any export merely reduces the amount of generation sterilised behind a

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transmission constraint between Scotland and England. Imports from Northern Ireland may be limited due to a local transmission constraint depending on the volume of wind powered generation.

The new interconnector to Ireland (0.5GW) is currently nearing the end of its commissioning period and is due to go into commercial operation.

Power flows on the interconnectors with France and the Netherlands are in accordance with the energy traded by market participants and the net flow can be in either direction up to a total of 3 GW. There is a likelihood of exports to mainland Europe over the peaks. Indeed, this is manageable in all scenarios except for the 1 in 20 or worse cold weather conditions when exports could erode some of the reserve requirement.

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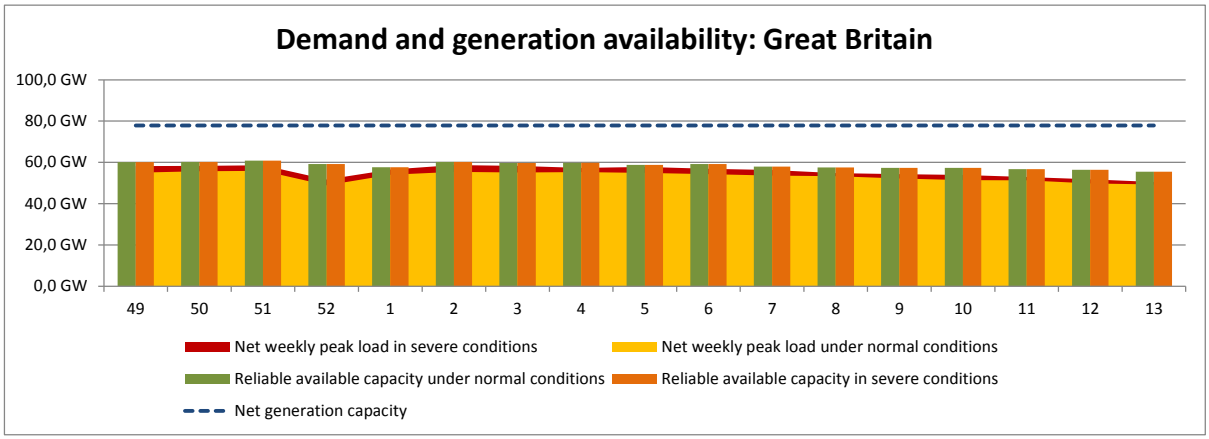
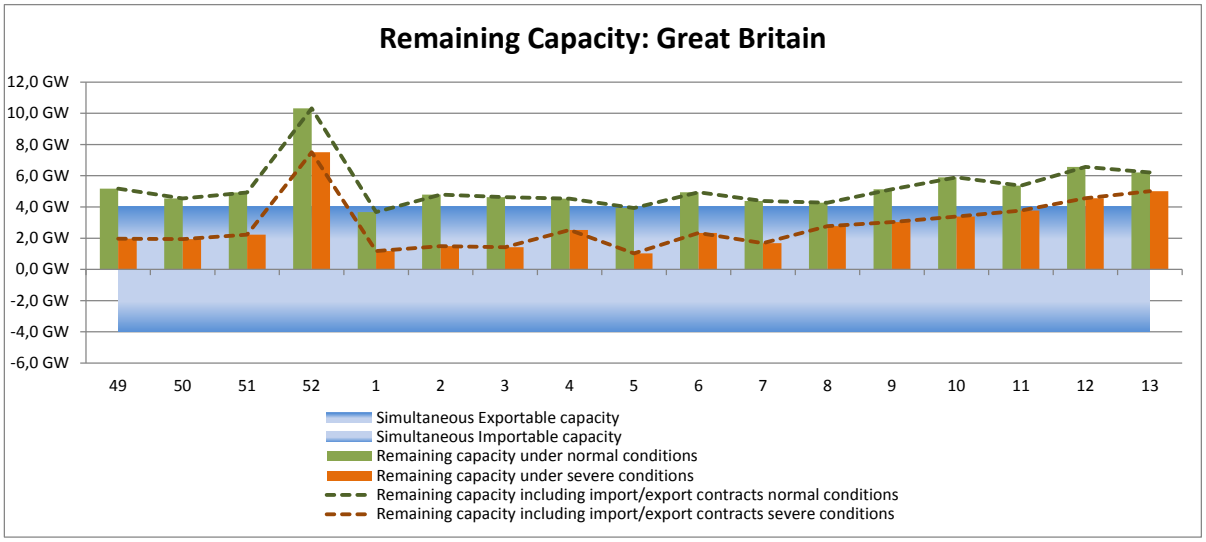
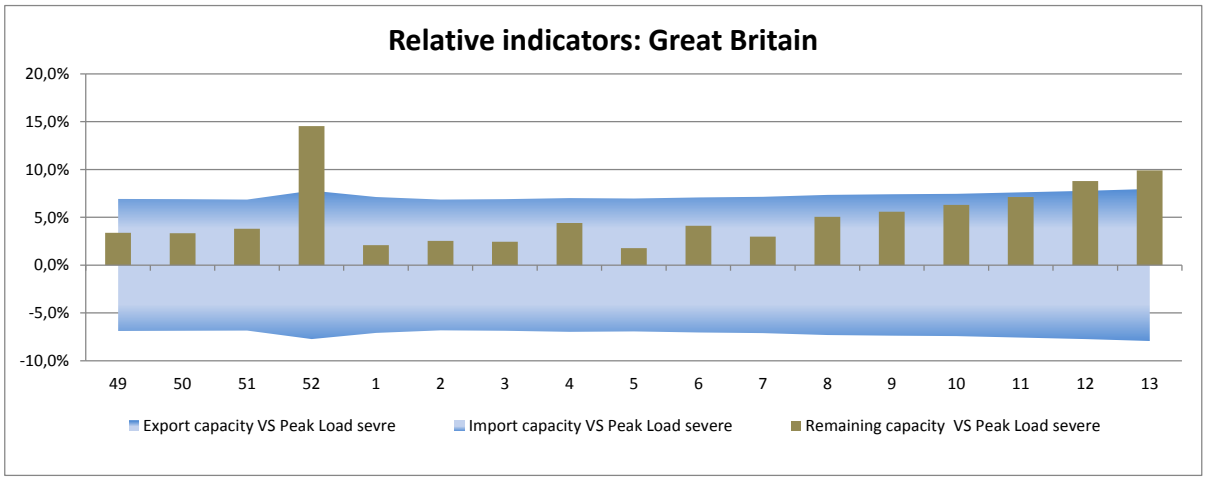

Demand and generation availability: Great Britain
100,0 GW
80,0 GW
60,0 GW
40,0 GW
20,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Great Britain
12,0 GW
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
-6,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Great Britain
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

GREECE

For the upcoming winter season 2012 - 2013, it is thought that the adequacy and security of the Greek interconnected system will not be threatened under normal weather conditions, taking into account the available importable capacity of interconnections. The hydro conditions were very good this year, thus meaning that the water reserves are at the sufficient level.

The northern interconnections have been strengthened with the new 400KV connection between the neighbouring systems of Greece and Turkey (Phase C of Trial Parallel Operation CESA and TEIAS systems which has been extended for one year) and have increased the capacity from the northern neighbouring systems. This has had a positive effect on the facilitation of energy exchanges in the region.

The most critical period remains during December and January. Moderate imports are needed to meet our operating criteria under normal conditions.

In the case of severe conditions, the usage of the maximum available import capacity of the interconnections will be needed. Extreme conditions are not expected for the winter season.

The Greek system is expected to be in balance in the upcoming winter period (2012-2013). The expected commissioning of a new unit in the system, the good hydraulic storage of hydropower stations and the strengthening of the northern interconnections, ensure the adequacy and security of the Greek interconnected System, which is not threatened under normal or severe weather conditions.

In the long term, a System Load Forecast study covering both energy and yearly peak load is carried out every year. The results are included in the study for Transmission System Expansion Plan issued by IPTO and published upon approval of the Regulatory Authority for Energy and the Ministry of Development of Greece. In this frame, monthly peaks are also calculated.

In the medium and short term, IPTO conducts studies concerning the Generation Adequacy Assessment. The studies include load forecasts and multiple scenarios on energy management using deterministic methods. The energy management studies aim to assess the actual energy situation and the level of hydro reserves. These studies are regularly revised to include mainly variations in the load and/or the availability of the thermal units.

IPTO regularly performs studies designed to assess midterm generation adequacy. These studies usually focus on a five year period, and take into account the most recent information available to IPTO regarding the foreseen evolution of loads and expansion of the generation system. The main purpose of these studies is to evaluate the possible risk concerning the ability of the generation system to cover the future demand, as well as determining necessary enhancements of the generation system, thus providing signals to the market. Based on the adequacy assessment, IPTO may take emergency measures, such as calling for tenders for new generating or reserve capacity.

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Due to the random nature of parameters involved in the operation of a generation system (evolution of loads, unit availability, hydraulic conditions, etc), adequacy is assessed through the commonly used reliability indices LOLP (Loss of Load Probability) and EUE (Expected Unserved Energy).

Annual production simulation is performed in order to calculate the above-mentioned reliability indices, for every year of the period under consideration. Furthermore, the additional capacity, if any, required to meet the forecast demand with the desired level of reliability is determined. Simulation is performed by the probabilistic production costing model which simulates the operation of a power system for a given time horizon and computes the energy balance, the cost of operation, the polluting emissions and finally the generation reliability indices.

A large number of scenarios are examined in order to evaluate the impact of parameters with significant uncertainties, such as hydraulic conditions, RES generation, and availability of imports through interconnections with neighbouring counties.

The IPTO uses the power balance studies to assess system adequacy in the very short term, thus meaning that the required information, on a weekly basis for the winter period, is not currently available.

To underline the most critical periods of next winter, this report focuses on the monthly peak demand. The power balance is based on the results of the UCTE System Adequacy Report – Forecast 2008-2020 and on the IPTO energy management studies for the generation adequacy report, in addition to the experience of IPTO's personnel who are responsible for the System Operation.

Best estimate of the minimum NTC for IPTO that we anticipate is given in the excel spreadsheet.

With regards to national generating capacity, the total net output thermal capacity will be increased by one unit of 430 MW, in relation to the previous year. This new thermal unit, in combination with the good hydraulic storage of hydropower stations and the strengthening of the northern interconnection lines, ensures the balance of the Greek system.

A provisional overhaul schedule of the thermal power plants for the next year is communicated to IPTO by the generators. The final schedule will be agreed between IPTO and the generators, having taken into account the forecasts carried out by IPTO. The overhauls of the thermal power plants are avoided during periods of high demand. In this assessment, the provisional overhaul schedule of the thermal units has been considered. As for the overhauls of the hydro power plants, they are implemented during periods of low use, including low water reserves or low load periods. Therefore, the scheduled outages of the hydro power plants do not affect the remaining generating capacity.

In this assessment, the unavailability of the thermal power plants due to forced outages has been calculated according to the provisions of the new 'Grid Operating and Power Exchange Code'. The forced outage rate of the thermal generating units is expressed by the Equivalent

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Demand Forced Outage Rate (EFORd). According to the calculations, a commonly held assumption of two typical large units of 300MW each is considered out of operation due to forced outages.

The non-usable capacity includes mainly capacity of wind power plants. The hydro conditions were very good this year meaning that the water reserves are at the sufficient level. The water management aims to save the water reserves to use them at the peak demand and only for irrigation requirements. As for the capacity of the wind power plants, an average of 78% is non-usable at the winter peak.

The monthly peak load is calculated for both normal and severe conditions. Monthly peaks, as well as yearly peaks depend heavily weather conditions, mostly temperature. A statistical approach is followed based on recorded hourly load and temperature data covering the period since 1997. For the winter peak load, the dependency of the load on the temperature averages 150 MW/C.

The load is the sum of two components. The first one reflects the load sensitivity to the weather (temperature, humidity), while the other one is dependent on miscellaneous effects (financial and human activities). The net monthly peak load calculated for normal conditions represents the 90% probability of not exceeding the forecast maximum, while in severe conditions the respective probability is 97.7%. The losses of the transmission system are included in the monthly peak load.

The financial crisis has lowered the expectations to electricity consumption, which has improved the balance.

In recent years, the usage of gas as fuel of production units has continuously increased. For the coming winter, there are no estimated problems concerning gas, because the import of gas in the country has two different paths. The first path is through the north borders of the country whilst the other is a type of LNG stored and converted to gas in the relevant installations which supplies the main transmission grid of the gas.

Load reduction is available should the decision be made by the Ministry of Development and the Regulatory Authority for Energy. However, in this report no load reduction measures are considered. System services include primary, secondary and tertiary reserve according to the ENTSO-E OH Policy 1.

The NTC values were submitted by making estimations according to:

-The total NTC values (yearly + monthly + daily) of the last 3 months, both for imports and for exports, per direction and per border.

-The total NTC values (yearly + monthly + daily) of the same period (winter months) of the last year, winter 2011, both for imports and for exports, per direction and per border.

In the IPTO control area, there are no installed nuclear power plants. The neighbouring country Bulgaria has some nuclear power units whose operation is extremely crucial for the general balance of energy in the Balkan area. Indeed, the non-operation of these units could possibly change Bulgaria from an export country to an import country.

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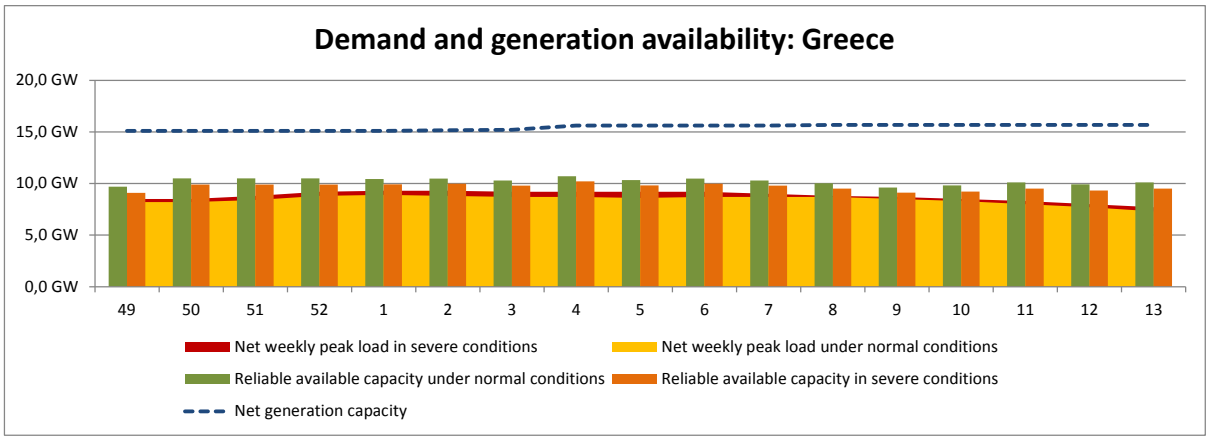
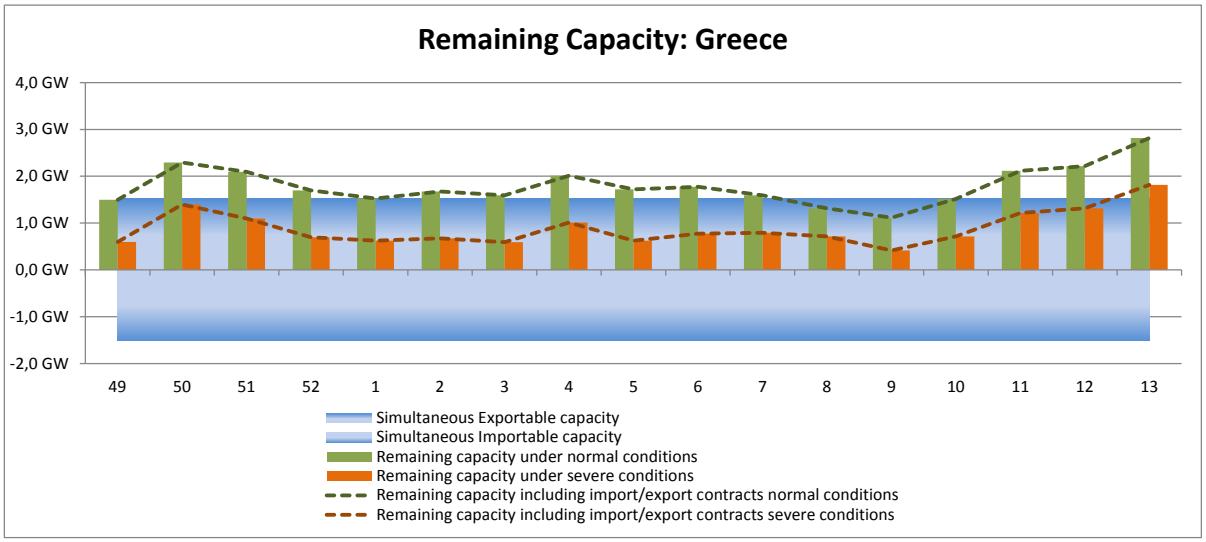
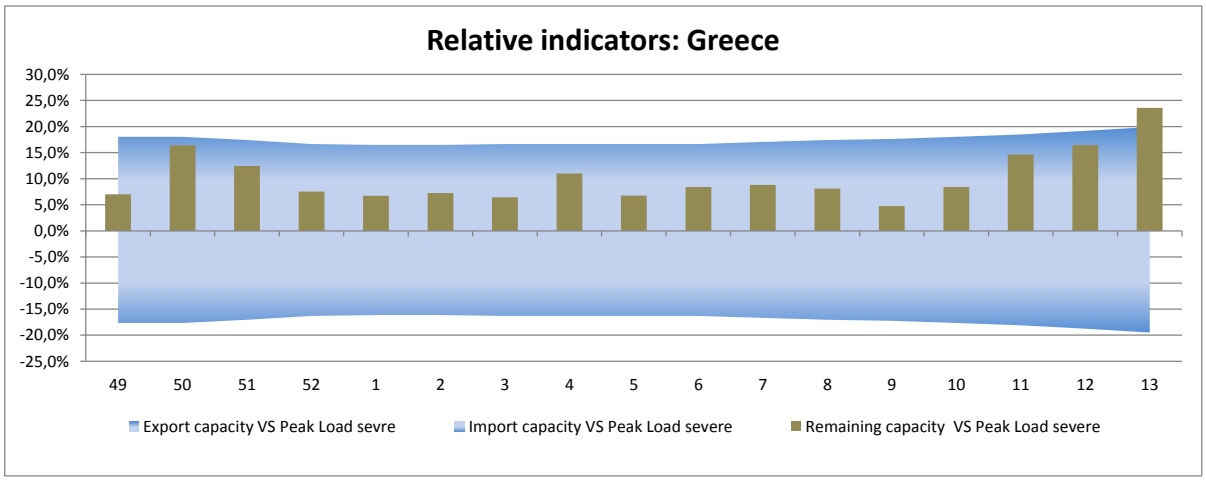

Demand and generation availability: Greece
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Greece
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Greece
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
-5,0%
-10,0%
-15,0%
-20,0%
-25,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

HUNGARY

It is a historical feature of the Hungarian power system, that most of the time the required adequacy margin can only be guaranteed with a considerable amount of import. Several years are needed to overcome this handicap.
The generation capacity is essentially gas based, whilst the majority of the units are old, inflexible and relatively expensive. The most critical periods are caused by the severe weather conditions, since the units are temperature dependent. The critical weeks are expected to be in February and March.

After liberalisation, import is mainly an issue for the traders, whilst available interconnection capacity is satisfactory. To be able to handle any unanticipated case, such as crisis of the primary fuel, the producers also have to store alternative fuel.

In spite of the growing uncertainty on both the generation and demand side, as a result of liberalisation on the one hand, and promotion of intermitted generation on the other, the Hungarian power system is expected to be on the safe side during the next winter period.

However, there are a few risks which must be carefully managed by the TSO. These risks are:

- Availability of fuel, first of all that of natural gas. During long-lasting cold winter periods, demand for natural gas becomes very high in households and at power plants at the same time. Therefore, a well-functioning gas market, as well as satisfactory replacement fuel reserves at generators are essential to keep the lights on. A high capacity gas storage was built so that the security of the gas supply could be increased.
- The required level of remaining capacity can only be guaranteed by a certain amount of import, mainly under severe conditions. Cross-border exchange is a matter of economy for market players. Their decision-making can be influenced by contractual conditions, e.g. on reserves.
- Overall cross-border capacity is satisfactory, however, allocation of cross-border capacity rights on the respective border sections may be an issue.

The reference adequacy margin at weekly peak is 0.5 GW, the capacity of the largest generation unit in the power system.

The Hungarian TSO (MAVIR Hungarian Independent Transmission Operator Co.) maintains a deterministic yearly rolling capacity plan.

For this purpose, load forecast, generation maintenance schedules, required international exchange of electricity, and forecast production of intermitted generators are determined on a daily basis. The necessary data and information comes from the statistical database of the TSO itself, or from the generating companies and other market participants.

There are three scenarios for average, severe minimum and severe maximum loads.

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The necessary reserve level is determined in accordance with the procedure described in the ENTSO-E Operation Handbook, taking into consideration the specialties of the Hungarian power system.

The plan is updated and published monthly on the website of MAVIR, combined with actual data.

Generation capacity – Hydro generation is unfortunately not considerable. Mothballed capacities are practically not available under any circumstances. Renewable energy (mainly biomass and wind) and co-generation has a portion in the generation mix, whilst their operation is very much legislation-sensitive, i.e. difficult to predict – take-off is obligatory, on regulated prices. Wind generation (0.33 GW at the moment) due to its low availability is not taken into account in the balance (i.e. calculated as non-usable capacity at peak load).

Demand – Overall demand level depends on the state of the economy. Weather sensitive extremes can be handled by using different scenarios. Demand-side management is an efficient tool, but it is in the hands of the supply companies, and therefore this is a considerable uncertainty for the TSO, resulting in higher reserve requirement.

System services reserves – Our requirement for primary, secondary and tertiary reserve is calculated with respect to the ENTSO-E OH Policy 1, taking into consideration the Hungarian specialties. These specialties include weather dependent wind power production or the previously mentioned demand.

Remaining capacity – Secure operation requires at least 0.5 GW of remaining capacity during the weekly peak demand periods, even under severe conditions (i.e. the capacity of the largest generation unit in the power system). It can currently be provided partly by import capacity.

Interconnection capacity –Since the Hungarian Power System is part of the highly meshed Central-European network, volatile transit flows are comparable to the NTC values, stated in the excel attached. Therefore, cross-border trade is considerably limited by transit flows. However, cross-border capacity is, more often than not, available for the necessary amount of import.

International exchange – The Hungarian electricity market is traditionally import-oriented, whilst the import part is high. After liberalisation had been completed, international exchange became much more sensitive to market conditions, even in the short-term. The Hungarian TSO does its best to stimulate, or even oblige market players through market rules (pricing of balancing energy) and contracts (on provision of reserve power) to ensure the required level of import, and thus to guarantee reliability of the power system. For the time being, a high amount of import energy is available on the market, which increases our security.

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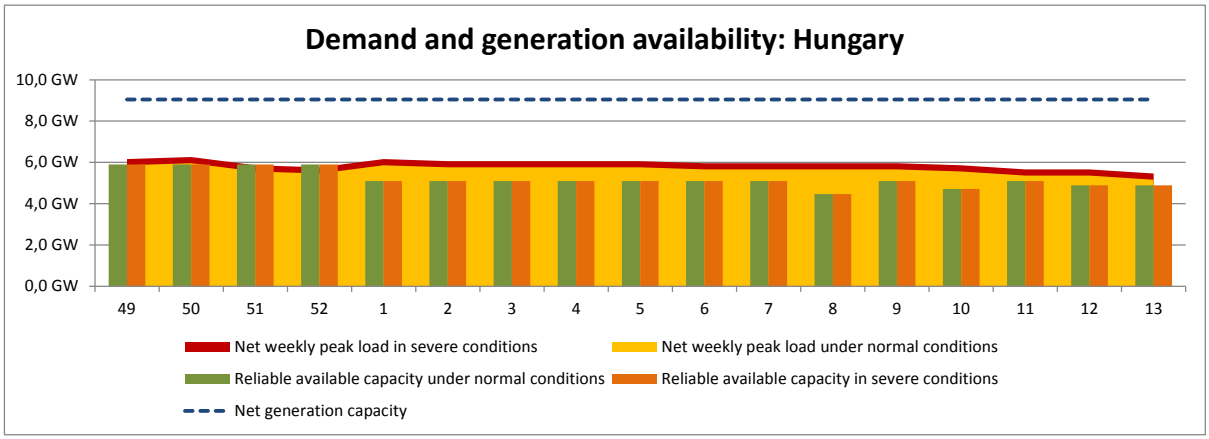
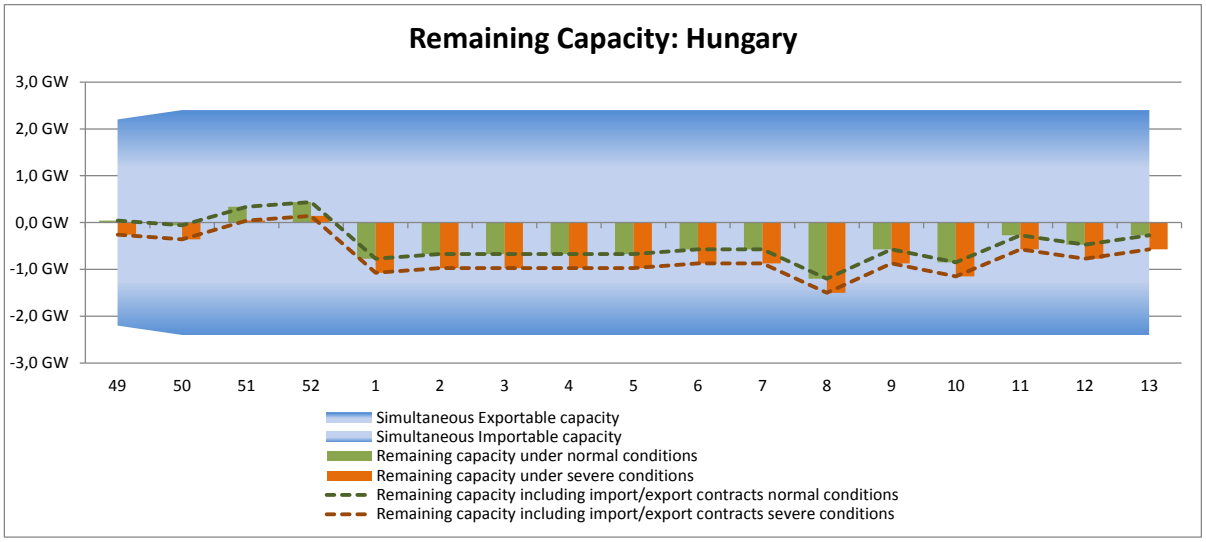
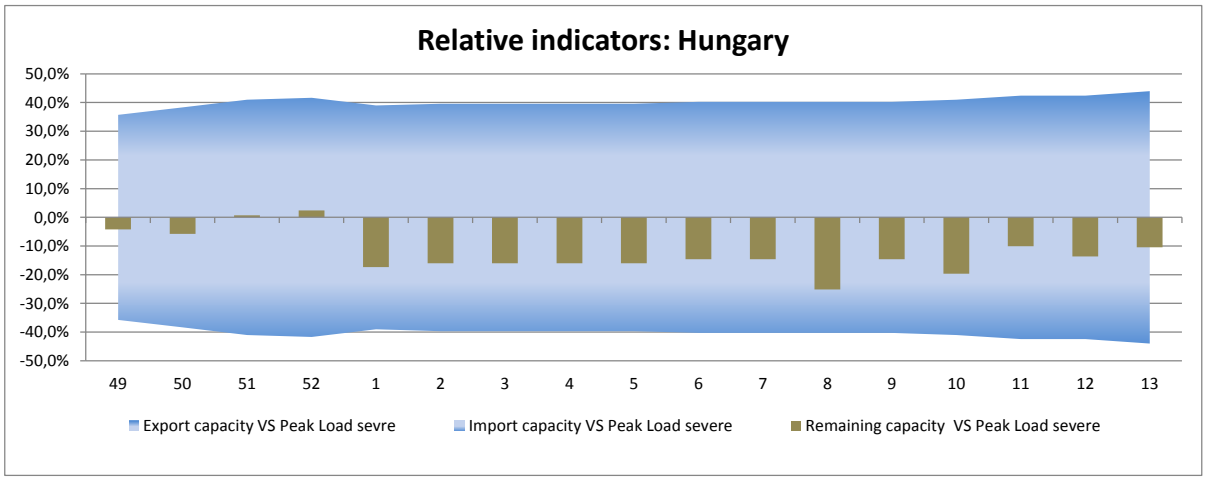

Demand and generation availability: Hungary
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Hungary
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Hungary
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
-40,0%
-50,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

IRELAND

General Comments

EirGrid, the Transmission System Operator of Ireland, expects that the generation capacity will be sufficient to meet the expected peak demands this winter and to ensure that the appropriate level of security of supply is maintained. Both deterministic and probabilistic analyses were carried out to examine the capability of the generation portfolio available to EirGrid when it comes to meeting the demand for every half hour period during the coming winter period. The adequacy margin used to determine secure operation is 8 hours Loss of Load Expectation (LOLE) per annum and is based on the analysis in the studies. This will not be breached in 2013. The peak demand is expected to occur in the week before Christmas. Areas of growth in demand, the capacity and performance of generation (both conventional and wind) and available import capacity were all considered. The East-West Interconnector, which links Ireland with Great Britain, will be in its first year of operation, which is also expected to enhance the overall level of security of supply.

