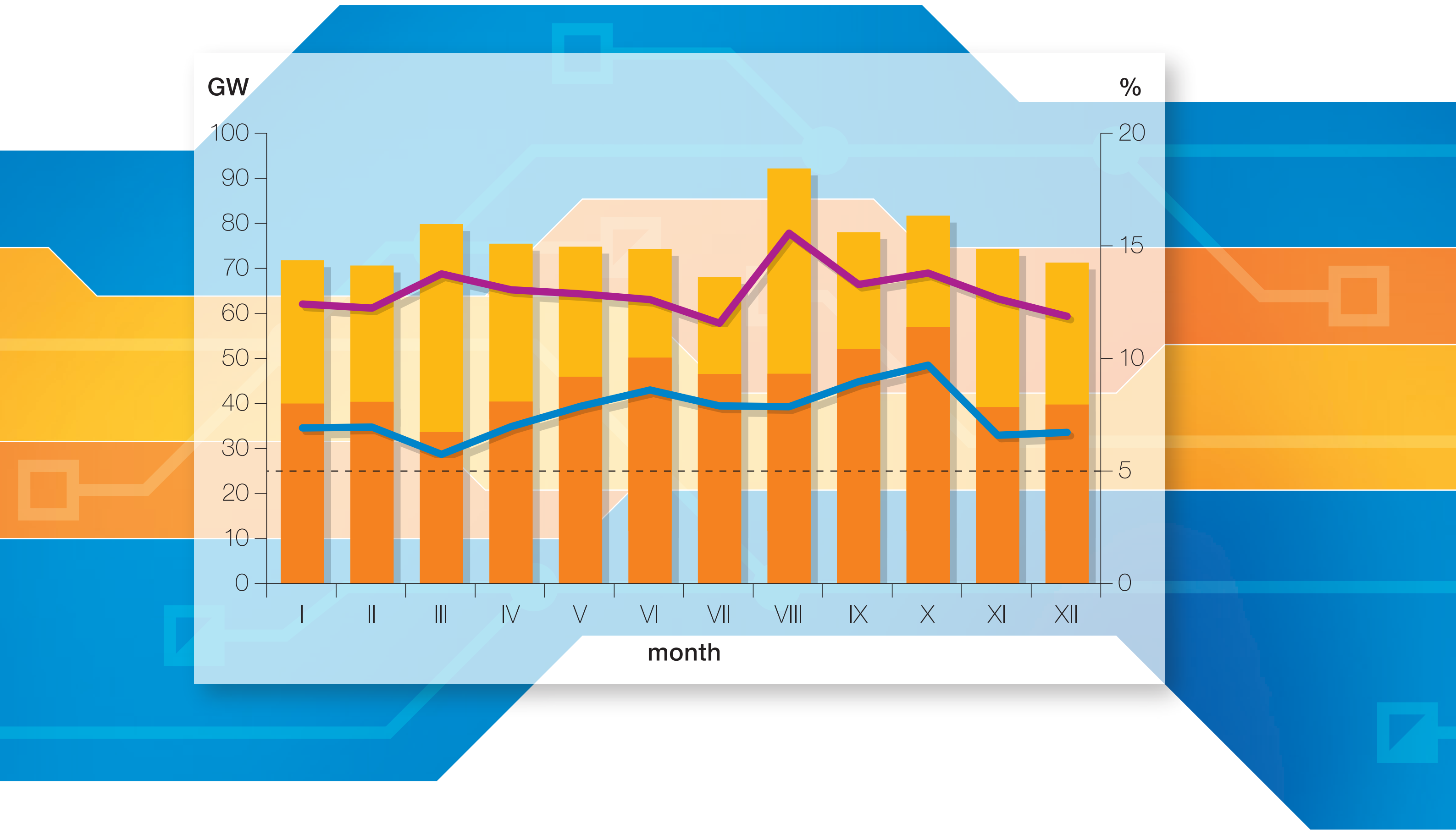
UCTE



System Adequacy Forecast 2006 – 2015

union for the co-ordination of transmission of electricity

December 30th, 2005

UCTE SYSTEM ADEQUACY FORECAST 2006 - 2015

Union for the Co-ordination of Transmission of Electricity

December 2005

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EXECUTIVE SUMMARY 1

1. Executive summary

1.1. Aims and methodology of the report:

This UCTE System Adequacy Forecast report aims at providing all players of the European power market with an overall overview of:

- Generation and demand in the UCTE system in 2006, 2008, 2010 and 2015,
- Adequacy analysis for overall UCTE and for main regional blocks over 2006 – 2015,
- Transmission system adequacy.

