ATSOI

BALTSO

UKTSOA

8th November 2006

WINTER OUTLOOK
2006 - 2007

EXECUTIVE SUMMARY

The Winter Outlook report, prepared at European level, presents the summary of the national or regional power balances between forecasted own generation and demand on a weekly basis for the winter period from the end of November 2006 until the end of March 2007.

The analysis is based on the generation and peak load forecasts with interconnection capacities generally set to typical winter values. No specific approach has been carried out at this stage to estimate the power flows on the whole European High Voltage interconnected network.

The results rest on a data collection and information available by UCTE, Nordel, Baltic countries, GB and Ireland's TSOs at the end of September 2006.

The survey shows that on the whole, **no particular risk for power shortage is expected for next winter under normal conditions.**

The generation-load balances forecasted in each country are generally considered as suitable.

Only a few countries may depend on imports from their neighbours in some specific periods : Belgium, Portugal, Hungary, Serbia, Greece.

Former Yugoslav Republic of Macedonia, Latvia, Northern Ireland and Ireland need imports to reach adequate margins.

In these cases the transmission capacity allows for imports if intact.

Conversely, **under severe conditions** due mainly to low temperature or unfavourable hydro-conditions **the power systems might be stressed,** especially when the same periods are critical for neighbouring countries as well.

The most critical period is the annual winter peak period (December-January) but in some cases may also extend until the beginning of March.

In such period, unfavourable conditions could reduce the export capabilities from exporting countries that can lead to tight situations at the regional level in Central Western Europe (Great-Britain, France, Belgium, The Netherlands) and South Eastern Europe (Serbia, Former Republic of Macedonia, Greece, Romania, Bulgaria).

In addition Great-Britain, Spain, Austria, Italy, Hungary and Romania stress **the risks linked to the gas market.**

This survey contributes to improve operational cooperation between TSO's and gives signals for further enlarged analysis on a bilateral or multilateral basis in order to assess the global adequacy of the interconnected systems and to verify that congestions on the transmission grid do not limit the exchange capacity.

The market players may also use this preliminary assessment for further contacts.

1. INTRODUCTION AND METHODOLOGY

1.1. Presentation of the involved countries

This report has been drawn up with the contribution of the following countries:

- **UCTE members :**

Belgium
Germany
The Netherlands
Luxembourg
France
Spain
Portugal
Switzerland
Italy
Austria
Slovenia
Croatia
Poland
Slovak Republic
Czech Republic
Hungary
Western Ukraine
Bosnia Herzegovina
Serbia
Montenegro
Former Yugoslav Republic of Macedonia
Greece
Romania
Bulgaria

- **NORDEL countries : Denmark, Finland, Norway, Sweden**
- **BALTSO members: Estonia, Latvia, Lithuania**
- **UKTSOA and ATSOI members : Great Britain, Northern Ireland, Ireland**

1.2. Aim and methodology

1.2.1 General considerations

The aim of this report is to present UCTE, UKTSOA, ATSOI, BALTSO and NORDEL TSOs' views as regards national or regional System Adequacy Forecast for the coming winter and possibilities of the neighbouring countries to contribute to the balance in critical situations. The survey gives them the opportunity to share information and gives impetus to further studies on a bilateral basis.

The following information is based on the answers to a questionnaire sent to every TSO in September. The questions concerned the TSOs' practices as well as some quantitative elements in order to present every country's forecasts on a common basis.

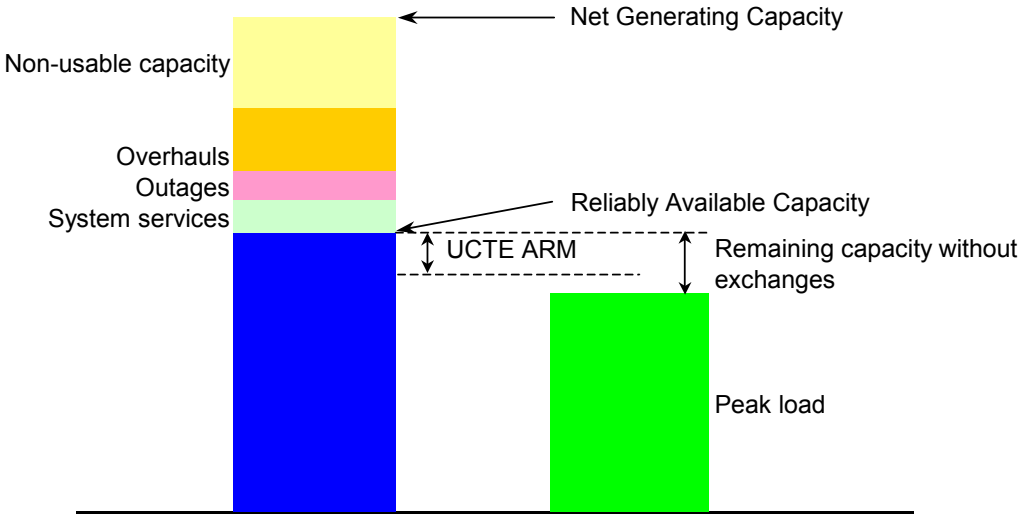
Available generation and peak load data were sought for each week, from end of November 2006 (week 48) until end of March 2007 (week 13). The TSOs were also questioned on whether the generation–demand balance should be considered at risk or not for the winter 2006/07. No specific analysis was carried out at this stage to simulate the power flows on the whole European High Voltage interconnected network. Moreover, interconnection capacities were in most cases set to typical winter values.

N.B. : The data used for this Report represents the information available to TSOs at the end of September.

1.2.2 Methodology

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

For UCTE countries, an Adequacy Reference Margin (ARM) has been used as adequacy index ; it corresponds to a proportion of the Net Generating Capacity, set between 5% and 10% according to the country considered depending on its electric system characteristics.



The figures of the Appendix show the National Generating Capacity, the Reliably Available Capacity and the peak load under normal and severe conditions. The remaining capacity is calculated for normal conditions and compared with the Adequacy Reference Margin (ARM) for UCTE Members. The remaining capacity is also evaluated with firm import/export contracts and for severe conditions.

1.2.3 Structure of the report

Section 2 gives the main risks factors that come out of the contributions (§ 2.1) and presents the main features (§ 2.2), completed by additional comments, country by country (§ 2.3).

Section 3 deals with blocks or regions according to mini-fora splitting.

Section 4 is the conclusion.

Last, the **Appendix** collects each country's comments, completed by schemas illustrating the Generation – Demand Balance.

2. MAIN RESULTS

2.1 Risk factors

Before drawing the main features of the generation-load forecasts of the different countries, it should be pointed out that the basis of the analysis is the so-called "normal conditions"[1], which means that the generation forecasts (generation capacity, planned outages) rests on the information made available to TSOs and that the different statistical elements that have an influence on the balance are set to average or typical winter values.

Among these elements, the ***temperature*** has a particular place, since it influences directly the level of the load. Therefore, to illustrate the sensitivity of the balance to this parameter, a severe winter scenario was built, showing the load level and the relative generation-load balance that could be experienced week by week in case of low temperatures.

Other factors have a direct influence on the generation level, namely :

- ***Outages of large units***, including of course overhauls and unplanned unavailabilities, but also extension of the duration of planned outages ;
- ***Hydrologic conditions,*** low inflows leading to reduced generation of hydro units,
- Market conditions on fuels, especially ***gas***, with possible effect on the energy that could be generated by Combined Cycle Gas Turbines.

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

- ***Extreme climatic conditions***, that could affect the availability of the network,
- ***Congestions*** that limit the possible use of generation or in extreme cases the supply of local loads,
- ***Loop-flows***, due to the physical laws of electricity transmission,
- ***Generation-load imbalances in other countries*** of the same interconnected block, that can lead to unforeseen flows through the country.

2.2. Main features

As expected, the more stressed period is generally the peak period (December-January) apart from the end of the year's holiday period.
But for some countries, the generation-load balance is also to be watched on a longer period, e.g. until the end of February and in some cases mid-March.

On the whole, TSOs expect no generation-load balance problems for the coming winter under normal conditions.
Nevertheless, **Belgium** encounters negative margins the first half of December and reduced margin at the end of March, which would make imports necessary.
Portugal has very tight margins from mid-December to mid-March, with even negative values for two weeks in case of severe conditions.
Hungary encounters tight or even negative margins in December and in the end of March, due to the planned outage of large generating units.
Slovenia shows very tight margins in January**.**

[1] *Some countries, however, included some unfavourable hypothesis even in the "normal scenario", e.g. a dry hydrologic scenario*.

Serbia shows tight margins under normal conditions at the end of the year and until mid-February ; imports are needed on the whole period to meet the load under severe conditions.
The Former Yugoslav Republic of Macedonia has to rely on firm import contracts to meet the load over the period.
Greece needs to import in order to meet its operational criterion, especially in December and January.
With the firm import/export contracts, **Northern Ireland** shows tight margins from mid-December to the end of January, but could notably improve its balance by adapting the exchanges.
Ireland needs imports to reach adequate margins in December, the first half of January, the second half of February and mid-March. Under severe conditions, imports are necessary for the whole period.
Latvia needs imports from neighbouring power systems to cover peak loads during the winter season.
In Nordel, the more stressed period is December, due to the outage of a nuclear unit in Sweden. Despite a presently low level of water in the reservoirs, the Nordel TSOs estimate that the energy balance in the coming winter period can be managed on a Nordic level.

Besides, most TSOs insist that the national generation-load balance could deteriorate in case of cold temperature or higher than expected generation outages.

Great Britain, Spain, Austria, Italy, Hungary and Romania stress the risk linked to the gas market. In such circumstances, they would reduce the exports or rely on import contracts.

Last, load-flow simulations could – when necessary – aim at verifying that the exchange capacities between neighbours are not limited by congestions on the transmission grid.

2.3. Additional comments

Great Britain
The projected level of generation availability would be sufficient to meet demands expected under normal and Average Cold Spell demand conditions. In the event of 1 in 50 cold winter conditions, where temperatures across the country average -2 °C for 30 days, and +2 °C for 60 days, the projected level of generation would be sufficient to meet demands, provided that the system does not experience high levels of plant breakdowns, and that sufficient non-power generation gas demand response is provided by industry such that adequate Combined Cycle Gas Turbines generation remains available.

Northern Ireland
The balance of the system along the winter shows very tight margins, which are even smaller taking into account firm import/export contracts. Additional imports are necessary to meet the load under severe conditions.

Ireland
Capacity is adequate to meet forecast demand only with dependence on imports and only if forced outages are within forecast values

NORDEL
The available Nordic generation capacity covers the hourly peak demand even during so cold spells that can occur once a decade. The Nordic power system, as a whole, can manage such a situation without any power imports. While Finland and Sweden have a deficit of capability, Denmark and

Norway have a surplus. The capacity is sufficient to cover the non-availability of the biggest generation unit at peak.
Due to the low precipitation during the past months, the water reservoir levels are significantly lower than normal. However, the Nordic energy consumption in the coming winter period can be covered by increased thermal power production, voluntary consumption reduction due to high prices and expected increased import from the continental Europe. The transmission capacity, when intact, allows for an increased import.
Locally however, southern Norway has a risk of energy shortage. This is the case especially if the precipitation remains low during the coming weeks and if the transmission capacity from Denmark and Sweden gets restricted and if the autumn and winter are colder than normal.

Estonia
Estonian generation capacity should be sufficient to cover domestic needs.
Also there will be a new energy link to Finland (Estlink) ready for use during December 2006. This new interconnection is expected to strengthen the Baltic energy systems and might considerably enhance security of supply in the Baltic region.
Estonian transmission grid is sufficient to guarantee enough transmission capacity for domestic needs and transit, also to provide adequate security of supply.

Latvia
Provision of power demand and supply balance for the Latvian power system in the coming winter shall not be associated with extraordinary events. Thanks to the availability of excess generation capacity in the neighbouring power systems and adequate transmission capacity, Latvian TSO could manage the balance. At the same time domestic generation capacity is not sufficient to cover peak loads during the winter season, until the beginning of the spring flood period. It usually starts on the week 10 to 12. During the flood period Latvia itself has an excess generation capacity originating from hydro power plants.
No significant additions of generation capacity are forecasted during the 2006/2007 winter period. However, new electric interconnection between the Baltic and Nordic States (Estlink cable) shall be commissioned before the winter season, which might considerably enhance security of supply in the Baltic power systems.

Lithuania
In normal or even severe conditions, the Lithuanian system is balancing well without imports. Emergency reserve agreements between the Baltic countries, Russia and Belarus provide the system with the ability to cope with the loss of the biggest generating unit on the system.

Belgium
The desired safety level of 1000 MW for the generation-load balance is not reached during the peak of week 48, 49 and 50 of 2006 and during the peak of week 13 of 2007, it is assumed that system adequacy will be respected when taking into account the current available simultaneous import capacity. In order to assure a maximum level of available simultaneous import capacity, no outages of 380kV international lines are planned during the critical winter periods. The first analysis of the system adequacy for the coming winter is positive, assuming a net import during periods where there is a generation-load imbalance.
The two main risk factors for the Elia grid that may jeopardize the current positive winter adequacy assessment are:

- atypical winter loop flows from the South to the North causing congestion problems in the Elia grid;
- a generation-demand imbalance for the whole of the UCTE-main block.

Germany
The remaining capacity under normal conditions will just meet the UCTE ARM of 5% of the national generation capacity.
The main problem in Germany is the difficulty to obtain reliable data from many market players.

Netherlands
The remaining generation margin comes out at only 3 % of the national capacity. Nevertheless, in Tennet's opinion, the adequate criterion would be the average available and/or offered reserve capacity.
The import capacity could be reduced due to two phenomena : the high transit flows through the Dutch network originating from high wind generation in Germany, and congestion on the French-Belgian border.
To manage better these phenomena a regional consultation with the German, Belgian and French TSOs and authorities was started. This consultation resulted in more detailed operational arrangements, which by using better the available information and forecasting methods for wind generation, facilitate secure cross-border transmission flows and maximum cross-border transmission capacity on a daily basis.

Luxembourg
Due to the special situation of the two grids in Luxembourg, an industrial grid and a public grid and the fact that the major part of energy is imported, the TSO considers that there is no risk for problems during the coming winter. Line capacity is sufficient and the contractual binding to RWE covers the load.

France
Under normal conditions, the generation–load balance on the French system is not considered at risk for the coming winter, so exports should be available.
Nevertheless, under severe conditions, December and January (except the last week of 2006) will show tighter margins, therefore for this period the export capacity is likely to be reduced and some imports may even be needed, especially in January.
The end of the winter is expected to be less stressed.
The main risk factors are the sensitivity of load to temperature, the unplanned outages of generating units and the level of water inflows.

Spain
Taking into account the results of generation-load balance, the forecasted situation for supplying demand for the coming winter is not critical.
Only simultaneous extreme peak demand, very drought hydro conditions and a very high thermal forced outage rate can lead to low values of remaining capacity.
However, the most important risk factors for this next winter in the Spanish system are:

- Hydro and wind conditions;
- Very high sensitivity of load to temperature in extreme weather conditions;
- Fuel (gas) availability to combined cycle and gas thermal plants.

Portugal
The system is constrained by the expected unusual outages necessary for the installation of atmospheric emissions control equipment in some thermal units (EC 2001/80/CE compliance).
This thermal generation profile combined with a dry hydrologic regime leads to remaining generation margins lower than 10% of the national generation from mid-December to mid-March (apart from the last two weeks of the year). Should a cold period occur, the system could rely on imports for two weeks (2 and 6).

Switzerland
The main result of the Winter Outlook Assessment is that under foreseeable conditions Switzerland won't have any problem with the electricity supply during the winter 2006/07. This will be true even under severe temperature conditions and even in the case of disturbed interconnections, because the inland generation capacity will be sufficient to cover the expected load.

Italy
The adequacy evaluations for 2006-2007 winter period do not indicate particular risks for capacity adequacy and peak load cover.
However, specific analysis performed to evaluate energy adequacy, in relation with the gas national supply system's criticality observed during the last year, preface an increasing trend in gas consumption in the thermoelectric sector.
This trend makes more significant the support of interconnection.

Austria
Verbund-APG points out that about 50% of the Austrian thermal power plants are fired by natural gas. In case of problems concerning natural gas delivery this can cause critical situations, especially in winter.
Furthermore, Austria underlines the strong North to South congestion in their network. Two new 380 kV lines are planned, but meanwhile, three phase-shifters are to be commissioned at the end of 2006.

Slovenia
Suitable margins are expected, apart from the period between weeks 1 and 8. Conversely, the generation-load balance shows very tight margins for January and February, especially for weeks 2 to 5. The safety operation of the system clearly relies on imports for this period.

Croatia
The Croatian system is not at risk under normal conditions ; considering severe conditions, the margins are tighter, especially from December to the beginning of March.

Poland
Under normal conditions, the Polish system balances well and allows some possibility to export.
However, the strong winter last year (especially January) and the growth of the demand lasting all the year resulted in the forecasted demand being increased by the PSE-Operator. It is also assumed that the amount of outages of thermal power stations may increase during exceptionally cold periods. A dry and hot summer and autumn has reduced the level of the water in the rivers. If followed by a frosty winter, it may result in the lower availability of river hydro power stations (although they constitute a small share in Polish generation mix) and it may also cause some problems for thermal power stations that use the water from rivers in the cooling system.

Slovak Republic
The power balance in normal conditions is not considered risky. The contracts (import/export) may have some influence but they are not known at the time of preparing the report. Considering severe conditions, the fifth week is rather tight and the ARM criteria (5%) has not been fulfilled in January and February.
The electricity market has been export oriented for the last seven years. Following the shutdown of one nuclear unit at the end of this year the situation may change towards import mode. After the unbundling process and liberalisation, the firm contracts of cross border exchanges are known just one day before.
Unexpected transit flows sometimes occur in the direction CEPS - MAVIR and may cause congestion on the SEPS - MAVIR border. But no constraints are foreseen in import and export possibilities. The cross border capacities are considered sufficient for reliable operation of the power system in the next year.

Czech Republic
CEPS does not expect significant problems with balance during coming winter period. Only in stressed circumstances might the exports be reduced.

Hungary
It is a historical feature of the Hungarian electric power system, that most of the time the required adequacy margin can only be guaranteed with a considerable amount of imports. Several years are needed to overcome this handicap.
After liberalisation, imports are mainly an issue for the traders, available interconnection capacity is satisfactory. Access is possible via yearly, monthly and even daily capacity tenders. The only limitation is due to high transit flows through the interconnections.
Critical factors of the winter period are the availability of fuel (natural gas in the first place), some risks of availability of generation capacities in a few large power plants, as well as uncertainties in the operation strategy of intermittent generators.
The most consideration is required in December (weeks 48-51), even under normal conditions, and in March (weeks 11-13) under severe conditions.

Western Ukraine
Although the remaining generation capacity (at least 21%) exceeds the UCTE ARM (5%) even under severe conditions, it is worth pointing out that the margins are considerably reduced taking into accounts the firm export contracts, so that the system is considered at risk by the TSO.

Bosnia Herzegovina
The remaining generation capacity exceeds by far the UCTE ARM (5%) whatever the calculation hypotheses are.

Serbia
Even under normal conditions and taking into account a firm import contract of 200 MW, the UCTE ARM criterion is not met from mid-December to the end of February, so that the system should be considered at risk for this period. Under severe conditions the risk extends to the whole period, the imports possibilities just offsetting the negative margins of the national balance from mid-December to mid-March.

Montenegro
The UCTE ARM criterion is just met from mid-January to the end of February, but taking into account a firm import contract, the system is not considered at risk.

Former Yugoslav Republic of Macedonia
MEPSO relies on firm imports contracts to reach some balance between generation and load.

Greece
For the winter 2006-2007, it is considered that the adequacy and security of the Greek Interconnected System is not threatened, taking into account the available import capacity of the interconnections.
The most critical period is December and January. Nevertheless, under normal conditions, the operating criterion of the HTSO is met, thanks to a volume of imports considered as firm.
Under severe conditions, the available import capacity of the interconnections as well as the existing contracts for imports are mainly the means to meet the demand. If it is necessary, additional measures may be applied in extreme conditions, such as modifications in the planned outages of the units, increase of the imports in order to use the entire capacity of the interconnections or decrease of the exports.

Romania
From the point of view of system adequacy, the next coming winter does not cause any problem to the Romanian system safety operation. The remaining capacity could cover any unit tripping which exceed the average expected value for outages in either case for normal or severe winter conditions.
A demand value higher than estimated one for severe winter could be managed by the remaining capacity as well.

Bulgaria

The most important event for the power system of Bulgaria is the shutting down of the 4 oldest units in the Kozlodui nuclear power plant on 31 December 2006 with total installed capacity of 880 MW. Even so, the balance is not considered at risk.

3. ADDITIONAL ANALYSIS BY BLOCKS

This analysis aims at comparing the situation in neighbouring countries and at identifying the potential difficulties, especially the periods where tight margins are identified on both sides of the border.

It will give signals on the respective possibilities of imports or on the reliability of these imports in case of severe conditions affecting some parts of the European system simultaneously.

This comparison is made on a regional basis which is derived from the mini-fora organization.

At this time, the analysis is just sketched out as deeper investigations would be needed to check the consistency of the hypotheses made by the different TSOs. This is not the aim of the present report.

Ireland – Great-Britain – France

During weeks 50, 2, 4 and 5, margins in Great Britain are less than 2 GW under severe conditions and GB forecasts 1.25 to 1.5 GW import from France.

In Northern Ireland, margins are tight for the period, and at their minimum for weeks 49 - 50, 3 and 5.

In Ireland, margins are negative between week 48 and 4 (apart from weeks 52 and 1) and low at weeks 8-9 and 11. During this period, Ireland relies on imports from Northern Ireland (and GB) whereas this period corresponds to the expected more stressed period for these countries.

The French margins are at their minimum for weeks 48 – 51 and 1 - 5, which coincides with minimum margins for GB, although this would only potentially be a problem if demand peaks coincided (which due to the time difference is not typically the case).

However, it should be noted that electricity prices in the individual markets will influence the direction and magnitude of flow on the interconnector.

France – Spain – Portugal

Spain has tight but positive margins even under severe conditions from the beginning of the period until March (except week 52); the minimal values are expected for weeks 50 – 51 and 3 –6.

In Portugal, the most stressed period is for weeks 50 and 1 – 10 ; under severe conditions, some imports would be needed, especially on weeks 2 and 6.

Under severe conditions, France's margins are minimum for weeks 48 – 5 (except week 52).

Weeks 50 and 3 - 6 are stressed periods for every country.

France – Belgium – Luxembourg – Netherlands – Germany

Margins are at their minimum in Belgium at weeks 48 - 50 (which are part of the most stressed period in France) and 13.

For this period, Belgium relies on imports (up to 1200 MW for weeks 48 – 49) to reach the minimum margin needed for a secure operation of the system.

At the same time the Netherlands, while they don't mention any particular risk, indicate that they rely on imports on non-predictable moments of the year 2007.

