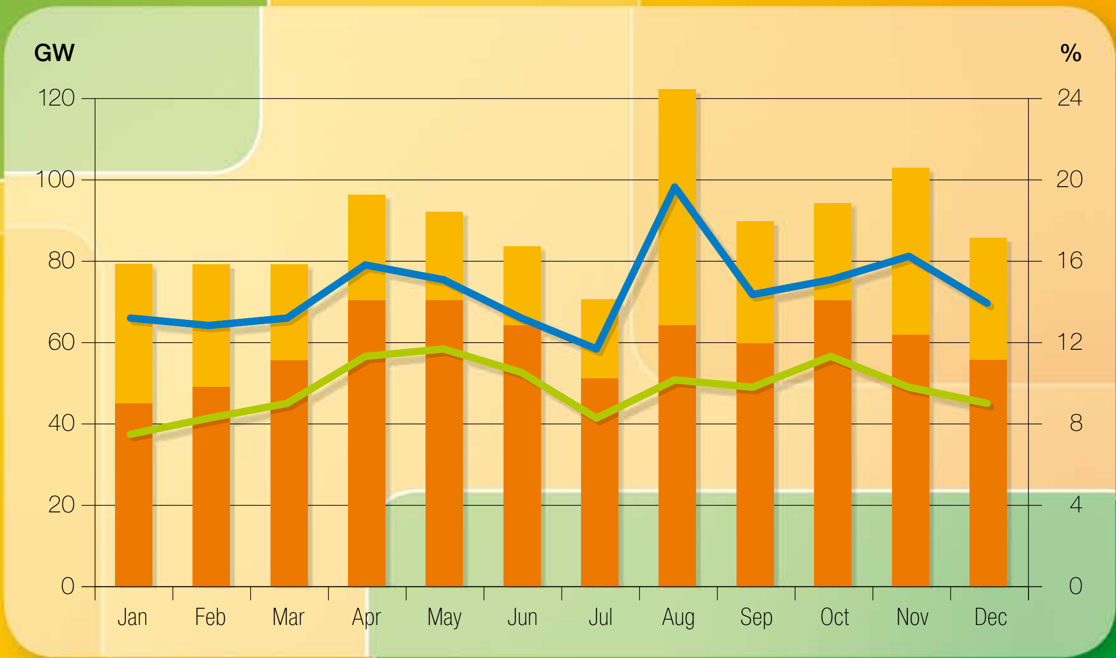
UCTE



System Adequacy Retrospect 2006

Union for the Co-ordination of Transmission of Electricity

July 18th 2007

SYSTEM ADEQUACY
RETROSPECT 2006

Union for the Co-ordination of Transmission of Electricity

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EXECUTIVE SUMMARY

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Objectives

This UCTE System Adequacy Retrospect 2006 report aims at providing stakeholders in the European electrical Market with an overview of:

- Generation, demand and their adequacy in the UCTE Power System in the year 2006 with a focus on the power balance and margins, and the generation mix;
- The state and the evolution of the UCTE Transmission Grid with a focus on the congestion on interconnection tie-lines and their possible influence on system security.

Energy Balance

The following tables give an overview of the energy balance of the UCTE system in 2006.

Table 1 UCTE Annual Energy Balance Retrospect

	2003	2004	2005	2006	2005 to 2006	
	TWh	TWh	TWh	TWh	TWh	%
Hydro Power Generation	*312.5*	*321.3*	*294.8*	*307.8*	*13.0*	*4.4*
Nuclear Power Generation	*788.1*	*797.4*	*791.4*	*801.0*	*9.6*	*1.2*
Fossil Fuel Power Generation	*1 271.1*	*1 296.4*	*1 349.6*	*1 355.8*	*6.2*	*0.5*
Renewable Energy Sources Generation (exclud. hydro power)	*54.8*	*76.5*	*94.2*	*109.5*	*15.3*	*16.2*
Not Clearly Identified Sources Generation	*27.0*	*9.4*	*8.5*	*10.1*	*1.6*	*18.9*
Total Generation	2 453.5	2 501.0	2 538.5	2 584.1	45.7	1.8
Physical Exchanges Balance (I-E)	-13.5	-11.5	-1.8	-14.2	-12.5	708.7
Pumped Storage	44.7	43.8	46.8	45.0	-1.8	-3.9
Consumption	2 395.3	2 445.7	2 489.9	2 524.9	35.0	1.4

Energy Consumption

Energy consumption in UCTE system reached 2524.9 TWh in 2006 with a growth rate of +1.4%.

The growth rate is lower than in 2005 and 2004. The highest growth rates, all above +3%, were achieved in Luxembourg, Poland, Bulgaria, Slovakia, Hungary, Austria and FYROM in decreasing order.

Generation

In December 2006, the total generating capacity on the UCTE system was 625.1 GW (see Table 2). This value is 13.8 GW over the 2005 value due to an excess of commissioning over decommissioning. New combined cycle plants and renewable power sources plants made most of the new generating capacity. The renewable energy sources generating capacity including hydro power capacity increased by more than 20% in 2006, thanks to wind energy development mostly. Decommissioning mainly concerned fossil fuel plants (Large Combustion Plant Directive) and some nuclear ones.

Total generation in UCTE system reached 2584.1 TWh in 2006 with a growth rate of +1.8%

Hydro power generation rose by +4.4% due to the normal hydro conditions observed in 2006 contrasting with the dry ones in 2005. Fossil fuel generation remained stable.

Non-hydro renewable generation has once again increased by a 2-digit growth rate of +16.2% in 2006, mainly due to wind generation development. The share of renewable energy generation, including hydro generation[1], in the UCTE total generation was approximately 16.1%[2] in 2006. In 2005 and 2006 alike, this evolution was especially strong in Spain and in Germany. This development also has significant impacts on the load flows on the network and the transmission system development requirement.

Import / Export

The UCTE system was almost balanced in 2006.

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[1] In this document hydro generation includes pumped storage generation.

[2] The European Union indicative target for 2010 from the 2001/77/CE Directive is that the renewable energy sources generation (including hydro) should count for 21 % of the total energy consumption. This target addresses the 27 EU members including Nordel, UKTSOA, ATSOI and the Baltic countries.

The energy balance of the exchanges out of UCTE remained small compared to energy consumption.

Power Balance

Power balance analysis is made for every month of the year at reference time 11:00 am on 3rd Wednesday.

The following table gives an overview of the power balance of the UCTE system in December 2006.

Table 2 UCTE Power Balance Retrospect in December at Reference Time

	2003	2004	2005	2006	2005 to 2006	
	GW	GW	GW	GW	GW	%
Total Generating Capacity	569.1	593.2	611.3	625.1	13.8	2.3
Reliably Available Capacity	414.2	431.6	440.3	455.2	14.9	3.4
Load at Reference Time	348.2	360.6	369.5	368.1	-1.4	-0.4
Remaining Capacity w/o Exchanges	66.0	70.6	70.8	87.0	16.3	23.0
Physical Exchanges Balance (I-E)	1.6	3.4	8.2	2.4	-5.8	-70.6

Generation System Adequacy

The Reliably Available Capacity is calculated by reducing the Net Generating Capacity of the Unavailable Capacity. The result is then compared to the Load at Reference Time.

Generating Capacity increased by +13.8 GW with a strong contribution of wind farms commissioning. This type of generation has an important amount of non usable capacity reducing the increase of the Reliably Available Capacity to half of this amount.

Still, in December 2006 the Reliably Available Capacity was +16.3 GW higher than in December 2005.

The Load at Reference Time in December 2006 was 368.1 GW, almost equal to the one in December 2005. Indeed, the on-going growth of load has been compensated by milder weather conditions in December 2006 than in December 2005.

In these circumstances, the Remaining Capacity without Exchanges in December 2006 was higher than the December 2005 one.

To assess generation adequacy, the Remaining Margin is calculated as the Remaining Capacity at reference time minus the Margin Against the Monthly Peak Load in order to take into account that the monthly Peak Load did not usually occurred at the Reference Time.

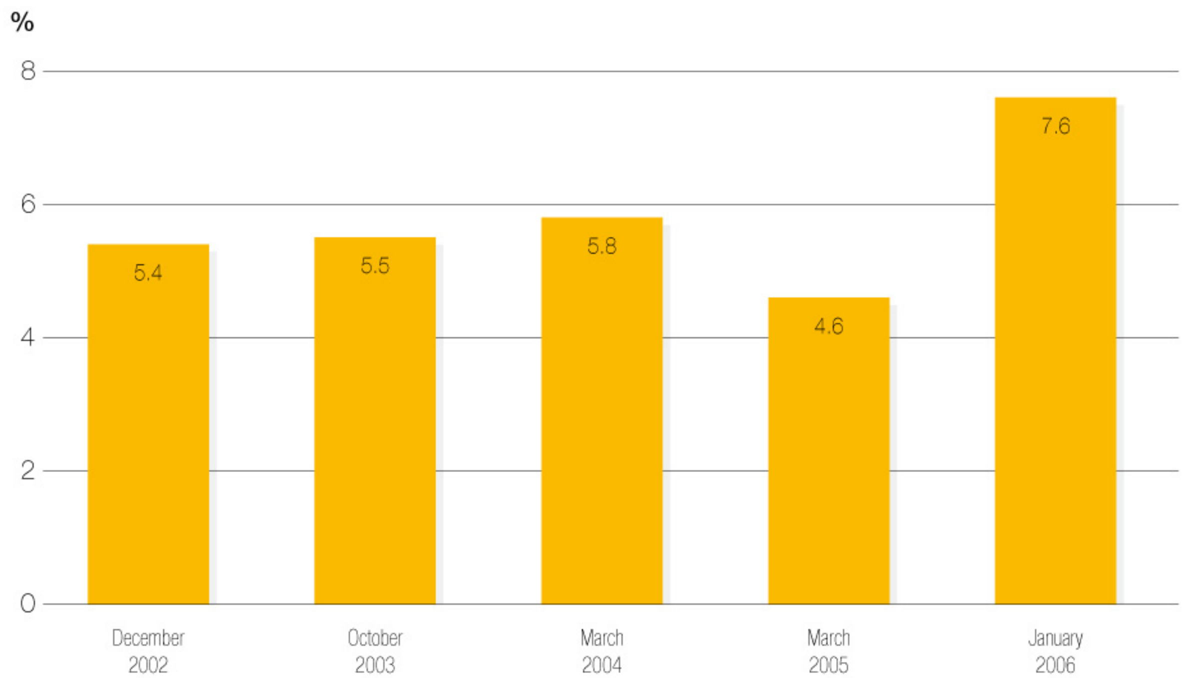
From a forecast point of view, as in the System Adequacy Forecast reports, it is usually admitted that the Remaining Margin should be at least 5% of the global generating capacity.

When calculated *ex-post*, as in the System Adequacy Retrospect reports, the Remaining Margin does not have to fulfil the provisional Reference Margin of 5%. Indeed, from a retrospective point of view any positive Remaining Margin shows that the generation has actually been sufficient to cover the load. Nevertheless, it is interesting to calculate it in percentage of the generating capacity to assess the level of generation which was still available, should the system had to face more severe conditions. It is then followed year by year as an indicator of the overall evolution of the system margins and operating conditions.

In December 2006, the Remaining Margin on the UCTE system was 9.1% of the generating capacity.

The lowest rate over the year 2006 (7.6%) has been achieved in January. During the rest of the year, the Remaining Margin has been slightly higher than in 2005. The lowest value in 2005 was met in March when then system had to face a strong cold wave which was did not occurred in March 2006.

Figure 1 UCTE Minimum Remaining Margin / Net Generating Capacity Ratio Retrospect



In conclusion, it appears that the security of supply has not been at risk in 2006 as far as generation adequacy is concerned[3]. New developments in generation capacity, partly in renewable energy sources generation capacity, balance the increase of energy consumption and the rhythm of decommissioning. Along with the rather mild weather conditions in 2006, this made the observed Remaining Margin higher than in the previous years.

Transmission System Adequacy

The analysis of congestion on cross-border lines shows that the eastern part of UCTE was still the main area of congestion. Interconnection lines in and around the North Eastern[4] block have been used at their maximum capacities almost 100% of the time in 2006.

No additional interconnection lines were achieved in 2006 but new or upgraded components led to an increase of the cross-border capacity from the Slovak Republic to Hungary and from France to Belgium.

[3] The disturbances of November 4th 2006 had no connection to system adequacy, see final UCTE report on the UCTE Web site http://www.ucte.org/pdf/Publications/2007/Final-Report-20070130.pdf

[4] Made of Poland, Czech Republic, Slovak Republic and Hungary was previously identified as the CENTREL block;

INTRODUCTION AND METHODOLOGY

1

1 INTRODUCTION AND METHODOLOGY

1.1 Introduction to the UCTE

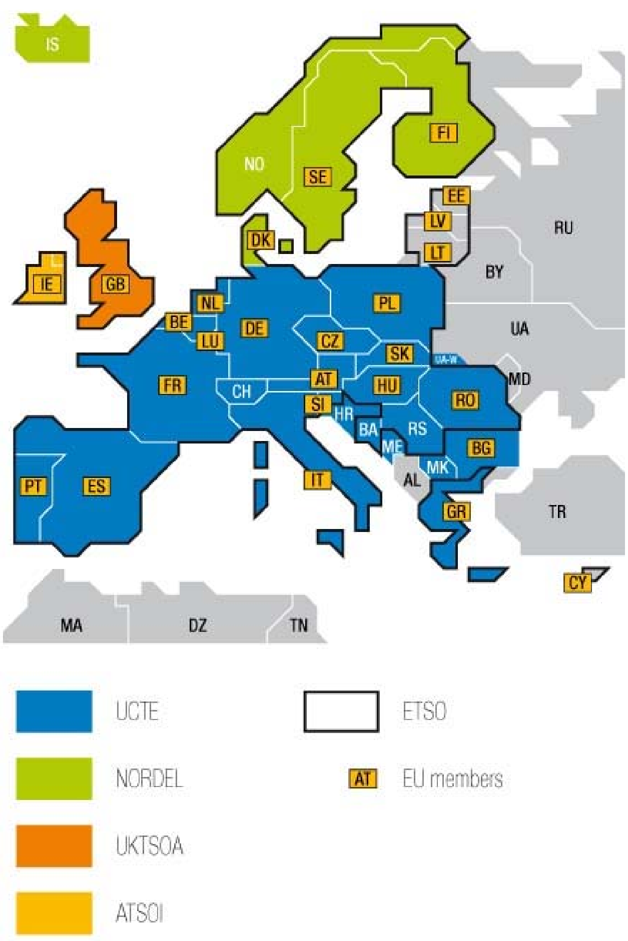
The Union for the Co-ordination of Transmission of Electricity (UCTE) co-ordinates the interests of transmission system operators in 23 European countries. Their common objective is to maintain the security of operation of the interconnected power system.

50 years of joint activities laid the basis for a leading position in the world which the UCTE holds in terms of the quality of synchronous operation of interconnected power systems.

Through the networks of the UCTE, 450 million people are supplied with electric energy ; annual electricity energy consumption exceeds 2500 TWh (16% of world electricity energy consumption).

With regard to the other members of ETSO (European Transmission System Operators, 37 Transmission System Operators in 23 countries), the geographical perimeter of UCTE in 2006 is represented in the picture below.

Figure 2 European TSO Cooperative Bodies



Optimal Co-operation Requires Joint Action

Close co-operation of member companies is imperative to make the best possible use of benefits offered by interconnected operation. For this reason, the UCTE has developed a number of rules and recommendations that constitute the basis for the smooth operation of the power system.

Only the consistent maintenance of the high demands on quality will permit to set standards in terms of security and reliability in the future as well as in the past.

The UCTE – Security of Electric Power Supply and Promotion of Competition

From the very outset of liberalization in the European electricity markets, the UCTE has intensively pursued the development of schemes for the promotion of competition in the electricity sector. The aim is to support the electricity market without accepting restrictions in the security of supply.

The liberalization of electricity markets cannot be implemented without a transparent and non-discriminatory opening up of electric networks.

The UCTE sets the prerequisites that enable a compromise to be ensured between competition and security of supply.

1.2 Objectives

This UCTE System Adequacy Retrospect 2006 report aims at providing stakeholders in the European electrical Market with an overview of:

- Generation, demand and their adequacy in the UCTE Power System in the year 2006 with a focus on power balance, security margins, and generation mix;
- The state and the evolution of the UCTE Transmission Grid in year 2006 with a focus on congestion on interconnection tie-lines and their possible influence on system security.

This document is a synthesis of the related data and comments collected from representatives in each country of the geographical perimeter mentioned before.

Information concerning network and generation developments as well significant events that occurred on the UCTE network in year 2006 can be found on a regular basis on the UCTE Website in the Living Grid[5] section.

No details on the disturbances of November 4th 2006 can be found in this document as there was no connection to system adequacy. Dedicated report[6] is still available on the UCTE Website.

Data, may also be consulted on a monthly basis in the Online Data[7] section on the UCTE Website.

1.3 Geographical Perimeter

Table 3 System Adequacy Retrospect 2006 Geographical Perimeter

Abbreviation	Complete name
AT	Austria
BA	Bosnia-Herzegovina
BE	Belgium
BG	Bulgaria
CH	Switzerland
CS	Serbia and Montenegro[8]
CZ	Czech Republic
DE	Germany
ES	Spain
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IT	Italy
LU	Luxembourg
MK	Former Yugoslav Republic of Macedonia
NL	Netherlands
PL	Poland
PT	Portugal
RO	Romania
SI	Slovenia
SK	Slovak Republic
UA-W	Ukraine West

[5] http://www.ucte.org/ourworld/living_grid/2006/e_default.asp

[6] http://www.ucte.org/pdf/Publications/2007/Final-Report-20070130.pdf

[7] http://www.ucte.org/statistics/onlinedata/definition/e_default.asp

[8] Albeit Montenegro declared its independency on June 3rd 2006, this is the last UCTE System Adequacy report where Montenegro (ME) and Serbia (RS) are aggregate all year long in the former Serbia and Montenegro (CS).

1.4 Definitions

Generic explanation concerning system adequacy terms used in this document may be found in the Statistics[9] section on UCTE Website.

1.4.1 Adequacy

In this note, the CIGRE definition[10] for adequacy is used.

Adequacy – a measure of the ability of the power system to supply the aggregate electric power and energy requirements of the customers within component ratings and voltage limits, taking into account planned and unplanned outages of system components. Adequacy measures the capability of the power system to supply the load in all the steady states in which the power system may exist considering standards conditions.

1.4.2 Generation

In this document, generation is segregated in several categories including the regular nuclear, fossil fuel and hydro power but also some specific ones detailed bellow.

1.4.2.1 Renewable Energy Sources

Although hydro power is a Renewable Energy Source[11] (RES), UCTE separate it from the other RES power stations. Therefore, the RES category comprises the following primary energy sources: wind, solar, wave, geothermic, biomass, waste, etc. but not hydro.

Among all those RES type, wind power is segregated in this document.

1.4.2.2 Not Clearly Identifiable Energy Sources

The "Not Clearly Identifiable Energy Sources" comprises power plants which, according to the primary energy used, do not correspond to or can not be categorised among the previously mentioned categories: hydro power, nuclear power, fossil fuel and RES.

1.5 Methodology

Power balance retrospect is performed at the single monthly reference time on the 3rd Wednesday at 11 am.

The power balance retrospect analysis aims at determining global margin on the system. Scheme below summarises the methodology to assess the margin between generation and load:

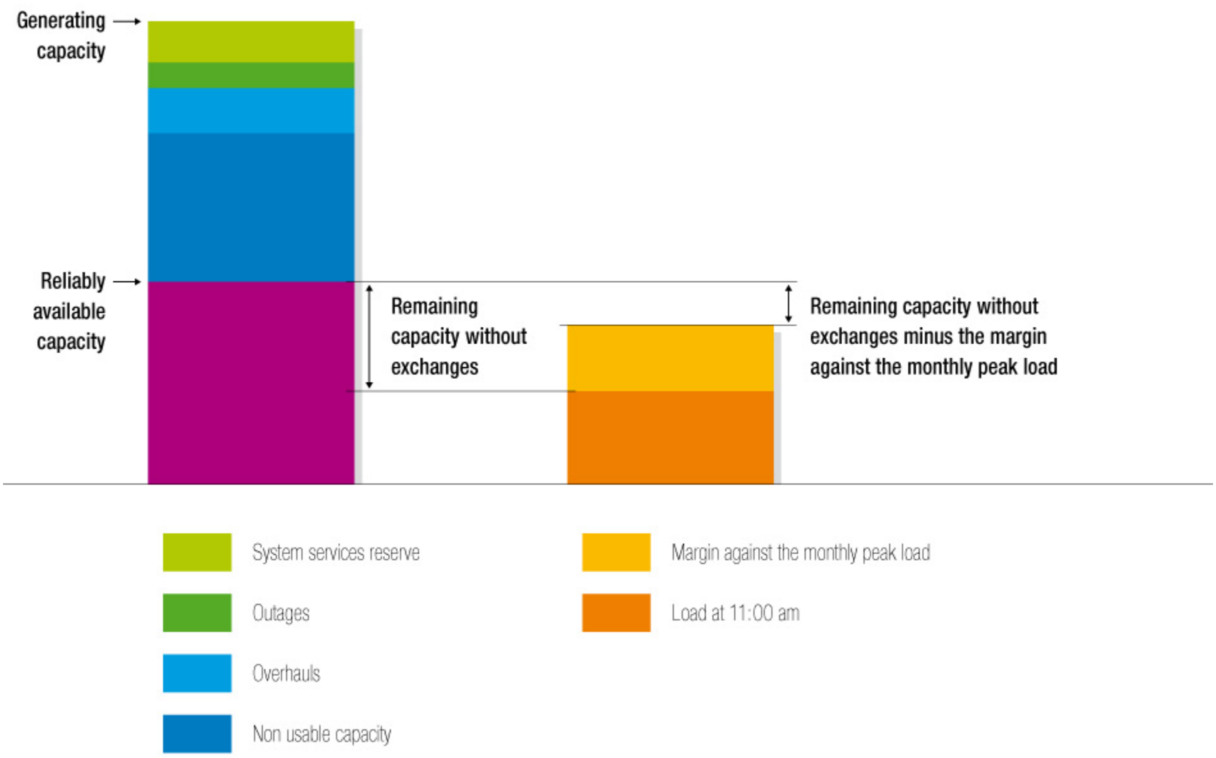
- Reliably Available Capacity is the available generation capacity once taken out Non-Usable capacity, Overhauls, Outages and System Service Reserve;
- Load at the reference time is completed by the Margin Against the Monthly Peak Load to take into account the fact that the reference time does not match with exact peak load time.

[9] http://www.ucte.org/statistics/terms_power_balance/e_default.asp

[10] Refer to the CIGRE publications: Power System Reliability Analysis – Application Guide, Paris, 1987, Power System Reliability Analysis – Composite Power System Reliability Evaluation, Paris, 1992.

[11] According to the definition in the EU Directive n° 2002/77/EC dated September 27th, 2002

Figure 3 UCTE System Adequacy Assessment Methodology



To simplify, the Remaining Capacity without exchanges minus Margin Against Monthly Peak Load will be referred to as the Remaining Margin. This value may be compared to the amount (5% or 10%) of generation capacity used to assess generation adequacy in the last forecast covering year 2006[12].

This method is obviously very simplified and may contain uncertainties (see §1.6 below) but it allows to follow the evolution over years or at least over the period of study, assuming that the data perimeter is stable enough.

1.6 Remarks

1.6.1 Geographical Perimeter

The perimeter of this UCTE System Adequacy Retrospect 2006 is made of all UCTE members minus the Denmark West associated member Energynet.dk plus the Ukraine West company Ukrenergo[13].

The differences between the UCTE perimeter and the actual geographical perimeter of this system adequacy retrospect analysis are small enough to extend its results to the actual UCTE perimeter.

1.6.2 Provisional Data

Data regarding year 2006 are still provisional in most countries, as the final official data are to be published many months later. For the same reason, data regarding year 2005 sometimes differ from the data published in last year System Adequacy Retrospect 2005 report[14] because they have been updated in the meantime.

[12] http://www.ucte.org/pdf/Publications/2006/UCTE-SAF2006-2015.zip

[13] Ukrenergo operates the UCTE interconnected grid around the town of Burshtyn in Western Ukraine called Burshtyn Island.

[14] http://www.ucte.org/pdf/Publications/2005/UCTE-SAR-2005.zip

1.6.3 Data Representativeness

In some countries the data collected by UCTE representatives do not cover the entire demand and generation on the interconnected grids. Data reported in this document may represent a part of the total demand and/or total generation. The table below gives the retrospect of these estimated ratio indexes when they were not always equal to 100%.

Table 4 National Data Representativeness Estimated Index

	2003		2004		2005		2006	
	Generation	Load	Generation	Load	Generation	Load	Generation	Load
AT	**84.0**	**82.0**	**90.0**	100.0	**90.0**	**88**	**90.0**	**88.0**
BA	**99.0**	**99.0**	**99.0**	**99.0**	100.0	100.0	100.0	100.0
BE	**99.0**	**99.0**	**99.0**	**99.0**	100.0	100.0	100.0	100.0
BG	100.0	100.0	100.0	100.0	100.0	100.0	**99.8**	**99.9**
CS	**96.0**	**96.0**	**96.0**	**96.0**	100.0	100.0	100.0	100.0
DE	100.0	**91.0**	100.0	**91.0**	100.0	**91.0**	100.0	**91.0**
ES	**94.0**	**94.0**	**94.0**	**94.0**	**94.0**	**94.0**	**98.0**	**98.0**
LU	**96.0**	**98.0**	**96.0**	**98.0**	**99.0**	100.0	100.0	100.0
MK	100.0	100.0	**n.a.**	**n.a.**	**n.a**	**n.a**	100.0	100.0
NL	100.0	**85.0**	100.0	**85.0**	100.0	100.0	100.0	100.0
PT	**92.0**	**92.0**	**94.0**	**94.0**	**92.0**	**92.0**	**97.0**	**97.0**

The data representativeness index for the whole geographical perimeter of this System Adequacy Retrospect report can be estimated using the national representativeness estimated indexes and the related national energies. Estimations are then above 99.5% for both generation and load.

BE – Belgium

The reported figures are best estimates based on actual measurements and extrapolations of survey results.

DE – Germany

Electricity statistics in Germany refer to 3 categories (common/public supply, industry and German railways), whereas the UCTE –power – balance - statistics relate to common/public supply only. The ratio within these categories can change from one year to the next, and can differ with regard to generation, load and consumption. The above mentioned percentages are calculated on the basis of former data of the German Federal Statistical Office. The German railways are not included in the synchronous operation of public/common electricity systems.

Excluded capacity is considered as a combination of self-balancing and power reserve contracts

The evolution of the index is due to the development of self-production.

GR – Greece

The representativeness factors refer to the Greek Interconnected System. The remote systems of the Greek islands are not included.

Excluded capacities are considered as self-balanced.

NL – The Netherlands

For Consumption and Generation we use the figures of our National Statistics Office, which are complete data for the whole country.

Regarding the peak load; TenneT only measures the load on the high voltage grid in which isn't included load covered by generation on lower voltage levels. On basis of analysis we've concluded that the national load is on average about 10% higher than the load as measured by TenneT, so the given data are increased by 10%. We have to keep in mind that this approximation might cause seasonally a slight inaccuracy.

PT – Portugal

In general our statistics refer to the consumption supplied by the public grid. This means that in the auto-production we consider the surplus delivered to the public grid, but not the auto-consumption. However, in the case co-generators use the legal possibility to sell all the energy produced (including the auto-consumption), to profit from special status regime tariff, we consider all that production.

Excluded capacities are considered as self-balanced.

ES – Spain

The evolution of the index is due to the development of own consumption of co-generators.

Excluded capacities are considered as self-balanced.

UA-W – Western Ukraine

All data in power balance are given in gross values.

In energy balance data of Burshtyn TPP and hydro PS are given in net values, data of industrial TPS are given in gross values (generation of industrial TPS is approximately 4 % of total generation of fossil fuel power stations).

1.6.4 Rounding in Tables

Due to rounding of figures, slight differences may be observed in the following tables between the sum of individual values and the associated total value of lines or columns.

1.6.5 Conclusions

Considering these uncertainties on data collection, the following remarks must be kept in mind:

1. ***Comparison between figures for 2005 and 2006 must be carefully considered due to differences in the data representativeness.***
2. ***An uncertainty on figures of the overall generation / load of UCTE of about 5 GW is highly probable. As a consequence, the value of UCTE margins given in the report must be considered with plus or minus 10 % uncertainty.***

ENERGY BALANCE 2

2 ENERGY BALANCE

Extra figures regarding energy balance are in APPENDIX 1 page 87.

2.1 Energy Balance Summary

Table 1 UCTE Annual Energy Balance Retrospect

	2003 TWh	2004 TWh	2005 TWh	2006 TWh	2005 to 2006 TWh	2005 to 2006 %
Hydro Power Generation	*312.5*	*321.3*	*294.8*	*307.8*	*13.0*	*4.4*
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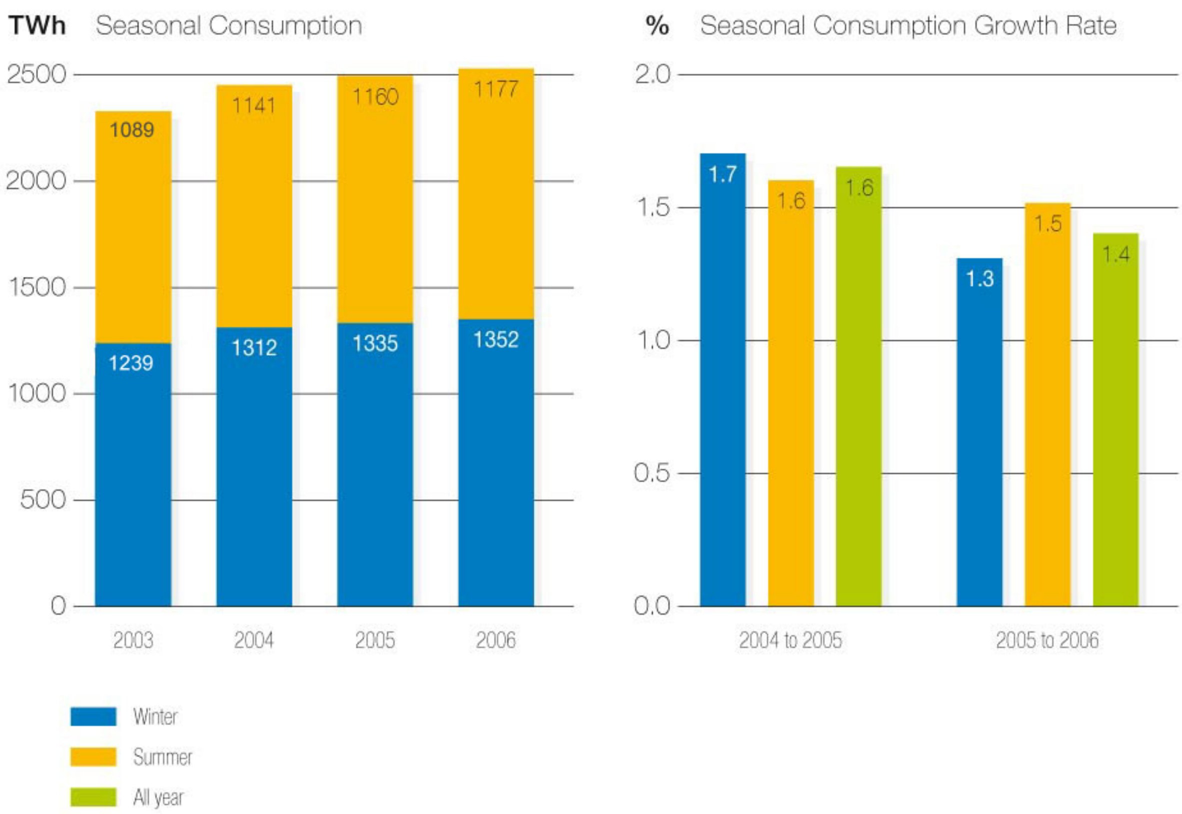
Pumped Storage	44.7	43.8	46.8	45.0	-1.8	-3.9
Consumption	2 395.3	2 445.7	2 489.9	2 524.9	35.0	1.4

2.2 Consumption

2.2.1 Energy Consumption

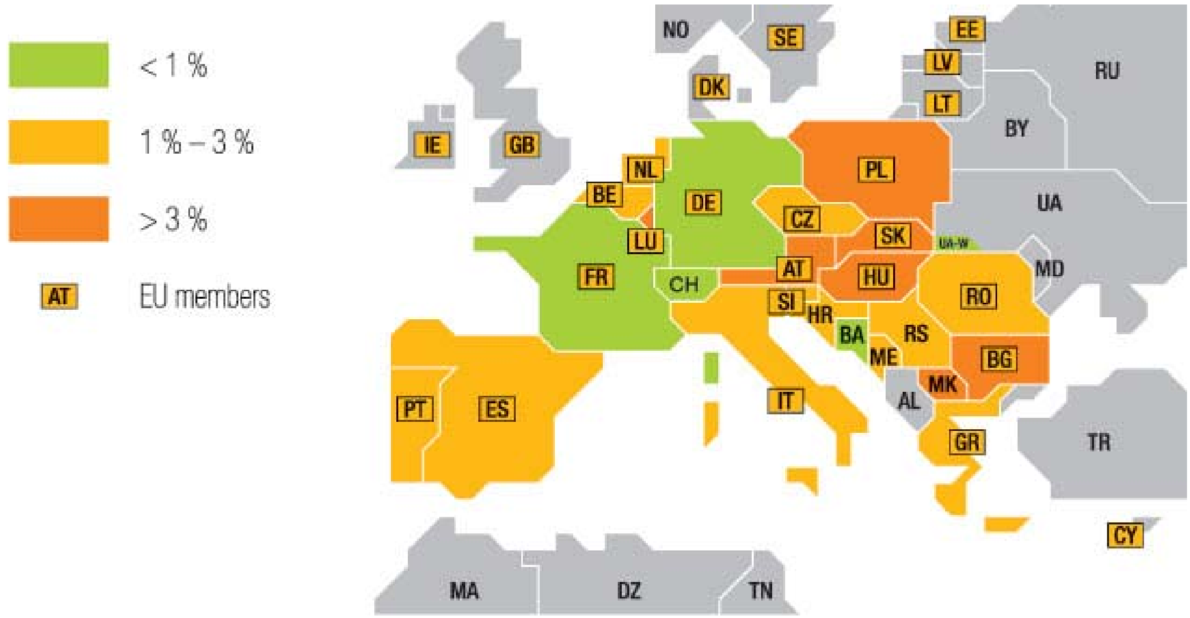
Energy consumption in the UCTE system increased by +1.4% in 2006 up to 2539.3 TWh.

Figure 4 UCTE Seasonal Energy Consumption and Growth Rate Retrospect



Winter and summer respectively refer to Winter Semester (Q1+Q4) and Summer Semester (Q2+Q3) of the same calendar year 2006. Apart from 2003 and its extreme weather conditions, the increase of the UCTE annual energy consumption has been quite stable over the last 2 years.

Figure 5 National Annual Energy Consumption Growth Rate

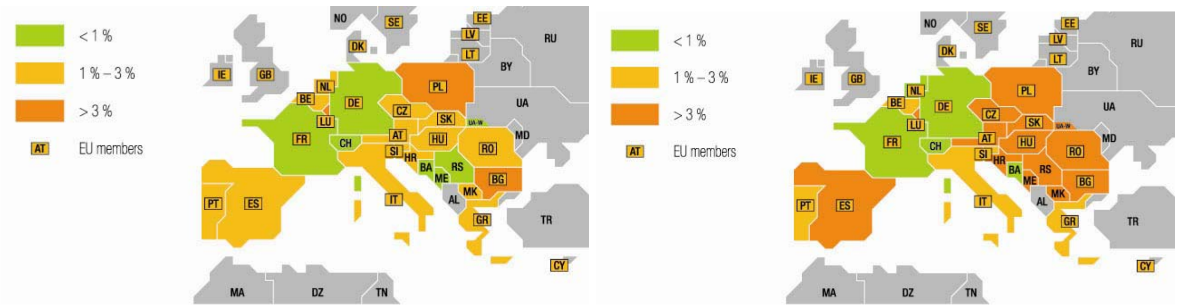


In 2006, the annual energy consumption highest growth rates were observed in Luxembourg with +6.3%, in Poland with +4.5%, in Bulgaria with +3.8%, in Slovakia and FYROM with +3.5%, in Hungary with +3.3% and finally in Austria with +3.2%.

Annual energy consumption has actually decreased by –1% in France and slightly increased by +0.7% in Germany.