Generation-Demand Balance

The installed conventional generation capacity will be 6,794 MW of the dispatchable plant. The capacity figure also does not allow for any forced outages which could be expected in the winter period. Generation unit performances, specifically Forced Outage Probabilities, are based on past performance and on EirGrid's discussions with the generators. The system average Forced Outage Rate for the analysis is 7.5%.

The installed capacity of wind generation is expected to increase to between 2,200 and 2,300 MW over the coming winter, giving an average capacity credit of 266 MW.

The generation portfolio on the island of Ireland is scheduled for dispatch as one entity rather than two separate systems. Imports from Northern Ireland can provide a contribution towards the ability to meet system demand in Ireland. The level available at any point in time is dependent on the generation availability in Northern Ireland, the status of the Moyle interconnector (from Northern Ireland to Scotland), tie-lines between the two jurisdictions and the status of the transmission network on both the Irish and Northern Ireland systems.

The forecast peak demand for winter 2012/2013 is derived from historical analysis while the current economic climate is also taken into account. The peak demand in winter 2011/12 was a lot lower than previous years, due to the significantly milder temperatures and decrease in overall energy demand. All things considered, it is anticipated that the peak demand for winter 2012/2013 will be approximately 4,724 MW.

Role of interconnectors

The East West Interconnector will provide a potential 500MW of capacity to the system this winter compared to previous years. The predicted low level of generation maintenance this winter, coupled with relatively high generation margins (>2GW at time of peak demand), will ensure that the system is not solely dependent on imports from the Great Britain system. The flow of power on the interconnector will be primarily dependent on the market conditions between the two countries, unless in an emergency situation, when interconnector flows can be deviated away from the market profiles.

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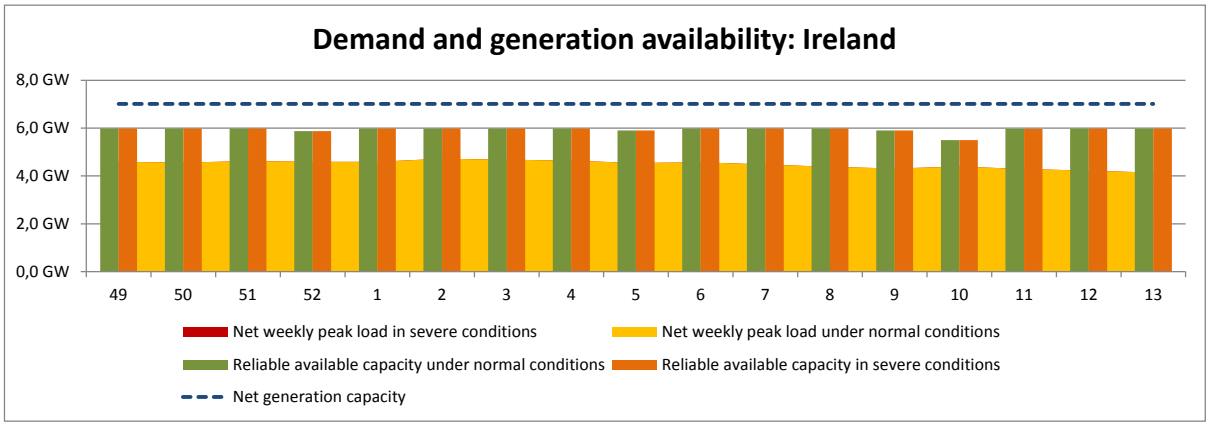
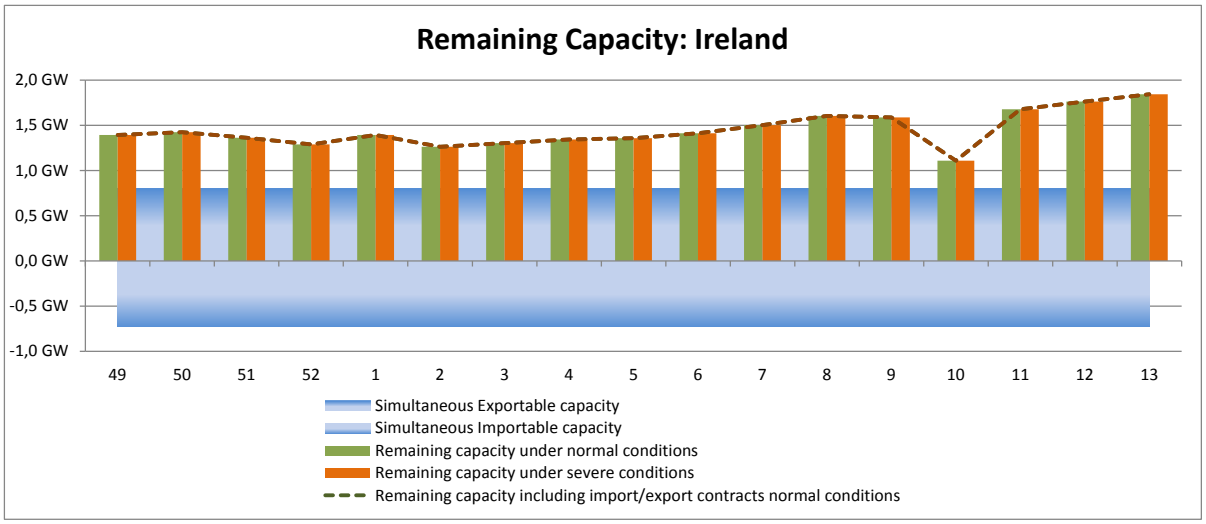
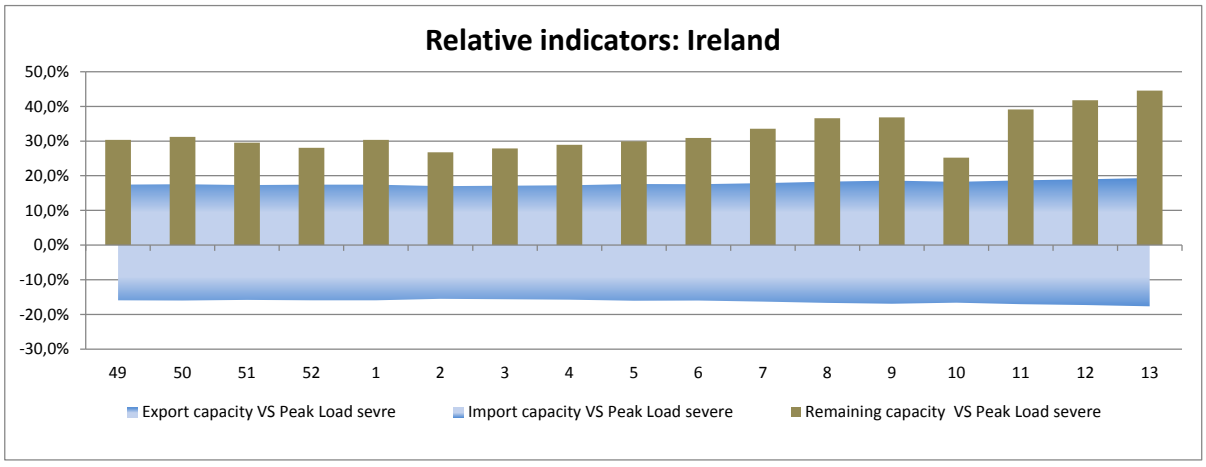

Demand and generation availability: Ireland
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Ireland
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
-0,5 GW
-1,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions


Relative indicators: Ireland
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

ITALY

General Comments

Under normal conditions, no problem regarding system adequacy is expected in the Italian system: the reliable available capacity is expected to be widely higher than the peak load over the entire period. In addition, under severe conditions the general situation expected in the winter is not critical, with some problems which may arise only on the island of Sicily.

Generation- Demand Balance

The second and third weeks of December, as well as the third week of January could be identified as the most stressful weeks of the winter period. The main risk factors are:

- **High renewable production** (wind and solar) **during low load periods** (Christmas holidays) which could lead to a lack of adequate downward regulating capacity. To handle such issues, Terna has prepared several countermeasures, from enhanced cooperation with neighbouring TSOs, new strategies on operational planning, re-dispatching measures, topological remedies, to the curtailment of renewable generation when needed.
- **Shortage of gas supply** which could harm the availability of CCGT power plants which cover up to 50% of the demand. In order to monitor the availability of gas supply for the CCGT power plants, a special Working Group was established in 2006. This group is in charge of monitoring the security of gas supply held by the Italian Government, and will work in collaboration with Italian gas and electricity TSOs.
- **Extreme weather condition** which can influence the level of load and lead to a high level of unplanned outages of grid elements. In order to cope with this preliminary action an emergency plan has been prepared.

The main issues which could affect the generation capacity and the related countermeasures are the following:

- **Shortage of gas supply**
  In order to monitor the availability of gas supply for the CCGT power plants, a special Working Group in charge of monitoring the security of gas supply held by the Italian Government in collaboration with Italian gas and electricity TSOs was established in 2006.
- **Grid constraints**
  The limitations applied to the generation plants due to grid constraints are minimised through the planning of the outages of relevant grid elements during appropriate periods.
- **Energy constraints issues**
  The management of the hydro plants is charged to the owners of the power plants. However, Terna monitors the availability of the hydro generation capacity.

- **Expected forced outages**
  Forced outages are taken into account in the adequacy evaluations.
- **Expected congestion in the internal grid, including local voltage regulation problems**
  The expected congestions and voltage problems will be solved through predefined actions (e.g. re-dispatching) or special actions (e.g. not flexible generation curtailment).

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After the huge increase of PV installation, experienced during 2011 (+9GWp) and which continued during 2012 (Italy overtook at the beginning of September 15GWp of installed capacity while no new thermal power plant is actually in construction) the Italian TSO has to cope with several new challenges, such as:

- **Frequency transient leading to massive photovoltaic plants' disconnection** from the grid whenever the system frequency reaches 0.2-0.3 Hz deviations from the normal value (50.0Hz). This increases the risk of a widespread loss of supply and compromises the effectiveness of emergency defence systems. A large scale retrofit program has been launched by our regulator, thus reducing the share of photovoltaic plants at risk of disconnection.
- **Lack of adequate downward regulating capacity:** Highly renewable production (wind and solar) during low load periods, taking into account the level of the other inflexible generation, could lead to a lack of adequate downward regulating capacity;
- **Voltage regulation problem and congestions:** high voltage problems can arise especially in the south due to low load, reduced flows along EHV and highly renewable production. Market and physical congestion, especially from the South to the Central South market zone, could arise during the winter period.
- **Load demand balancing**: a huge and fast re-dispatch of conventional power plants is needed in the evening hours in order to meet the load due to the shutdown of PV plants after the sunset forces the thermal units to even faster rates.

To handle such issues Terna has taken the following actions:

- Preliminary action and emergency plans;
- New strategies on operational planning of critical network elements (i.e. collocation in periods or hours with a lower PV feed-in);
- Re-dispatching measures and topological remedies in order to solve voltage problems, congestions or downward regulating capacity;
- Curtailment of renewable generation when needed. It should be noted that wind farms can be almost entirely curtailed in near-real-time whilst Terna, in cooperation with DSOs, can also reduce a share of PV production.
- Support to the plan for the massive retrofit of PV plants aimed at widening the frequency operating range.
- Enhanced cooperation with neighbouring TSOs to take special remedial actions.
- Planned installation of battery storage to reduce congestions due to RES feed-in in the most critical area in South Italy.

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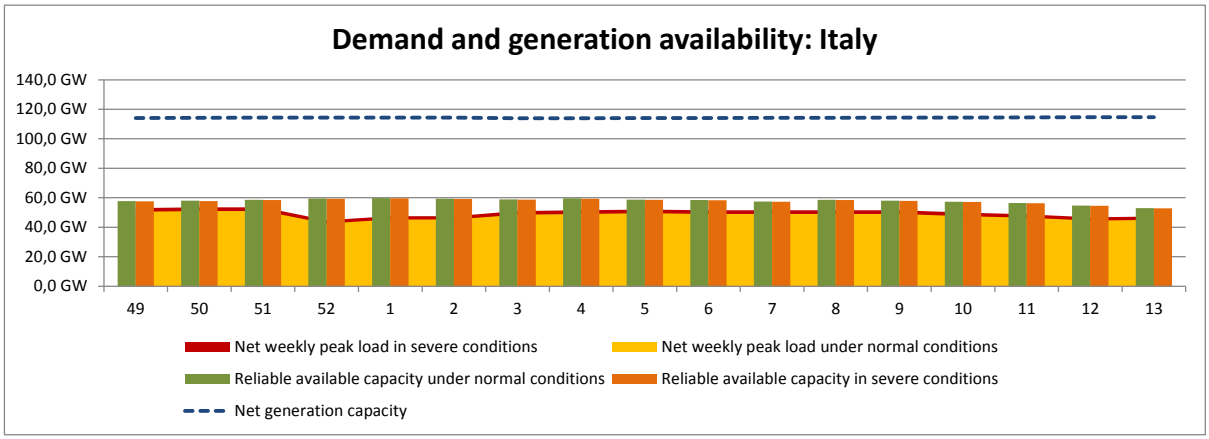
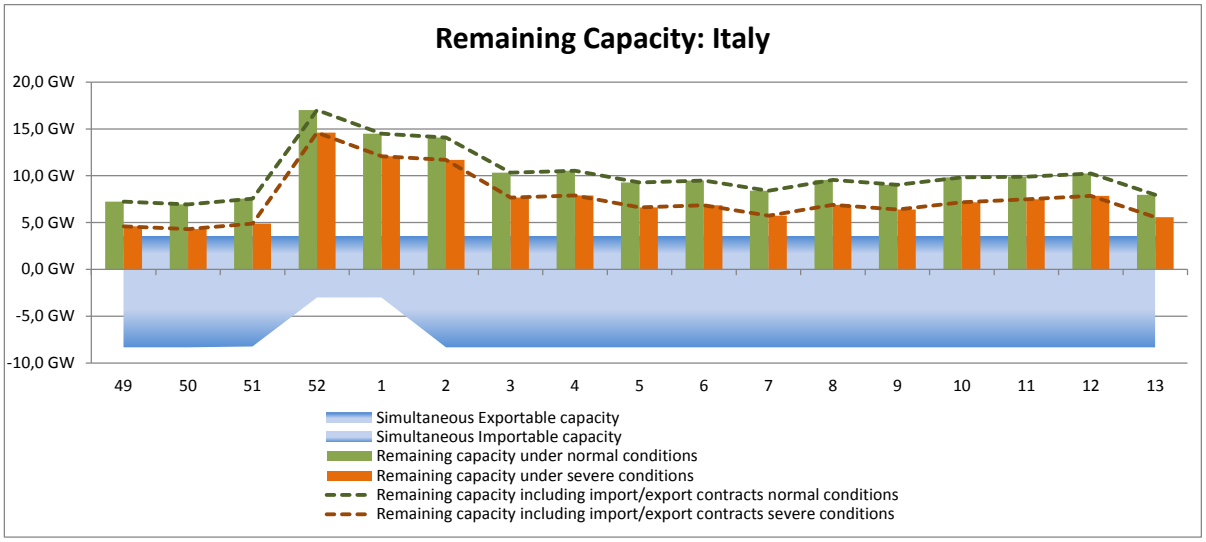
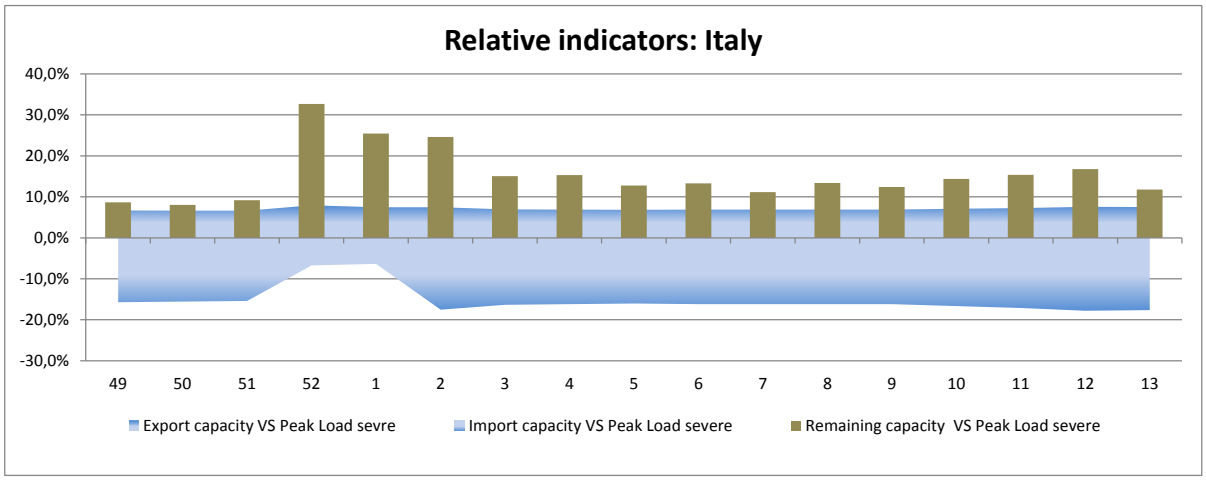

Demand and generation availability: Italy
140,0 GW
120,0 GW
100,0 GW
80,0 GW
60,0 GW
40,0 GW
20,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Italy
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
-5,0 GW
-10,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Italy
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

LATVIA

Looking to the next winter overview, the Latvian TSO “Augstsprieguma tikls” AS did not perform any specific studies or assessments for the upcoming winter period 2012/2013 at a national level or in cooperation between neighbouring TSOs. Baltic TSOs always maintain close relationships when it comes to transmission network and cooperation for security of supply in Baltic region. The load prognosis is prepared according to the last winter (2011/2012) weather conditions, water inflow level in the Daugava river, heat consumption and existing gas prices.

Generation - Demand balance

Due to the current economic situation in Latvia, our forecast weekly peak load is expected to be 1 – 2% higher as in last year in normal load conditions and up to 3 – 5% higher as in last year in severe load conditions. Load sensitivity is mostly dependent on air temperature in winter whilst air temperature is one of the significant indicators when it comes to load deviations from yearly average load.

Generation Available

Despite sufficient installed capacity on the hydro power plants, shortage of inflow water is the main limiting factor for generation availability. The main periods of stress for Latvia’s power system are possible if water inflow in the Daugava river will be very low and all consumption must be covered by CHPP. Last winter the air temperature, compared with the previous one was quite high and water inflow in the Daugava river was as expected.

The basic schedules for planned maintenance of power plants which are connected directly to the transmission system are already known for the coming winter period and further. The schedule for 2013 will be confirmed at the end of 2012.

Role of interconnections

The interconnection capacity in the winter period is usually higher than during the summer period in normal load and severe load conditions, although the Latvian TSO is ready for any restrictions regarding cross-border transfer capacity between Latvia and Estonia. During the winter period the plan is to perform some repairs in the Latvian internal transmission network, which causes no significant decrease in transfer capacities between neighbouring countries.

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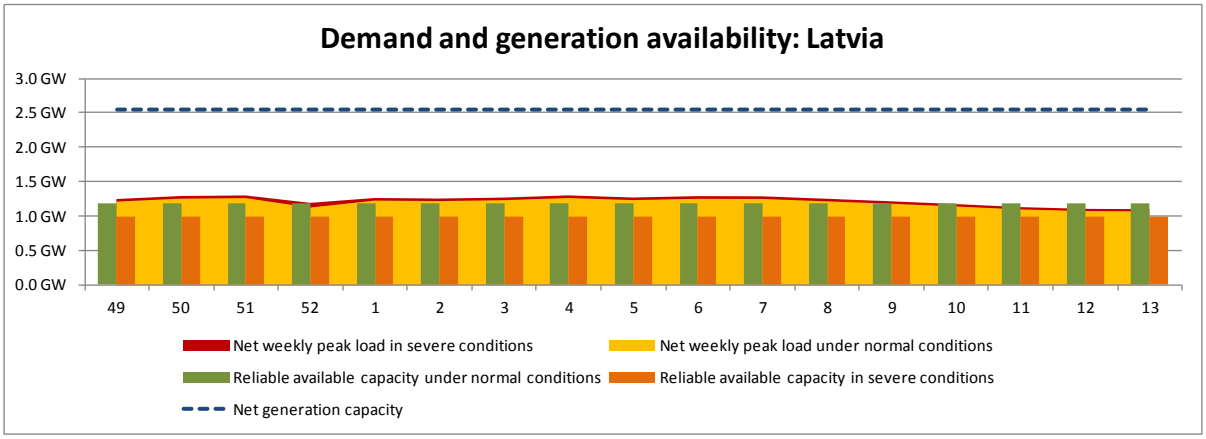
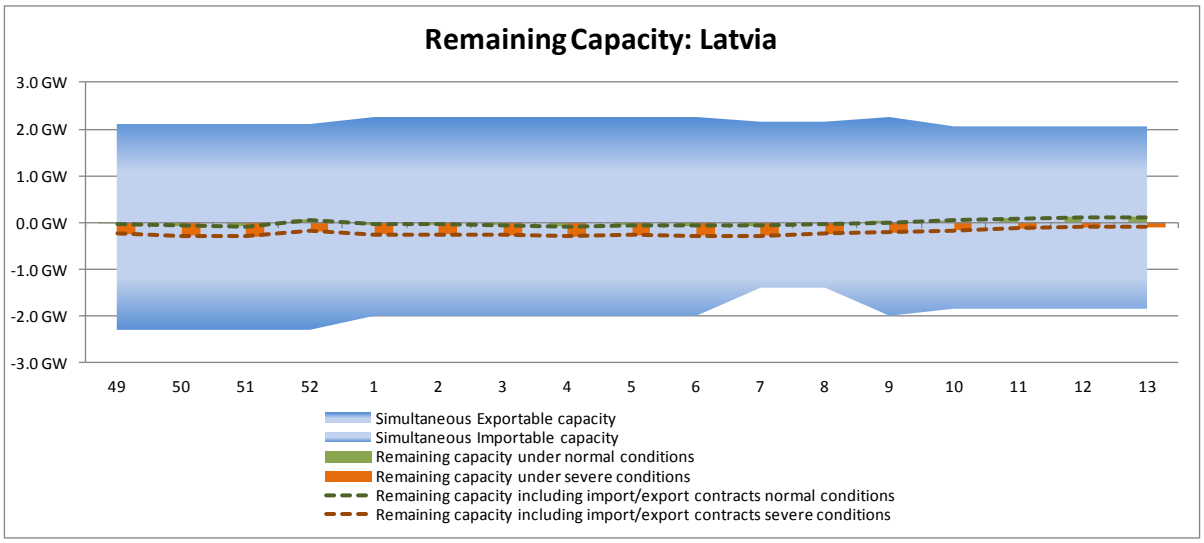
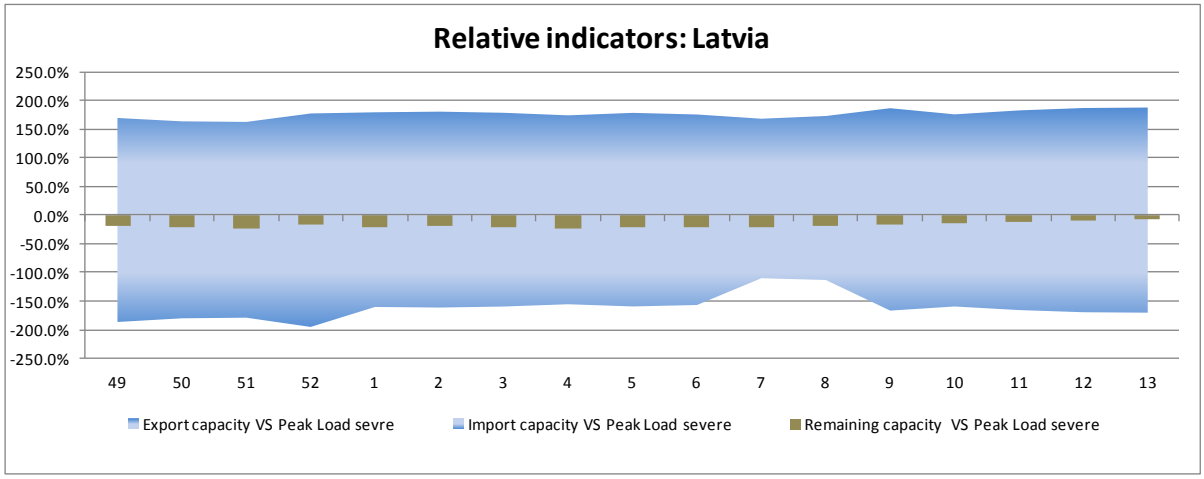

Demand and generation availability: Latvia
3.0 GW
2.5 GW
2.0 GW
1.5 GW
1.0 GW
0.5 GW
0.0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Latvia
3.0 GW
2.0 GW
1.0 GW
0.0 GW
-1.0 GW
-2.0 GW
-3.0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Latvia
250.0%
200.0%
150.0%
100.0%
50.0%
0.0%
-50.0%
-100.0%
-150.0%
-200.0%
-250.0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

LITHUANIA

General comments

Nowadays Lithuania is the deficit area in power balance and depends on power import all year round, even during peak hours. The highest load is expected to be reached at very low temperatures. The balance is foreseen to be met with import from the neighbouring systems without major difficulty. The situation during the coming winter 2012-2013 is expected to be very similar to the previous winter, with no intense periods.

The maintenance schedule of the generating units is set to minimum in the winter period. No problems in the transmission network are expected because most of the maintenance works has been accomplished during the summer period.

The electricity generation from the thermal and hydro power plants is expected to cover approximately 45% of demand, while 55% is expected to be covered by imports. Intermittent energy sources will not cause problems even if the wind power plants' installed capacity achieves 250 MW (~15% of demand). Even in that case, wind generation could be balanced with the local generation resources.

Generation-Demand balance

Generation Available:

Generation Available:

Forecast NGC during the upcoming winter will reach 3950 MW. The total net output of thermal capacity will increase by the capacity of the new 455 MW CCGT unit, replacing 2X150 MW old units in the biggest Power Plant in Lithuania – Lithuanian PP. During the peak load period, it is expected that the new CCGT unit will cover a significant part of demand; however, generation in Lithuania will still be dependent on gas supply.

The generation portfolio will consist of 14% of gas fired PP, 4% - oil fired PP, 52% - mix fuel PP, 8% - renewable PP and 22% - hydro PP. It is important to note that gas is used as primary fuel in mix fuel PP. If any limitations of gas supply occur, Lithuania has the possibility to switch 730 MW generation capacity to oil fuel, and respectively guarantees to cover ~43% of peak load. Import or export capacities could be reduced because of faults in the internal transmission network or in the interconnections, but all existing transmission capacity is foreseen to be available.
A significant part of the generation portfolio during the winter period will be covered by local CHPs - up to 40% on average, which uses mainly gas (75%), followed by oil (21%) and biofuels (4%). 10% of the generation portfolio will be covered by wind power, since highest utilisation of installed wind capacity is reached. Nevertheless, the instability of wind generation and the possibility of icing is taken into account while assessing required system services in the system and adequacy level.

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Demand:

Peak load is expected either in the second half of January or in the first half of February. Forecast weekly peak load is expected to be 1.5% higher than that of last year, and 5% higher in severe load conditions. The maximum load for normal conditions is expected to be 1700 MW and for severe conditions is expected to be 1785 MW during the 6th week of winter.

Role of interconnections

330 kV OHLs' maintenance and outages plan for 2013 of BRELL electrical loop (Belarus, Russia, Estonia, Latvia and Lithuania) will be confirmed on the 15th of October 2012. There is only a preliminary Baltic TSO outages plan for 2013 at this moment. Therefore, the interconnection's capacity values were determined according to the preliminary outage plan and parallel operation agreements between Lithuania, Latvia, Russia and Belarus TSOs are used. The TRM value of Lithuania-Latvia interconnection was considered to be 50 MW.

There are no planned outages which would significantly reduce importable capacity during the upcoming winter period. Most reduction of importable capacity is foreseen during the 49th week of this year, whilst an outage of 330 kV OHL will reduce the Belarus-Lithuania interconnection capacity by 300 MW up to 800 MW. The largest exportable capacity reduction is foreseen during weeks 8-13 of 2013. An outage of 330 kV OHL will reduce the Lithuania - Belarus interconnection capacity by 500 MW up to 850 MW. An outage of 330 kV OHL during weeks 7 and 8 of 2013 will reduce the Lithuania-Latvia interconnection capacity by 450 MW, up to 400 MW. No stress situations or restrictions on system security are expected due to these outages in the upcoming winter and all existing transmission capacities are foreseen to be sufficient to meet the power deficit.