In Germany the indicative Adequacy Reference Margin introduced for UCTE long term forecasts is just met in December and January.

France – Switzerland – Austria – Slovenia – Croatia – Italy

In Switzerland there is no specific risk for the coming winter, nor in Italy apart from in case of gas supply crisis.

Austria mainly stresses the congestions in the internal network as well as the risk on gas supply.

Slovenia encounters tight margins between weeks 1 and 8, especially between weeks 2 and 5.

If the Croatian system is not at risk under normal conditions, the margins are tighter considering severe conditions, especially from week 49 to week 10.

France's most stressed period under severe conditions is for weeks 48 – 5 excluding week 52.

Centrel

Without import/export, the Czech Republic has sufficient margins even under severe conditions. Under normal conditions, exports should be available up to 900-1000 MW and even more under favourable circumstances. On the contrary, in stressed circumstances, exports should be reduced, especially for weeks 48 – 50, 2 and 9.

Hungary is balancing well apart from weeks 48 – 51 and 11 – 12 when it relies on imports.

The Slovak Republic has available margins in December so that exports could be available. The most stressed period is for weeks 2 – 9 (annual peak load) and 12 (beginning of the overhaul season).

Poland has very high remaining capacity even under severe conditions and there is no particular stressed period. Nevertheless, possible congestions on the grid may limit the export capacity to UCTE as well as to Nordel.

Nordel – UCTE – Baltic countries

According to Nordel's estimations, the Nordic system should balance well even under severe conditions without imports. Firm Imports from Russia and Estonia (via Estlink which should be commissioned in December) still increase the operating margins.

Actually the Baltic countries as a whole, as well as Estonia in particular show some possibility to export for the whole period.

Exports should also be available in Poland.

However, attention must be paid to the Southern part of Norway which is at risk of energy shortage especially if the precipitation remains low during October, if there are bottlenecks in the transmission grid from Denmark and Sweden and if the winter is colder than normal.

Baltic countries

Latvia relies on imports to reach some operating margin on the whole period.

Estonia balances well, so that exports should be available, especially in December and March.

Lithuania shows comfortable margins with no stressed period, at least with no outage in Ignalina nuclear power plant.

Unless in case of unfavourable generation unavailability, the Baltic countries as a whole should encounter no particular problems ; furthermore the commissioning of Estlink in December should improve their security of supply.

Serbia – Montenegro – Macedonia

These three systems rely on firm import contracts to reach the balance between generation and demand. As Greece is in a similar situation, the availability of export capacities from Bulgaria and Romania is crucial for the region.

Greece – Romania– Bulgaria

Greece most critical period for the generation – load balance is December and January; HTSO relies on imports to meet its criterion on minimum operational margin. In severe conditions, Greece would rely on imports for the whole period.

The generation-load balance is at risk neither in Romania, even under severe conditions, nor in Bulgaria.

Margins are nevertheless lower in January and February in both countries, especially in Bulgaria after the closure of the Kozloduy plants.

Considering the need of imports of Serbia, Montenegro, Macedonia and Greece, the general balance of the region can become tight in case of severe conditions.

4. CONCLUSION

This “Winter Outlook” exercise provides an overview of the national generation-load balances expected for the coming winter. This could be used as the starting point for further bilateral contacts of neighbour countries in order to assess the global adequacy of their systems and carry out the appropriate network analyses.

This survey shows that on the whole, no particular risk for power shortage is expected for next winter under normal conditions. The generation-load balances forecasted in each country are generally considered as suitable. Only some countries may depend on imports from their neighbours. In these cases the transmission capacity allows for import if intact.

Conversely, under severe conditions such as low temperature or gas supply crisis, the power systems become more stressed, especially if the same periods are critical for neighbouring countries.

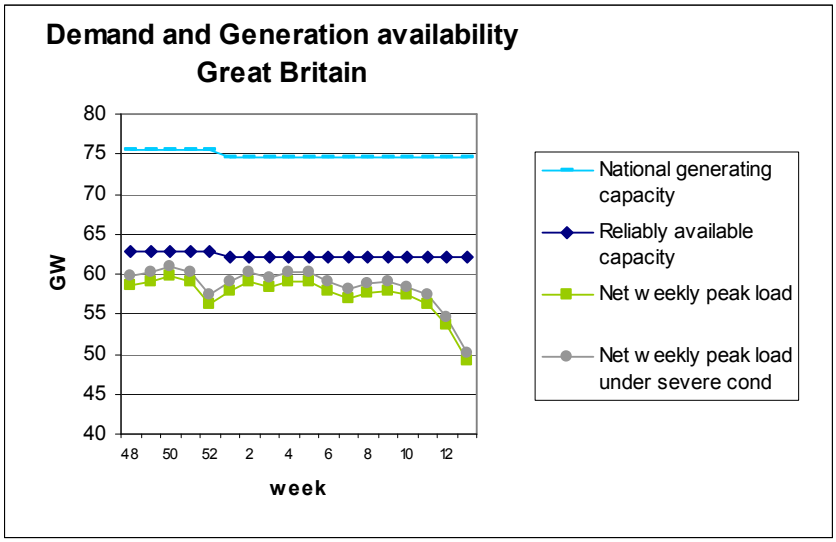
The risk period is the annual winter peak period (December-January) but may also extend until the beginning of March in some cases.

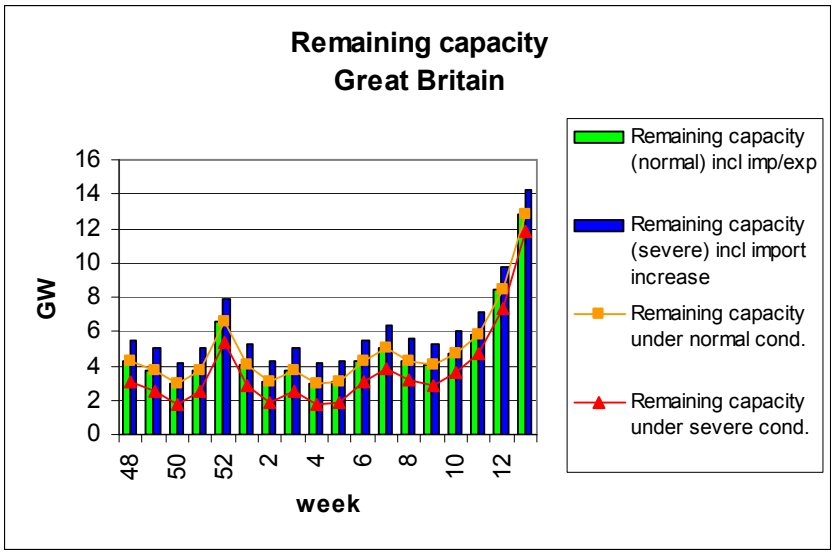
The risk relative to the availability of gas supply is particularly mentioned by Great Britain, Spain, Italy, Austria, Hungary and Romania.

APPENDIX

CONTENTS

Great Britain
Northern Ireland
Ireland





Method Used for Winter Outlook

Each year National Grid as the Great Britain System Operator publishes a Winter Outlook Report (see National Grid Winter 2006/07 Consultation Report, dated 21 September 2006)[2]. The plant margin in Great Britain (that is the surplus of generating plant over forecasted peak demand) is projected to be approximately 22%. Typically a 20% figure has been considered adequate for security of supply of the British system.

This report contains 4 chapters in the main document and annexes in a separate document:

Chapter 1 – Gas
Chapter 2 – Electricity
Chapter 3 – Gas / Electricity Interactions

[2] http://www.nationalgrid.com/uk/Electricity/SYS/outlook/

Chapter 4 – Industry Framework Developments
Annexes

The text provided below is an overview of the relevant parts of the National Grid Winter Consultation Report 2006/07 for the ETSO Winter Outlook Report 2006-2007. If clarification of any issue is required, please refer to the National Grid Winter Consultation Report 2006/07.

Generation-Demand Balance

The National Grid forecast of Normal Demand is 60.1 GW including a forecast 0.3 GW export to Northern Ireland at peak. Hence excluding the export to Northern Ireland the GB normal demand is 59.8 GW. This is presented as the "net weekly peak load" in this report.

The National Grid forecast of Average Cold Spell (ACS) winter peak demand for the coming winter is 61.3 GW including a forecast 0.3 GW export to Northern Ireland at peak. This is used to highlight that in a typical year; there will be some weeks that are colder than others. This has been represented in this report as "net weekly peak load under severe conditions".

National Grid also includes an assessment of more severe weather conditions, i.e. a "1 in 50" cold winter condition. This data is not presented in this report but is available in the National Grid Winter Consultation Report. For a 1 in 50 cold winter condition, based on 1946/47 weather pattern, the peak demand may increase in the order of 2 GW above ACS demand.

All the above demand forecasts include 1 GW of demand reduction (demand-side response) at system peak, in line with demand management observed in the winter of 2005/06. Hence without this demand reduction the figures would all need to be increased by 1 GW.

The Interconnector to France is not included in the demand data, as it is expected that at time of GB system peak, it is more likely to be a source of generation rather than demand.

At an operational level, generators provide National Grid with more detailed information about their expected availability. Using this information, there is currently 75.6 GW[3] of capacity operationally available during winter 2006/07, assuming 2 GW capability from France. In practice, the direction and level of flow on the Interconnector is heavily influenced by the differential in electricity prices between the UK and continental Europe.

There is a further 1.8 GW of generation capacity currently mothballed, of which we understand that 0.8 GW can return for this winter. We have been told that the remaining 1.0 GW cannot physically return to service in the required time scales. The National Grid Winter 2006/07 Consultation Report assumes the 0.8 GW of mothballed plant that can return for winter will do so.

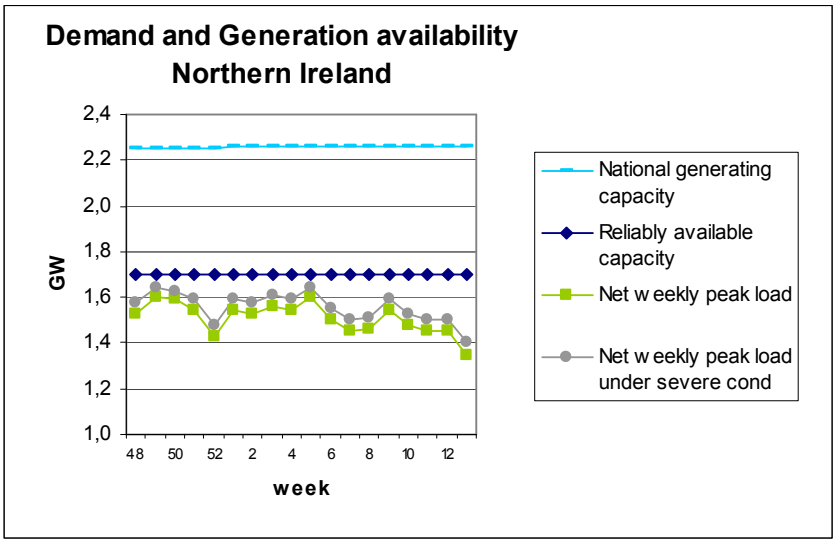
Role of Interconnection

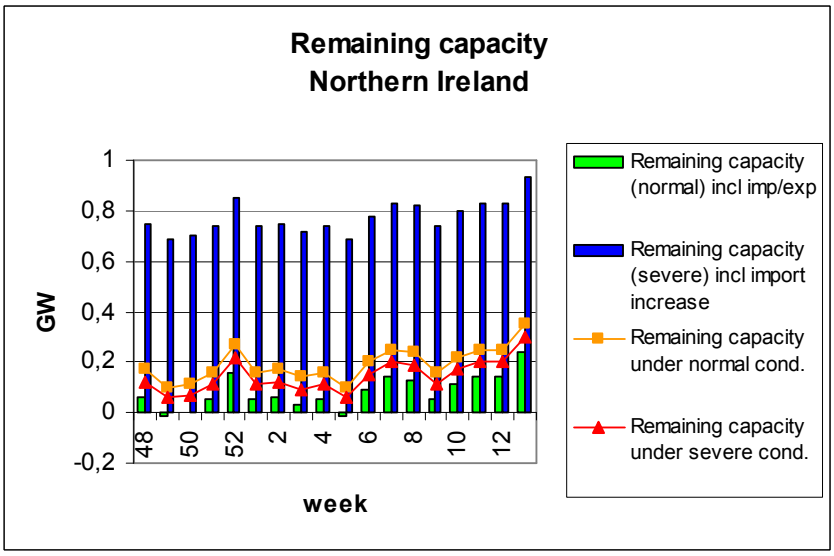
The assumptions used in the Winter 2006/07 Consultation Report are that there will be 2 GW import accessible from France; with expected available flow to be 1.25 GW between 3pm - 7pm (GMT), 1.5 GW between 7pm - 7am (GMT) and at float at other times. The Report also assumes 0.3 GW export to Northern Ireland at the time of system peak demand. Our 0.3 GW forecast is a central view based on recent experience but a higher (or lower) outturn could still occur.

[3] Position prior to the closure of Dungeness A and Sizewell A on 31 December 2006.

Conclusion

Taking into account the above assumptions, the projected level of generation availability would be sufficient to meet demands expected under normal and ACS demand conditions. In the event of 1 in 50 cold winter conditions, where temperatures across the country average -2 °C for 30 days, and +2 °C for 60 days, the projected level of generation would be sufficient to meet demands, provided that we do not experience high levels of plant breakdowns, and that sufficient non-power generation gas demand response is provided by industry such that adequate CCGT generation remains available.





Comments

Data provided by the System Operator of Northern Ireland – SONI.

Generation-Demand Balance

Northern Ireland has a peak demand under normal conditions of ~1.6GW, and National Generation Capacity of ~2.25GW, and a reliably available capacity of 1.7 GW.

Significant factors considered in the winter outlook include the relatively large size of the generating units compared to total generating capacity, and the amount of interconnection.

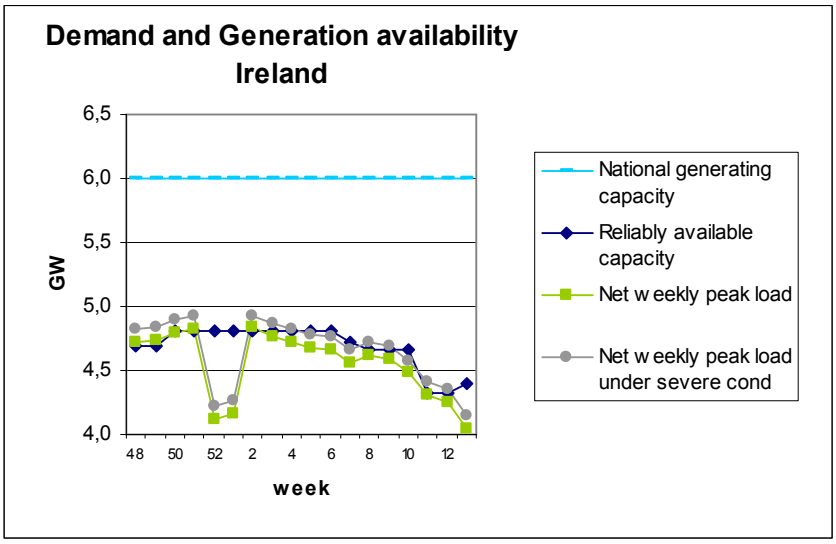
Role of Interconnection

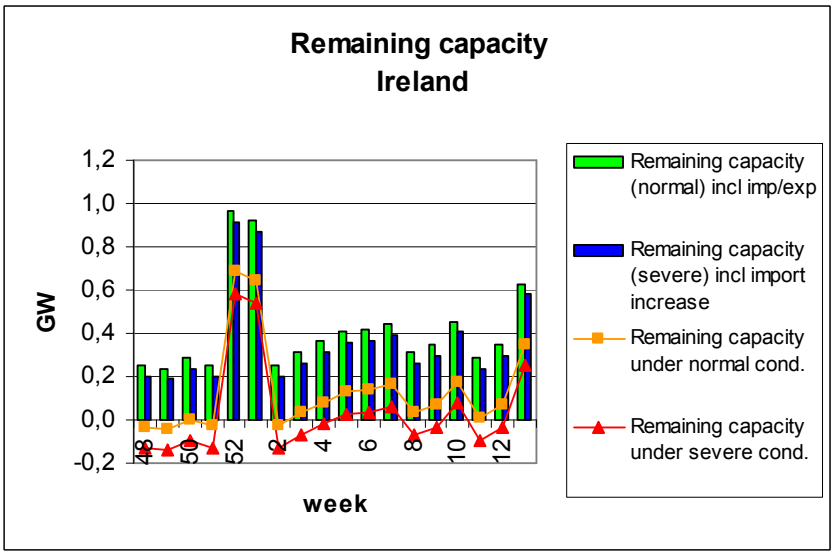
Presenting the data for Northern Ireland separately means that the treatment of interconnection to GB (450MW) and interconnection to Ireland (330MW) is significant. The SONI assumption in preparing the data that has been used in this report is that there will be a ***165MW*** import from GB and a ***280MW*** export to Ireland at the time of System peak.

Consequences of 165MW import from GB and an Explanation of Interconnector use to offset these Weeks

Small negative values are obtained on Weeks 49 & 5 on the 'Remaining capacity including Import/Export', the main reason is that only 165MW of firm capacity has been purchased on the GB (Moyle) interconnector. However this is offset by the 'Export reduction or Import increase possibilities' which has increased to 715MW. This means that there is the ability to trade up to 285MW (400MW plus 50MW Emergency assistance) on the GB (Moyle) interconnector and up to 440MW (330MW export North- South plus 100MW Import) on the interconnector to Ireland.

Each month there is an auction for unsold capacity on both interconnectors which can increase the firm capacity.





Comments

Data provided by EirGrid.

Generation-Demand Balance

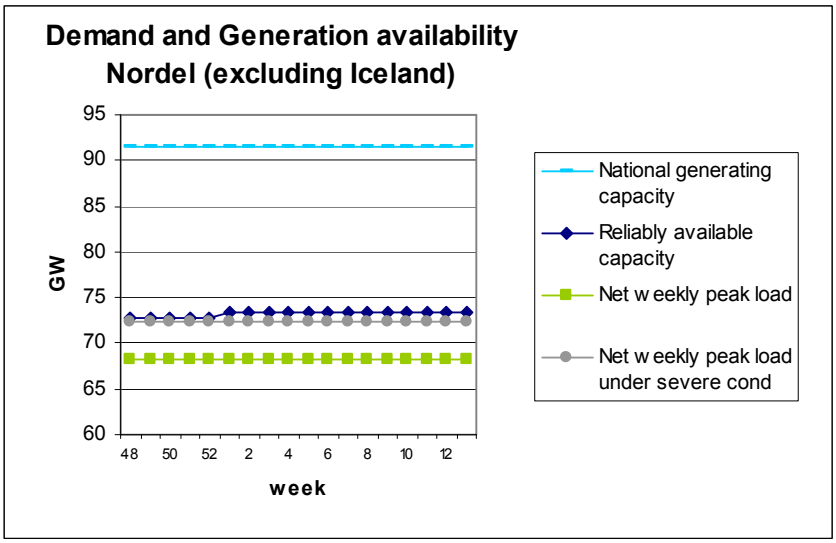
Ireland has a peak demand under normal conditions of ~4.5GW. The National Generating Capacity is 6GW. The Reliably Available Capacity each week varies between 4.32GW and 4.83GW. The system services reserve is 0.42GW.

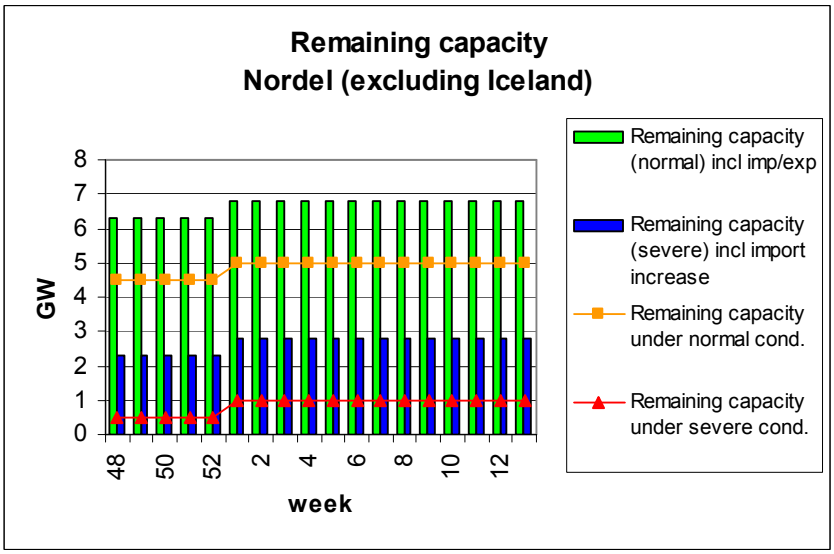
Role of Interconnection

Capacity is adequate to meet the forecast demand only with dependence on imports and only if forced outages are within forecast values.

Generator performance has declined during 2006. It is expected that the normal security standard will be met if there is no further deterioration.

NORDEL COUNTRIES
Denmark
Finland
Norway
Sweden





Method used for Winter Outlook

The Nordic TSOs together within Nordel estimate the Nordic power balance for the coming winter annually. The estimates are made for the hourly peak demand corresponding normal winter temperature or a cold winter day that can occur once in ten years (severe conditions). The peak demand may come true in any week during the winter period although the probability is biggest in the period from December to the beginning of March. The same estimates for the peak demand have been used for all weeks included in this report.

The data represent an estimate of a simultaneous peak demand in the Nordel countries Denmark, Finland, Norway and Sweden (Iceland has been excluded).

The available generation capacity is based on the current hydrological situation and experiences from the earlier peak demand situations. Operational reserves in generation have been excluded from the available capacity. The output of nuclear power is expected to be 100 % of the capacity except one nuclear unit in Sweden (470 MW) that is expected to be out of operation until the end of

year 2006. Wind power is not expected to generate during the peak hours. There are no planned overhauls of the big power stations during the winter period.

Generation-Demand Balance and the Role of Interconnections

The Nordel system is in a positive balance (500 - 1000 MW) even in severe conditions without import. The balance in severe conditions is most critical until the turn of the year when one nuclear unit is out of operation. The remaining capacity in the beginning of year 2007 allows an outage of the biggest unit.

The import from Russia and Estonia (totally 1780 MW) can be considered to be firm both in normal and severe conditions although experiences from last winter showed some reduction during the peak hours. This import can be considered as a generation resource in Finland and thus will increase the remaining capacity in the Nordel system.

The estimated peak demand corresponds to the current price level in the Nordic market. Higher prices can activate demand response and contribute positively to the balance. The import from the continental Europe will also be driven by the prices. The transmission capacity from the continental Europe allows an import of about 2600 MW.

Nationally without import, there is a deficit of generation capacity in Finland both in normal and severe conditions (1800 MW) and in Sweden in severe conditions (350 MW). In Denmark and Norway there is a surplus of capacity (totally about 1600 MW).