The adequacy analysis is based on a relatively simple comparison of the "Remaining Capacity" (RC) to the "Adequacy Reference Margin" (ARM), for each country and for the global UCTE.

The Remaining Capacity is obtained by deducing from the "Net Generating Capacity" (NGC) all the non-usable or reserve capacity.

The Adequacy Reference Margin is defined as the sum of two terms:

- a proportion of the Net Generating Capacity set to 5% or 10% according to the country considered depending on its electric system characteristics,

- a "Margin Against the Peak Load" that compensates the fact that the analysis is made at a predefined synchronous time points (e.g. 3rd Wednesday of January 11:00, January 19:00 and July 11:00) and not specifically at the peak load of the country.

For the global overview of reliability at UCTE level the ARM is calculated as 5% of UCTE total NGC plus the sum of individual margins against peak load – knowing that the peak load of each country are not synchronous.

In this method, we consider that capacity exchanges between countries are infinite, which is, of course not the case.

The simplified feature used in this report to characterise the reliability of UCTE system is then, for each of the studied time points:

Remaining Capacity > Adequacy Reference Margin

with ARM = 5% Net Generating Capacity + Margin against the daily peak load

The analysis of adequacy is carried over two scenario of generation capacity evolution:

- **Scenario A "Conservative**": only new generation projects known as firm are integrated.

- **Scenario B "Best estimate":** it takes into account future power plants whose commissioning can be considered as reasonably probable according to the information available for the TSOs.

1.2. Main results

Over the period **2006-2008**, the reliability of the UCTE system seems not to be at risk. Substantial developments of the generation capacity are expected, among which capacity from renewable energy sources represents a growing share: 7% in 2006, 9% in 2008.

Renewable energy sources have a lower availability ratio than other generating plants. Their impact on the reliably available capacity is lower than thermal power plants, hydro or nuclear stations commissioning : in most cases 75% - but up to 95% for some countries - of wind power capacity is considered as non usable at reference time.

Given this, Remaining Capacity on January 11:00 is decreasing from 2006 to 2008: 79.6 GW in 2006, 76.9 GW in 2008. Those levels remain quite acceptable when compared to the UCTE Adequacy Reference Margin.

Remaining Capacity is lightly lower for January 19:00. But comparison with ARM gives the same results as reference time 11:00 because the evaluation of ARM is lower too (margin against the daily peak load is lower for 19:00 than 11:00).

The period 2008-2010 shows a slight decrease of margins and investments on generating capacities. At that time, renewable energy sources (mainly wind power) should represent 11% of the UCTE generating capacity.

In **2010**, foreseen power plants commissioning helps to cover part of the load increase. However Remaining Capacity continues to decrease, but is still significantly higher than what is considered as a reasonable security margin. In 2010, Renewable energy sources represent 11% of the generating capacity.

For **2010 – 2015 period, the situation is more tightened**. Most of the increase of generating capacity relies on renewable energy sources, thus the global Remaining Capacity decreases more drastically.

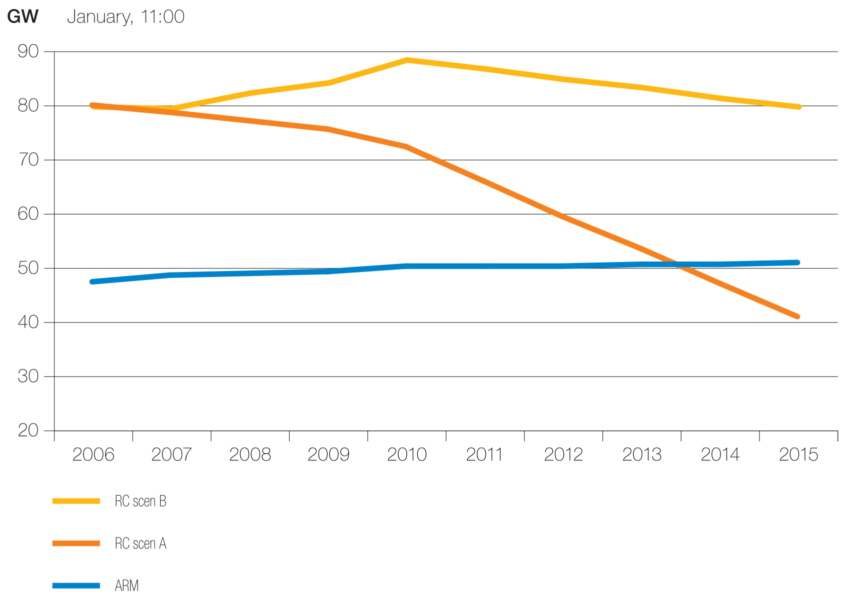
Without any additional commissioning program, Remaining Capacity at UCTE level may not respect the Adequacy Reference Margin. For 2013-2014, the security of the whole UCTE grid will no more be secured.