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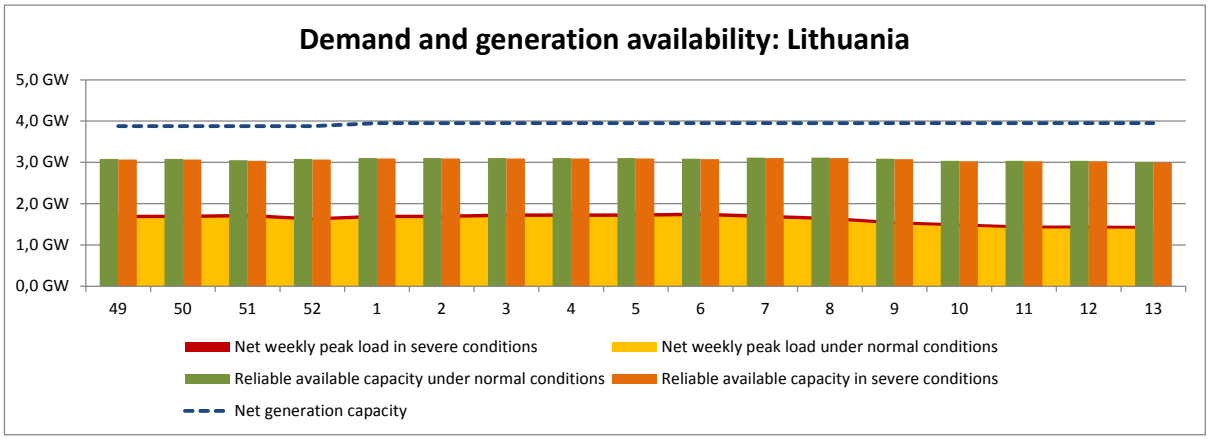
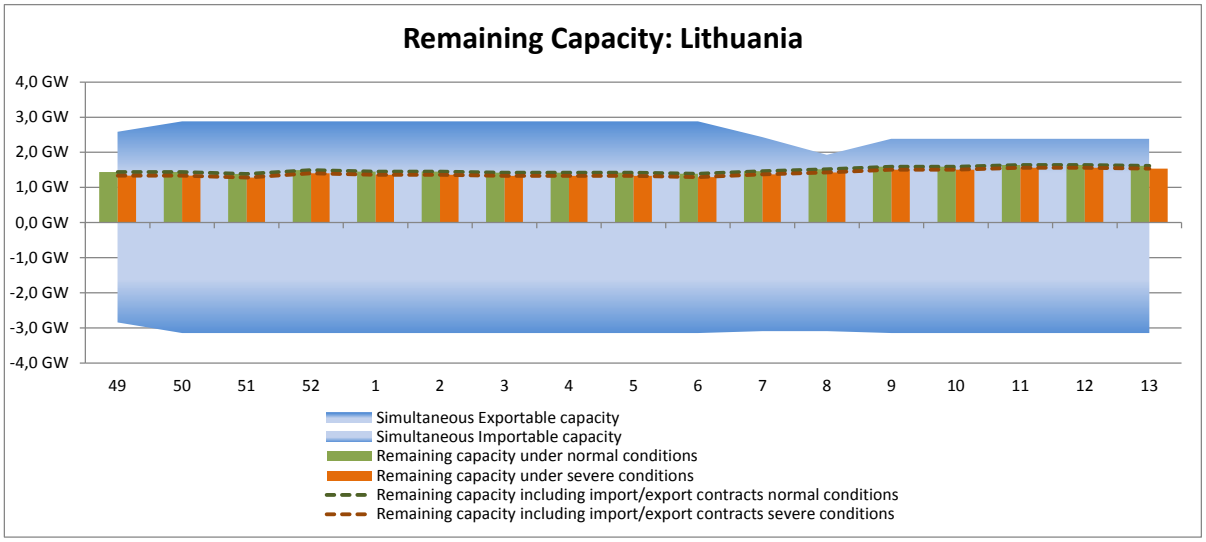
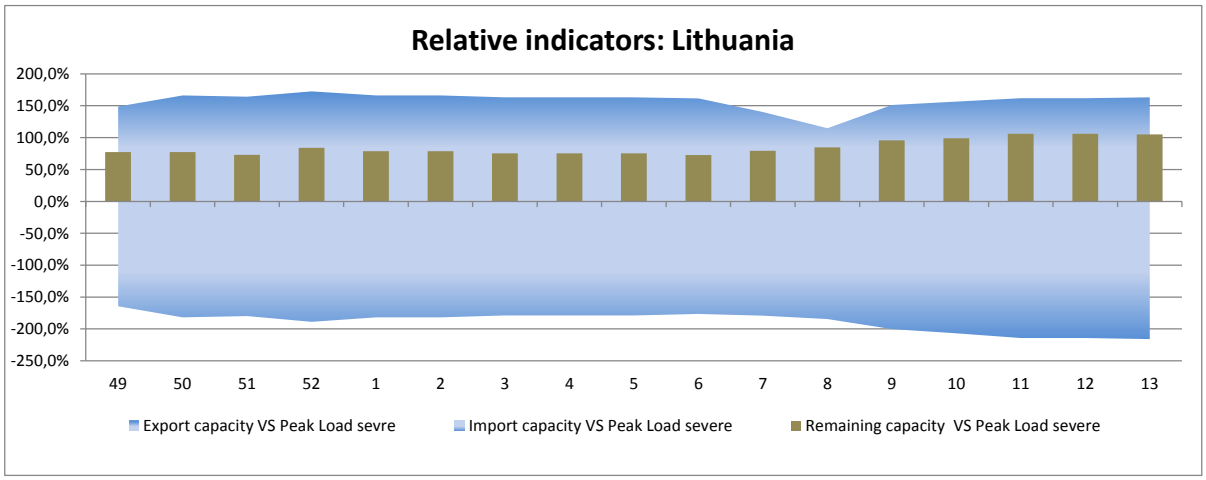
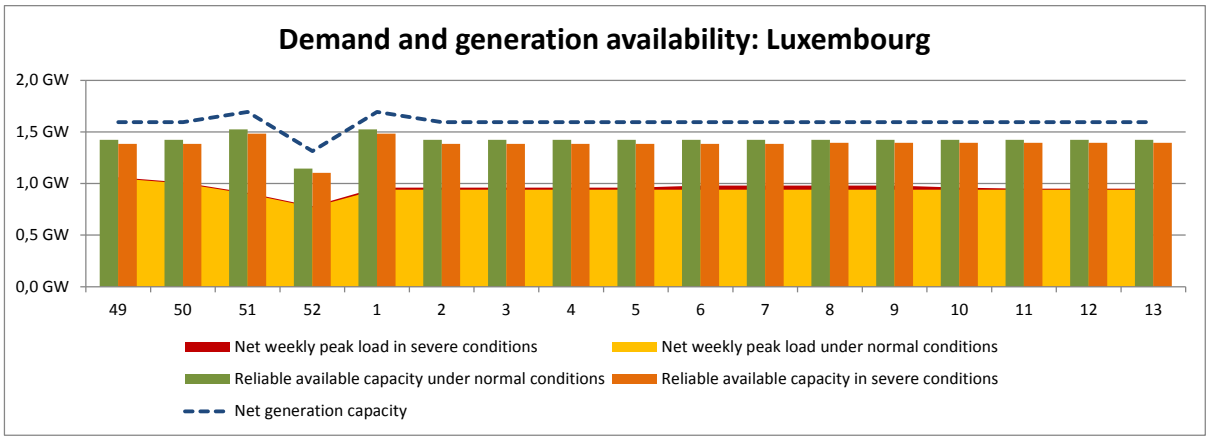
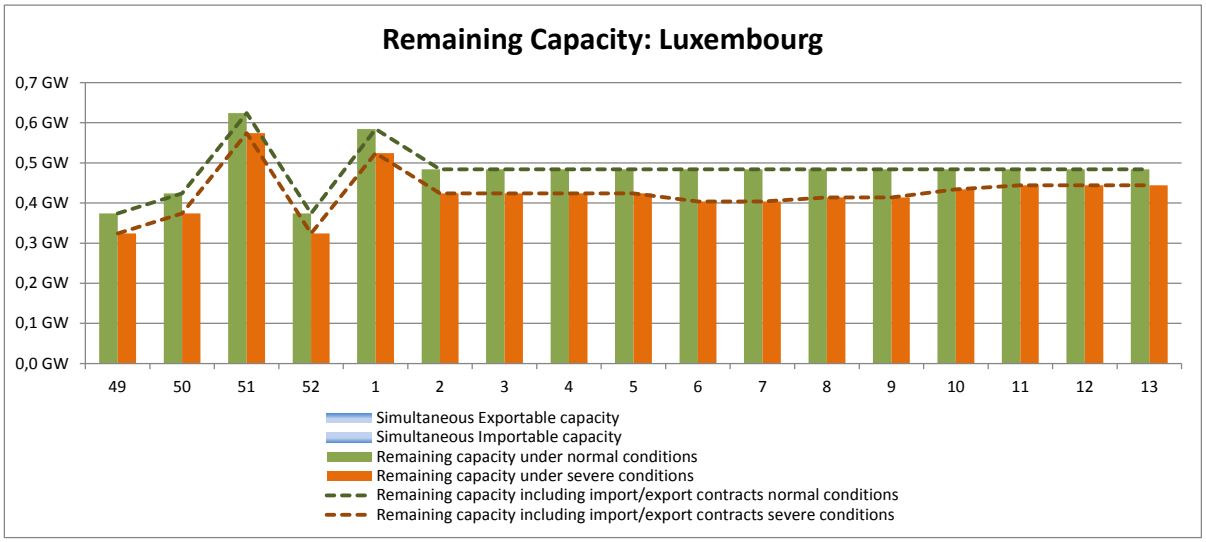

Demand and generation availability: Lithuania
5,0 GW
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity

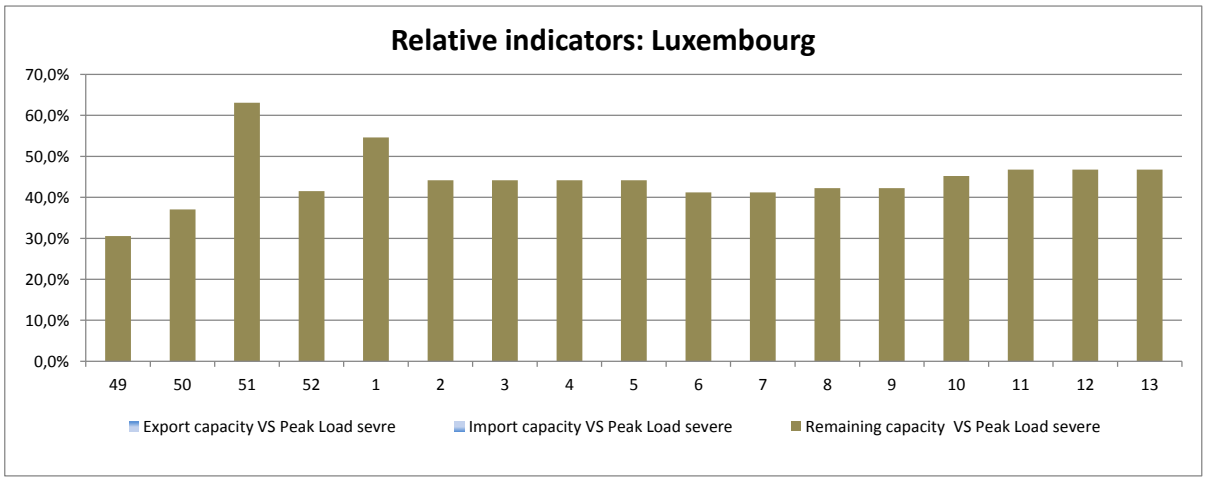

Remaining Capacity: Lithuania
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
-4,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Lithuania
200,0%
150,0%
100,0%
50,0%
0,0%
-50,0%
-100,0%
-150,0%
-200,0%
-250,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

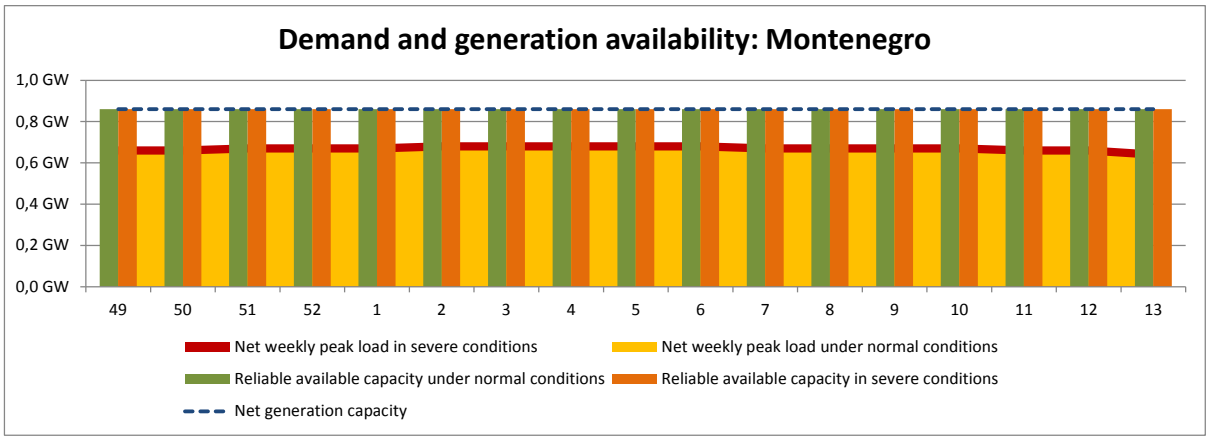
LUXEMBOURG

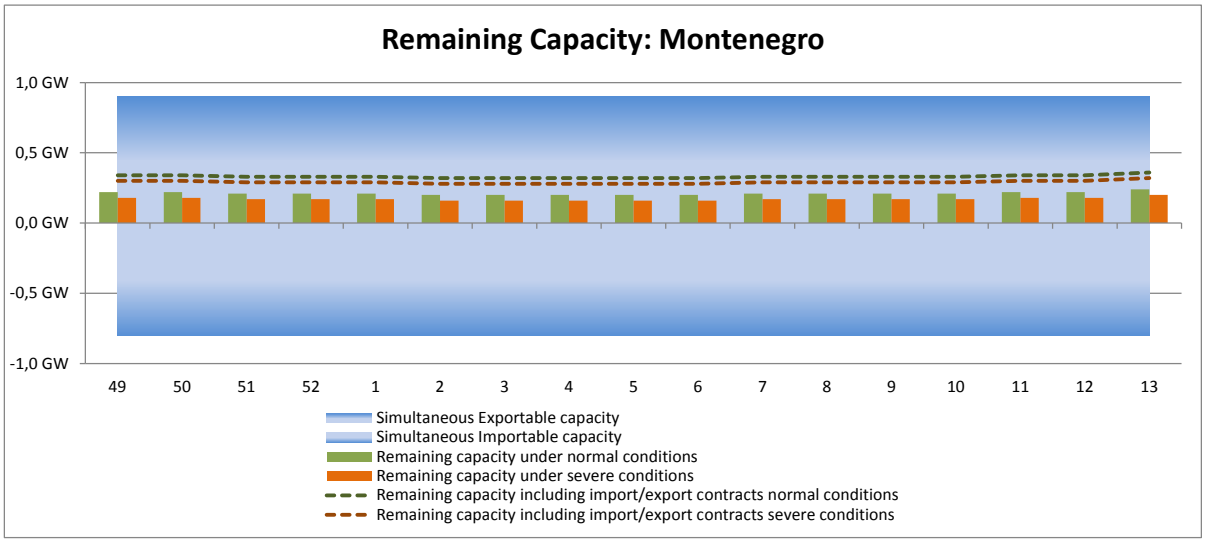

Demand and generation availability: Luxembourg
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity

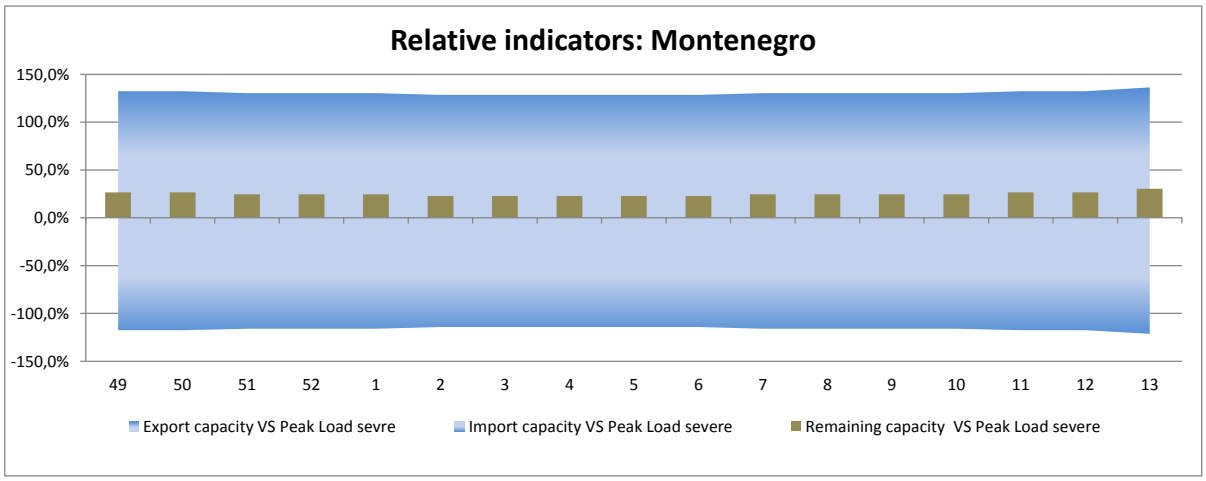

Remaining Capacity: Luxembourg
0,7 GW
0,6 GW
0,5 GW
0,4 GW
0,3 GW
0,2 GW
0,1 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Luxembourg
70,0%
60,0%
50,0%
40,0%
30,0%
20,0%
10,0%
0,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

MONTENEGRO*

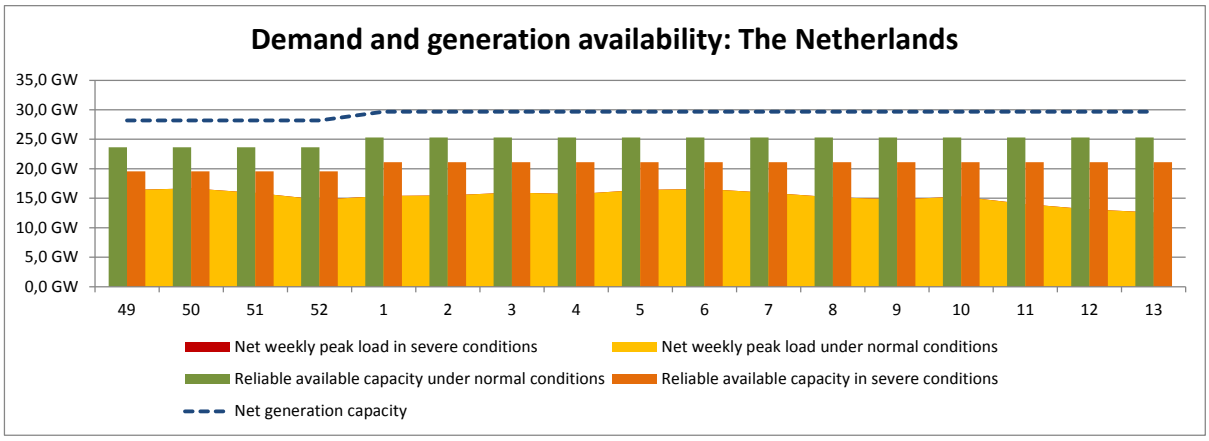


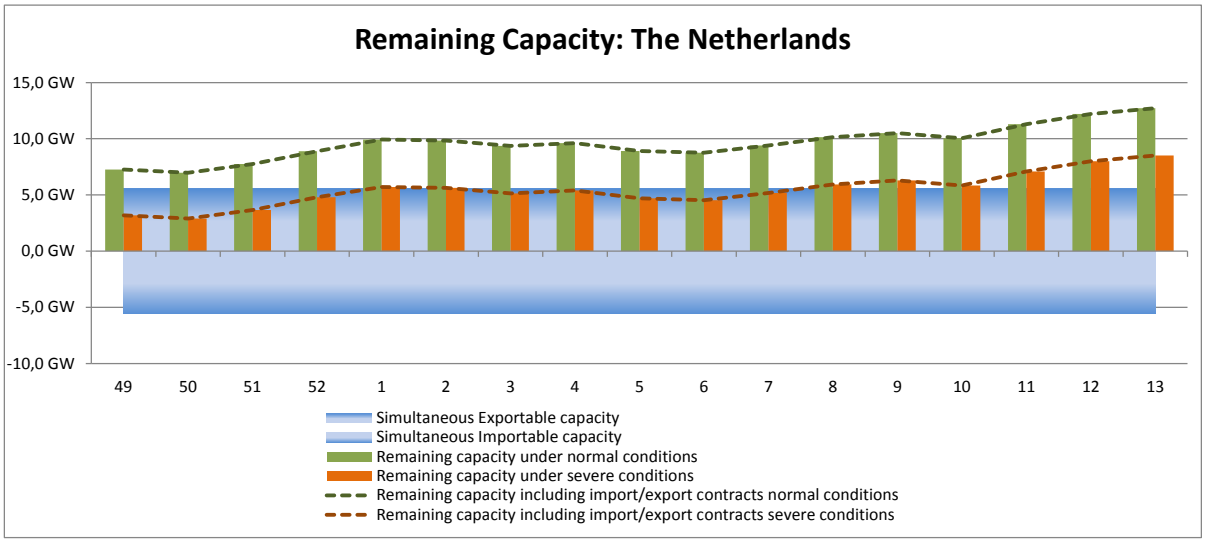


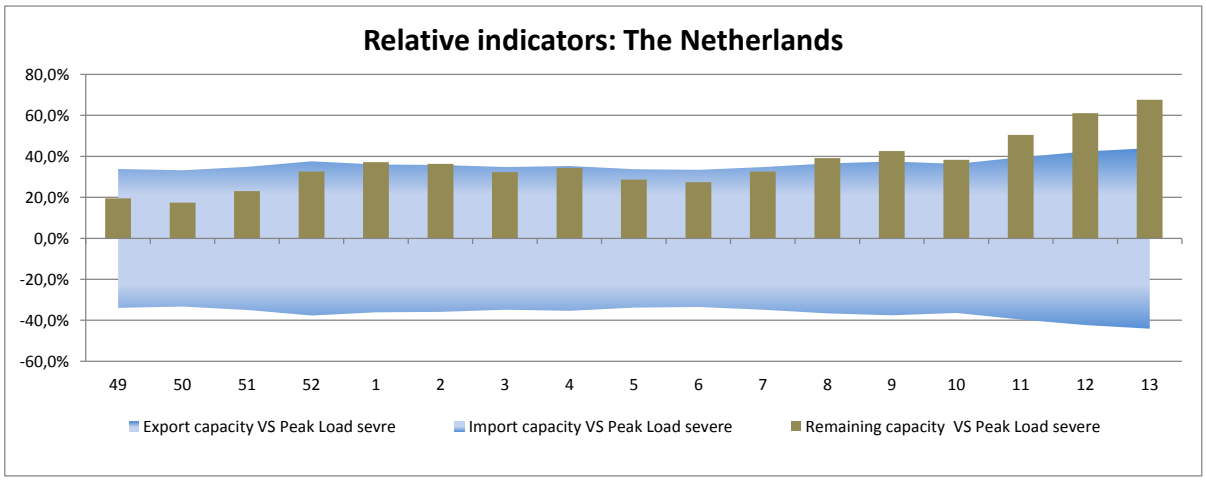


*** BASED ON 2011 DATA**

NETHERLANDS







NORTHERN IRELAND

General comments

SONI expects that the generation capacity will be sufficient to meet the expected peak demands this winter and to ensure that the appropriate level of security of supply is maintained. Both deterministic and probabilistic analyses were carried out in examining the capability of the generation portfolio available to SONI when it comes to meeting the demand for every half hour period during the coming winter period. The adequacy margin used to determine secure operation is 4.9 hours Loss of Load Expectation (LOLE) per annum and is based on the analysis in the studies. This will not be breached in 2013. The peak demand is expected to occur during week 51 of 2012. Areas of growth in demand, the capacity and performance of generation (both conventional and wind) and available import capacity were all considered. The East-West Interconnector, which links Ireland with Great Britain, will be in its first year of operation and this is also expected to enhance the overall level of security of supply.

Generation-Demand Balance

The installed conventional generation capacity will be 2,336 MW of the dispatchable plant. In addition, the capacity figure does not allow for any forced outages which could be expected in the winter period. Generation unit performances, specifically Forced Outage Probabilities, are based on past performance and on SONI's discussions with the generators. The system average Forced Outage Rate for the analysis is 7.5%.

The installed capacity of wind generation is 451 MW over the coming winter, giving an average capacity credit of 107 MW.

The generation portfolio on the island of Ireland is scheduled for dispatch as one entity rather than two separate systems. Imports from Ireland can provide a contribution towards the ability to meet system demand in Northern Ireland. The level available at any point in time is dependent on the generation availability in Ireland, the status of the EWIC interconnector (from Ireland to Wales), tie-lines between the two jurisdictions and the status of the transmission network on both the Northern Ireland and Ireland systems.

The forecast peak demand for winter 2012/2013 is derived from historical analysis, whilst also taking into account the current economic climate. The peak demand in winter 2011/12 was considerably lower than previous years due to the significantly milder temperatures and decrease in overall energy demand. All things considered, it is anticipated that the peak demand for winter 2012/2013 will be approximately 1,731 MW.

Role of interconnectors

The East West Interconnector will provide a potential 500MW of capacity to the system this winter compared to previous years. The predicted low level of generation maintenance this winter, coupled with relatively high generation margins (>2GW at time of peak demand), will ensure that the system is not solely dependent on imports from the Great Britain system. The flow of power on the interconnector will be primarily dependent on the market conditions between the two countries unless an emergency situation occurs, which would mean that interconnector flows are deviated away from the market profiles.