Generation-Energy Consumption Balance

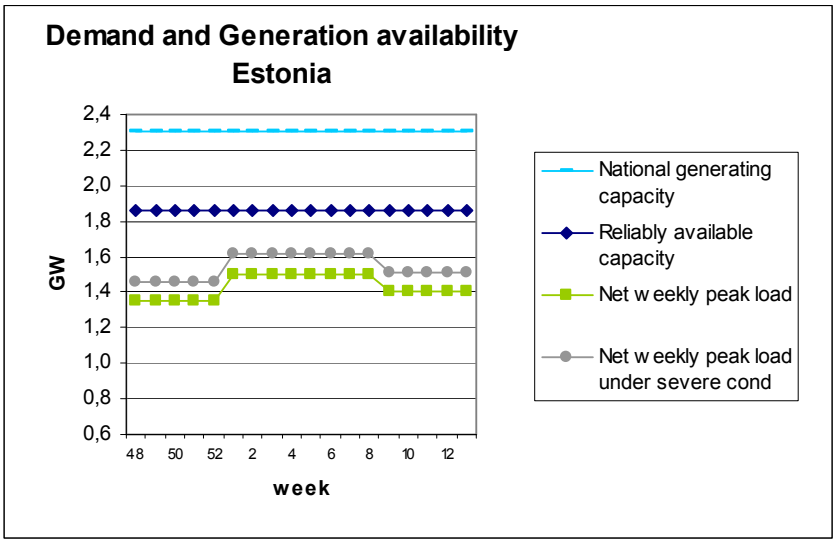
About half of the energy produced in the Nordic countries is based on hydro power. The Nordic TSOs make also an estimate of the energy balance for the winter period before the flood season begins.

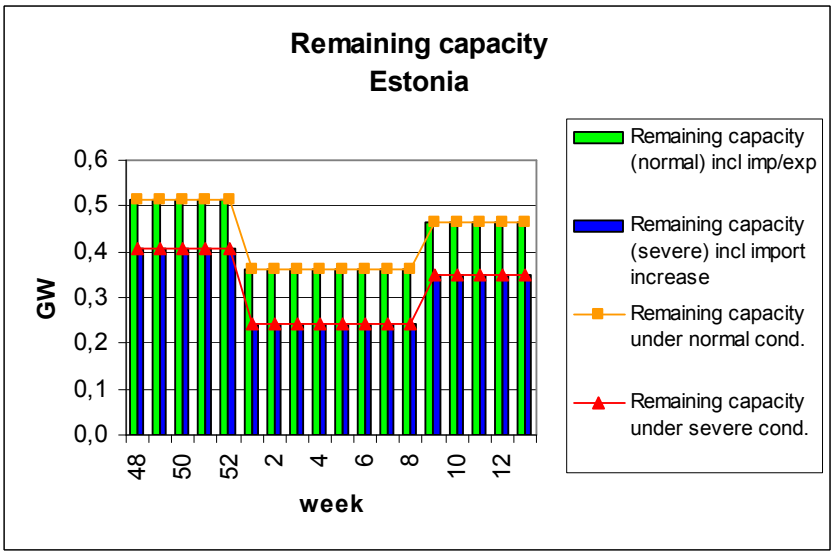
Due to the low precipitation during the past months, the water reservoir levels are significantly lower than normal. However, the Nordic energy consumption in the coming winter period can be covered by increased thermal power production, voluntary consumption reduction due to high prices and expected increased import from the continental Europe. The transmission capacity, when intact, allows for an increased import.

Locally however, southern Norway has a risk of energy shortage. This is the case especially if the precipitation remains low during the coming weeks and if the transmission capacity from Denmark and Sweden gets restricted and if the autumn and winter are colder than normal.

BALTIC COUNTRIES
Estonia
Latvia
Lithuania

ESTONIA





Synopsis

Estonia synopsis presumes tight integration with EU economical and political structures. At the same time Estonia retains quite intense connections with Russia and other CIS countries. Estonia joins with European Monetary Union 2006-2007, which remarks continuously tighter connections with European markets, companies' extensive collaboration and accessions to international corporations. We also presume continuous private enterprise development in Russia, which permits Estonia become transit country between West and East.

Estonian base load and half peak-load are suitable to cover with condensation aggregates.

On the assumption of necessity, objective is to cover all regions load from local power plants. Besides, power production dispersing and different fuels usage is presumed.

On the basis of power balance, power plants total net, base, half peak/peak as well nuclear power plant capacities are appointed. Because of the wind farms power production occasional factor, it is

not possible to include them into power balance calculations. Therefore, wind generators foundations do not reduce necessity of traditional power plants technologies.

Thanks to the availability of domestic generation capacity and adequate transmission capacity, Estonian TSO could manage the balance.

The power system maximum load day, which is usually registered in January (week 1-3), might be the most critical period for the Estonian power system. Currently it seems that we should cover our needs.

The main risk factors for the Estonian power system are the possibility of severe East-West directional strong 330 kV lines will be switched off (due to low temperature – icing).

Also important risk factor is generation availability for electricity export to Finland during the winter peak-load period.

Methodology Used for Winter Outlook

The adequacy assessment was made according to the Estonian Grid Code and Estonian Energy Market Act which will appoint the operating rules for Estonian energy system.

Average long-term values for thermal power plants generation and normal weather conditions are used in the forecasts.

Generation–Demand Balance

There has been significant electricity consuming rise during the year 2006. The peak-load during the 2005/2006 winter period was approx. 1500 MW. In comparison with the previous year, the load might rise by 5% under normal weather conditions.

During the 2006/2007 winter season, Estonian power system should be in balance. Domestic generation capacity should be sufficient to cover peak loads during the winter season.

There are a few additions of generation capacity forecasted during the 2006/2007 winter period. Estonian generation capacity should rise by approx. 24 MW, which will stand for new wind generators capacities.

National generating capacity during wintertime should be approx. 2300 MW.

Primary (frequency) reserve for the Baltic power system is secured by the Russian power system, however Baltic power systems have sufficient amount of primary control reserve according to UCTE methodology. Secondary and tertiary reserves are organized by the agreements about the parallel operation between the Baltic, Russian and Belorussian TSOs, which will assume provisions about the sharing of reserve capacity.

Estonian generation capacity should be sufficient for covering domestic needs.

Role of Interconnections

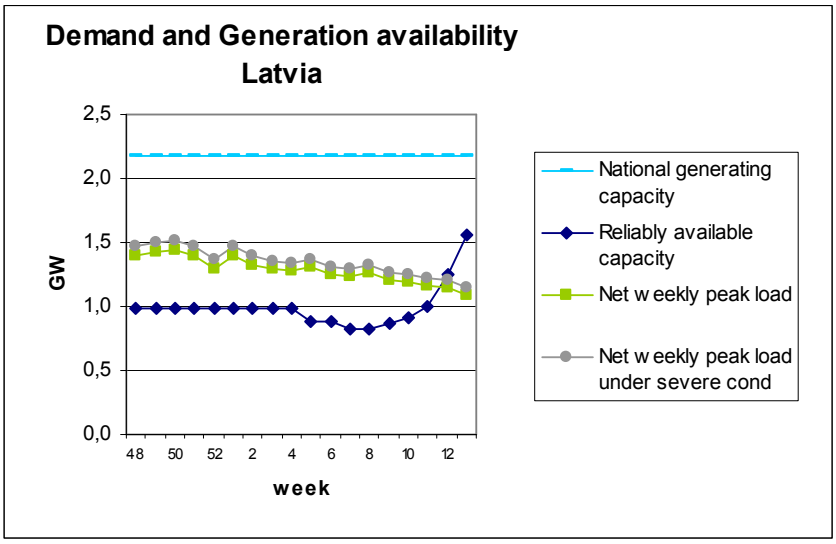
Estonian 110-330 kV grid condition is sufficient. Estonian has very good interconnection with Russia and sufficient interconnection with Latvia. Estonia is ready to establish new interconnection with Finland (HVDC submarine cable) in the end of 2006.

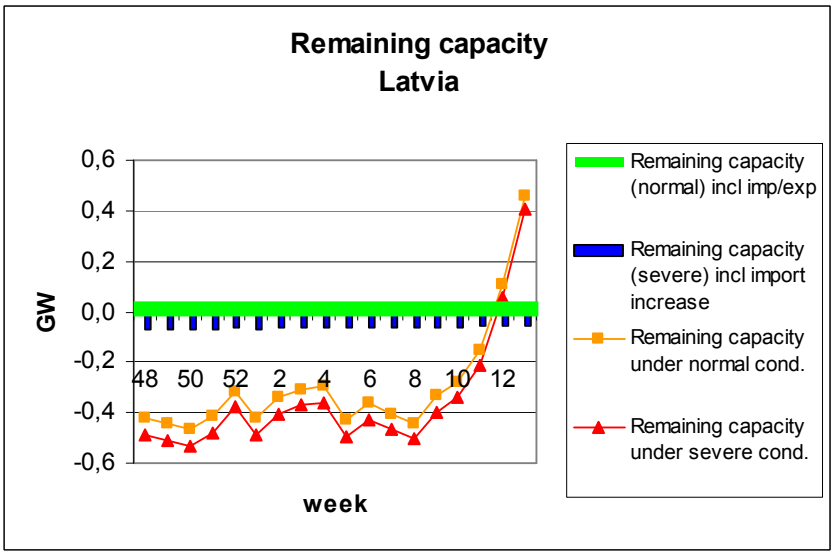
The main problem in 330 kV transmission grid is drain of transmission capacity in East-West direction with reference to increase of demand in region of Tallinn and foundation of future submarine cable “Estlink”.

Existing transmission capacity of cross-border interconnections entirely ensures the flow of power between the Baltic States. The transmission capacity is sufficient to secure the peak load of Estonian power system for 100% with own generation aggregates.

New electric interconnection between the Baltic and Nordic States will be commissioned in December 2006, which will increase security of supply in the Baltic power systems, and increase potential for electricity import.

LATVIA





Synopsis

Provision of power demand and supply balance for the Latvian power system in the coming winter shall not be associated with extraordinary events. Thanks to the availability of excess generation capacity in the neighbouring power systems and adequate transmission capacity, Latvian TSO could manage the balance.

The power system maximum load day, which is usually registered in the middle of December (week 50-51) or in the middle of January (week 1-3), might be the most critical period for the Latvian power system. This is the period with the highest dependency on power supply from the neighbouring power systems through the interconnections.

The second critical period, which happens at the end of the winter (week 10-12) – is the flood period, when Latvian power system is changing from deficient to excess power system. The beginning of the flood period, the real inflow in the rivers and consequently the output of hydro power plants could hardly be predicted. That is why it is always a stress for the power traders and the TSO.

The main risk factors for the Latvian power system are the possibility of severe winter peak demand due to extremely low temperatures and low available hydro capacity due to insufficient water inflow in the rivers. In fact, such an extremely low temperature and the record-breaking high electric load was registered in January of this year. The most problematic situation is the situation when both risk factors coincide.

The third risk has a longer term nature. This is an availability of generation capacity (in the neighbouring countries) for electricity export to Latvia. For the last several years, this potential was constantly decreasing. Nowadays, the excess generation capacity in the neighbouring countries is not so big anymore. That is why, in the event of the outage of large generation units, the selection of substitutes is not so big.

Nevertheless, until the end of 2009, when the second unit of Ignalina Nuclear Power Plant (in Lithuania) is scheduled to be closed, there should not be a big problem with electricity import.

The forth risk might be associated with subnormal climatic conditions, such as hurricanes. In January 2005 such a hurricane resulted in outage of major cross-boarder interconnections and created a very dangerous situation for the Latvian power system. Fortunately the system has not collapsed.

As the remaining capacity figure is negative in the Latvian power system, but available generation capacity in the neighbouring countries is reducing, the Latvian TSO in its adequacy reports provide signals to the market players to construct new generation capacity. As a fact, new 400 MW CCGT CHP plant in Riga to be commissioned in July 2008 would help to release partly such a complicated situation.

Methodology Used for Winter Outlook

25.04.06 Regulations of the Cabinet of Ministers of Latvia No. 322 require the TSO to provide/publish power market and system information and forecasts once a year, including generation and transmission adequacy issues. The methods for adequacy assessment used in TSO Report and for the Winter Outlook Report are the same.

Average long-term values for water inflow / hydro generation and normal weather conditions are used in the forecasts.

Generation–Demand Balance

Due to dynamic development of economic activities and new electricity consumers connected, load is expected to increase significantly. In comparison with the previous year the load growth might reach 3.5 - 4.0% at normal weather conditions. During the winter period, the increase of electricity demand for each °C of decrease of the temperature might reach 1 - 1.5% of load or approximately from 10 to 20 MW. For the severe winter peak demand conditions an overall increase of load equal to 5% is assumed. At the end of the winter period (week 13), the electric load is just about 75%-80% of the maximum load.

During the 2006/2007 winter season Latvian power system would have a capacity deficit of 25%-35% of the peak loads. However, at the end of the winter season (week 12-13) the remaining generation capacity might reach more than 400 MW (usually exported). Deficit capacity, in accordance with agreements, Latvia receives from Estonia, Lithuania and Russia.

No significant additions of generation capacity are forecasted during the 2006/2007 winter period. So the TSO must rely on existing generation capacity.

Fossil fuel power stations are CHP plants capable to operate both in cogeneration and condensing mode. During the winter period CHP plants mostly are operating at nominal power. Maintenance is usually not planned for the winter heating season. The forced outage rate of CHP plants might be around 3%-3.5%.

Capacity of hydro power stations strongly depends on water inflow in rivers. During the winter peak hours the average expected capacity of large hydro power plants (Daugava HPP with installed capacity 1520 MW) is approximately 400 MW with the standard deviation of $\pm$200 MW. Capacity of small hydro (overall installed capacity 26 MW) and wind power stations (overall installed capacity 28 MW) is assumed as zero. During the last weeks of the winter season (week 10-13), when the flood period starts, the available capacity of large hydro power plants start to increase and might even reach the nominal level. The forced outage rate of large hydro power plants might be as low as 0.5%.

Primary (frequency) reserve for the Baltic power system is secured by the Russian power system (Volga hydro power plant cascade), however, Baltic power systems have sufficient primary control capabilities according to UCTE methodology. Secondary reserve is provided in Daugava HPP in Latvia and Krounis HPSP in Lithuania. Tertiary reserve is delivered by thermal power plants, including CHP plants in Latvia. The agreement about the parallel operation between the Baltic, Russian and Belorussian TSOs assumes provisions about the sharing of reserve capacity.

Remaining capacity is mostly negative, except for the last weeks of the winter period.

Role of Interconnections

Existing transmission capacity of cross-border interconnections entirely ensures the flow of power between the Baltic States. The transmission capacity is sufficient to secure the peak load of Latvian power system for 100%, in condition of available generation capacity in the neighbouring countries.

Significant capacity of cross-border transmission line is explained by the fact that Baltic IPS (Integrated Power System) used to be a part of so-called power loop of Northwest part of Soviet Union. Interconnection of the Power Systems of Estonia, Latvia and Lithuania (Baltic IPS) operates in parallel (as synchronous AC grid) with the Unified Power System (UPS) of Russia and the Power System of Belarus via a power loop, which was created in the early sixties of last century by interconnecting power systems of West part of the former USSR: Baltic states, North-West Russia, Central Russia and Belarus. Russian power system provides regulation of frequency in the system. The electrical networks of Estonia, Latvia, Lithuania, as well as neighbouring electrical networks of Russia and Belarus, form an electric Ring, consisting of 330 and 750 kV lines. The 750 kV network in the integrated power system is not closed.

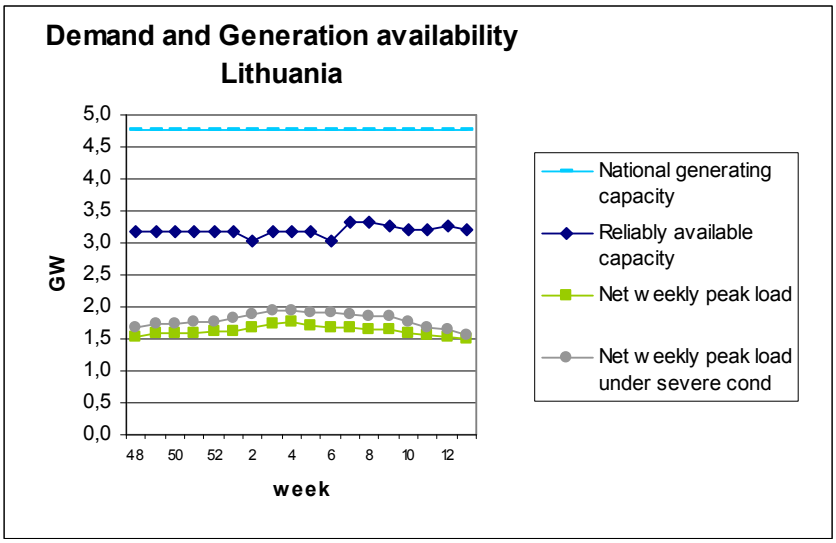
New electric interconnection between the Baltic and Nordic States (Estlink cable) shall be commissioned before the winter season, which might considerably enhance security of supply in the Baltic power systems, and increase potential for electricity import.

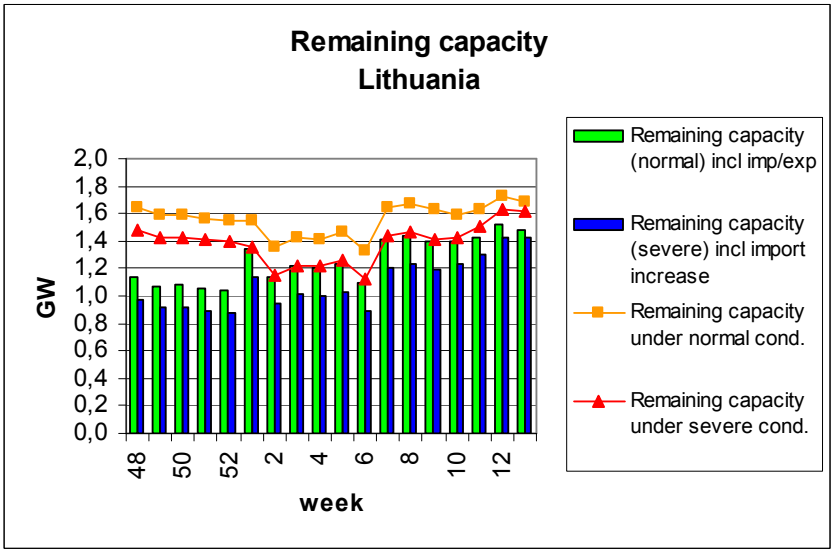
Due to poor predictability of the output of hydro power plants, firm import / export contracts are usually not practised. Nomination of necessary capacity happens just several days in advance.

Additional comments

1. Contribution from intermittent energy sources, such as small hydro and wind, for the peak load coverage is considered as zero.
2. One unit in Riga CHP-2 (60 MW) is practically decommissioned and could not be made available anymore.
3. In normal conditions, there are practically no limitations in transmission capacity for power import in Latvia.
4. Energy constraint issues for hydro power plants were described above.
5. At the moment, there are not any fuel supply limitations, which could limit capacity of fossil fuel power stations.

LITHUANIA





Comments

Generation-Demand Balance

The winter adequacy assessment takes into account information about generator availability, demand and planned outages of lines.

In Lithuania, electricity production is based mainly on nuclear and gas fuel. The biggest electricity producer in Lithuania is the Ignalina Nuclear Power Plant. Due to huge capacity of the INPP unit, the reliable operation of the power system necessitates parallel operation of Lithuania power system not only with Baltic power system, but also with power systems of Russia and Belarus, i.e. Lithuania has to use the benefits of regional cooperation. Other generators in the Lithuanian power sector are mainly the Lithuania Power Plant and CHP plants; many of which are required to help to provide the high level of reserve needed in Lithuania to cover forced outages of Ignalina. The output of nuclear power is expected to be 100% of the capacity. Hydro and wind generation is not considerable for the time being. Mothballed capacities are practically not available under any circumstances. There are no planned overhauls of big power stations during the winter period. Data for overhauls concerns only fossil fuel power station.

The assessment is made on a weekly basis for the week peak based on previous years experience. The growth of load under severe conditions is reversely correlated with the temperature. The average load sensitivity to temperature is around 14 MW/°C. Concerning the winter months the

experience is that the situation is most severe in January and February. March is usually not critical. No load reduction is being used.
During the past 3 years final electricity consumption in the economic sectors has increased on average by 4–5% per annum.

In normal conditions Lithuanian system is balancing well without import. This winter it is planned that Lithuania will have a peak demand under normal conditions of about 1.75 GW excluding export and under severe conditions of about 1.95 GW excluding export. Under severe conditions the remaining capacity is positive – average about 1.26 GW.
Emergency reserve – is an active power reserve which is to be activated to compensate for shortage of power being generated in the Lithuanian power system after an emergency loss of a power providing unit.
Emergency reserve needed to maintain in Lithuanian power system is calculated considering the following:

- Under the agreement between the Russian, Belarusian, Estonian, Latvian and Lithuanian power system operators, power systems of the Baltic countries, Belarus and Russia must be hold emergency reserve.

- Under the agreement between the Lithuanian, Latvian and Estonian power system operators respective power systems jointly maintain emergency reserve which is needed to cover the loss of the largest power generating unit in the Baltic power systems minus emergency reserve which are to be provided by Belarusian and Russian power systems in a case of an emergency. The share of the joint emergency reserve respective power systems need to maintain is proportional to their largest power generating unit.

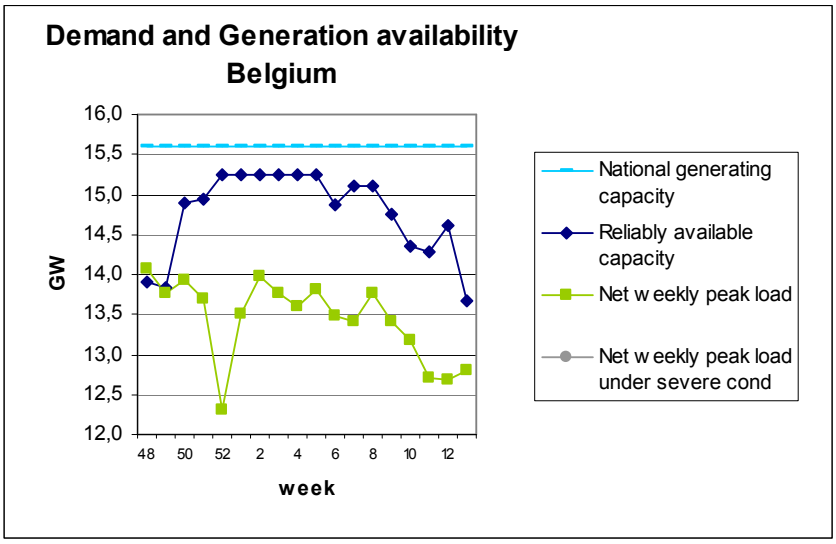
In the case of an emergency in any of the respective power systems under the mentioned agreements first of all the emergency reserve maintained by the accidental system is activated and only afterwards the emergency reserve from the neighboring systems is to be provided.
The provision of power by the emergency reserve units is planned to last up to the twelve hours.