> In scenario A confirmed investment decisions seem sufficient, at UCTE's level, to allow a reasonable level of adequacy from now on to 2010.
> Nevertheless, security will be at risk after 2013-2014 if further investments are not decided in due time; the reliability of UCTE system cannot be considered as achieved at this time horizon.

In addition to the uncertainties on future developments there are also uncertainties on future decommissioning which should more particularly result from CO_2 trading and Large Combustion Plants European Directive on.

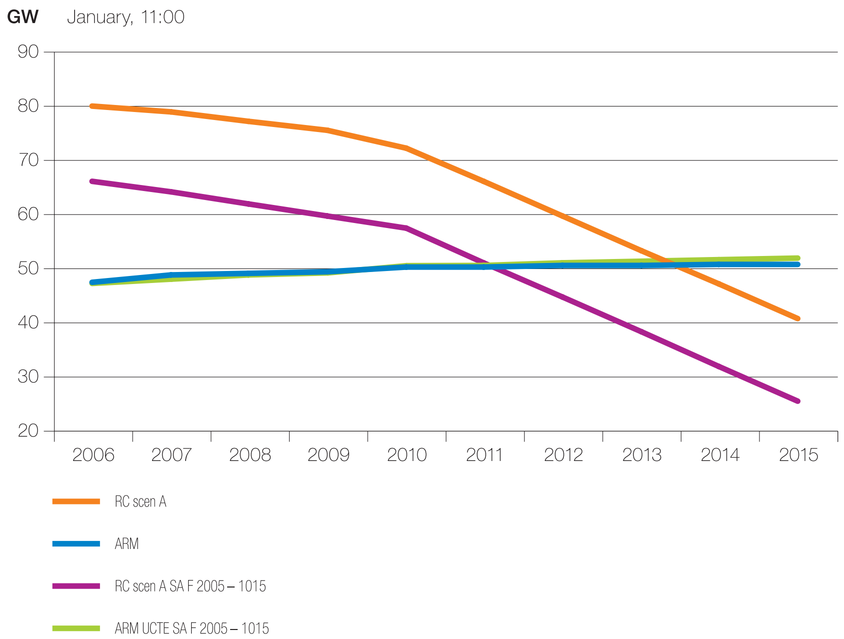
Such decisions, which are notified to TSOs with short delay, would negatively affect the margins.

Figure 0.1 Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00



It is noticeable that the mismatch between Remaining Capacity and the Adequacy Reference Margin, expected in 2010 in last year's System Adequacy Report, has been postponed to the period 2013-2014 in this year's forecasts.

Figure 0.2 Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00 – Comparison with SAF 2005-2015 – Scenario A "Conservative"



These results have to be counterbalanced by a synthetic vision of each of the five main UCTE geographical blocks[1]. As each block has limited interconnection capacities, it may be uneasy in some situations to take advantage of full potential of extra capacities from neighbouring blocks.

[1] It is to be noticed that geographical blocks do not correspond to area control blocks

Main UCTE block[2]:

ARM feature is respected all over the period 2006-2010. But in a conservative scenario, there will be a lack of 11 GW to fulfil the indicative adequacy feature in 2015. This block, globally exporter today, is expected to have a decrease in its potential for export, and could show a need for import in 2015.

Spain + Portugal block:

From 2006 to 2008, the adequacy index is respected for January reference time. After 2010, ARM feature is no longer met and a lack of about 13 GW appears in summer 2015. Development of local generation and reinforcement of interconnections are needed to increase the reliability of Spanish and Portuguese systems.

Italian block:

Thanks to the commissioning of conventional thermal plants – partly in reaction to the 2003 black-out - the remaining capacity of the block is significantly improving. The ARM is met from January 2006 to January 2015. The adequacy is just achieved for summer reference time 2015.