Figure 6 National Seasonal Energy Consumption Growth Rate

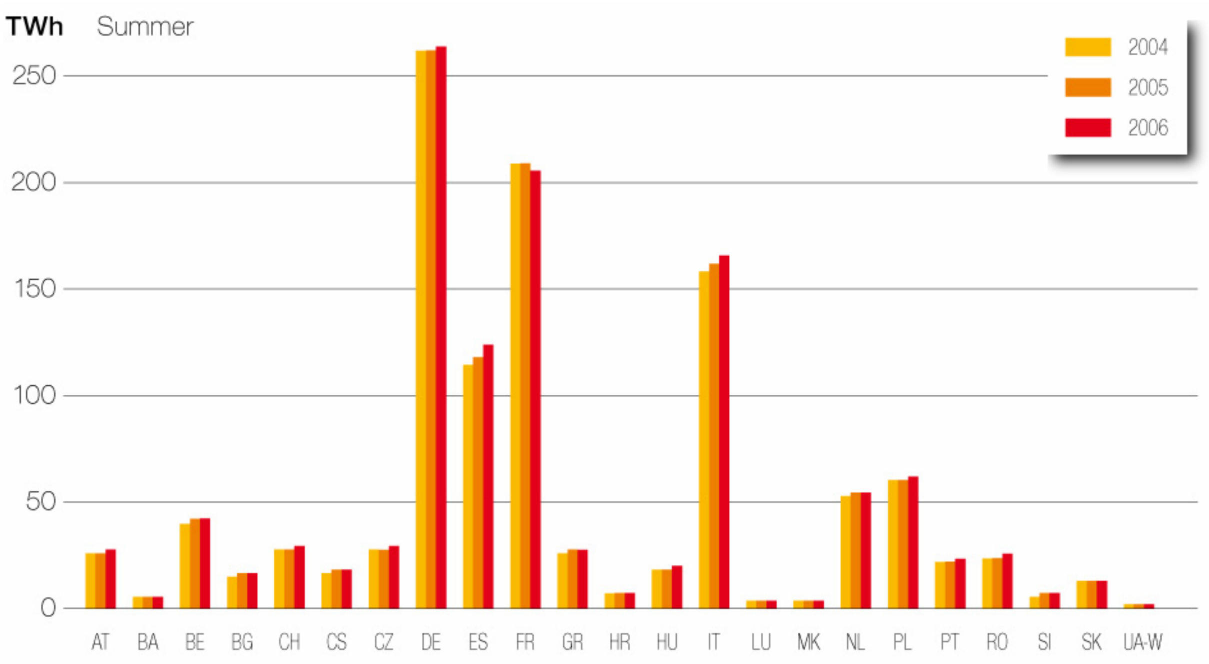
Winter remarks Summer remarks

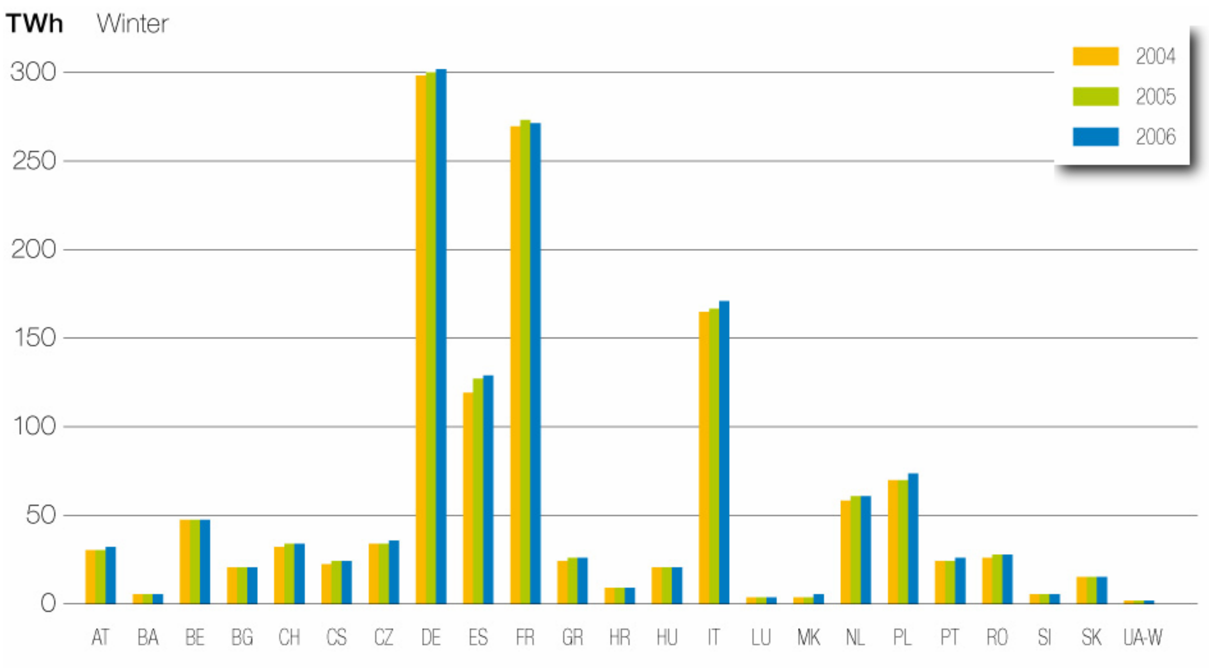


In 2006, Spain and most of the countries in the Eastern part of the UCTE system experienced a higher energy consumption growth rate in the summer semester than in the winter one. Spain had the highest summer semester energy consumption growth rate with +3.6%.

The exceptions were Switzerland, France, Greece, Italy, Luxembourg, the Netherlands and Slovenia.

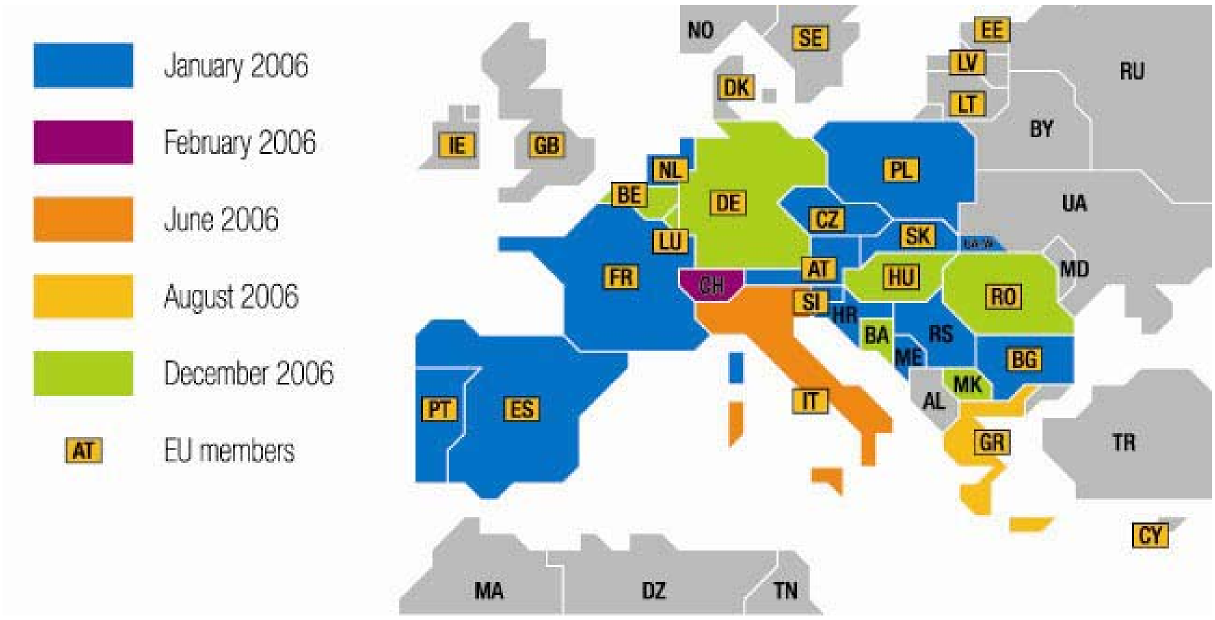
Figure 7 National Seasonal Energy Consumption Retrospect





2.2.2 National Peak Load

Figure 8 National Annual Peak Load Period



Peak load has been reached in winter in most of the countries except in Italy and in Greece were the impact of air-cooling systems is more important than the one of heating systems.

Table 5 National Annual Peak Load Characteristics

	Occurrence			Temperature		Peak Value		
	Day	Date	Time	Daily Average °C	Average Deviation °C	2006 MW	2006- 2005 %	Historical MW
AT	mercredi	25-janv	18:00	n.a.	n.a.	9.481	3,2	9.481
BA	vendredi	29-déc	18:00	n.a.	n.a.	2.019	0,7	2.019
BE	lundi	18-déc	17:45	2,0	-2,3	13.848	0,9	13.943
BG	mercredi	25-janv	18:00	-10,5	-6,0	6.930	6,6	8.332
CH	mercredi	15-févr	10:15	-3,0	-6,5	10.218	4,4	10.218
CS	jeudi	26-janv	18:00	-3,2	-6,2	7.699	1,0	7.799
CZ	mercredi	25-janv	15:00	-9,9	-9,1	10.484	4,7	10.484
DE	lundi	11-déc	17:30	3,4	1,8	77.800	1,4	79.700
ES	lundi	30-janv	20:00	6,3	-2,2	42.153	-2,8	43.378
FR	vendredi	27-janv	19:00	-1,1	-6,7	86.280	0,3	86.280
GR	lundi	21-août	13:00	36,0	4,0	9.889	4,2	9.889
HR	mercredi	25-janv	20:00	n.a.	n.a.	3.036	4,7	3.036
HU	mercredi	13-déc	17:00	-0,7	-4,3	6.074	-0,1	6.080
IT	mardi	27-juin	11:00	28,0	6,0	55.619	1,1	55.619
LU	mardi	12-déc	18:00	0,3	-3,5	1.035	-1,1	1.046
MK	dimanche	31-déc	18:00	-2,0	n.a.	1.565	5,0	1.565
NL	jeudi	12-janv	17:30	1,9	-0,9	16.496	-2,5	17.334
PL	mardi	24-janv	18:00	-18,4	-17,8	22.673	4,6	(*) 24685
PT	lundi	30-janv	20:30	6,3	-3,5	8.804	3,2	8.804
RO	mercredi	13-déc	17:00	2,5	3,5	8.151	0,6	10.248
SI	jeudi	26-janv	19:00	-6,7	-5,0	2.075	0,1	2.075
SK	jeudi	26-janv	18:00	-10,4	-13,3	4.423	1,8	4.471
UA-W	mercredi	25-janv	19:00	-15,4	7,8	1.028	0,4	1.028

(*) The Polish peak load in 2006 is a net value whereas the historical value was a gross value.

In 2006, the annual peak load increased all over UCTE except Spain with –2.8%, the Netherlands with –2.5%, Luxembourg with –1.1% and Hungary with –0.1%. The growth rate was above +3% in FYROM, Croatia, Switzerland, Greece, Portugal and Austria.

In 11 of the 23 countries of the geographical perimeter, the peak load observed in 2006 superseded the historical peak load observed up to 2005.

2.2.3 National Comments

BA – Bosnia-Herzegovina

There are no significant differences between consumption in 2005 and 2006.

The annual peak load in 2006 was the historical peak load.

CZ – Czech Republic

The consumption in the whole year rose about 2,4 % and about 3,2 % in the summer period. This raising was caused by very hot summer in 2006 and by higher using of the air condition. On the other side the relatively lower increasing in winter period was caused by warm weather period from October to December.

No load reduction measures were taken at the 2006 peak load even if these possibilities are still very limited. Significant deviations (more than 9 °C) from normal temperatures were observed in the whole week of occurrence.

DE – Germany

Similar climate conditions in winter as compared to the previous year. Temperatures in summer higher than in the previous year.

The load data published in the monthly statistics are provisional values. An update in the UCTE-database will be made according to the values in this document.

FR – France

2006 was marked by very cold periods up from the end of January (with a new historical peak load) until mid-April and by mild temperatures at the end of December.

Overall, these deviations from the seasonal norm resulted in consumption +6.5 TWh higher than expected. The heat wave that occurred during July, meanwhile, saw electricity consumption figures almost 1 TWh higher than normal. Nonetheless, the total increase of +7.5 TWh caused by climatic contingencies was lower than the +11.5 TWh one recorded in 2005.

No load reduction measures were taken at the peak load.

The use of pumped storage rose by 12.6 %. The 2006 pumped storage amount came back to levels recorded during the years from 2002 to 2004.

GR – Greece

In 2006, the increase in consumption comparing with 2005 was 2,1% which is lower increase than the one observed last year (3.2%). Especially in summer, despite the high peaks, the increase in consumption was very low. The climatic conditions were close to the average with some fluctuations of the temperature that caused the high peaks of the load. Consumption growth in summer semester was 1.7% while in winter it was 2.5%.

On 21.8.2006 the annual peak load was recorded. The mean hourly value recorded by our energy meters was 9889 MW. The increase of the load compared to the peak of the previous year is 4.19%. The average temperature observed during that day in Athens was 36 °C but the highest was 42 °C.

The load reduction measures taken concern the reduction in irrigations that were not allowed on peak hours. PPC as the dominant supplier of the country introduced special prices for eligible customers connected to HV and MV aiming at voluntary load reduction on peak hours.

Pumps were in operation during the night when the load was low. Expensive hydro energy was saved by consuming cheaper electrical energy produced by lignite.

IT – Italy

On summer period very high temperatures recorded with consequent increase of the demand. For the first time on June, the country reached his historical peak of the load.

A very mild winter season with temperatures over the average has marked the last part of the year with sensible decreasing of the demand.

LU – Luxembourg

With an average temperature of 3,8 °C December 2006 was milder than December 2005 which has an average temperature of 1 °C.

No load reduction measure was taken at the peak load.

MK – Former Yugoslav Republic of Macedonia

No load reduction measures were taken at peak load.

NL – The Netherlands

The growth of the consumption in 2006 was in line with that of the last years. In general no exceptional trends towards climatic conditions can be concluded.

The peak load of 2006 happened contrary to most years in January and not in December, probably because the month of December 2006 was relatively warm. The peak load was 2,5 % lower than the year before, and 4,8 % lower than the historic highest peak load of 2004. The sky on the 12th of January was cloudy, but there was no precipitation. No as far as we know there were no load reduction measures at peak load.

There is no pumped storage in the Netherlands.

PL – Poland

Consumption in the year 2006 increased at about 4,5% in relation to the year 2005. This fact, besides steady growth observed in few latest years, was also caused by heavy winter in January and hot summer.

Due to extremely cold weather in January, the peak demand in Polish power system reached its highest ever level since 1988 with 22673 MW / 24640 MW (net / gross value). Gross value to compare with 24 685 GW historical peak load (gross value only). No load reduction.

Decrease of the energy used by pumps was caused by a long-term maintenance of upper reservoir in Żarnowiec pumped-storage power plant (the biggest hydro power station in Poland). Moreover, since October Polish TSO has had the intervention reserves in pumped-storage hydropower stations at his full disposal.

PT – Portugal

In 2006 the consumption increased 2.6%. With correction of temperature and working days this value rise to 3.2%.

RO – Romania

The 2006 consumption was a little bit greater than the 2004 consumption and it cannot be explained only in relation with the climatic conditions due to a relative economical growing in 2006.

The peak load from 2006 and the peak load from 2005 have close values. The temperature recorded on the days of the 2006 and 2005 year's peak load had close values as well.

According to Energy Balance table the consumption formula (E9=E6+E7+E8) includes the pumped consumption as well. This consumption value is not in accordance with the national electrical consumption definition.

SI – Slovenia

Consumption was not so much higher with the respect to the year 2005 as it was in the year 2005 with the respect to the year 2004.

Load data in the monthly statistics include operational counter data, load data in the table below include the verified counter data without network losses included. No load reduction measure was taken at peak load.

SK – Slovak Republic

From January till October there was higher consumption, especially in January (+5,6%) and in June, July, August (about +8 %). The winter 2005/2006 was very hard and summer 2006 was very hot and dry. December 2006 was mild and we had -2,0 % decrease of consumption.

Increase of the maximum load due to the hard winter. No load reduction measures were taken at peak load.

2.3 Generating Capacity

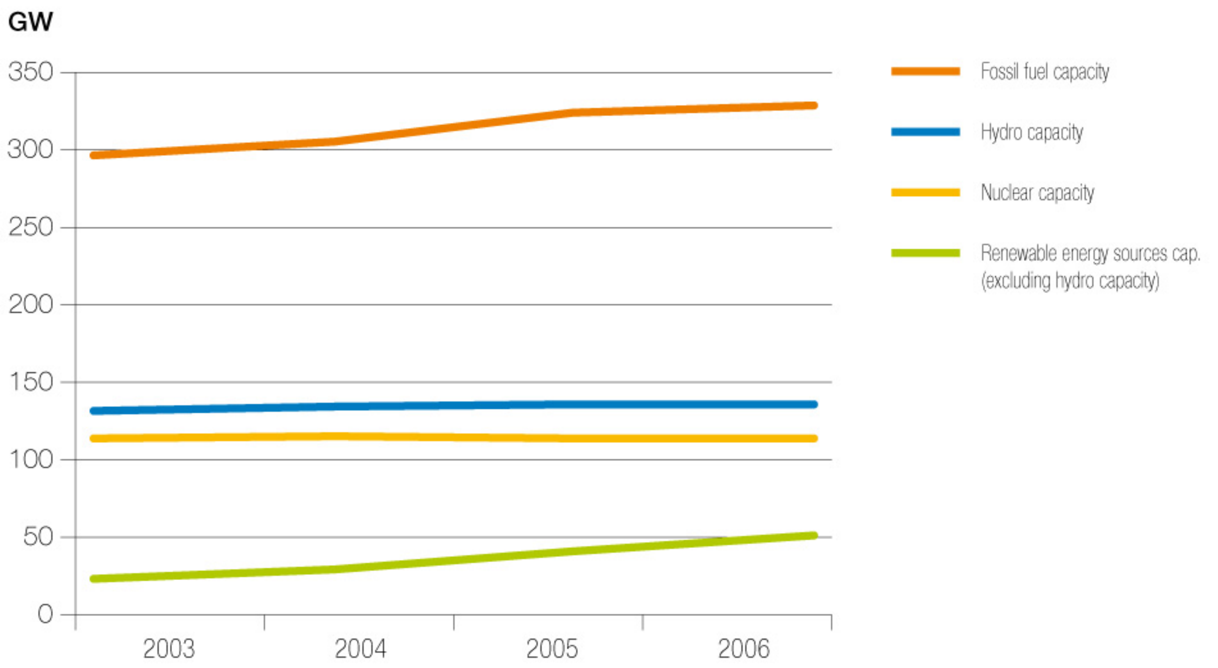
2.3.1 UCTE Outline

Table 6 UCTE Generating Capacity Retrospect in December

	2003 GW	2004 GW	2005 GW	2006 GW	2005 to 2006 GW	2005 to 2006 %
Hydro Capacity	129,4	132,2	134,7	134,8	0,1	0,1
Nuclear Capacity	112,8	113,3	112,7	112,4	-0,2	-0,2
Fossil Fuel Capacity	294,8	303,4	322,6	327,0	4,5	1,4
Renewable Energy Sources Capacity (exclud. hydro capacity)	21,8	27,7	39,9	49,2	9,3	23,3
Non Clearly Identifiable Energy Sources	1,9	1,7	1,4	1,6	0,2	13,0
Total Generating Capacity	560,7	578,4	611,3	625,1	13,8	2,3

The total installed generating capacity in the UCTE increased of 13.8 GW up to 625.1 GW by the end of 2006. It came with an annual growth rate of +2.3% after +3% in 2005.

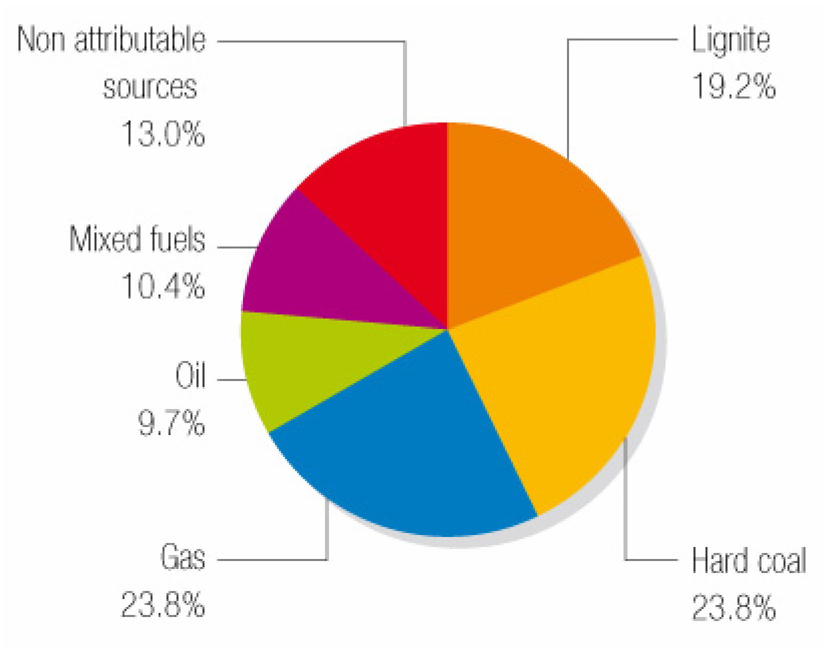
Figure 9 UCTE December Generating Capacity Retrospect



The global trend was still up mostly due to a continuous increase of the RES capacity excluding hydro, which was of 49.2 GW at the end of 2006 including 39.0 GW of wind power capacity. The RES capacity annual growth rate was +23.6% in 2006 after +21% in 2005, excluding hydro.

Yet, the generating capacity mix was quite stable with more than half of the generating capacity burning fossil fuel.

Figure 10 UCTE Fossil Fuel Generating Capacity Mix



The fossil fuel generating capacity mix has been monitored from 2006 on and its evolutions will be reported next year. Both hard coal and pure Gas power plants represent a quarter of the fossil fuel generating capacity in 2006.

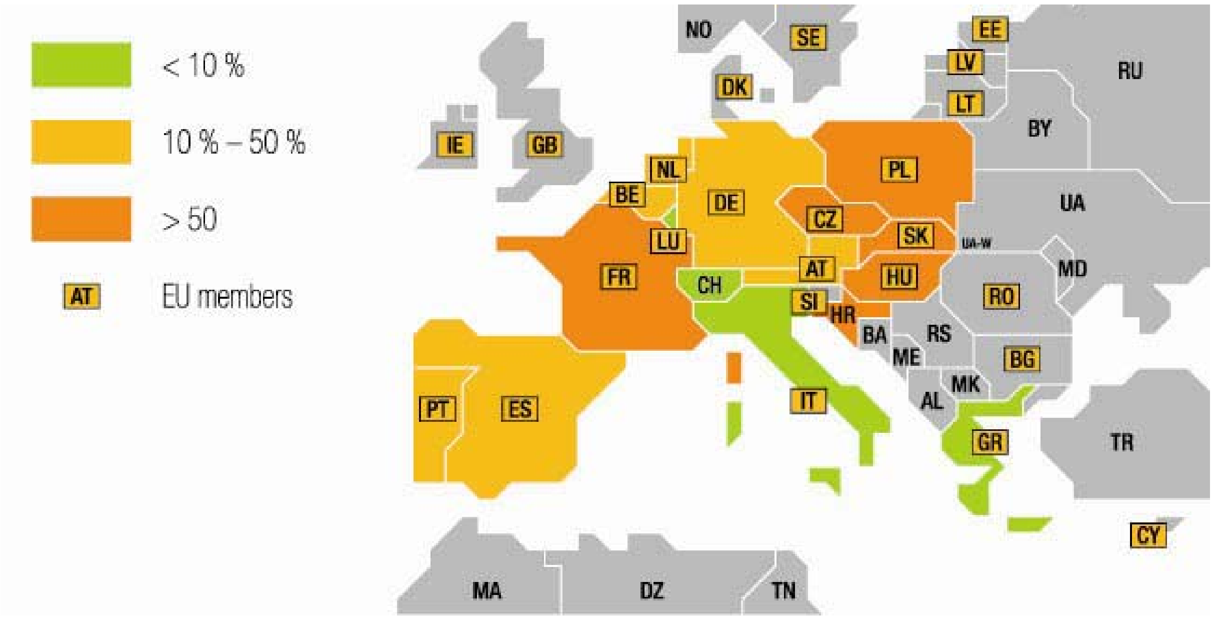
Figure 11 National Net Generating Capacity Growth Rate

The growth rate is based on the capacity at the end of 2005 and 2006.

The generating capacity increased all over UCTE except in the Slovak Republic with an annual growth rate of –5.4%, due to the shutdown of the Jaslovske Bohunice 440 MW nuclear power plant on December 31st 2006.

In 2006, annual growth rate higher increases took place in Portugal with a strong +6.4% and in Greece with +4.5%. Germany, Spain and Romania got a +4% growth rate whereas Italy had +3.8%.

Figure 12 National RES Capacity Growth Rate Excluding Hydro



RES capacity excluding hydro increased all over UCTE.

No RES generating capacity other than hydro power generating capacity has yet been reported in Bulgaria, Romania, FYROM, Bosnia-Herzegovina, Slovenia and the Serbia and Montenegro aggregate.

2.3.2 National Comments

AT – Austria

Power plants <10MW are not considered.

The 330 MW lignite power plant Voitsberg 3 was shutdown on April 13th 2006.

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.

BE – Belgium

The major power plants that have been shutdown in 2006 were the 23 MW gas power station Angleur TG8 in August 2006, the 92 MW hard coal/blast furnace gas power station Monceau 3 in September 2006 and the oil power stations HAM-GENT D1 (20 MW) and HAM-GENT D2 (27 MW) on November 2nd 2006.

The major new power plants that have been commissioned in 2006 were the 136 MW gas power station INESCO in July 2006 and the 39 MW waste burning power station SLECO in July 2006.

The net generating capacity of renewable energy sources (other than hydro) contained 243.4 MW of net generating capacity in centralized power stations at the end of 2006.

CZ - Czech Republic

The major power plant commissioned in 2006 was the 45 MW gas power station Kladno (ECKG unit GT 8) on October 23rd 2006.

ES – Spain

The major power plants commissioned in 2006, all of natural gas power stations, were the 720 MW Castelnou power station in June 30th 2006, the 391 MW Colón 4in November 18th 2006, the 3 times 385 MW El Fangal 1, 2 and 3 in November 30th 2006 and the 804 MW Escombreras 6 in November 8th 2006.

The major shutdown was of the 142 MW nuclear power station José Cabrera in April 30th 2006.

FR – France

The major shutdowns in 2006 were the 480 MW hard coal power stations VAIRES 1&2 in January 2006 and the 234 MW gas power station DUNKERQUE 3&4 in January 2006 too.

As of 31st December 2006, the maximum installed capacity of fossil fuel power stations connected to the RTE network is 20 950 MW of which 3 780 MW are mothballed.

The total installed capacity on the RTE network fell by around 1,000 MW (the main reductions were in conventional thermal generation, and to a lesser extent in hydroelectric generation).

There was a substantial rise in installed capacity on the HTA distribution grids (+1,220 MW) with:

- an increase of 715 MW in generation from renewable sources (other than hydropower), mainly due to a rise of 610 MW in wind generation,
- an increase of 355 MW in generation from cogeneration installations,
- a rise of 150 MW in hydro-electric generation.

GR – Greece

LAVRION V is a new 378 MW combined cycle unit installed by PPC in the area of Athens. The unit was synchronised in March 2006 and entered into test operation but it was fully available all year long.

MEGALOPOLI H/Z is a 60 MW fossil fuel power station, which was temporarily commissioned from June to September 2006.

HR – Croatia

No major power plants were not commissioned or shutdown in 2006.

HU – Hungary

The major power plants commissioned in 2006 , all of fossil fuel power type, were the 49 MW Kelenföld II.(condensing unit) on August 1st 2006 and the 12 MW TEVA Gödöllő on January 20th 2006.

The major shutdown was of the 13 MW fossil fuel power station Hatvani Cukorgyár on January 1st 2006.

IT – Italy

The major power plants commissioned in 2006 were 2790 MW of combined cycle type i.e. gas power stations made of 760 MW Torviscosa in January, 740 MW Energia Termoli in February, 3 times 370 MW Enipower Brindisi in May, Roselectra in July and S. Barbara in August, 2 times 240 MW Teverola and Sparanise in June and 40 MW Tenarisa Dalmine in November.

Other major power plants commissioned in 2006 were wind power stations made of 40 MW Monte Cute and 72 MW Sant'Agata di Puglia in November, 41 MW Daunia Calvello, 20 MW Poggi Alti, 17 MW Contrada Colla and 24 MW Vizzini in December, 29 MW Montemurro in March and 15 MW Troia in July.

MK – Former Yugoslav Republic of Macedonia

There are no major plants which have been commissioned or shutdown in 2006.

NL - The Netherlands

The major power plant commissioned in 2006 was the 60 MW offshore wind-park in November 2006.

PL – Poland

The major power plant commissioned in 2006 were the 50 MW Tymień wind farm in April 2006 and the 87 MW hard coal power station Żerań in August 2006.

These generating units were commissioning according to the schedule.

PT – Portugal

In 2006 about 40 wind farms were commissioned totalising about 600 MW.

The major power plants commissioned in 2006, all of wind power type, were the 108 MW Pinhal Interior in December, the 96 MW Candeeiros in July, the 76 MW Caramulo in November and the 90 MW Pampilhosa da Serra in April.

RO – Romania

The major power plants commissioned in 2006 were the 10 MW hydro power station Valenii de Munte in January 2006, the 130 MW hard coal power station Paroseni 4 in September 2006, the 88 MW made of small fossil fuel plants and the 59 MW capacity made of small hydro units. The commissioning dates are not available for these 2 sets of small units due to the fact that they do not belong to any dispatching centre authority.

The major power plants shutdown in 2006, all of mixed oil / gas power type shutdown in December 2006, were the 147 MW CET Borzesti 4-5--6, the 55 MW Galati 1, the 93 MW Galati 2 and the 41 MW capacity made of small power plants.

The generation capacity difference regarding fossil fuel power stations between the values for December 2005 and for December 2006 is due to the increase of both auxiliary services consumption and block transformers' loses.

SI – Slovenia

The major power plant commissioned in 2006 was the 3 x 13 MW Bostanj hydro power plant on May 25th 2006.

Due to environmental requirements in the national energy plan, wind power capacity is foreseen in the next 8 years to a total capacity around 200 MW.

SK – Slovak Republic

The major power plant shutdown in 2006 was the 440 MW Jaslovske Bohunice nuclear power plant on December 31st 2006.

In 2006, the Italian company ENEL took a control over 66 % shares of the company Slovenské elektrárne, a.s. During the year 2007 ENEL will decide on the potential completion/finalisation of the two 440 MW blocks of the Nuclear Power Plant in Mochovce.

2.4 Energy Generation

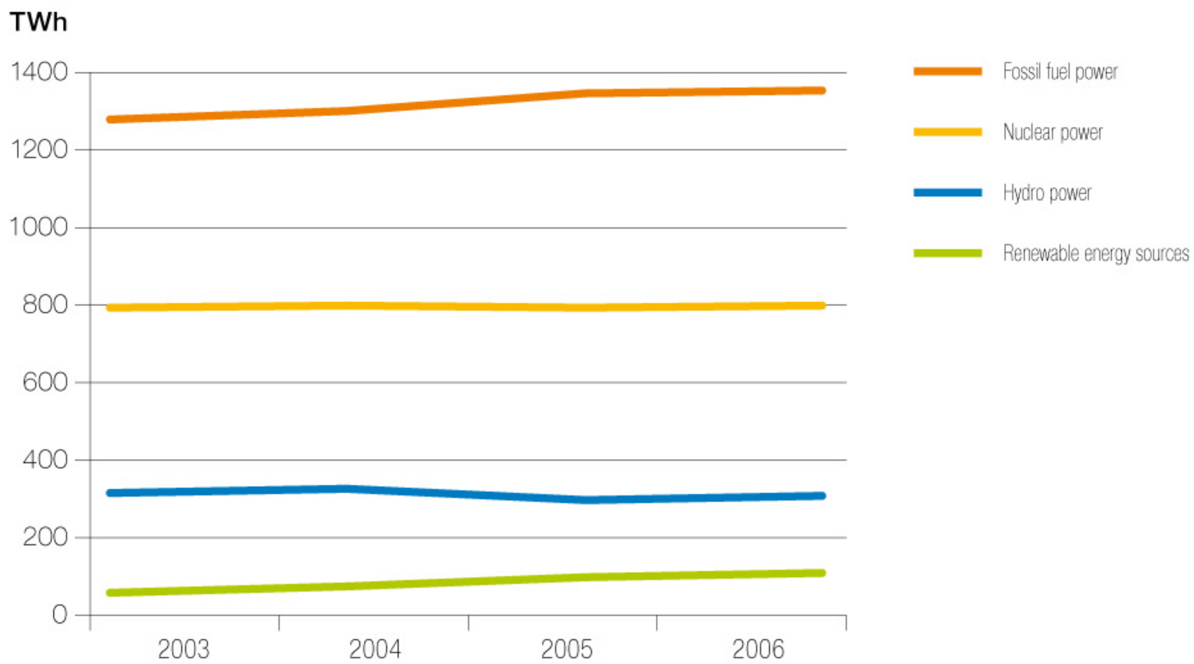
2.4.1 UCTE Outline

Table 7 UCTE Generation Retrospect

	2003 TWh	**2004 TWh**	**2005 TWh**	**2006 TWh**	**2005 to 2006 TWh**	**%**
Hydro Power	312.5	321.3	294.8	307.8	13.0	4.4
Nuclear Power	788.1	797.4	791.4	801.0	9.6	1.2
Fossil Fuel Power	1271.1	1 296.4	1 349.6	1 355.8	6.2	0.5
Renewable Energy Sources (excluding hydro)	54.8	76.5	94.2	109.5	15.3	16.2
Not Clearly Identified Sources	27.0	9.4	8.5	10.1	1.6	18.9
Total Generation	2453.5	2 501.0	2 538.5	2 584.1	45.7	1.8

The annual generation in the UCTE in 2006 was 2584.1 TWh with a growth rate of +1.8% i.e. +45.7 TWh more than in 2005.

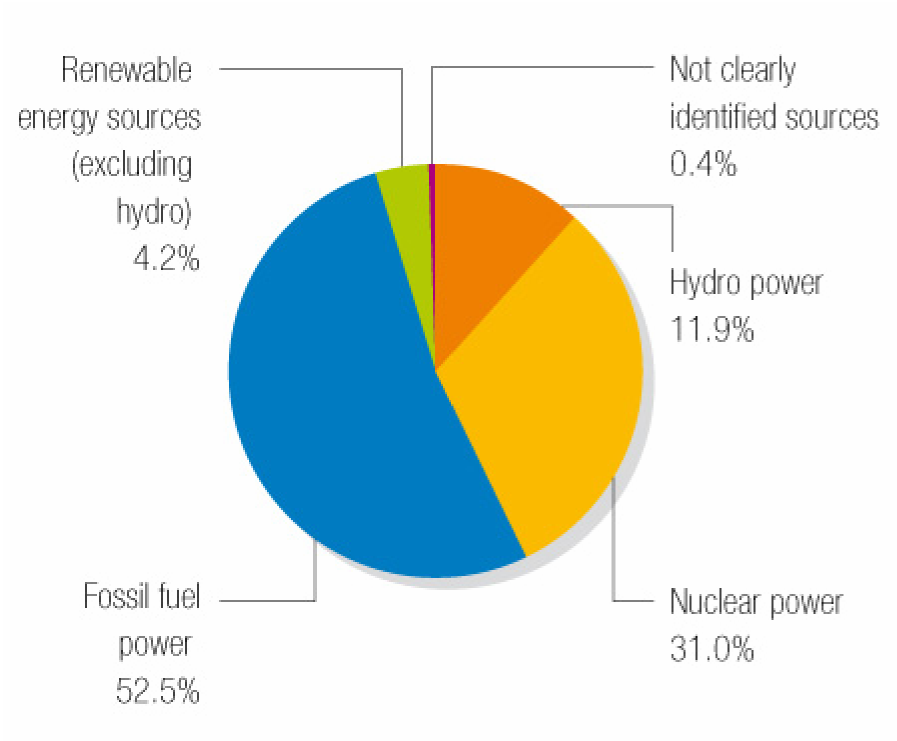
Figure 13 UCTE Generation Retrospect



Fossil fuel generation is the greatest increasing generation of all in the UCTE system while nuclear power and hydro power generations are quite stable.

RES generation excluding hydro generation has greatly increased at the UCTE level.

Figure 14 UCTE Generation Mix



In 2006, fossil fuel plants have generated more than half of the UCTE generation and nuclear plants a third.