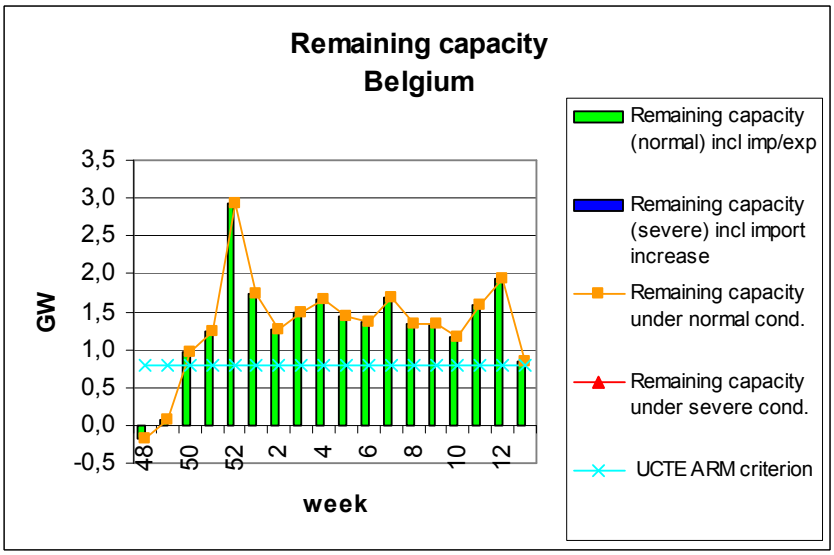
Role of Interconnection
The expected importable and exportable capacities are considered as physical flows, that are based on previous year experience. The assumptions used in the Winter Outlook Report are that there will be export to neighboring countries from 0.2 GW to 0.51 GW in normal and severe conditions.

Conclusion
Taking into account the above assumptions, the projected level of generation availability would be sufficient to meet demands expected under normal and under severe conditions.

UCTE MEMBERS

BELGIUM





Comments

Synopsis

The desired safety level of 1000 MW for the generation-load balance is not reached during the peak of week 48, 49 and 50 of 2006 and during the peak of week 13 of 2007, it is assumed that system adequacy will be respected when taking into account the current available simultaneous import capacity. In order to assure a maximum level of available simultaneous import capacity, no outages of 380kV international lines are planned during the critical winter periods. The first analysis of the system adequacy for the coming winter is positive, assuming a net import during periods where there is a generation-load imbalance.

The two main risk factors for the Elia grid that may jeopardize the current positive winter adequacy assessment are:

- atypical winter loop flows from the South to the North causing congestion problems in the Elia grid;
- a generation-demand imbalance for the whole of the UCTE-main block.

The Framework and Method Used for Winter Outlook

An adequacy forecast study is carried out each year for the Elia control area, which comprises Belgium and the SOTEL area (a part of the G-D Luxembourg).
Deterministic methods are used to fulfil this analysis. Although the assessment is based on only one scenario, it is modified and reassessed several times. The assessment takes into consideration the following items:

1. Total installed capacity of the generators that signed an agreement with Elia.
2. The actual, announced overhaul and outage schedules of the generator units that signed an agreement with Elia. These programs are communicated to Elia in week 34 of the year preceding the considered year.
3. The peak load of the Elia control area measured on Wednesday and Saturday in the past year per considered week augmented with 1.5 percent.
4. The planned outages of lines.
5. As far as long-term contracts resulting from investments of local generators in neighboring control areas still exist, they can no longer benefit from a preferential cross-border capacity allocation. Consequently, these long-term contracts were no longer considered in this assessment.

The final result of this assessment is available in week 45 of the year preceding the considered year. The complete following year is examined on a weekly basis. For each week, two moments are assessed, namely the week peak (Wednesday) and the weekend peak (Saturday) (for instance week 48 until week 52 of the year 2006 was examined for the first time in 2005). A first revision of the assessment takes place 8 weeks before the beginning of a quarter. At this time the assessment is carried out for the peak of each day of the considered trimester. The same analysis, but using each time an adapted generation-demand balance, is also made for the peak of every day of the considered week, from 8 weeks until 1 week before the considered week. Finally, for every day of that week, the situation is reassessed two days and one day before the actual day.

A remaining capacity margin of 1000 MW (equivalent to the biggest unit in the grid) for the generation-load balance is judged as the desired safety level for the short-term adequacy analysis. This deterministic criterion reflects the highest risk due to a single incident for the Elia grid taking into account the total generating capacity minus the actual, announced overhaul and outage schedules. The main objective of this short-term analysis is to assess whether the Elia grid can remain autonomously when this incident occurs. The system will rely on net imports during periods of non-respect.

The UCTE approach for medium and long-term system adequacy applies a stricter probabilistic criterion. This approach indicates the dependency on possible net imports to face contingencies and to allow some freedom in maintenance planning during non-respect.

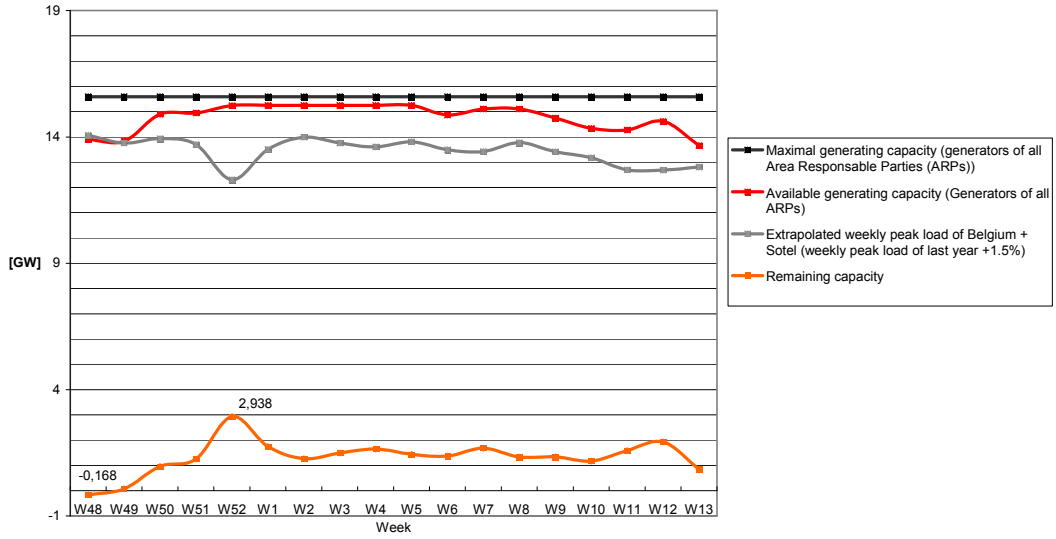
In the Annex a complete overview of the differences between both methodologies is given.

Generation – Demand Balance

In the figure below, an overview is given of the result of the assessment of winter 2006-2007 for the week peak. A low level of overhauls combined with the lowest level of forecasted demand for the week peak of week 52 of 2006, result for that week in the highest remaining capacity level for the coming winter for the week peak. On the contrary, a high level of overhauls combined with the highest level of forecasted demand for the week peak of week 48 of 2006, result for that week in the lowest remaining capacity level for the coming winter for the week peak.

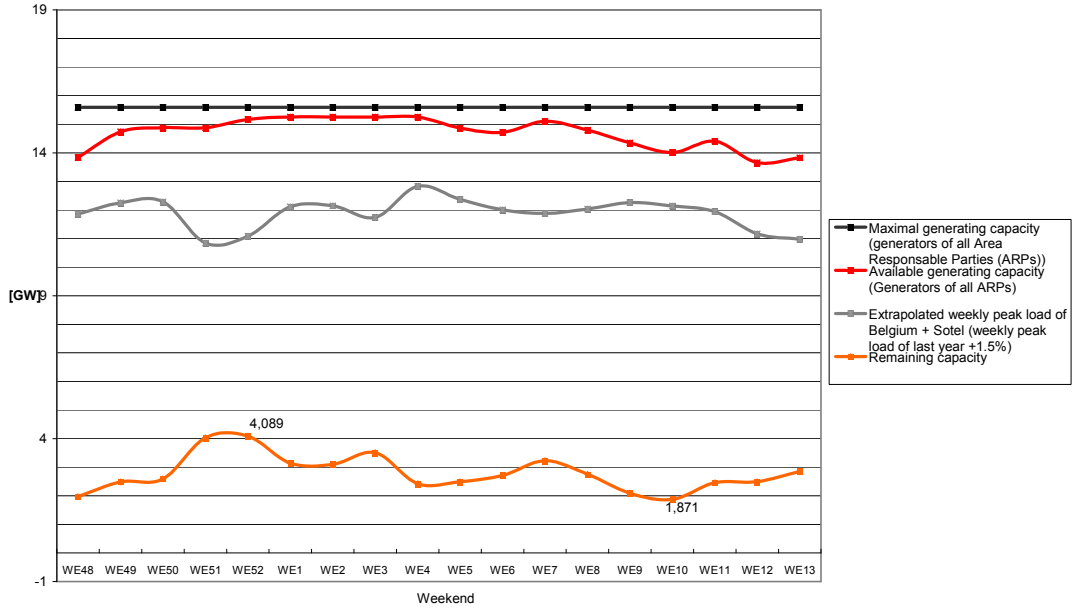
The desired safety level of 1000 MW for the generation-load balance is not reached during the peak of week 48, 49 and 50 of 2006 and during the peak of week 13 of 2007. However, system adequacy should be respected when taking into account the current available simultaneous import capacity. In order to maximize the available simultaneous import capacity in these weeks, no maintenance of 380kV international lines are scheduled.

Adequacy assessment Winter 2006-2007 (week peak)
evaluation time September 2006



The figure below gives an overview of the result of the assessment of winter 2006-2007 for the weekend peak. The desired safety level of 1000 MW is reached for all weekend peaks the coming winter. The lowest level of remaining capacity for the weekend peaks the coming winter is 1871 MW.

Adequacy assessment Winter 2006-2007 (weekend peak)
evaluation time September 2006



At the moment, the above explained analysis does not take into consideration severe load conditions. Load and generation modification based on meteorological forecasts are only considered for the assessments made as from one week before the considered week. The load is reversely correlated with the temperature. Hence a negative deviation of the meteorological prevision of 1 degree Celsius from the temperature measured the year before for this specific time, results in a positive correction of the load by 100 MW.

Role of Interconnection

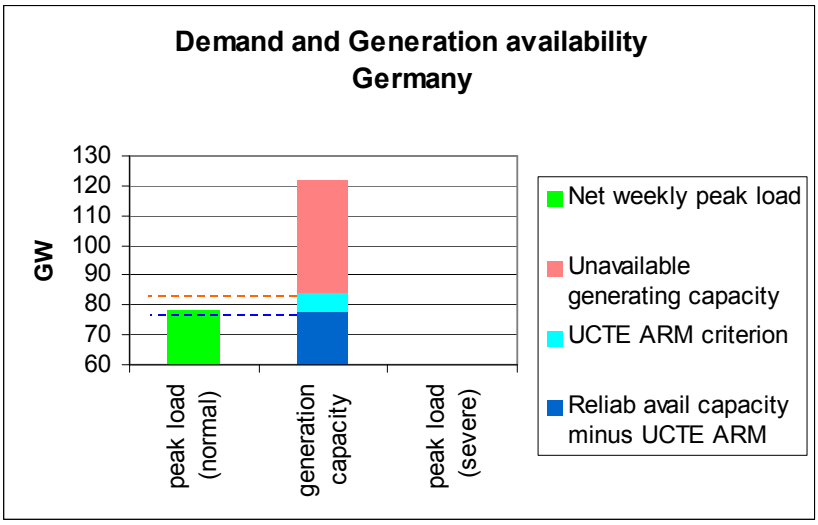
At the moment the Elia control area structurally depends on import within the UCTE-main block in order to obtain the desired safety level of 1000 MW during the coming winter. Last winter period (from week 48 of 2005 until week 13 of 2006), on average an import of 508 MW was measured during week peak times (from 6 pm until 7 pm) on the Belgian South border (F-B border) and an import of 1089 MW was measured during week peak times (from 6 pm until 7 pm) on the Belgian North border (NL-B border). Taking into account the electricity flows on both Belgian borders (B-NL and F-B borders), the average net import during peak times last winter period totalled 1124 MW. During 50 percent of the peak times of last winter period a level between 897 MW and 1396 MW of import was attained.

The simultaneous import capacity for the coming winter is situated between 2490 MW and 2805 MW while the simultaneous export capacity is situated between 1659 and 1589 MW. The simultaneous import and export capacity was obtained by adding the NTC-values (according to the ETSO definition) of both borders and multiplying this sum with a simultaneous coefficient of 70 percent.

Annex: Comparison between Elia's Short-Term Winter Outlook and the Medium & Long-Term System Adequacy - UCTE Approach

ELIA's short term winter outlook				**Medium and long term system adequacy – UCTE approach**			
			MW				MW
1.	Load of the system	Load observed by the TSO (after netting of generation embedded in distribution) including the SOTEL area (a part of the G-D Lux.).	Le	1.	Load of the system	Load observed by the TSO (after netting of generation embedded in distribution) including the SOTEL area (a part of the G-D Lux.).	Le
2.	Generation capacity	Total generation capacity expected to be available, based on actual, announced overhaul and outage schedules, taking account of winter conditions (minimum maintenance in peak winter conditions).	Ge	2.	Generation capacity	Total generation capacity expected to be available, based on actual, predetermined overhaul schedules, taking account of winter conditions (minimum maintenance in peak winter conditions).	Ge
3.	margin	To account for unexpected outage of largest unit. Margin includes system service reserves.	1000	3.	Margins	System service reserves	1150
						Non usable part of Ge	140
						Probabilistic part of Ge, expected to be in unavailable for outages	568
						Additional margin of 5 % of Ge	780
					Total margin		2638
4.	Criterion	***Short term autonomy***	Ge-1000-Le >0	4.	Criterion	***Medium and long term System Adequacy***	Ge – 2638 – Le > 0
5.	Non-respect of the criterion means :	***The system will definitely rely on net imports during periods of non-respect.***		5.	Non-respect of the criterion means:	***The system is not able to comply with security criteria during non-respect: it has to rely on net imports to face contingencies and to allow some freedom in maintenance planning.***	
6.	Duration that the criterion is not respected in winter 06-07 in Belgium:	***Approximately four weeks.***		6.	Duration that the criterion is not respected in winter 06-07 in Belgium:	***Approximately the whole winter period***	

GERMANY

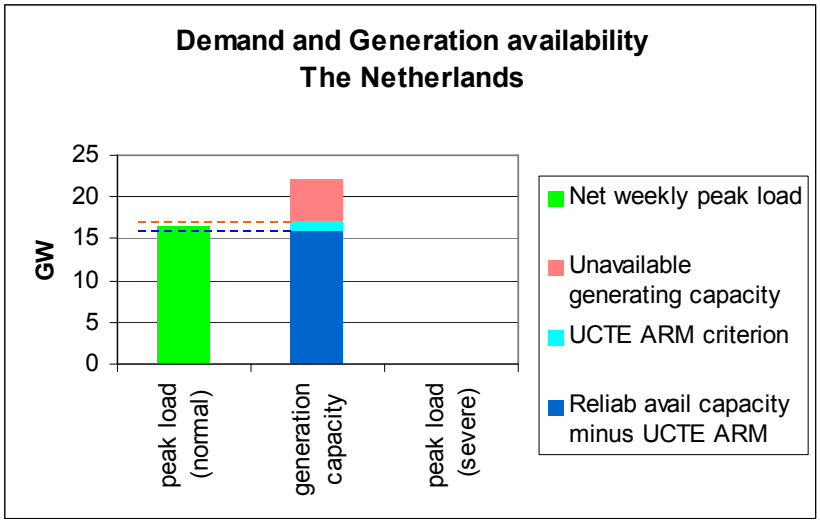


Comments

The German contribution to the ETSO Winter Outlook Report 06/07 has been prepared on the basis of the 3rd Wednesday figures of January 2007 which have been delivered to UCTE in the framework of the current inquiry for the UCTE System Adequacy Forecast 2007-2020 (according to the UCTE Methodology). The result is that the peak load is expected to be 78.4 GW (i.e. peak load at reference time + margin against peak load). Taking the different elements of the Power Balance Forecast into account, this will result in a so called "Remaining Capacity" of around 5 to 6 GW which means that the "Adequacy Reference Margin" will just be met. Concerning the other winter months, the experience is that the situation is most severe in December and January and that the figures for January can be applied for December too. February and March are usually not critical, so that the given values are likely to represent the worst case.

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

NETHERLANDS



Comments

For the Netherlands no winter adequacy assessment in the sense of forecast is done by TenneT TSO.
In the Netherlands, the issue of security of supply is a responsibility of Ministry of Economic Affairs. Therefore TenneT TSO assesses on request of the Ministry of Economic Affairs every year for a period of 8 years the Reliability of Supply in the Electricity Market in the Netherlands. Enclosed the last report for the period 2005-2013.

Report_Monitoring_Reliability-of-Supply_2005-2013.pdf

Framework and Method Used for Winter Outlook
No winter forecast is done by TenneT TSO because there are no specific data available for this period from week to week. Only are given the data for the third week of January in accordance with the system adequacy forecast 2007-2020.

Generation – Demand Balance

In the aforementioned monitoring report the balance is not considered at risk for the coming winter-period 2006-2007. One of the conclusions is that the Netherlands will rely on imports in the year 2007, but nothing specific can be said on forehand about when or how these imports will be needed.

Demand
Load forecast for a medium long period is not carried out by TenneT-TSO, because the load on itself on each moment is not our concern, but of market parties. The role of a TSO is limited to order and supply control and reserve capacity to balance the system at each moment.

Remaining Capacity in Normal Conditions
To our opinion the remaining capacity is only a global indicator for generation adequacy. The average available and/or offered reserve capacity says more about actual market conditions.

Severe Load Conditions
TenneT TSO does not have scenarios for extreme weather conditions, as temperature dependency of load is limited.

Role of Interconnection

Firm Import/Export Contracts
As a consequence of the decision of the European Court of Justice to not longer allow preferential import-capacity, TenneT made available to the market the cross border capacity of former firm import contracts since the 1st of September 2005. That means that their capacity is included in the Year-Month-Day auction and that there is no longer reduction of import capacity.

Comments on expected additional loads of interconnections due to transit-flows which affect the import/export capacity
In past winter periods we experienced vast transit flows through the Dutch network, originating from wind generation in Germany. Analysis of these transit flows has shown that this could happen in the coming winter periods in an even stronger way.

Potential Additional Areas for Comments

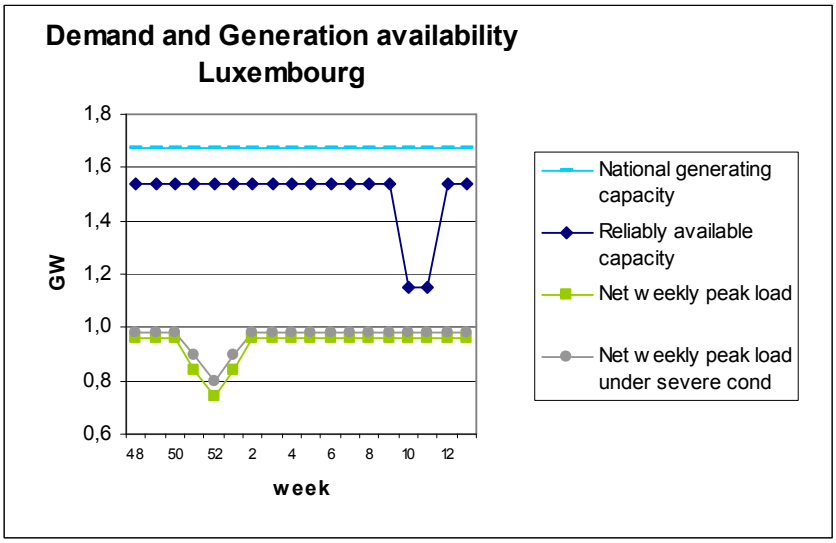
1. ***Treatment and amount of mothballed plant***
At the moment there are no mothballed plants, only there are some units out of operation for serious defects. These units could come back in operation after large reconstructions but no plans for that are known at the moment.

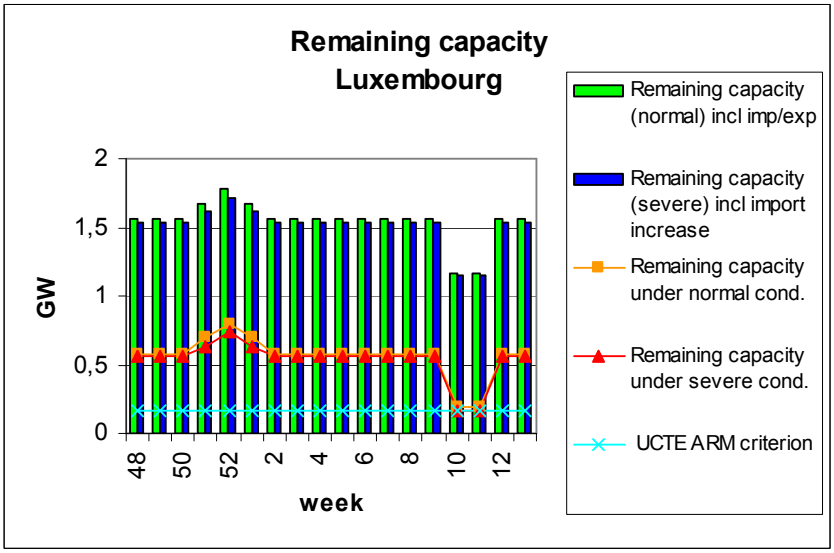
2. Interconnection Capacity
There are two phenomena which could affect the import capacity of the Netherlands in the sense of reductions or congestions:
The first is the high transit flows through our network originating from high wind generation in Germany. Last winter periods these flows threatened at some moments the (n-1) security of the cross border lines and TenneT TSO had to reduce import capacity for the market;
The second is the congested flows on the French-Belgian border which on return reduce the import capacity on the Belgian-Dutch border.
To manage better these phenomena, a regional consultation with the German, Belgian and French TSOs and authorities was started. This consultation resulted in more detailed operational arrangements, which by using better the available information and forecasting methods for wind generation, facilitate secure cross-border transmission flows and maximum cross-border transmission capacity on a daily basis.

3. Any other fuel supply issues which could affect availability e.g. gas supply issues
Still under study in relation to gas infrastructure.

4. Other issue
In our market system of "Program Responsibility" each participating PR-party has the obligation to assure its own reserve power. TenneT TSO in her role as balancing manager only requires that enough balancing power will be offered in the bidding system that we employ for this purpose. Sometimes is offered less power than considered necessary and then requests for offering more are sent to market parties. Until now no real shortage happened.