JIEL[3]+ Greece block:

The remaining capacity of the block is low and reliability is not ensured. The situation for this block is very tightened since 2006: the margins are 3 GW below ARM for summer load. The situation will be worsened if investments are not realised.

Centrel block[4] :

This block presents a Remaining Capacity significantly higher than the Adequacy Reference Margin. This situation is stable from 2006 to 2008, and even improves in 2010. It remains sufficient in 2015 without any extra commissioning. CENTREL is the only block that seems to have a long-term export-orientated position.

Romania + Bulgaria block:

Generation capacity is decreasing slowly from 2006 to 2010 but adequacy is achieved for this period.
In 2015 the NGC remains at the same level as 2006. Additional investments up to 2 GW are needed to meet the ARM.

[2] Main UCTE block: Belgium, Germany, France, Slovenia, Croatia, Luxembourg, Netherlands, Austria, Switzerland, Bosnia Herzegovina.
[3] JIEL Block is made of Serbia Montenegro and Macedonia.
[4] CENTREL: Czech Republic, Poland, Hungary, Slovakia, Western Ukraine

2 INTRODUCTION AND METHODOLOGY

2. Introduction and methodology

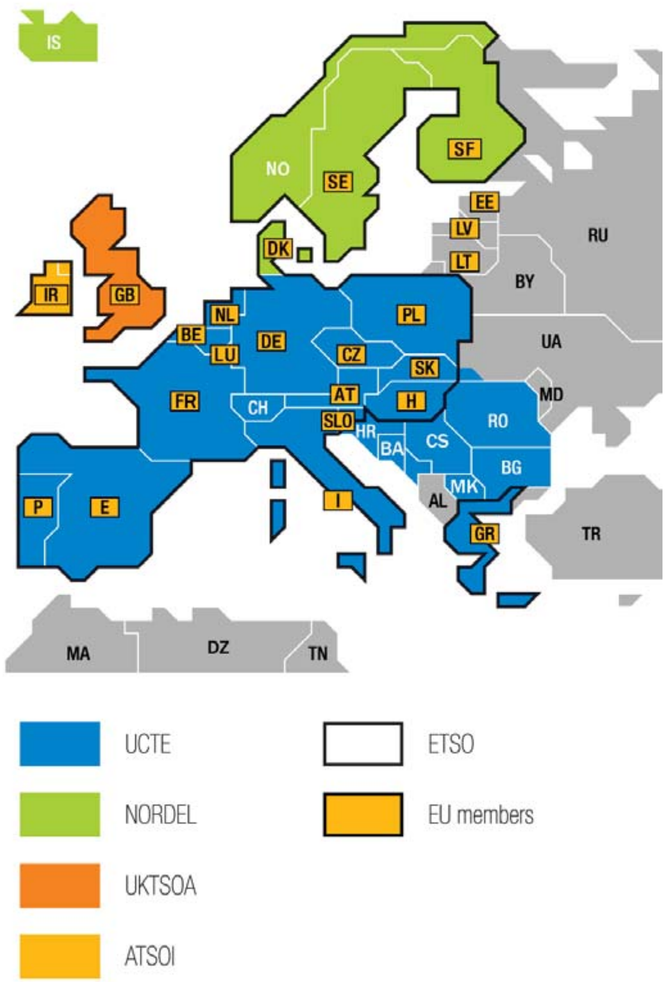
2.1. Presentation of UCTE

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 consumption exceeds 2400 TWh (16% of world electricity consumption).

With regard to the other members of ETSO (European Transmission System Operators, 36 Transmission System Operators in 23 countries), the geographical perimeter of UCTE in 2004 is represented in the picture below :



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.

As of System Adequacy Forecast 2005-2015, the member companies of the UCTE come from the following countries:

UCTE countries		
Country name	2005-2015 Country Code	2006-2015 Country Code
Belgium	B	BE
Germany	D	DE
Spain	E	ES
France	F	FR
Greece	GR	GR
Italy	I	IT
Slovenia	SLO	SI
Croatia	HR	HR
Former Yugoslav Republic of Macedonia	FYROM	MK
Serbia Montenegro	SCG	CS
Luxembourg	L	LU
Netherlands	NL	NL
Austria	A	AT
Portugal	P	PT
Switzerland	CH	CH
Czech Republic	CZ	CZ
Hungary	H	HU
Poland	PL	PL
Slovak Republic	SK	SK
Bosnia Herzegovina	BIH	BA
Romania	RO	RO
Bulgaria	BG	BG
Western Ukraine	BI-UA	UA-W

NB: For this forecast 2006-2015, new country abbreviations are used.