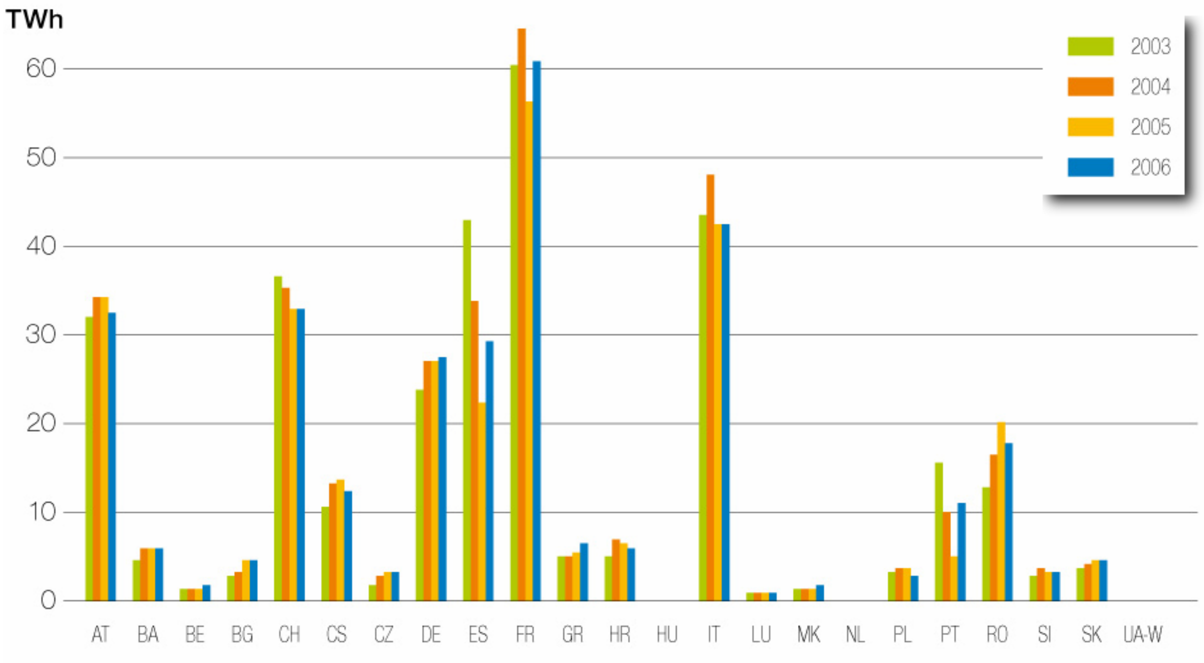
Including hydro generation, renewable energy sources have reached 16% of UCTE generation.

2.4.1.1 Hydro Power

Unlike in 2005, favourable weather conditions in 2006 made hydro power generation increase by +13.0%.

In 2006, almost 75% of the total UCTE hydro power generation have been generated in France, Italy, Switzerland, Austria, Spain and Germany.

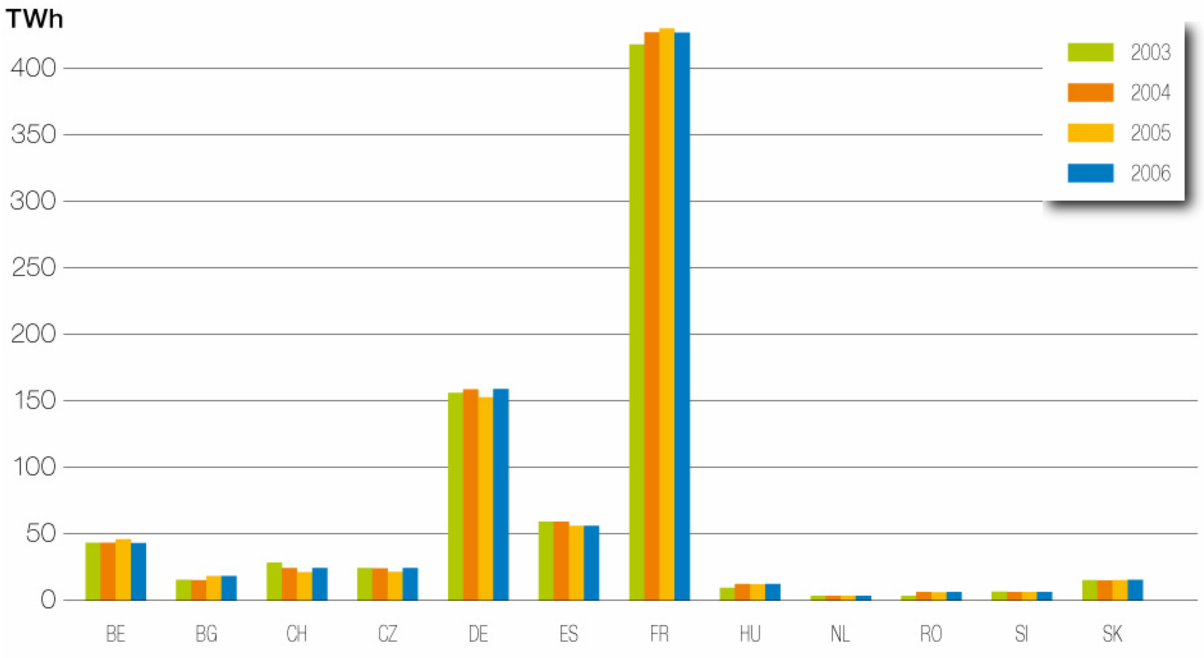
Figure 15 National Hydro Generation Retrospect



2.4.1.2 Nuclear Power

Almost 75% of the total UCTE nuclear generation have been generated in France and Germany in 2006.

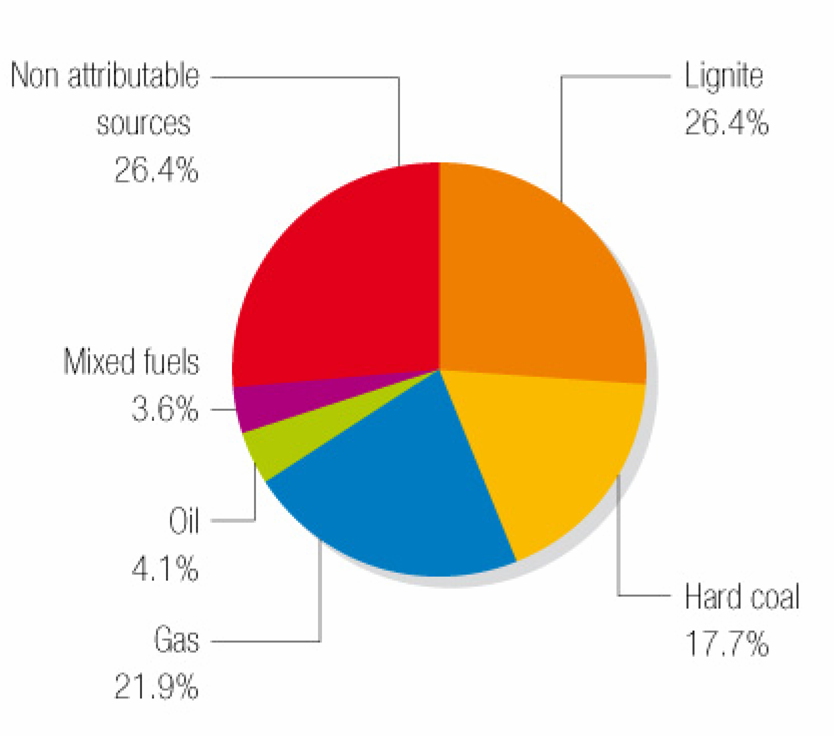
Figure 16 National Nuclear Generation Retrospect



2.4.1.3 Fossil Fuel

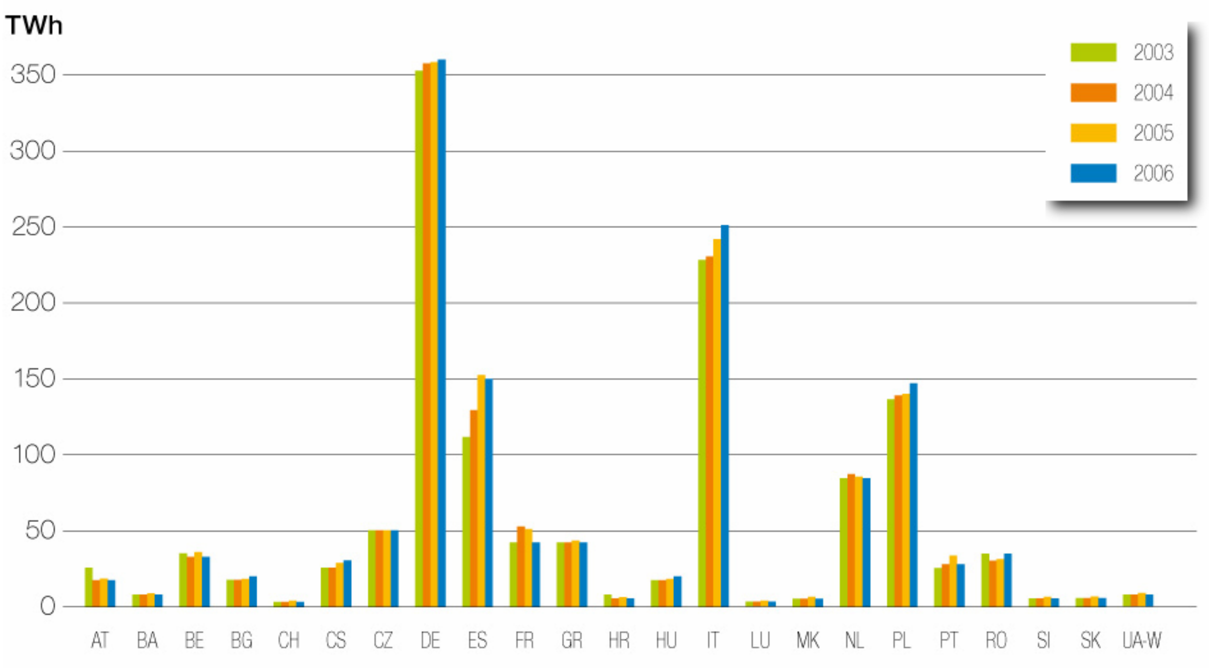
As far as fossil fuel generation is concerned, lignite was in 2006 the most important fuel prior to gas and hard coal. Although, mixed fuel generation is segregated from this UCTE System Adequacy Retrospect analysis, more and more power plants burn other kinds of fossil fuel mixes. The share of the mixed fossil fuel generation in the total fossil fuel generation went up to 30% in 2006.

Figure 17 UCTE Fossil Fuel Generation Mix



More than 50% of the total UCTE fossil fuel generation have been generated in Germany, Italy and Spain in 2006.

Figure 18 National Fossil Fuel Generation Retrospect



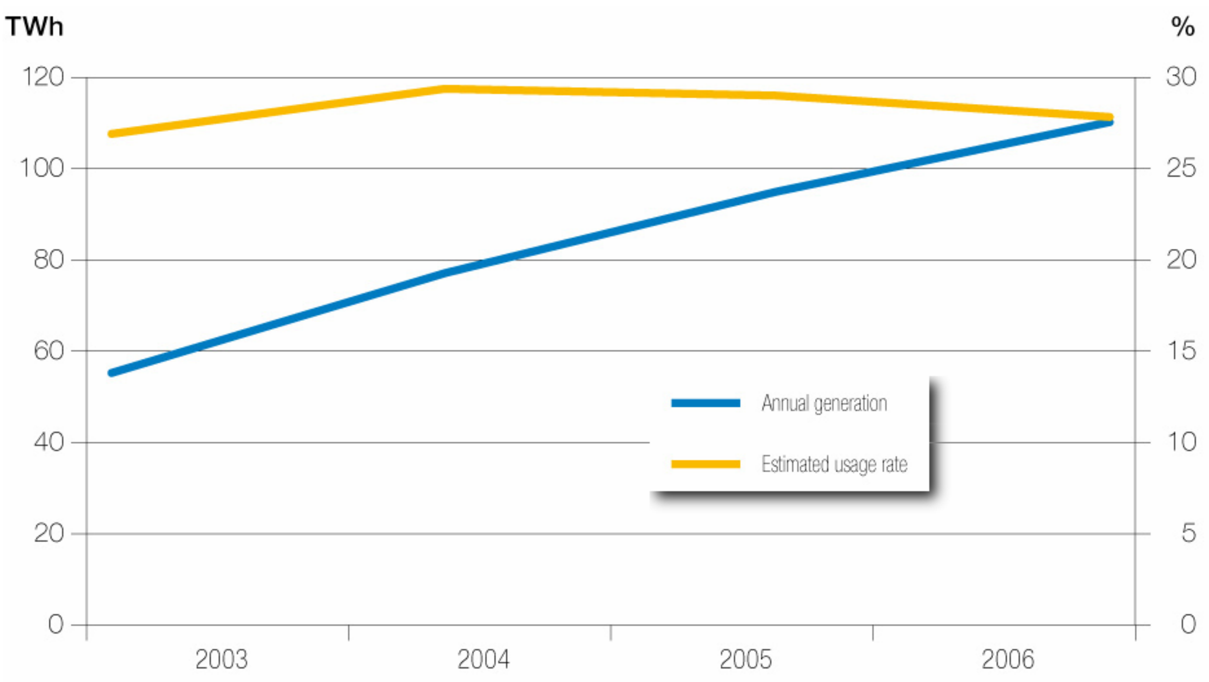
Fossil fuel generation has decreased in 2006 in Spain, Portugal, Belgium and France only.

2.4.1.4 Renewable Energy Sources Excluding Hydro

Renewable energy sources generation excluding hydro generation increased up to 109.5 TWh.

The total generation out of any type of renewable energy sources has increased in 2006 by +20% up to 417.3 TWh but its growth rate is slowing down.

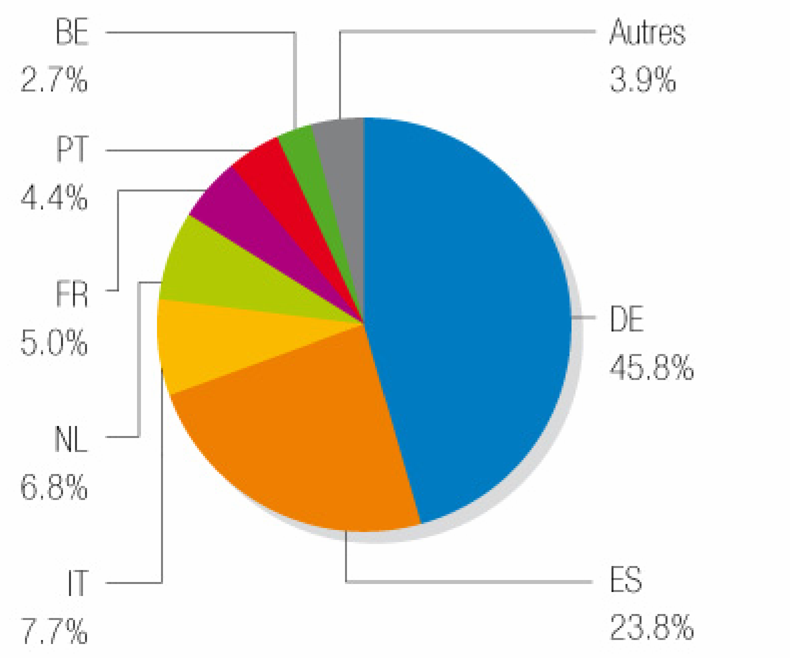
Figure 19 UCTE RES Estimated Usage Rate Retrospect Excluding Hydro



Generating capacity annual usage rate is estimated as the ratio of the actual generation to the average installed capacity.

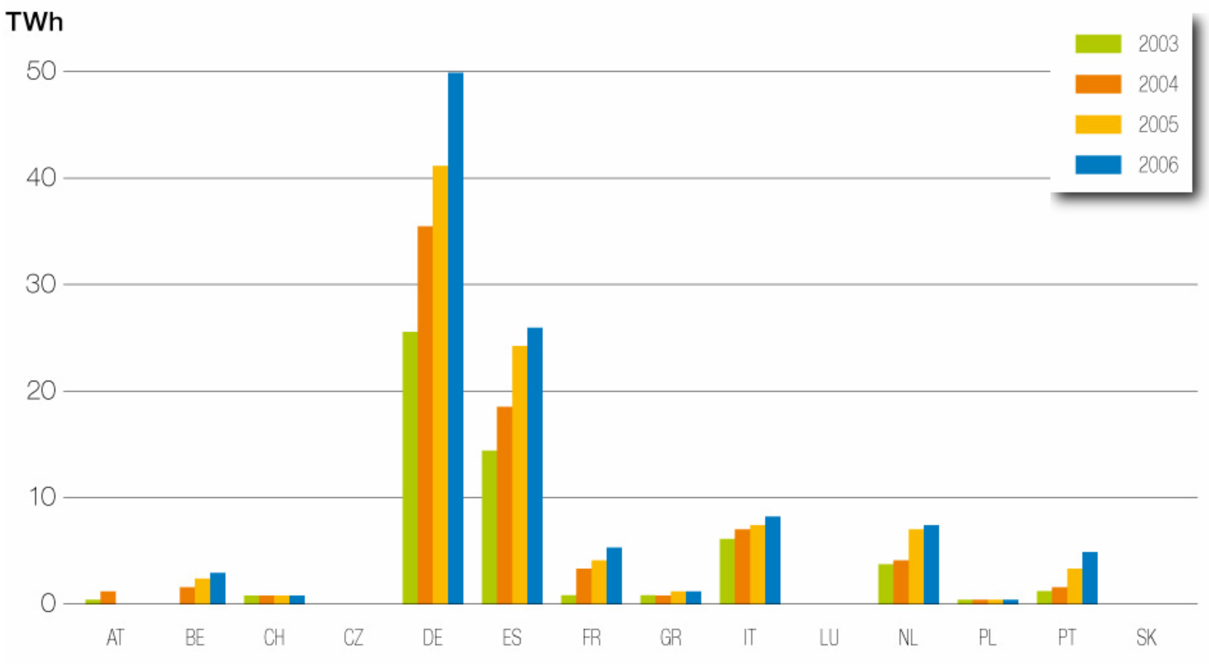
Although the annual generation from RES excluding hydro was increasing year after year, the usage rate was decreasing because most of the additional RES power plants were wind power plants. Therefore, even if capacity has highly increased, the generation has not increased as much as it could have been expected.

Figure 20 National Shares in the UCTE RES Generation Excluding Hydro



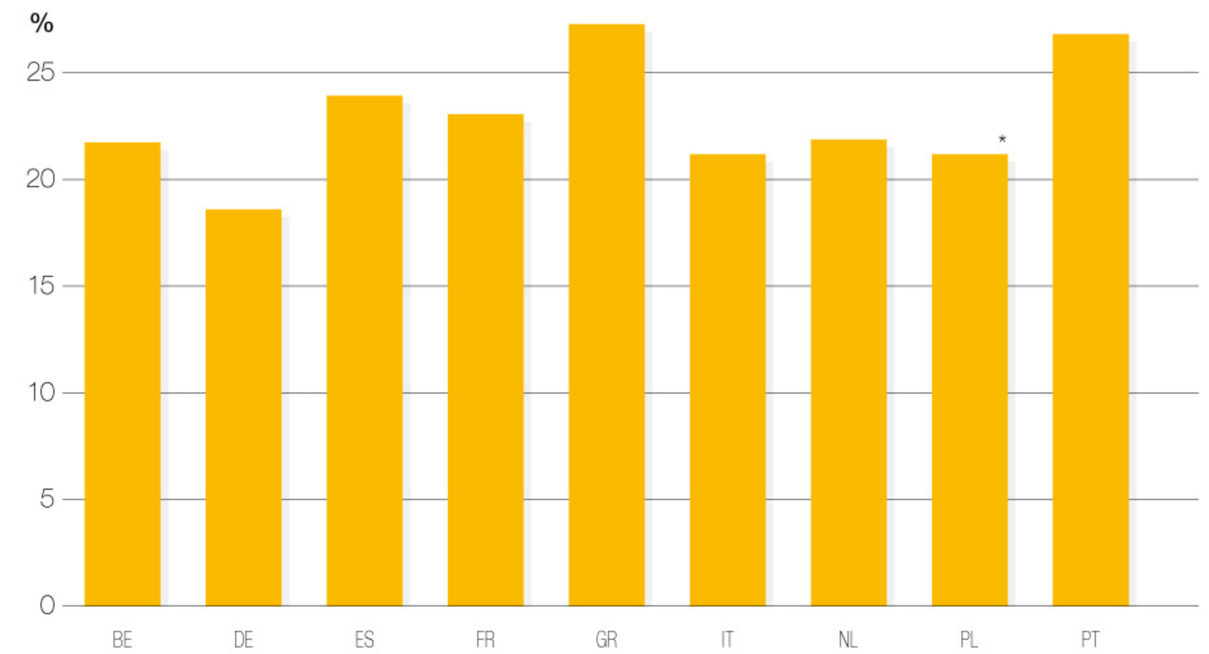
RES generation excluding hydro generation in Germany and Spain represented almost 75% of the total RES generation excluding hydro generation in the UCTE system in 2006.

Figure 21 National RES Generation Retrospect Excluding Hydro



Germany is where the RES generation excluding hydro generation increase was the most significant with +8.7 TWh, followed by Spain with +1.6 TWh.

Figure 22 National Wind Power Estimated Usage Rate



(*) The Polish wind power usage rate has not been estimated by UCTE but calculated accurately by PSE-Operator S.A.

In order to be relevant enough, the wind power usage rate is estimated for the countries with more than 100 MW annual average installed capacity.

2.4.2 National Comments

BA – Bosnia-Herzegovina

Hydro conditions in 2006 were worse than in 2005, so the hydro production has decreased by –2,4%.

The generation of conventional thermal power stations has increased by +12,8%, in relation with lower hydro generation and higher export volume.

BE – Belgium

The national generation was 2.4% lower in 2006 as compared to 2005. The fossil fuel generation went down by 4.4%. Nuclear generation decreased by 2.2%. However, hydro generation and renewable energy sources generation increased by respectively 1.1% and 22.2%.

CZ – Czech Republic

The hydro production went up of about 7.5 % due to better weather condition then in previous year.

Significant increasing of the nuclear production of about 5.3 % was observed in 2006.

Both the amount of the production and using of the fuel types were approximately the same as in 2005.

The renewable sources production rose up about 173 %. But the share of renewable energy production is still quite negligible.

The not clearly identifiable energy sources data contain values of production from the biomass burned in the boilers of coal power stations. The amount was 516 GWh in 2005 and we suppose the production more than 550 GWh in 2006.

DE – Germany

A slight increase in hydro generation of about 2 % has been observed as compared to the previous year.

Nuclear power stations generation increased by about 3% as compared to the preceding year. Accounting for 27% of electricity production it still has the highest share in total generation.

The generation of conventional thermal power stations has increased by about 0.4%.

Wind power generation increased by 12%. Its share in total production amounted to more than 5%. The share in total production of renewable energy sources amounted to nearly 12% and reached almost the EU requirements for 2010 (12.5%).

Forecast values on the basis of reference power plants have been used for the monthly statistics. Updates of the monthly statistics will be done during this year.

FR – France

The hydro-electric generation rose by +8.4% compared with 2005, as a result of more favourable water conditions instead of dry ones in 2005.

The fossil fuel power stations generation fell by 9.6 % due to its role of achieving balance between demand and generation.

Generation from renewable sources other than hydro rose by +27.7% i.e. +1.2 TWh. In 2006, it accounted for a total of 5.5 TWh, with 2.2 TWh of that amount produced by wind farms. The volume of wind generation rose by +126% compared with 2005, in line with the increase of the installed capacity.

GR – Greece

The overhauls of the hydro power plants usually take place in low load periods. The level of hydro production only depends on the water reserves. In 2006 the hydro conditions were favourable for the longest part of the year. Production from hydro sources was higher than in 2005.

In 2006 the production from fossil fuel sources was decreased in comparison with the one in 2005. The total fossil fuel production represents the 84,63% of the total electricity production. The contributions of the different fuels are: lignite 68,38%, oil 7,78%, and natural gas 23,84%. The production from natural gas sources is gradually replacing the production from lignite.

There is no significant increase in production from renewable energy sources.

HR – Croatia

Production of hydro power stations was only lower (approximately 5% than in the year 2005) due to relatively favourable hydro conditions during the year 2006.

Production of fossil fuel power stations was approximately 4.6% higher than in the year 2005.

The second commercial wind park started to deliver electrical energy to Croatian power system in 2006 and therefore production in 2006 was higher than in 2005.

Renewable energy sources generations were taken into account under the category "thermal conventional net production" in the monthly statistics.

HU – Hungary

The RES estimated capacity usage rate is not applicable to Hungary due to the high share of biomass co-firing in coal fired power plants, which capacity is entirely included in the fossil fuel power capacity.

IT – Italy

The hydro production marked a sensible decreasing with respect the 2004 (-14,9%). Apart few months the remaining period of the year has been marked with a low hydro conditions with a historical minimum on July with respect to its multi-year average value.

The fossil fuel production has signed an increase of 4,2% with respect the 2005.

The total RES production has signed an increase of 13,3% with respect the 2005, especially sensible for the wind source (+37%).

These generations are taken into account in the monthly statistics and included in the thermal balance voice.

LU – Luxembourg

The hydro power is greatly influenced by the implementation of the pump storage plant

NL – The Netherlands

Hydro is only a small share, the given value is an estimation, no specific information available.

The given share is derived from data of our National Statistics Organisation. TenneT is not informed with specific information such as fuelling, performance and constraints.

The generation by renewable sources stayed nearby stable. Values of renewable production are now based on certificates of Enerq, a subsidiary of TenneT TSO B.V. So bio-fuels which are additional fuels in coal or gas-fired units are separated on basis of their caloric value and brought within the category "renewables". Another component in this category is municipal waste incineration.

There are no differences with 2005 not clearly identifiable energy sources values because the values are estimations. The generation by not clearly identifiable energy sources is normally included in the values of conventional thermal generation in the monthly statistics.

PL – Poland

Hydro generation was of 22% less then in 2005. This fact was caused by:

- Low level of water in river during the dry summer and autumn time,
- Overhaul in Żarnowiec pumped-storage power plant. This hydro power station was not available because of upper reservoir long-term maintenance. This is the biggest hydro power station in Poland, so this overhaul had the significant influence on total generation of hydro.

Strong winter in January 2006 and hot summer 2006 caused big increase of load. This load was covered by bigger generation of fossil fuel power station (The biggest hydro power station was in long-term maintenance).

Increase of net generating capacity of wind generation caused increase of generation of renewables with respect of year 2005. But, in fact the share of RES in global production in Poland is still not significant from the point of view of TSO.

Values in the SAR are the sum of generation from monthly statistics.

PT – Portugal

In 2006 the hydro conditions were regular. The hydro power production more than doubled the 2005 production.

The wind generation increased almost 70% comparing to previous year, reaching 6% of the consumption.

The generations are included in monthly statistics exactly as in the energy balance.

RO – Romania

On yearly bases the entire amount of wind farms generation is 1GWh. In the monthly statistic database the monthly values are too small to be recorded.

SI – Slovenia

The generation of hydropower stations between year 2005 and 2006 was similar with slightly increasing trend of production.

Generation of Nuclear power station NEK was in comparison with year 2005 about 6% lower, mostly because there was no overhaul in this station in year 2005.

No significant differences in the fossil fuel power stations generation compare to 2005.

SK – Slovak Republic

Hydro conditions caused significantly higher production in June (+42,6%) and November (+87%). But on the other hand, due to dry summer, extremely lower production was in August (-32%). Lower production was also in January (-23%), July (-18%) and October (-18%).

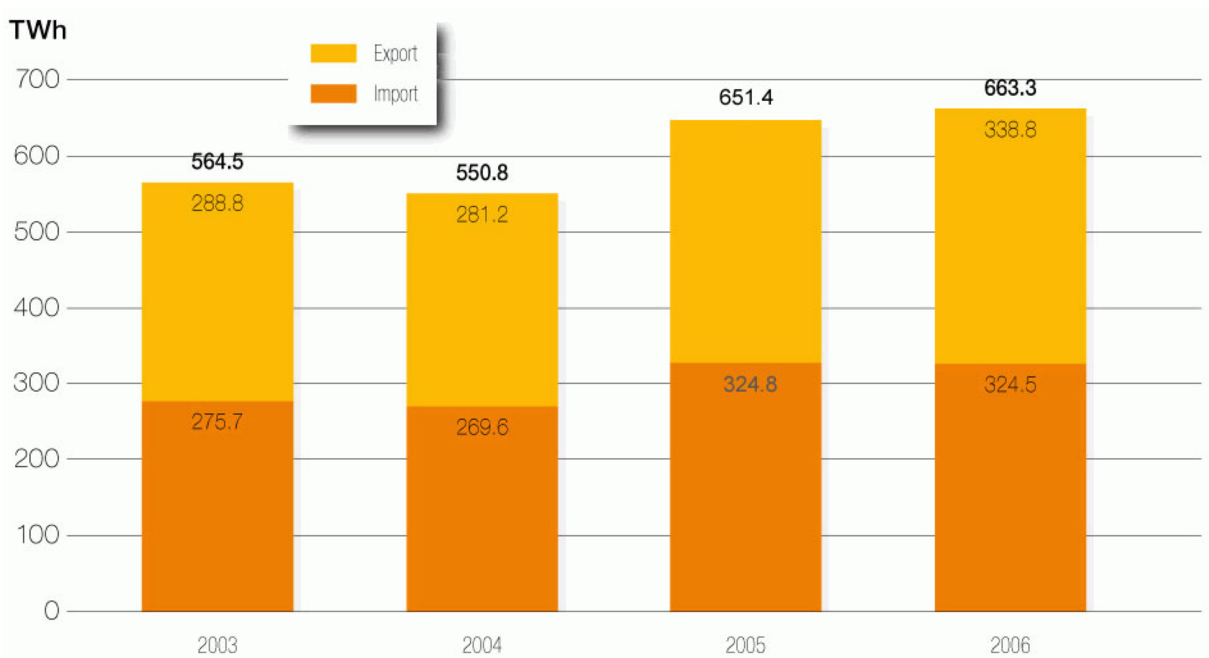
2.5 Physical Exchanges

The physical exchanges should not be confused with the contractual exchanges. Import oriented physical exchanges may results from the netting of both import and export oriented contractual exchanges. Therefore, this chapter does not refer to the commercial use of the interconnections but to their physical use.

2.5.1 UCTE Outline

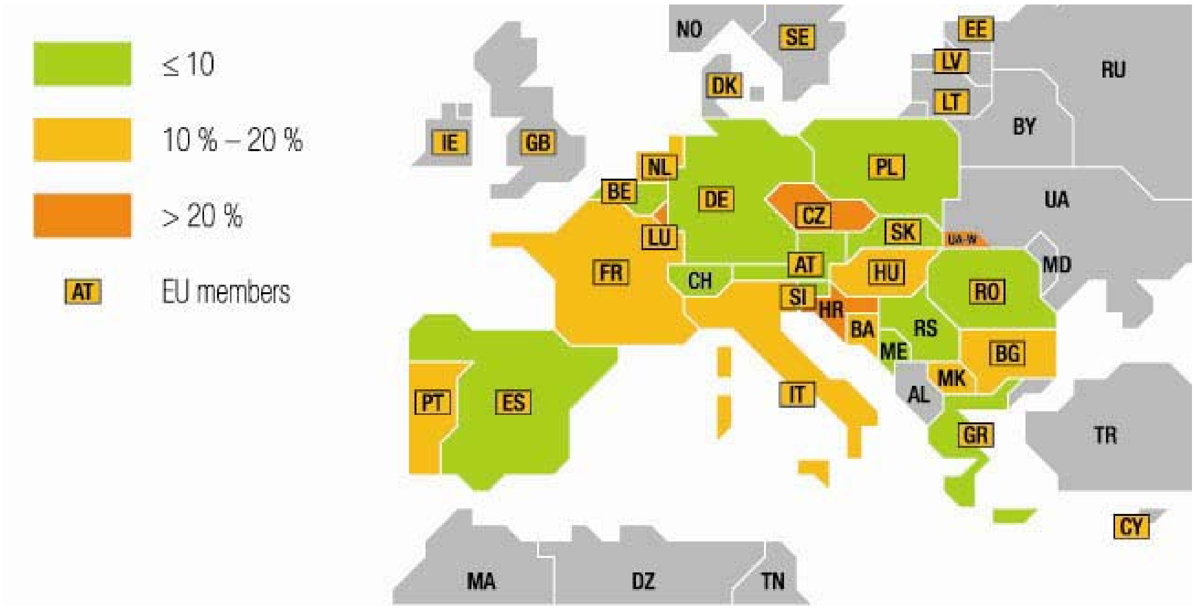
The UCTE system has almost been balanced in 2006 as physical exchanges balance accounted for less than 0.5% of the total energy consumption.

Figure 23 UCTE Physical Exchanges Balance Retrospect



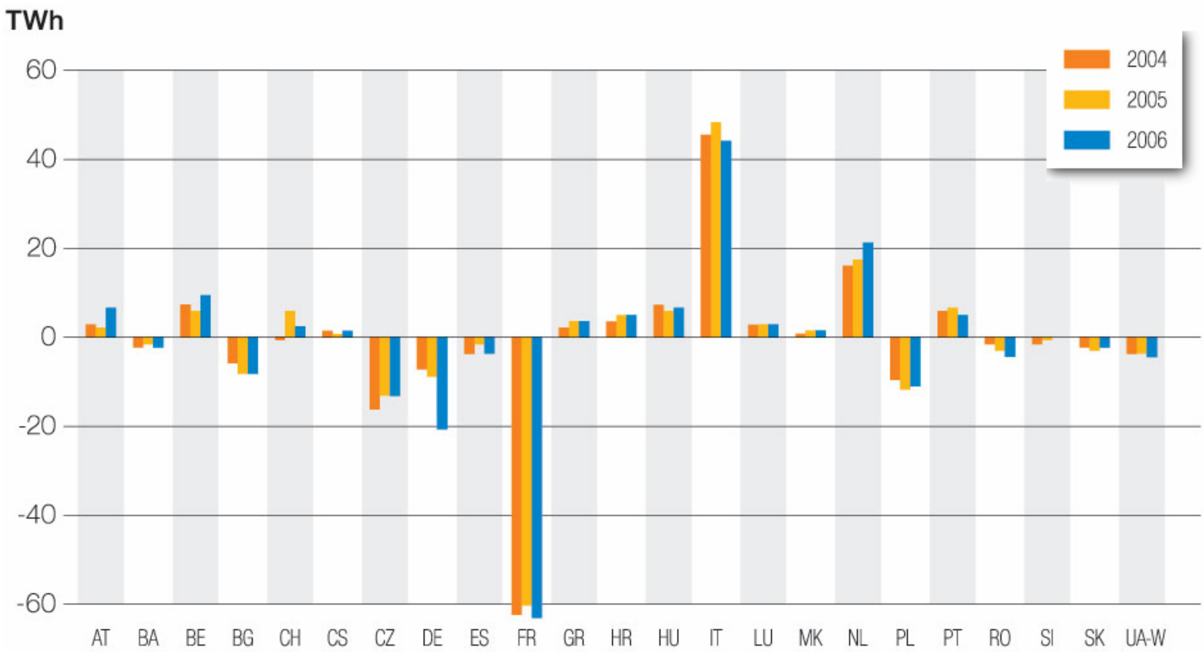
Physical exchanges remained quite stable in 2006 and 2005 with import and export oriented physical exchanges all together stabilised around 650 TWh.

Figure 24 National 4-Year Average Physical Exchanges Balance / Energy consumption Ratio



Report on the Transmission System Adequacy is in chapter 4 page 62.

Figure 25 National Physical Exchanges Balance Retrospect



No country has turned from an Import oriented physical exchanges balance to an Export oriented one.

2.5.2 National Comments

BE – Belgium

The physical imports increased by 31.7% in 2006 compared to 2005. The physical exports also went up, at a more moderated rate of 8.4%. The exchange balance (physical imports – physical exports) significantly rose with 61.3% in 2006.

The national physical exchanges include the exchanges with France that do not transit via UCTE lines.

BG – Bulgaria

Compared with 2005 the export has increased by +2.15 %.

CZ – Czech Republic

Both the export and the import slightly decreased but the final balance value stayed stabile and relatively high (more than 12 TWh of export).

DE – Germany

In 2006, electrical energy imports totalling 46 TWh had a share of about 7% in the electricity output of total supply in Germany. As compared to the preceding year, imports decreased by –7.4 TWh, i.e. -14%. A distinct decrease was recorded for imports from Sweden (-52%) and Denmark (-44%) (physical flows). The main reason for that may have been unfavourable water conditions in Scandinavia and the lower production of a nuclear power station in Sweden as compared to the previous year. France remains the country with the highest exports to Germany, measured against physical energy flows across national frontiers. Its share in Germany's total imports amounted to 35%, followed by the Czech Republic (26%), Denmark and Austria (13%).

Germany's physical exports to neighbouring countries increased by +6% to 66 TWh as compared to the previous year. The highest increase in percent was recorded for exports to Denmark (+580%) and Sweden (+345%). The highest share in German exports was registered for the Netherlands with 34%, followed by Austria (22%) and Switzerland (21%). However, Germany's physical exports also include transits from other countries through Germany. In particular, large parts of the physical imports from France are likely to have passed through Germany over Switzerland and Austria to Italy, or through Germany to the Netherlands.

In 2006, the exchange volume (i.e. the sum of imports and exports) corresponded to approx. 19% of Germany's total generation.