LUXEMBOURG





Comments

Appreciation of the Generation – Load Balance

Our generation capacity (including pump storage power) is much higher than our consumption. But as the whole energy of the major generation plants is exported, we have to re-import the main part of the energy to cover our consumption. So, Luxembourg does not have a criterion for a direct relation between load balance and generation balance.

Generation – Demand Balance

Synopsis

Due to the special situation of the two grids in Luxembourg, an industrial grid and a public grid and the fact that the major part of energy is imported, we consider that there is no risk for problems during the coming winter. Line capacity is sufficient and our contractual binding to RWE covers the load.

Generation – Demand balance

Generation Available

- Luxembourg has two large generation plants, the first 1.100 MW pump storage capacity whose start up is determined by RWE TSO, and the second, a thermal plant of 385 MW injecting the energy to the Belgium grid. As the major part of electric energy is imported from Germany and Belgium, it is impossible to determine a risk for generation;
- Non-usable capacity is mainly determined by the lack of wind but is relatively low;
- During all the considered weeks one unit of 100 MW of the pump storage plant is out of service for maintenance and the thermal plant has scheduled the overhaul of his plant during the weeks 10 and 11 in 2007;
- As the two main power plants inject their energy directly to the neighboring TSO's RWE TSO and ELIA, outages will have no effect to our grid;
- System services reserve for the Luxembourg public grid is assumed by RWE TSO and for the industrial grid by Elia.

Demand

- The peak load in the public grid is generally located at 12h00. As at this moment the peak load in the industrial grid is not necessarily at its maximum because it depends largely from the production cycle of electrical arc furnaces (100, 90 and 60 MW), the peak load for the total grid may be different. As the moment of peak load in the industrial grid is not predictable the total peak load for Luxembourg may vary in a range of 250 MW. We consider the worst case which is the sum of both loads;
- Possible load reduction is practically inexistent (~ 20 MW).

Remaining capacity in Normal Conditions

- The remaining capacity is largely influenced by the production of the pump storage of Vianden, whose start up is determined by RWE and whose production is exported to Germany.

Severe Load Conditions

- As detailed under point 3.3.2, the maximum of the load is more influenced by the production of the three electrical arc furnaces than by extreme weather conditions. However as the possibility exists that the maximum of the peak load in the public and the industrial grid are in the same period combined with extreme weather conditions, we have taken in account this scenario.

Role of Interconnection

Interconnection Capacity

Luxembourg imports the major part of electrical energy. The interconnection capacity is sufficient to cover the whole consumption. No additional capacity is needed to cover the outage of one of the power plants.

During weeks 48 - 50 the interconnection capacity with Germany will be reduced due to maintenance works on one of the interconnection line.

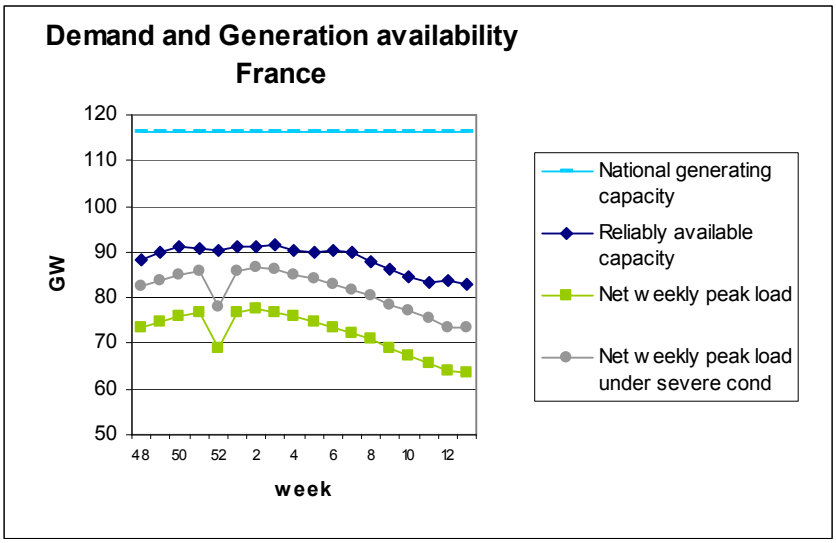
Firm Import/Export contracts

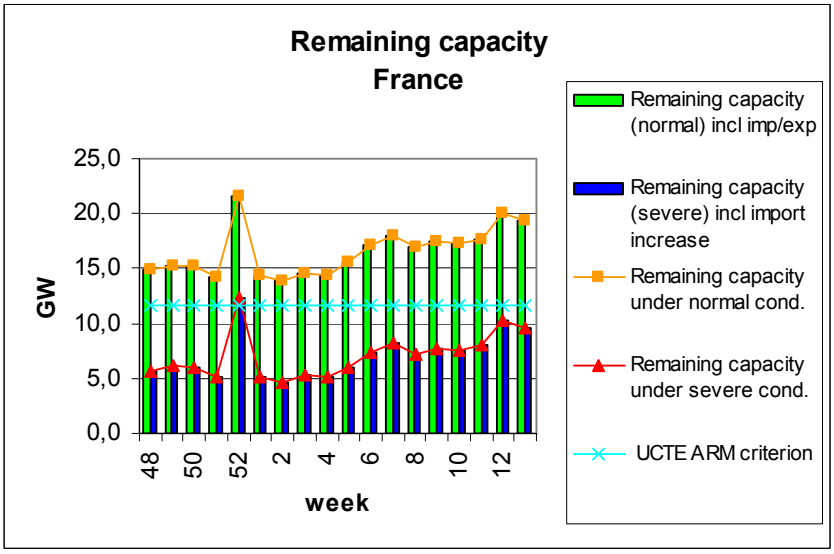
The existent import/export contracts cover the need for the whole internal consumption.

Transit Flows

We have no interconnections close between Belgium and Germany so there are no transit flows.

FRANCE





Comments

Framework and Method Used for Winter Outlook

An adequacy forecast study is carried out each year for the October-March period, using a probabilistic approach to simulate random situations of load and generation.
This is an internal study, but the results are communicated to the Ministry of Energy and to the Regulation Authority (Commission de Régulation de l'Energie) and published on the RTE website.

The study considers the weekly peak loads and estimates the remaining generation margin. This margin is compared to a minimum level corresponding to a probability of 1% of not meeting the load. This level is calculated for each week.

The main risk factors are :

- The sensitivity of the load to low temperatures;
- Unplanned events;
- Random levels of inflows to hydro generating units.

These studies are reviewed at different time horizons (monthly, weekly, infra-weekly and day-ahead).

Generation-Demand Balance

The generating capacity includes 1.4 GW of wind energy farms, with an average availability of 24%.

Non-usable capacity comprises, in addition to mothballed plants and wind power unavailability, reductions on hydro available power as well as on embedded generation.

For each week, the hydro inflows are supposed at low values for November, then at their average value.

Overhauls are consistent with the last schedule given by the Generators to RTE at the beginning of the winter outlook study (i. e. end of August). A sensitivity analysis can be carried out if needed.

Outages capacity is calculated considering the unavailability rates of thermal units.

The weekly peak load is calculated for normal conditions.

The net weekly peak load takes into account load restrictions corresponding to the statistical value of load reduction available for customers (eligible or not eligible) with special contracts. It does not account for customers' offers on the Balancing Mechanism.

The severe load scenario is built considering a temperature lower by 5°C than the season normal temperature, which corresponds to a probability of around 5%.

System services are composed of primary, secondary and 15 minutes reserve.

RTE considers that the acceptable risk level is for a remaining capacity between 11 GW and 13,5 GW.

Role of Interconnection

The export capabilities to Belgium could be reduced, should loop flows happen on the French-Belgian border. This situation, which occurs when the wind energy generation is low in Northern Germany, is potentially expected for the coming winter.

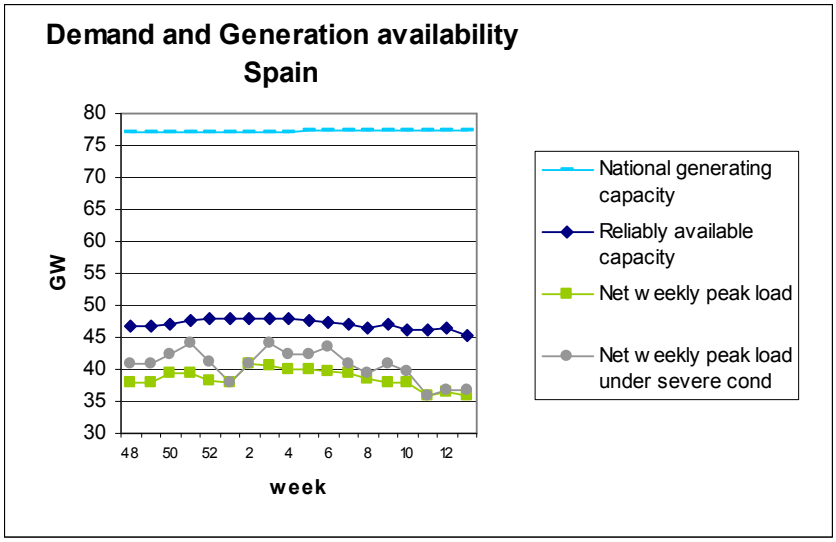
Conclusion

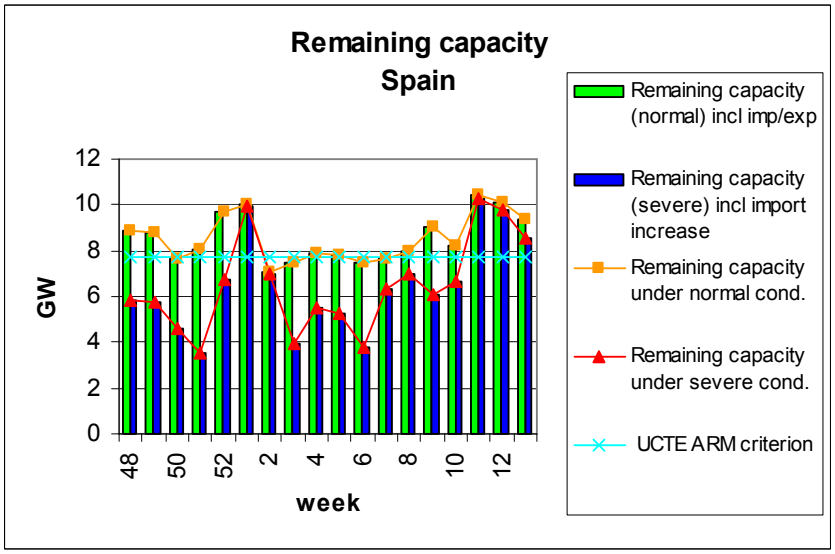
Under normal conditions, the generation – load balance on the French system is not considered at risk for the coming winter, so that exports should be available.

Nevertheless, under severe conditions, the period December - January (except the last week of 2006) will show tighter margins, therefore for this period our export capacity is likely to be reduced to a lower value and some imports may even be needed, especially in January.

The end of the winter is expected to be less stressed.

SPAIN





Comments

Among other reports, every month, a medium term system adequacy forecast report for the next 12 months is produced by REE (TSO of Spanish Power System).

Medium term system adequacy forecast is carried out using a hydrothermal coordination model with stochastic dynamic programming that minimizes variable operation costs. The analysis is based on a probabilistic tool where hydro stochastic behaviour and non planned thermal outages are considered. In addition, regional studies are performed looking for congestion situations.

Framework

The medium term forecast considers several hydro conditions, available thermal capacity and wind production scenarios.
All scenarios are built under the following assumptions:

- Overhaul planning notified by generators for the incoming winter;
- Guaranteed fuel (gas) supply to combined cycle and gas thermal plants;

- Low wind conditions: wind generation considered is only 6% of available capacity. Wind generation has been above this rate with a probability of 90%.

Extremely severe conditions for the system are simulated as:

- Extreme demand value due to severe weather conditions, typically very low temperatures;
- Severe drought hydro conditions. Significant non usable hydro capacity resulting from lack of water in the reservoirs;
- Only 300 MW of import capacity are considered in the study. They are not taken into account in the generation-load balance;
- Permanent non available thermal capacity of 2.000 MW is simulated.

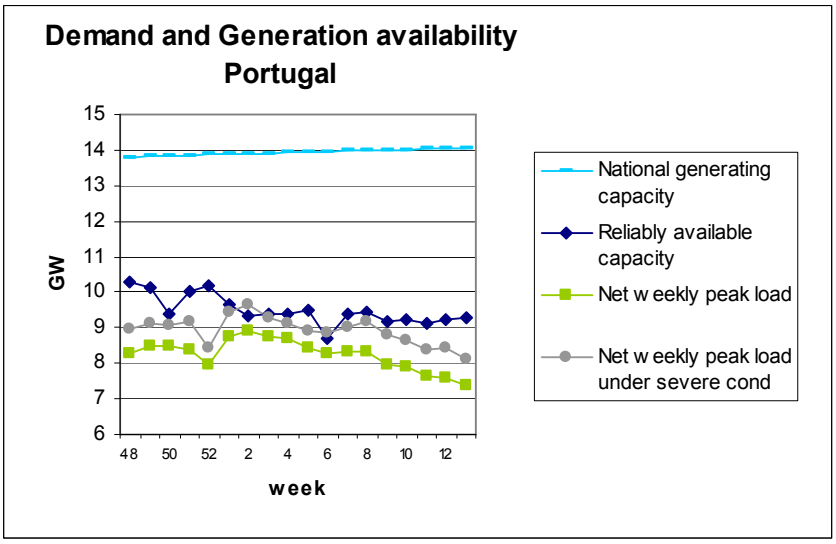
Conclusions

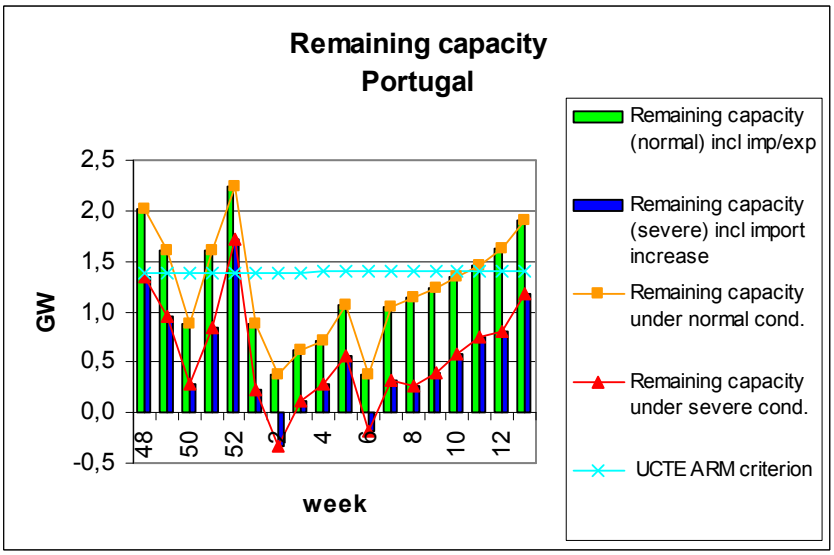
Taking into account the results of load – generation balance, the forecasted situation for supplying demand for the coming winter is not critical. If average conditions are considered, remaining capacity will be around 6700 MW. Minimum value will decrease to 4600 MW.
Only in case of simultaneous extreme peak demand, very drought hydro conditions and a very high thermal forced outage rate, we can find values of remaining capacity of 3500 MW.
The demand supply index is defined as the relationship between available capacity and peak demand. Available capacity is defined as generating capacity minus non usable capacity at peak load, overhauls and outages.
In terms of the demand supply index, in case of normal conditions the forecasted value is always over 1,13. Only in case of severe conditions as described before, it could decrease down to 1,10.
The reference security value for the demand supply index is 1.10 (10% of margin between available capacity and peak load).

However, the most important risk factors for this next winter in the Spanish system are:

- Hydro and wind conditions;
- Very high sensitivity of load to temperature in extreme weather conditions;
- Fuel (gas) availability to combined cycle and gas thermal plants.

PORTUGAL





Comments

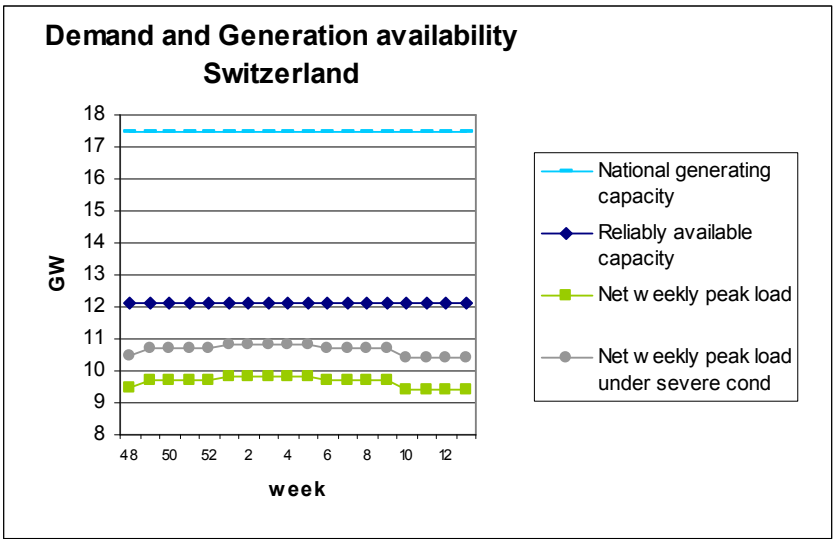
REN still manages PPA's (Power Purchase Agreements) with almost all the Portuguese producers (all large hydro power stations and about 80% of the large thermal power stations).

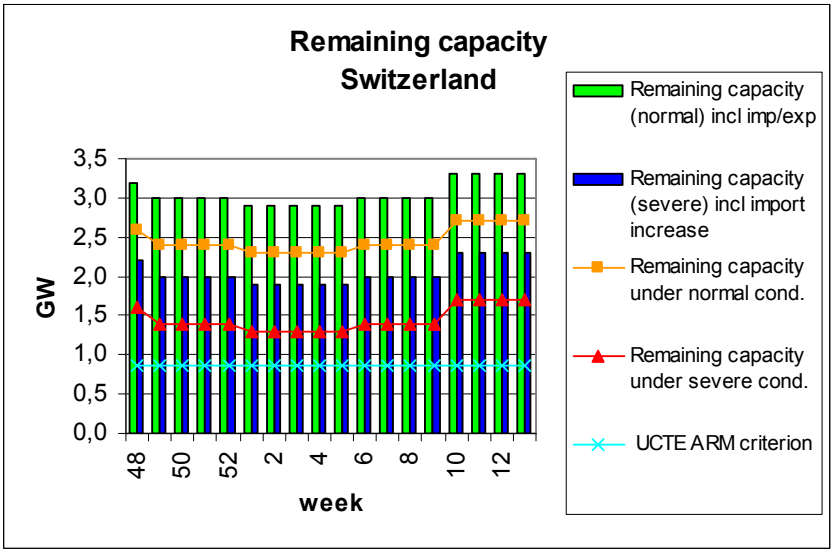
The results presented here are based on the simulation that is usually made for optimisation of the Portuguese system within the scope of the management of the PPA's. These studies are made with internally developed tools that determine the water value of the reservoirs with a probabilistic approach, and optimise the hydro and thermal production, with the objective of minimising the costs and guarantee the consumption. These studies are not public and are made for the horizon of up to the end of the next year.

The results show some reduced power margins, affected namely by unavailabilities due to the works needed for compliance with the directive EC 2001/80/CE, if we don't consider the possibility of imports. These results were achieved considering a dry hydrologic regime. However the wind conditions considered are not equally restrictive as we considered the average availability (27%). Considering an average hydrologic regime would increase the remaining capacity by around 200 MW.

The same severe generation scenario combined to low temperatures (peak demand with a probability of being exceeded of 1%), thus with a low probability of occurrence, leads even to negative margins for two weeks if we don't consider the possibility of imports.

SWITZERLAND





Comments

The remaining capacity in Switzerland will amount to at least 1.3 GW even in severe temperature conditions during the winter 2006/07. Therefore, ETRANS appreciate the generation/load balance as unproblematic regarding the security of supply.

Synopsis

No critical period is expected during the winter 2006/07. The main factor of risk is the outage of the largest nuclear power plant (1.2 GW), but even then the load can be covered by the remaining plants. This is true even under severe temperature conditions.

The reference adequacy margin amounts to 1.2 GW (7% of the national generating capacity). As stated in the Swiss System Adequacy Forecast 2007 – 2020, this criterion is fulfilled for 2007.

Framework and Method Used for Winter Outlook

In Switzerland the winter adequacy assessment is not undertaken on the national level. However, each of the 7 largest Swiss utilities has its own supply plan containing all the necessary considerations from technical and economical points of view. Since the reference adequacy margin does not present any considerable problem, in this plans the economic part prevails. Therefore, the winter itself is only a special case within the frame of economic calculations.

Generation - Demand Balance

The generation/demand balance will be not at risk during the winter 2006/07.

Generation available
In Switzerland there are 5 nuclear power units. Under normal conditions there is no maintenance or overhaul of nuclear power plants during the winter. The outages of these units are very rare and can be neglected. However, from the statistical point of view, 0.1 GW can be considered as an average expected value for the outage capacity.
As to the other plants, they are all without significant exceptions hydropower plants. According to the UCTE definition their maintenance is a part of the non-usable capacity and should not be stated separately under maintenance, overhauls and outages.

Demand
According to the Swiss temperature statistic, January was the coldest month during the last 30 years with an average daily temperature in Bern as of -0.2°C. However, December and February are only about a single degree warmer (+1.2°C and +1.1°C respectively). In November the mean daily temperature is as of +3.9°C and in March +5.0°C. Our observations suggest that there is a load temperature dependency that amounts to about 70 MW/°C. In the data used for this report the load is given in accordance to this finding.

Remaining capacity in normal conditions
The remaining capacity in normal conditions will be sufficient during all the winter 2006/07.

Severe load conditions
Under severe load conditions we understand a drop of the daily mean temperature from about 0°C to -15°C that is beyond any doubt the worst scenario. Using the above mentioned load temperature dependency of 70 MW/°C one finds that under these conditions, an additional load of about 1 GW will arise.