2.2. General features

2.2.1. *Abbreviations*

Abbreviations below are used in the report.

Abbreviation	Complete title
ARM	Adequacy Reference Margin
CENTREL	CENTREL is a regional group of four transmission system operator companies: - ČEPS, a.s. **- of the Czech Republic;** - Hungarian Power System Operator Company MAVIR Rt.of **Hungary;** - PSE-Operator S.A. **of Poland;** - Slovenská elektrizačná prenosová sústava, a.s. – SEPS a.s. **- of Slovakia**
ETSO	European Transmission System Operators
JIEL	JIEL is a regional group composed by two transmission system operator companies: - MEPSO **of Macedonia;** - EKC of **Serbia and Montenegro**
Main UCTE	The main UCTE is a regional group of transmission system operator companies: - VERBUND-Austrian Power grid AG of **Austria** - ELIA of **Belgium**, - NOS BIH of **Bosnia Herzegovina** - HEP of **Croatia** - RTE of **France** - VDN of **Germany** - CEGEDEL of **Luxembourg** - TenneT of **the Netherlands**, - ELES of **Slovenia** - ETRANS of **Switzerland**
NGC	Net generating capacity
NORDEL	Nordel is an association for electricity co-operation in the Nordic countries: - **Denmark,** - **Norway,** - **Finland,** - **Iceland** - **Sweden**
RAC	Reliably Available Capacity
RC	Remaining Capacity
RL	Reference load
SAF	System Adequacy Forecast
SAR	System Adequacy Retrospect
TSO	Transmission System Operator
UCTE	Union for the Coordination of Transmission of Electricity

2.2.2. *Definitions*

In this note, CIGRE definitions for reliability, adequacy and security are used.

Reliability – a general term encompassing all the measures of the ability of the system, generally given as numerical indices, to deliver electricity to all points of utilisation within acceptable standards and in the amounts desired. Power system reliability (comprising generation and transmission facilities) can be described by two basic and functional attributes: adequacy and security.

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.

Security – a measure of power system ability to withstand sudden disturbances such as electric short circuits or unanticipated losses of system components or load conditions together with operating constraints. Another aspect of security is system integrity, which is the ability to maintain interconnected operations. Integrity relates to the preservation of interconnected system operation, or the avoidance of uncontrolled separation, in the presence of specified severe disturbances.

The above definitions are described in detail in the following two CIGRE reports:
Power System Reliability Analysis – Application Guide, Paris, 1987,
Power System Reliability Analysis – Composite Power System Reliability Evaluation, Paris, 1992.

2.3. Methodology

2.3.1. *General approach*

Over the past years UCTE has made continuous efforts to improve the content of the system adequacy forecast reports: in 2002 information concerning the transmission grid developments were introduced, in 2003 the time horizon of forecasts has been extended up to 7 years.

This was a contribution to the general debate concerning the security of supply in the European power system that rose in the previous years and has been reinforced in 2003 after the blackouts in North America and in Italy.

In 2004, UCTE System Adequacy Forecast report was integrating three major developments:

- **the extension of the time horizon** up to ten years ahead ;
- **the improvement of the method used to assess generation adequacy** in order to take into account the specificity of every individual system ;
- **the introduction of a new reference point in January at 19.00**, closer to the synchronous peak load than the usual reference point January 11.00.

The same methodology is applied for the 2006 report.

2.3.2. *Scenarios of the UCTE System Adequacy Forecast*

Because these longer term forecasts are subject to higher uncertainties, considering that today it takes two to three years to build new power plants, UCTE has developed long term **scenarios** whose aim is to give an evaluation of the range of uncertainties, and an evaluation of the risks concerning security of supply over the ten coming years.

The first scenario is called “conservative scenario” (scenario A); it only takes into account the new power plants whose commissioning can be considered as sure : plants under construction or whose investment decision is notified as firm to the TSOs.

This scenario shows the evolution of the potential unbalances if no new investment decision were taken in the future. It allows to identify the amount of investments which are necessary over the period to maintain a targeted standard of security of supply.