To some extent, physical energy flows for an agreed exchange across national frontiers do not take a direct way between the sending and the receiving country due to the close meshing of the West European EHV system. However, accounting of deliveries between the individual countries is made on the basis of the relevant contractual supply agreements.

During 8 months of the year 2006, a positive exchange balance at reference time could be observed similar as during the previous years.

FR – France

The values of exchanges with countries outside the UCTE include the exchanges with abroad countries (Jersey Island, Belgium, Germany, Switzerland, Italy, Spain), which do not transit on UCTE lines, the exchanges on the public distribution network, and the trade to compensate water rights relative to power plants located on borders.

GR – Greece

In 2006 the exchange balance was intensively positive as for the import direction. The bulk of energy was imported from the north while the exchanges between Greece and Italy took place in both directions but the total exchange balance was positive as for the export direction.

There was an increase of imports throughout 2006. The bulk of electrical energy was imported from the northern interconnections because the prices of electricity in the neighbouring countries are lower than in Greece. Greece exported to Albania and to Italy.

HR – Croatia

Exchanges between Croatia and neighbouring countries were higher mainly due to increased transits and import of cheaper electrical energy.

IT – Italy

With compare to the previous year the export signed a sensible increase (+44,7%). The export instead decrease totally by –7,8%, this decrease has been particularly pronounced during the first period of the 2006. The net imports-exports balance for the year 2006 marked a sensible decrease of –9%.

MK – Former Yugoslav Republic of Macedonia

Macedonia is a country which imports energy. According to the yearly and weekly contracts with traders, the balance between demand and supply is good.

All exchanges are with countries inside of UCTE.

NL – The Netherlands

The volumes of imports rose in comparison with 2005 with +15.4%.

The export volumes rose not in that extent but still with +9%.

PL – Poland

Main differences compare to 2005 were caused by trade exchanges on commercial DC-link PL-SE.

PT – Portugal

In 2006 both the imports and the exports were the highest ever verified.

RO – Romania

The network topology and the remaining capacity allowed and increased export exchanged against the 2005 export exchanges.

In 2006 the import physical value increased due to the fulfilled reinforcement works of an important 400 kV substation near to the North border.

SI – Slovenia

About –18 % lower exchanges were observed as in the previous year. Exchanges balance varies from –328 MW to +318 MW.

Import in months January-April, September, November and December, export in other months.

Half of the production in the nuclear power plant Krško was delivered to the Croatia during the whole year.

SK – Slovak Republic

Slovakia was an exporter for the previous 6 years. Unusually in the year 2006 we imported energy in September and October. In November we had very low export compared to the past years.

UA-W – Western Ukraine

From April till September – to 550 MW, other months of the year – 500 MW.

POWER BALANCE 3

3 POWER BALANCE

Extra figures regarding power balance are in APPENDIX 2 page 91.

3.1 Power Balance Summary

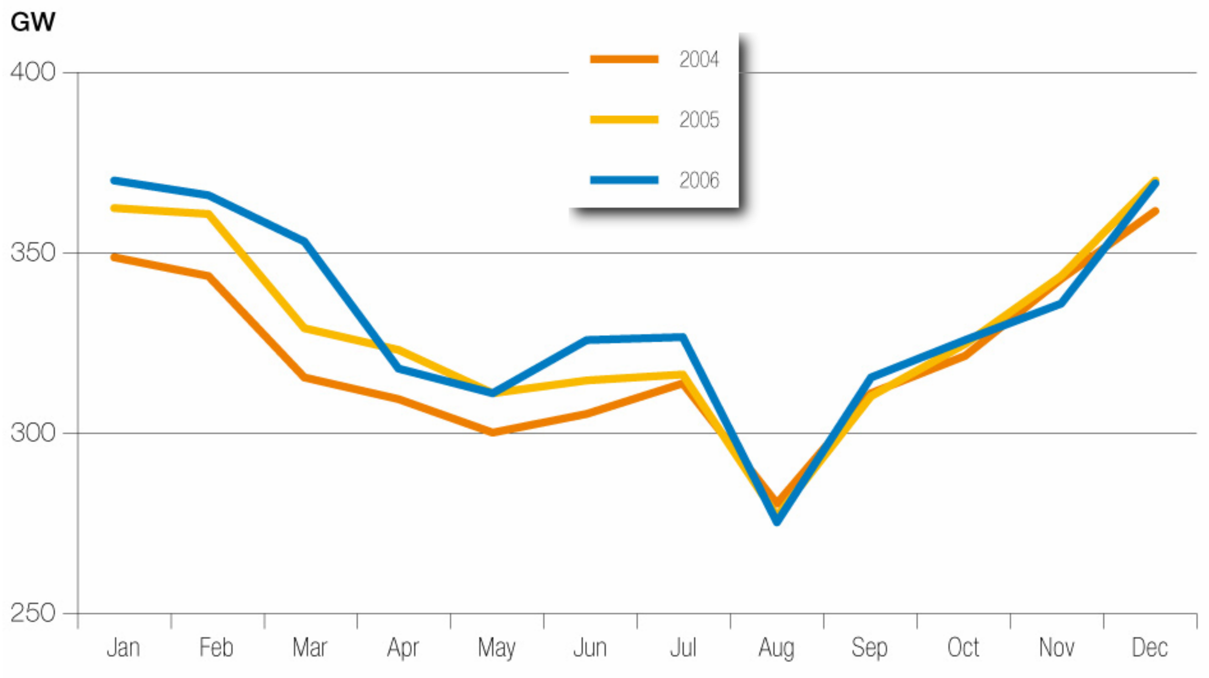
Table 2 UCTE Power Balance Retrospect in December

	2003 GW	2004 GW	2005 GW	2006 GW	2005 to 2006 GW	2005 to 2006 %
Total Generating Capacity	569.1	593.2	611.3	625.1	13.8	2.3
Reliably Available Capacity	414.2	431.6	440.3	455.2	14.9	3.4
Load at Reference Time	348.2	360.6	369.5	368.1	-1.4	-0.4
Remaining Capacity w/o Exchanges	66.0	70.6	70.8	87.0	16.3	23.0
Physical Exchanges Balance (I-E)	1.6	3.4	8.2	2.4	-5.8	-70.6

3.2 Load At Reference Time

3.2.1 UCTE Outline

Figure 26 UCTE Load at Reference Time Retrospect



Load at reference time has achieved its 2006 maximum value of 369.5 GW in January 2006 close in time and in value to its 2005 maximum value achieved in December 2005.

Load at reference time was amazingly stable throughout the last 3 years on the August to December period. But this is not the case on the beginning of the year.

3.2.2 National Comments

Table 8 National Load at Reference Time

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	9.0	8.9	8.6	7.5	7.7	7.9	7.7	7.2	7.7	7.9	8.4	9.2
BA	1.6	1.6	1.6	1.4	1.3	1.4	1.3	1.3	1.4	1.5	1.5	1.6
BE	12.6	12.7	11.9	11.6	11.4	11.3	10.6	10.9	11.3	11.9	11.7	12.6
BG	5.8	6.0	5.5	3.9	3.7	3.9	4.0	4.1	4.1	4.6	4.7	5.7
CH	10.0	9.8	9.5	8.4	8.4	8.6	7.9	8.2	8.6	8.4	8.9	9.2
CS	6.7	6.4	6.7	5.2	4.4	4.6	4.3	4.4	4.6	5.3	5.6	6.5
CZ	9.7	9.5	9.4	7.8	7.7	7.7	7.5	7.3	7.6	8.2	8.4	9.1
DE	71.8	71.6	68.7	65.3	65.9	67.0	65.4	63.5	66.6	68.5	69.0	70.0
ES	37.3	36.0	34.0	32.1	33.3	34.7	37.1	26.7	32.7	32.9	33.2	39.5
FR	74.4	75.5	73.1	60.4	55.1	56.4	57.5	46.3	54.8	57.8	62.1	76.4
GR	7.8	7.8	7.2	6.4	6.6	8.4	8.0	7.4	7.0	7.0	6.8	7.0
HR	2.7	2.6	2.5	2.1	1.9	2.0	2.2	2.0	2.1	2.1	2.1	2.6
HU	6.0	5.8	5.5	5.1	5.3	5.7	5.5	5.1	5.3	5.4	5.5	5.5
IT	52.7	52.4	49.6	46.7	46.2	52.9	53.1	31.4	48.1	46.8	49.3	50.2
LU	0.9	0.8	0.9	0.8	0.9	0.8	0.8	0.6	0.8	0.9	0.9	0.9
MK	1.4	1.3	1.3	0.9	0.8	0.8	0.9	0.8	0.8	1.0	1.0	1.3
NL	16.5	16.0	16.4	15.5	14.9	15.2	16.3	14.3	15.2	17.0	16.9	19.0
PL	20.4	19.0	19.0	17.1	16.2	16.8	16.5	16.0	17.0	18.2	18.7	20.2
PT	7.6	7.2	6.6	6.3	6.6	6.5	6.9	5.4	6.6	6.6	6.6	7.6
RO	7.5	7.4	7.4	6.8	6.0	6.2	6.2	6.0	6.3	6.7	6.7	7.3
SI	2.0	2.0	1.9	1.8	1.8	1.9	1.9	1.6	1.8	1.9	1.9	1.9
SK	4.3	4.2	4.1	3.5	3.4	3.4	3.4	3.3	3.4	3.9	4.1	4.3
UA-W	0.9	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7
UCTE	**369.5**	**365.4**	**352.4**	**317.4**	**310.1**	**324.8**	**325.5**	**274.3**	**314.4**	**325.2**	**334.8**	**368.1**

BE – Belgium

The average temperature during January, February, March, April and August 2006 was lower than the decennial monthly average temperature (1997-2006). The average temperature in July 2006 was 4.9°C higher than the decennial average temperature for that month.

DE – Germany

The load data published in the monthly statistics are provisional values. An update in the UCTE-database will be made according to the values shown in the table of the power balance.

FR – France

Temperatures were below the normal ones and colder than in 2005 from the end of January to mid April.

A short and limited heat wave peaking at +5°C than normal temperature occurred on the second week of June. A stronger one happened from the 2nd to the 3rd weeks of July with the average temperature +4.8°C over the normal one.

GR – Greece

No inconsistency with the monthly statistics.

MK – Former Yugoslav Republic of Macedonia

The value of load depends of the consumption of the households, so when the temperature is very low, we have very high value of consumption and according to this the hourly load is big.

NL – The Netherlands

The given figures are calculated from the load as observed by TenneT, taken into account an average representation factor of 0,9 to reach consistency with the 100% values of the monthly statistics.

PL – Poland

Polish TSO observed the big increase of load caused by the weather condition in January and during the summer time.

For example the increase of the load in July 2006 with respect of July 2005 (3rd Wednesday, 11:00) amounted 6,7%. The biggest growth of load was observed on June, 26th 2006 (Monday) for 13:00 – over 10% (with respect of June, 3rd Wednesday 2005, 11:00).

Both load in monthly statistics and load in SAR are given as the average value for the preceding hour (value at 11:00 am is the average value between 10:00 and 11:00).

SI – Slovenia

Load data in the monthly statistics include operational counter data, load data in this report include the verified counter data without network losses included.

3.3 Generating Capacity Reminder

Table 6 UCTE Generating Capacity Retrospect in December

	2003	2004	2005	2006	2005 to 2006	
	GW	GW	GW	GW	GW	%
Hydro Capacity	129,4	132,2	134,7	134,8	0,1	0,1
Nuclear Capacity	112,8	113,3	112,7	112,4	-0,2	-0,2
Fossil Fuel Capacity	294,8	303,4	322,6	327,0	4,5	1,4
Renewable Energy Sources Capacity (exclud. hydro capacity)	21,8	27,7	39,9	49,2	9,3	23,3
Non Clearly Identifiable Energy Sources	1,9	1,7	1,4	1,6	0,2	13,0
Total Generating Capacity	560,7	578,4	611,3	625,1	13,8	2,3

More details on the Generating Capacity in chapter 2.3 page 25.

3.4 Unavailable Generating Capacity

The installed Net Generating Capacity is not fully available to cover the demand all the time. There are four kinds of unavailable capacity[15]: Non-Usable capacity, capacity reserved for system services purposes, thermal power capacity unavailable as a result of overhauls or outages.

3.4.1 Non-Usable

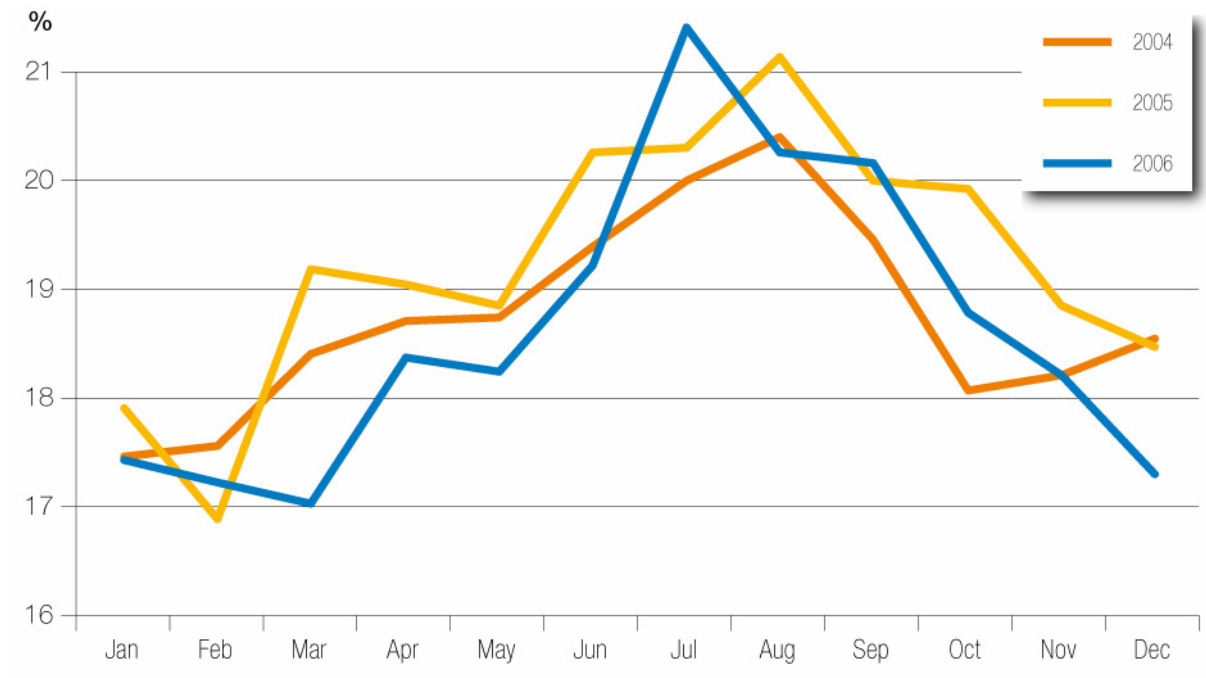
Non-Usable capacity is the generating capacity which cannot be used due to scheduled but temporary limitations including mothballed, environmental constraints, network constraints, etc.

Table 9 UCTE Non Usable Capacity Retrospect

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
2006	106.2	105.3	104.4	112.8	111.9	118.3	132.5	125.6	125.1	116.6	113.2	107.8
2005	106.7	100.7	114.3	113.6	112.4	120.8	120.9	126.0	119.1	118.9	112.3	110.0
2004	100.7	101.4	106.6	108.6	109.0	112.8	117.0	119.8	114.4	106.4	107.6	109.7

[15] Definitions are on the UCTE website at http://www.ucte.org/statistics/terms_power_balance/e_default.asp

Figure 27 UCTE Non Usable Capacity / Net Generating Capacity Ratio Retrospect



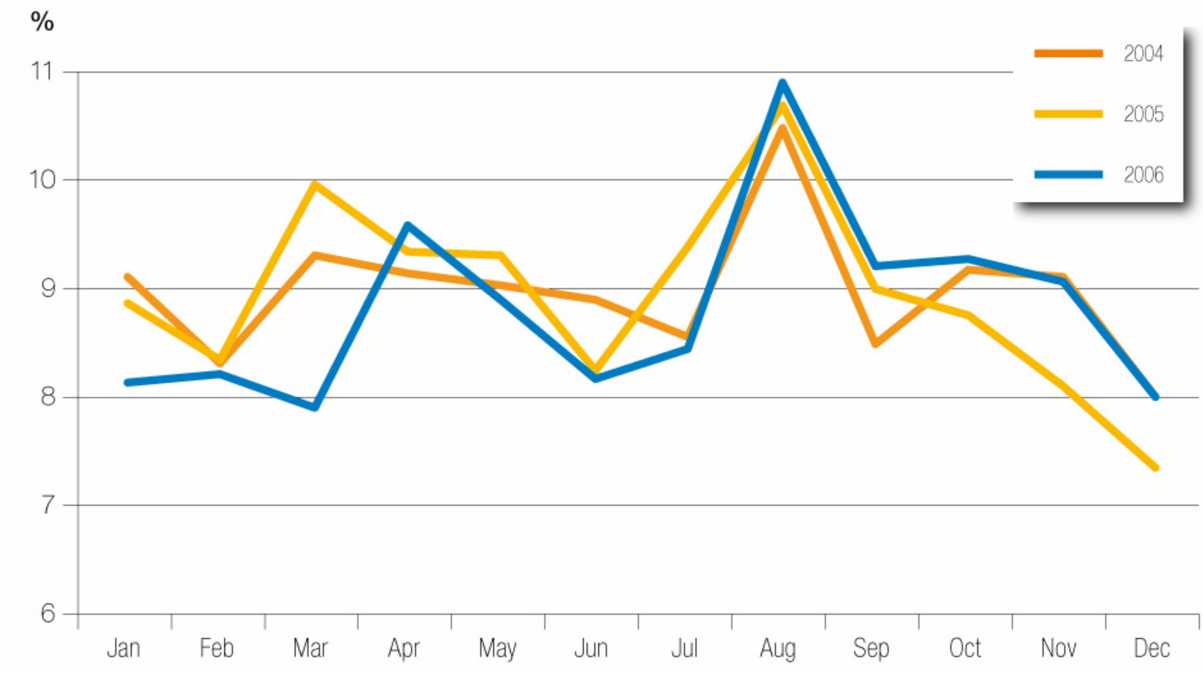
3.4.2 System Services Reserve

System Services Reserve is the generating capacity, contracted by each TSO, which is required to compensate real-time unbalances and to control both voltage and frequency.

Table 10 UCTE System Services Reserve Retrospect

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
2006	29.9	29.9	27.7	30.4	27.4	26.4	27.4	29.8	28.8	30.1	30.2	29.3
2005	32.0	29.9	32.6	30.0	28.8	25.7	29.5	29.4	27.7	28.3	27.6	27.0
2004	31.5	28.3	29.1	28.2	27.0	27.0	26.6	29.3	26.2	29.3	31.0	28.7

Figure 28 UCTE System services Reserve / Load at Reference Time Ratio Retrospect



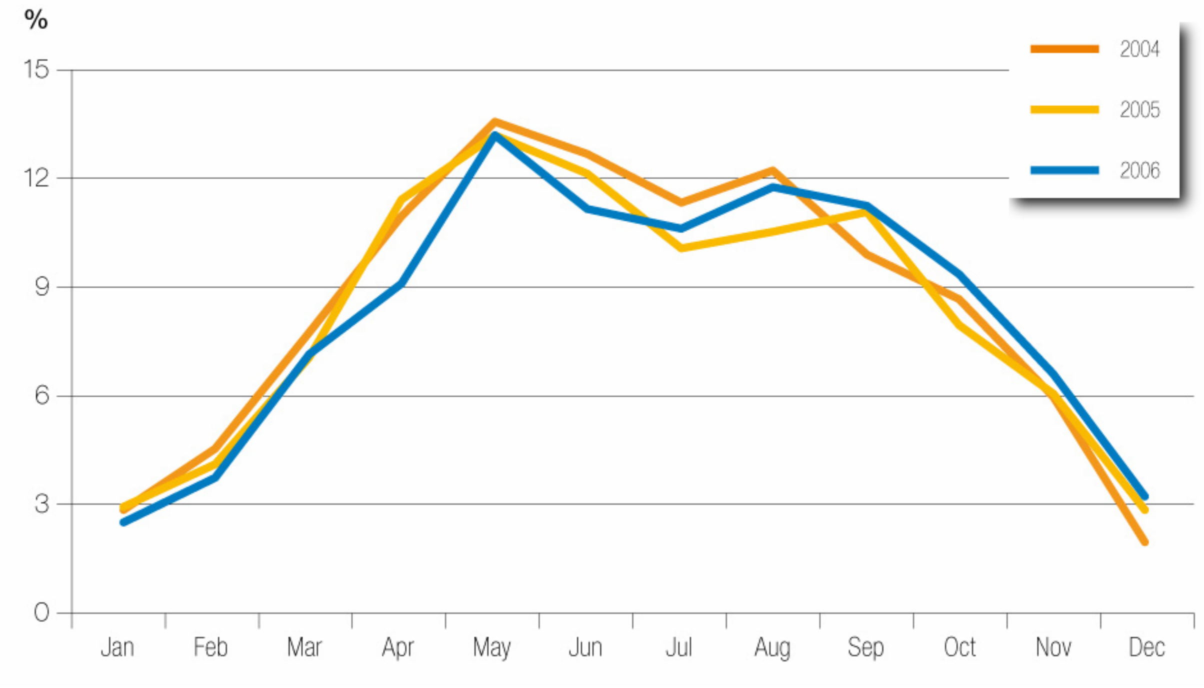
3.4.3 Overhauls

Overhauls capacity is the thermal generating capacity which cannot be used due to scheduled and organized unavailability, including nuclear refuelling.

Table 11 UCTE Overhauls Retrospect

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
2006	10.4	15.7	30.3	39.0	56.6	47.8	45.8	50.8	48.4	40.3	28.5	13.7
2005	12.2	17.2	29.8	48.3	56.2	51.7	42.9	44.6	47.0	33.7	25.8	11.8
2004	11.6	18.5	31.9	45.8	56.5	52.8	47.6	51.7	41.5	36.6	25.2	7.9

Figure 29 UCTE Overhauls / Thermal Generating Capacity Ratio Retrospect



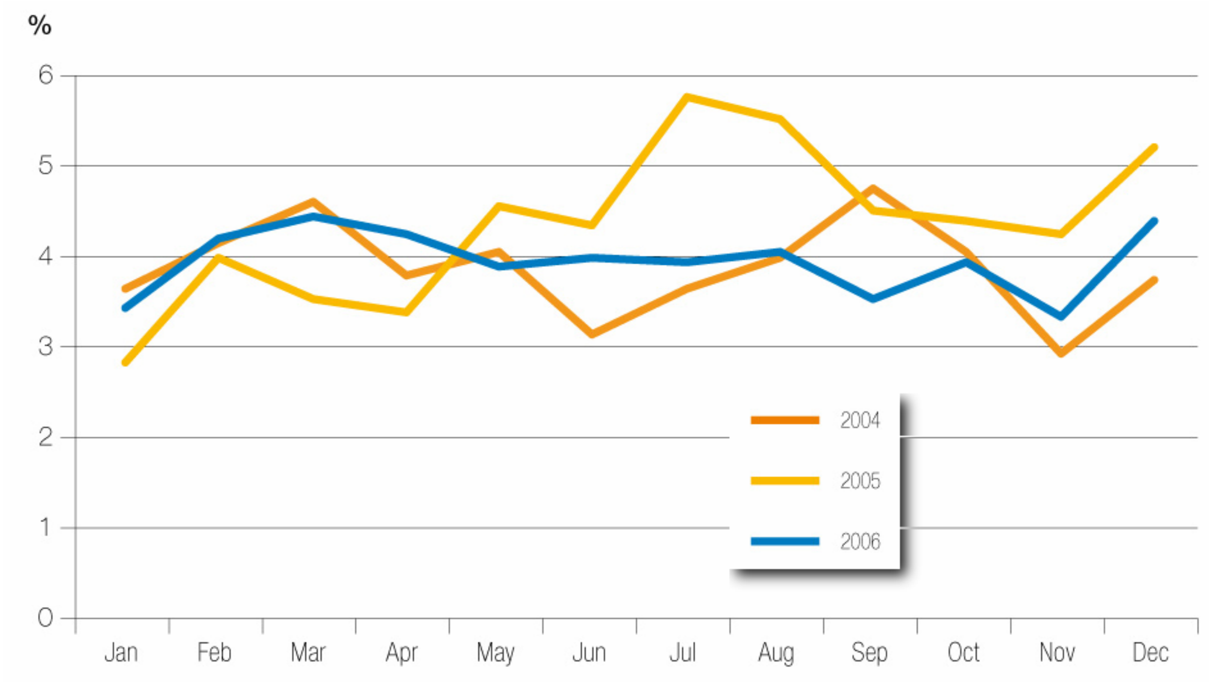
3.4.4 Outages

Outages capacity is the thermal generating capacity which cannot be used due to unforeseen and forced unavailability which does not belong to one of the previous unavailable capacity categories.

Table 12 UCTE Outages Retrospect

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
2006	14.7	18.0	19.2	18.3	16.8	17.2	17.0	17.6	15.4	17.0	14.3	19.2
2005	11.9	16.9	15.1	14.3	19.3	18.6	24.5	23.4	19.3	18.7	18.0	22.3
2004	15.2	17.2	19.2	15.7	16.8	13.1	15.2	16.9	20.2	17.1	12.4	15.8

Figure 30 UCTE Outages / Thermal Generating Capacity Ratio Retrospect



3.5 Reliably Available Capacity

Reliably Available Capacity is the difference between the generating capacity and the unavailable capacity.

3.5.1 UCTE Outline

Table 13 UCTE Reliably Available Capacity Retrospect

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
2006	450.1	444.0	432.8	414.8	403.0	407.9	397.6	397.5	404.3	419.0	437.6	455.2
2005	434.7	434.7	408.1	394.7	384.8	385.7	384.8	381.1	393.7	408.9	426.0	440.3
2004	419.4	413.6	393.4	383.7	373.8	378.4	380.3	371.3	387.4	401.5	416.0	431.2

In 2006, the Reliably Available Capacity on the UCTE system had its minimum value in August, as usual, with 397.5 GW representing 64.0% of the Net Generating Capacity. The total Load at that time represented 69.0% of the Reliably Available Capacity.

Figure 31 UCTE Reliably Available Capacity / Net Generating Capacity Ratio Retrospect

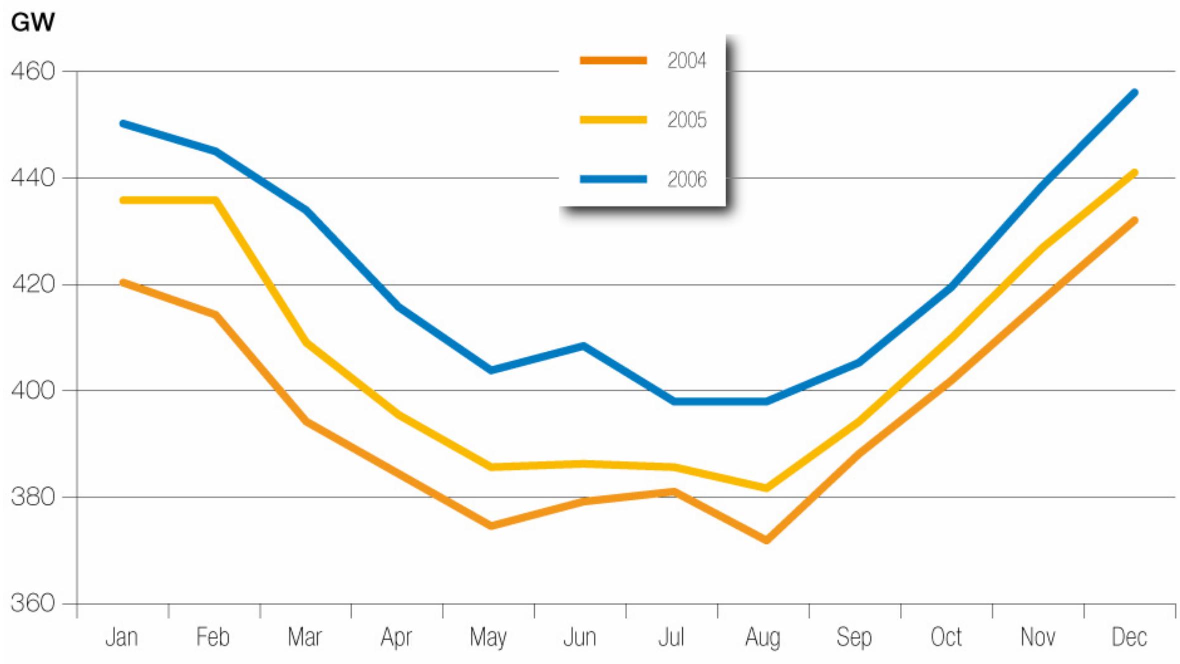
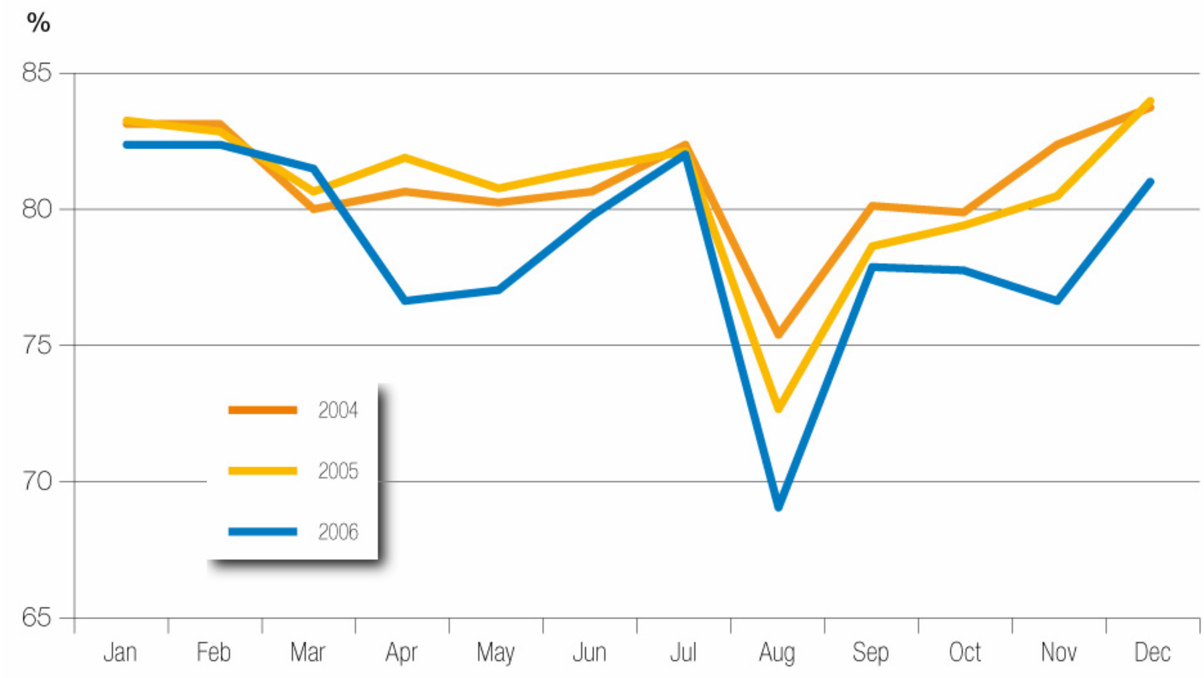


Figure 32 UCTE Load at Reference Time / Reliably Available Capacity Ratio Retrospect



3.5.2 National Comments

Table 14 National Reliably Available Capacity

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	14.2	14.2	14.2	12.3	12.2	12.2	13.4	13.4	13.4	14.5	13.5	13.5
BA	3.2	3.2	3.3	2.7	2.7	3.2	3.0	3.0	3.1	2.8	3.2	3.4
BE	13.3	13.0	12.5	13.4	11.1	11.5	12.0	11.5	11.1	11.9	11.4	12.7
BG	7.2	7.1	6.5	5.4	5.1	5.1	5.3	5.4	5.3	5.9	6.2	7.2
CH	12.1	12.1	12.1	13.8	13.8	12.8	13.8	11.6	13.8	12.1	12.1	12.1
CS	7.0	6.9	7.1	5.9	5.2	5.1	4.7	4.4	4.9	5.9	5.7	6.7
CZ	11.6	11.8	11.1	11.3	10.9	10.1	10.8	10.7	10.4	10.2	10.7	11.8
DE	87.3	87.1	84.9	82.3	76.5	81.4	78.7	77.1	79.2	81.0	84.4	87.2
ES	50.6	47.1	44.9	42.7	43.9	45.0	48.5	46.2	44.4	49.9	53.8	52.4
FR	77.7	80.3	82.2	79.8	74.7	71.9	63.0	69.7	73.6	76.1	84.1	89.4
GR	8.7	9.3	9.4	8.6	8.6	10.1	9.9	9.4	9.5	9.1	8.6	8.9
HR	3.5	3.5	3.5	3.4	3.4	3.4	3.4	3.3	3.3	3.2	3.3	3.5
HU	6.7	6.4	5.8	5.6	5.1	5.4	5.5	5.5	5.4	4.9	5.5	5.8
IT	60.0	60.2	60.2	58.2	61.0	61.4	61.5	60.2	60.6	61.5	62.3	62.9
LU	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
MK	1.1	1.1	1.1	1.0	0.8	0.8	1.1	0.9	0.9	1.1	1.1	1.3
NL	18.1	18.4	18.3	17.1	17.2	18.4	18.1	18.5	18.0	17.7	17.2	19.0
PL	26.0	25.7	24.3	22.1	21.1	20.7	17.3	18.6	19.6	21.5	22.4	25.4
PT	9.5	9.4	9.5	10.1	9.7	9.7	9.1	9.1	8.6	9.8	10.8	10.8
RO	11.4	11.5	11.4	10.5	10.7	10.5	10.5	10.4	10.6	10.4	11.2	10.7
SI	2.1	2.1	2.2	1.6	2.3	2.3	2.1	2.1	2.1	2.2	2.2	2.3
SK	5.2	5.1	5.3	4.1	4.1	4.0	3.4	3.8	3.4	4.3	4.7	5.1
UA-W	1.5	1.5	1.4	1.3	1.4	1.3	1.0	1.2	1.3	1.4	1.5	1.5
UCTE	**449.4**	**444.0**	**432.8**	**414.8**	**403.0**	**407.9**	**397.6**	**397.5**	**404.3**	**419.0**	**437.6**	**455.2**

BG – Bulgaria

The scheduled maintenance of the units in the system for 2005 was met 90 %

The total duration of forced outages was 1.4 % higher than the forecasted value.

The services system reserve values correspond to the predefined optimal values calculated on the basis of probability models.

CH – Switzerland

In 2005 the nuclear power plant Leibstadt (1.2 GW) was out of operation between end of March and end of August. This event changed significantly the operating conditions of the Swiss system. Less power was produced at home and more power was imported. There was no such disturbance during 2006 and the production pattern resembles to that of the year 2004.

CZ – Czech Republic

The overhauls values are lower than expected but they depend especially on real overhauls programs of the biggest nuclear units.

DE – Germany

According to the new methodology, the German TSOs do not collect detailed information on these items. As a result of legal unbundling, the German transmission system operators do not receive detailed data on these power balance items from power plant operators. The data have partly been determined on the basis of estimations made prior to the liberalisation of the German electricity market.

The share of renewable energy sources in the installed generating capacity has again considerably increased in 2006. This increase also explains the high level in non-usable capacity.

In Germany, the TSOs' system services reserve (formerly included in the total reserves) shows a relatively constant value over the year (around 6% of the generating capacity).

FR – France

Lowest Reliably Available Capacity in July was mainly the result of the environmental constraints put on thermal generation plants during a strong hot wave.

GR – Greece

The energy capability factor was very high and ranged between 1,47 and 1,00 by the end of September. There was an increase in hydro production. The water reserves were high and the hydro production contributed to the system adequacy covering the high demand in summer. On the contrary, the hydro conditions were very poor, at the end of the year.

In 2006 the hydro conditions were favourable for the longest part of the year , the hydro production was high and covered the peaks in summer. A new power plant of 378 MW in the area of Athens was synchronised in March and while in test operation, the unit was available all year long. A power unit of 60 MW was temporarily commissioned in the South in order to meet the consumption in summer.

The performed overhauls were more extended comparing with the schedules

Every year the majority of the unit overhauls take place in spring and autumn in order to make the units reliably available in summer and winter which are the heavy load periods. In 2006 the overhaul programs were extended.

There is an increase of outages comparing to the forecasts 2006-2015. A new study carried out in December 2005 on the basis of the three last years revised the forecasted average amount of outages. The results of this new study are fully complied with the retrospect.

The "seconds reserve" includes the primary and secondary reserves according to the UCTE OH. The "minutes reserve" includes the tertiary reserve. There is a significant difference from the forecasts because there the tertiary reserve was not included.

HR – Croatia

Hydro conditions during the year 2006 were relatively favourable (6.07 TWh) which contributed to higher production of hydro units and more flexible operation of Croatian power system.

Overhauls were reasonably rescheduled in accordance with favourable hydro conditions, consumption and capabilities of production units during the year 2006.