Role of Interconnection

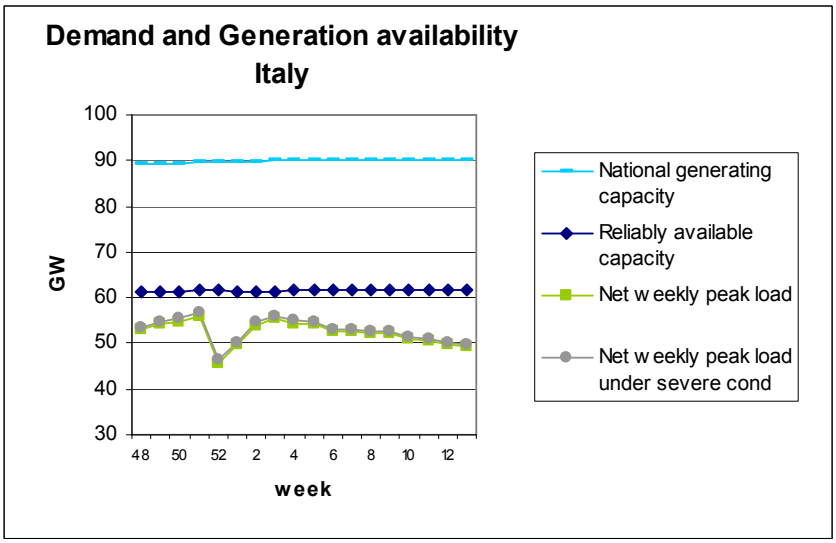
The interconnections are, of course, important for the functioning of the Swiss transmission network, but the Swiss power balance is given even without them. On the other hand the Swiss generation can via interconnections contribute to the power balance of the neighbouring systems, if necessary.

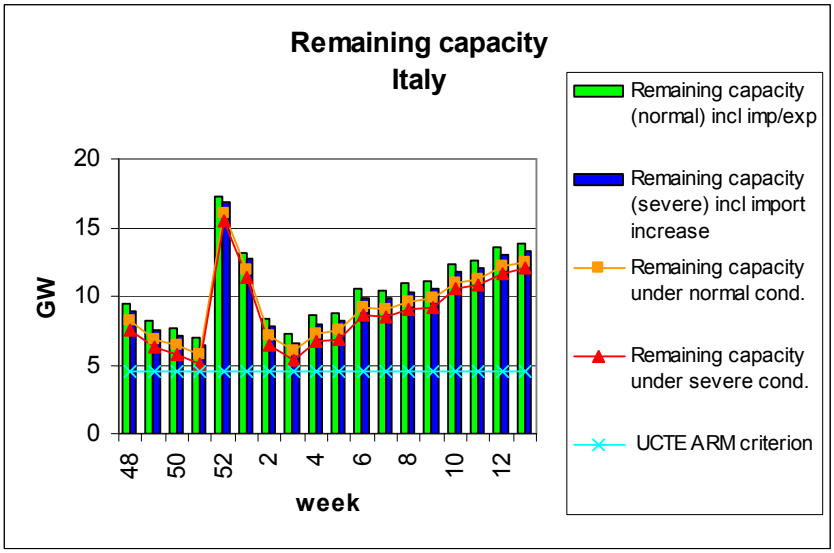
Interconnection capacity
We don't expect any variations of the interconnection capacities during the winter 2006/07.

Firm import/export contracts
Swiss utilities have firm contracts with nuclear power plants mostly in France amounting to 2-3 GW. However, this capacity can be significantly reduced by the producers during a period of several weeks, so that in the end only 0.6 GW can be assumed as a guaranteed firm import capacity.

Additional loads due to transits
Additional flows due to transits are not expected during the winter 2006/07. However, the transit flows throughout the Swiss transmission network are permanent and high. If necessary they will be reduced by using the NTC procedures.

ITALY





Comments

Framework and Method Used for Winter Outlook

1) The mid-term adequacy assessment is conducted using a deterministic methodology, in which statistical evaluations of some parameters are also considered.
On the basis of such methodology, the remaining capacity for Italy continental zone and also for Sicily and Sardinia, is determined for each weekly peak load of one year of forecasts, considering the planned outages and the transit's limits between the market's zones. This assessment is then generally refined on a monthly basis.
The sensible parameters of this procedure are:

- Load, evaluated on "market perimeters" of all Italy market's zones;
- Hydroelectric production, evaluated on statistical basis of last five years;
- Wind, geothermic and others production, evaluated on statistical basis;
- Thermoelectric production, evaluated on the basis of the installed capacity or, alternatively, mean production, considering planned unavailable capacity, forced unavailability on statistical basis, and long-term unavailability;

- Import, considering the Italy northern border interconnection capacity (NTC): 7190 MW on winter peak hours, 6540 MW on winter off-peak hours, 6090 MW on summer peak hours and 5540 on summer off-peak hours;
- Transmission constraints, in term of further reduction of available capacity determined on present and future production plants due to particular grid configuration or important maintenance and development works.

2) Load variation against the outside temperature. We consider an increase of demand for each °C of decrease of the temperature in winter of 350 MW. This consideration was applied over the single month and for each day.
The scenario is in normal weather conditions for the considered period.
A second scenario, in case of severe load condition (extreme weather conditions), is also considered (this event is very unlikely and if it occurred, this situation of extreme cool is limited for a brief period).

3) Interconnections. It's a further way to maintain the system security, this also guarantees to share part of the reserve with the others union countries. The interconnection permits to make exchanges in term of economical convenience.
The values of NTC (just provided in methodology) will not be interested by significant variations in the next winter. However, they could have low significance for adequacy evaluation, due to probable strong variations in import-export physical flows, as recorded in 2005-2006 winter.

Conclusion

The adequacy evaluations for the 2006-2007 winter period do not indicate particular risks for capacity adequacy and peak load cover.
However, a specific analysis performed for evaluating energy adequacy, in relation with the gas national supply system's criticality observed during the last year, preface an increasing trend in gas consumption in thermoelectric sector.
This trend makes more significant the support of interconnection.

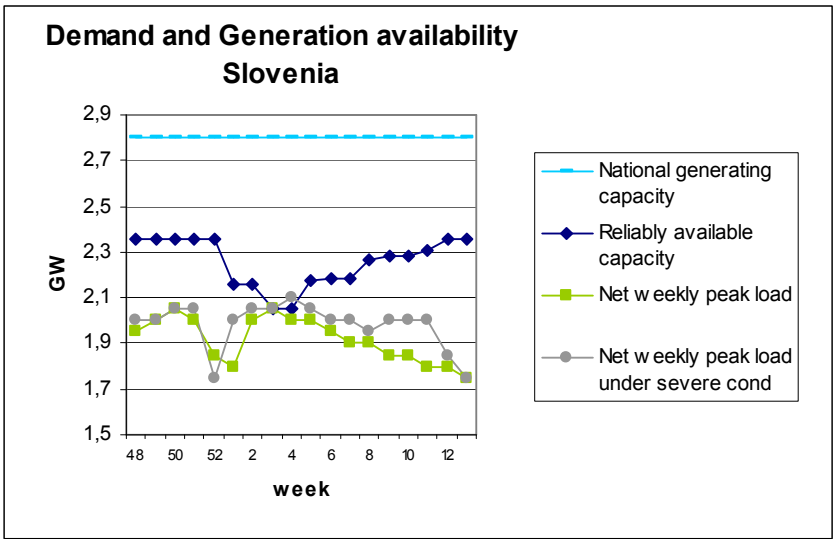
AUSTRIA

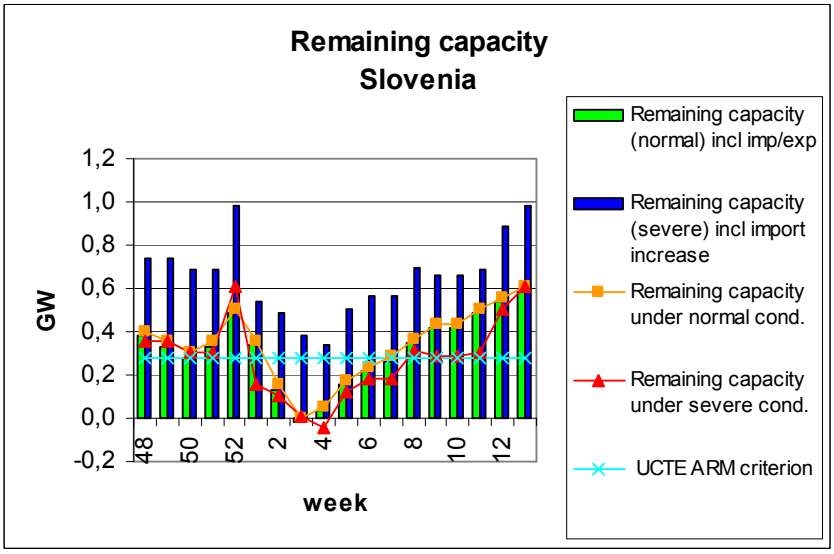
Comments

Serious congestions in the Austrian network have been occuring on the three 220kV lines from the north to the south of Austria. Since 2001 the (n-1) criterion has been repeatedly violated especially in the winter season during the night, although extensive congestion management measures had been taken. As in recent years, also winter 2005/2006 has been characterized by a high utilization of the Austrian transmission grid.
The surplus of electricity in the north and the deficit of electricity in the south of Austria combined with insufficient north-south-transmission capacity has resulted in congestions in the transmission grid of Verbund-APG. Verbund-APG has had to take counter measures in order to reduce these congestions. This is done by redispatching of power plants (including restrictions for pumping) and special switching in network operation.
Due to the decommissioning of a thermal power plant in the south by mid 2006 which was very important for congestion management and the further increased wind power and biomass-production in the north the above mentioned bottlenecks will become even more critical in winter 2006/2007.
For permanent improvement of these structural congestions, new 380 kV lines (Südburgenland - Kainachtal, St. Peter – Tauern) are planned to be put into operation.
As the commissioning of these lines has been delayed because of authoritative procedures, additional congestion management measures will have to be taken.
In this context, APG decided to install three phase shifting transformers (PST). As planned in 2005, the beginning of operation will be by the end of 2006. This measure will allow for a better balanced distribution of load flows and thus for higher utilization of the existing three 220 kV lines. In case of an outage of one of the north-south lines the remaining lines can be protected for overloads. An increase of the internal north-south-capacity ((n-1) limit) by 200 MW will be possible.
The installation of phase shifting transformers in combination with redispatching will help to handle the north-south-bottlenecks until the commissioning of the above mentioned 380 kV lines. This concept was presented at the CEE high-level 8-TSO-meeting in Vienna on 28.02.2005, at the meeting of the UCTE System Development Group in Paris on 11.01.2006 and to all neighbouring TSOs.

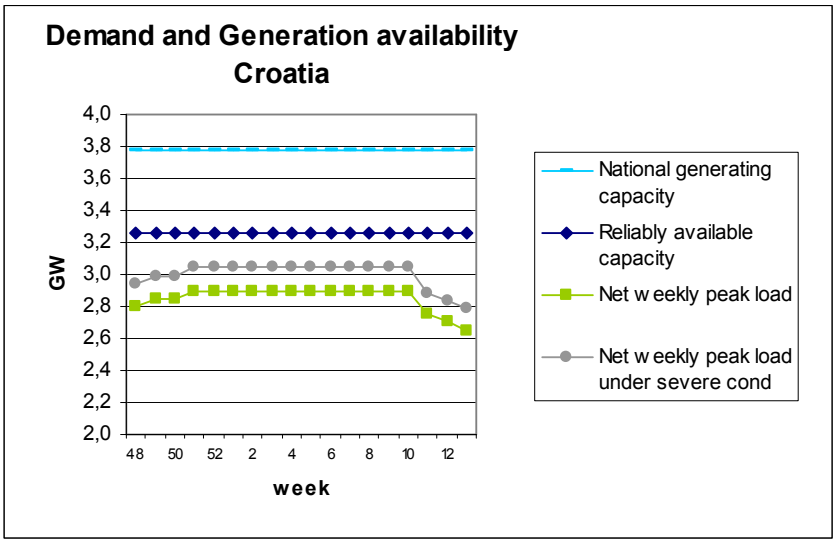
Furthermore we must point out, that about 50% of the Austrian thermal power plants are fired by natural gas. In the case of any problems concerning natural gas delivery this could cause critical situations, especially in winter.

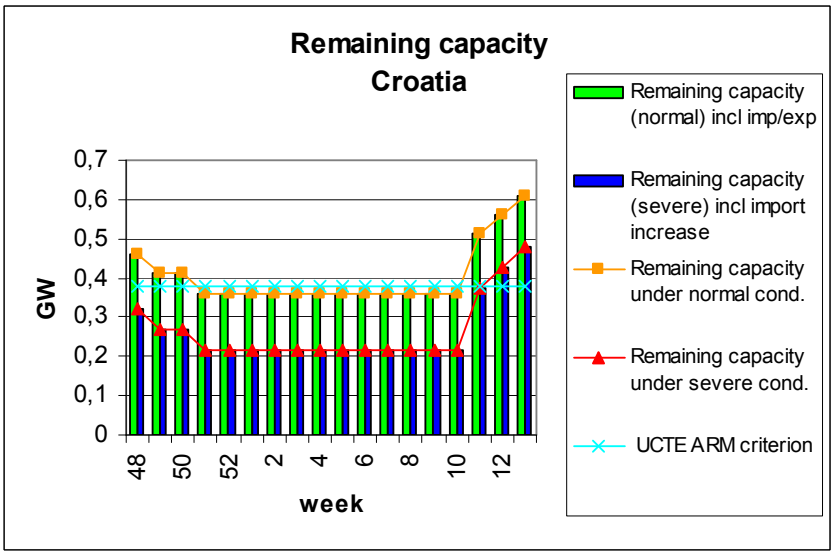
SLOVENIA


Demand and Generation availability
Slovenia
GW
2,9
2,7
2,5
2,3
2,1
1,9
1,7
1,5
48
50
52
2
4
6
8
10
12
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond

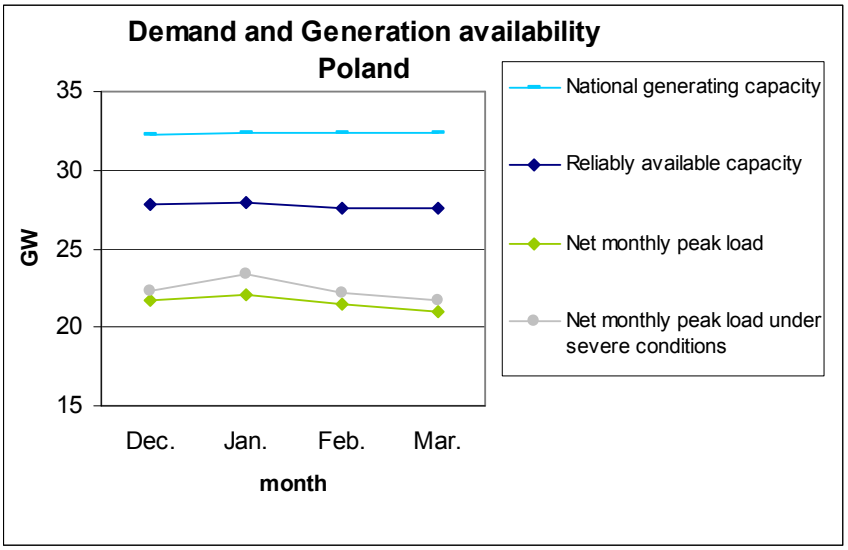

Remaining capacity
Slovenia
GW
1,2
1,0
0,8
0,6
0,4
0,2
0,0
-0,2
48
50
52
2
4
6
8
10
12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

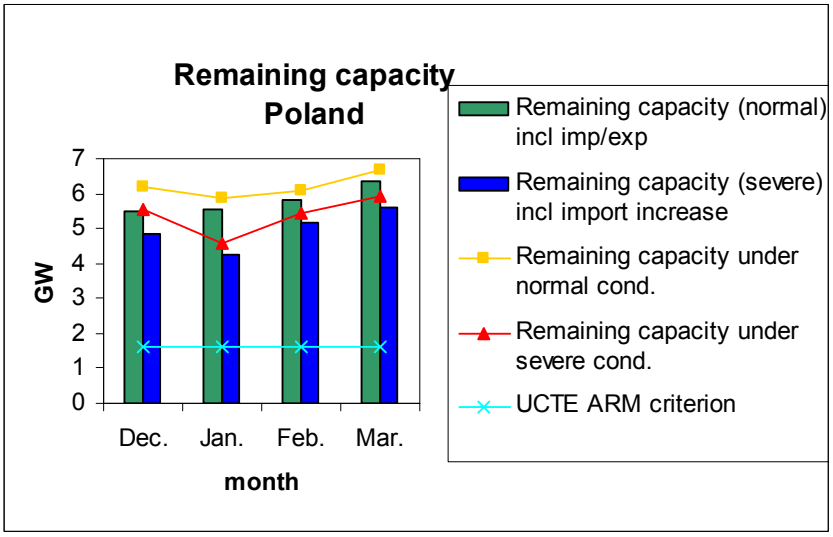
CROATIA


Demand and Generation availability
Croatia
GW
4,0
3,8
3,6
3,4
3,2
3,0
2,8
2,6
2,4
2,2
2,0
48
50
52
2
4
6
8
10
12
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond


Remaining capacity
Croatia
GW
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0
48
50
52
2
4
6
8
10
12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

POLAND





Comments

Yearly peak load is observed in winter season. Statistically December was the critical month, but last winter the coldest month was January and the highest demand during winter season was registered in the second half of January.

Data are prepared on the basis of the 3rd Wednesday for every month it concerns.

Synopsis

Strong winter last year (especially January) and the growth of the demand lasting all the year caused that the forecasted demand has been increased by PSE-Operator. It is also assumed that the amount of the outages of thermal power stations may increase during exceptionally cold periods. Dry and hot summer and autumn have caused falling of the level of the water in the rivers. In connection with the frosty winter it may result in the lower availability of the run of river hydro power station (although they constitute a small share in Polish generation mix) as well as it may cause some problems for thermal power stations that use the water from rivers to the cooling system.

Framework and Method Used for Winter Outlook

In Poland no special assessment for winter is made. Forecast Plans are being done for the whole year on a monthly basis – yearly coordinating plan. That is the reason why the data is not divided into weeks. Yearly coordinating plans are published on the PSE-Operator web site at the end of November every year. Five days before the present month PSE-Operator publishes monthly coordinating plans, which include the precise information for all the days of a given month. Further specification takes place in the day ahead planning.
PSE-Operator prepares one coordinating plan – no different scenarios.
Polish data is deterministic.

Generation – Demand Balance

Difficulties with covering system demand are not expected, though in case of long period of heavy winter (with low temperatures) the power balance can be quite tight.

Generation Available

- Non-usable capacity:

Contains mainly heat production in combined heat and power plants, decreased power due to hydrological reasons, technical problems caused by low temperatures. During severe winter this value may rise. The level of wind generation is assessed as the 25% of its generating capacity. The rest of its capacity (75%) is considered as non-usable.

- Overhauls:

Data for overhauls concerns only fossil fuel power stations.

- Outages:

Forecasts for outages are based on statistical data. During severe winter this value may rise.

- System Services Reserves:

The figures for the "system reserves" are comprised of primary control reserve, secondary control reserve and other reserves. Other reserves are so-called intervention reserves (at pumped storage power plants) which are necessary to ensure a required margin in the day ahead operational planning.

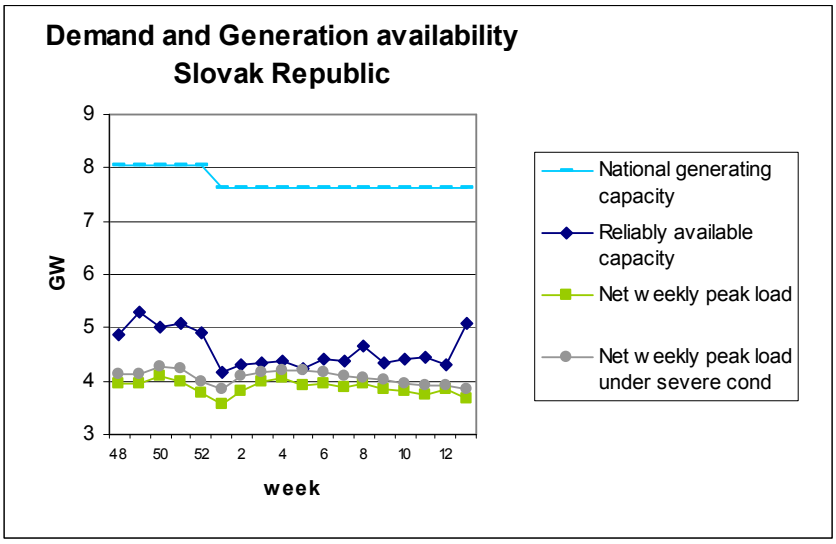
Remaining capacity
Taking into account the expected load and level of remaining capacity for the period under consideration no troubles with covering the demand are foreseen, however value of remaining capacity may decrease due to unexpected growth of level of outages and non-usable in connection with extreme weather conditions.

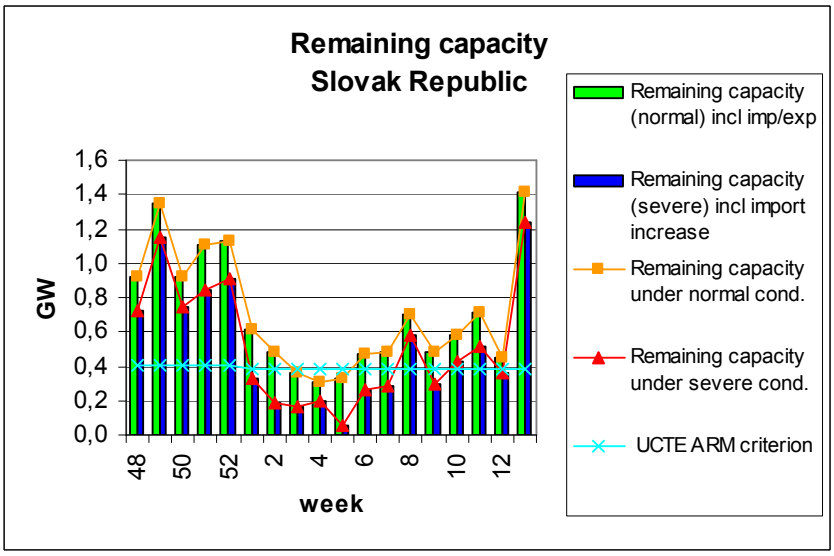
Role of Interconnection

Interconnection capacity
Export and import capacities are approximate, maximal NTC values. These data are the sum of all PL profiles – between UCTE and outside UCTE countries. NTC utilization depends on market parties needs.

Although surplus of generation (remaining) capacity is observed in Poland it does not mean it can always be utilized to help other power system to balance in extreme conditions because of transmission bottlenecks limiting transfer capacities towards other UCTE countries (usually fully utilized by market participants in normal situations) as well as towards Nordel (below the rating of DC link due to internal transmission constraints in the north of Poland).

SLOVAK REPUBLIC





Comments

Foreword

The TSO in Slovak Republic (SEPS, a.s.) estimates the national power balance yearly and states more precisely monthly, weekly and daily.
So-called yearly study on operation is finished in November for the next year. The document is for internal purposes mainly, but selected parts are distributed among market participants. Yearly estimations are made for Monday, Wednesday, Saturday and Sunday each week all the year. The estimation is based on one scenario - normal climatic conditions are considered.