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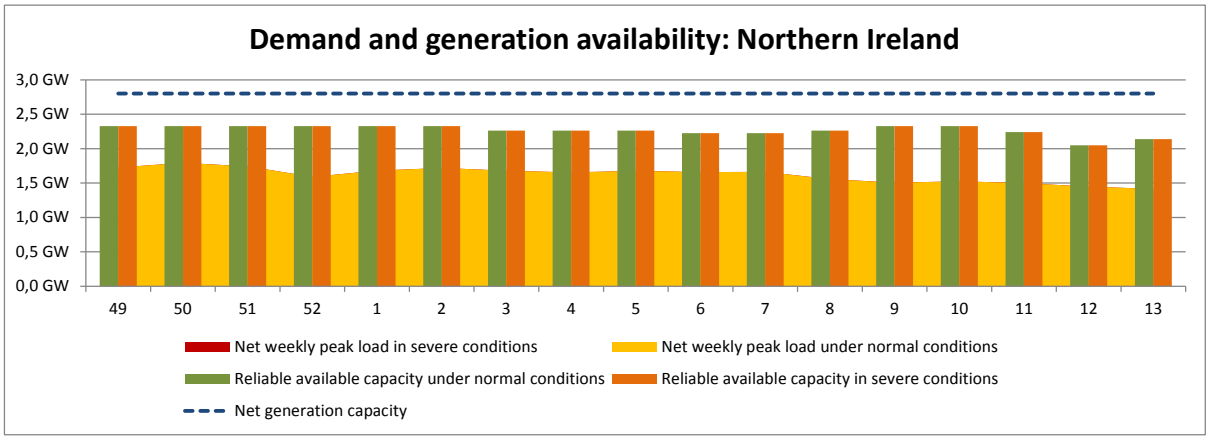
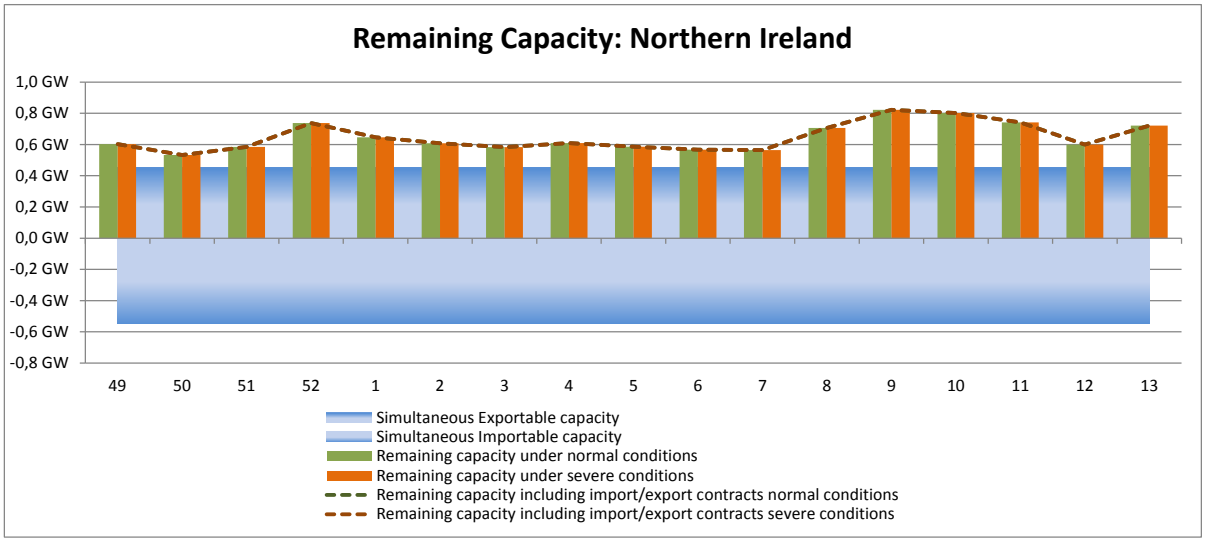
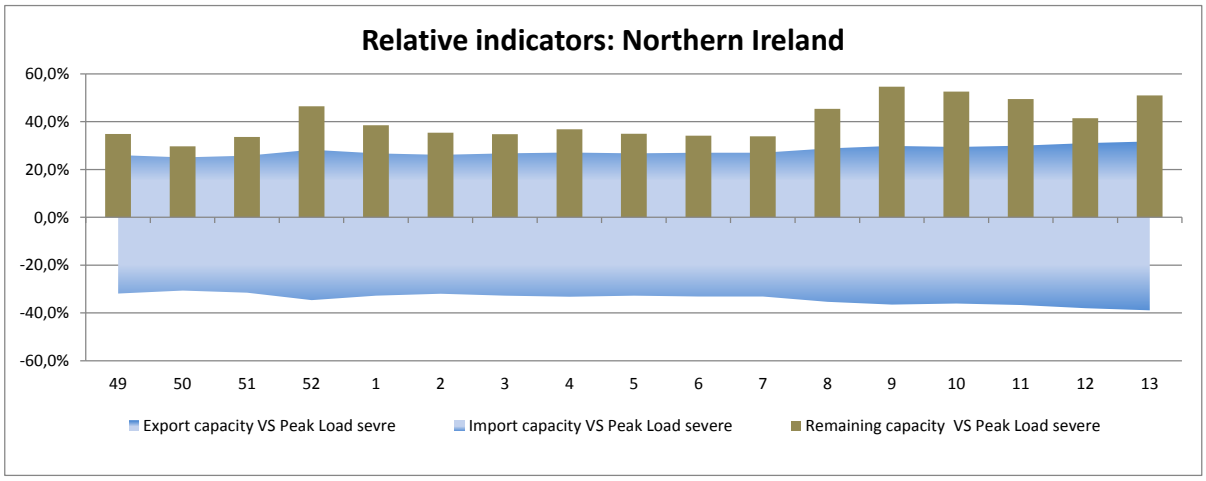

Demand and generation availability: Northern Ireland
3,0 GW
2,5 GW
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Northern Ireland
1,0 GW
0,8 GW
0,6 GW
0,4 GW
0,2 GW
0,0 GW
-0,2 GW
-0,4 GW
-0,6 GW
-0,8 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Northern Ireland
60,0%
40,0%
20,0%
0,0%
-20,0%
-40,0%
-60,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

NORWAY

Norway is self-supporting with energy and power during the coming winter. Even on cold days, Norway can support neighbouring countries with power.

Norway is entering the winter of 2012/13 with a higher hydrological balance than normal. The inflow has also been higher than normal this year, and has resulted in low prices, especially in the southern part of the country.

With regards to power balance, Norway is not dependent on imports from its interconnection during the winter of 2012/13.

It is expected that Norway will be able to export to the Netherlands, Sweden, Denmark and Finland during cold days. It is also expected that available capacity will remain stable during the coming winter. However, internal grid constraints may reduce the export capacity on cold days.

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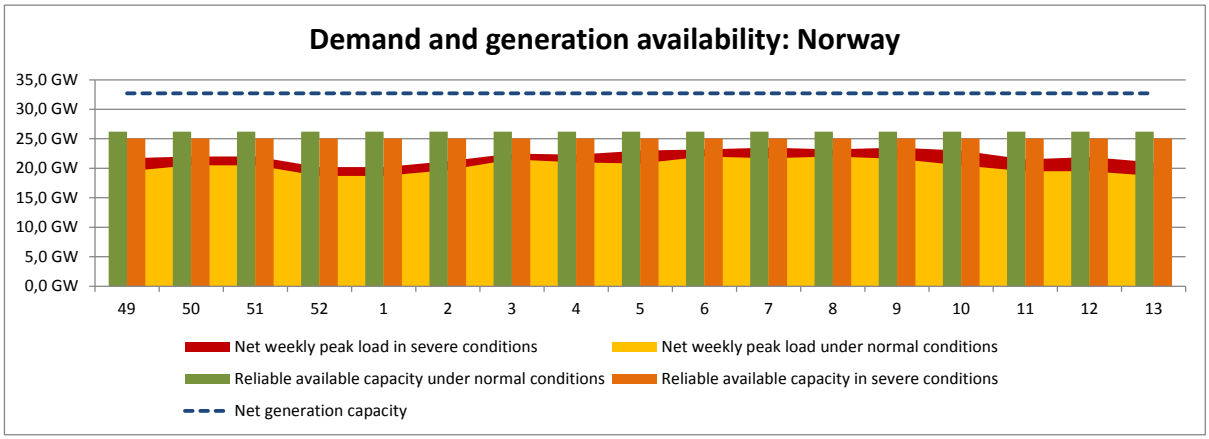
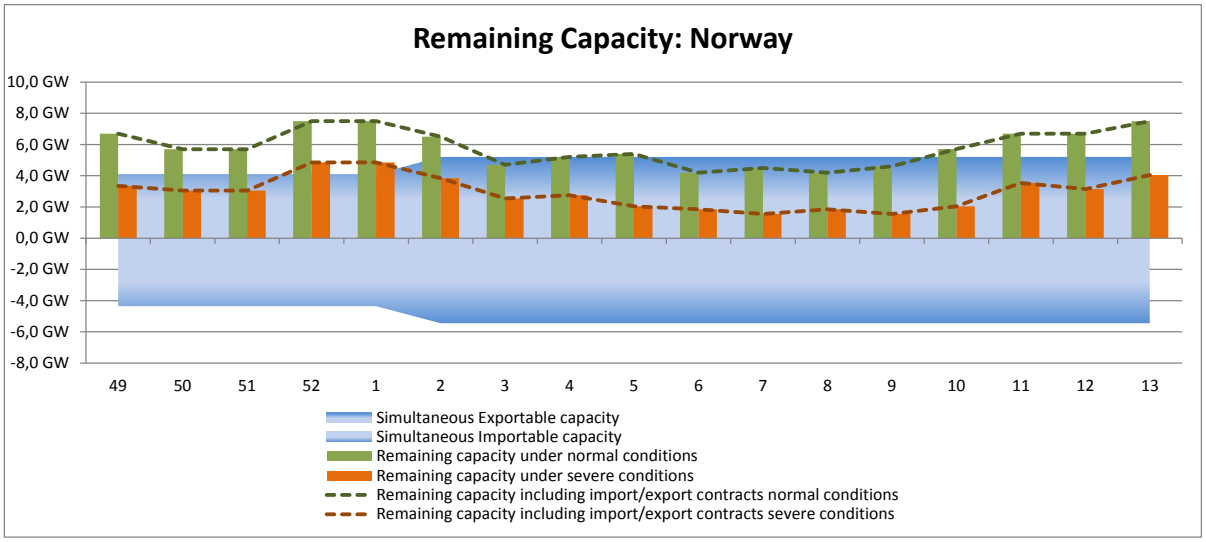
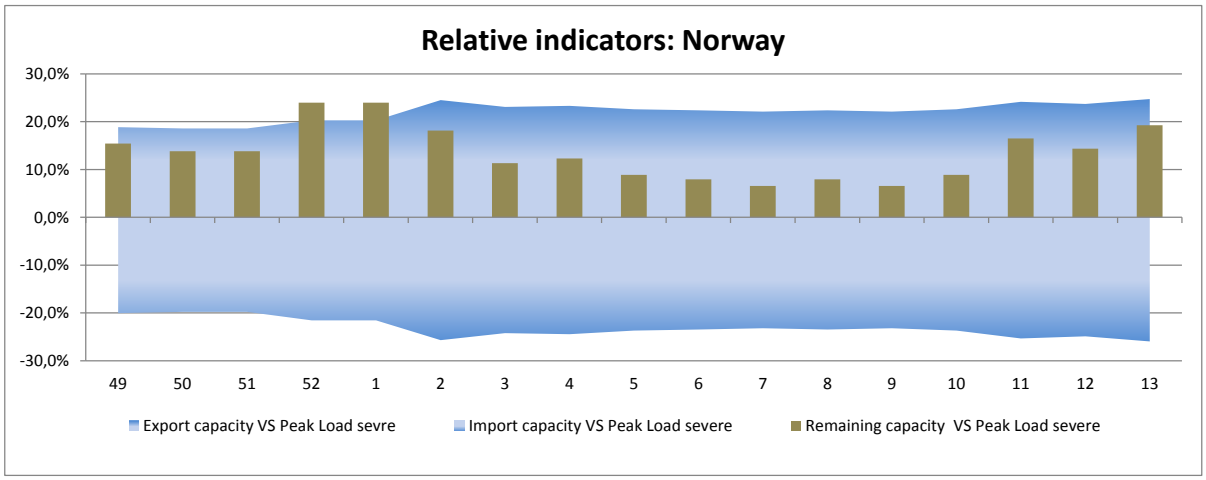

Demand and generation availability: Norway
35,0 GW
30,0 GW
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Norway
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
-6,0 GW
-8,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Norway
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

POLAND

In Poland, forecast plans (yearly coordination plans[1]) are compiled for the entire year on a monthly basis (average values from working days at peak time), until the 30th November every year.

On 26th every month, PSE Operator publishes monthly coordination plans, which include precise information regarding peak time for all days of the next month.

Further specification is done within the operational planning (weekly and daily).

At the moment, the Polish system has no problem with balancing the system during the night (expect for 3-4 days per year, especially during Christmas, Easter and holidays in May). This is why PSE Operator does not prepare the balance for minimum load in monthly and yearly forecasts. Such analyses are done during the daily planning.

Because Outlook reports require weekly data, PSE Operator has prepared special assessment for the Winter Outlook, where weekly data of NGC, maintenance, load and "best estimate of the available NTC" are available. It is important to underline that there is still a yearly planning horizon. This assessment, as well as coordination plans, are coherent and based on information from producers (NGC, overhauls, non-usable capacity), and Polish TSOs' own analysis (load, outages, reserves, non-usable capacity, NTC). Additionally, PSE Operator has prepared the required data for downward regulation capabilities for all required reference points, although this is only a kind of estimation. In normal conditions, PSE Operator classifies 89% of wind NGC as non-usable capacity, whilst for severe conditions it is 100%.

In normal conditions PSE Operator does not expect any problems with balancing the system this winter. For the whole analysed period, the balance of the Polish power system is positive at 19:00 (CET). During peak hours, a negligible unbalance is expected only during the first week of December (in December and January the peak load in Poland takes place c.a. at 17:00 and the difference between load at peak time and load at 19:00 (CET) on working days may reach 700 MW).

The figure below shows the forecast peak load and load at 19:00 (CET).

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

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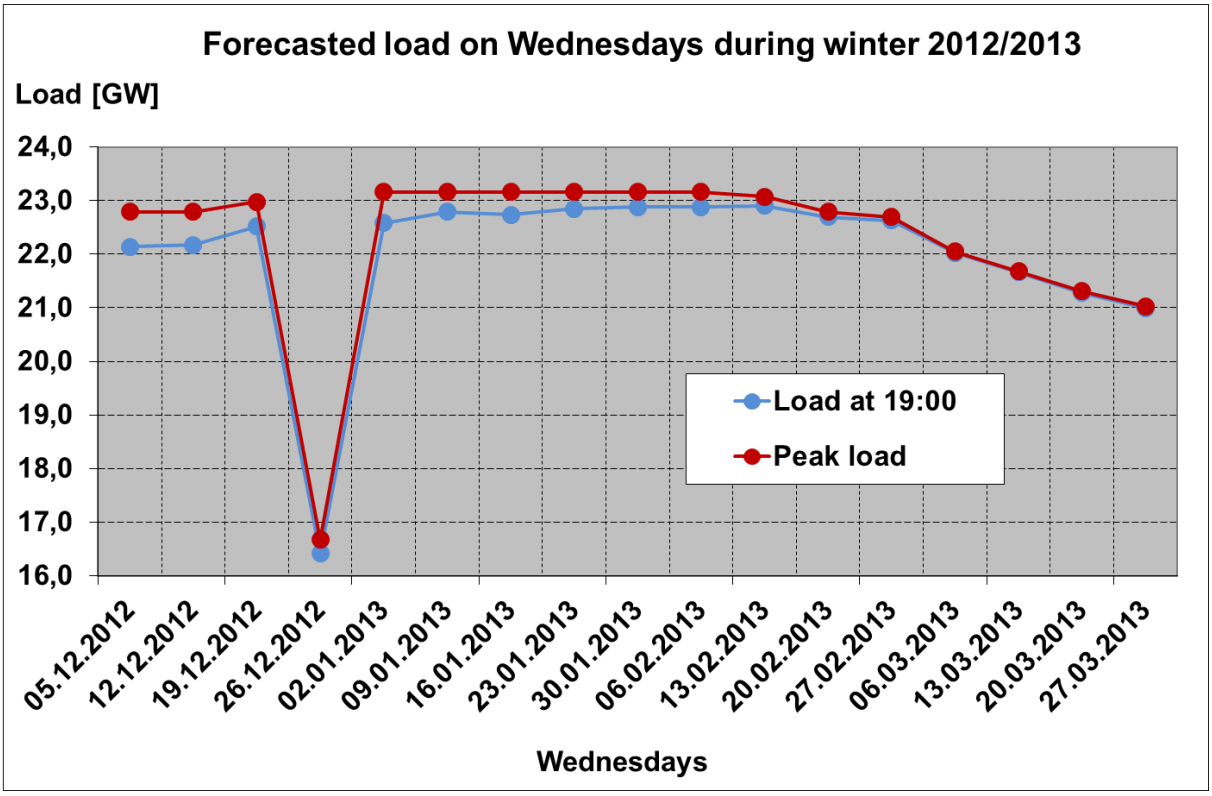

Under severe conditions, for all analysed reference points (except for the holiday on the 26th of December), PSE Operator observes a negative balance. Such a forecast takes into consideration both high demand and low generation availability, which usually take place simultaneously in Poland under long lasting severe conditions (low temperature, hydrological constrains after dry Autumn / during dry Winter). To keep the balance at a safe level, Polish TSOs can use operational procedures to cope with power shortage.

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

Referring to network conditions, for years PSE Operator S.A. has been affected by unplanned transit flows through the system from the west to the south. The flows limits capacity, which could be offered to the market on the borders, but mainly causes network problems with operation, such as overloading of tie-lines and internal elements, rather than fulfilling N-1 criteria on the borders. To keep the system safe in such situations, PSE Operator will take the following action:

1. Activate DC loop flow (HVDC rescheduling) PL→DE→DK→SE→PL.
2. Activate internal re-dispatching
3. Activate cross-border re-dispatching.
4. Activate multilateral re-dispatching (new measure, one year trial period since May 2012. This measure was activated for the first time on 22nd August 2012,– see under Summer Review paragraph).

PSE Operator provides aggregated NTC data for the whole 220/400 kV synchronous PL - DE/CZ/SK profile on the base of the Polish Grid Code which accounts for physical power

flows in the interconnected systems of Continental Europe, i.e. unplanned flows through the Polish system from the west to the south.

Additional Polish connections in use are: DC cable to Sweden, 220kV line to Ukraine, on which only import is possible (Ukrainian units are connected synchronously to the Polish system).

As the “best estimate of the available NTC” for Winter Outlook, PSE Operator provides a seasonal forecast of NTC, which takes into consideration unplanned transit flows through PSE Operator control area. Additionally, December’s forecast includes network constraints caused by planned switching off of the cross-border and / or internal lines (or other elements). Such constraints for 2013 will be agreed until the end of November. Both factors limit the transmission capacity of the Polish system in the yearly planning horizon.

For the entire analysed winter period (in fact during the whole year) the yearly forecast of NTC in import direction on PL – DE/CZ/CK profile amounts to zero. This is caused by low level of TTC, which is calculated on the basis of N-1 criteria, with a simultaneously high level of TRM, resulting from transit flows through Poland. In other words, all capacity which can possibly be offered to the market players is already consumed by these transit flows. Therefore, the arrows to Poland (import direction) for synchronous profile on the maps at the beginning of the report are red, not black.

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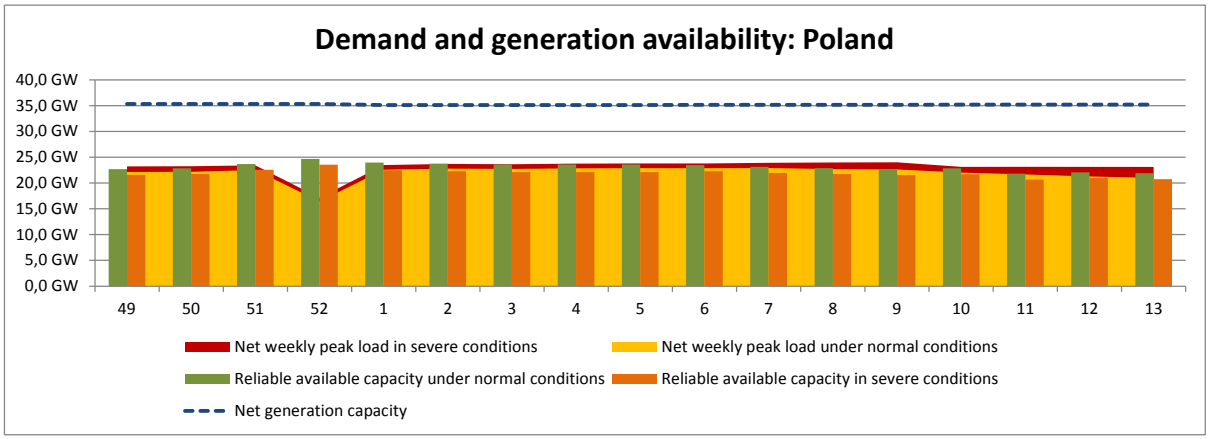
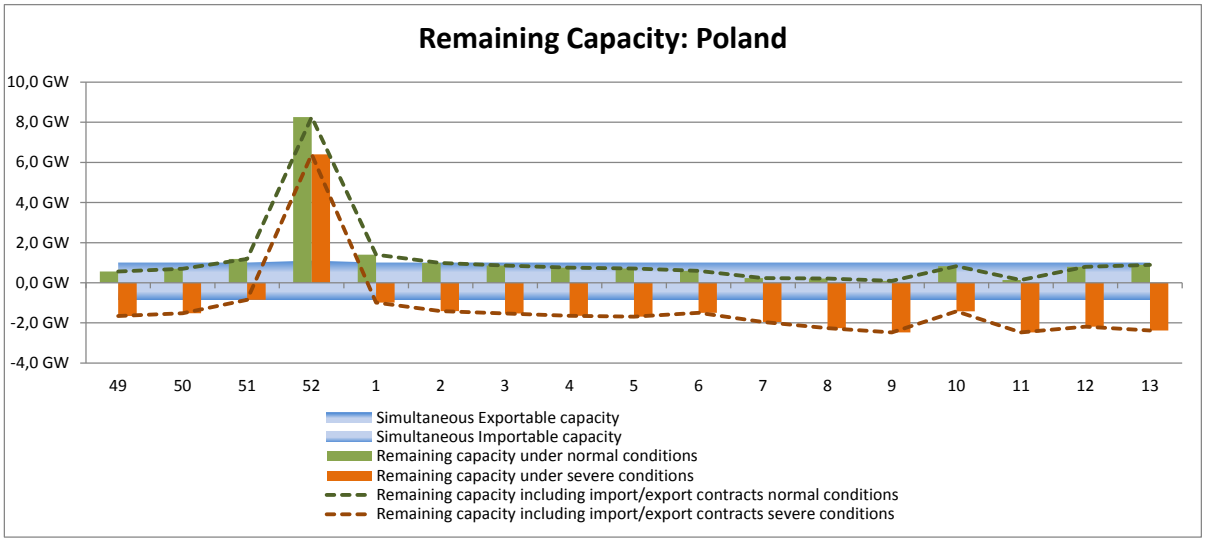
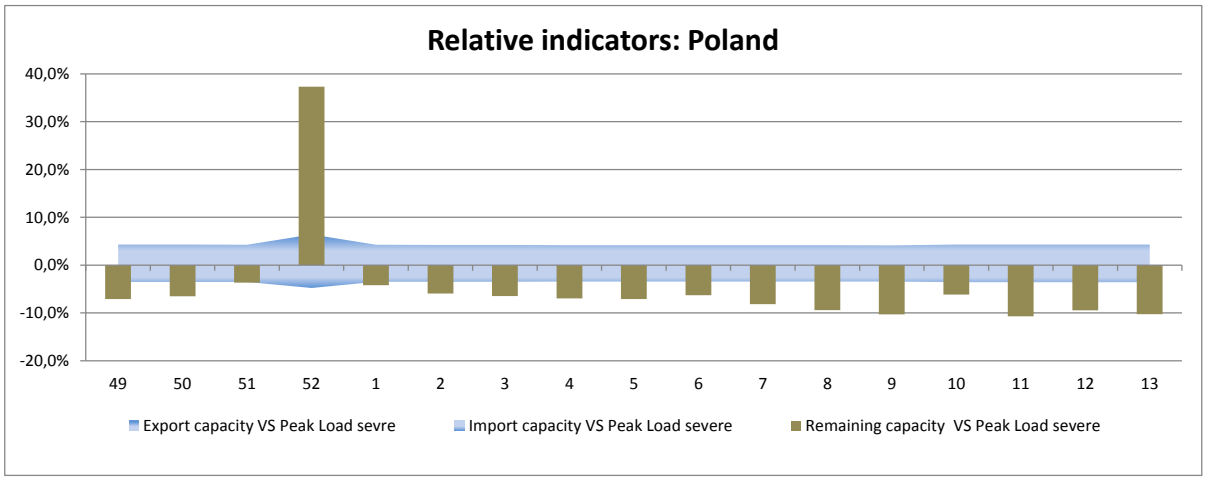

Demand and generation availability: Poland
40,0 GW
35,0 GW
30,0 GW
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Poland
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Poland
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

PORTUGAL

General comments

In the next winter, as in previous years, generation/demand balance is expected to be met without any problems. The decommissioning of Setúbal, a 946 MW old conventional thermal power plant, should be, in large, compensated by the new reversible units in the hydro plant of Alqueva (256 MW) and, more expressively, by the decrease in demand motivated by the depressed economic environment. The supply's security of the Portuguese system is usually not dependent on the neighbour country and so is expected to be in the next winter. However, in a low hydro scenario, and under certain market conditions, some power flow in the interconnections could be expected. No problems are envisaged with inflexible generation, as minimum demand, and the now reinforced pumped storage capacity, have enough room to accommodate excess wind output and remaining must run units in all scenarios.

Generation-Demand balance

For the next winter season, generation/demand balance presents a very comfortable situation. Under normal conditions, the remaining capacity margin is expected to remain above the 23% of installed capacity. In the outcome of extreme conditions, from both the supply and demand sides, the margin is approximately 6% of installed capacity, on average, even without resorting to imports. No potential threats or critical periods were identified.

The results are based on studies undertaken in the framework of guarantee of consumption supply analysis. These studies are conducted on a weekly basis, with internally developed tools, to assess the water value of the reservoirs and determine the expected behaviour of hydro and thermal production. The method uses a probabilistic approach where several hydro inflow scenarios are considered.

The quantitative elements provided in this report were computed according to the following:
Normal conditions

- average hydro inflows (taking into account the actual levels of the reservoirs)
- average wind production based on historical data (32% of utilisation)
- peak demand forecasts with a probability of 50%
- planned available capacity for largest hydro and thermal power stations

Severe conditions

- average of the 5 lowest hydro inflow scenarios on historical data (and taking into account the actual levels of the reservoirs), corresponding to a 1 in 8 year scenario
- wind production reduced to 3% (corresponding to a 1 in 20 year scenario)
- peak demand levels configuring a 1 in 10 year scenario
- planned available capacity for largest hydro and thermal power stations

Outage rates are based on historic averages (5% for thermal and 1.5% for hydro) and were considered the same for both normal and severe scenarios. For the assessment of the downward regulation system capability we considered a demand scenario with a 50% probability and set a downward regulation requirement corresponding to the monthly average of the bids for reserve at the 04:00 CET submitted by the TSO to the market during the last three years. Run-of-river generation must run was set in accordance to our simulations, considering a high inflow scenario with a probability of 1 in 8 years.

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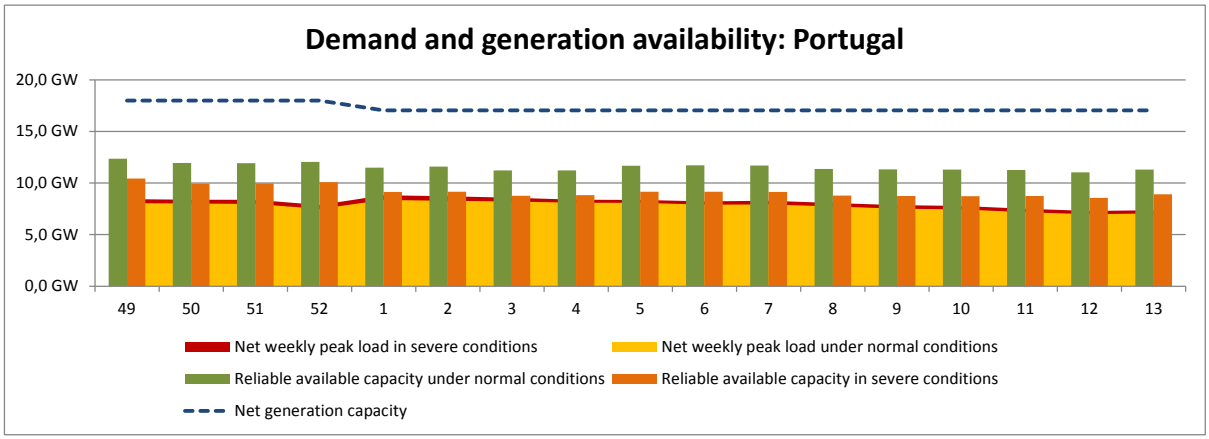
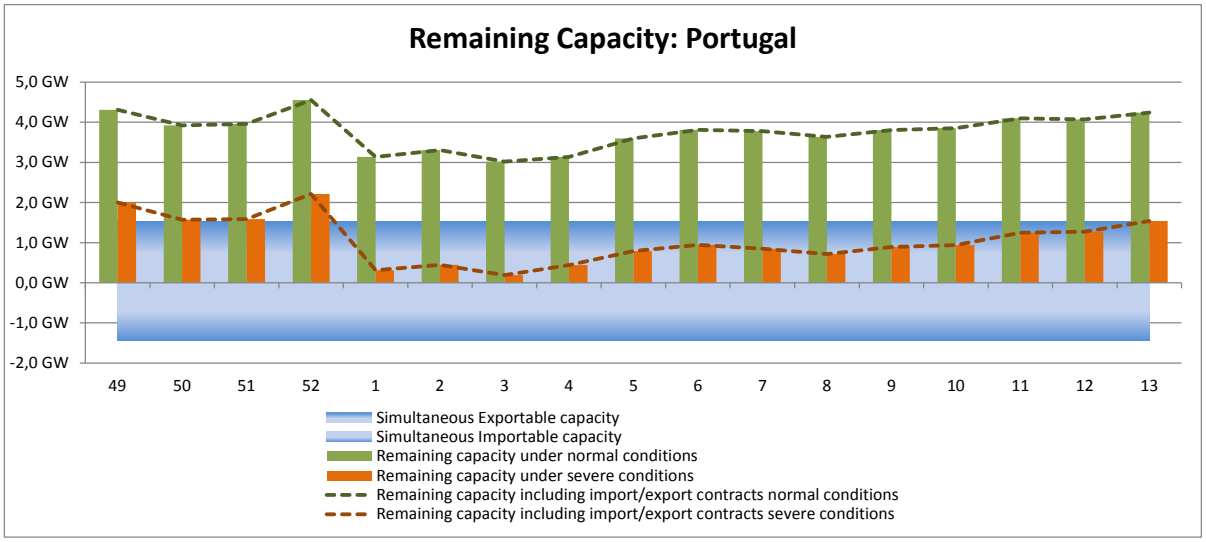
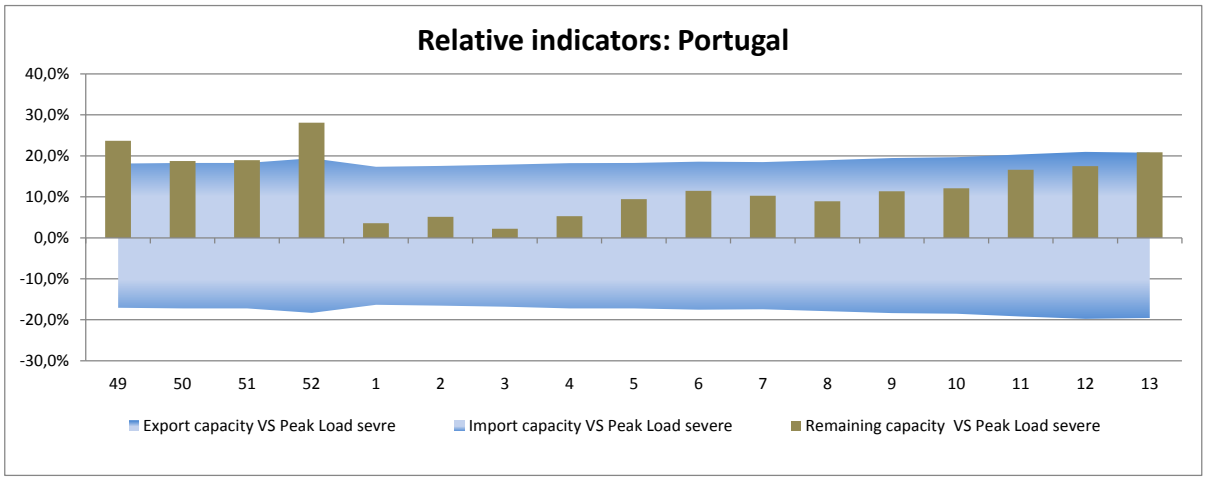

Demand and generation availability: Portugal
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Portugal
5,0 GW
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Portugal
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
-30,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

SERBIA

We do not expect any problem during the next winter for normal weather conditions. The adequacy analyses show that Serbia will probably have to import additional amounts of electricity for extreme weather conditions.