Overhauls of major TPPs (TPP Rijeka, TPP Sisak and TPP Plomin 2) were not planned in 2006 at all, respectively to 2005.

HU – Hungary

Overhauls and outages caused temporary shortages in May, June and October. They were covered by import.

IT – Italy

Low hydro conditions marked the last part of the year. A historical minimum of the hydro energy capability factor got on June with respect to its multi-year average value.

A very mild winter season with temperatures over the average has marked the last part of the year with sensible decrease of the demand.

A better availability of system services reserve over the year thanks to new power plants in service.

LU – Luxembourg

The overhaul of the main thermal power plant was scheduled for the first week in February, but the performed overhaul took place from 17th to 25th of February. At the reference time it was in operation.

In 2005 the main power plant had 2 overhauls.

No special outage was registered in 2006.

MK – Former Yugoslav Republic of Macedonia

Before the start of the year (2006), the Planning Department made a yearly forecast for overhauls of the Power plants and for 400, 220 and 110kV lines. All planned overhauls were performed according to that plan.

The System Services reserve is according to the UCTE rules.

Primary reserve: 7MW

Secondary reserve: 37 MW

Tertiary reserve: 100 MW

SUM: 144 MW

NL – The Netherlands

There were no cooling-water restrictions.

As TenneT is not informed about the realisation of overhauls, the scheduled overhauls are given.

Volume of the overhaul schedule 2005: 21 866 MW per week

Volume of the overhaul schedule 2006: 74 710 MW per week

As TenneT is not informed about outages, an average estimation for outages of thermal power plants is given based on historical known values.

The given system services reserve is only a part of the total capacity for system services reserve. About another 300 MW is available as sheddable load.

PL – Poland

Referring to the environmental constraints PSE-Operator observed increasing dynamically significant limitations of the available generating capacities caused by the lack of sufficient amount of the cooling water or its high temperatures, exceeding allowed limit.

A big percentage value for hydro-power stations in June is caused by a long-term maintenance of upper reservoir in Żarnowiec pumped-storage power plant (the biggest one hydro-power plant in Poland).

Other positions are the standard level.

However in summer 2006, especially between end of June and beginning of August the percentage of non-usable capacity due to the transmission network constrains was between 14% and 18%! This growth was caused by lower permissible loadings of transmission lines related to wire sags and increased reactive power slows (both originated by high temperatures).

Referring to the SAF 2006-2015 Report, realised and scheduled overhauls were at the same level.

Increase in number of outages can be noticed. This increase is a result of difficult operating conditions connected with the weather and load growth at the average level of 4,5 % with respect of 2005. This situation caused the decrease of reserves in the system. In order to restore reserves PSE-Operator ordered to start all available units, what in turn showed the real number of forced outages was higher then declared by GenCos.

Polish TSO has noticed the decrease of reserves in January and summer time with respect of forecasted caused by difficult operating conditions. For the critical day in July, 25th, there was lack of reserves in Polish power system for 13:00 hrs. Observed growth of reserves from October is the result of having by Polish TSO the intervention reserves in pumped-storage power plant at his full disposal.

RO – Romania

The thermo performing was generally identically with the overhauls schedule without the first trimester. For this interval the amount of thermo overhauls doesn’t impact the system operation safety due to an appreciative hydro reserves. There are not important differences with 2005.

The thermal outages were higher than in the 2006 – 2015 forecast with 10% for January 2006 and 25% for July 2006.

SI – Slovenia

Hydro conditions: below average hydro conditions were most of the year, while above average or higher was in months of March-June. The Hydro production in 2006 was higher for 2,8 % in comparison with the year 2005. No impact on system reliability was detected.

No significant differences between the performed and the scheduled overhauls. The main difference was in the period of the overhauls of the nuclear power plant – year 2005 no overhauls, year 2006 – overhauls from 8th April to 10th of May 2006 (24 days).

No significant differences with outages mentioned in the SAF 2006-2010.

System service reserve was as required.

SK – Slovak Republic

Overhauls mentioned in the table are according the scheduled overhauls. The biggest difference with 2005 is in June (-0,440 GW). The reason was that on 3rd Wednesday 2006 one nuclear unit less was in overhaul than in 2005.

No significant differences with 2005 regarding outages. In the forecast, numbers were slightly higher (0,1 GW) than reality.

System services reserve is the total of all available reserves (primary, secondary, tertiary, cold reserves).

UA-W – Western Ukraine

Load shedding 45 MW agreed with distribution companies in case of reserve deficiency may be added to reserve.

3.6 Remaining Capacity

Remaining Capacity is the difference between the “ Reliably Available Capacity and the Load at Reference Time. It represents the reserve left to power plant operators at the reference time.

However, this should not be considered as an over-capacity. In practice power plant operators need their own reserve capacity not to be confused with the system service reserve. This capacity is necessary to them to guarantee the reliability of supply to their clients, to cope with power plant failures for instance.

3.6.1 Remaining Capacity Without Exchanges

Table 15 UCTE Remaining Capacity w/o Exchanges

	Jan GW	**Feb GW**	**Mar GW**	**Apr GW**	**May GW**	**Jun GW**	**Jul GW**	**Aug GW**	**Sep GW**	**Oct GW**	**Nov GW**	**Dec GW**
NGC	611.3	612.9	614.4	615.3	615.8	617.7	620.3	621.4	622.1	623.0	623.8	625.1
RAC	450.1	444.0	432.8	414.8	403.0	407.9	397.6	397.5	404.3	419.0	437.6	455.2
Load	369.5	365.4	352.4	317.4	310.1	324.8	325.5	274.3	314.4	325.2	334.8	368.1
RC w/o X	80.6	78.7	80.4	97.4	92.9	83.1	72.1	123.2	89.9	93.8	102.7	87.0
RC/NGC (%)	13.2	12.8	13.1	15.8	15.1	13.5	11.6	19.8	14.4	15.1	16.5	13.9

In 2006, the Remaining Capacity without Exchanges on the UCTE system had its minimum value in July with 72.1 GW. The Remaining Capacity without Exchanges was always above 5% of the Net Generating Capacity with a minimum ratio of 11.6% in July.

Table 16 UCTE Remaining Capacity w/o Exchanges Retrospect

	Jan GW	**Feb GW**	**Mar GW**	**Apr GW**	**May GW**	**Jun GW**	**Jul GW**	**Aug GW**	**Sep GW**	**Oct GW**	**Nov GW**	**Dec GW**
2006	80.6	78.7	80.4	97.4	92.9	83.1	72.1	123.2	89.9	93.8	102.7	87.0
2005	73.1	74.7	79.2	72.1	74.7	71.9	69.3	104.5	84.3	84.8	83.4	70.8
2004	71.2	70.5	78.9	74.6	74.4	73.8	67.6	91.6	77.2	80.9	74.0	70.6

Figure 33 UCTE Remaining Capacity w/o Exchanges Retrospect

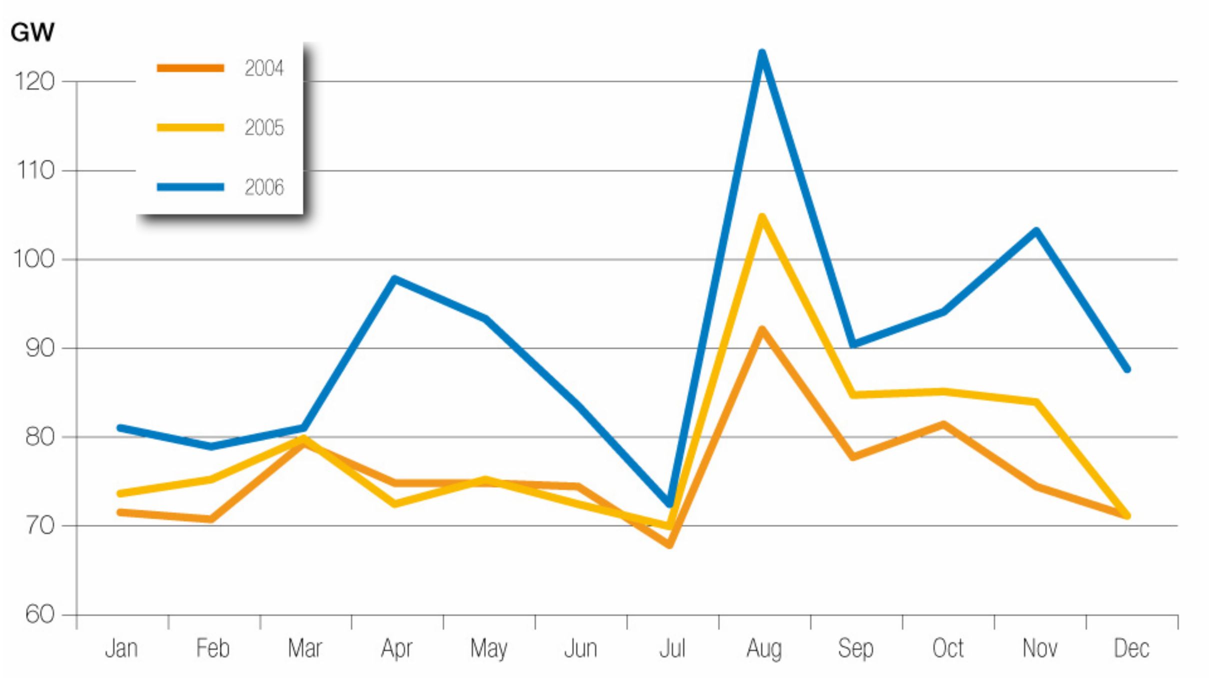


Table 17 National Remaining Capacity w/o Exchanges / Net Generating Capacity Ratio

	Jan %	Feb %	Mar %	Apr %	May %	Jun %	Jul %	Aug %	Sep %	Oct %	Nov %	Dec %
AT	29.1	29.6	31.3	26.7	25.1	24.0	31.5	34.3	31.5	36.3	28.0	23.6
BA	39.0	39.0	41.5	31.7	34.1	43.9	41.5	41.5	41.5	31.7	41.5	43.9
BE	4.3	1.9	3.6	11.1	-1.8	0.8	8.3	4.2	-1.1	-0.1	-1.8	0.5
BG	13.1	9.5	9.3	13.4	12.8	10.5	11.1	11.6	11.4	12.2	13.9	13.9
CH	12.1	13.2	14.9	31.0	31.0	24.1	33.9	19.5	29.9	21.3	18.4	16.7
CS	3.0	4.6	4.5	6.5	8.0	5.0	4.1	0.4	3.0	5.4	0.7	2.1
CZ	11.7	14.2	10.5	21.6	19.8	14.8	20.4	21.0	17.3	12.3	14.1	16.6
DE	13.0	12.9	13.5	14.1	8.8	11.8	10.9	11.1	10.3	10.2	12.5	13.9
ES	18.7	15.5	14.9	14.5	14.6	13.9	15.3	25.9	15.5	22.7	27.3	17.1
FR	11.9	8.8	7.9	16.9	17.0	13.4	4.8	20.3	16.3	15.8	19.0	11.2
GR	8.1	12.6	19.0	18.8	17.1	15.0	15.3	16.5	21.2	17.7	14.8	15.8
HR	21.6	24.1	26.7	33.3	38.1	36.2	32.0	33.2	32.1	28.8	30.2	24.6
HU	9.4	7.7	2.9	5.1	-2.3	-3.5	0.6	4.6	1.1	-6.8	0.1	3.7
IT	8.3	8.8	12.0	13.0	16.7	9.6	9.4	32.1	14.0	16.4	14.4	14.1
LU	48.1	53.5	45.8	50.7	44.9	50.7	50.5	62.4	53.5	44.2	46.6	46.1
MK	-23.7	-19.1	-14.5	4.5	-4.9	-1.8	13.6	3.4	3.5	7.4	4.0	0.4
NL	7.6	11.3	8.3	7.2	10.5	14.7	8.2	19.2	13.0	3.0	1.2	-0.1
PL	17.4	20.8	16.5	15.7	15.0	12.2	2.4	8.2	7.9	10.2	11.3	16.1
PT	14.2	17.3	22.1	29.1	23.5	24.4	16.8	27.4	15.0	24.0	30.9	23.5
RO	22.1	23.2	22.2	20.7	26.2	24.0	24.3	24.7	24.0	20.6	25.1	19.1
SI	0.9	2.8	7.9	-5.8	17.5	11.5	8.7	17.3	10.0	11.8	10.2	14.5
SK	11.1	11.2	14.8	6.9	8.8	7.2	-0.5	6.2	-0.7	4.9	8.0	10.4
UA-W	24.1	26.2	22.7	26.1	30.3	28.7	14.5	23.6	28.3	27.6	31.6	30.3
UCTE	**13.2**	**12.8**	**13.1**	**15.8**	**15.1**	**13.5**	**11.6**	**19.8**	**14.4**	**15.1**	**16.5**	**13.9**

Figure 34 National Number of Months with Limited Remaining Capacity w/o Exchanges

For security reason, Remaining Capacity without Exchanges is usually expected to cover more than 5% of the Net Generating Capacity. It was actually the case in most of the countries.

3.6.2 Remaining Capacity Including Exchanges

As seen in Table 17 some countries experienced negative Remaining Capacity without Exchanges thus relying on import to supply their consumers. Considering physical exchanges within UCTE, their situation got better. Physical exchanges outside UCTE are almost not involved.

Table 18 UCTE Remaining Capacity Including Exchanges

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
NGC	611.3	612.9	614.4	615.3	615.8	617.7	620.3	621.4	622.1	623.0	623.8	625.1
RAC	450.1	444.0	432.8	414.8	403.0	407.9	397.6	397.5	404.3	419.0	437.6	455.2
Load	369.5	365.4	352.4	317.4	310.1	324.8	325.5	274.3	314.4	325.2	334.8	368.1
Exchanges	2.1	2.7	-0.6	-0.2	-2.6	1.0	0.1	-2.0	0.0	0.7	1.8	2.4
RC inc. X	82.7	81.4	79.9	97.2	90.3	84.1	72.2	121.2	89.8	94.6	104.6	89.4
RC/NGC (%)	18.4	18.3	18.5	23.4	22.4	20.6	18.2	30.5	22.2	22.6	23.9	19.6

Table 19 National Remaining Capacity Including Exchanges / Net Generating Capacity Ratio

	Jan %	Feb %	Mar %	Apr %	May %	Jun %	Jul %	Aug %	Sep %	Oct %	Nov %	Dec %
AT	35.8	34.6	24.6	24.4	23.5	16.2	18.2	28.2	30.9	33.0	30.8	31.9
BA	26.8	29.3	26.8	19.5	26.8	39.0	36.6	34.1	34.1	29.3	36.6	31.7
BE	15.2	9.9	15.2	21.9	9.8	7.9	15.1	9.7	7.9	5.8	8.7	9.1
BG	2.3	-1.7	0.2	4.8	8.8	1.2	3.6	3.0	4.7	5.5	9.2	6.2
CH	20.1	16.7	13.2	31.0	16.1	12.6	12.1	17.8	13.8	10.3	18.4	15.5
CS	8.1	10.9	7.0	9.4	8.7	2.9	1.7	3.2	4.5	9.0	7.1	8.0
CZ	3.7	6.2	4.3	14.2	9.3	6.8	8.6	9.9	6.2	3.1	4.9	5.5
DE	11.3	9.9	10.8	15.6	11.4	13.4	13.1	14.4	14.1	12.6	12.7	12.1
ES	18.7	15.4	14.0	15.7	14.8	12.4	14.5	26.2	15.3	20.3	26.8	15.8
FR	6.6	6.5	7.6	6.6	7.3	8.0	3.8	11.4	7.4	9.2	11.8	7.4
GR	10.3	16.8	21.5	21.4	18.1	20.2	21.6	21.2	24.6	20.7	16.6	19.9
HR	40.4	43.9	49.9	45.0	52.3	59.0	52.0	55.7	44.4	40.5	50.8	50.4
HU	20.5	22.4	7.4	20.2	13.4	13.3	10.6	17.4	14.5	6.8	12.4	14.8
IT	15.1	16.4	16.3	21.4	23.4	16.4	12.9	36.3	20.8	23.9	22.6	21.0
LU	53.0	60.3	69.4	67.4	71.7	70.0	75.5	71.7	75.5	62.1	73.6	71.3
MK	-2.8	5.0	0.6	17.1	15.2	10.6	15.8	21.3	23.3	20.4	22.1	21.9
NL	22.0	21.4	19.5	22.8	22.5	30.8	19.3	30.9	25.8	15.3	11.8	14.0
PL	11.3	14.5	11.4	9.7	10.6	9.1	0.7	5.9	3.5	6.7	7.6	11.3
PT	19.1	20.5	24.5	26.8	24.5	31.5	18.9	30.9	19.7	31.3	29.9	24.1
RO	16.7	17.0	17.9	16.7	23.0	21.4	22.1	21.4	21.4	16.7	20.0	15.1
SI	4.9	6.8	6.8	5.8	10.9	3.0	3.6	6.0	-0.5	9.3	14.0	19.8
SK	7.5	9.4	13.4	5.5	8.8	5.1	1.8	4.8	4.9	8.3	7.8	10.2
UA-W	4.2	6.5	4.2	4.2	8.7	6.9	0.7	2.0	6.6	8.1	12.1	10.7
UCTE	**13.5**	**13.3**	**13.0**	**15.8**	**14.7**	**13.6**	**11.6**	**19.5**	**14.4**	**15.2**	**16.8**	**14.3**

3.7 Margin Against Monthly Peak Load

Margin Against Monthly Peak Load is the difference between the actual monthly peak load and the load at reference time, thus it is the additional margin necessary to face the actual monthly peak load.

As Peak Load are not synchronised across the UCTE system, the sum of the national Margin Against Monthly Peak Load overestimates the UCTE Margin Against Monthly Peak Load.

3.8 Remaining Margin

It is interesting to analyse the Remaining Capacity without Exchanges along with two figures:

- the Margin Against Monthly Peak Load, which is the difference between the actual peak load and the load at reference time, thus necessary to face the actual peak load;
- the 5% of the generating capacity which is considered by many operators as the level necessary to guarantee the reliability of supply to their clients, and compensate, for instance, longer power plant failures.

Remaining Capacity without Exchanges minus Margin Against Monthly Peak Load is called Remaining Margin. Expressed as a percentage of the Net Generating Capacity, this margin is checked against the 5% margin.

Note that the objective of a 5% margin from a provisional point of view may be respected even if the realised margin is eventually lower.

Table 20 UCTE Remaining Margin Without Exchanges

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
Reliably Available Capacity	450.1	444.0	432.8	414.8	403.0	407.9	397.6	397.5	404.3	419.0	437.6	455.2
Non Usable Capacity	106.2	105.3	104.4	112.8	111.9	118.3	132.5	125.6	125.1	116.6	113.2	107.8
Overhauls	10.4	15.7	30.3	39.0	56.6	47.8	45.8	50.8	48.4	40.3	28.5	13.7
Outages	14.7	18.0	19.2	18.3	16.8	17.2	17.0	17.6	15.4	17.0	14.3	19.2
System Services Reserves	29.9	29.9	27.7	30.4	27.4	26.4	27.4	29.8	28.8	30.1	30.2	29.3
Load	369.5	365.4	352.4	317.4	310.1	324.8	325.5	274.3	314.4	325.2	334.8	368.1
Remaining Capacity w/o X	80.6	78.7	80.4	97.4	92.9	83.1	72.1	123.2	89.9	93.8	102.7	87.0
Margin Against Monthly PL	34.3	28.6	24.8	26.8	21.1	17.4	19.6	59.0	29.2	23.1	40.9	30.4
Remaining Margin w/o X	46.3	50.0	55.7	70.6	71.8	65.7	52.5	64.2	60.7	70.7	61.8	56.6
Net Generating Capacity	611.3	612.9	614.4	615.3	615.8	617.7	620.3	621.4	622.1	623.0	623.8	625.1
RC w/o X / NGC (%)	13.2	12.8	13.1	15.8	15.1	13.5	11.6	19.8	14.4	15.1	16.5	13.9
RM w/o X / NGC (%)	7.6	8.2	9.1	11.5	11.7	10.6	8.5	10.3	9.8	11.3	9.9	9.1

Figure 35 UCTE Remaining Margin Without Exchanges

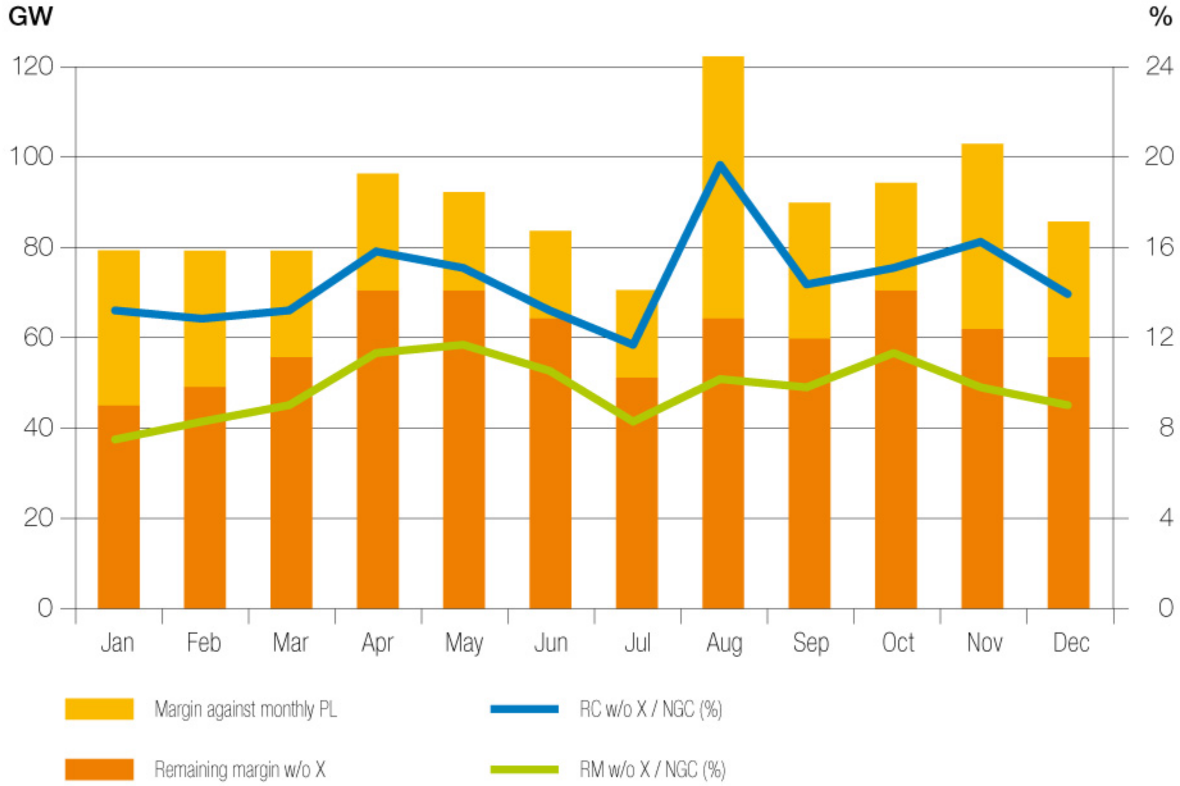


Figure 36 UCTE Annual Minimum Remaining Margin Without Exchanges - January

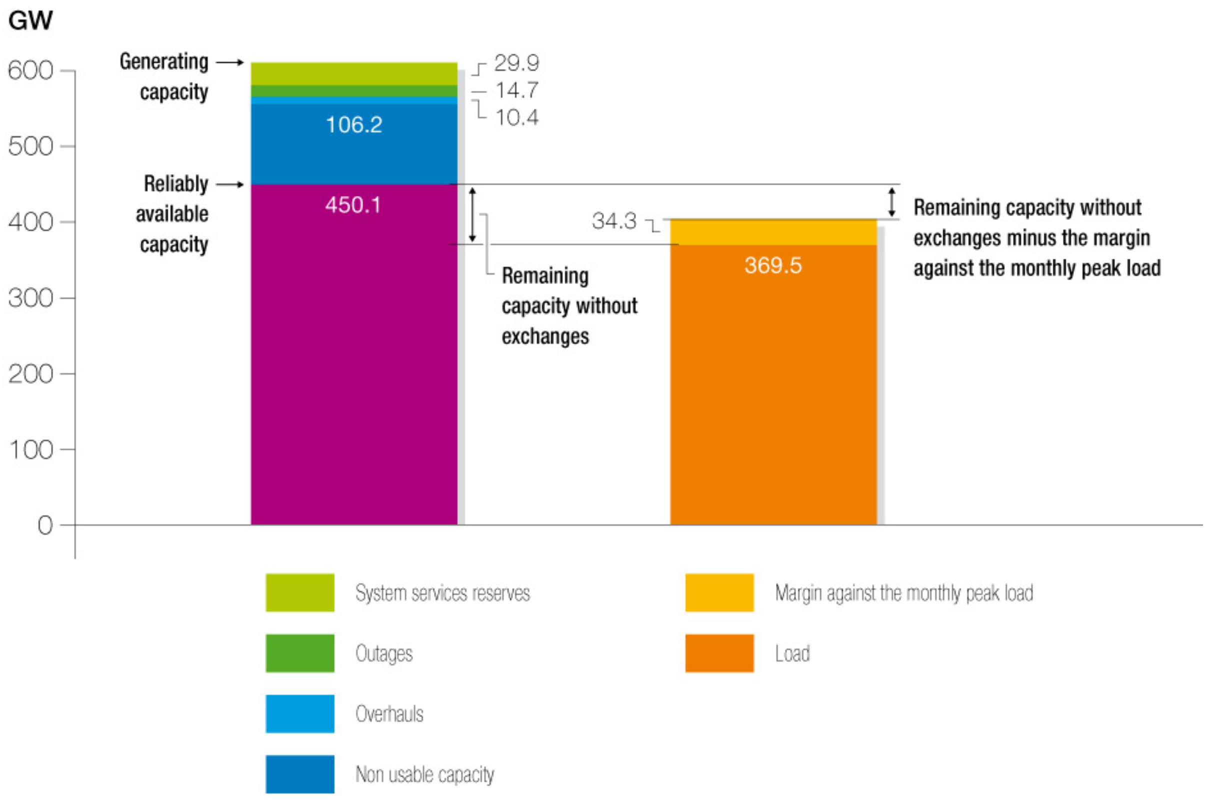
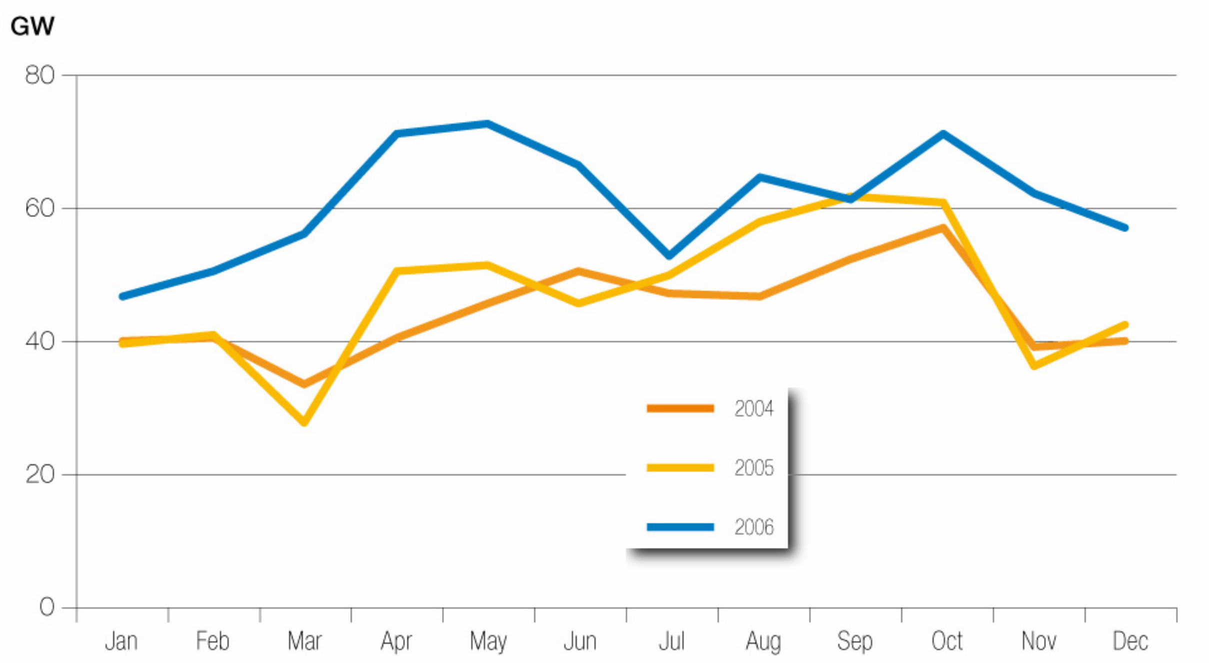


Figure 37 UCTE Remaining Margin Without Exchanges Retrospect



New developments in generation capacity, partly in renewable energy sources generation capacity, balance the increase of energy consumption and the rhythm of decommissioning. Along with the rather mild weather conditions observed in 2006, this made the observed Remaining Margin higher than in the previous years.

Figure 1 UCTE Minimum Remaining Margin / Net Generating Capacity Ratio Retrospect

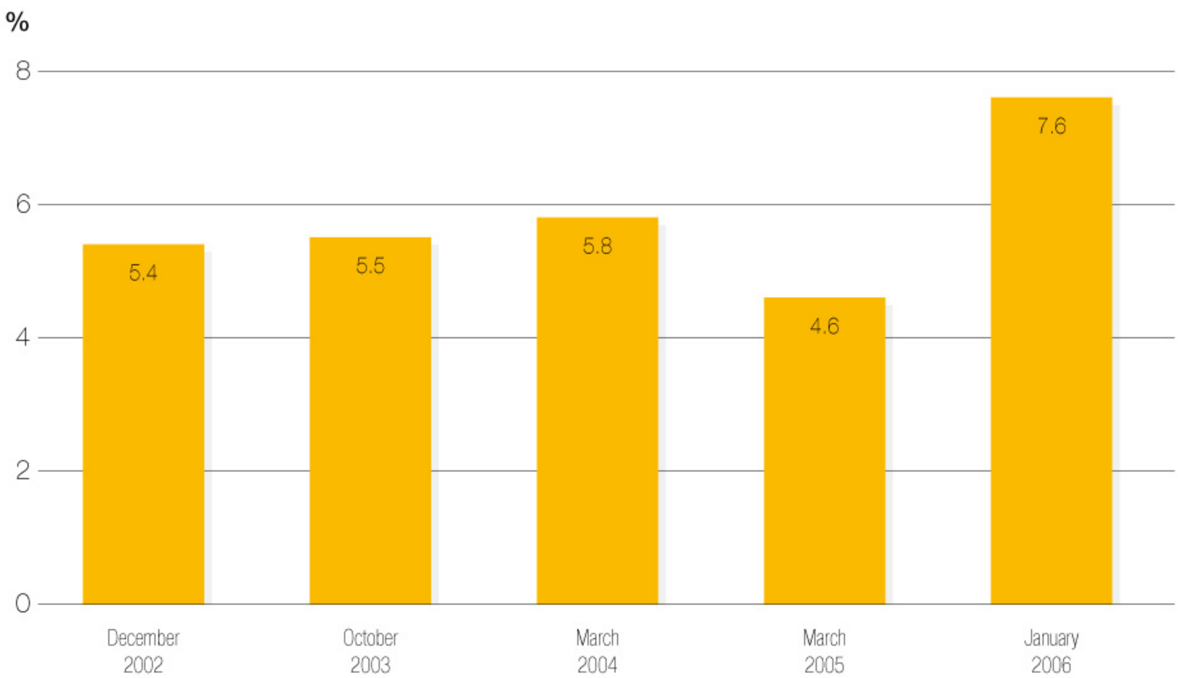


Table 21 National Remaining Margin w/o Exchanges / Net Generating Capacity Ratio

	Jan %	Feb %	Mar %	Apr %	May %	Jun %	Jul %	Aug %	Sep %	Oct %	Nov %	Dec %
AT	26.3	27.9	30.2	21.7	24.6	22.9	29.8	30.4	29.8	33.5	26.4	23.1
BA	34.1	34.1	39.0	29.3	29.3	41.5	39.0	39.0	36.6	26.8	34.1	39.0
BE	-2.0	-3.2	-2.6	7.6	-5.4	-2.4	-0.4	-0.8	-4.9	-2.5	-10.6	-6.4
BG	2.7	3.7	5.1	4.8	4.8	6.3	7.7	6.6	6.1	3.7	1.8	6.7
CH	10.9	12.1	13.8	29.9	29.9	23.0	32.8	18.4	28.7	20.1	17.2	15.5
CS	-6.9	-5.7	0.2	-3.4	-3.4	-2.4	-3.4	-9.2	-5.4	-3.9	-12.7	-9.4
CZ	6.8	9.9	8.6	15.4	19.1	12.3	19.1	17.3	14.2	7.4	6.7	13.5
DE	9.8	9.4	9.1	10.5	4.4	9.7	8.0	6.0	4.8	5.3	6.1	7.6
ES	11.8	9.9	7.6	11.9	12.0	9.7	10.7	9.8	6.4	19.1	22.0	13.9
FR	2.1	1.8	4.8	9.7	14.1	12.1	3.1	12.3	14.3	14.1	9.3	7.5
GR	0.7	5.6	11.8	12.6	4.7	5.1	6.2	-4.3	9.4	11.7	5.9	4.7
HR	12.0	15.2	17.9	25.1	31.4	24.5	22.6	23.8	23.3	19.7	17.3	17.4
HU	4.4	1.9	-4.9	-1.3	-4.5	-7.8	-3.4	-0.7	-2.3	-14.2	-9.5	-7.7
IT	5.1	7.1	9.9	11.1	13.9	6.5	6.6	11.0	9.9	13.6	10.1	9.4
LU	38.6	39.7	40.2	40.9	43.5	44.0	42.7	48.6	42.2	41.0	38.9	38.6
MK	-23.7	-19.1	-14.5	4.5	-4.9	-1.8	13.6	3.4	3.5	7.4	4.0	0.4
NL	4.4	8.1	5.1	4.0	7.3	11.5	5.0	16.0	9.8	-0.1	-2.0	-3.2
PL	10.4	14.0	11.5	9.4	12.7	10.4	0.0	2.3	2.3	4.1	4.5	10.5
PT	5.0	5.7	11.0	25.2	19.5	19.8	10.6	16.3	9.7	19.9	23.5	14.8
RO	19.2	21.0	21.2	18.5	22.6	20.8	21.5	21.2	20.5	15.8	19.0	14.3
SI	-1.1	1.8	6.1	-9.4	14.1	11.4	8.2	9.3	7.0	8.6	6.2	8.1
SK	9.7	9.2	14.1	3.5	7.7	6.2	-1.4	4.0	-3.0	4.9	7.2	9.9
UA-W	18.6	20.2	16.0	15.3	25.6	23.4	10.8	19.2	22.8	20.5	24.8	21.8
UCTE	**7.6**	**8.2**	**9.1**	**11.5**	**11.7**	**10.6**	**8.5**	**10.3**	**9.8**	**11.3**	**9.9**	**9.1**

Figure 38 National Number of Months with Limited Remaining Margin w/o Exchanges

For security reason, Remaining Margin is usually forecasted to cover more than 5% of the Net Generating Capacity. It was actually the case in most of the UCTE countries.

3.9 National Comments

DE – Germany

During all the months, the remaining capacity without exchanges totalled more than 5% of the generating capacity.

GR – Greece

The remaining capacity without exchanges was low in heavy load periods or in case of many outages. Imported electrical energy covered the peaks of the load. The HTSO is tendering the construction of new power plants for commissioning in 2009. Contracted units are temporarily commissioned every summer to face the high peaks due to high temperatures.

IT – Italy

Better availability of power and operational reserve.

NL – The Netherlands

The given remaining capacity is of limited significance, because exact values of outages are not available.

PL – Poland

Due to extremely cold weather in January, the peak demand in Polish power system reached its highest ever level since 1988 with 22673 MW / 24640 MW (net / gross value). However, the generation reserves were still sufficient although some generating companies had to limit their output due to extremely low temperatures (e.g. difficulties in lignite transport).

Also in summer Poland experienced extraordinary weather conditions, this time a long lasting heat wave with extraordinary high temperature (the highest for the latest 227 years, i.e. since temperature has been recorded in Poland) and low rainfall (25% of average rainfall). These unusual weather conditions caused very difficult operational situation beginning with voltage instability incident on June 26th and further shortage of available generation capacity during the most of July.

On June 26th the combination of several circumstances - among others - demand significantly higher then expected (especially for reactive power), forced outages of several generating units, including two “must run” ones combined with the long term overhaul of the important pump storage power plant resulted in serious voltage instability in north-east part of Poland. To prevent further spreading of voltage decrease and to return power system to normal operation PSE-Operator had to undertake several extraordinary remedial actions, including the load shedding of 110 MW.