The second scenario is called “best estimate scenario” (scenario B), it takes into account future power plants whose commissioning can be considered as reasonably probable according to the information available for the TSOs : commissioning resulting from governmental plans or objectives, concerning for example the development of renewable sources in accordance with the European legislation, or estimation of the future commissioning resulting from the requests for connection to the grid of from the information given by producers to the TSOs. This scenario gives an estimation of potential future developments, provided that market signals give adequate incentives for investments.

2.3.3. *Generation adequacy assessment*

Generation adequacy assessment consists in investigating the ability of the generating units to match the system load evolution.

UCTE approach is based on a comparison between the load and the generating capacity considered as "reliably available" for power plant operators (generating capacity after the deduction of various sources of unavailability - non-usable capacity, scheduled and unscheduled outages - and reserves required by TSOs for system services ; see figure hereafter).

The load corresponds to a common synchronous reference for the entire UCTE network. The selected reference points are the third Wednesday of January at 11.00 and 19.00 and the third Wednesday of July at 11.00 ; the load forecast is based upon the assumption of normal climatic conditions.

In addition the difference between these reference loads and peak load is estimated.

The resulting balance, called "remaining capacity" (RC), can be interpreted as the capacity that the system needs to cover the difference between the peak load of each country and the load at the UCTE synchronous reference time, and, at the same time to cover demand variations (resulting for example from weather conditions) and longer term unplanned outages which the power plant operators are responsible to cover with additional reserves.

Developments have been performed by UCTE in order to estimate the level of RC necessary to provide a given level of security of supply taking into account the characteristics of every subsystem. A probabilistic approach has been used which allowed to define the statistical characteristics of the RC as the results of the probabilistic characteristics of each component: load and unavailability of generation.

Considering a level of risk for each national system corresponding to 1% is consistent for the UCTE system and some national systems with RC at peak load representing 5% of the national generating capacity.

For some other national systems, more sensitive to random factors (load variations or unavailability of generation), RC should represent around 10% of the national generating capacity.

Thus when considering individual countries, generation adequacy will be assessed on the basis of the comparison between RC and ARM.

This method is also applied to assess generation adequacy for the whole UCTE system or for larger geographical blocks ; in this case the synchronous peak load of the blocks is estimated by the sum of the peak loads of the individual countries.

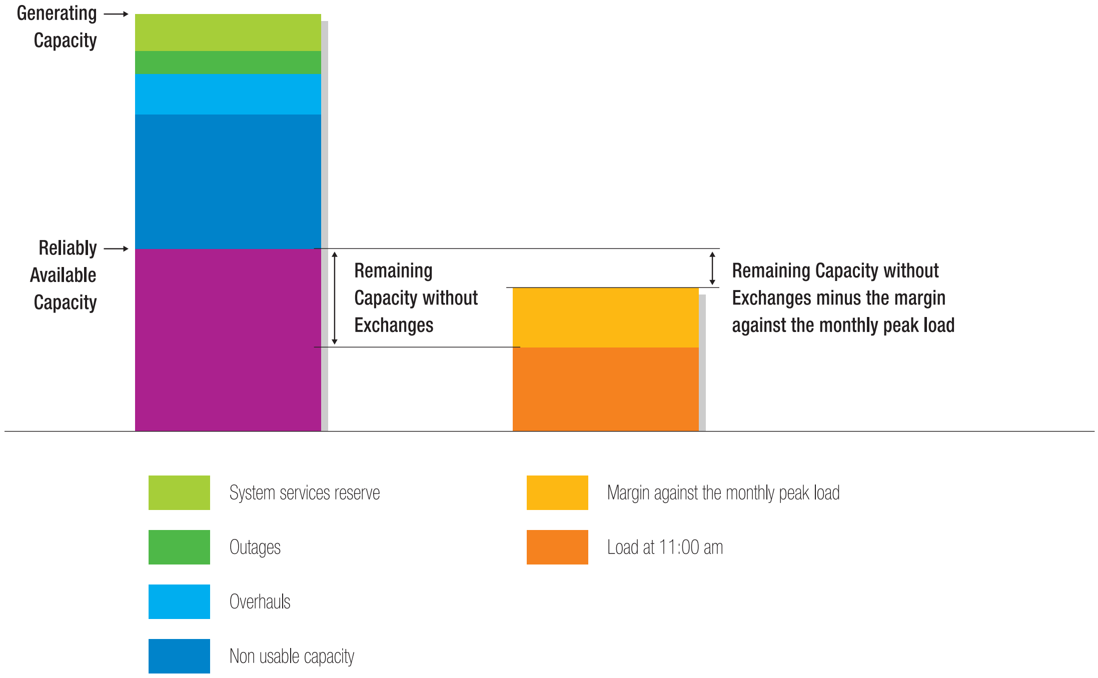
This approximation leads on one hand to an overestimation of the peak load for the largest geographical blocks and to a conservative view of the level of adequacy. On the other hand, considering the synchronous peak load of large size blocks leads to rely on the assumption that it is always possible to carry where needed the generating power available in a country in any other country of the block, whereas the capacities of the transmission system actually limit these possibilities.