We have identified only one 220 kV internal line which is affected for one specific generation pattern, but so far this could be solved by topology measures and the re-dispatching of available units.

Gas supply stoppage could result in a cease of heating plant operation, which stipulates increase of electricity load. However, even this cannot significantly affect the transmission system.

There is a problem with the estimation of NTC values because the Annual maintenance schedule for 2013 will be accomplished at the end of November. We used values from the last winter period 2011/2012.

ENTSO-E reserve rules are inadequate i.e. very expensive for small TSOs with large units, which is the case for us. In order to more realistically depict our situation, we put in figure 0 for expected outages, as we consider that it is to be covered by the high system reserve (real value of average outages is 0.2 while system reserve is 0.6 GW, net capacity is 8.37 GW). In order to overcome this situation, we have concluded five contracts for importing of emergency energy.

There are only two small units of 0.13 GW which we considered as mothballed. Being small and placed in Kosovo region, we have not asked for any detailed information about their future availability.

A Serbian Generation Company have signed a contract with a Montenegrin Generation Company to lease the Montenegrin Hydro Power Plant Piva and it is represented in the spreadsheet as 342 MW firm import contract from Montenegro and 116 MW export to Montenegro.

During the entire winter, the Serbian Generation Company is planning to buy a certain amount of energy to cover its demand. This energy will be bought from traders on the Serbian market so at this moment it is not possible to define from which borders it will be.

A problem could be lack of energy on the market due to low temperatures and low hydrology.

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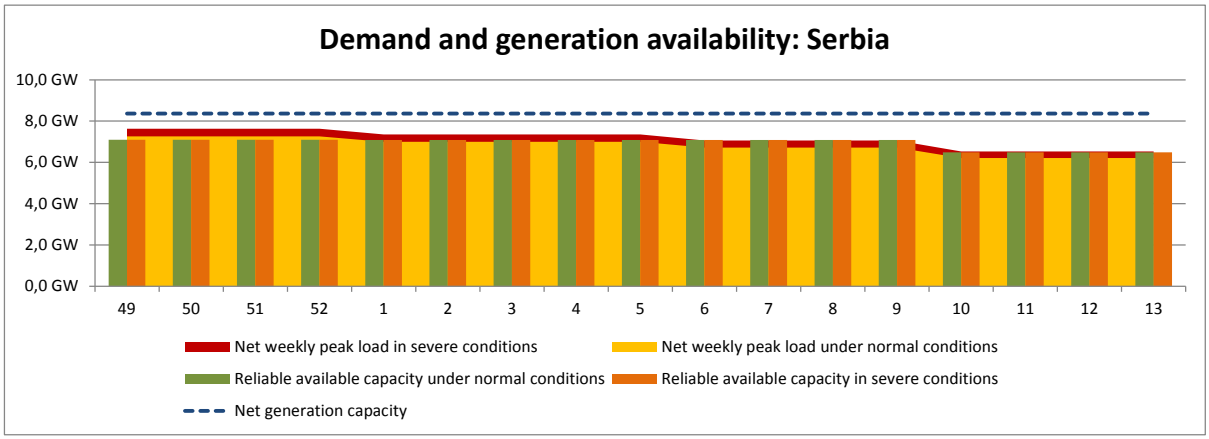
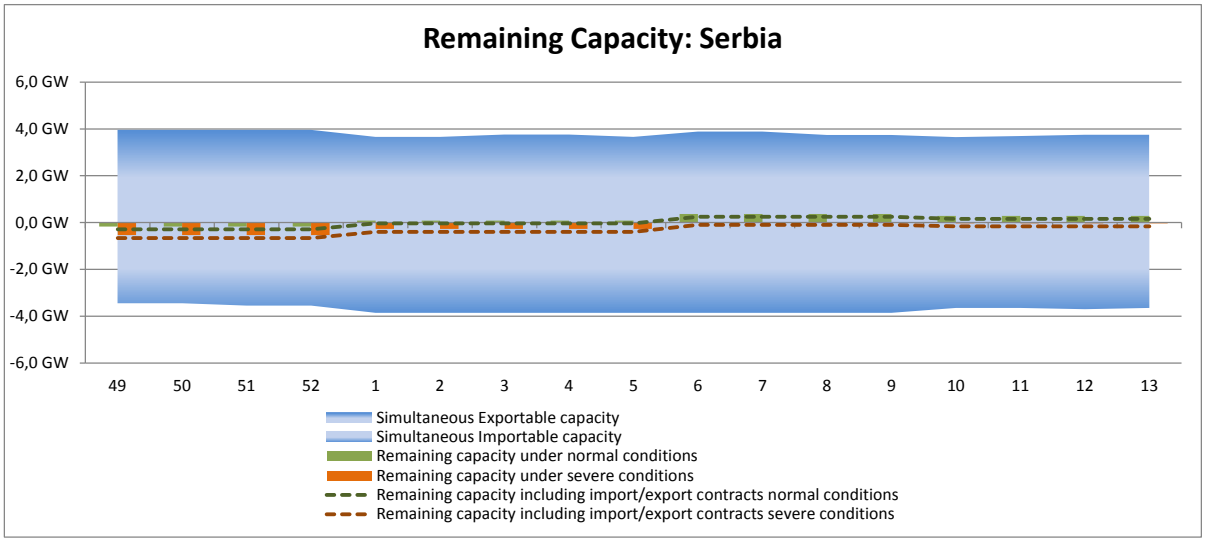
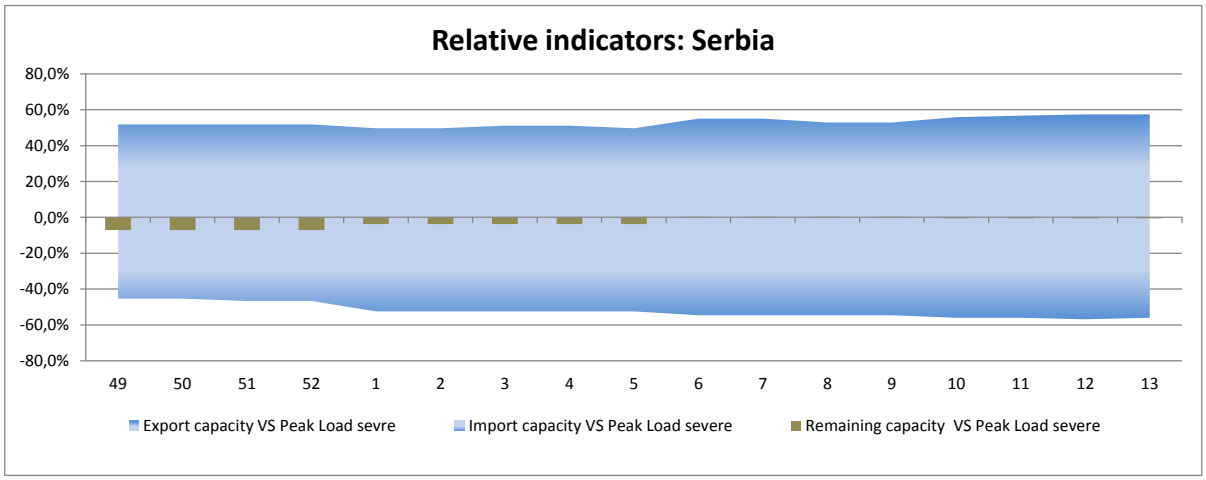

Demand and generation availability: Serbia
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Serbia
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
-4,0 GW
-6,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Serbia
80,0%
60,0%
40,0%
20,0%
0,0%
-20,0%
-40,0%
-60,0%
-80,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

ROMANIA

The national generating capacity in the Romanian Power System will be able to ensure the coverage of the consumption and the eventual export requirements.

The main risk is the decrease of the temperature when the gas pressure may be at low levels or when the coal freezes.

For the coming winter the expected and main role of the interconnectors between Romania and its neighbours is to facilitate the performing of the commercial exchange power. The role of interconnections is usually to support the exports for commercial purposes. However, for certain hourly intervals during the day imports may occur due to the market conditions.

In case of generation adequacy problems, there are bilateral agreements with certain neighbours in order to provide emergency exchange power.

In case of a gas crisis, certain thermal power plants can switch from gas fired to only oil fired.

The fast tertiary reserve (800 MW) which is sized to replace the tripping of the largest generation unit in Romania and an additional demand forecast error, has thus far also been sufficient when it comes to substituting the wind generation loss.

In the Romanian Power System the significant changes in terms of generation capacity for the coming winter 2012-2013 compared to the previous winter are:

- the future increasing of the wind farms' generation capacity with 55% meaning 800 MW by the beginning of December 2012;
- the installation during the summer 2012 of a combined cycle power plant of 860 MW as generation capacity. This new power plant leads to an increase of the remaining capacity and the possibilities to fulfil the system services requirements.

At the national level there is a Winter Program to ensure Power System reliability and stability during the winter season, which is approved by the Romanian Government. The main purpose of the Winter Program is to evaluate the consumption for the time interval between October 2012 and March 2013 in order to cover its forecast in terms of quality and safety feeding in the context of the safe and stable operation of the Romanian Power System. This program foresees the necessary fuel stocks to be got during July-September 2012 for the proper operation of the thermal power plants during the winter season, even taking into account the necessary ancillary services. Besides this, the Winter Program establishes the implementation of the capacities market which will be used to sustain the ancillary services. There are provisions to acquire the necessary fuel for certain thermal power plants with few operation hours over the year, which are offered on the capacities market. In addition, this program foresees that the maintenance programs for the thermal power plants and hydro power plants should be carried out during the summer season. The Transelectrica's responsibilities as a Romanian TSO in terms of the Winter Program is to approve the carrying out of the maintenance plans for the generation units, in reliable operation conditions for the Power System. In addition, according to the national regulatory

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frame, Transelectrica is the administrator for the balancing market, the ancillary services market and the cross-border capacities market.

Transelectrica does not foresee any risk for the coming, winter taking into account the realisation of the Winter Program. The actual amount of ancillary services copes with the intermittent generation of the wind farms installed in the Romanian Power System.

The average rates for both Normal and Severe conditions have been calculated on a statistical basis.

NTC values were obtained from the maximum indicative non-guarantee export & import composite NTC calculated in the Romanian interconnection interface for normal topology in the winter of 2012-2013, distributed on bilateral borders. These bilateral values are aggregately on the Romanian interface.

Transelectrica has information which is the cause for the mothballed power plants status and for certain cases, the time at which they should be made available. They become available during extreme unbalanced situations (e.g. very low temperature) after the usage of the slow tertiary reserve and the remaining system capacity, but in certain time intervals known by Transelectrica.

Based on the current information held by Transelectrica for the coming winter, there will be no relevant transmission constraints affecting the cross-border capacities.

In case of a gas crisis, certain thermal power plants can switch from gas fired to only oil fired. In case of coal freezing, the slow tertiary reserve and part of the remaining capacity will be activated.

The “firm contracts” refer to the use of the yearly NTC for 2012, which has been given to the market since the end of 2011.

During the minimum demand periods, we do not expect any issue with inflexible plants, since the fast tertiary reserve is sufficient in so far as being used when the wind plants are in operation.

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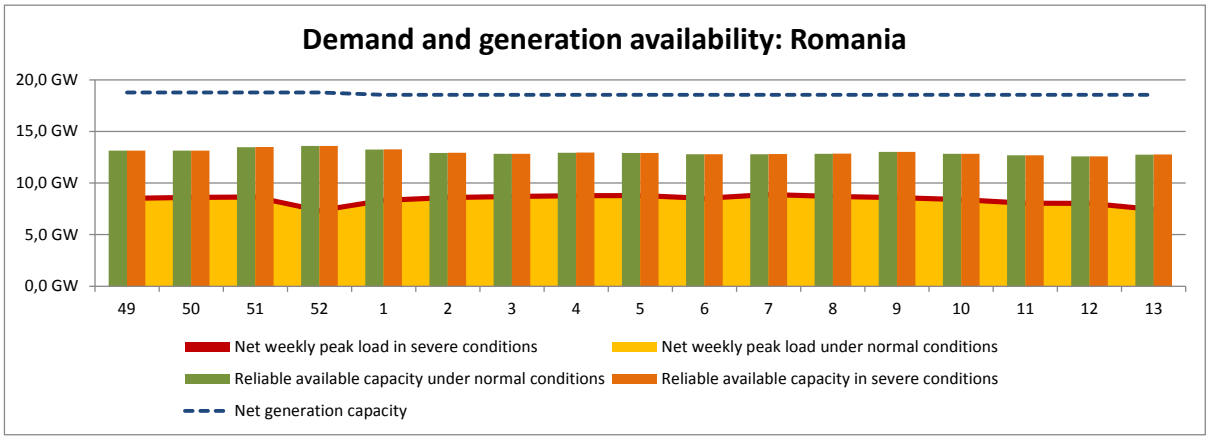
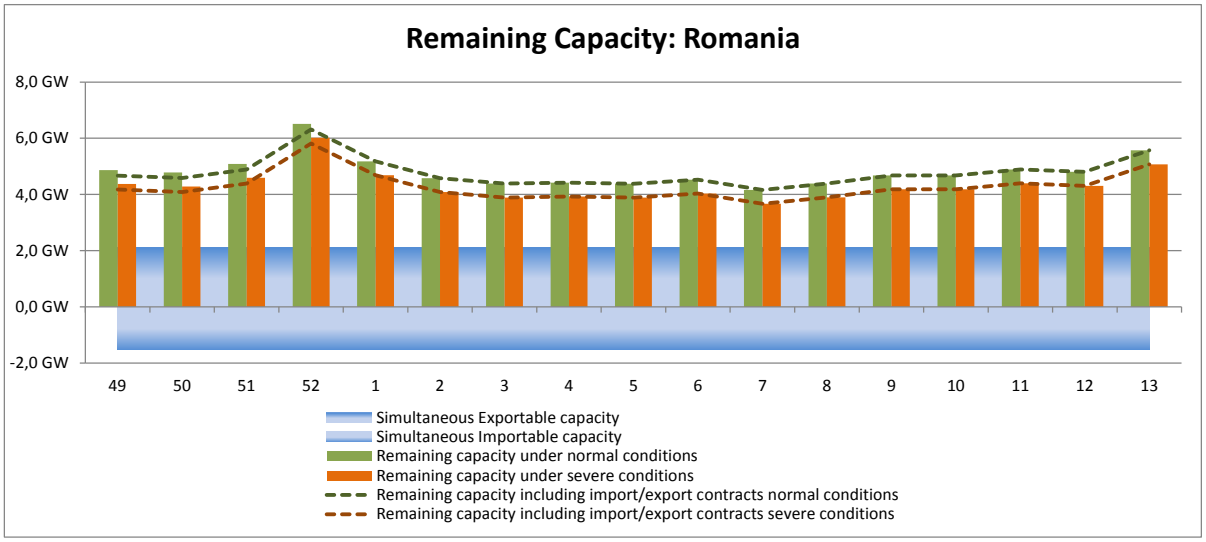
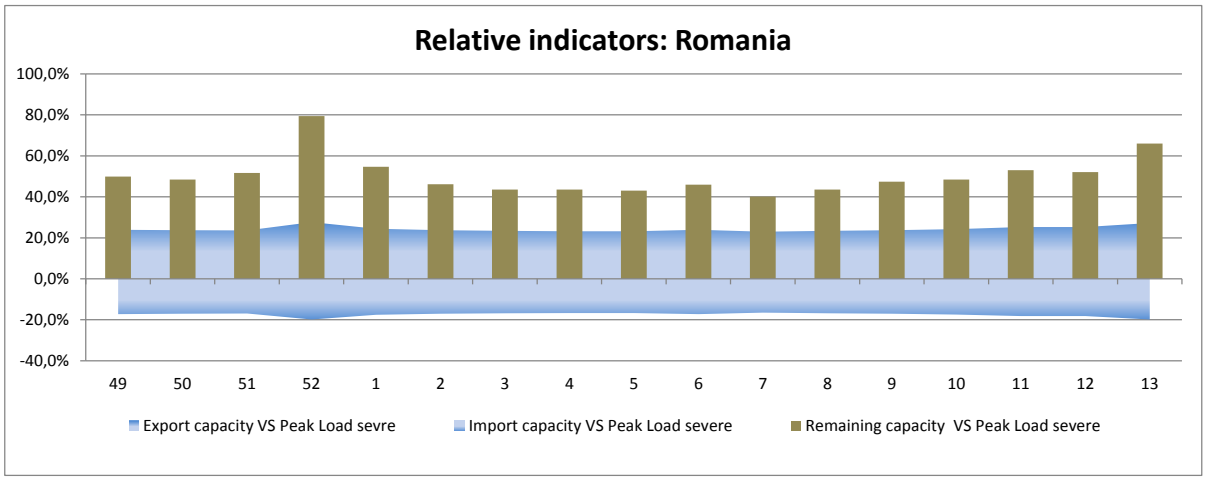

Demand and generation availability: Romania
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Romania
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
-2,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Romania
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
-20,0%
-40,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

SLOVAK REPUBLIC

The analysis for the coming winter 2012/2013 is positive, assuming standard conditions. In general, daily peak load values are expected to be slightly higher compared to last winter. Critical periods in the next winter are not expected, either under normal or severe weather conditions.

The lowest remaining capacity in normal conditions is foreseen during the 6th week (6th February), which leaves a remaining capacity of 240 MW (2.93% of net generation capacity). This assessment takes into account the scheduled overhauls, estimation of average outage schedules of generating units, estimation of non-usable capacity for each fuel type and system service reserves known from the yearly operational planning. The highest weekly peak load in normal conditions for this outlook report is foreseen during the 6th week (6th February), and is 4390 MW (the same as was foreseen in winter 2011/2012).

The scenario under severe conditions was also analysed. The maximum weekly peak load in severe conditions is expected to be 4420 MW (last winter it was 4395 MW). The cold weather conditions result in lower usage rate of hydro power plants and also nuclear power plants, i.e. the non-usable capacity increases. Therefore, in this scenario during some weeks (49 to 52, as well as days 2 and 5 to 8) the remaining capacities are negative.

Last year the Slovak Republic was an importer of electricity, 2.52% of total consumption. In the winter months of 2011/2012 (December, January and February) it was 6.11% of consumption, only in March the export was recorded at the level of 142 GWh (5.63% of total consumption). For the winter of 2012/2013, we expect similar behaviour of the Slovak power system.

No changes concerning the volume of cross-border capacities are planned (e.g. new tie-line or decommissioning of interconnection lines). In addition, during this winter period we expect high transits of electricity from the North-West to the South-East Europe caused by high production of electricity of renewable sources in the North-West Europe and deficit in the South-East Europe and high exports from adjacent TSOs. The same situation was also observed in the summer of 2011 and continued even in winter months 2011/2012. With this in mind, some countermeasures are being considered to avoid and mitigate the negative influence of these electricity flows across the Slovak transmission system.

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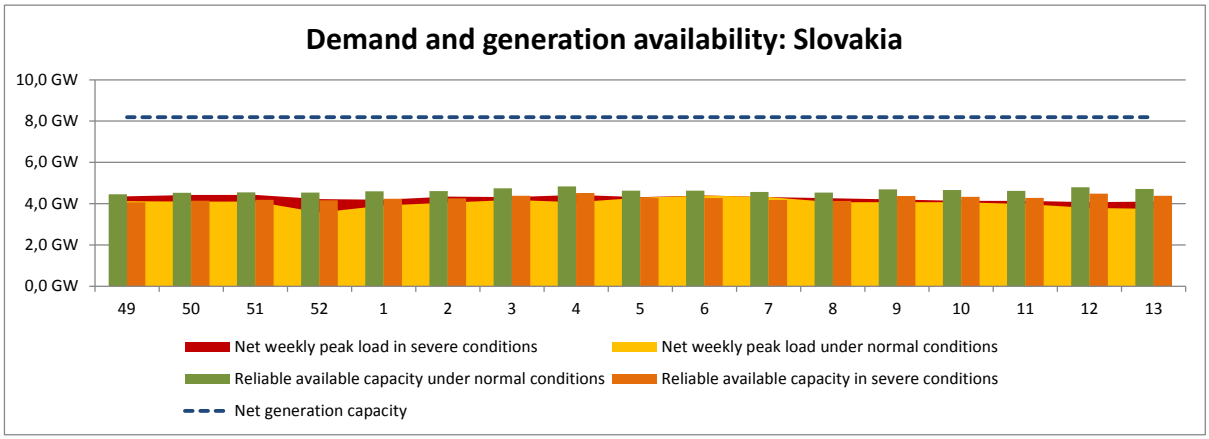
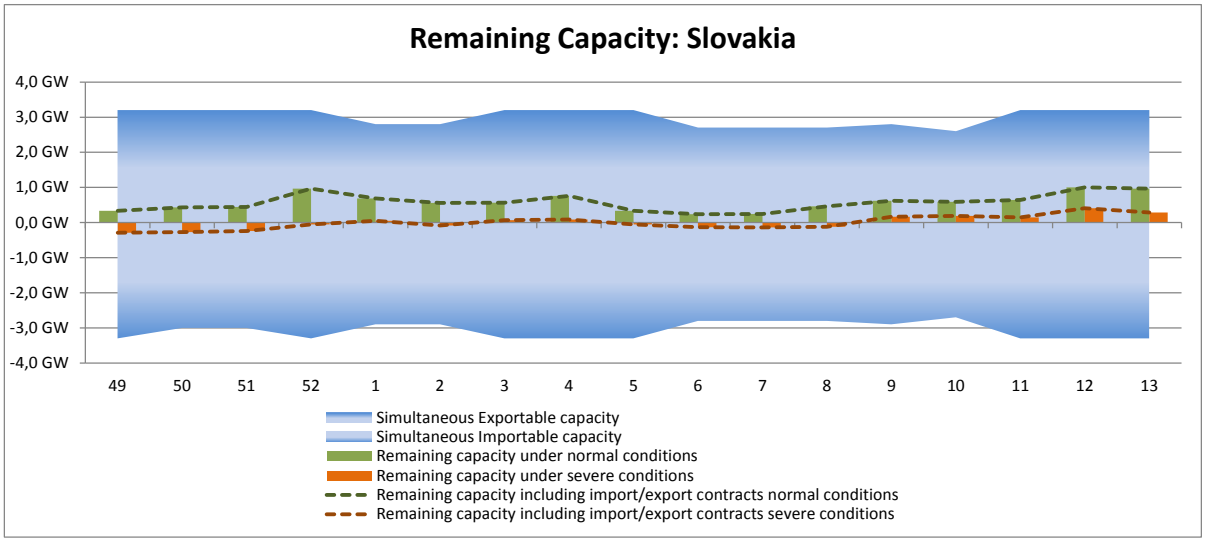
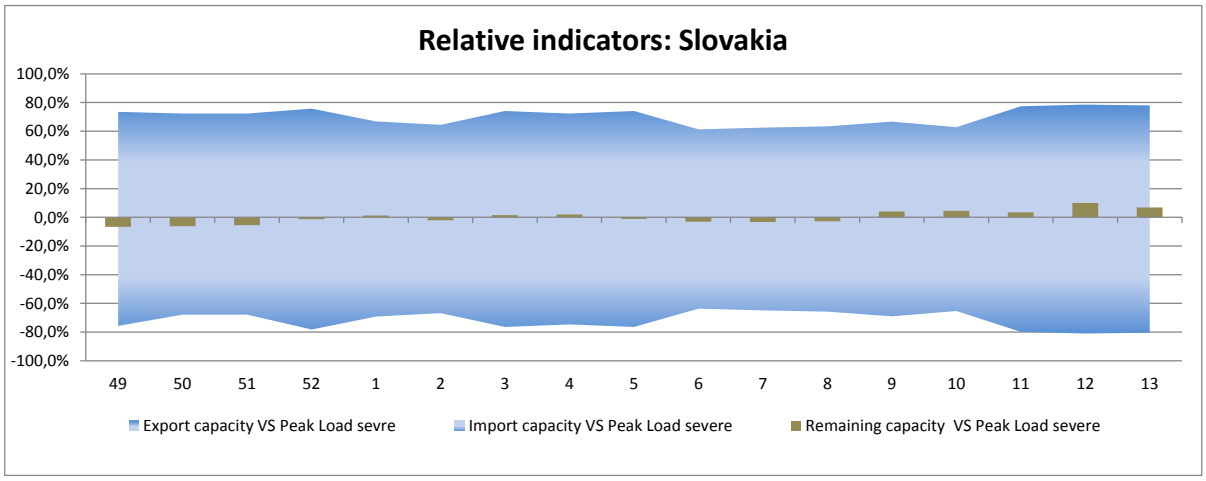

Demand and generation availability: Slovakia
10,0 GW
8,0 GW
6,0 GW
4,0 GW
2,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Slovakia
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
-4,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Slovakia
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
-20,0%
-40,0%
-60,0%
-80,0%
-100,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

SLOVENIA

General Comments

The RC is planned to be positive during the entire winter period. The lowest RC is expected during weeks 5 to 8. In this period, lower hydro production and higher consumption are expected due to low hydrology and low temperatures. Peak load in the winter period is expected in the second half of January and in February.

Generation- Demand Balance

No problems due to load-generation balance are expected in system operation security or security of supply.