The extraordinary weather conditions continued in the next five weeks leading to operation of Polish power system close to its limits. Power system demand significantly increased by 10% comparing to the last year, mainly due to increased usage of air-conditioning and cooling devices. On the other hand, this long lasting heat wave caused significant limitations of generating capacities available in power plants due to deterioration of their cooling conditions as well as increase of network constraints in their vicinities.

In order to balance the system PSE-Operator had to undertake extraordinary remedial actions by calling-up all available generating units usually non-dispatchable by TSO and curtailing on certain days the transmission capacities in export direction already allocated in monthly and yearly auctions. Furthermore, in two cases PSE-Operator had to use the support from the neighbouring TSOs in the form of emergency energy deliveries to maintain necessary generation reserves. Moreover, to manage difficult network operating conditions in the northern part of Poland PSE-Operator used in most working days of July emergency deliveries from Swedish TSO – SvK. All these actions allowed to secure operation of the Polish power system until August when the weather came back to normal conditions.

The lowest level of remaining capacity has been observed during the hottest period of summer 2006 – between end of June and beginning of August. On 3rd Wednesday of July Remaining Capacity without power exchanges amounted 0,784 MW, and Remaining Capacity with power exchanges - only 0,214 MW.

RO – Romania

In 2006 the values for remaining capacity was between 19% and 26% of generating capacity. The lowest value was reached in December.

SI – Slovenia

Remaining capacity was all the year available.

SK – Slovak Republic

Operating conditions in 2006 had no impact on the system reliability.

Extremely hot and dry summer caused increased non usable capacity (hydro stations) from July to September. Together with higher overhauls (especially in September) resulted in shortage of capacities on the 3rd Wednesdays in July and September.

TRANSMISSION SYSTEM ADEQUACY

4

4 TRANSMISSION SYSTEM ADEQUACY

Transmission system adequacy is analysed regarding three aspects:

- the main developments of the network during the year with information about the newly commissioned lines or transmission devices having a direct or indirect impact on the interconnections and on congestion (by increasing the NTC, by reducing or increasing constraints, by decreasing congestion costs, …). APPENDIX 3 shows in details these main developments in the different UCTE countries,
- the main disturbances which have affected the transmission lines are collected by the UCTE TSO Forum organization and published on the Living Grid[16] section on the UCTE Web site,
- the congestions observed on the transmission system during the year, especially on the interconnections. Information is given about the criticality of congestion seen by each country on interconnection, according to a common index.

4.1 Main Developments

Further details on developments are in APPENDIX 3 page 96.

BE –Belgium

The double circuit upgrade from 150kV to 220kV of the line Jamiolle-Monceau together with the installation of a phase shifter in Monceau (commissioned in January 2007) increase the simultaneous import capacity of Belgium. Consequently, the NTC-value from France to Belgium will increase with 300 MW for a reference grid situation in summer (indicative non-binding figures).

CS – Serbia and Montenegro

On 26.04.2006 the new international 400 kV line Sremska Mitrovica (Serbia) - Ugljevik (Bosnia & Herzegovina) was commissioned.

HU – Hungary

Newly commissioned 400 kV Győr-Szombathely line and 400kV/120kV Szombathely substation on 14. 09. 2006) increased the NTC on the Slovak-Hungarian interface (from Hungarian point of view).

IT – Italy

The international 220 kV tie-line Camporosso (IT) -Trinite' Victor (FR) replaced the 220 kV tie-line Camporosso (IT) - Broc Carros (FR).

A new 150 kV c.a. submarine link between Sardinia (IT) and Corsica (FR) CO.) for a total length of 31,06 Km.

Capacitor banks, for a total capacity of 700 MVAr, were installed in 13 HV substations. New transformers, for a total capacity of 3180 MVA, have been installed. Transforming capacity for a total amount of 720 MVA has been decommissioned.

ES – Spain

400 kV line: Spain - Marruecos 2 (submarine cable).

FR – France

225 kV tie-line Trinité Saint-Victor (FR) - Camporosso (IT) replaced the 225 kV tie-line Broc Carros (FR) - Camporosso (IT).

[16] http://www.ucte.org/ourworld/living_grid/2006/e_default.asp

A phase-shifter transformer was installed at the 225 kV substation in Guarbecque (Nord-Pas-de-Calais) and a 600 MW auto-transformer was installed at the substation in Mazures (Ardennes) to secure and increase the export capacity to Belgium.

A new 50 MW submarine AC cable between Corsica and Sardinia has been put in operation on February 3rd to increase the supply to the Corsican distribution-only network.

NL – The Netherlands

In 2006 construction works for the HV-DC cable-connection between the Netherlands and Norway started at full and good progress was made. At the end of the year about 35% of the 580 km cable was realised and the converters and the buildings for the converter stations were nearby completed. It's the intention that this cable can be taken in service at the end of 2007.

PT – Portugal

From this set of reinforcements the ones witch have a more significant impact on interconnection capacities are:

- Pego-Falagueira and Falagueira-Cedillo, at 400 kV, as a result of opening the pre existent Pego Cedillo line at Falagueira substation.
- Bodiosa-Paraimo, at 220 kV, a new double circuit line with one circuit installed, prepared for 400 kV but initially used at 220 kV.
- Batalha-Pego, at 400 kV, a new single circuit line.

RO – Romania

Substation Rosiori's commissioning after its reinforcement increases the NTC import values on the NE border.

4.2 Main Disturbances

BE – Belgium

In April due to an extraordinary maintenance in a 380 kV substation, and risk of 2000 MW generation outage, Elia requested and obtained over 1000 MW emergency reserves from RTE, RWE, Etrans and TenneT. The reserves did not have to be activated. During summer and especially in August the internal 380 kV Doel-Zandvliet is very high loaded (all the time, day and night), requiring several topological measures in Belgium, France and the Netherlands in order to ensure N-1.

CZ – Czech Republic

Balance problems in the Czech Republic in the week between 23.01.2006 and 27.01.2006: During the period from 23.01.2006 to 27.01.2006 the Czech Republic experienced important shortage of electrical energy due to extreme cold weather which coincided with high failure rate of units up to 1400 MW. On Tuesday 24th January the historical peak load 11308 MW (gross) was recorded. To solve the situation all ancillary services including emergency deliveries from abroad were used up.

Breakdown of 400 kV line Hradec - Etzenricht on 25.05.2006: Extraordinary weather conditions in the West part of the Czech Republic (gust wind, rain, hail-storm) caused destruction of 4 pylons of the double line Hradec - Etzenricht (D) on the 25.05.2006 at 20:30 (CET). To mitigate serious consequences also at the interface with the neighbouring system, a prompt decision to construct a temporary line was made. The line was switched 04.06.2006, followed by complete reconstruction works leading to the successful and full commissioning of the line on 25.07.2006.

Emergency situation in the Czech system on 25.07.2006: A non-predicted change of real flows during the morning period of the day caused overloading of the 400 kV line Cechy Stred - Chodov and, this line had to be opened. By this event, the n-1 criterion could not be respected further in the system. At 12:01 (CET), another line tripped as a consequence of rupture of one cable of the triple-bundled phase line Hradec-Mírovka. Subsequent cascading tripped several 400 and 220 kV lines. As a consequence, the system was not in state to absorb output from major generating units and the generation had to be limited. Non-planned imports amounted up to 1600 MW. CEPS immediately reacted to the emergency situation by summoning its "emergency body" and pronouncing the State of Emergency on the whole territory of the Czech Republic. The demand of electricity was curtailed. To solve the situation, CEPS also used contracts on emergency assistance with neighbouring TSOs and procured regulating energy amounting up to approx. 1300 MW from abroad. CEPS used its standard procedures for emergencies, which led to the definitive solution at 23.00 (CET) when the state of emergency was called off.

DE – Germany

The system disturbance on 04.11.2006 affected the grid of E.ON Netz. The grid was split up in two parts, the northern part as well as the grid of VE-T being connected to the over-frequency area of north eastern Europe and the southern part being connected to the under-frequency area of western Europe together with the grids of EnBW TNG and RWE TSO. See UCTE dedicated Report[17].

FR – France

On 01.01.2006: tripping of 400 kV tie-line Argia (FR) - Hernani (ES) and 225 kV tie-line Argia (FR) - Arkale (ES).

On March 3rd, due to the tripping of to internal lines 400 kV, the NTC between France and Spain was reduced to 0 MW.

On 04.04.2006: due to the tripping of a tie-line between Switzerland and Italy, reduction in real time of the scheduled exchanges between France, Italy and Switzerland (trilateral procedure).

On 26.05.2006: a fault in the 400 kV substation of Villarodin (FR) caused the tripping of the 400 kV tie-line Villarodin (FR) - Venaus (IT) with a reduction of the exchanges between France, Italy and Switzerland (trilateral procedure).

On 07.06.2006: tripping of the 225 kV tie-line Pragneres (FR) - Biescas (ES) with a reduction of the capacity between France and Spain.

GR – Greece

On 22.06.2006 at 14:57 (CET) the mechanism of the load shedding was activated and a consumption of about 740 MW was disconnected in Athens and Thessalonica areas due to the overload of the 400 kV line between Greece - Bulgaria. The overload provoked after the subsequent trip of two lines in JIEL Control Block and of one line between Bulgaria and FYROM.

HU – Hungary

On 04.11.2006, due to the spread system disturbance, SndorfalvaArad (RO), PaksSndorfalva, Hvzerjavinec (HR) I-II. 400 kV transmission lines were disconnected, while a consumer island around Sndorfalva substation remained supplied through SndorfalvaSubotica (Serbia) 400 kV tie-line. There were no significant problems in power supply.

IT – Italy

On 22.02.2006 at 23:22 (CET) a fault in the 380 kV substation "La Spezia" caused the unexpected outage of all the lines connected to the substations and of its busbars. 340 MW of generation connected to the substation were lost as well. To face the consequent critical conditions in the internal grid, over 1000 MW of emergency power were imported from neighbouring TSOs and 550 MW were shed. Critical conditions were overcome in the early morning of the day after.

NL – The Netherlands

Just as reported in earlier years, there were again extensive flows over the Dutch grid in relation to huge wind power generation in the Northern part of Germany, mainly during the first three months and the last month of the year. Together with the neighbouring German TSOs operational arrangements have been agreed upon, in which each of the involved TSOs is committed to take countermeasures to reduce these transports when operational limits of the cross borderlines will be reached. One of these measures is to reduce gradually import capacity of the Netherlands in the daily planning phase in dependency of the German wind power forecasts. These measures showed to be effective as the (N-1) security level at the

[17] The disturbances of November 4th 2006 had no connection to system adequacy, see final UCTE report on the UCTE Web site http://www.ucte.org/pdf/Publications/2007/Final-Report-20070130.pdf

Dutch-German border was only in a few cases affected during the year by unexpected transits and could be managed with available measures.

PL – Poland

During the critical period of time, in July Polish TSO had to curtail on certain days the transmission capacities in export direction already allocated in monthly and yearly auctions. Furthermore, in two cases PSE-Operator had to use the support from the neighbouring TSOs in the form of emergency energy deliveries to maintain necessary generation reserves. Moreover, to manage difficult network operating conditions in the northern part of Poland PSE-Operator used in most working days of July emergency deliveries from Swedish TSO – SvK.

SI – Slovenia

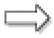
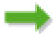
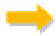
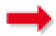
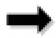
On 30.03.2006 at 12:07 there was an incident in substation Maribor. Because of that incident Slovenian system was split in two parts (East and West). East part was fed from Italy and West part was fed from Nuclear power plant Krsko and from Croatia. Voltage phase angles were too big to synchronize the Slovenian system. With technical support from Slovenian neighbouring system operators the conditions for synchronization were achieved and Slovenian system was successfully recoupled at 14:43.

4.3 Cross-border congestions

As far as interconnection access is concerned, it is considered in this report that a congestion occurs when access cannot be granted to all the actors who request it, that is when market players are eager to buy more capacity than on sale in any direction.

Accordingly, **congestions in the meaning of the present report are not necessary physical congestions but may correspond to commercial or contractual congestions.** Their causes are to be found not only in the exchange capacity of physical interconnection lines, but also in the allocation mechanisms of the available capacity which are applied.

For each border, and for each direction through it, each UCTE country rates the strength of the congestion with a severity index based on the annual frequency of congestion. The severity of this congestion reflects the percentage of the time duration of the situation of congestion within the year.

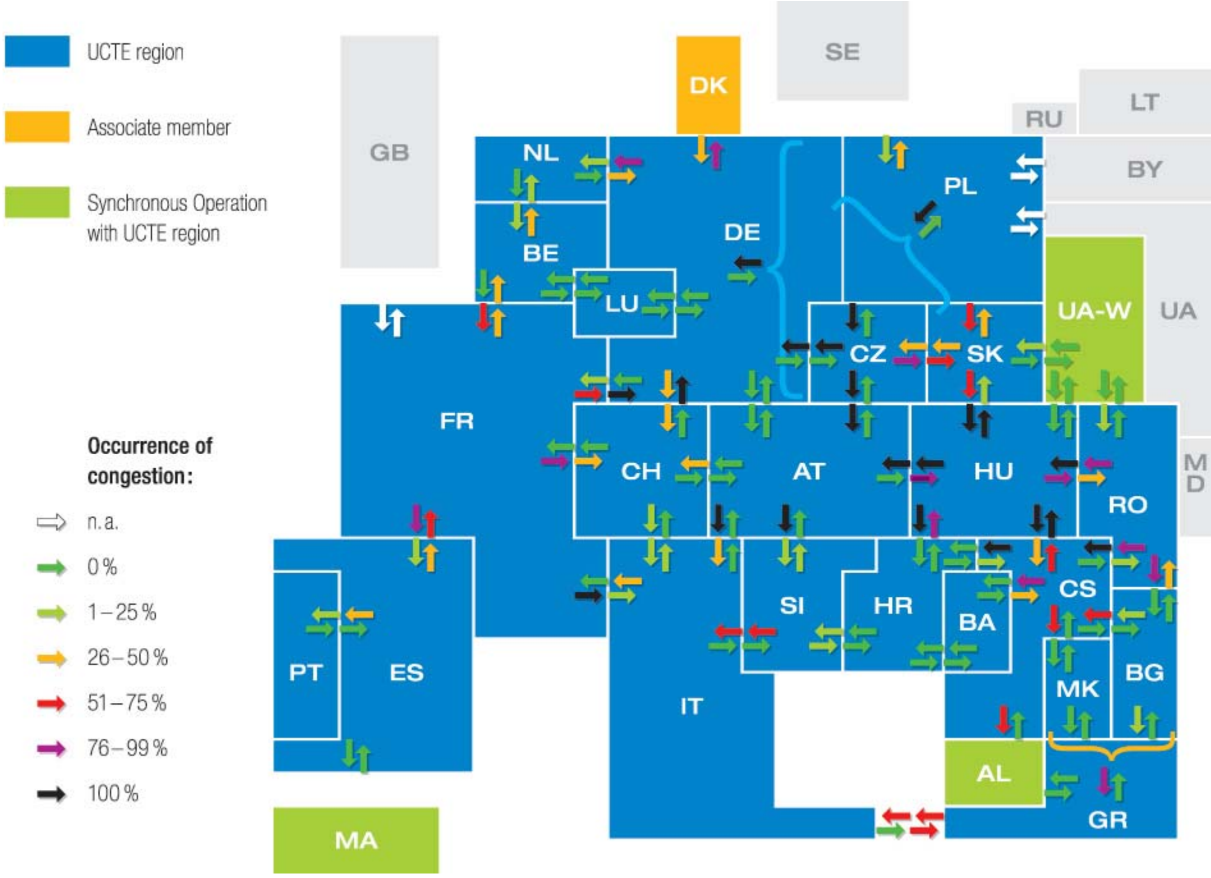
Severity Index	Arrow's colour	Annual Frequency of Occurrence
n.a.		n.a.
0		0%
1		1-25%
2		26-50%
3		51-75%
4		76%-99%
5		100%

Next figure represents the severity index of congestion observed between UCTE countries throughout 2006 year.

The fact that severity index may differ between one side of a border and the other means that maximum capacity allocation is more often reached on one side. Various reasons may explain this : existence of physical congestion on the internal network of the TSO may be one, as well as capacity allocation process which may differ. Next chapter provides national comments concerning these issues.

According to this rather "commercial" definition of congestion, it is also possible to observe congestion simultaneously in both directions. For instance when the maximum amount of capacity to be allocated is fully fixed ex-ante in both directions and there is neither export capacity nor import capacity left on sale. This is why the total of severity indexes in both directions may exceed 100% in some cases.

Figure 39 UCTE Cross-Border Congestions Map



4.4 National Comments

In the following pages, details are given about the state of congestion for each country with its interconnected neighbours.

In order to qualify more precisely the congestion, the table below has been used to classify more precisely when possible the occurrence according to the season, and hour of the day :

Season	Hours
Never (**N**)	Never (**N**)
Spring (**Sp**)	Varying (**V**)
Autumn (**Au**)	Peak hours (**P**)
Summer (**Su**)	Night hours (**Ni**)
Winter (**W**)	Day hours (**D**)
All year (**AY**)	All day (**A**)

In order to provide a more comprehensive view of the situation in the European power system, the following comments are organised on a geographical logic taking into account the different areas issued from the congestion observed in the UCTE system. Methods for congestion management in each country are specified.

As complement to this topic, it can be useful for readers to download the latest ETSO report[18] on cross-border congestion management dated May 2006.

[18] http://www.ucte.org/ourworld/living_grid/2006/e_default.asp

4.4.1 Iberian Block

ES – Spain

Border		Severity index	Season	Hours	Remarks
From	To				
ES	FR	1	W	D	
ES	FR	1	SP	D	
ES	FR	1	AU	D	
FR	ES	2	AY	A	
ES	Morocco	0	SU	P	
ES	Morocco	0	W	D	
ES	PT	2	AY	A	
PT	ES	0	Sp	P	

PT – Portugal

Border		Severity index	Season	Hours	Remarks
From	To				
PT	ES	1	Au	A	
ES	PT	1	W	A	
ES	PT	1	Sp	A	
ES	PT	3	Su	A	
ES	PT	1	Au	A	

4.4.2 North Western Block

AT – Austria

Serious congestions in the Austrian network occur on the three 220kV lines from the north to the south of Austria. Since 2001 the (n-1) criterion was repeatedly violated especially in the winter season during the night, although extensive congestion management measures were taken. As in the last years, also 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 results in congestions in the transmission grid of Verbund-APG. Verbund-APG has 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 13.5.2006 which was very important for congestion management and the further increase of 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 is 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 operation started by 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. The weak north south lines can be also protected in case of an outage of a line or system. Thus, 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 high-level 8-TSO-meeting in Vienna on 28.02.2005, at the meeting of the System Development Group in Paris on 11.01.2006 and to all neighbouring TSOs.

Furthermore we point 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.

Border		Severity index	Seasons	Hours	Remarks
From	To				
AT	CZ	0			
CZ	AT	5	AY		
AT	IT	5	AY		
IT	AT	0			NTC 220MW
AR	SI	5	AY		
SI	AT	0			
AT	HU	0			
HU	AT	5	AY		
AT	CH	0			
CH	AT	0			

Interconnection	Capacity	Allocation method	Comment
AT>CZ	600MW Base	Explicit Auction	www.auction-office.at www.ceps.cz
CZ>AT	450MW Base; 150MW Peak	Explicit Auction + Long term contract	www.auction-office.at www.ceps.cz
AT>IT	Capacity according to pentalateral agreement on the Italian northern interconnection	Explicit Auction (yearly, monthly, daily) + Long term contract	Only share of AT
IT>AT	110 MW, except line disconnection	Splitting of capacity Explicit Auction (yearly, monthly, daily)	Only share of AT
AT>SI	225MW Base; 100MW Peak	Splitting of capacity Explicit Auction (yearly, monthly, daily)	Only share of AT
SI>AT	225MW Base; 100MW Peak	Splitting of capacity Explicit Auction (yearly, monthly, daily)	Only share of AT
AT>HU	100MW Base in some month 50MW base additional capacity	Explicit Auction (yearly, monthly, daily)	Allocation by AT Allocation by HU
HU>AT	100MW Base, 100MW Peak	Explicit Auction (yearly, monthly, daily)	Allocation by AT Allocation by HU
AT> CH	140 – 250 MW Base	Explicit Auction	Allocation by AT

	0 – 200 MW additional daily capacity	(monthly, daily)	Allocation by CH
CH>AT	600 MW Base	Explicit Auction (monthly, daily)	Allocation by AT Allocation by CH

Auction: The allocation of the capacity is organized by an auction office

Splitting of capacity: Each country (TSO) is responsible for 50% of the available capacity. The allocation of each share takes place according to the national laws.

Splitting of direction: Each country is responsible for a single direction.

Base: 01.01.2004 00:00h – 31.12.2004 24:00h

Peak: 02.01.2004 – 31.12.2004 Monday to Friday daily 08:00h – 20:00, excepting Austrian holidays

BE – Belgium

Explicit auctioning on the Belgian South border started in 2006. The prices of the auction capacity of the Belgian South border (from France to Belgium) were initially very low during the first quarter of 2006. Capacity prices increased significantly in periods where available capacity for monthly and daily auctions (from France to Belgium) was below 750 MW in total.

The prices for monthly and daily auction capacity of Belgian North border (from Belgium to the Netherlands) were significantly higher in the second half of 2006.

Daily auctions at both borders were characterized with high hourly capacity price variations as well as high day-by-day price volatility.

From the start of Tri Lateral Coupling between (November 21st, 2006), the former explicit methods for allocating daily capacity have been replaced by the implicit allocation resulting from a coupling between the French, Belgian and Dutch markets.

This new process avoids the well-known drawbacks of explicit allocation by:

- Coordinating capacity allocation on both borders,
- Allowing full netting of counter-flows,
- Automatically fulfilling the 'use-it-or-lose-it' principle for the ATC allocated to the TLC.

The first results indicate indeed that:

- a common price for the 3 markets has been established (i.e. a full coupling) over 60% of the time and two of them were coupled about 39% of the time ; this fulfils, for the 3 countries, the European objective of an Integrated Energy Market;
- the volatility of Dutch and French prices has been strongly reduced, providing the market actors with a significant price signal;
- no counter-flows have been observed (nominations from more expensive zones to cheaper ones), while they were rather frequent before introduction of the Market Coupling.

Border		Severity index	Seasons	Hours	Remarks
From	To				
FR	BE	2	Su	D	
BE	FR	0	N	N	
NL	BE	1	AY	D	
BE	NL	2	Su	D	
LU	BE	0	N	N	
BE	LU	0	N	N	

CH – Switzerland

Border		Severity index	Season	Hours	Remarks
From	To				
CH	IT	1	Su	P	
IT	CH	0	N	N	
CH	DE	0	N	N	
DE	CH	2	W	Ni	
CH	FR	0	N	N	
FR	CH	2	W	Ni	
CH	AT	0	N	N	
AT	CH	2	W	Ni	

In December 2005 - due to network constraints - a market-based, transparent and non-discriminatory capacity allocation process in form of monthly explicit auctions has been implemented for the year 2006 on the Swiss/German and Swiss/Austrian border. Mid of January 2006 explicit auctions for daily capacity have been added. This capacity allocation process has been enlarged in December 2006 with the implementation of yearly auctions on both borders. At the same time, also the possibility of Secondary Trading of yearly and monthly capacity has been implemented at the Swiss/Austrian border and will be implemented mid 2007 at the Swiss/German border.

Furthermore, in December 2006 the German energy exchange EEX and the Austrian energy exchange EXAA started their day-ahead markets in Switzerland.

DE – Germany

Border		Severity index	Season	Hours	Remarks
From	To				
DE	CH	2	AY	A	Auctions EnBW TSO
DE	FR	2	AY	A	Auctions RWE TSO
DE	AT	0	N	N	No congestion in 2006
AT	DE	0	N	N	No congestion in 2006
CZ/PL	DE	5	AY	A	Information refer to the German side (VE-T)
DE	CZ/PL	0	N	N	Information refer to the German side (respectively the transmission grid of VE-T)
DK (East)	DE				(*) Congestion management of the KONTEK submarine cable between the transmission networks of the Danish Energinet.dk and VE-T is carried out on the basis of a Market Coupling (MC) procedure through the Energy Exchange (NordPool Spot AS). The direction, severity and frequency of restrictions result from the changing market price situations; they cannot be represented by TSOs in the desired manner. Furthermore, it has to be pointed out that the principle of MC is based on a purposive control of demand for network access or transmission capacity through the Energy Exchange, i.e. demand maximally refers to the existing capacity. The following interpretation is also conceivable against this background: Using this procedure, network access can be granted to the

					desired extent. Consequently, there is no restriction taking effect according to the definition mentioned at the beginning of this chapter. Therefore, depending on the point of view, completely different information could be given in the Table as to „Severity / Season / Hours “.
DE	DK (East)				See remarks above.
DE	DK (West)	4	AY	A	Result of auctions
DK (West)	DE	2	AY	A	Result of auctions
DE	CZ	0	AY	A	Result of auctions
CZ	DE	5	AY	A	Result of auctions
DE	NL	4	AY	A	Result of auctions
NL	DE	2	AY	A	Result of auctions
DE	FR	5	AY	A	Auctions RWE TSO
DE	CH	5	AY	A	Auctions EnBW TSO
FR	DE	5	AY	A	Auctions RTE
CH	DE	5	AY	A	Auctions EnBW TSO

Within the scope of coordinated monthly auctions (CEPS/PSE-O) → VE-T, auction prices ranged from about 6,000 €/MW to about 29,000 €/MW. Clear-cut high or low-tariff periods cannot be identified. A tendency towards rather lower prices becomes apparent in the middle of the calendar year.

Higher demand for transmission capacity existed mostly at the network border with PSE-O or for the direction Poland → Germany.

FR – France

Border		Severity index	Season	Hours	Remarks
From	To				
FR	BE	2	AY	V	
BE	FR	3	AY	V	
FR	DE	3	AY	V	
DE	FR	1	AY	V	
FR	CH	4	AY	AD	
CH	FR	0	AY	AD	
FR	IT	5	AY	AD	
IT	FR	0	AY	AD	
FR	ES	4	AY	V	
ES	FR	4	AY	V	The capacity might be simultaneously and totally sold on both directions of the Spanish border.
FR	UK	3	AY	V	
UK	FR	1	AY	V	

LU – Luxembourg

Border		Severity index	Season	Hours	Remarks
From	To				
LU	DE	0	N	N	Radial operation of the grid
DE	LU	0	N	N	Radial operation of the grid
LU	BE	0	N	N	Radial operation of the grid
BE	LU	0	N	N	Radial operation of the grid

NL – The Netherlands

Border		Severity index	Season	Hours	Remarks
From	To				
NL	BE	0	N	N	
BE	NL	1	AY	V	In relation to France-Belgium border
NL	DE	0	N	N	
DE	NL	1	Au, W	V	Due to high transits from wind-generation NTC-values were reduced for 12% of hours

There are no notorious bottlenecks on the Dutch cross-border lines themselves, but sometimes imports from Belgium/France or transports from France towards Germany should be restricted in operational planning because of expected high loads on the France/Belgium cross-border lines.

In autumn and winter months there are extensive flows over the Dutch grid in relation to high wind power generation in the Northern part of Germany These transit flows cause that on some hours TenneT is obliged to reduce the import capacity on the German border to guarantee network security. This procedure was used in nearby 12% of the time in 2006.

SI – Slovenia

The congestion on internal network sometimes occurs on the line DV 400 kV Beričevo-Podlog, usually when high power flows from Croatia crosses Slovenia and exits on Italian border.

Border		Severity index	Season	Hours	Remarks
From	To				
SI	IT	3	AY	A	Pentalateral procedure, redispaching
IT	SI	0	N	N	
AT	SI	1	AY	A	Pro rata allocation mechanism.
SI	AT	1	AY	A	Pro rata allocation mechanism.
HR	SI	1	AY	A	Pro rata allocation mechanism.
SI	HR	1	AY	A	Pro rata allocation mechanism.

In the beginning of the year trend of high prices for auction capacities for export on Italian border, the prices later decrease. From October 2006 the price for auction capacities for import of energy from Austrian border starts to rise and is still rising.

The new interconnection lines (2x400 kV) between Hungary and Slovenia and 2x400 kV line between Slovenia and Italy are planned – to solve the congestions on the Italian border and on Austrian border.

4.4.3 Italian Block

IT – Italy

FR Border: N-1 criterion not satisfied when the limit of the export goes over or when some internal lines are switched-off for critical conditions.

CH-SI-GR Border: An automatic switching-off of the one of internal line involved in these exchange areas reduce automatically the internal production and prevents the overload with consequent risk of failure.

Border		Severity index	Season	Hours	Remarks
From	To				
FR	IT	1	Sp	A	
IT	FR	2	AY	Ni	
CH	IT	1	AY	A	
IT	CH	1	W	Ni	
AT	IT	2	Su	A	
IT	AT	0	AY	A	
SI	IT	3	AY	D	
IT	SI	0	AY	A	
GR	IT	3	AY	A	
IT	GR	0	AY	A	

4.4.4 South Eastern Block

BG – Bulgaria

There were no internal congestions in 2006.

Interconnection capacities are allocated by a pro-rata mechanism.

Border		Severity index	Season	Hours	Remarks
From	To				
BG	CS	1	SU	D	Maintenance activities in Serbian EPS
BG	GR	1	SU	D	Maintenance activities in Serbian and FYROM EPS

CS – Serbia and Montenegro

1. Direction 400 kV Sofia (BG) – Nis (CS), usually congested; n-1 problems in Nis area
2. Direction CS→MK, n-1 problems; interdependent with direction BG→GR
3. Direction CS→HR+BA, n-1 problems

Border		Severity index	Season	Hours	Remarks
From	To				
CS	RO	0	N	N	EMS: pro-rata monthly allocation of 50% of ATC
RO	CS	5	AY	A	EMS: pro-rata monthly allocation of 50% of ATC
CS	BG	0	N	N	EMS: pro-rata monthly allocation of 50% of ATC
BG	CS	3	W	A	EMS: pro-rata monthly allocation of 50% of ATC
CS	MK	3	AY	A	EMS: pro-rata monthly allocation of 50% of ATC
MK	CS	0	N	N	EMS: pro-rata monthly allocation of 50% of ATC
CS	Albania	3	AY	A	EMS, EPCG: pro-rata monthly allocation of 50% of ATC
Albania	CS	0	N	N	EMS, EPCG: pro-rata monthly allocation of 50% of ATC
CS	BA	4	AY	A	EMS: monthly explicit auction (50%)*, EPCG: priority list of 50% of ATC
BA	CS	2	AY	A	EMS: monthly explicit auction (50%)*, EPCG: priority list of 50% of ATC

CS	HR	5	AY	A	EMS: monthly explicit auction (50%)*
HR	CS	2	W	A	EMS: monthly explicit auction (50%)*
CS	HU	3	AY	A	EMS: pro-rata monthly allocation of 50% of ATC
HU	CS	2	AY	A	EMS: pro-rata monthly allocation of 50% of ATC

EMS: Serbian TSO, EPCG: Montenegrin TSO

Explicit auction introduced since January 2007, during 2006 pro-rata allocation

GR – Greece

No congestions on the national network in 2006.

Newly commissioned lines or transmission devices do not have any impact on the interconnections.

Border		Severity index	Season	Hours	Remarks
From	To				
BG&FYROM	GR	5	Su	D	
BG&FYROM	GR	4	W	D	
BG&FYROM	GR	2	AY	Ni	
BG&FYROM	GR	4	Au	D	
BG&FYROM	GR	4	Sp	D	
GR	IT	3	Sp	P	
GR	IT	5	Su	A	
GR	IT	5	Au	A	
GR	IT	3	W	P	
IT	GR	0	AY	A	

RO – Romania

Border		Severity index	Season	Hours	Remarks
From	To				
RO	BG	4 (84%)	AY	A	
RO	CS	4 (88%)	AY	A	
RO	HU	4 (79%)	AY	A	
BG	RO	2 (35%)	AY	A	
CS	RO	1 (8%)	AY	A	
HU	RO	2 (30%)	AY	A	
UA-W	RO	1 (8%)	AY	A	

4.4.5 North Eastern[19] Block

CZ – Czech Republic

Internal Bottleneck /congestion	Severity index	Season	Hours	Remarks
V243,4	1	AY	V	Tie lines 220kV CZ-A – unexpected flows

[19] Previously identified as the CENTREL block.

V245,6	1	W	P	Tie lines 220kV CZ-PL– unexpected flows
V253,4	1	AY	V	Internal lines located between tie lines mentioned bellow – unexpected flows

Border		Severity index	Season	Hours	Remarks
From	To				
CZ	DE	5	AY	A	100 % real using – all days
DE	CZ	0	N	N	---
CZ	AT	5	AY	A	100 % real using – all days
AT	CZ	0	N	N	----
CZ	PL	0	N	N	----
PL	CZ	5	AY	D	100 % real using – day hours only
CZ	SK	4	AY	V	80 % real using of allocated capacity
SK	CZ	2	AY	V	60 % real using of allocated capacity

Border (From -> To)	Maximal monthly auction prices and Month
CZ -> DE (VE-T)	26 132 €/MW in January
CZ -> DE (E.ON)	21 200 €/MW in January
DE (E.ON) -> CZ	0.03 €/MW in December
DE (VE-T) -> CZ	0.1 €/MW in December
CZ -> AT	9 658.50 €/MW in July
PL -> CZ	29 090.82 €/MW in December
CZ -> PL	0€/MW
CZ -> SK	211 €/MW in October
SK -> CZ	345.07 €/MW in February

HU – Hungary

Main Internal Outages	Overloaded element
Göd 400/120 kV transformer	Göd 400/120 kV transformer
Győr 400/120 kV transformer	Győr 400/120 kV transformer
Győr-Litér 400 kV line	Győr 400/120 kV transformer
Győr-Wien 400 kV line	Győr 400/120 kV transformer
Göd-Levice 400 kV line	Győr 400/120 kV transformer

As the Hungarian capacity on sale is fully fixed – in terms of amount and time – ex-ante in both directions, you can simultaneously observe that there is neither export capacity nor import capacity left on sale in 100% of the year. This is the case on most of the Hungarian cross-borders.

Border		Severity index	Season	Hours	Remarks
From	To				
SK	HU	5	AY	V	
HU	SK	5	AY	V	

HR	HU	4	AY	V	
HU	HR	5	AY	V	
UA-W	HU	0	0	0	
HU	UA-W	-	-	-	
RO	HU	5	AY	V	
HU	RO	4	AY	V	
CS	HU	5	AY	V	
HU	CS	5	AY	V	
AT	HU	4	AY	V	
HU	AT	5	AY	V	

PL – Poland

Although many network constraints occur in Polish transmission system it is difficult to determinate any structural bottlenecks (i.e. those related to the particular sets of lines over longer periods of time). The actual network constraints heavily depend on given system load, network configuration and generation pattern and vary according to their changes. Most of network constraints result from limitations related to voltage stability in a given area, not from permissible loading of transmission lines themselves (apart from some cases of the sub transmission 110 kV lines). To manage congestion coming from these network constraints Polish TSO has to re-dispatch the generation.

Border		Severity index	Season	Hours	Remarks
From	To				
PL	DE/CZ/SK	5	AY	V	*
DE/CZ/SK	PL	0	AY	V	*
PL	SE	2	AY	V	Commercial DC link
SE	PL	1	AY	V	Commercial DC link
PL	UA-W				not applicable
UA-W	PL				not applicable
PL	BY				not applicable
BY	PL				not applicable

*in 2006 as in the previous years PSE-Operator managed congestion on all synchronous international tie lines (to D,CZ, and SK) together and thus the description of congestion situation is given for this whole profile.

<u>Auctions</u>

On the Polish-German border the highest prices were in December and March (respectively 29090 and 29018 €/MW/month) on export direction. The lowest price was in June and July (10022 and 15337 €/MW/month).

On the Polish-Czech and Polish-Slovak profile the highest prices were also in December and March (respectively 29090 and 29018 €/MW/month) on export direction. The lowest price were also in July and June (4472 and 4950 €/MW/month).

The high prices on the Polish-German profile were caused by a high demand for transfer capacities, which is an effect of energy price difference on markets in Poland and Germany.

The capacities in import direction were totally allocated in yearly auction. Price in import direction for all Polish profiles is much lower in comparison to export prices and was equal to 6746 €/MW/month for the whole year.

SK – Slovak Republic

Border		Severity index	Season	Hours	Remarks
From	To				
SK	HU	5	W,Au	D	
SK	HU	4	W,Au	Ni	
SK	HU	4	Sp,Su	D	
SK	HU	3	Sp,Su	Ni	
HU	SK	1	Ay	A	
SK	CZ	2	Sp,Su,W	A	
SK	CZ	1	Au	A	
CZ	SK	2	Sp,Su	A	
CZ	SK	3	Au,W	D	
CZ	SK	2	Au,W	Ni	
UA-W	SK	2	Su	A	
UA-W	SK	1	Sp,Au,W	A	
SK	UA-W	0	Ay	A	
SK	PL	0	Ay	D	
SK	PL	3	Ay	Ni	
PL	SK	5	Au,W	D	
PL	SK	4	Sp,Su	D	
PL	SK	3	Ay	Ni	

UA-W – Western Ukraine

There are no congestions on any interconnection with the Burshtyn Island in 2006. But in the last month of 2006 considerable North - South power flow were observed, from Slovakia to Romania via substation 400 kV Mukachevo. The values of this power flow were close to the limit of the 400 kV Line Kapushany - Mukachevo.