The future trends in generation capacity are developed according to the assumptions underlying each scenario.

But when considering the results of these scenarios the following simplifications must be taken into account:

- because decommissioning decisions concerning generation units are often notified to TSOs with a short notice, the national generating capacity can be overestimated, especially on the medium long term,
- because cross-border exchanges forecasts are not taken into account in the power balance, the analysis considers neither long term contracts nor the participation in power plants located out of the national territory. However, these contracts can represent a significant and permanent contribution to satisfying the national load in some countries.

Here below is shown the graph illustrating the Power Balance according to UCTE methodology:



For an individual country, remaining capacity minus the margin against the peak load should be at least 5% or 10% of the national generating capacity.

The synthetic feature is: Remaining Capacity should be higher or equal to the ARM to ensure the reliability of the system.

Remaining Capacity > ARM means possibility of export
Remaining Capacity < ARM means need of import

2.3.4. *Transmission System Adequacy*

After the generation adequacy assessment has highlighted the ability of each country to cover the internal load with the available national capacity, transmission adequacy assessment consists in investigating if the transmission system is sufficiently sized in order to enable the power flows across the European system resulting from the location of loads and generation, and in analysing the role which the internal and the interconnected networks play in terms of system security.

At this stage the methodology does not aim at identifying the cross border flows that would be originated by market price differences resulting for example from differences in fuel mix between countries.

At the UCTE level the transmission system adequacy analysis is focused on the interconnection and on the internal lines which have a direct effect on the international exchanges.

Because the remaining capacity (as a result of the power balance) represents, if positive, a potential possibility for export and, if negative, a potential need for imports, transmission adequacy assessment consists in comparing this remaining capacity with the Net Transfer Capacity at the borders, as published by ETSO or estimated by the TSOs.

The comparison is made for each country considered individually, but also at the interfaces of the different regional blocks which can be identified in the UCTE system.

For more details about the methodology, the reader can also refer to the document available on the UCTE web site (www.ucte.org).

2.3.5. *Structure of the report*

The **overall results** of the forecasts are shown in **Chapter 3** (with **Appendix A** showing a more detailed analysis of the power balance elements), with a special focus on remaining capacity. **Chapter 4** of the report deals with the **transmission system adequacy** (supported by **Appendix C**). **Appendix D** presents extraordinary **trends and remarks** about the status of deregulation in UCTE countries.

Results are given for scenario A and when necessary, differences with scenario B are shown.

It is to be noticed that power balance elements for 2010 and 2015 do not present the same level of credibility as data for years ahead.

2.4. Comparison with EURPROG exercise

Another report showing a general picture of the perspectives of the European electricity system is published by EURELECTRIC in its yearly EURPROG report and can be ordered at www.eurelectric.org.

UCTE is producing its System Adequacy Reports to give accurate information concerning the future situation from a today's operational perspective without considering major macroeconomic changes or political trends and to provide to market players and public authorities early warning signals concerning potential needs for new investments. These assumptions are taken to best meet the aims of the Association focusing on providing a complete overall view on the power system evolution and at investigating system adequacy and not only generating capacity adequacy (in order to match the system load evolution).

Therefore, concerning generating capacity commissioning, only those new projects are taken into account in scenario A, which are considered as sure, according to the information TSOs receive (connection agreement signed or going to be signed, new power plants taken into account in the long-term plan for transmission system development, or signature of other agreements according to country rules). As far as shutdowns are considered, the best estimation is given, being as close as necessary to the present situation.

Scenario B proposes additional commissioning, based on TSO's assumptions of probable further developments of generation capacities at a time horizon when decisions are not yet taken ; these estimations are not made in the purpose of satisfying specific adequacy standards.