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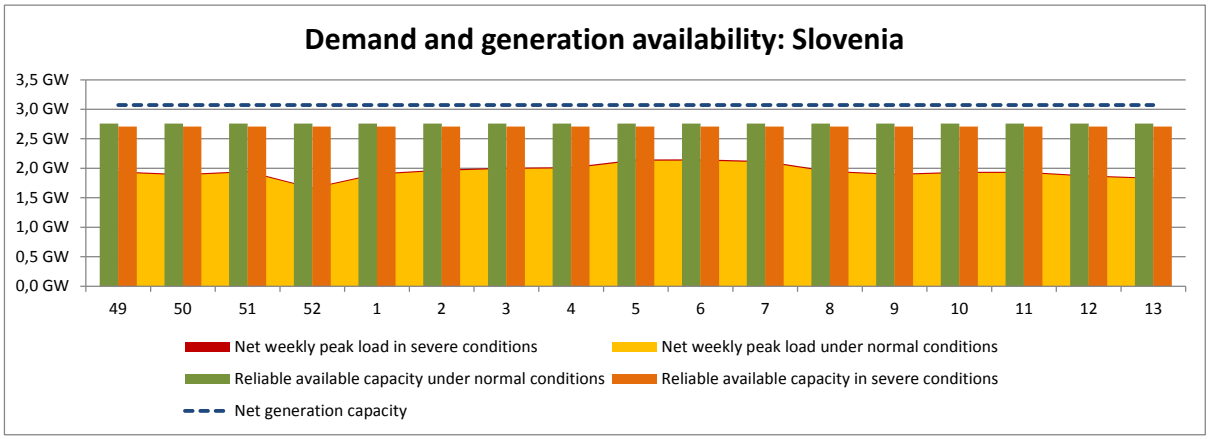
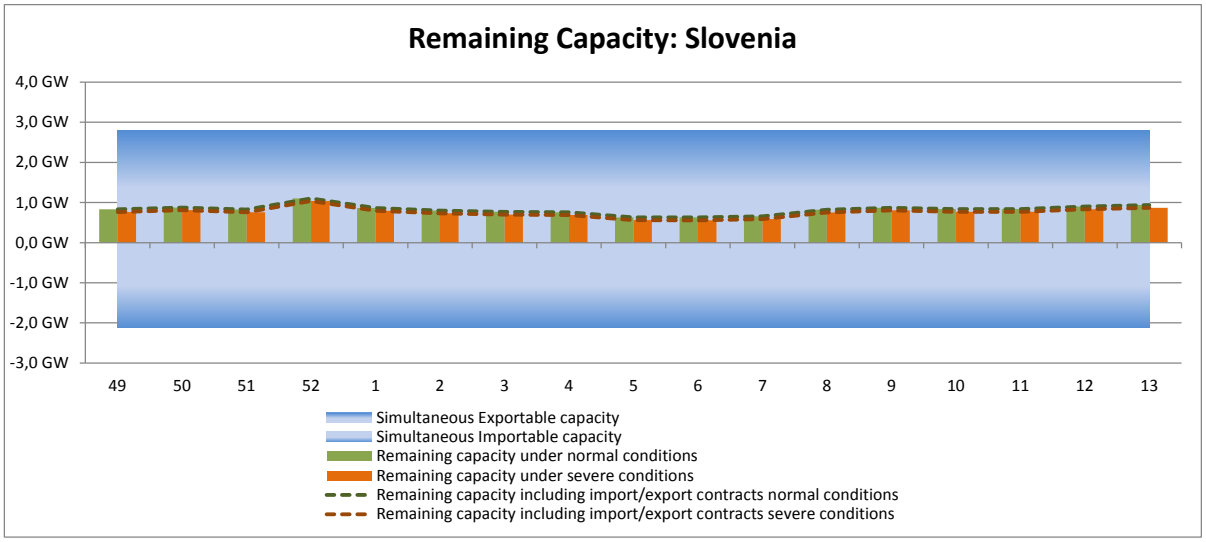
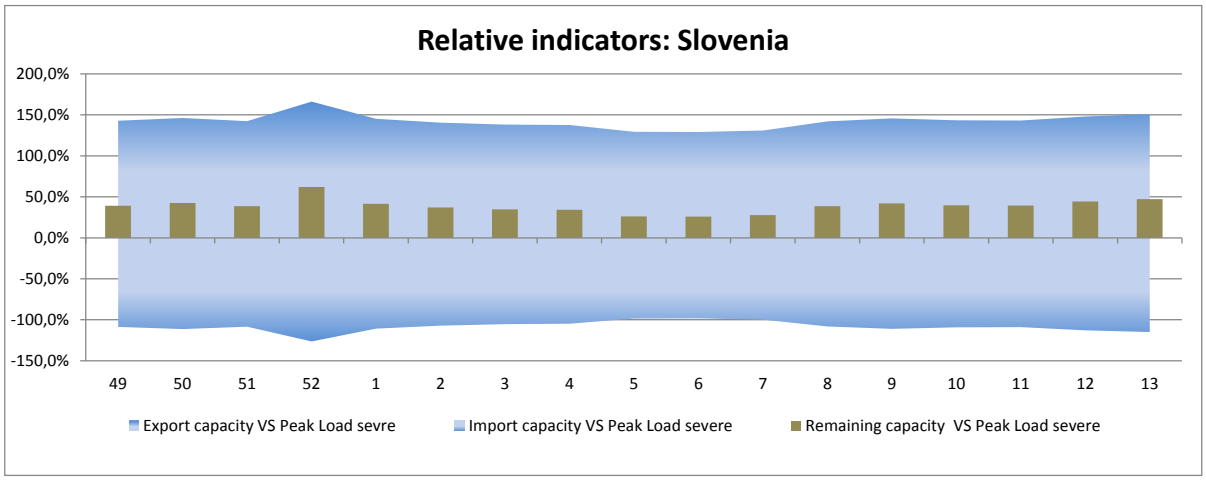

Demand and generation availability: Slovenia
3,5 GW
3,0 GW
2,5 GW
2,0 GW
1,5 GW
1,0 GW
0,5 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Slovenia
4,0 GW
3,0 GW
2,0 GW
1,0 GW
0,0 GW
-1,0 GW
-2,0 GW
-3,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Slovenia
200,0%
150,0%
100,0%
50,0%
0,0%
-50,0%
-100,0%
-150,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

SPAIN

General Comments

From the generation adequacy perspective, there is no detected risk situation in the Spanish peninsular system for the upcoming winter. Good generation/demand adequacy can be expected regardless of imports from neighbouring countries. If average conditions are considered, remaining capacity will be over 16500 MW. In the case of simultaneous extreme peak demand, very low wind generation (less than 8% of wind installed capacity), severe drought conditions and a high thermal forced outage rate, assessed remaining capacity is still over 8500 MW.

The demand values have continued to decrease during 2012, after the significant drop which took place during 2011, due to the economic and financial crisis. It is expected that the demand during 2013 will remain still, even with a slight further drop. The demand peak values expected for winter, with low temperature values and a probability to be reached of 4%, are 2% lower than in 2011.

The most important risk factors for the next winter in the Spanish system are hydro and wind conditions, sensitivity of load to temperature in extreme weather conditions and gas availability to combined cycle and gas thermal plants.

Generation-Demand Balance

Due to the drought conditions during the last year in Spain, the hydro reserves are below their average level. Besides, given the characteristics of the Spanish hydro system, with a great inter-annual and monthly variability regarding hydro flows, a conservative estimation of available hydro power is advisable. The 90% percentile is considered an accurate estimation.

The wind power covers a high amount of Spanish generation, with an installed wind power capacity of around 20% of total generating capacity. In order to assess the wind power generation under extreme conditions during winter, historical data were used. Wind generation assessed is around 7% of available capacity. Wind generation has been above this rate during winter periods with a frequency of 95%.

Solar PV energy is not taken into account when calculating generation capacity for winter peak demand, given that winter peak demand values take place after the sunset. Only a residual value for thermal solar generation is assessed (6% of installed capacity).

The generating capacity of several power stations could be reduced due to network capacity constraints. However, these constraints have been significantly reduced with the installation of operational inter-tripping equipment.

Voltage issues due to surplus of reactive power at low demand hours may be mitigated with the commissioning of new reactance. In the long term, CHP and renewable power plants' contribution to voltage control should be considered.

At minimum demand periods, with high amounts of renewable production, power surplus with spilling of RES can take place. The Spanish TSO has a specific control centre for renewable sources (CECRE), which is permanently monitoring the renewable production. Downward regulation reserves may be composed by renewable power plants; first, thermal production is

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reduced upon security criteria compliance. If additional reduction is needed, the RES Control Centre (CECRE) sends a new set point and supervises renewable production to maintain a balanced situation.
All scenarios are built under the following assumptions:

- Overhaul planning notified by generators for the upcoming winter.
- Guaranteed fuel (gas) supply for CCGT plants.
- Low wind conditions: wind generation considered is around 7% of available capacity. Wind generation has been above this rate with a probability of 95%.

Extremely severe conditions for the system are simulated as:

- Extreme demand due to severe weather conditions, typically very low temperatures
- Severe drought conditions. Significant non usable hydro capacity due to lack of water in the reservoirs.
- No import capacity is considered in the study in severe conditions. Therefore, it is not taken into account in the load – generation balance.
- Unplanned average forced outage of thermal capacity with a 10% probability of being higher (around 3.800 MW).

Role of interconnectors

The export capacity of interconnectors is a key factor in order to avoid curtailment of renewable energy, mainly wind power. However, given the short exporting capacity from the Iberian Peninsula to north Europe, it is necessary to point out the importance of demand management and energy storage –mainly hydro pump storage plants- in order to properly manage the excess of inflexible power at minimum demand periods. Nowadays, the installed capacity of hydro pump storage plants in Spain is around 5000 MW.

The NTC values are calculated taking into account calculations made from forecast scenarios which are shared with neighbouring countries, with different time scopes. Weekly values are calculated after taking into account planned outages and overhauls in the system.

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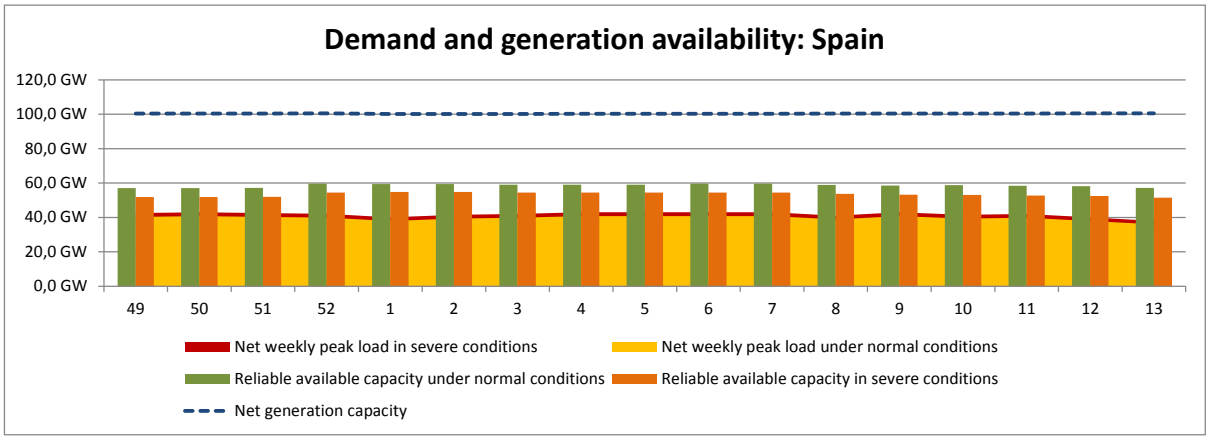
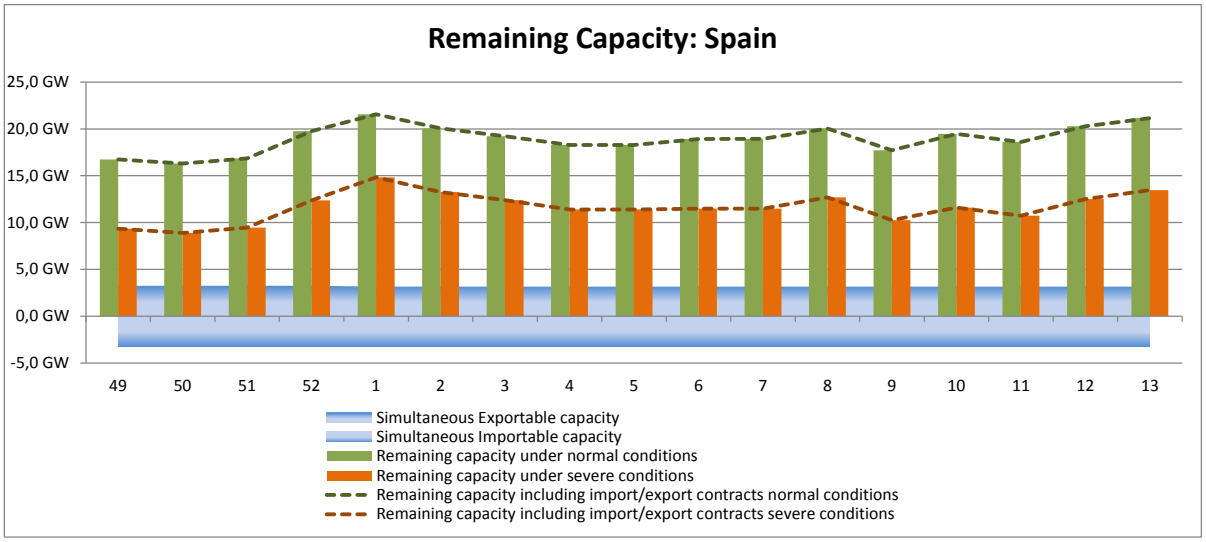
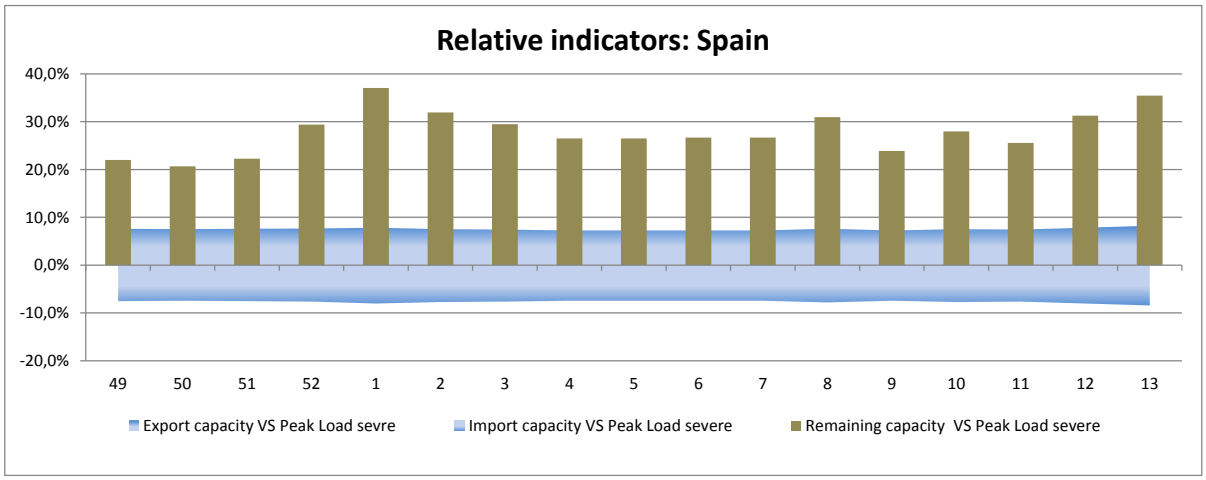

Demand and generation availability: Spain
120,0 GW
100,0 GW
80,0 GW
60,0 GW
40,0 GW
20,0 GW
0,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Net weekly peak load in severe conditions
Net weekly peak load under normal conditions
Reliable available capacity under normal conditions
Reliable available capacity in severe conditions
Net generation capacity


Remaining Capacity: Spain
25,0 GW
20,0 GW
15,0 GW
10,0 GW
5,0 GW
0,0 GW
-5,0 GW
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Simultaneous Exportable capacity
Simultaneous Importable capacity
Remaining capacity under normal conditions
Remaining capacity under severe conditions
Remaining capacity including import/export contracts normal conditions
Remaining capacity including import/export contracts severe conditions


Relative indicators: Spain
40,0%
30,0%
20,0%
10,0%
0,0%
-10,0%
-20,0%
49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13
Export capacity VS Peak Load sevre
Import capacity VS Peak Load severe
Remaining capacity VS Peak Load severe

SWEDEN

For the upcoming winter, 2012/2013, Svenska Kraftnät predicts that Sweden as a whole will have the possibility to meet domestic consumption with the available production in case of a normal winter, without having to rely on import. However, Sweden will, during severe winter conditions, most likely need some net import to meet the domestic consumption. This is, however, during a pessimistic scenario rather than in the domestic report.

The peak load in Sweden is statistically occurring in between 17:00 to 18:00 CET, but the load at 19:00 is usually almost as high (99.6% on average during the year 2011). Indeed, this means that the scenarios during this winter outlook report does indeed effectively represent the most strained hours for Sweden.

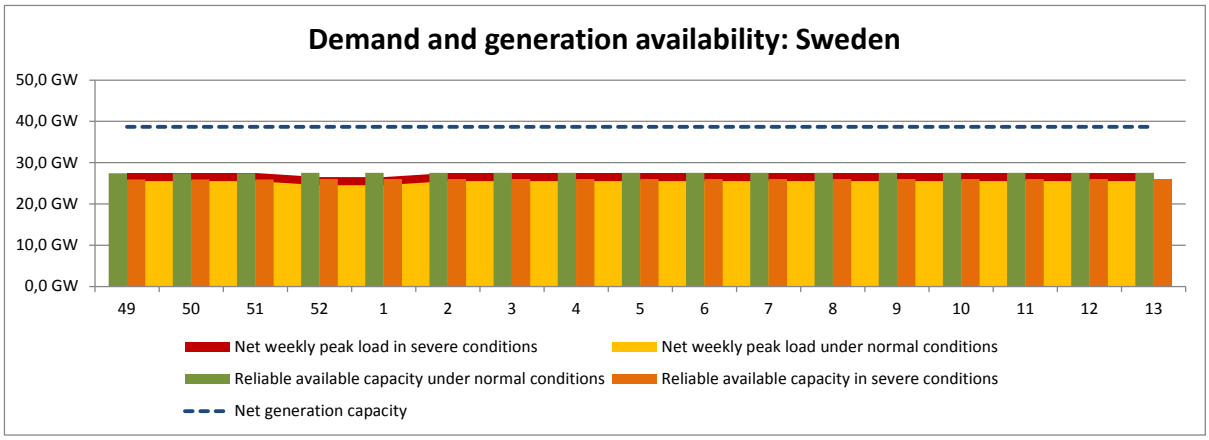
In both cases (normal and severe) there is a surplus of generation in the northern part of Sweden and a deficit in the south, where most of the consumption is located. Therefore, Svenska Kraftnät avoids all planned maintenance works which reduce the north to south transfer capacity during the winter period, so as not to increase the risk of power shortages. Furthermore, Svenska Kraftnät is also contracting producers as well as consumers for a Peak Load reserve during this period. This reserve brings about the possibility of increasing production and decreasing consumption, if needed, during strained situations. The total amount of Peak Load reserves for the winter of 2012/2013 is 1.255 GW of generation, and 0.464 GW of load reduction. This reserve would probably not be available without economic stimulation (for example these production units are deemed to be mothballed without the economic compensation they get for participating in the Peak Load reserve).

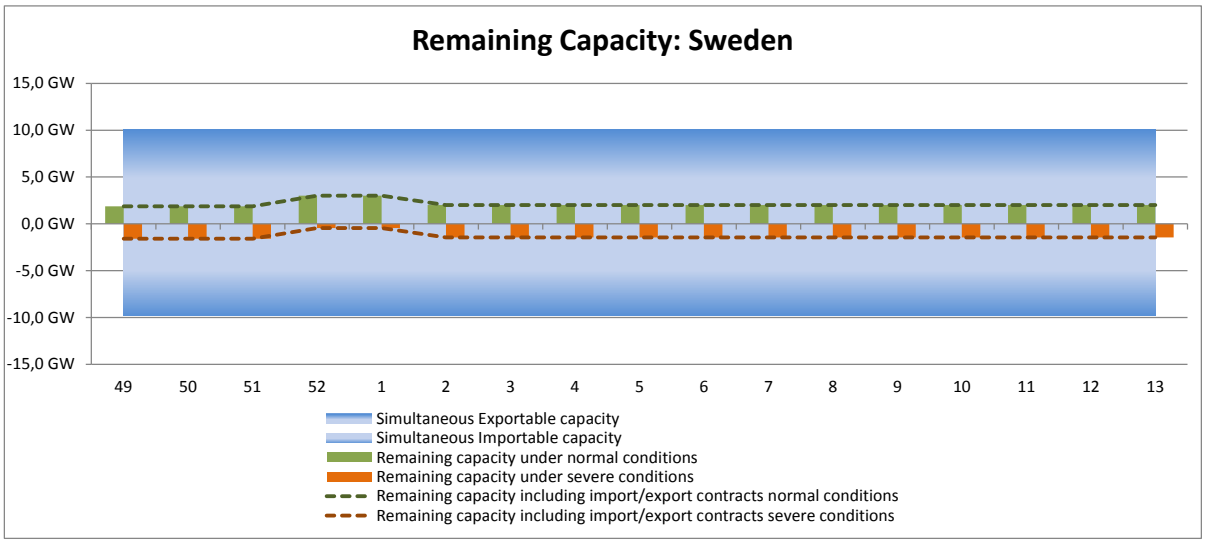
The main risk factor in the power balance is if the nuclear power plants (NPP's) should not work as planned. This would both reduce the north to south transfer capacity as well as worsening the power balance in the south of Sweden even further. The availability of the Swedish NPPs has also been hard to predict over recent years (as a consequence of upgrades and modernisations); therefore, this usually contributes to the biggest uncertainty when studying the domestic generation versus demand adequacy. Svenska Kraftnät estimated, in their annual domestic report, that an NPP availability of approx. 80% is needed for Sweden to be self-supporting and not to be dependent on any net import. It is deemed as likely to exceed this availability figure. It is once again worth mentioning that the severe scenario in this report is even more pessimistic than in the domestic Swedish report.

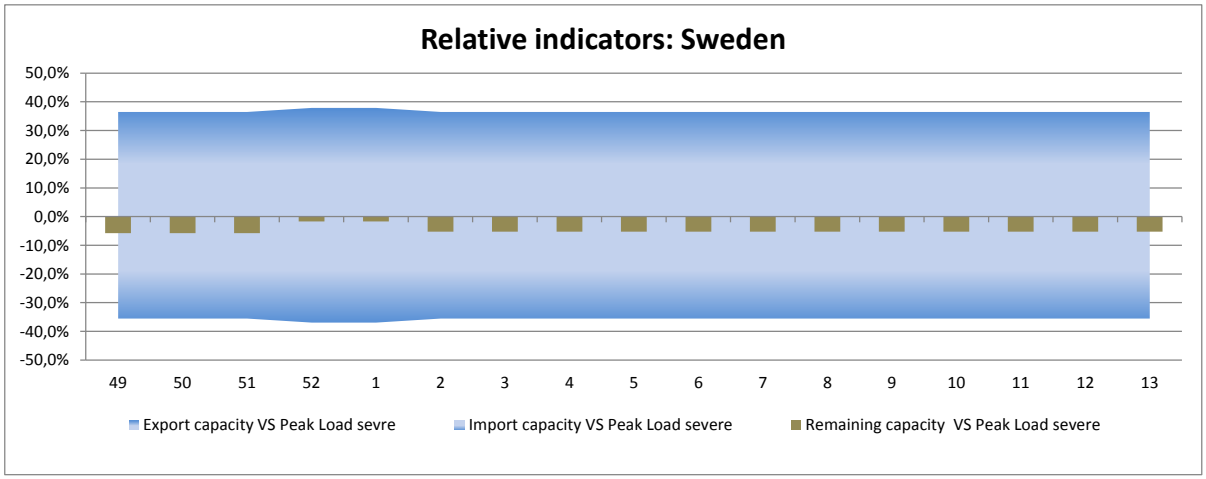
When performing adequacy studies, Svenska Kraftnät estimated generation outage rates by using a combination of historical data and experience. For instance, although Sweden has approx. 16.2 GW of hydro power installed, Svenska Kraftnät's experience is that only 13.7 GW could be run at once due to hydrological constraints. Furthermore, mothballed plants are usually excluded when estimating available generation, although some of them may be available by the right price signals (that is by prices high enough, during periods long enough).

The producer's maintenance programs are continuously followed by Svenska Kraftnät to investigate how healthy the domestic balance is. These maintenance programs are published externally by the producers at Nord Pool Spot (the Nordic power market) according

to current regulations. If the domestic production is less than the prognosis for consumption, then import capacity is investigated further to ensure that the consumption can be met.

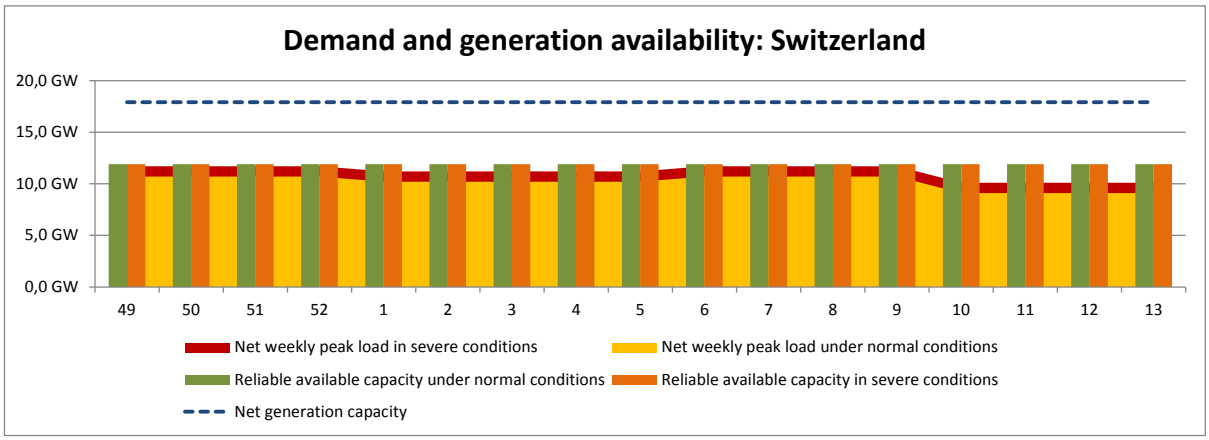


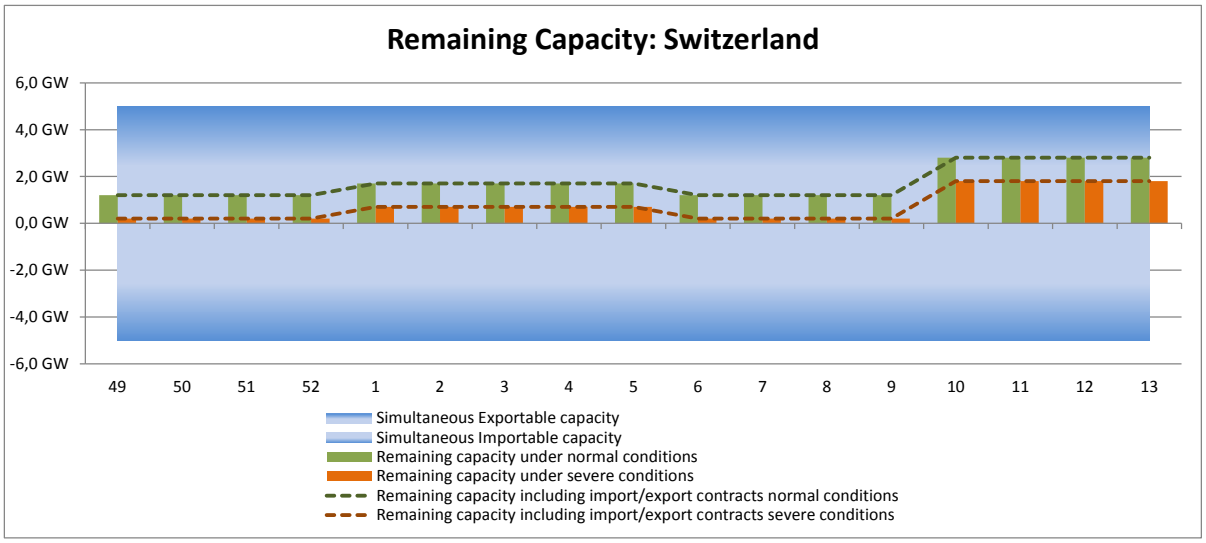


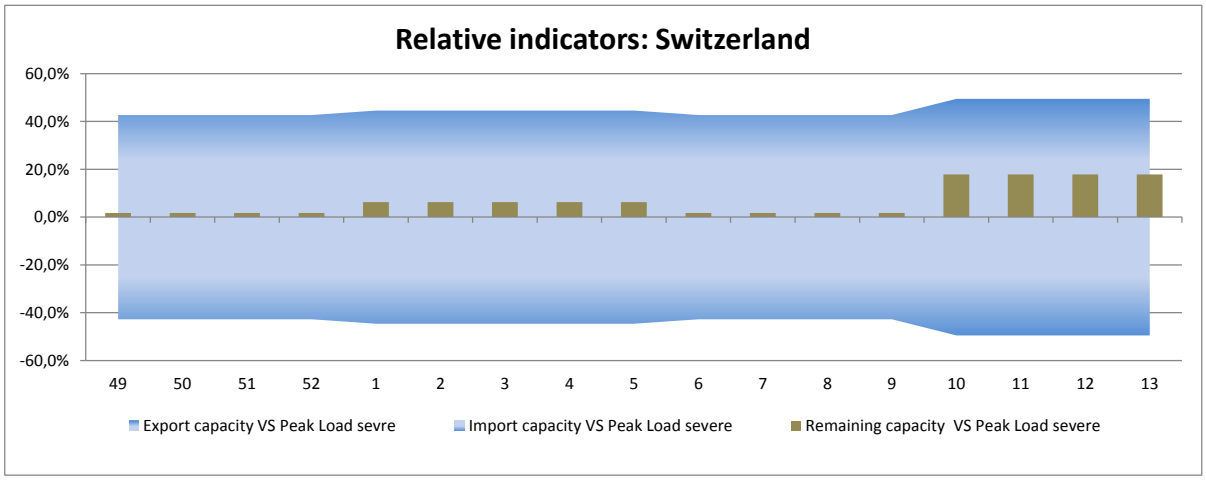


SWITZERLAND

No problem concerning generation adequacy is expected for the coming winter by the Swiss TSO. Switzerland will not be dependent on imports during the winter period.