MARKET DEVELOPMENTS 5

5 MARKET DEVELOPMENTS

This chapter gives some general information on the opening up of the internal market in terms of implementation of the EU Electricity Directive and market developments occurred in the UCTE countries.

BA – Bosnia-Herzegovina

According to current rules end-customers may acquire the eligible customer status in accordance with the following time schedule:

- customers with annual consumption of electricity higher than 10 GWh as of January 1, 2007, creating the level of market opening of 33%,
- all customers, except households, as of January 1, 2008 (market opening of 57,5%),
- all customers as of January 1, 2015.

Until February 2007, all end customers are still regulated. Possibility to be eligible customer used nobody.

BE – Belgium

The TLC (tri-lateral coupling) between the French, Belgian and Dutch markets (Powernext, Belpex and APX respectively) has started on November 21st 2006 (first day of delivery 22 November 2006). Therefore, it is too early to deduct information regarding trends in the Belgian electricity prices.

However, even after only three months of trade on the Belpex Day Ahead Market for electricity a record volume of 33,205.3 MWh was reached on 22 January 2007 (delivery 23 January 2007). This volume equals 11.81% of the average Belgian electricity consumption. The volume can be split in 18,391 MWh during peak hours and 14,814.3 MWh during the off-peak hours. This indicates that a sufficient level of liquidity has been reached to provide a significant price signal.

Belpex's hourly price curve is highly correlated with Belgian consumption and is becoming a useful benchmark for the market players in Belgium.

Since 1st February 2007, Belpex has enlarged its product range by implementing block bids on the day-ahead market. Block bids create new trading opportunities and facilitate the Belgian electricity market development.

BG – Bulgaria

51 Market Players were active on the open market in 2006, among them 6 Independent Producers, 33 Eligible Customers, 1 public supplier – NEK and 12 traders. The total energy supplied under bilateral contracts in 2006 is 3214552 MWh.

Step by step the model shall be developed further and a complex market incorporating a spot "day-ahead market" for short-term deals with electricity and ancillary services will be put in place.

CH – Switzerland

On December 15, 2006, Swissgrid ag started its operations as a national Transmission System Operator. As a grid operator, swissgrid is responsible for ensuring the safe, reliable and cost-efficient operation of the very-high-voltage grid.

The Electricity Supply Law that intends to open the Swiss electricity market gradually passed the Council of States in October 2006 and will be discussed in the National Council in March 2007. The draft provides for ownership unbundling of the transmission system assets from the large Swiss electricity utilities and their transfer to the national TSO swissgrid within 5 years. It is expected that the law will come into force on the January 1, 2008, but this can be delayed in the case of a referendum.

On May 17, 2006 the Swiss Federal Government issued a mandate for negotiations with the European Union, which should lead to a bilateral agreement between Switzerland and EU on rules and regulations related to power transit (utilisation of the transmission network, tariffs and congestion management), cross-border electricity market access and trading of green electricity (mutual recognition of green electricity certificates).

CZ – Czech Republic

The electricity market has been opened for all customers including householders since 1st January 2006.

Prices on the electricity markets in the Czech Republic achieved the highest values on 26.-27.7.2006. The maximal spot price was 109307 CZK/MWh (approx. 3900 EUR/MWh). It was the same development as it was observed on EEX Exchange.

The lowest values were achieved on the Czech Exchange on 1.1.2006, 9.2.-10.2.2006, 21.5.2006 and 25.6.2005. The price was lower than 10000 CZK/MWh (approx. < 357 EUR/MWh).

DE – Germany

The European Energy Exchange (EEX) finished the year 2006 with record sales. EEX managed to set new records with an increase of the trading volume of electricity on the EEX Spot and Derivatives Market by 88 per cent to 1,133 TWh (previous year: 602 TWh).

The volume of electricity traded on the Derivatives Market for power, which increased by 102 per cent to 1,044 TWh compared with 517 TWh during the previous year, displayed a particularly good development. On the Derivatives Market for power the base load for the year 2007 (Phelix Base Year Future) in Germany was quoted at EUR 50.70 per MWh and the peak load for the year 2007 (Phelix Peak Year) in Germany was quoted at EUR 77.97 per MWh on 27 December 2006.

Moreover, an increase of the trading volume was also achieved on the Spot Market for power. In 2006, 88.7 TWh were sold. The turnover during the previous year totalled 85.7 TWh. On average, the Spot Market prices (Phelix Day Base) amounted to EUR 50.79 per MWh during the year 2006 compared to EUR 45.98 per MWh during the previous year.

On the EEX Spot and Derivatives Market for CO2 emission allowances (EUA) a volume of in total 11,699,846 EUA was traded (previous year: 3,196,791 EUA).

On the EEX Derivatives Market for coal, which was launched on 2 May 2006, the volume from OTC clearing amounted to 1,949,000 t until the end of December.

In the course of the year 2006, the number of trading participants increased from 132 to 158 companies from a total of 19 countries (previous year: 16 countries).

Under network perspectives, 2006 was characterized by the implementation of the 2005 Energy Industry Act (German abbreviation: EnWG), and in particular by the regulation of electricity and gas networks. The German Federal Network Agency and the regulation authorities of the German Lander have reviewed and approved about 500 out of 900 network charges by the end of 2006; in many cases, charges were cut by 10-20% as compared to the charges applied for. Several legal proceedings are still in progress. Due to the introduction of incentive regulation scheduled for 2009, the future of network regulation is subject to great uncertainties. However, the investment cycle of many networks urgently requires increasing replacement investments which also need to be reflected in network charges subject to incentive regulation.

The investment cycle becomes also apparent in the planned constructions of new power stations. Not only the capacity of renewable energy sources and their network feed-in are continuously increasing, but also about half of the conventional generating capacity has to be replaced until around 2020. Many of these new power stations are planned to be erected near the coast or in the Rhineland and Ruhr area. This still contributes to an intensification of the effect of onshore and offshore wind energy development leading to an ever increasing part of feed-in in the Northern part of Germany. As a result, there will be a great demand for new transmission lines from North to South. The portion attributable to wind energy had already been specified in the 2005 Dena study. Further investigations on the network integration of wind energy which both in Germany and Europe go beyond the 2015 planning horizon of the Dena I-study, have been initiated: For Germany, by the Dena II follow-up study, and for Europe by the European Wind Integration Study EWIS carried out by ETSO and UCTE, the European associations of transmission system operators.

FR – France

Auction mechanisms extended to the interconnections between France and neighbouring countries, with positive results

In 2006, the following auctions took place:

- annual, monthly and daily auctions (since January 2006) on the interconnections with Belgium and Germany. On the Belgian border, explicit daily auctions were replaced by implicit allocations on 21 November 2006, when the French, Belgian and Dutch markets were coupled;
- annual, monthly (since January 2006) and daily (since February 2006) auctions on the interconnection with Italy (only export capacities were auctioned in 2006, since import capacities were lower than the available capacity; RTE and TERNA each took responsibility for allocating 50% of the available export capacity);
- monthly and daily (since February 2006) and intra-day (since July 2006) auctions on the interconnection with Spain;
- annual, semesterly, quarterly, monthly, weekend and daily auctions on the interconnection with England.

In November 2006, a trilateral market coupling operation was successfully established between the Netherlands, Belgium and France.

On 21 November, the coupling mechanism for the Belgian, Dutch and French markets was launched. The coupling of the three electricity markets is helping to harmonise prices in the three countries concerned, and results in a single price whenever there are sufficient exchange capacities to implement all the desired cross-border transactions. It is also improving liquidity on all the power exchanges and opening the way for a more closely integrated European electricity market. In addition, it enables maximum use to be made of interconnection infrastructures.

Between 22 November and 31 December 2006, the three prices on Powernext, Belpex and APX were identical in 56% of baseload cases (0:00-24:00) and in 43% of peak cases (8:00-20:00).

On the France-Belgium interconnection, the Belgian and French prices were identical in 73% of baseload cases and 69% of peak cases.

On the Belgium-Netherlands interconnection, the Belgian and Dutch prices were identical in 82% of baseload cases and 73% of peak cases.

GR – Greece

In Greece, the electricity market is currently under restructure. As planned, the implementation of this new market will take place in five steps so called Reference Dates. In market issues, we have been running a transitional period. The new market will be fully implemented in 2008.

Under the current regime, In Greece, the whole market is cleared ex-post at a unique price, the System Marginal Price(SMP). In heavy load periods, especially in summer, the SMP gets high due to expensive units that are usually committed to meet the high demand

The provisions of the new Grid and Power Exchange Code that govern the Greek electricity market require the creation of a day ahead market where the bulk of the transactions are cleared at the day ahead System Marginal Price as well as an Imbalances Market that operates ex-post and is cleared at a System Marginal Price for Imbalances.

In 2006 a new market has been introduced, that of the capacity availability certificates issued by the generators and held by the suppliers according to the capacity of their customers. The capacity assurance mechanism aims at ensuring long-term adequate generation capacity availability. The HTSO is the Operator of this new market.

In accordance with Regulation no 1228/2003 of EU, on conditions for access to the network for cross-border exchanges in electricity, HTSO drafted Auction Rules setting out the terms and conditions governing the allocation of the auctioning Interconnection capacity in both directions on the interconnections. These rules regulate all matters concerning yearly, monthly and daily auctions for capacity allocation on the interconnections.

LU – Luxembourg

A new energy law will be voted during 2007, replacing the existing law of 27th July 2000.

Cegedel NET however fulfils all the requests of the EU directive.

Since 1st July 2004 all non domestic clients are eligible.

By 1st July 2007, 100% opening will be reached.

MK – Former Yugoslav Republic of Macedonia

Macedonia is a country which imports energy, especially in winter period.

The amounts of imported energy are according the yearly contracts. On the first tender for supply of energy, the offered energy didn't satisfy the demand, so there was another tender of energy for December. The average price of energy for 2006 was 28% greater than in 2005.

The New Marked Code is finished and these days the Regulatory Commission will adopt it.

NL – The Netherlands

The coupling of the three electricity exchanges in the Netherlands (APX), France (Powernext) and Belgium (Belpex) was launched November 21 without any problems. This coupling replaces the explicit allocation of interconnection capacity on the Belgian-French and Belgian-Dutch borders. It creates an integrated electricity market in the three countries, with uniform pricing and represents a step ahead towards the integration of the northwest European electricity market. The intention is to expand this market coupling with Nord Pool Spot, once the NorNed cable is realised.

The Minister of Economic Affairs brought into discussion in the Parliament a proposal for a change of the Electricity Law to split up all networks from Energy Trading Companies. This proposal wasn't agreed upon by the Parliament, but nevertheless was proven a related item, to bring all the HV networks ≥110 kV under the accountability of TenneT-TSO in order to better the manageability of the electricity transport infrastructure.

TenneT TSO is preparing now the organisational process to realise this alliance of the whole of the HV-networks at January 1st 2008.

PL – Poland

In March 2006 the Polish Government approved the Program for the Electricity Sector. It provides for general directions on the Polish power market restructuring and development including establishment of two strong consolidated energy groups, and further possible consolidation of smaller generators and distributors. With reference to the market developments, this Document determines:

- to introduce new market mechanism for the development of the generation investments,
- to strengthen competencies of the national energy regulator,
- to develop interconnections,
- to promote new sustainable and cost effective power generation technologies.

In 2006 main preparatory works on the realisation of this Program were carried out.

During 2006 a coordinated auction procedure for cross-border capacities was conducted on the basis of multilaterally agreed rules and in accordance with the EU legislation. In auction processes TSOs allocated yearly, monthly and daily available transmission capacity on profiles between PSE-Operator S.A., CEPS a.s., SEPS a.s., VET GmbH and E.ON Netz GmbH. The regional cooperation was further developed in respect to regular framework for dialogue with TSOs and Regulators in the Central East Europe Region, concerning especially congestion management and transparency issues, under regional initiatives and minifora.

According to the Polish Energy Law Act, in July 2007 the electricity market will be open for the household customers when all customers will be eligible for changing electricity supplier. The aim of these actions is to increase customers' activity on the power market. Polish TSO has substantially extended the scope of publicly available information on the Polish power market in order to increase its transparency and smooth operation.

New modified draft law on the termination of national long-term supply contracts is still under legislation process in Poland and is expected to have approval by the European Commission.

At the end of December 2006, the competent authorities have taken a decision on transferring shares of the PSE-Operator SA from PSE SA to the State Treasury in the form of a dividend, in order to meet the provisions of the Polish Energy Law Act.

According to the legal obligations expressed in the ordinance of Minister of Economy from November 2006 the share of electricity from RES in total electricity sold to the end-users should increase every year from 5.1% in 2007 to 10.4% by 2010 and 2014 (increase in relation to the previous one – 4.8% and 9.0% respectively).

Year 2006 was also the first full year that the system of trading in proprietary rights relating to the RES guarantees of Origin existed.

PT – Portugal

In 2006 the Portuguese market became completely liberalised.

RO – Romania

The Romanian Power Market Operator OPCOM comment:

For 2006 the market opening degree remained at 83.5% as it was established in 2005 (according to GD no. 644/2005), all industrial consumers having the right to change theirs supplier.

The structure and model of the electricity market were oriented towards a full competitive market, the multi-market concept being implemented starting with 2005. In 2006 OPCOM administrated the Centralized Market for Bilateral Contracts and the Day-Ahead Market (spot market), the Balancing Market being administrated by Transelectrica.

Participation on the markets administrated by OPCOM are voluntary. The day ahead market principle is based on simple price-quantity bids for each trading interval of the next day expressing the willingness to buy and sale of each market participant. The market participants in the day ahead market are suppliers, producers, network operators licensed by Romanian Electricity and Heat Regulatory Authority.

The Centralized Market for Bilateral Contracts is referring to contracts awarded through public auction, the market being opened for producers, suppliers and eligible consumer's participation. Establishment of this bilateral contracts market has the purpose to create a transparent framework to conclude electricity selling/purchase contracts. The offers are not standardized from the view of offered quantities, delivery period and delivery starting point, this standardization of the contracts is going to follow in 2007 together with other improvements of trading mechanism.

Besides those markets where electricity is traded, OPCOM is operating Centralized Green Certificates Market. The quota system combined with trading of green certificates was established as support scheme for RES by Romanian Government Decision. There is a mandatory yearly quota fixed by Regulatory Authority which is applied for all suppliers to final consumers. The green certificates price is market based set: either bilateral contracts concluded between producers and suppliers or centralized auction within the market operated by OPCOM. All trades are registered in the register kept by OPCOM. There is a scale for offer price between a lowest price limit in order to protect the E-RES generators and a highest price limit in order to protect the consumers.

OPCOM relevant development trends

- Day-Ahead Market (DAM) Liquidity Parameters

Number of players - The number of registered DAM participants increased from 69 at the beginning of 2006 to 92 in December. The average of the participation in 2006 was 51 market participants.

Volumes – The total volume traded in 2006 on the OPCOM spot market was 4.106 TWh. OPCOM has increased its traded volume by 27% year-on-year, to 2.18 TWh for the last six months of 2006 compared with the same period in 2005. This comparison is made only for the last six months due to the fact that OPCOM has been operating the spot market starting with 1st of July 2005.

Market prices - DAM prices registered higher values at the end of 2006 compared with prices established in 2005.

- Green Certificates Market (GCM) Figures

The number of green certificates traded in the 12 sessions in 2006 is 7,841, with an average price of 155.08 lei.

- Centralized Market for Bilateral Contracts (CMBC) Figures

During 2006, a volume of 0.7 TWh was traded for 2006 (1.36% from the domestic consumption) and 2.25 TWh for 2007 (a quota of 4.34%) on CMBC trading platform.

The average prices were 130 lei/MWh for 2006 deliveries and 159 lei/MWh for 2007 deliveries.

The Balancing Market comment:

Balancing Market (representing up to 4% from internal consumption), administrated by Transelectrica company, is controlling:

- exchanges between Balancing Market Participants;
- energy offers provided by each producer;
- dispatchable units physical notification and availabilities;

The data flow is controlled by three software:

- Scheduler Software: capable to take over all the energy transactions between the BRP and external exchanges (and signal eventual mismatches between the transactions or imbalances and also to receive compatible data from foreign TSO!), Physical Notifications and availabilities by dispatchable units);
- Balancing Market Offer software: capable to take over the offers coming from the Producers and displays dispatch orders by Dispatch Units and energy type;
- Balancing Market clearing order software: a tool which loads all dispatch orders by energy type for each dispatchable unit.

Balancing Market trend

Since the first transaction on Balancing Market lot of improvement was implemented into the software mentioned above.

The experience gained by the team of the Balancing Market was shared also with other TSO. For example, a Bulgarian delegation was invited in Transelectrica, at Balancing Market Department, to share the Romanian experience. According to Bulgarian representatives, this was a very fruitful visit, and also improved a lot the communications between the two TSO.

Now Transelectrica is boldly looking into the future, trying to share further its experience by participating on numerous meetings, internal and international symposiums, and Working Groups, moving to faze two of the Balancing Market on side and to Regional Market on the other hand.

SK – Slovak Republic

Slovenská elektrizačná prenosová sústava a.s. (SEPS, a.s.) as a transmission system operator and the subject responsible for the safe and reliable operation of the whole Power System of the Slovak Republic provides the electricity transmission, as well as the electricity import and export.

In 2006, there was in force the legislation framework in the Slovak Republic, which was formed for the electricity sector mostly by the Energy Act, Regulation Act and the Electricity Market Rules and related secondary legislation (regulations of the Ministry of Economy of the Slovak Republic and other obligatory documents for the market players, e.g. The Technical Conditions for Connection, Access and Transmission System Operation and The Trading Order SEPS, a.s.).

The new Energy Policy of the Slovak Republic, which also emphasizes energy savings, security of supply and environmental protection, was passed in January 2006 in compliance with the Energy Act.

During the year 2006, there were updated the Technical Conditions for Connection, Access and Transmission System Operation by the Slovak TSO-SEPS, a.s. and in terms of Directive 2003/54/EC the document “Technical Rules of SEPS, a.s.” by the European Commission was notified.

Concerning the obligation fulfilment, which the Slovak Republic adopted in the process of access negotiations, on 31st December 2006 the first 440 MW block of the V1 Nuclear Power Plant in Jaslovské Bohunice was decommissioned. The other block will be closed down/decommissioned for the same reason in December 2008.

Because of the existing environmental limits and ending of lifetime of used technology there will be necessary to close down another almost 700 MW (in the Fossil Fuel Power Plants).

In 2006, there were regulated only the prices for the services related to the power system operation in the electricity sector of the Slovak Republic. The Regulatory Authority didn’t regulate the commodity electricity prices any more (except the households). During the year 2006 the Regulatory Authority modified some price regulations, in particular as a consequence of problems with the ancillary services.

In 2006, the Italian company ENEL took a control over 66 % shares of the company Slovenské elektrárne, a.s. During the year 2007 ENEL will decide on the potential completion/finalisation of the two 440 MW blocks of the Nuclear Power Plant in Mochovce.

In 2006, there was implemented the unbundling in the distribution companies. The process has not been accomplished yet.

By now, there has not been created the Power Exchange. SEPS, a.s. as a TSO is in charge of the Deviation Settlement.

APPENDIX

APPENDIX 1 ENERGY BALANCE ADDITIONAL DATA

Table 22 National Energy Balance 2006

	AT TWh	BA TWh	BE TWh	BG TWh	CH TWh	CS TWh	CZ TWh	DE TWh	ES TWh	FR TWh	GR TWh	HR TWh	HU TWh	IT TWh	LU TWh	MK TWh	NL TWh	PL TWh	PT TWh	RO TWh	SI TWh	SK TWh	UA-W TWh	UCTE TWh
Hydro Power	32,5	5,9	1,6	4,5	32,6	12,5	3,2	27,5	29,2	60,9	6,4	6,1	0,2	42,4	0,9	1,6	0,1	2,8	11,2	18,0	3,1	4,4	0,1	307,8
Nuclear Power	-	-	44,3	18,1	26,2	-	24,5	158,7	57,4	428,7	-	-	12,7	-	-	-	3,3	-	-	5,2	5,3	16,6	-	801,0
Fossil Fuel Power	16,2	7,5	32,6	18,9	2,3	28,8	49,9	359,8	149,3	54,0	42,7	5,4	18,7	250,9	3,2	4,9	84,0	145,7	28,4	34,2	4,7	5,4	8,3	1.355,8
including lignite sources	*-*	*7,5*	*-*	*10,6*	*-*	*28,8*	*39,2*	*139,7*	*20,2*	*-*	*29,2*	*-*	*5,0*	*-*	*-*	*4,9*	*-*	*49,2*	*-*	*18,9*	*-*	*1,7*	*-*	*354,9*
including hard coal sources	*-*	*-*	*1,4*	*6,4*	*-*	*-*	*6,0*	*-*	*42,2*	*21,6*	*-*	*2,0*	*1,7*	*39,4*	*-*	*-*	*-*	*92,4*	*14,1*	*3,6*	*4,7*	*2,2*	*-*	*237,8*
including gas sources	*-*	*-*	*21,1*	*-*	*-*	*-*	*3,7*	*-*	*80,2*	*13,9*	*10,2*	*0,3*	*10,3*	*126,0*	*3,2*	*-*	*-*	*4,1*	*9,8*	*10,3*	*0,0*	*1,2*	*-*	*294,3*
including oil sources	*-*	*-*	*0,1*	*-*	*-*	*-*	*0,2*	*-*	*6,5*	*7,8*	*3,3*	*0,8*	*0,0*	*33,3*	*-*	*-*	*-*	*-*	*1,4*	*1,3*	*-*	*-*	*-*	*54,8*
including mixed sources	*-*	*-*	*8,8*	*1,9*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*2,3*	*1,8*	*33,5*	*-*	*-*	*-*	*-*	*0,2*	*-*	*-*	*-*	*-*	*48,5*
including non attributable sources	*16,2*	*-*	*1,1*	*-*	*2,3*	*-*	*0,7*	*220,1*	*0,3*	*10,6*	*0,0*	*-*	*-*	*18,7*	*-*	*-*	*84,0*	*-*	*2,9*	*0,1*	*-*	*0,3*	*8,3*	*365,5*
Renewable Energy Sources	-	-	2,9	-	1,1	-	0,2	50,1	26,1	5,5	1,3	0,1	1,2	8,4	0,1	-	7,4	0,3	4,8	0,0	-	0,0	-	109,5
including wind farms	-	-	0,3	-	0,0	-	0,0	30,5	22,2	2,2	1,2	0,1	0,0	3,2	0,1	-	2,7	0,2	2,9	0,0	-	0,0	-	65,6
Non Clearly Identifiable Energy Sources	6,8	-	-	-	-	-	-	-	-	-	-	-	0,7	-	-	-	-	-	-	-	-	2,6	-	10,1
Net Generated Energy	**55,5**	**13,3**	**81,4**	**41,5**	**62,1**	**41,3**	**77,8**	**596,1**	**262,0**	**549,1**	**50,4**	**11,6**	**33,4**	**301,7**	**4,2**	**6,6**	**94,8**	**148,9**	**44,4**	**57,4**	**13,1**	**29,0**	**8,4**	**2.584,1**
Physical imports	21,1	3,0	18,9	1,1	48,8	9,7	11,5	46,0	9,1	8,3	6,1	8,4	15,3	46,3	6,8	3,0	27,3	4,8	8,6	1,6	7,7	9,3	1,8	324,5
Physical exports	14,4	5,2	8,7	8,9	46,1	7,8	24,1	66,0	12,4	71,5	1,9	2,7	8,1	1,6	3,3	1,2	5,9	15,8	3,2	5,9	7,5	10,9	5,8	338,8
Physical Exchanges Balance	**6,8**	**- 2,2**	**10,2**	**- 7,7**	**2,7**	**1,9**	**- 12,6**	**- 20,0**	**- 3,3**	**- 63,3**	**4,2**	**5,7**	**7,2**	**44,7**	**3,6**	**1,8**	**21,5**	**- 11,0**	**5,4**	**- 4,2**	**0,2**	**- 1,6**	**- 4,1**	**- 14,2**
Pumped Storage Energy	3,3	-	1,7	0,5	2,7	0,8	0,9	9,1	5,5	7,4	0,6	0,2	-	8,6	1,1	-	-	1,4	0,7	0,2	-	0,2	-	45,0
Consumption	**58,9**	**11,1**	**89,9**	**33,3**	**62,1**	**42,4**	**64,2**	**567,0**	**253,2**	**478,4**	**54,0**	**17,1**	**40,6**	**337,8**	**6,6**	**8,4**	**116,2**	**136,5**	**49,2**	**53,3**	**13,4**	**27,2**	**4,3**	**2.525,2**

Table 23 National Energy Balance 2005

	AT TWh	BA TWh	BE TWh	BG TWh	CH TWh	CS TWh	CZ TWh	DE TWh	ES TWh	FR TWh	GR TWh	HR TWh	HU TWh	IT TWh	LU TWh	MK TWh	NL TWh	PL TWh	PT TWh	RO TWh	SI TWh	SK TWh	UA-W TWh	UCTE TWh
Hydro Power	34,2	6,0	1,6	4,6	32,8	13,9	3,0	26,9	22,5	56,2	5,6	6,4	0,2	42,4	0,9	1,5	0,1	3,6	4,9	19,9	3,0	4,6	0,1	294,8
Nuclear Power	-	-	45,3	17,3	22,0	-	23,3	154,6	55,0	430,0	-	-	13,0	-	-	-	3,8	-	-	5,1	5,6	16,4	-	791,4
Fossil Fuel Power	18,4	6,6	34,1	18,3	2,2	27,5	49,9	358,3	152,6	59,7	43,3	5,2	17,9	240,9	3,1	5,0	85,5	140,2	33,3	29,8	4,6	5,5	8,0	1.349,6
including lignite sources	*-*	*6,6*	*-*	*10,2*	*-*	*27,5*	*39,3*	*141,6*	*21,7*	*-*	*32,1*	*-*	*4,5*	*-*	*-*	*5,0*	*-*	*-*	*-*	*-*	*-*	*1,8*	*-*	*290,3*
including hard coal sources	*-*	*-*	*-*	*6,2*	*-*	*-*	*5,9*	*-*	*51,5*	*25,9*	*-*	*-*	*1,8*	*-*	*-*	*-*	*-*	*-*	*14,3*	*-*	*4,6*	*2,3*	*-*	*112,4*
including gas sources	*-*	*-*	*-*	*-*	*-*	*-*	*3,8*	*-*	*69,9*	*14,9*	*7,9*	*-*	*10,2*	*-*	*3,1*	*-*	*-*	*-*	*11,4*	*-*	*0,0*	*1,2*	*-*	*122,4*
including oil sources	*-*	*-*	*-*	*-*	*-*	*-*	*0,2*	*-*	*9,3*	*8,2*	*3,3*	*-*	*0,0*	*-*	*-*	*-*	*-*	*-*	*3,8*	*-*	*-*	*-*	*-*	*24,8*
including mixed sources	*-*	*-*	*-*	*1,8*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*-*	*1,4*	*-*	*-*	*-*	*-*	*-*	*1,2*	*-*	*-*	*-*	*-*	*4,4*
including non attributable sources	*18,4*	*-*	*34,1*	*-*	*2,2*	*-*	*0,6*	*216,7*	*0,3*	*10,6*	*0,0*	*5,2*	*-*	*240,9*	*-*	*-*	*85,5*	*140,2*	*2,6*	*29,8*	*-*	*0,3*	*8,0*	*795,4*
Renewable Energy Sources	-	-	2,4	-	0,9	-	0,1	41,4	24,5	4,3	1,0	0,1	1,4	7,3	0,1	-	7,0	0,2	3,5	-	-	0,0	-	94,2
including wind farms	-	-	0,2	-	0,0	-	0,0	27,2	20,5	1,0	0,9	0,1	0,0	2,3	0,1	-	2,1	0,1	1,7	-	-	0,0	-	56,3
Non Clearly Identifiable Energy Sources	5,2	-	-	-	-	-	-	-	-	-	-	-	0,6	-	-	-	-	-	-	-	-	2,7	-	8,5
Net Generated Energy	**57,8**	**12,6**	**83,4**	**40,2**	**57,9**	**41,4**	**76,2**	**581,2**	**254,5**	**550,1**	**49,9**	**11,6**	**33,1**	**290,6**	**4,1**	**6,5**	**96,4**	**143,9**	**41,7**	**54,8**	**13,3**	**29,1**	**8,1**	**2.538,5**
Physical Imports	20,3	1,1	14,3	0,8	47,1	8,5	12,4	53,4	10,2	8,1	5,6	8,8	15,6	50,3	6,4	2,4	23,7	5,0	9,6	1,6	9,3	8,6	1,8	324,8
Physical Exports	17,6	2,5	8,0	8,4	40,7	7,3	25,0	61,9	11,6	68,4	1,8	3,6	9,4	1,1	3,2	0,8	5,4	16,2	2,8	4,5	9,5	11,3	5,5	326,6
Physical Exchanges Balance	**2,6**	**- 1,4**	**6,3**	**- 7,6**	**6,4**	**1,2**	**- 12,6**	**- 8,5**	**- 1,3**	**- 60,3**	**3,8**	**5,2**	**6,2**	**49,2**	**3,3**	**1,6**	**18,3**	**- 11,2**	**6,8**	**- 2,9**	**- 0,2**	**- 2,7**	**- 3,7**	**- 1,8**
Pumped Storage Energy	3,3	-	1,8	0,5	2,6	1,0	0,9	9,5	6,4	6,6	0,8	0,1	-	9,3	1,1	-	-	2,2	0,6	-	-	0,1	-	46,8
Consumption	**57,1**	**11,2**	**87,9**	**32,1**	**61,6**	**41,6**	**62,7**	**563,2**	**246,8**	**483,2**	**52,9**	**16,6**	**39,3**	**330,5**	**6,2**	**8,1**	**114,6**	**130,6**	**47,9**	**51,9**	**13,0**	**26,3**	**4,4**	**2.489,9**

Table 24 National Seasonal Energy Consumption Retrospect

	2003		2004		2005		2006	
	Summer TWh	Winter TWh	Summer TWh	Winter TWh	Summer TWh	Winter TWh	Summer TWh	Winter TWh
AT	25,6	30,0	26,0	30,6	26,1	31,0	27,2	31,7
BA	4,6	5,7	4,7	6,0	5,1	6,0	5,1	6,0
BE	45,4	39,9	41,0	46,6	41,2	46,7	42,2	47,7
BG	12,5	17,9	15,3	20,3	15,9	20,7	16,5	21,4
CH	27,1	32,1	27,6	32,8	28,2	33,5	28,4	33,8
CS	16,2	23,0	16,8	23,1	17,4	24,3	18,0	24,4
CZ	26,3	33,6	27,2	34,3	27,8	34,9	28,7	35,5
DE	237,7	269,8	263,1	298,1	264,1	299,1	265,9	301,1
ES	109,7	114,0	115,0	120,4	119,6	127,2	123,9	129,5
FR	200,4	250,4	209,8	269,4	209,9	273,3	206,3	272,1
GR	25,4	24,4	25,8	25,4	26,7	26,2	27,2	26,8
HR	7,1	8,4	7,3	8,7	7,7	9,0	8,0	9,2
HU	18,3	20,2	18,1	20,2	18,7	20,6	19,4	21,2
IT	159,6	160,0	159,9	165,4	162,9	167,5	166,0	171,8
LU	2,9	3,2	3,0	3,3	3,0	3,3	3,2	3,5
MK	1,9	2,7	3,1	4,3	3,4	4,7	3,5	4,8
NL	52,7	57,4	52,7	58,5	54,8	59,8	55,3	60,9
PL	57,4	69,3	60,0	70,6	60,0	70,7	63,0	73,5
PT	20,6	22,5	21,7	23,8	22,8	25,1	23,4	25,7
RO	23,0	26,4	23,5	27,2	24,0	27,9	24,9	28,2
SI	6,0	6,4	6,1	6,5	6,7	6,1	6,8	6,2
SK	11,7	14,7	11,9	14,4	11,9	14,4	12,6	14,6
UA-W	1,6	2,5	1,8	2,6	1,8	2,6	1,9	2,5
UCTE	**1.089,0**	**1.239,2**	**1.141,4**	**1.312,5**	**1.159,6**	**1.334,5**	**1.177,2**	**1.352,0**

Table 25 National Generating Capacity Spread by Primary Sources in December

	Hydro Power GW	Nuclear Power GW	Fossil Fuel GW	RES w/o Hydro GW	Not Clearly Identified GW	2006 GW	NGC 2005 to 2006 GW	%
AT	11,3	-	5,9	1,0	-	18,2	0,3	1,7
BA	2,1	-	2,0	-	-	4,1	0,1	2,0
BE	1,4	5,8	8,2	0,7	-	16,1	0,1	0,3
BG	2,9	2,9	6,6	-	-	12,4	-	-
CH	13,4	3,2	0,3	0,3	0,2	17,4	0,0	0,1
CS	3,5	-	6,4	-	-	9,9	-	-
CZ	2,2	3,5	10,6	0,1	-	16,3	0,1	0,6
DE	9,1	20,3	70,3	24,4	-	124,1	4,8	4,0
ES	18,7	7,5	37,3	12,2	-	75,7	2,9	4,0
FR	25,5	63,3	24,8	2,4	-	116,0	0,2	0,2
GR	3,1	-	8,1	0,6	-	11,8	0,5	4,5
HR	2,1	-	1,7	0,1	-	3,8	0,0	0,3
HU	0,0	1,8	5,3	0,4	0,7	8,2	0,1	0,6
IT	21,0	-	66,3	2,5	-	89,8	2,8	3,2
LU	1,1	-	0,5	0,1	-	1,7	0,0	0,7
MK	0,5	-	0,9	-	-	1,4	-	-
NL	0,0	0,4	19,3	2,3	0,0	22,1	0,1	0,5
PL	2,3	-	29,8	0,2	-	32,3	0,2	0,7
PT	4,9	-	6,7	2,0	-	13,6	0,8	6,1
RO	6,3	0,7	10,8	-	-	17,8	- 0,0	- 0,04
SI	0,9	0,7	1,3	-	-	2,8	0,0	1,8
SK	2,4	2,2	2,3	0,0	0,7	7,6	- 0,4	- 5,4
UA-W	0,0	-	2,5	-	-	2,5	-	-
UCTE	**134,8**	**112,4**	**327,0**	**49,2**	**1,6**	**625,1**	**13,8**	**2,3**

Table 26 National Physical Exchanges Retrospect

	Imports			Exports			Balance (Import - Export)			Balance / Consumption		
	2004	2005	2006	2004	2005	2006	2004	2005	2006	2004	2005	2006
	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	TWh	%	%	%
AT	16,5	20,3	21,1	13,3	17,6	14,4	3,2	2,6	6,8	5,7	4,6	11,5
BA	1,7	1,1	3,0	3,6	2,5	5,2	-1,9	-1,4	-2,2	17,8	12,7	19,8
BE	14,6	14,3	18,9	6,8	8,0	8,7	7,8	6,3	10,2	8,9	7,2	11,3
BG	0,7	0,8	1,1	6,6	8,4	8,9	-5,9	-7,6	-7,7	16,6	20,7	20,4
CH	37,7	47,1	48,8	38,4	40,7	46,1	-0,7	6,4	2,7	1,2	10,3	4,4
CS	6,0	8,5	9,7	4,0	7,3	7,8	2,0	1,2	1,9	5,0	2,9	4,5
CZ	9,8	12,4	11,5	25,5	25,0	24,1	-15,7	-12,6	-12,6	25,5	20,1	19,7
DE	44,2	53,4	46,0	51,5	61,9	66,0	-7,3	-8,5	-20,0	1,3	1,5	3,5
ES	8,1	10,2	9,1	11,1	11,6	12,4	-3,0	-1,3	-3,3	1,3	0,5	1,3
FR	6,6	8,1	8,3	68,7	68,4	71,5	-62,1	-60,3	-63,3	13,0	12,5	13,2
GR	4,9	5,6	6,1	2,0	1,8	1,9	2,8	3,8	4,2	5,5	7,2	7,8
HR	10,1	8,8	8,4	6,4	3,6	2,7	3,7	5,2	5,7	23,2	30,9	33,1
HU	13,8	15,6	15,3	6,3	9,4	8,1	7,5	6,2	7,2	19,6	15,8	17,8
IT	46,5	50,3	46,3	0,8	1,1	1,6	45,7	49,2	44,7	14,0	14,9	13,2
LU	6,5	6,4	6,8	3,1	3,2	3,3	3,4	3,3	3,6	54,0	52,2	53,7
MK	2,0	2,4	3,0	0,8	0,8	1,2	1,2	1,6	1,8	16,2	19,7	21,4
NL	21,4	23,7	27,3	5,2	5,4	5,9	16,2	18,3	21,5	14,6	16,0	18,5
PL	5,3	5,0	4,8	14,6	16,2	15,8	-9,3	-11,2	-11,0	7,1	8,6	8,1
PT	8,6	9,6	8,6	2,1	2,8	3,2	6,5	6,8	5,4	14,3	14,2	11,1
RO	1,7	1,6	1,6	3,0	4,5	5,9	-1,1	-2,9	-4,2	2,2	5,6	8,0
SI	4,3	9,3	7,7	5,0	9,5	7,5	-0,8	-0,2	0,2	6,3	1,7	1,8
SK	8,7	8,6	9,3	10,6	11,3	10,9	-1,9	-2,7	-1,6	7,2	10,3	5,9
UA-W	1,6	1,8	1,8	4,9	5,5	5,8	-3,3	-3,7	-4,1	75,0	84,5	92,5
UCTE	**281,3**	**324,8**	**324,5**	**294,3**	**326,6**	**338,8**	**-13,0**	**-1,8**	**-14,2**	**0,5**	**0,1**	**0,6**

APPENDIX 2 POWER BALANCE ADDITIONAL DATA

Table 27 UCTE Power Balance Summary

Net values in GW, at the reference time 11 AM on 3rd Wednesday		Jan.	Feb,	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
P1	Hydro power capacity	134.6	134.6	134.6	134.6	134.6	134.6	134.7	134.7	134.7	134.7	134.7	134.8
P2	Nuclear power capacity	112.6	112.6	112.6	112.6	112.4	112.4	112.4	112.4	112.4	112.4	112.4	112.4
P3	Fossil fuel power capacity (*)	321.4	322.1	322.9	322.9	323.2	324.2	326.0	326.5	326.5	326.9	326.8	327.0
P3a	*including lignite sources*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*	*62.7*	*62.8*	*62.8*	*62.8*	*62.8*	*62.8*
P3b	*including hard coal sources*	*78.1*	*77.6*	*77.6*	*77.6*	*77.6*	*77.6*	*77.6*	*77.7*	*77.8*	*77.8*	*77.8*	*77.8*
P3c	*including gassources*	*72.1*	*73.4*	*74.1*	*74.1*	*74.6*	*75.5*	*77.2*	*77.5*	*77.5*	*77.9*	*77.9*	*77.9*
P3d	*including oil sources*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.9*	*31.8*	*31.8*
P3e	*including mixed sources*	*34.3*	*34.3*	*34.3*	*34.3*	*34.3*	*34.3*	*34.3*	*34.3*	*34.2*	*34.2*	*34.2*	*34.0*
P3f	*including non attributable sources*	*42.3*	*42.3*	*42.3*	*42.3*	*42.1*	*42.1*	*42.2*	*42.2*	*42.2*	*42.2*	*42.2*	*42.7*
P4	Renewable energy sources (excl. hydro power) capacity	41.3	42.2	42.9	43.7	44.1	44.9	45.6	46.2	46.8	47.4	48.3	49.2
P4a	*including wind farms*	*34.1*	*34.8*	*35.2*	*35.8*	*36.0*	*36.4*	*36.8*	*37.1*	*37.4*	*37.8*	*38.4*	*39.0*
P5	Non Clearly Identifiable Energy Sources Capacity	1.5	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6
P6	**Net Generating Capacity** (P6 = P1 + P2 + P3 + P4 + P5)	**611.3**	**612.9**	**614.4**	**615.3**	**615.8**	**617.7**	**620.3**	**621.4**	**622.1**	**623.0**	**623.8**	**625.1**
P7	Non-Usable	106.2	105.3	104.4	112.8	111.9	118.3	132.5	125.6	125.1	116.6	113.2	107.8
P8	Overhauls (thermal power stations)	10.4	15.7	30.3	39.0	56.6	47.8	45.8	50.8	48.4	40.3	28.5	13.7
P9	Outages (thermal power stations)	14.7	18.0	19.2	18.3	16.8	17.2	17.0	17.6	15.4	17.0	14.3	19.2
P10	System Services Reserve	29.9	29.9	27.7	30.4	27.4	26.4	27.4	29.8	28.8	30.1	30.2	29.3
P11	**Reliably Available Capacity** (P11 = P6 - (P7 + P8 + P9 + P10))	**450.1**	**444.0**	**432.8**	**414.8**	**403.0**	**407.9**	**397.6**	**397.5**	**404.3**	**419.0**	**437.6**	**455.2**
P12	Load	369.5	365.4	352.4	317.4	310.1	324.8	325.5	274.3	314.4	325.2	334.8	368.1
P13	Margin against the monthly peak load	34.3	28.6	24.8	26.8	21.1	17.4	19.6	59.0	29.2	23.1	40.9	30.4
P14	**Remaining Capacity without Exchanges** (P14 = P11 - P12)	**80.6**	**78.7**	**80.4**	**97.4**	**92.9**	**83.1**	**72.1**	**123.2**	**89.9**	**93.8**	**102.7**	**87.0**
P15	Physical imports	41.8	42.6	36.8	39.3	35.8	36.1	32.0	31.8	33.9	37.2	40.9	40.5
P16	Physical exports	39.7	39.9	37.4	39.5	38.4	35.1	31.9	33.8	34.0	36.5	39.0	38.1
P17	**Physical exchanges balance** (P17 = P15 - P16)	**2.1**	**2.7**	**- 0.6**	**- 0.2**	**- 2.6**	**1.0**	**0.1**	**- 2.0**	**- 0.0**	**0.7**	**1.8**	**2.4**

(*) In case no fossil fuel capacity breakdown is available, total fossil fuel capacity is in line P3f.