Generation - Demand Balance

In the process of access negotiations with EU, the Slovak government accepted a commitment to close down (in 2006 or 2008 respectively) two 440 MW units of the nuclear power plant in Jaslovske Bohunice. The first unit will be decomissioned at the end of 2006. Moreover with respect to existing environmental limits, four fossil fuel units in the power station Vojany are considered as non-usable capacity.

The second scenario (severe conditions) was calculated for this report only. Scenarios of load in normal and severe conditions are based on the statistics for the previous ten years.

Non-usable capacity comprises in addition to mothballed plants mainly reductions of hydro available power. Mothballed plants are four units in the power station Vojany as mentioned above. Overhauls are specified according to information received from producers and they have not significant impact on the balance. Outages are based on the long-term statistic.

Taking into account the above assumptions the power balance in normal conditions is not considered risky. The contracts (import/export) may have some influence but they are not known at the time of preparing the report. Considering severe conditions, the fifth week is rather tight and the ARM criteria (5%) has not been fulfilled in January and February.

The data (capacities, loads) are given in gross values.

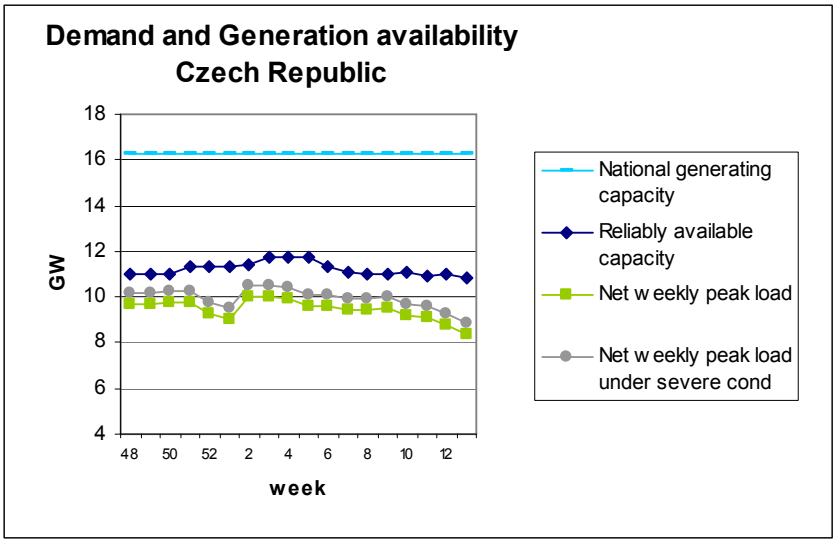
Role of interconnection

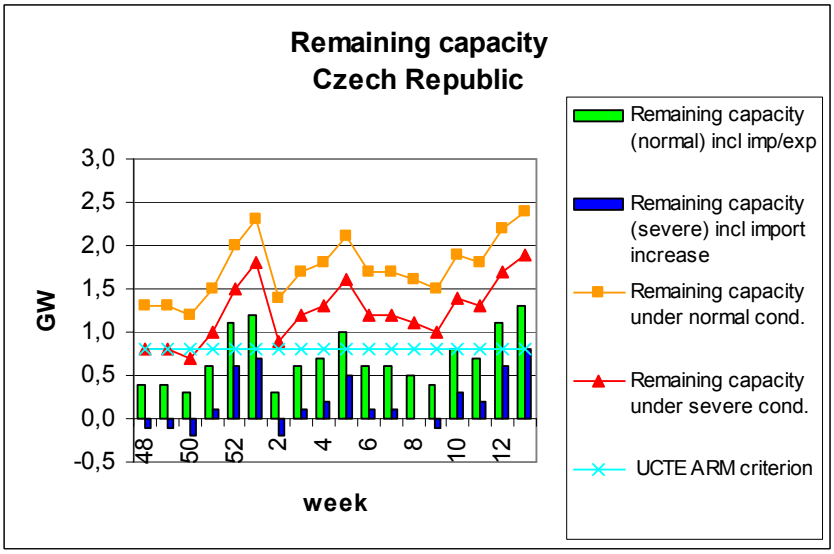
SEPS, a.s. is a member of common regional auctions of cross border capacities with four other TSOs. Capacities on SEPS - CEPS (CZ) and SEPS - PSE-O (PL) borders are allocated within the common regional auctions. Capacities on the border with MAVIR (HU) are allocated according to the bilaterally agreed rules and capacities on the WPS (Ukraine) border are allocated in one-sided procedure. Capacities of all the borders are allocated in yearly, monthly and daily patterns plus intra-day allocation procedure on SEPS - CEPS border introduced in May 2006.

The electricity market has been export oriented during seven years. For the shutdown of one nuclear unit at the end of this year the situation may change towards import. After the unbundling process and liberalisation, the firm contracts of cross border exchanges are known just one day before.

Unexpected transit flows sometimes occur in the direction CEPS - MAVIR and may cause congestion on the SEPS - MAVIR border. But no constraints are foreseen in import and export possibilities. The cross border capacities are considered sufficient for reliable operation of the power system in the next year.

CZECH REPUBLIC





Comments

Synopsis

This chapter describes methods applied, sources of data used for Winter Outlook and risks for the coming winter period.

CEPS does not expect significant problems with balance of the Czech system during the coming winter period. Only in stressed circumstances, the export might be reduced.

Framework and Method Used for Winter Outlook

In the Czech Republic, operation scheduling is executed in annual, monthly, weekly and daily time levels.

The presented data comes from the Annual Operational Plan (AOP) 2006 and 2007, the final version of which will be approved in late November 2007.

The AOP is based on a stochastic model. It coordinates the annual schedules of outages of the units, quick capacities and maintenance of the grid elements. In the AOP, forecasts of the demand and load in the Czech system are presented, together with the results of the analysis of the balance in the one-year frame, values of individual categories of ancillary services, outage planning of capacities, schedule of disconnections of Transmission System (TS) facilities, check of transmission and short circuit conditions in the TS, overview of facilities, etc.

Results of AOP are then used as:

- information backing annual, monthly, weekly and daily operation scheduling of the CEPS control center and all market participants in the Czech Republic (generators, distributors, eligible customers, etc.);
- background for the document publishing values of ancillary services which are necessary for reliable operation of the Czech TS;
- data for price decisions of Energy Regulatory Office concerning pricing of system services;
- data for CEPS long-term contracts purchasing ancillary services;
- data for generators seeking their opportunities in the market with ancillary services;
- data for evaluation of international interconnections in the electricity trade.

Generation-Demand Balance

Forecast of demand and load is influenced by significant increase of both values by increasing GDP (Gross Domestic Product).

Load reduction: The agreements between CEPS and significant consumers have been prepared and signed but the amount is still quite negligible

Problems on the side of sources may be caused by extreme increase of failure rate, due to unfavourable climatic conditions.

The results of the balance enable sustainable export of electric energy over the whole winter period.

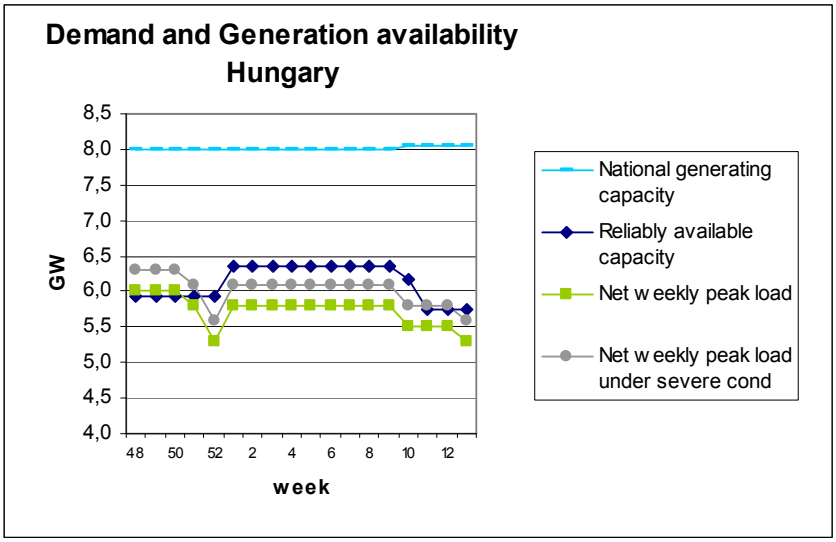
CEPS supposes that export will amount to 900 MW until the end of December. From January CEPS expects that export raises to 1100 MW. Increasing exports are expected in case of “normal” weather conditions and low rate of power stations outages.

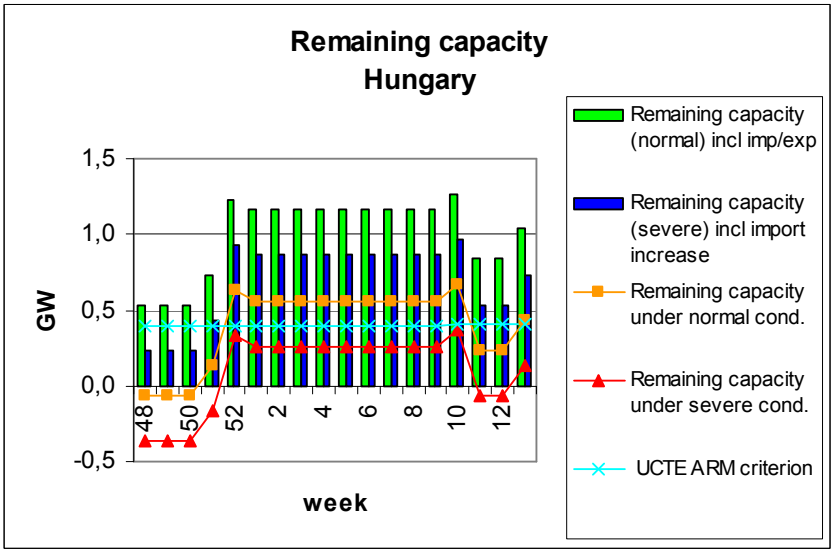
Role of Interconnection

CEPS organizes, at present, coordinated auctions in the region. CEPS also maintains sufficient capacity in the interconnectors usable in emergency situations, and CEPS has also concluded emergency contracts with neighbouring TSOs.

During the winter period, problems with unexpected flows may arise, especially in the North-South direction.

HUNGARY





Comments

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

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

- Availability of fuel, first of all of natural gas. During long-lasting cold winter periods, demand for natural gas becomes very high at households and at power plants at the same time. Therefore a well-functioning gas market, as well as satisfactory replacement fuel reserves at generators is essential to keep the lights on;
- There is a very special work going on in the nuclear power plant of Paks in the last quarter of 2006. Damaged fuel should be removed from a container outside reactor No. 2. The exact length of this procedure is hard to tell for sure, so availability of the net 430 MW unit is at risk from January;

- The required level of remaining capacity can only be guaranteed by higher import. 0.5-0.6 GW is required above the firm contracts, mainly in December and in March. It is nothing impossible, because 1.2-1.4 GW total import is typical for peak hours.

The secure operation of the system requires at least 0.23 GW of remaining capacity under severe conditions, including import/export.

****

Introduction

The Hungarian TSO (MAVIR Hungarian Transmission System Operator Co.) maintains a deterministic yearly rolling capacity plan.
For this purpose, load forecast, generation outage schedules, expected international exchange of electricity, forecasted production of intermittent 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, minimum and maximum loads.
The necessary reserve level is determined in accordance with the procedure described in UCTE Operation Handbook, taking into consideration the specificities of the Hungarian power system.
The plan is updated and published monthly on the web-site of MAVIR, combined with actual data.

Generation-Demand Balance

Generation capacity – Hydro and wind generation is not considerable for the time being. Mothballed capacities are practically not available under any circumstances. Renewable energy (mainly biomass) and co-generation have a growing portion in the generation mix (over 13 %), and their operation is very much legislation-sensitive, i.e. difficult to predict – must run units.

Demand – Overall demand level depends on the state of economy. Weather sensitive extremes can be handled by using different scenarios. Demand-side management is an efficient tool, but in the hands of the supply companies – 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 UCTE OH Policy 1, taking into consideration the Hungarian specificities. (See the note on demand)

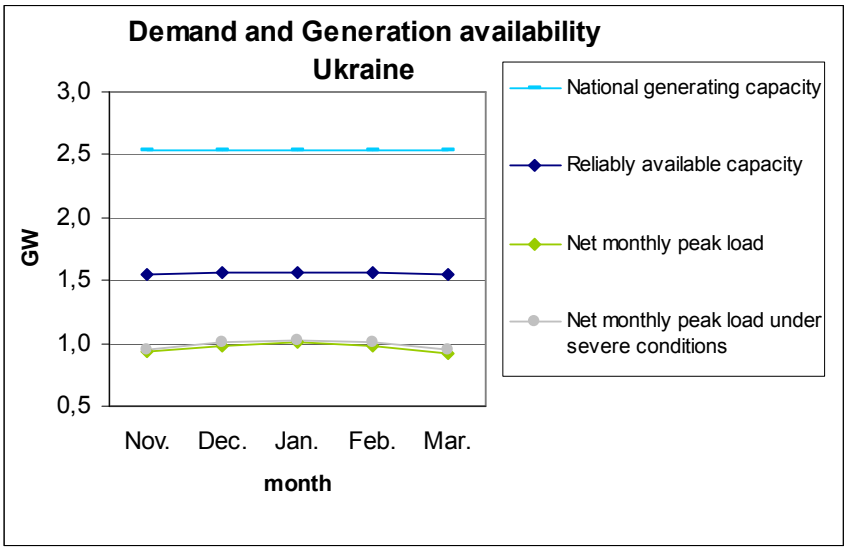
Remaining capacity – Due to the fact that outages are calculated with their average value, secure operation requires at least 0.23 GW of remaining capacity during the weekly peak demand periods, even under severe conditions.

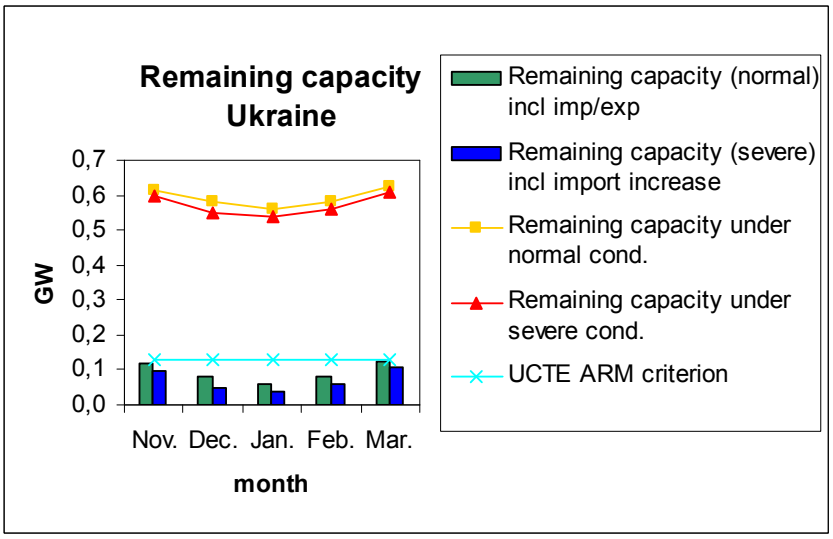
Role of Interconnections

Interconnection capacity – The import/export capacities are NTC values. Since the Hungarian Power System is a part of the highly meshed Central-European network, transit flows are comparable to those values. Therefore import NTC is considerably limited by those transit flows.

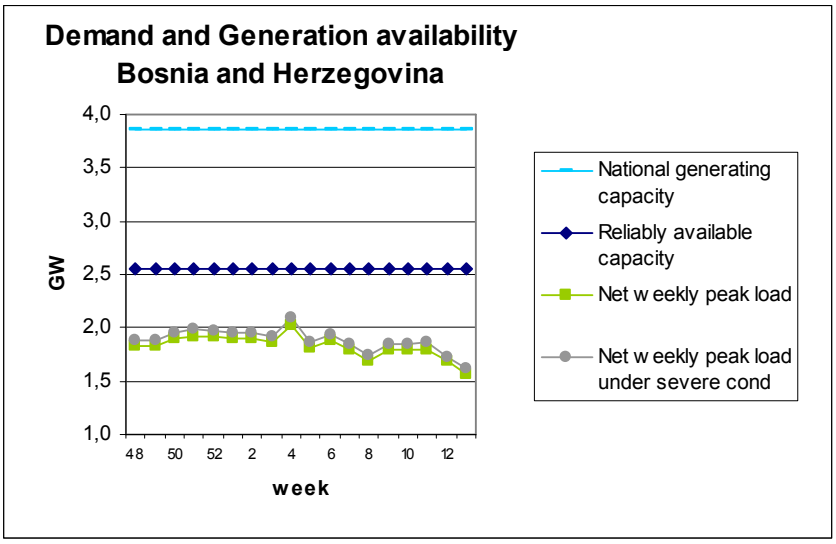
Firm import/export contracts – The Hungarian electricity market is traditionally import-oriented. This means that firm import contracts contribute to the security of supply. Nevertheless, after liberalisation in 2003, international exchange became much more sensitive to market conditions, even in short-term.

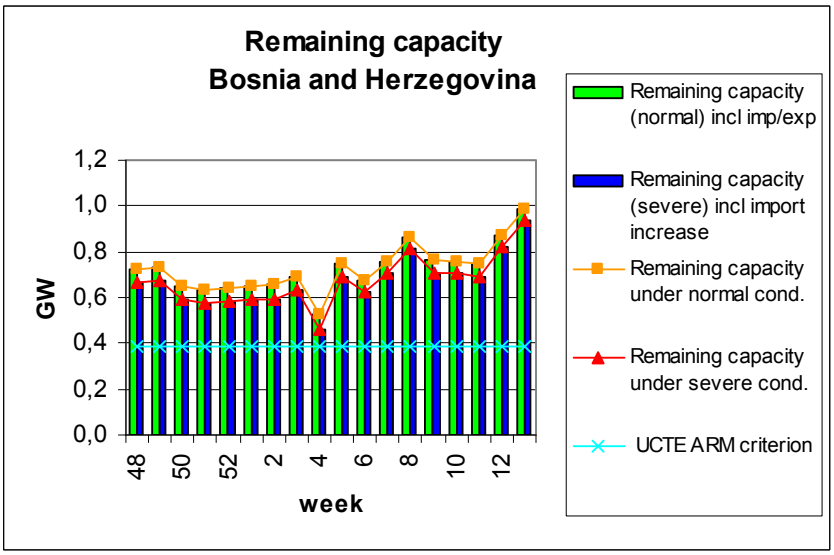
WESTERN UKRAINE


Demand and Generation availability
Ukraine
3,0
2,5
2,0
1,5
1,0
0,5
GW
Nov.
Dec.
Jan.
Feb.
Mar.
month
National generating capacity
Reliably available capacity
Net monthly peak load
Net monthly peak load under severe conditions

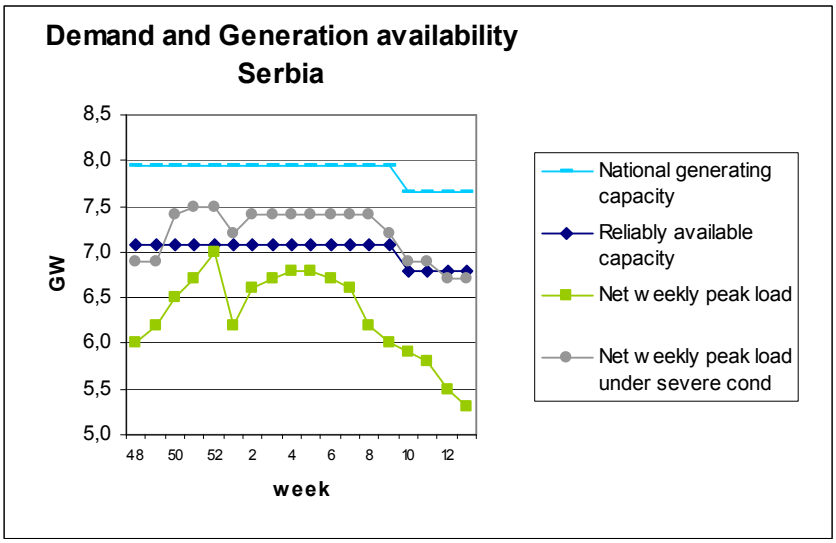

Remaining capacity
Ukraine
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
GW
Nov.
Dec.
Jan.
Feb.
Mar.
month
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

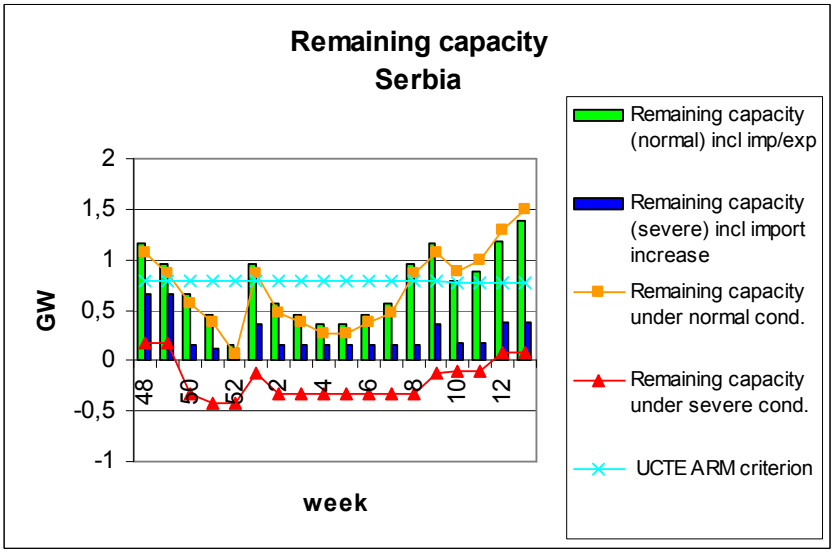
BOSNIA HERZEGOVINA


Demand and Generation availability
Bosnia and Herzegovina
GW
4,0
3,5
3,0
2,5
2,0
1,5
1,0
48
50
52
2
4
6
8
10
12
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond

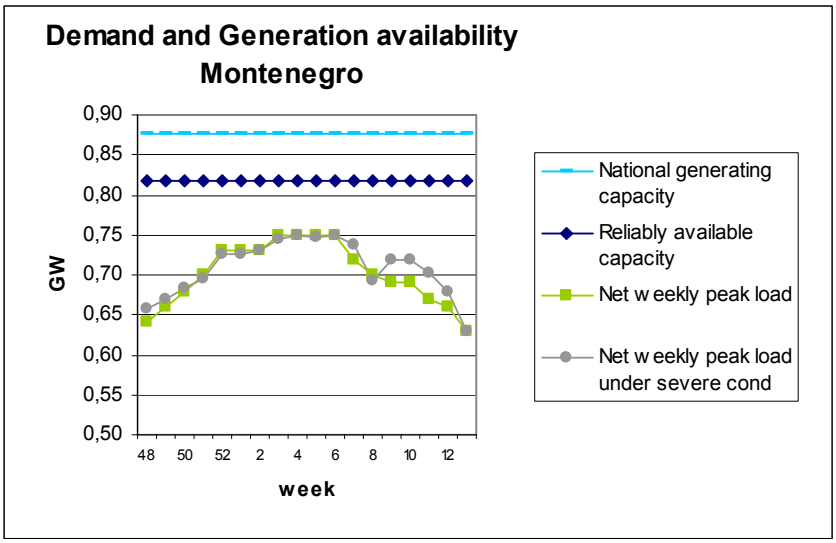

Remaining capacity
Bosnia and Herzegovina
GW
1,2
1,0
0,8
0,6
0,4
0,2
0,0
48
50
52
2
4
6
8
10
12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