6.2 INDIVIDUAL COUNTRY RESPONSES TO THE SUMMER REVIEW

Albania

Austria

Belgium

Bosnia & Herzegovina

Bulgaria

Croatia

Cyprus

Czech Republic

Denmark

Estonia

Finland

Former Yugoslav Republic Of Macedonia (FYROM)

France

Germany

Great Britain

Greece

Hungary

Iceland

Ireland

Italy

Latvia

Lithuania

Luxembourg

Montenegro

Netherlands

Northern Ireland

Norway

Poland

Portugal

Republic Of Serbia

Romania

Slovak Republic

Slovenia

Spain

Sweden

Switzerland

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ALBANIA

During the summer period of this year, the Albanian Power System did not encounter any unexpected or unusual events / conditions.
The temperatures were somewhat above those predicted, especially during August, although they were not classified as severe conditions. Due to these temperatures, we faced an increased consumption of electricity and a slight increase in peak loads, with the exception of September. The increased demand was covered mainly by public generation company KESH, using the favourable situation of hydro energetic reserves at the begging of June.
Water levels in reservoirs of Drini Cascade (the main source generation of the country), except for the month of June, were below target levels due to insufficient inflows of the catchment. As a result of this situation, and increased generation, the hydro energetic reserves at Drini Cascade were reduced apparently, as was the efficiency of power plants.
Most of the intended repair works were completed in accordance with the plans.
Interconnection was available during the whole period, without any outage, and we did not face any difficulty with regards to NTC quantity, cross-border allocation, or relationships with market participants.

The following diagrams present the comparison between forecast data and realised data.

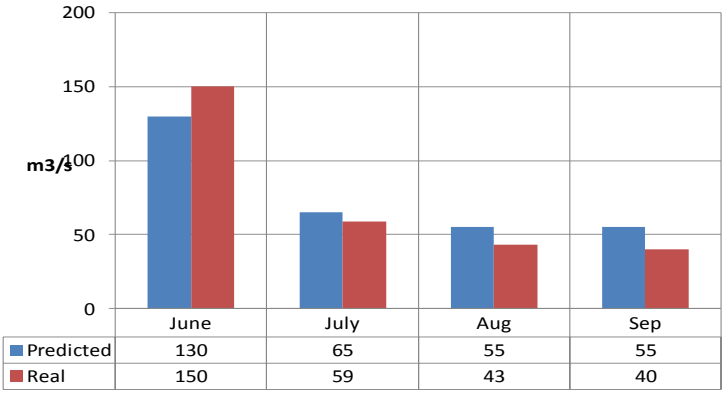
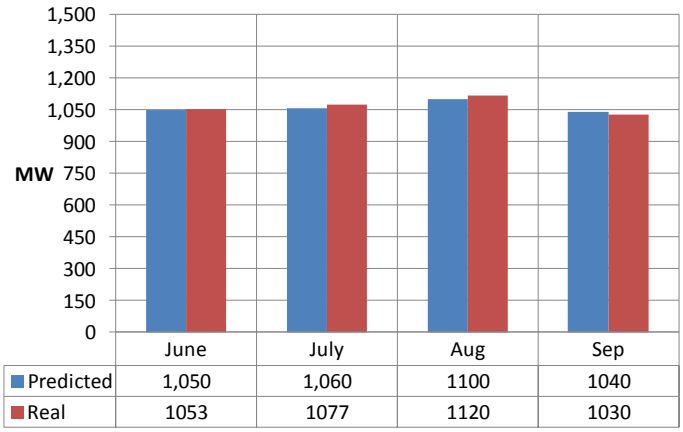
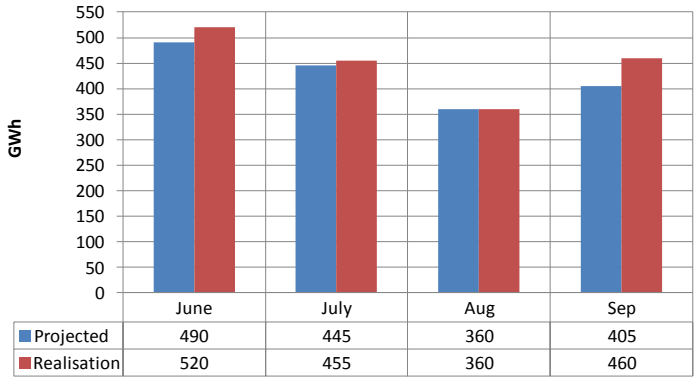


Diagram 1: Monthly inflows at Fierza HPP



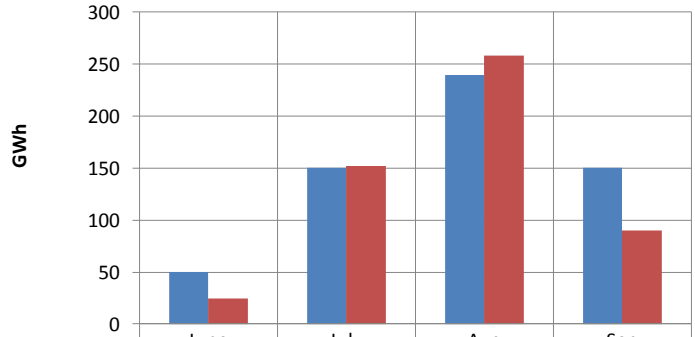
	June	July	Aug	Sep
Predicted	1,050	1,060	1100	1040
Real	1053	1077	1120	1030

Diagram 2: Monthly Peak Load



	June	July	Aug	Sep
Projected	490	445	360	405
Realisation	520	455	360	460

Diagram 3: Monthly Total Production



	June	July	Aug	Sep
Projected	50	150	240	150
Realisation	25	152	258	90

Diagram 4: Monthly Imports

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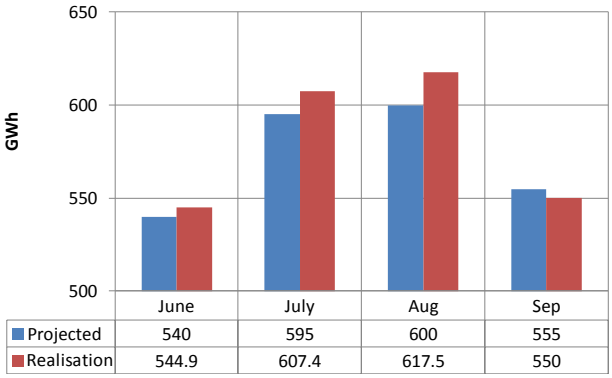

	June	July	Aug	Sep
Projected	540	595	600	555
Realisation	544.9	607.4	617.5	550

Diagram 5: Monthly Total Consumption

AUSTRIA

No critical events concerning the Austrian power grid occurred in the summer of 2012.

Power demand remained at the level of last year. Summer 2012 had no special events concerning the power balance situation.

In August 2012, there was a heat wave in Austria which led to higher loads than usual in the APG-Grid.

Due to the high share of run of river and storage power plants, the reliably available capacity was far above demand.

From the summer of 2011 to the summer of 2012 the generation capacity of the wind power plants in Austria increased by 200 MW.

As mentioned in the last Summer Outlook, the reconstruction of the important 220kV line between Tauern (AT) and Salzburg-Elixhausen (AT), destroyed by an avalanche in February. 2012, was completed by May 2012.

The phase-shifting transformer in Lienz (AT) was put into operation on May 24th 2012.

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BELGIUM

Conclusions

The adequacy forecast study “summer 2012” carried out in March 2012 for the Belgian area indicated that:

- Concerning upward regulation margins:

o under normal conditions: no large issues were to be expected concerning the generation-load balance for Belgium;

o under severe conditions: only in week 23 a structural dependency on imports from neighbouring countries was noted;

- Concerning downward regulation margins:

o extended periods were revealed with an elevated risk on the generation surplus, leading to incompressibility problems.

2. Actions taken by Elia to mitigate the revealed risks:

As an elevated risk of incompressible generation was revealed when planning for the summer, Elia took a number of actions to mitigate these risks as much as possible:

- Balance Responsible Parties were informed of the detected risks, and were asked to do their utmost to avoid these situations of generation surplus;

- Additional downward regulation means were set up to increase the available downward regulation margin;

- The imbalance pricing system was adapted to ensure that a correct incentive would be given to the market parties in case of a generation surplus;

- A specific procedure for the Elia System Operators was developed and implemented to be followed in case of incompressibility issues;

- A new tool was developed to allow for the prevision, detection and monitoring of possible issues concerning the downward regulation adequacy.

3. In hindsight:

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No noteworthy issues were experienced regarding the upward adequacy. Available production levels were sufficient for the entire summer to cover the Belgian load as predicted. No extraordinary atmospheric conditions (extended periods of draught, …) were experienced during the past summer.

However, incompressibility issues were experienced on specific and isolated days during summer. Especially on some holidays and weekend days, the risk of an excessive generation surplus arose due to low load conditions and/or high renewables in-feed. The effect was however limited thanks to the correct functioning of the incentive mechanisms for the market, combined with all other preventive actions which were taken by Elia.

Additionally, during the most critical period, the risk was smaller than predicted due to an extension of the scheduled maintenance of 1000 MW of generation.

As a conclusion, Elia stated that no specific situations endangering Security of Supply were experienced over the past summer. Actions which were taken before summer upon detection of the elevated risk, allowed Elia and the market participants to cope with the situation of an excessive generation surplus; this was a very rare situation for the Elia grid up to the past summer.

BULGARIA

The electricity demand for the summer period June – August 2012 decreased by 1.8% compared with the same period of 2011 (comparison based on normal temperature-adjusted monthly consumptions).

Temperature conditions were near normal and only one heat wave was observed during July. The hottest working day was the 7th of August (Tuesday) with temperatures of: T_{min} = 21.5 ˚C, T_{ave}=29.4 ˚C, T_{max}=37.5 ˚C. For this day the peak load was 4783 MW (observed at 02:00 p.m.) and the daily consumption: 100709 MWh.

There were no adequacy problems in the period. Failure rates of units were as expected and maintenance schedules were strictly fulfilled. Water levels in the big reservoirs were slightly below target levels because of very low rainfall during the period. Nevertheless, hydro plants operated normally in the peak zone of the daily load curve.

There were no critical outages in the transmission network. During the whole period, Bulgaria exported electricity to neighbouring countries. There were no unplanned outages of any interconnection lines.

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CROATIA

Last summer, the Croatian power system was forced to confront a great drought. The situation in accumulations was not satisfactory and consequently the electricity generation of hydro power plants was decreased. The lack of energy was compensated mainly by imports.

Extremely high temperatures in July and August caused higher loads, but the maximum and average load values were not so different in comparison with the previous year.

In coastal areas during the summer the fires caused problems. In order for the fires to be extinguished, the high voltage lines nearby had to be switched off. In some cases this led to interruption in supply.

The capacity of installed renewable generation units (apart from hydro plants) in Croatia is still rather small, and thus their impact is negligible.

CYPRUS

No unusual or significant system events occurred during the summer period. In addition, no unusual or significant system events related to “Downward Adequacy” occurred during this summer period.

CZECH REPUBLIC

Our system experienced no significant/unusual events, and there were no issues with regards to “Downward Adequacy“.

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DENMARK

The summer was normal without any major difficulties.

It has been a summer with a fairly large amount of thunder and lightning which has caused a few 150 kV and 132 kV interconnectors to trip. However, no consumers have been unsupplied due to the trippings.

There have been quite a few planned outages due to overhauls and project work, including yearly overhauls on a number of 400kV, 150kV, and 132kV plants. In addition, the HVDC connection to Norway, Skagerrak, has been disconnected several times as a result of overhauls and renovation in Norway. In addition to this, the Kassø-Tjele project and the Anholt project have required a good deal of disconnection time in Trige and Kassø.

The power balance has been quite good during the summer period. There have been days when it has been a little strained due to the overhauls of power plants and interconnectors to our neighbouring countries, but this has not resulted in notably higher prices.

There have been no major difficulties in terms of keeping the voltage down. For long periods of time there has been a relatively large flow on the interconnectors to our neighbouring countries which has implied that the voltage has been quite good during the summer period.

Due to conditions in the Norwegian water reservoirs, there has been a large flow from Norway to Denmark. During almost the entire summer, the transmission capacity on Skagerrak has been fully utilised in the direction from Norway to Denmark.

The platform to Anholt and the landfall have both been commissioned. The plant was operational by the end of June, whilst the first windmill was commissioned in September.

The transmission capacity on the border to Germany (TTG) was increased from 950MW to 1500MW in the direction from Germany to Denmark as of September 1st. On October 1st the transmission capacity from Denmark to Germany will be increased from 1500MW to 1780MW.

ESTONIA

Congestion occurred on the Latvia –Estonia/Russia interconnection during large parts of the summer.

The reason for congestion was that there is a large electricity deficit in Latvia and Lithuania, and most of the time there was transit flow from Russia to Lithuania. In addition to that, during the summer period, and due to hot weather conditions, the transmission capacity in Latvia-Estonia/Russia interconnection lines was reduced as there is dependence between line capacities and air temperature.

Estonian and Latvian TSOs made counter trades in order to avoid over loadings in cross border. In addition, transmission lines maintenance on the Latvia-Estonia/Russia interconnection was limited during the whole summer. In addition to that, Estonian and Latvian TSOs started to use temperature horizons, which means that during the night, when temperature was lower, the capacity of the Estonia-Latvia cross boarder was increased and more capacity was given to the market.

FINLAND

Import from Russia was remarkably lower than before due to capacity tariff on their market. At the same time, import from Scandinavia was very high due to low prices in the market caused by good hydro conditions in Scandinavia. Transmission capacity limited import from Scandinavia. Compared to normal situations, this transmission capacity was further limited by 500 MW during the last two weeks of August and the whole September. This was due to the outage of Fenno-Skan 1 HVDC link in order to upgrade the automation and protection system.

FORMER YUGOSLAV REPUBLIC OF MACEDONIA (FYROM)

Generally, the 2012 summer conditions were very close to those forecast.

During this summer the hydro conditions were very poor, due to low amounts of rainfall. At this moment, the levels of reservoirs are below the forecast level, but during the autumn we expect that the levels will increase, and will be at the proper level for the high load winter period.

Planned maintenance of Thermal and Hydro Power Plants was realised in planning period and finished. The overhauls of the interconnections and power plants were according to the plans which were coordinated with the other countries in the SEE region, as part of the SEE Maintenance group’s activities.

No unexpected situations were predicted during the summer period.

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FRANCE

There was no heat this summer and the temperatures were relatively low for the season. Consequently, no significant decreases in generation due to environmental constraints occurred.

A significant delay in the maintenance of power plants occurred in summer 2012, with no effect on the adequacy.

There was also no constraints on margins, downward or upward. Moreover, the 3 IFA bipole losses on the 25th of July, 21st of August and the10th of September had no consequence on the load-supply balance neither on the 400kV grid.

GERMANY

The common evaluation of the German TSOs provides a review of the security of electricity supply over the summer of 2012.

The shutdown of the nuclear power plants in 2011 is still causing a shortage of available active and especially reactive power. This has led to voltage problems during the summer.

During the last summer the installed capacity of PV plants has further increased to a value of approximately 30 GW. The German government has decided to stop subsidies for new PV plants when an installed capacity of 52 GW has been reached.

In June a temporary massive under-coverage of the German Control Areas occurred due to problems with PV feed-in. One issue was forecast errors which predicted a higher PV-feed-in. As balancing power was insufficient, emergency reserves had to be activated. Further problems for the forecast occurred due to incomplete knowledge about the installed capacity of PV-generators.

Problems related to the refitting of PV plant installations to remove the 50.2 Hz started in august. At 50.2 Hz the control of old PV-plants disconnect the plant from the grid. The refitting will continue until the end of 2014.

GREAT BRITAIN

One system warning was issued this summer – a risk of localised negative reserve margins not being met (Localised Negative Reserve Active Power Margin Warning) for Scotland. In the event negative reserve margins were maintained.

Periodically during the summer, wind output has had to be curtailed in Scotland due to transmission constraints.

Large interconnector swings during the GB minimum period (to meet the demand increase on the continent) have been challenging as the volume of synchronised generation available within GB to balance the swing is at its lowest during the minimum period.

Apart from that mentioned above, there were no other significant or unusual events.

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GREECE

During the summer of 2012 the peak demand was slightly lower than the summer of 2011, even if the temperature of 41^{o}C was higher than the temperature recorded during the peak of 2011. The highest electricity consumption recorded thus far still remains the peak of summer 2007. There were no major events threatening critical transmission circuits in the transmission grid. IPTO did not experience any significant issues in balancing generation or demand during summer of 2012.

Minimum demand conditions during the summer are not as low as during spring and fall due to the warm weather. Due to this fact we did not experience any Downward Adequacy problems.

HUNGARY

We did not experience any significant event. Generator outages were under 500 MW during the entire summer period, excluding only a few days, but there was no need to make extra precautions on these days either.

IRELAND

EirGrid (Ireland) had experienced a double generation trip resulting in the loss of 475MW whilst the system frequency went to 48.83 Hz. 185MW of customer load was shed in order to recover frequency into its normal operational range. Investigations are currently underway with the generators to determine the cause of the double trip and how they can prevent it from happening in the future.

High wind feed-in during the minimum demand conditions was also problematic for EirGrid and this resulted in the curtailment of wind power plants. EirGrid continues to develop the necessary power system tools to ensure system limits are not breached.

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ITALY

The adequacy evaluations for the 2012 summer period have not evidenced particular risk for capacity adequacy or load covering, or indeed with that of the national supply system's.

During this summer season, with the exception of May and June, an increase in average temperatures was recorded, with consequent growth of expected volume with respect to the same period of the previous year. In addition, the hydro monthly energy capability factor which resulted in a low level of seasonal rainfall, was lower than the corresponding values recorded throughout the 2011.

Renewable source recorded, over this period, a sensible increase of production (+48.6%) thanks to an increase in new power plant installation. In addition, favourable wind conditions sensibly increased the production of this renewable source (+26.7%). There was nothing to remark for generation plants availability with respect to the generation overhauls (both planned/unplanned) as they were consistent with forecast figures.

Over this period the total volume of demand decrease was 2.6% with respect to the same period of 2011. In particular the month of September, although the average values of temperature were higher than normal condition, showed a sensible decrease of monthly electricity demand on the national power grid (-9.3%). In addition, during this period monthly volume of demand did not exceed the amount of 2008. Particularly, over the summer, the peak of consumption was reached on July 10th with 54.113 MW (-4.2% with respect to 56.474 MW July 13th 2011). The balance of the physical exchanges showed a decrease of 9.5%.

Other new lines, substation and electrical devices were put into service with reinforcement of the transmission network with benefits on reducing local congestions.

The sizing of NTC in the low-consumption period has been confirmed as adequate for the correct management of the Italian system, with particular regard to the voltage profiles and the dynamic stability in conditions of high disperse generation in-feed.

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LATVIA

The Summer Outlook 2012 was as forecast, with normal load conditions and severe load conditions. The weather in this summer was rainy and not so warm as previous summers. The average air temperature during this summer was 16^0 C, although during the previous summer it was 18^0 C. Only one month during the summer period was quit close to average summer weather conditions, but the rest of the summer was cloudy with less than average air temperature during the summer. Due to lower air temperature and more cloudy weather conditions peak load increased when compared with the previous summer, although total consumption did not change significantly.

In the summer, the Latvia electricity power system covered approximately 35% of electricity consumption with electricity import from neighbouring countries. As we expected base power plants (CHP) went through annual maintenance and when considering low heat consumption during the summer period, CHPs operated with small part of installed capacity and did not work at full power.

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LITHUANIA

In the summer of 2012, new generating capacity (450 MW) was connected to the Lithuanian power system for test operation. At the end of the year, this new capacity will replace two old units (2x150 MW) in the largest power plant in Lithuania (Lithuanian PP). Generation in Lithuania has increased by 42% during the summer period, from 445 GWh in 2011, to 764 GWh in 2012, while the summer minimum demand respectively has decreased by 12% from 700 MW in 2011, to 615 MW in 2012.

The most loaded interconnection in Lithuanian Power System during this summer was the interconnection with the Kaliningrad Power System. Actual loading was more than 50% in this summer period, at 78.6% of the time, less than 50% - at 5.8% of time. Other interconnections with Power Systems of Belarus and Latvia were usually loaded less than 50%. Availability and capacity of Lithuanian interconnections in this summer period did not influence electricity trading volume with other Power Systems. The main factor limiting electricity trading possibilities to the Lithuanian PS was low capacity of the interconnection Estonia, Pskov-Latvia, which is strongly dependent on weather temperatures.

During the period of August 18 – 26th 2012 Russian TSOs took out of service 330 kV power line Kingisep – Pskov. Due to this power line disconnection, which was not planned nor properly coordinated among the TSOs of the BRELL (Belarus, Russia, Estonia, Latvia, Lithuania) ring, Baltic TSOs had to reduce the Estonia – Latvia cross border ATC, hence available cross border trade capabilities for the day ahead markets were 45%. As a consequence of this event, a significant reduction of ATC on the Lithuania – Belarus cross-border section during daytime hours also took place. Diminished cross-border capacities as well as reduced available generating capacities of a few major producers in the Baltic States at a time created a tense situation in the market. Indeed, this made electricity prices at Nord Pool power exchange's Lithuanian and Estonian bidding areas spike, starting on August 20th and lasting for the rest of the week.

There was no significant shortage of down regulation during this summer 2012. Lithuania has few possibilities to provide down regulation: with thermal power plans, Kaunas HPP and in case of high wind – Kruonis HPSPP. 2012 summer was used economically advantageous option - capability to trade downward regulation with Russian PS, based on agreements regarding regulation and balancing electricity trade between Lithuanian and Russian PS.

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NETHERLANDS

During the summer the Dutch Transmission Grid did not experience any significant or unusual events. In the Netherlands we have a standard protocol for the role of TenneT within prolonged periods of warm weather:

(http://www.tennet.org/english/operational_management/coolingwater.aspx).

During the summer of 2012 we have not effected this protocol.

NORWAY

During the summer the Norwegian transmission grid did not experience any significant or unusual events. The lines between Norway and Sweden have been operated with reduced capacity.
Generally speaking, the weather was rainy with normal temperatures. The reservoir level has been slightly higher than normal.

POLAND

The most stressed event during the summer of 2012 took place on the 22nd August, when the Polish power system was effected by extremely high unplanned transit flow through the Polish control area from the west to the south. In the morning the unplanned transit flow was already very high and still increasing, thus causing overloading of the several internal and cross-border lines as well as not fulfilling n-1 criteria on the Western border of the Polish power system. Indeed, this was the case despite activating the following emergency measures:

1. DC Loop flow (HVDC rescheduling PL→DE→DK→SE→PL), since 9:00 am,
2. IGCC regulation blocking between 50 Hertz and CEPS, since 9:00 am,
3. Internal re-dispatching, since 12:30,
4. Bilateral re-dispatching between PSE Operator and 50Hertz, since 12:30,

The unplanned flow from 50 Hertz system reached over 2000 MW (at 12:20). All of the measures taken increased unplanned flows to the southern border. It also resulted in non-fulfilment of the n-1 criteria. For that reason, the PSE Operator had to switch on the alert light in the RAAS system (at 12:10). This emergency situation required the activation of extraordinary measures, including the first multilateral re-dispatch for this reason. This re-dispatch was realised from CEPS to 50 Hertz (100 MW) between 13:30 and 15:00 and from APG to 50 Hertz (800 MW) via German TenneT, between 14:00 and 16:00.

The emergency alert switched off at 17:45, however the unplanned flow was still high (next day PSE Operator had to switch on the alert light in the RAAS system again).

The second stressed event took place on Friday, 27th July 2012, when an extremely high level of unavailable capacity was registered, mostly caused by forced outages. Starting from Monday 24th, within 5 working days, the level of the unavailable capacity coming from forced outages reached almost 4 GW, which made up over 20% of total available capacity at Friday's peak time. The average forecast level of outages in July in yearly planning amounts

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to 1,7 GW. At that time the level of operational reserves in the Polish power system was below required. To keep the system safe, the PSE Operator increased generation in units normally not dispatchable by TSOs (CHP plants) and realised emergency delivery from SEPS and CEPS.

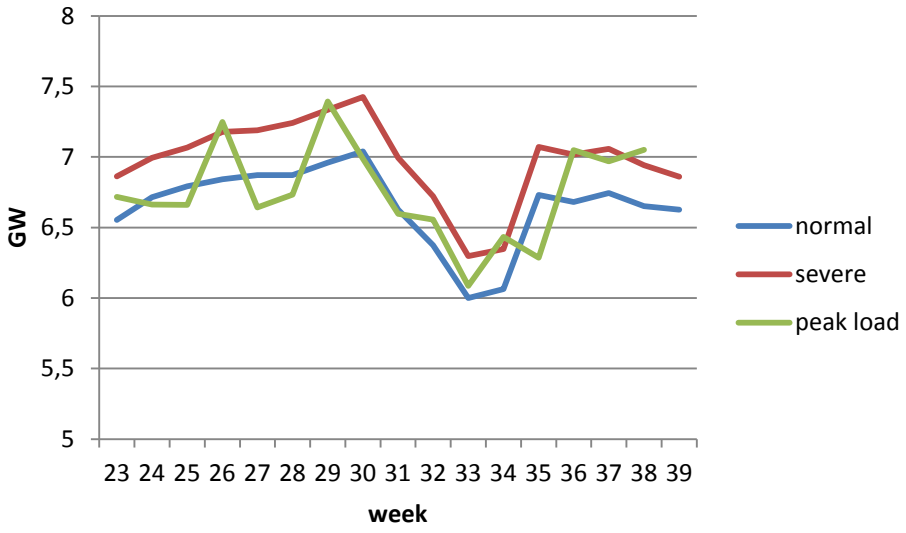
PORTUGAL

The difficult hydrological conditions, anticipated in the SOR 2012, were confirmed during the summer season and were even surpassed to some extent. In fact, the hydro generation, since the beginning of 2012, is ranking the second lowest in the last 40 years.

This deficit on hydro generation was compensated by mainly resorting to imports, however this was essentially motivated by market conditions, as thermal generators were used at only 38% of their capacity.

Wind generation availability was in accordance with the SOR 2012 normal condition scenario levels.

The negative trend on electricity demand, in the sequence of the economic crisis, has continued during the summer season. Energy demand dropped by approximately 3% from last year's levels.



Weather conditions were on average most of the time, despite the occurrence of extreme heat waves during weeks 26, 29 and during the first weeks of September. In all situations, peak demand fitted with the scenarios presented in the report.

In general, the system operation was performed with the secure margins identified in SOR in 2012.

SERBIA

An extremely dry period during this summer caused very low hydro levels and generally lower hydro production in run on river plants than planned. This lack of energy was compensated by the higher production of storage hydro plants and thermo plants. As a result of this, in September our hydro storage was lower than planned and we were forced to start up gas thermal power plants to improve the hydro storage situation before winter.

During this summer our system did not experience any “Downward Adequacy“ problem at the low load conditions.

ROMANIA

During the summer period in the Romanian Power System no significant or unusual events materialised.

SLOVAK REPUBLIC

The summer of 2012 was warm and dry in July and August, whilst the weather in September was dry but cold, and in June it was normal. Average temperature during summer months was 19.5 °C (the same level as in the last summer of 2011). September was a colder month, with an average temperature of 16.9 °C (2.0 °C lower than in 9/2011). The first months of the summer period (July and August) were fairly warm (1.2 °C and 1.4 °C higher than in 2011).

There was only a slight increase in consumption (1.25%) and production (1.51%) of electricity from June to September, compared to the same period of the 2011 summer. With regards to production, increase was from nuclear (3.3%), non-identifiable (6.5%) and solar (30.1%) power plants production, whilst a contrariwise decrease was observed from hydraulic (-7.9%) and fossil fuels (-2%) power plants production. The summer peak load was recorded on Monday, 24th September 2012 at 20:00, 3 672 MW, whilst the predicted value of the summer peak was 3710 MW during the 39th week.

In the summer outlook report 2012, the import of electricity was expected for the whole summer period of 2012. Import of electricity decreased by approximately 7.8 % in comparison with the summer of 2011. In June, July and September the total amount of import was approximately 289.4 GWh (only in August was there an export of 67 GWh). Import of electricity shared approximately 2.5% of summer consumption in 2012 (2.7% of consumption in summer 2011). These imports were caused not by a lack of generation in Slovakia but by the electricity trades on the electricity markets.

From June to the end of August, high power flows via the transmission system of Slovakia occurred. The transmission system was influenced by unexpected high power flows from North to South-East Europe. Due to high power flows the criterion n-1 was not fulfilled many

times. The loading of some transmission lines was above 80 or even 90%, and in some hours it was at the limit of the permanent transmission loading of the lines (e.g. tie-line between Slovakia and Ukraine). To unload lines of the transmission system of Slovakia, which were at the limit of their transmission capacities, reconfigurations (changes) of connection in the selected substations (Lemešany and Varín) were performed many times during the period spanning from the 1st of June to the 27th of August 2012.