Table 28 National Non-Usable Generating Capacity

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	3.0	3.0	3.0	5.0	5.0	5.0	4.0	4.0	4.0	3.0	4.0	4.0
BA	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
BE	1.1	1.3	1.0	1.2	1.4	1.4	1.7	1.5	1.5	1.4	1.7	1.3
BG	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
CH	4.4	4.4	4.4	2.7	2.7	2.7	2.7	2.7	2.7	4.4	4.4	4.4
CS	1.2	1.0	1.1	1.4	1.4	1.9	1.4	1.4	2.0	1.3	1.8	1.0
CZ	2.4	2.6	2.7	2.1	2.1	2.4	2.1	2.7	2.4	2.5	2.6	2.6
DE	21.2	19.5	21.6	21.6	21.9	21.0	24.8	23.9	22.4	22.8	22.3	22.9
ES	19.1	21.9	23.3	22.2	21.0	22.8	21.5	23.3	25.6	20.6	19.8	20.5
FR	18.6	15.6	12.6	20.4	19.5	23.6	32.7	26.5	24.4	23.1	20.1	15.6
GR	0.8	0.6	0.9	0.9	0.8	0.9	0.8	0.6	0.7	0.8	1.0	1.0
HR	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HU	0.7	0.7	0.7	0.9	1.0	1.1	1.2	1.1	1.0	1.0	1.0	0.9
IT	18.4	18.5	18.5	18.5	18.6	18.7	18.8	18.8	18.8	18.9	18.9	18.9
LU	-	-	-	-	-	-	-	-	-	-	-	-
MK	-	-	-	-	-	-	-	-	-	-	-	-
NL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PL	3.5	4.3	3.4	4.5	4.9	5.1	7.6	6.6	6.7	5.0	4.7	3.4
PT	2.7	2.8	2.5	2.0	2.4	2.6	3.4	3.1	3.5	2.3	1.9	2.1
RO	3.6	3.4	3.3	3.9	3.8	3.1	3.3	3.2	3.3	3.6	3.5	3.7
SI	0.4	0.4	0.3	0.1	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.2
SK	2.0	2.1	1.8	2.1	2.1	2.6	3.1	2.7	2.8	2.3	2.0	2.0
UA-W	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
UCTE	**106.2**	**105.3**	**104.4**	**112.8**	**111.9**	**118.3**	**132.5**	**125.6**	**125.1**	**116.6**	**113.2**	**107.8**

Table 29 National Overhauls Characteristics

	December Thermal* Generating Capacity	Average Overhauls Capacity		Maximum Overhauls Capacity			
	GW (1)	GW	% of (1)	GW	% of (1)	Date	2005
AT	5,9	-	-	-	-	-	n.a.
BA	2,0	0,3	12,9	0,4	20,0	Apr	May
BE	14,0	1,1	7,8	2,2	15,6	Sep	Sep
BG	8,3	2,2	26,3	3,3	39,2	Jun	Jul
CH	3,5	0,3	7,6	2,2	62,9	Aug	Jul
CS	6,4	1,0	15,5	2,5	38,7	Jul	Jul
CZ	14,1	1,8	12,7	2,7	19,1	Sep	Sep
DE	90,6	6,6	7,3	12,5	13,8	May	Jun
ES	44,8	1,5	3,3	4,4	9,7	Apr	Apr
FR	88,1	8,4	9,5	15,0	17,1	May	Aug
GR	8,1	0,6	7,6	1,6	19,7	May	Nov
HR	1,7	0,1	6,4	0,3	17,6	Oct	Sep
HU	7,0	0,6	9,1	1,4	19,4	Oct	Sep
IT	66,5	4,4	6,7	5,4	8,1	Aug	Nov
LU	0,5	-	-	-	-	-	Feb
MK	0,9	0,3	29,7	0,5	55,5	May	May
NL	19,7	1,6	7,9	2,5	12,7	Nov	May
PL	29,8	2,5	8,5	5,0	16,8	Jul	Jul
PT	6,7	0,2	3,5	0,6	8,9	Sep	Oct
RO	11,5	1,3	10,9	2,2	19,1	Jul	Jun
SI	2,0	0,1	5,1	0,7	37,2	Apr	Jul
SK	4,9	0,5	10,6	1,1	22,4	Apr	Apr
UA-W	2,5	0,3	13,4	0,8	30,6	Jul	Jul
UCTE	**439,5**	**35,6**	**8,1**	**56,6**	**12,9**	**May**	**May**

* Thermal generating capacity is made of Nuclear and Fossil Fuel generating capacities

Table 30 National Outages Characteristics

	December Thermal* Generating Capacity	Average Outages Capacity		Maximum Outages Capacity			
	GW (1)	GW	% of (1)	GW	% of (1)	Date	2005
AT	5,9	-	-	-	-	-	n.a.
BA	2,0	0,3	13,8	0,5	25,0	Apr	Aug
BE	14,0	0,4	2,9	1,3	9,4	May	Jun
BG	8,3	0,3	3,9	0,4	5,0	Jul	Jan
CH	3,5	-	-	-	-	-	Apr
CS	6,4	0,8	13,2	1,6	24,4	Aug	Nov
CZ	14,1	0,2	1,4	0,6	4,3	Nov	Dec
DE	90,6	3,6	3,9	4,8	5,3	Dec	Nov
ES	44,8	2,4	5,3	4,6	10,3	Aug	Aug
FR	88,1	2,7	3,0	6,4	7,3	Mar	Jul
GR	8,1	0,3	4,2	0,8	9,9	Aug	Jun
HR	1,7	-	-	-	-	-	Nov
HU	7,0	0,3	3,7	0,7	9,4	May	Mar
IT	66,5	2,3	3,4	3,1	4,7	Apr	Aug
LU	0,5	-	-	-	-	-	n.a.
MK	0,9	-	-	-	-	-	n.a.
NL	19,7	1,0	5,1	1,0	5,1	Jan	n.r.
PL	29,8	1,3	4,4	1,9	6,3	Nov	Oct
PT	6,7	0,0	0,1	0,0	0,5	Oct	Apr
RO	11,5	1,2	10,3	2,0	17,4	Dec	Feb
SI	2,0	-	-	-	-	-	Dec
SK	4,9	0,0	0,7	0,2	4,5	Nov	Apr
UA-W	2,5	0,0	0,9	0,1	5,6	Aug	Sep
UCTE	**439,5**	**17,1**	**3,9**	**19,2**	**4,4**	**Mar**	**Jul**

* Thermal generating capacity is made of Nuclear and Fossil Fuel generating capacities

Table 31 National System Services Reserve Capacity

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
BA	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
BE	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
BG	1.4	1.3	1.3	1.5	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2
CH	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
CS	1.0	1.3	0.6	1.0	1.0	0.3	0.7	0.6	0.6	0.6	1.2	1.5
CZ	0.9	0.8	0.9	0.9	0.8	0.8	1.0	1.0	0.7	0.8	0.8	0.9
DE	7.1	7.7	7.1	7.1	6.9	7.2	6.9	7.4	7.3	7.1	7.6	7.3
ES	0.9	0.9	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.9
FR	7.3	4.6	4.2	5.6	4.4	4.2	4.3	6.7	5.4	6.2	5.2	4.4
GR	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
HR	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
HU	0.5	0.8	0.7	0.7	0.5	0.1	0.6	0.6	0.5	0.8	0.8	0.8
IT	2.8	2.5	2.7	3.6	2.5	3.0	3.2	2.4	3.2	2.9	2.7	2.5
LU	-	-	-	-	-	-	-	-	-	-	-	-
MK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NL	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
PL	1.4	1.5	1.5	1.3	1.3	0.9	0.8	1.1	1.3	1.7	1.8	1.7
PT	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8
RO	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
SI	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
SK	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9
UA-W	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
UCTE	**31.3**	**29.4**	**27.7**	**30.4**	**27.4**	**26.4**	**27.4**	**29.8**	**28.8**	**30.1**	**30.2**	**29.3**

Table 32 National Remaining Capacity w/o Exchanges

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	5.2	5.3	5.6	4.8	4.5	4.3	5.7	6.2	5.7	6.6	5.1	4.3
BA	1.6	1.6	1.7	1.3	1.4	1.8	1.7	1.7	1.7	1.3	1.7	1.8
BE	0.7	0.3	0.6	1.8	-0.3	0.1	1.3	0.7	-0.2	0.0	-0.3	0.1
BG	1.5	1.1	1.0	1.5	1.4	1.2	1.2	1.3	1.3	1.4	1.6	1.6
CH	2.1	2.3	2.6	5.4	5.4	4.2	5.9	3.4	5.2	3.7	3.2	2.9
CS	0.3	0.5	0.4	0.6	0.8	0.5	0.4	0.0	0.3	0.5	0.1	0.2
CZ	1.9	2.3	1.7	3.5	3.2	2.4	3.3	3.4	2.8	2.0	2.3	2.7
DE	15.5	15.5	16.2	17.0	10.6	14.4	13.3	13.6	12.6	12.5	15.4	17.2
ES	13.3	11.2	10.9	10.6	10.6	10.3	11.4	19.4	11.7	17.1	20.6	12.9
FR	13.7	10.1	9.1	19.4	19.6	15.5	5.5	23.4	18.8	18.3	22.0	13.0
GR	0.9	1.4	2.2	2.2	2.0	1.8	1.8	2.0	2.5	2.1	1.8	1.9
HR	0.8	0.9	1.0	1.3	1.4	1.4	1.2	1.3	1.2	1.1	1.1	0.9
HU	0.8	0.6	0.2	0.4	-0.2	-0.3	0.1	0.4	0.1	-0.6	0.0	0.3
IT	7.3	7.8	10.6	11.5	14.8	8.5	8.4	28.8	12.5	14.7	13.0	12.7
LU	0.8	0.9	0.8	0.8	0.8	0.8	0.8	1.0	0.9	0.7	0.8	0.8
MK	-0.3	-0.3	-0.2	0.1	-0.1	0.0	0.2	0.0	0.0	0.1	0.1	0.0
NL	1.7	2.5	1.8	1.6	2.3	3.2	1.8	4.2	2.9	0.7	0.3	0.0
PL	5.6	6.7	5.3	5.0	4.8	3.9	0.8	2.6	2.6	3.3	3.6	5.2
PT	1.8	2.2	2.9	3.8	3.1	3.2	2.2	3.7	2.0	3.2	4.2	3.2
RO	3.9	4.1	4.0	3.7	4.7	4.3	4.3	4.4	4.3	3.7	4.5	3.4
SI	0.0	0.1	0.2	-0.2	0.5	0.3	0.2	0.5	0.3	0.3	0.3	0.4
SK	0.9	0.9	1.2	0.6	0.7	0.6	0.0	0.5	-0.1	0.4	0.6	0.8
UA-W	0.6	0.7	0.6	0.7	0.8	0.7	0.4	0.6	0.7	0.7	0.8	0.8
UCTE	**80.6**	**78.7**	**80.4**	**97.4**	**92.9**	**83.1**	**72.1**	**123.2**	**89.9**	**93.8**	**102.7**	**87.0**

Table 33 National Margin Against Monthly Peak Load / Load at Reference Time Ratio

	Jan %	Feb %	Mar %	Apr %	May %	Jun %	Jul %	Aug %	Sep %	Oct %	Nov %	Dec %
AT	5.6	3.4	2.3	12.0	1.3	2.5	3.9	9.7	3.9	6.3	3.6	1.1
BA	12.5	12.5	6.3	7.1	15.4	7.1	7.7	7.7	14.3	13.3	20.0	12.5
BE	8.1	6.4	8.3	4.8	5.1	4.5	13.3	7.5	5.5	3.1	12.1	8.8
BG	20.1	10.8	8.6	24.4	24.4	12.0	9.4	13.8	14.8	21.1	29.2	14.3
CH	2.0	2.0	2.1	2.4	2.4	2.3	2.5	2.4	2.3	2.4	2.2	2.2
CS	14.6	15.9	6.3	18.9	25.7	16.0	17.4	21.6	18.1	17.3	23.5	17.6
CZ	8.2	7.4	3.2	12.8	1.3	5.2	2.7	8.2	6.6	9.8	14.3	5.5
DE	5.3	5.9	7.6	6.6	8.0	3.9	5.5	9.8	10.1	8.8	11.4	11.1
ES	13.1	11.1	15.7	5.7	5.7	9.1	9.3	45.3	21.0	8.0	12.0	6.2
FR	15.1	10.7	4.8	13.7	6.1	2.8	3.3	19.9	4.2	3.4	18.1	5.6
GR	10.8	10.2	11.7	11.5	22.1	13.9	13.4	33.1	20.1	10.2	15.5	18.6
HR	13.7	13.1	13.5	14.7	13.1	22.0	16.3	17.7	16.1	16.3	22.7	10.8
HU	6.8	8.1	11.4	10.0	3.4	6.1	5.9	8.3	5.3	11.1	14.3	17.0
IT	5.3	2.9	3.8	3.6	5.4	5.1	4.7	60.2	7.5	5.3	7.9	8.4
LU	18.3	29.7	10.4	19.9	2.5	13.7	15.7	36.5	24.4	5.7	14.4	14.0
MK	-	-	-	-	-	-	-	-	-	-	-	-
NL	4.3	4.4	4.3	4.5	4.7	4.6	4.3	4.9	4.6	4.1	4.1	3.7
PL	11.0	11.5	8.4	11.8	4.5	3.4	4.8	11.8	10.7	10.8	11.8	9.0
PT	15.5	21.0	21.9	8.1	8.0	9.3	11.9	27.5	10.7	8.6	15.2	15.6
RO	6.8	5.2	2.5	5.7	10.7	9.1	8.1	10.3	10.0	12.6	16.2	11.8
SI	2.7	1.4	2.6	5.6	5.5	0.1	0.9	14.1	4.6	4.8	5.9	9.7
SK	2.5	4.0	1.3	7.8	2.7	2.3	2.1	5.4	5.5	-	1.6	0.8
UA-W	15.9	18.1	21.9	40.8	19.8	22.4	16.0	19.8	23.6	27.5	23.5	29.2
UCTE	**9.3**	**7.8**	**7.0**	**8.5**	**6.8**	**5.3**	**6.0**	**21.5**	**9.3**	**7.1**	**12.2**	**8.3**

Table 34 National Remaining Margin w/o Exchanges

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	4.7	5.0	5.4	3.9	4.4	4.1	5.4	5.5	5.4	6.1	4.8	4.2
BA	1.4	1.4	1.6	1.2	1.2	1.7	1.6	1.6	1.5	1.1	1.4	1.6
BE	- 0.3	- 0.5	- 0.4	1.2	- 0.9	- 0.4	- 0.1	- 0.1	- 0.8	- 0.4	- 1.7	- 1.0
BG	0.3	0.4	0.6	0.5	0.5	0.7	0.9	0.7	0.7	0.4	0.2	0.7
CH	1.9	2.1	2.4	5.2	5.2	4.0	5.7	3.2	5.0	3.5	3.0	2.7
CS	- 0.7	- 0.6	0.0	- 0.3	- 0.3	- 0.2	- 0.3	- 0.9	- 0.5	- 0.4	- 1.3	- 0.9
CZ	1.1	1.6	1.4	2.5	3.1	2.0	3.1	2.8	2.3	1.2	1.1	2.2
DE	11.7	11.3	11.0	12.7	5.3	11.8	9.7	7.4	5.9	6.5	7.5	9.4
ES	8.4	7.2	5.5	8.7	8.8	7.1	8.0	7.3	4.8	14.4	16.6	10.5
FR	2.5	2.0	5.6	11.1	16.3	13.9	3.6	14.2	16.5	16.3	10.8	8.7
GR	0.1	0.6	1.4	1.5	0.6	0.6	0.7	- 0.5	1.1	1.4	0.7	0.6
HR	0.5	0.6	0.7	1.0	1.2	0.9	0.9	0.9	0.9	0.7	0.7	0.7
HU	0.4	0.1	- 0.4	- 0.1	- 0.4	- 0.6	- 0.3	- 0.1	- 0.2	- 1.2	- 0.8	- 0.6
IT	4.5	6.3	8.7	9.8	12.3	5.8	5.9	9.9	8.9	12.2	9.1	8.5
LU	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7
MK	- 0.3	- 0.3	- 0.2	0.1	- 0.1	- 0.0	0.2	0.0	0.0	0.1	0.1	0.0
NL	1.0	1.8	1.1	0.9	1.6	2.5	1.1	3.5	2.2	- 0.0	- 0.4	- 0.7
PL	3.3	4.5	3.7	3.0	4.1	3.3	- 0.0	0.7	0.7	1.3	1.4	3.4
PT	0.6	0.7	1.4	3.3	2.6	2.6	1.4	2.2	1.3	2.7	3.2	2.0
RO	3.4	3.7	3.8	3.3	4.0	3.7	3.8	3.8	3.7	2.8	3.4	2.5
SI	- 0.0	0.1	0.2	- 0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2
SK	0.8	0.7	1.1	0.3	0.6	0.5	- 0.1	0.3	- 0.2	0.4	0.6	0.8
UA-W	0.5	0.5	0.4	0.4	0.7	0.6	0.3	0.5	0.6	0.5	0.6	0.6
UCTE	**46.3**	**50.0**	**55.7**	**70.6**	**71.8**	**65.7**	**52.5**	**64.2**	**60.7**	**70.7**	**61.8**	**56.6**

Table 35 National Physical Exchanges

	Jan GW	Feb GW	Mar GW	Apr GW	May GW	Jun GW	Jul GW	Aug GW	Sep GW	Oct GW	Nov GW	Dec GW
AT	1.2	0.9	- 1.2	- 0.4	- 0.3	- 1.4	- 2.4	- 1.1	- 0.1	- 0.6	0.5	1.5
BA	- 0.5	- 0.4	- 0.6	- 0.5	- 0.3	- 0.2	- 0.2	- 0.3	- 0.3	- 0.1	- 0.2	- 0.5
BE	1.7	1.3	1.9	1.7	1.9	1.1	1.1	0.9	1.4	1.0	1.7	1.4
BG	- 1.2	- 1.3	- 1.0	- 1.0	- 0.5	- 1.0	- 0.8	- 1.0	- 0.8	- 0.8	- 0.5	- 0.9
CH	1.4	0.6	- 0.3	-	- 2.6	- 2.0	- 3.8	- 0.3	- 2.8	- 1.9	-	- 0.2
CS	0.5	0.6	0.2	0.3	0.1	- 0.2	- 0.2	0.3	0.1	0.4	0.6	0.6
CZ	- 1.3	- 1.3	- 1.0	- 1.2	- 1.7	- 1.3	- 1.9	- 1.8	- 1.8	- 1.5	- 1.5	- 1.8
DE	- 2.0	- 3.6	- 3.2	1.8	3.2	1.9	2.7	4.1	4.7	3.0	0.3	- 2.2
ES	0.0	- 0.1	- 0.7	0.9	0.1	- 1.1	- 0.5	0.2	- 0.2	- 1.8	- 0.4	- 1.0
FR	- 6.1	- 2.6	- 0.3	- 11.8	- 11.2	- 6.2	- 1.1	- 10.3	- 10.3	- 7.7	- 8.4	- 4.4
GR	0.2	0.5	0.3	0.3	0.1	0.6	0.7	0.6	0.4	0.4	0.2	0.5
HR	0.7	0.8	0.9	0.4	0.5	0.9	0.8	0.9	0.5	0.4	0.8	1.0
HU	0.9	1.2	0.4	1.2	1.3	1.4	0.8	1.0	1.1	1.1	1.0	0.9
IT	5.9	6.7	3.8	7.4	6.0	6.1	3.1	3.7	6.1	6.8	7.3	6.2
LU	0.1	0.1	0.4	0.3	0.4	0.3	0.4	0.2	0.4	0.3	0.5	0.4
MK	0.3	0.3	0.2	0.2	0.3	0.2	0.0	0.3	0.3	0.2	0.3	0.3
NL	3.1	2.2	2.4	3.4	2.6	3.5	2.4	2.6	2.8	2.7	2.3	3.1
PL	- 2.0	- 2.0	- 1.7	- 1.9	- 1.4	- 1.0	- 0.6	- 0.7	- 1.4	- 1.1	- 1.2	- 1.6
PT	0.6	0.4	0.3	- 0.3	0.1	0.9	0.3	0.5	0.6	1.0	- 0.1	0.1
RO	- 0.9	- 1.1	- 0.8	- 0.7	- 0.6	- 0.5	- 0.4	- 0.6	- 0.5	- 0.7	- 0.9	- 0.7
SI	0.1	0.1	- 0.0	0.3	- 0.2	- 0.2	- 0.1	- 0.3	- 0.3	- 0.1	0.1	0.2
SK	- 0.3	- 0.1	- 0.1	- 0.1	- 0.0	- 0.2	0.2	- 0.1	0.4	0.3	- 0.0	- 0.0
UA-W	- 0.5	- 0.5	- 0.5	- 0.6	- 0.5	- 0.6	- 0.4	- 0.6	- 0.6	- 0.5	- 0.5	- 0.5
UCTE	**2.1**	**2.7**	**- 0.6**	**- 0.2**	**- 2.6**	**1.0**	**0.1**	**- 2.0**	**- 0.0**	**0.7**	**1.8**	**2.4**

APPENDIX 3 GRID DEVELOPMENTS ADDITIONAL DATA

Table 36 National Grid Developments Details

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
AT	PST 21-Ternitz	220	30/11/2006	Phase Shifting Transformer
AT	PST 21-Ernsthofen	220	17/11/2006	Phase Shifting Transformer
AT	PST 21-Tauern	220	31/10/2006	Phase Shifting Transformer
BA	No commissioning in 2006			
BE	Woluwe	150/11	20/12/2006	New transformer replacing a transformer 36/11 kV
BE	Avelgem - Ruien	150	December 2006	Double circuit AC line replacing an existing single circuit AC line, ~1.1 km.
BE	Wondelgem - Nieuwe Vaart	150	December 2006	Additional double circuit, 3.3 km, AC line
BE	Woluwe	150/11	08/11/2006	New transformer replacing a transformer 36/11 kV
BE	Nivelles	150/15	20/09/2006	Additional transformer
BE	Oelegem	150/15	30/06/2006	Additional transformer
BE	Slijkens-Koksijde	150	May 2006	Single circuit, ~32.9km, AC cable
BE	Oisquercq	150/15	28/02/2006	Additional transformer
BE	Harenheide	150/11	26/01/2006	Additional transformer
BE	Zaventem	150/36	25/01/2006	Additional transformer
BE	Harenheide -Witloofstraat	150	January 2006	Single circuit,~1.2 km, AC cable
BE	Verbrande Brug -Witloofstraat - Zaventem	150	January 2006	Single circuit,~10.9 km, AC cable
BE	Jamiolle-Monceau	220	January 2006	Double circuit upgrade from 150kV to 220kV~2 * 29.7 km, AC line
BE	Eupen	150/70	December 2005	Additional transformer
BE	Oostrozebeke	150/10	December 2005	Additional transformer
BG	No commissioning in 2006			
CH	No commissioning in 2006			
CS	No data			

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
CZ	No commissioning in 2006			
DE	Second connection Eula	380	2006	Two double circuits, < 1 km, AC
DE	Weida - Remptendorf	380	2006	Upgrading of an AC- circuit from 220 to 380 kV, 61 km
DE	Connection Wessin	380	2006	Double circuit, < 1 km, AC
DE	Connection Niedervieland	380	2006	Double circuit, AC, 8 km
DE	Reiterseich - Redwitz	380	2006	Upgrading of an AC- double circuit from 220 to 380 kV
ES	Ln/ Cabra-La Roda	400	December 2006	82 km
ES	I/O Brovales Ln/Balboa-Alqueva	400	December 2006	0.36 km
ES	Ln/ Val D'Uxó-Segorbe	220	December 2006	46 km
ES	Benejama	400/220	December 2006	450 MVA
ES	El Palmar	400/220	December 2006	600 MVA
ES	I/O El Palmar - Ln/Litoral-Rocamora	400	November 2006	95.6 km
ES	Litoral	400/220	October 2006	600 MVA
ES	Moraleja	400/220	juillet 2006	450 MVA
ES	2nd Circuit Spain-Morocco	400	June 2006	AC submarine
ES	Ln/ Alvarado-Mérida	220	January 2006	41.9 km
ES	Ln/ Magallón-Jalón	220	January 2006	19 km (2nd circuit)
FR	PST at Niort substation	225	October 2006	45 MVA phase shifting transformer
FR	2 RTE Static VAR Compensators	225	October 2006	In the Bretagne region: one at Plaine Haute substation in the Côtes-d'Armor département and another at Poteau Rouge substation in the Morbihan département. Capacity delivered = 300 MVAR Capacity absorbed = 150 MVAR
FR	Hirsingue to Etupes-Sierentz	225	October 2006	25.5 km connecting substation to overhead line
FR	Vezilly to Ormes-Soissons Notre Dame	225	October 2006	29.6 km connecting substation to overhead line
FR	PST at Guarbecque substation	225	May 2006	400 MVA phase shifting transformer
GR	OHL 150KV s/s EGIO-XYLOKASTRO	150	December 2006	Reconstruction of a part, double circuit overhead line
GR	AUTOTRANFORMER s/s AG. STEFANOS	400/150	August 2006	

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
GR	HT s/s MAKRYXORIOU	150	juillet 2006	NEW SUBSTATION
GR	OHL 150KV s/s Komotini - Komotini CCPP	150	June 2006	Single circuit overhead line
GR	AUTOTRANFORMER s/s PALLINI	400/150	May 2006	
GR	HT s/s ORYXEIA KARDIAS	150	April 2006	NEW SUBSTATION
HR	no data			
HU	Gyor-Szombathely line	400	14/09/2006	
HU	Szombathely substation	400/120	14/09/2006	
IT	Carpi Fossoli - S. Damaso	380	2006	Single line 29,4 Km
IT	Caorso - Carpi Fossoli	380	2006	Single line 92,9 km
IT	Acciaiolo - Rosignano	380	2006	Single line 24,0 km
IT	Ferrara Focomorto - Ferrara Nord	380	2006	Single line 9,6 km
IT	Ferrara Nord - Ostiglia	380	2006	Single line 42,7 km
IT	Gariglaino - Sparanise	380	2006	Single line 27,7 km
IT	S.M.Capua Vetere - Sparanise	380	2006	Single line 21,9 km
IT	Rumianca - Sulacis	220	2006	Single line 53,1 km
IT	Grosio - Verderio	220	2006	Single line 106,8 km
IT	S.M. Capua Vetere - Presenzano	220	2006	Single line 47,9 km
IT	Capriati - S.M.Capua Vetere	220	2006	Single line 56,9 km
IT	Other 220 kV lines	220	2006	For a total of 75 km
IT	SAR.CO. (Sardinia-Corse)	150	2006	Submarine 31,06 Km AC link
IT	150/132 kV lines	150/132	2006	22 lines
IT	Camporosso(IT)-Trinité Victor(FR)	220	2006	replaced the 220 kV tie-line Camporosso (IT) - Broc Carros (FR).
IT	Capacitor banks in 13 HV substations	n.a.	2006	700 MVAr
IT	New transformers	n.a.	2006	3180 MVA, have been installed, 720 MVA has been decommisioned.
LU	No commissioning in 2006			

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
MK	No data			
NL	No commissioning in 2006			
PL	Olsztyn – Olsztyn Mątki	220	27/09/2006	new single line, length 17,5 km
PL	Transformer in Olsztyn Mątki	400/220	27/09/2006	new transformer 330 MVA
PT	Rio Maior-Alto de Mira	400	Concluded in 2006, in service early 2007	Prolongation of pre-existent Rio Maior-Fanhões line to Alto de Mira substation. 69.9 km lenght.
PT	Batalha-Pego	400	Concluded in 2006, in service early 2007	New single circuit line with 65.9 km.
PT	Bodiosa-Paraimo	220	Concluded in 2006, in service early 2007	New double circuit line with one circuit installed, prepared for 400 kV but exploited at 220 kV, with 62.7 km.
PT	Derivation from Rio Maior-Trajouce to Fanhões substation	220	Concluded in 2006, in service early 2007	One circuit of a double circuit line with 16.5 km.
PT	Castelo Branco-Ferro 1 &Castelo Branco-Ferro 2	220	31/12/2006	New double circuit line with 2x55.0 km.
PT	Recarei-Paraimo & Paraimo-Batalha	400	28/12/2006	Opening of pre-existent Recarei-Batalha line at Paraimo substation. Single circuit lines with 85.3 & 101.5 km, respectively.
PT	Sabóia-Portimão & Portimão-Tunes 1	150	23/12/2006	Opening of pre-existent Sabóia-Tunes line at Portimão substation. One circuit of a double circuit line with 35.1 and 27.9 km, respectively.
PT	Sines-Portimão & Portimão-Tunes 2	150	23/12/2006	Opening of pre-existent Sines-Tunes 2 line at Portimão substation. One circuit of a double circuit line with 95.6 and 27.9 km, respectively.
PT	Falagueira-Castelo Branco 1 & Falagueira-Castelo Branco 2	150	07/12/2006	Prolongation to Castelo Branco of pre-existent Falagueira-Ródão 1 & 2 lines. Double line with 2x41,6 km.
PT	Gardunha-Castelo Branco	150	07/12/2006	New single circuit line connecting to grid a wind farm power plant, with 31.9 km.
PT	Recarei-Batalha & Batalha-Rio Maior 3	400	06/09/2006	Opening of pre-existent Recarei-Rio Maior 2 line at Batalha substation. Single circuit lines with 182.6 and 41.9 km, respectively.
PT	Penamacor-Ferro	220	27/07/2006	New single circuit line connecting to grid a wind farm power plant, with 24.9 km.

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
PT	Vermoim-Custóias 2	220	28/06/2006	Put in service at 200 kV of a pre-existent line, prepared to 220 kV but previously used at 60 kV, with 6.6 km.
PT	Tunes-Estoi	150	22/06/2006	New double circuit line with 54.1 km.
PT	Bodiosa-Valdigem	220	30/05/2006	New double circuit line with one circuit installed, prepared for 400 kV but used at 220 kV, with 60.3 km.
PT	PST of Falagueira	400/150	24/02/2006	New Phase-Shifter (450 MVA).
PT	Pego-Falagueira & Falagueira-Cedillo	400	24/02/2006	Opening of pre-existent Pego-Cedillo line at Falagueira substation. Single circuit lines with 40.7 and 26.4 km, respectively.
RO	Brazi AT 2 200MVA	220 / 110	December 2006	new - 200MVA
RO	Iernut Substation	400+200	September 2006	reinforcement
RO	Iernut AT 1 - 400MVA	400 / 220	September 2006	new - 400MVA
RO	Slatina Substation	400	August 2006	reinforcement
RO	Slatina AT 1 - 400MVA	400 / 220	August 2006	new - 400MVA
RO	Gutinas Substation	400	juillet 2006	reinforcement
RO	Fundeni AT 1 - 400MVA	220 / 110	juillet 2006	new - 400MVA
RO	Gutinas AT 6 - 400MVA	400 / 220	June 2006	new - 400MVA
RO	Brazi Vest Substation	400	May 2006	reinforcement
RO	Rosiori Substation	400+220	May 2006	reinforcement
RO	Brazi Vest AT 3 - 400MVA	400 / 220	May 2006	new - 400MVA
RO	Rosiori AT - 400MVA	400 / 220	May 2006	new - 400MVA
RO	Focsani AT 200MVA	220 / 110	February 2006	new - 200MVA
RO	Mintia AT 4	400 / 220	January 2006	new - 400MVA
RO	Slatina AT 3 - 200MVA	220 / 110	January 2006	new - 200MVA
SI	Okroglo TR 412	400/110	2006	Transformer
SK	Transformer in Lemesany	400/110	12/2006	350 MVA
SK	Transformer in Krizovany	400/110	12/2006	350 MVA
SK	4 choke coils	33	12/2006	45 MVAr each

Country	Line or Equipment	Voltage	Commissioning	Main Characteristics
UA-W	No commissioning in 2006			

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