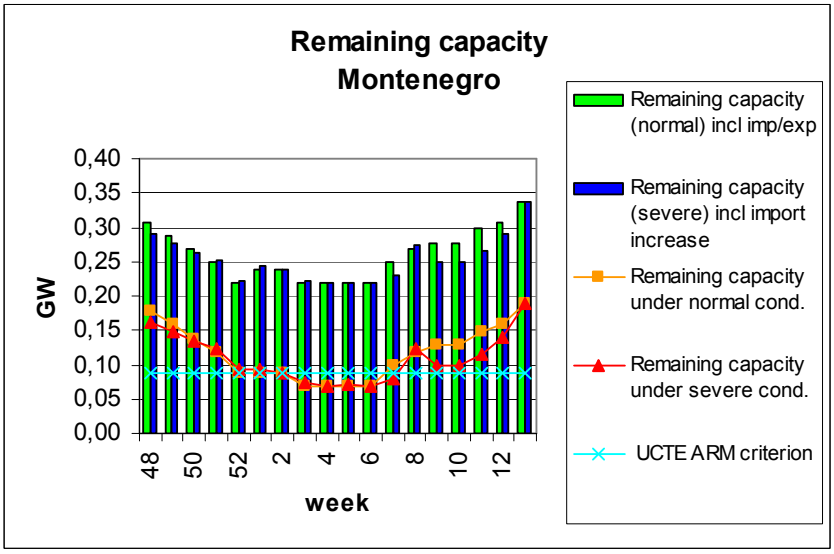
SERBIA


Demand and Generation availability
Serbia
GW
8,5
8,0
7,5
7,0
6,5
6,0
5,5
5,0
48
50
52
2
4
6
8
10
12
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond

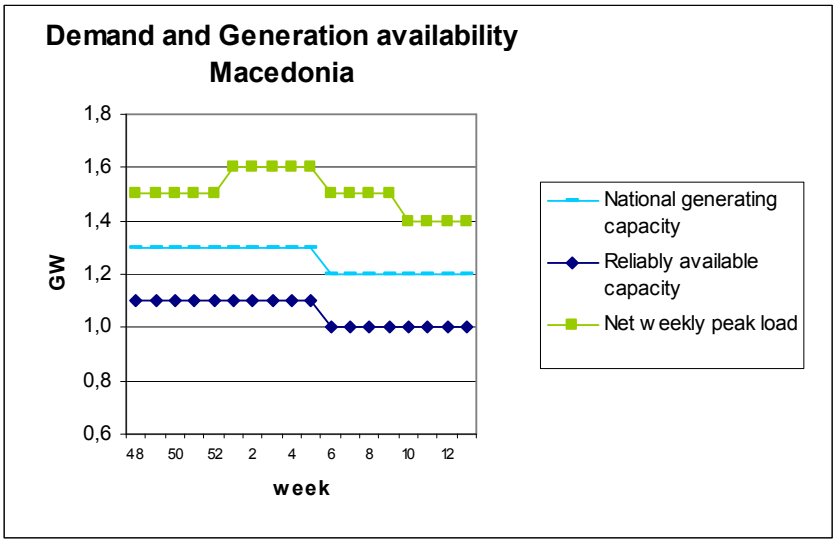

Remaining capacity
Serbia
GW
2
1,5
1
0,5
0
-0,5
-1
48
50
52
2
4
6
8
10
12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

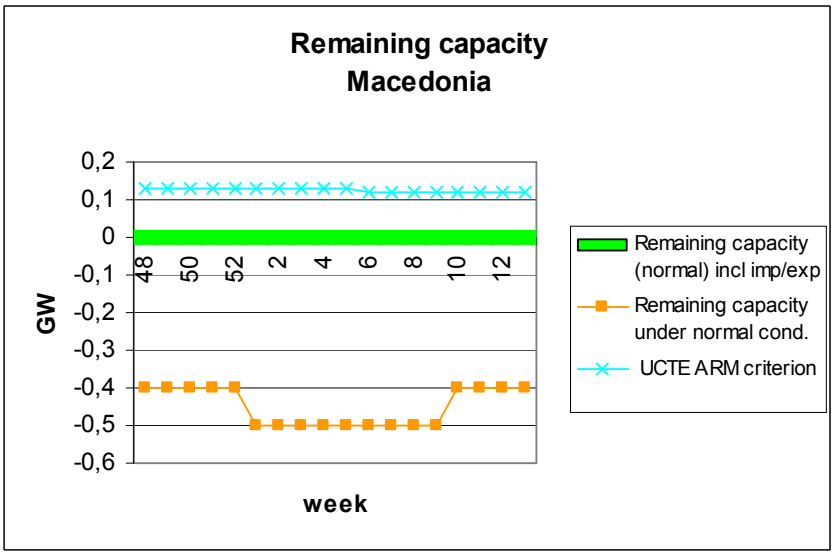
MONTENEGRO


Demand and Generation availability
Montenegro
GW
0,90
0,85
0,80
0,75
0,70
0,65
0,60
0,55
0,50
48 50 52 2 4 6 8 10 12
week
National generating capacity
Reliably available capacity
Net w eekly peak load
Net w eekly peak load under severe cond

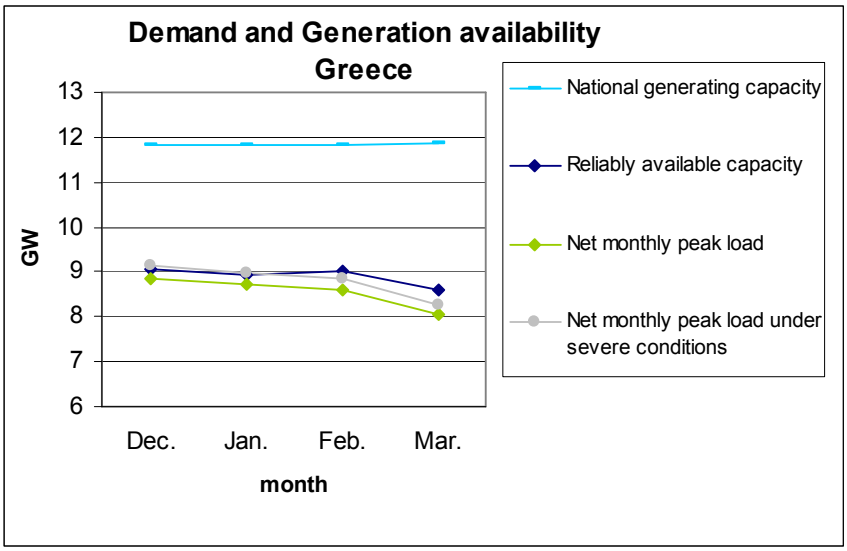

Remaining capacity
Montenegro
GW
0,40
0,35
0,30
0,25
0,20
0,15
0,10
0,05
0,00
48 50 52 2 4 6 8 10 12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity (severe) incl import increase
Remaining capacity under normal cond.
Remaining capacity under severe cond.
UCTE ARM criterion

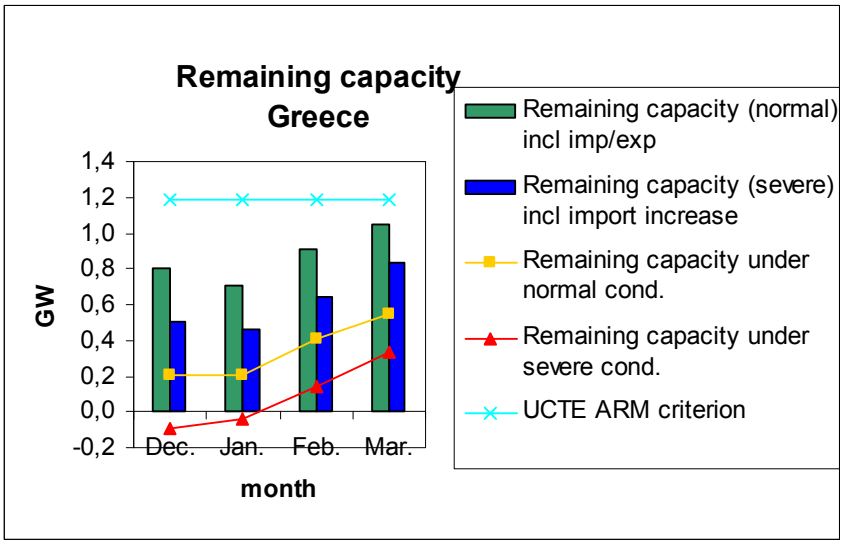
FORMER YUGOSLAV REPUBLIC OF MACEDONIA


Demand and Generation availability
Macedonia
1,8
1,6
1,4
1,2
1,0
0,8
0,6
GW
48 50 52 2 4 6 8 10 12
week
National generating capacity
Reliably available capacity
Net weekly peak load


Remaining capacity
Macedonia
0,2
0,1
0
-0,1
-0,2
-0,3
-0,4
-0,5
-0,6
GW
48 50 52 2 4 6 8 10 12
week
Remaining capacity (normal) incl imp/exp
Remaining capacity under normal cond.
UCTE ARM criterion

GREECE





Comments

Synopsis

For the coming winter, the generation - load balance is studied for the most stressed period, that is the monthly peak load, building two scenarios dependent on the weather conditions. The first scenario is based on normal weather conditions given that the forecast of the load represents the 90% probability of not exceeding forecasted maximum, while the second scenario is based on severe weather conditions and the respective probability is 97.7%. The remaining capacity without considering the one of the interconnections is low in both cases, normal and severe conditions, especially in December and January. According to the estimation of the HTSO a remaining capacity of 600MW is necessary for the secure operation of the system. Under normal conditions the operation criterion is met if we include the firm import contracts.
In case of severe conditions, extra importable capacity, additional to the firm import contracts, is available to meet the criterion of 600MW. In case of emergency, additional measures are available to ensure the system adequacy and security.

Methods Used for Winter Outlook

In long term, a five year 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 HTSO 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 medium and short term the HTSO 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 at checking 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.

The HTSO uses the power balance studies to assess the system adequacy in very short term, so 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 2007-2020, and on the HTSO energy management studies for the generation adequacy report, in addition to the experience of the HTSO personnel responsible for the System Operation.

Generation-Demand Balance

Concerning the **national generating capacity,** the total net output thermal capacity has increased by 767 MW due to the commissioning of two new thermal power plants.

A provisional **overhaul schedule** of the thermal power plants is communicated to the HTSO by the generators but the final schedule is agreed between the HTSO and the generators, having taken into account the forecasts carried out by the HTSO. The overhauls of the thermal power plants are avoided during periods of increased 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, that is 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 Demand Forced Outage Rate (EFORd). According to the calculations, a usually made assumption of two typical large units of 300MW each is considered out of operation due to forced outages.

The **non usable capacity** includes mainly hydro capacity which is reduced due to limited water reserves and capacity of wind power plants. The hydro conditions are favourable this year and the water management aims at saving the water reserves to use them at the peak demand. As for the capacity of the wind power plants, an average of 73% is non usable at the winter peak.

The **monthly peak load** is calculated both for normal and severe conditions. Monthly peaks, as well as yearly peaks highly depend on 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 147 MW/°C.

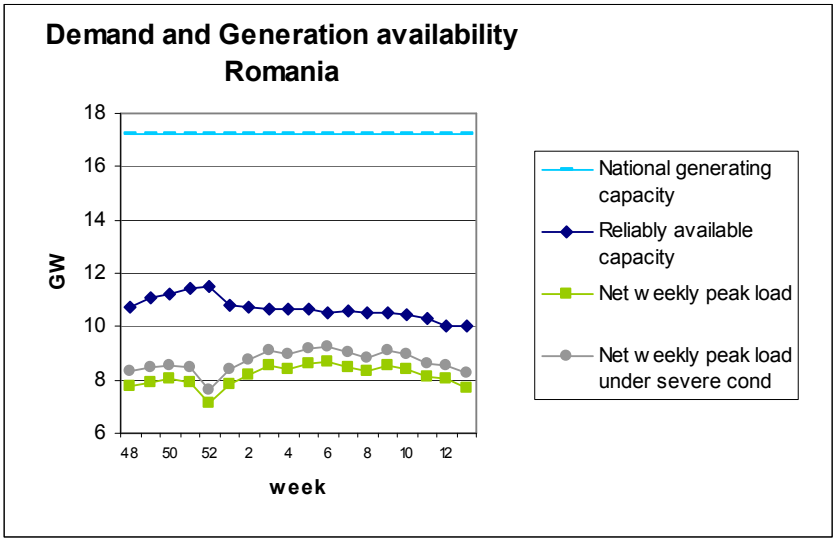
The load is the sum of two components. The first one reflects the load sensitivity to the weather (temperature, humidity), while the other one is dependent on miscellaneous effects (financial and human activities) The net monthly peak load calculated for normal conditions represents the 90%

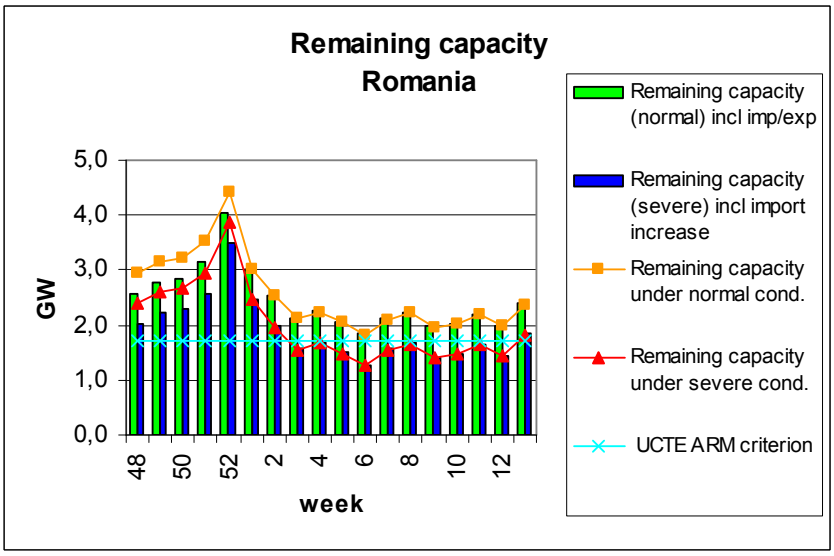
probability of not exceeding forecasted maximum, while in severe conditions the respective probability is 97.7%.The losses of the transmission system are included in the monthly peak load.

System services include primary, secondary and tertiary reserve according to the UCTE OH Policy 1.

The NTC value of the **interconnections** which totals 1100MW is allocated to the participants of the market by long and short term explicit auctions. The simultaneous importable capacity is estimated to be 900MW in the winter outlook assessment, while the volume of imports that is considered as firm ranges between 500 and 600MW.
For this period, the **remaining capacity** without considering the capacity of the interconnections is low, especially in December and January both in normal and severe conditions. Therefore, imported electrical energy is necessary to meet the peak demand. According to the HTSO estimation, a remaining capacity of 600MW is necessary for the adequate and secure operation of the system. Under normal conditions, this additional capacity will come from import contracts.
Under severe conditions, we mainly rely on the available importable capacity beyond the firm import contracts. In case of extreme conditions, additional emergency measures are available to confront the situation.

ROMANIA





Comments

For the coming winter the generating-consumption balance will be equable. The installed capacities will be able to ensure the coverage both of the consumption and of the eventual export requirements.
Relying to observed retrospects and tendencies it must be taken into account 2% rate of increase of the consumption against the last winter value.

Synopsis

From the point of view of system adequacy, the next coming winter does not cause any problem to our system safety operation. The remaining capacity could cover any unit tripping which exceeds the average expected value for outages in either case for normal or severe winter conditions.
A demand value higher than estimated one for severe winter could be managed by the remaining capacity as well.

Framework and Method Used for Winter Outlook

Based on a Grid Code and Commercial Code in compliance with UCTE rules, Transelectrica Company performs all the activities in order to ensure a reliable and stable operation to our network The main duty is to coordinate the operation of all installations with the purpose of satisfying the power demands in quality and safety conditions.
Semestrial planning studies are performed, based on load forecast, load flow, steady state and dynamic stability analyses. The network input data are based to the following items:

- harmonization of the producers schedules on yearly basis;
- an approved yearly internal line schedule (this product involves another analysis done by Transelectrica as well);
- coordination of the tie-lines schedule with the neighbouring power systems.

The results include information concerning the necessary generation amount, the network topology, voltage level measures in order to obtain a safety power system operation in those time intervals.
When there are some deviations from the input data, Transelectrica has to perform another analysis on monthly basis.
However with actual data Transelectrica carries out operational programming on short term, in fact one day, sustained at least on load flow computations as a means to detect daily network bottlenecks, which are removed by using the Balancing Market.

Generation - Demand Balance

The national generating capacity value is established related to the yearly declaration of the producers. The maintenance/overhauls of the units are scheduled during off-peak periods in accordance with the specific characteristics for each power plant type. Meanwhile the equivalent outage rates for the generating units are based on multi-annual statistics taking into account the probability of the units unavailability.
Regarding the demand forecast Transelectrica expects 2% rate of increase attributable to the state economy, but it still remains a possibility to exceed this value due to load sensitivity to temperature for short time intervals. Relied to statistics the peak load sensitivity for winter interval is approximately 40 MW/ºC.
Concerning the system services reserve, yearly or for any interval if needed, Transelectrica signs contracts with the producers in order to be able to: control the system frequency and balance exchange after a disturbance, compensate the consumption forecast deviation or network losses, maintain the voltage level within regular range.
There is a regulatory frame regarding the load reduction, but despite this there are not any solicitation to license the consumers yet.
The remaining capacity in normal conditions represents at least 10.6%. In severe conditions the remaining capacity represents 7.4% of the national generating capacity.
Consequently Transelectrica considers that its power system can very well respond to eventual export requirements. Taking into account that the maintenance works on the tie-lines will not carry out in winter season, the NTC values will allow export activities as well.

Role of Interconnection

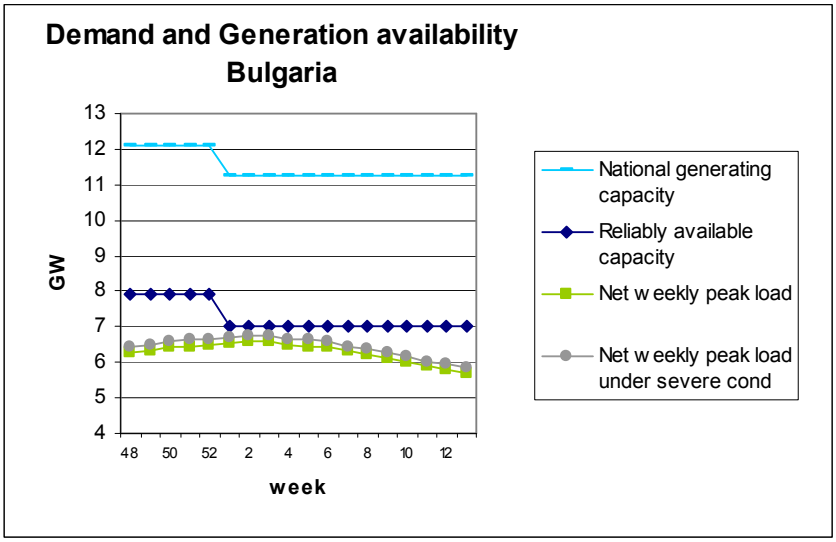
The synchronous interconnection allows Transelectrica to facilitate the performing of commercial exchange power with the neighboring TSOs and even to carry out some emergency help when somebody need it.
In respect of ETSO definitions Transelectrica furnishes coordinated bilateral (yearly and monthly) NTCs for commercial purposes, that can be used simultaneously in the same direction (export or import), with TRMs harmonized in bilateral agreements, without endangering system security.

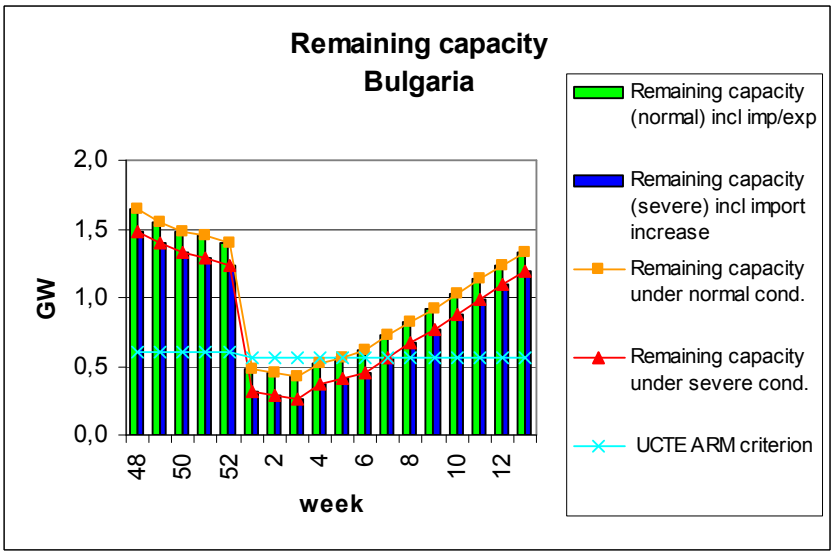
Concerning the simultaneous capacity values, we have to point out that the figures represent all transportable capacity which include also the lines possibly involved in island operation with non – UCTE countries. It must be noted that only 1600MW import and 1900MW export represent the NTC values with other UCTE countries. The NTCs with Burshtyn island must be added in amount of 400MW import and 50MW export, respectively.
Besides for the coming winter, Transelectrica does not expect transit flows which can jeopardize the interconnections.

Conclusion

From Transelectrica's point of view the assessment of the coming winter adequacy does not indicate major risk regarding the generating-demand balance. Regarding the remaining capacity it might occur some risks related to the necessity of using the natural gas and oil fired units, the risks concerning both the fuel higher price and the lower temperature values.

BULGARIA





Comments

The load sensitivity to temperature is around 77MW/°C.

The probability of severe peak demand is estimated to 33%.

This balance is not considered at risk for the system.

The most important event for the power system of Bulgaria is the shutting down of the 4 oldest units in Kozlodui nuclear power plant on 31 December 2006 with total installed capacity 880 MW.