It is worth mentioning that the new 400 kV line (V461) between substations Liptovská Mara and Medzibrod and the new transformer T401 in substation Medzibrod was put into operation in September 2012.

SLOVENIA

In the summer period, the consumption at the transmission level was 4.7% lower than predicted. The direct consumers and consumers on the distribution network consumed less electrical energy than planned. The generation on transmission level was 2.7% lower than predicted. The hydro units produced 5.9% less than planned, due to weather conditions. Thermal units produced 0.6% more than planned.

The physical imports were higher than exports for the whole summer period, thus the Slovenian EPS was net importer. The major imports were on the AT border and exports on the HR and IT border. In the summer period, the temperatures were higher than average and rainfall was lower than average.

SPAIN

System operation and system adequacy have functioned without any larger problems in the summer of 2012. No demand peak summer records were hit, and expected peak load for severe conditions was not reached. Consumption has dropped further due to the economic and financial crisis.

At minimum demand conditions, renewable production curtailment eventually took place, as expected.

Low demand levels and high renewable production can cause power surplus. The Spanish TSO permanently monitors renewable production using a specific control centre (CECRE). After reducing thermal production upon security criteria compliance, if additional reduction is needed, the RES Control Centre sends a new set point and supervises renewable production curtailment in order to maintain a balanced situation.

The development of new interconnections between the Spanish mainland and the rest of ENTSO-E is an issue of great importance in order to efficiently integrate RES and to minimise episodes of curtailment of renewable production. Another key issue is the importance of energy storage in order to properly manage the excess of inflexible power, mainly in pump storage plants.

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SWEDEN

The main direction of power flow during the summer period has been import from Norway (to Sweden) and export (from Sweden) to Finland, Denmark, Germany and Poland. There have also been several bouts of maintenance performed, as planned, both on the production side (NPP's for instance) and on the transmission side. On the transmission side there have been several occasions of maintenance performed both on interconnectors as well as on inter-area lines and stations (due to refurbishments and new constructions). During the summer, Svenska Kraftnät has taken both new lines and stations into operation. Among these new lines, one of them enforces the so called West Coast Corridor.

One of the biggest challenges was to manage all outages without risking cascade tripping of lines in the regional networks after fault (N-1). These problems typically occur when there is a (to the regional network) parallel high-voltage line disconnected due to outage. To be able to handle these outages Svenska Kraftnät has limited the trading capacity according to existing agreements.

On the 12th of August there was a cable fault on the Baltic Cable (which interconnects Sweden and Germany) which forced the interconnector out of service until the damages was repaired.

Finally, some voltage problems linked to outages are to be reported. These problems have mainly been managed by close cooperation with the DSOs. With regards to Downward Adequacy, no general downward regulation issues have been experienced.

SWITZERLAND

None experience of significant/unusual events or conditions during the summer period (e.g. major losses of supply, loss of interconnection availability/capacity, emergency situations etc.).

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7 APPENDIX

7.1 WINTER OUTLOOK QUESTIONNAIRE

INPUT FROM EACH COUNTRY

The input expected from each country comprises 3 main parts:

One or two paragraphs providing a high level overview of the generation – load balance for the coming winter; this synopsis will be included in the main report. No common format is suggested in order to fit with each country's specific case.

A table with quantitative elements with a common format; this table will not be published but sent only to those TSOs taking part in the exercise; the data will be used for building graphs attached in appendix to the report and illustrating the winter outlook for the country. In addition, the NTC data in this table will be analysed against all other regions to determine adequacy across the EU with a focus on those regions that require imports under normal or severe conditions.

A one-page or half-a-page synopsis and 1-2 pages comments on the generation-load adequacy for the coming winter that will be included in the Appendix of the report. In order to facilitate the production and use of these comments, common guidelines are provided hereafter, including a section for additional comments to highlight the issues that are particularly relevant for that country next winter.

Please note that there is an additional, parallel data collection carried out by means of a questionnaire sent to the SDC members, in close cooperation with the Operation Departments, seeking general qualitative information on TSO's expectations for the coming winter. This information is necessary to enable ENTSO-E meet the demand of providing a preliminary report on the 4th of October, well before the Winter Outlook publication date, therefore submitting your brief answers by the **17th of September** will be highly appreciated. The answers to this questionnaire can also be used for provision of this Winter Outlook's comments.

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QUANTITATIVE ELEMENTS

See attached Excel spreadsheet.

If weekly data is not available for any TSO then the data for the third Wednesday of January should be the minimum that is available to countries of the Regional Groups “Continental Europe” (as provided in the framework of the Scenario Outlook and Adequacy Forecast). It is therefore requested that a TSO that is unable to provide weekly data provide the data for the third Wednesday of January with updates in order to take into account the increased knowledge of the situation since the last SO&AF (outages, status of hydro reserves, etc.).

For PARTS A to PART D, TSOs that are able to provide weekly data, the data is requested for synchronous time each Wednesday (19:00 CET) in order to allow meaningful analysis when determining cross border flows. It is recognised that this may not be the peak demand in every region in the winter but 19:00 is chosen to be consistent with other reports.

An additional requirement is in PART E of the Excel spreadsheet to provide minimum demand data, downward reserve requirement, level of inflexible plant, pumped storage demand in order to allow an European overview of the need for countries to export across borders at times of high levels of inflexible generation such as wind. A synchronous time of each Sunday 04:00 CET is chosen as this represents the minimum European demand point.

GUIDELINES FOR COMMENTS

Each TSO is requested to provide the following information:

- Contribution to the main report
- A few lines on the main results of the assessment including:
    - General situation highlighting specifics such as low hydro levels, low gas storage, sensitivity to commissioning generation etc.
    - Most critical periods for the TSO and in particular which weeks are considered as most critical.
- Expected role of interconnectors in relation to maintaining adequacy and the ability to import or export.
- Measures to be activated or foreseen in case of a gas crisis or low renewable output.
- Expected role of interconnectors to managing an excess of inflexible generation at demand minimum periods.

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Synopsis

This qualitative assessment should stress the main critical periods and the main factors of risk. It would be useful to indicate, if any, which level of remaining capacity they consider as necessary when making this forecast in order to ensure a secure operation for the next winter (i.e. what is the reference adequacy margin) and the role of renewables.

Short explanation of the framework and the method used for making the winter adequacy assessment

The framework used is to determine adequacy under normal and severe conditions for each TSO. This is based on data that is submitted by each TSO. The analysis then checks that for countries that rely on imports, that they are available from neighbouring countries. To do this analysis, each TSO is requested to give its best estimate of the available NTC that it anticipates will be available.

The analysis is based on a spreadsheet that takes remaining capacity (under normal and severe conditions) from all the TSO submitted spreadsheets with all the submitted NTC values. If there are 2 countries that submit different NTC values on the same border, then the analysis will be completed taking the minimum submitted value. Based on the outcome of the analysis, additional questions may be asked from the relevant TSOs if particular country boundaries are considered critical.

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GUIDELINES FOR COMPLETING THE SPREADSHEET

The analysis is country based and not control area nor bid area based. It is recognised that this does cause issues for completing the spreadsheet and the guidelines below have attempted to resolve these issues.

If this Generation – Demand balance is considered at risk for the system i.e. too low, then please provide an explanation of the main risk factors (e.g. availability of generation, load sensitivity to temperature, low hydro levels, low wind etc) and how this risk is to be managed by the TSO. This part will only be included in the Appendix if the TSO wants it to be included.

According to the degree of available data please fill in the spreadsheets in PART A to PART D:

for each week of the considered period, namely Wednesday of each week at 19:00 CET, or

for each month of the considered period namely the third Wednesday of each week at 19:00 CET, or for typical weeks or days (at least the third Wednesday of January) at 19:00 CET.

PART A: INDIGINEOUS NATIONAL GENERATION (Lines 1 to 7):

The total generation capacity notified to the TSO as being installed for each week for the same period. The requested data on fuel types has been modified to better reflect the long term adequacy reports and in order to increase transparency in reporting.

The available generation capacity should be calculated according to a methodology directly derived from the one used for the former ETSO System Adequacy Forecast report and within the former UCTE for generation adequacy assessment.

It is noted that certain countries may have generators that are located in neighbouring countries and consider them as part of their capacity due to firm contracts or grid topology. Where this exists, please highlight so as for regional analysis it is important not to double account generation.

The following specific data is requested:

Net generating capacity (lines 1 to 5): installed capacity by fuel type. The fuel types are similar as found in the long term adequacy reporting in order to increase consistency between long term and short term adequacy reporting.

Net generating capacity (line 6): corresponds to the generating capacity as calculated from data input in lines 1 to 5.

"Normal Average Outage Rate" and a "Severe Average Outage Rate" is requested in order to increase transparency and allow comparisons across regions. This percentage outage rate can be used to automatically calculate the Outages in **lines 10 and 19** (formulae are included in the spreadsheet: for example if the outage rate is set at 10% and the capacity is 2 GW, then the spreadsheet will automatically calculate an outage value of 0.2 GW).

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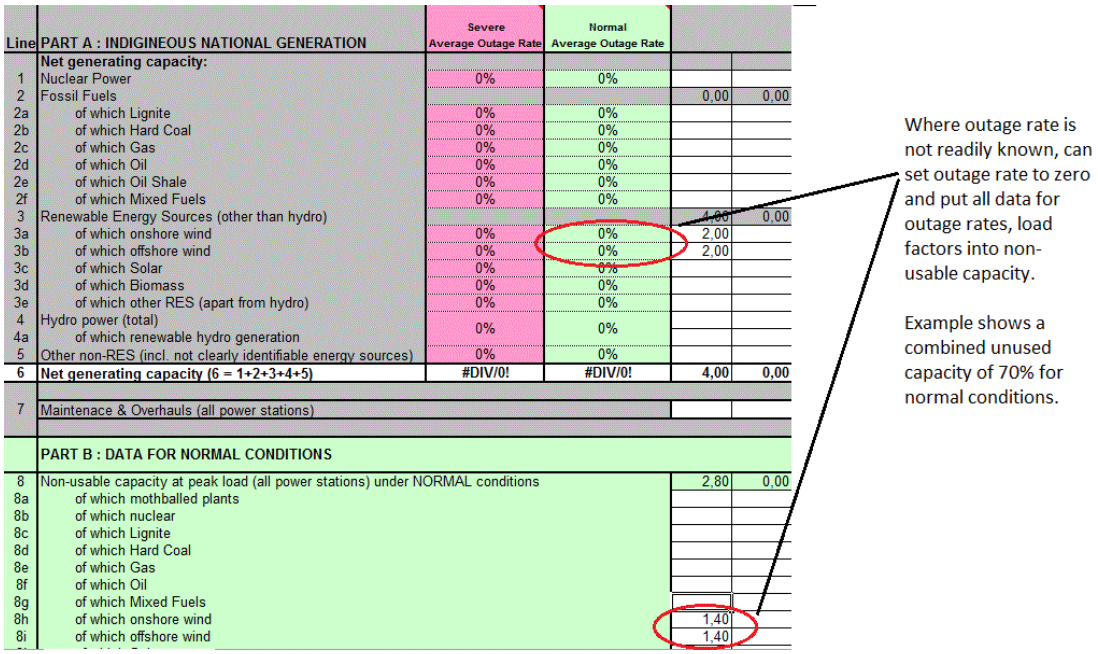
Alternatively, the user can overwrite the formula in lines 10 and 19 with more detailed weekly forecasted outage rates. For example, the user may wish to do this if they calculate outages rates at a weekly level. However, we do ask that you indicate a figure for the average outage rate percentage to allow comparison with other neighbouring regions.

It is recognised that some regions may not calculate percentage average outage rates for some plant types and may wish to bundle all the data into unused capacity. An example may be Wind where the outage rate is unknown across the fleet. An acceptable approach would be to set the average outage rate to zero but to combine outages and maintenances in unused capacity for Wind in PART B and C. In this way the remaining capacity is still calculated correctly which is inherently what the spreadsheet is forecasting. This is shown in the picture below.



Line	PART A : INDIGINEOUS NATIONAL GENERATION	Severe Average Outage Rate	Normal Average Outage Rate		
	Net generating capacity:				
1	Nuclear Power	0%	0%		
2	Fossil Fuels			0,00	0,00
2a	of which Lignite	0%	0%		
2b	of which Hard Coal	0%	0%		
2c	of which Gas	0%	0%		
2d	of which Oil	0%	0%		
2e	of which Oil Shale	0%	0%		
2f	of which Mixed Fuels	0%	0%		
3	Renewable Energy Sources (other than hydro)			4,00	0,00
3a	of which onshore wind	0%	0%	2,00	
3b	of which offshore wind	0%	0%	2,00	
3c	of which Solar	0%	0%		
3d	of which Biomass	0%	0%		
3e	of which other RES (apart from hydro)	0%	0%		
4	Hydro power (total)	0%	0%		
4a	of which renewable hydro generation				
5	Other non-RES (incl. not clearly identifiable energy sources)	0%	0%		
6	**Net generating capacity (6 = 1+2+3+4+5)**	#DIV/0!	#DIV/0!	4,00	0,00
7	Maintenace & Overhauls (all power stations)				
	PART B : DATA FOR NORMAL CONDITIONS				
8	Non-usable capacity at peak load (all power stations) under NORMAL conditions			2,80	0,00
8a	of which mothballed plants				
8b	of which nuclear				
8c	of which Lignite				
8d	of which Hard Coal				
8e	of which Gas				
8f	of which Oil				
8g	of which Mixed Fuels				
8h	of which onshore wind			1,40	
8i	of which offshore wind			1,40	

Where outage rate is not readily known, can set outage rate to zero and put all data for outage rates, load factors into non-usable capacity.

Example shows a combined unused capacity of 70% for normal conditions.

Maintenance & Overhauls (all power stations) (**line 7**): as notified by generators to TSOs at the time of completing the spreadsheet and hence the most up to date information is requested. In case of lack of information from generators, TSOs should include an estimate value based on historical data.

PART B: DATA FOR NORMAL CONDITIONS (Lines 8 to 16):

The following data is required for normal conditions which are defined as those conditions that correspond to normal demands on the system e.g. normal weather conditions resulting in normal wind, hydro output and normal outages:

Non-usable capacity at peak load under NORMAL conditions (**line 8a to 8n**): resulting from lack of primary sources (hydro, wind), insufficient fuel availability due to actual contracts, mothballed plants not in operation during the winter. This part has changed from previous submissions in terms of being broken down by fuel type. The reasons for this change is to increase transparency and to bring reporting more into line with long term

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reporting and to allow TSOs to give a fuller picture of where the non-usable capacity is on their respective system.

Available capacity under NORMAL conditions (line 9): automatically calculated from data submitted above.

Outages (line 10): as discussed above (section 5.1), this will automatically be calculated based on the percentage outage rate in PART A but can also be overwritten if required. There are standard normal outage rates published for nuclear and fossil fuels which are based on the Data Collection Guidelines[2] published by WG SAMM but it is anticipated that most TSOs will have actual outage rates for their system based on historical analysis.

System services reserves under NORMAL conditions (line 11): the amount of capacity required by the TSO to provide operating response/reserves. It corresponds to the level required one hour before real time (additional short notice breakdowns are already considered in the amount of outages). In some market structures, market participants may provide reserve however for the avoidance of doubt, the figure requested is the total amount of reserves that the country requires at 1 hour ahead.

Planned reliably available capacity under NORMAL conditions (line 12): is automatically calculated from the data given above.

Weekly peak load for NORMAL conditions (line 13): peak load excluding any demands on interconnectors and net of any demand management/demand side response in normal weather conditions for the period. Possible load reductions in normal conditions should be mentioned (line 14). It results in the Net weekly peak load for NORMAL conditions (line 15).

Remaining capacity for NORMAL conditions (line 16) corresponds to the generating capacity available above net demand and is the basis of the TSO's appreciation of the generation adequacy for the current week. It is used for the flow based NTC analysis with data from PART D.

PART C: DATA FOR SEVERE CONDITIONS (Lines 17 to 25):

The data format for Severe conditions is the same format as PART B DATA FOR NORMAL CONDITIONS.

Severe conditions are related to what each TSO would expect under a 1 in 10 year scenario. For example the demand will be higher than normal conditions and in certain regions the output from certain generating units such as wind may be very low or there may be restrictions in gas plants that operate at a reduced output under cold temperatures.

[2] https://www.entsoe.eu/extranet/kt/view.php?fDocumentId=37765

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In terms of average outage rate, regions may experience a higher outage rate than under normal conditions due to high generation running and it is intended that this is captured by a severe outage rate that is input in PART A and/or the non useable capacity in PART C.

It is difficult to be very specific and hence a description of the scenario being considered should be described by each TSO and if a TSO is not using a 1 in 10 year scenario e.g. only calculates at a 1 in 20 year demand level then this should be highlighted.

Where users do not submit data for severe conditions, a percentage reduction may be applied to the normal conditions (figure as yet to be determined).

FIRM IMPORT AND EXPORT CONTRACTS (Lines 26 and 27)

For countries where firm import/export contracts are notified to the TSO, their influence on the remaining capacity should be mentioned. Information on the possibility of export reduction or import increases will give a more complete view of the situation. It is important that a country that has a firm import contract from a neighbouring country ensure that the neighbouring country has also included the contract as an export contract. If this is not the case, the analysis may treat the firm contract as not firm and hence ignored in the analysis.

The spreadsheet requires the country from which the firm contract exists. If there is more than one country then please highlight either via a comment in the spreadsheet or by return. It is also important that if a firm import contract is assumed from a country then the NTC value is reduced to reflect that some of the capacity is being used.

PART D: ADDITIONAL INFORMATION FOR INTERCONNECTORS (Lines 31 and 32).

Additional data on interconnector capacity between countries is required. The reason for requesting this data is to allow analysis to be completed across the EU in order to check that countries that are relying on imports (under severe conditions in particular) have neighbouring countries that are able to provide exports.

It is recognised that this data is available via NTC tables but TSOs are requested to submit the NTC data in this spreadsheet. The NTC data requested is the TSOs best estimate of actually available NTC and may be different from what is published. It is recognised that on the day the value may be higher or lower due to system conditions but this analysis is to get a confidence around the capability of interconnectors to contribute to maintaining generation balance.

It should be stressed that there is no Grid model being developed for the analysis and it is not a market simulation either. Rather, it is a confidence test on highlighting where the most important country boundaries exist based on the data submitted by TSOs.

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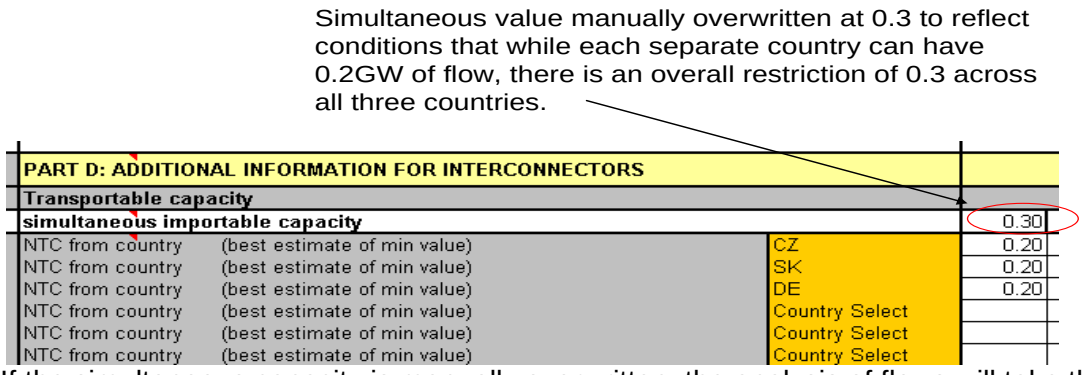
For that purpose the following items should be covered:

Simultaneous importable capacity (line 31) and Simultaneous exportable capacity (line 32): Importable and Exportable capacity with other national systems expected to be available each week and a range of possible outcomes for Interconnection power flow. It is recognised that for many TSOs, it is not possible to calculate weekly values and hence a best estimate taking into account known variables (such as planned maintenances) is requested.

It is recognised that due to loop flows or transit flows, it may be difficult for TSOs to be specific as a high flow across one boundary results in a lower capacity across another etc. It would be helpful if TSOs could provide a comment if this is the case in order to assist the analysis and to reflect the limitation via the simultaneous importable/exportable capacity (see below).

Transportable capacity is asked for as a per country value as well as a simultaneous value. The per country values are mandatory for the analysis. It is noticed that some countries may be divided into more than one Bid Area (Norway, Denmark …) then only the sum of the NTCs to/from these Bid Areas should be provided. The simultaneous value should always be smaller or equal to the sum of all per country values. When not completed, it is assumed to be equal to the sum of all per country values and the spreadsheet will automatically calculate the sum of all values unless it is manually overwritten in lines 31 and 32. The picture below gives an example where the simultaneous value is overwritten.



If the simultaneous capacity is manually overwritten, the analysis of flows will take this restriction into account.

Country codes are as found on the ENTSO-E website[3]. In cases where NTC codes do not exist, there is the ability to overwrite. A map of the ENTSO-E countries is included in the spreadsheet.

[3] https://www.entsoe.eu/fileadmin/template/other/images/map_entsoe.png

PART E: INFORMATION FOR DOWNWARD REGULATION CAPABILITIES (Lines 33 and 39).

The above described in 5.1 to 5.5 will be familiar to users who completed the previous Winter Outlook data request. For this Winter Outlook report, an additional PART E has been added with additional data items requested. The intention is to analyse the level of inflexible generation against minimum demand levels. For countries that have an excess of generation, the analysis will increase exports to regions that have more flexibility in order to solve. Hence, it is anticipated that the analysis will determine which countries are required to export under high renewables. This analysis was carried out for the Summer Outlook report and certain TSOs have indicated that downward regulation issues can occur across the winter at weekends.

	The dates are related to **Sunday** of each week	11.nov.12
	WEEK	45
	Time (CET)	**4:00**
	PART E: ADDITIONAL INFORMATION FOR MIN DEMAND CONDITIONS	
33	Weekly Minimum Demand (overnight valley minimum)	
34	Must Run Generation (excluding wind/solar/run of river, renewables)	
35	Run of river generation (Must Run)	
36	Downward Regulating Reserve	
37	Pumping Storage Capacity available	
38a	Highest expected proportion of installed onshore wind generation running	65%
38b	Highest expected proportion of installed offshore wind generation running	65%
39	DOWNWARD REGULATION CAPABILITIES: 39 = (33+37)-(34+35+36+38a*3a+38b*3b))	0

Overnight 04:00 selected as Synchronous Time on a weekend

A description of what information is requested is:

Weekly Minimum Demand (line 33): this is requested for 04:00 CET on each Sunday. If weekly data is not available, then please provide information on minimum demand that will be experienced in the weekend of 30th December.

Must Run Generation (line 34): the data should include the level of inflexible (i.e. not sensitive to price) generation that is anticipated to be running across the minimum demand periods. Thus it is anticipated that for most TSOs this will include a level of nuclear generation, CHP, Biomass and Coal and Gas generation that is always on the system to maintain overall system security and voltage regulation. The user is specifically asked not to include wind/solar as the analysis that is carried out will use generation data in PART A/B/C to calculate potential output from these generation sources.

Run of River (line 35): the data should include the level of inflexible run of river generation that is anticipated to be running across the minimum demand periods.

Downward Regulation (line 36): this is the minimum level of generation flexibility that is required by the TSO to be able to reduce output on the system.

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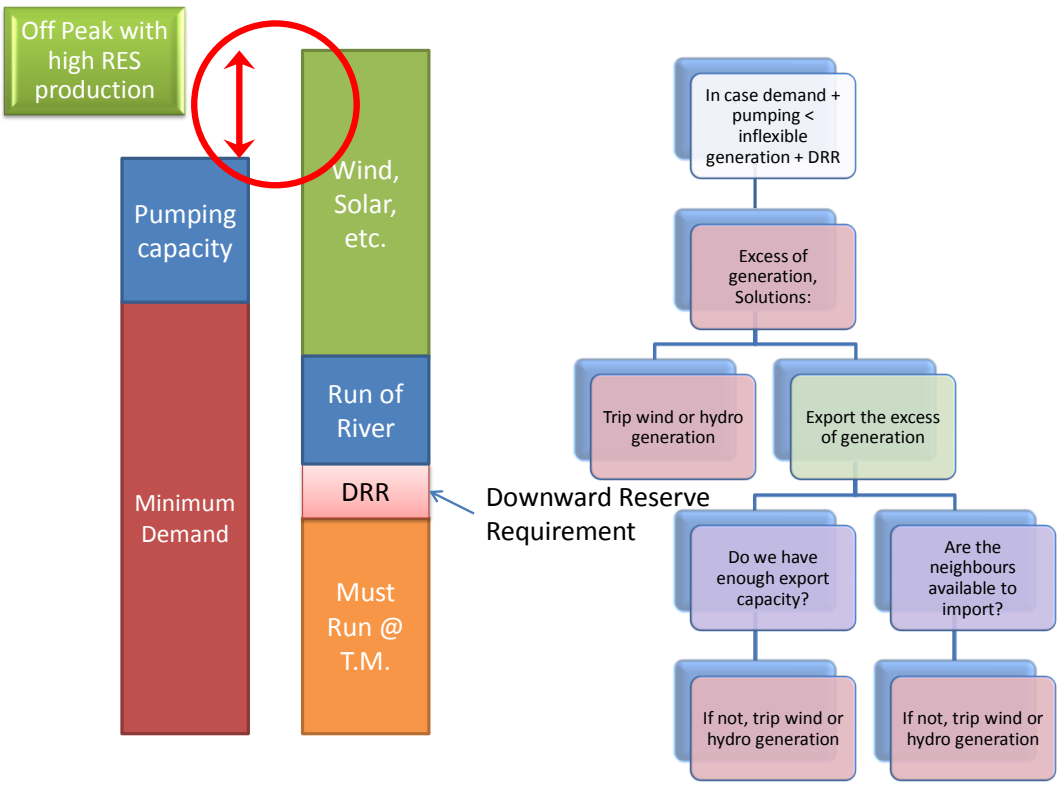
Pumping Storage Capacity (line 37): this is the level of pumped storage capacity and is requested **as it is recognised that it is different from the value requested in 4b.**

Highest expected proportion of installed wind generation running (lines 38a and 38b): This is set at 65% as a default value but can be overwritten as various TSOs will have historic experience of higher or lower output from wind generators across the winter.

The intention of the analysis is to look at high wind, run of river, renewable scenario (details of which to be determined). The levels of exports that a country may require when added to the "must run generation" will be compared against the demand, pumped storage capability and downward regulation for each country. If a country requires exports to maintain balance, the analysis will use submitted NTC values to determine there is a solution. This is described graphically below:



It is anticipated that the coloured maps that were developed for the Winter Outlook report (and what will be used for the peak demand overview) will also be employed to give an overview of countries that may be required to export surplus energy under a high renewable scenario.

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QUESTIONS AND COMMENTS

The main areas for comments that TSOs are asked to consider:

Please provide feedback on improvements that can be made to the spreadsheet and what difficulties the user had in completing the data.

Please indicate how the outage rates for both Normal and Severe have been calculated for the spreadsheet.

Please indicate how the submitted NTC values have been derived.

Treatment and amount of mothballed plants. Under what circumstances (if any) could they be made available?

Issues, if any, associated with utilising interconnection capacity e.g. existence of transmission constraints affecting interconnectors for export or import at time of peak load (such as maintenance or foreseen transit or loop flows)

Are there any energy constraint issues particularly for hydro based systems?

Any other fuel supply issues which could affect availability e.g. gas supply issues?

Do you expect any event that may affect the adequacy during the winter? If yes, what actions do you plan to activate (i.e. in case of shortage of gas supply this winter)?

If using “Firm contracts”, please explain how firm these are and in what situations the energy may not be delivered e.g. Force Majeure

Please describe any other forecast issues (such as effects on wind generation)

While the analysis focuses on winter peak demand and also weekend minimum demand, do you foresee any other issues across other periods of the winter?

Any other issues of relevance that are not covered above?

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7.2 SUMMER REVIEW QUESTIONNAIRE

Following the publication of the ENTSO-E Summer Outlook Report 2012, a summer review will be provided with the objective to present what happened during the summer 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 Summer Outlook.

1. Did your system experience any significant/unusual events or conditions during the Summer period (e.g. major losses of supply, loss of interconnection availability/capacity, emergency situations etc.)?

   1a. What were the cause(s) and remedial action(s)?

   1b. What are lessons learned for future prevention/management?

2. Did your system experience any “Downward Adequacy” at minimum demand conditions with high levels of renewable generation output?

   2a. What were the cause(s) and remedial action(s)?

   2b. What are lessons learned for future prevention/management?

For your reference the former ENTSO-E Winter Review and Summer Outlook Report 2011 is available on ENTSO-E webpage.

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