The EURPROG report of EURELECTRIC is based on the best view of country experts of what is likely to occur in each country with respect to the plant demand balance, taking into account recent trends and projections of economic, social, environmental and technological developments. The capacity projected allows for growth in demand and the adoption of a national plant capacity margin based on historical experience, which is sufficient to meet the security standards regarded as the norm in each country. This may mean the allowance for closures which have not been notified and the building of new plant which is not existing or under construction.

Therefore, both reports are complementary and follow different objectives with different approaches. However, the consistency is closely checked between both involved associations through regular contacts to make sure that the best data quality can be reached in all reports. The volitional differences in the data sets are based on:

- different points of view (pure TSO information versus a more general electricity industry view),
- different assumptions for forecasting values ("conservative" estimations from TSO reality versus global industrial estimations),
- different time frames,
- minor methodological differences.

3 GENERATION ADEQUACY : MAIN RESULTS

3. Generation Adequacy: main results

3.1. UCTE Power Balance Elements

Most significant overall results of the "System Adequacy Forecast 2006-2015" for the third Wednesdays in January (the representative winter day) and July (the representative summer day) **are shown in Table 1**, for the entire UCTE. Values are those for scenario A (“Conservative”), those for scenario B (“Best estimate”) are shown in italic.

Over 2006 – 2010, in spite of an increasing generating capacity (+35GW), the remaining capacity decreases by 10GW.

For 2010-2015 horizon, total UCTE generating capacity grows by 16GW whereas remaining capacity drops by 30GW.

Appendix A contains forecasts for national generating capacity, non-usable capacity, system service reserves and load for each country.

Table 1 **UCTE-Power Balance, 2006 – 2015 FORECASTS** **Results in GW**

	2006			2008			2010			2015		
	3rd Wednesday			*3rd Wednesday*			*3rd Wednesday*			*3rd Wednesday*		
	January		**July**	**January**		**July**	**January**		**July**	**January**		**July**
	11:00	**19:00**	**11:00**	**11:00**	**19:00**	**11:00**	**11:00**	**19:00**	**11:00**	**11:00**	**19:00**	**11:00**
Net Generating Capacity:												
Hydro power stations (1) sc A	133.5	133.5	133.6	134.3	134.3	134.5	135.3	135.3	135.8	136.3	136.3	136.5
sc B	*133.5*	*133.5*	*133.6*	*134.5*	*134.5*	*134.6*	*136.4*	*136.4*	*137.1*	*140.8*	*140.8*	*141.0*
Nuclear power stations (2) sc A	112.8	112.8	112.7	111.0	111.0	110.7	108.9	108.9	108.9	107.0	107.0	105.4
sc B	*112.8*	*112.8*	*112.7*	*111.0*	*111.0*	*110.7*	*108.9*	*108.9*	*108.9*	*108.6*	*108.7*	*107.0*
Fossil fuel power stations (3) sc A	315.3	314.9	318.2	326.6	326.6	327.6	326.3	326.3	327.4	326.0	326.0	324.2
sc B	*315.4*	*314.9*	*318.2*	*330.7*	*330.7*	*331.7*	*341.0*	*341.0*	*344.6*	*352.9*	*352.9*	*354.0*
Renewable energy sources (other than hydro) (4) sc A	42.3	42.3	45.4	56.4	56.4	59.5	68.8	68.8	72.0	86.9	86.9	88.7
sc B	*42.3*	*42.3*	*45.5*	*57.8*	*57.8*	*61.1*	*73.2*	*73.2*	*76.6*	*101.6*	*101.6*	*105.0*
Not clearly identifiable energy sources (5) sc A	1.6	1.6	1.6	1.7	1.7	1.7	2.0	2.0	2.0	2.1	2.1	2.1
sc B	*1.6*	*1.6*	*1.6*	*1.7*	*1.7*	*1.7*	*2.0*	*2.0*	*2.0*	*2.4*	*2.4*	*2.4*
National generating capacity (6=1+2+3+4+5) sc A	**605.6**	**605.2**	**611.4**	**630.0**	**630.0**	**634.1**	**641.4**	**641.4**	**646.1**	**658.4**	**658.4**	**657.0**
sc B	***605.6***	***605.2***	***611.5***	***635.7***	***635.7***	***639.9***	***661.6***	***661.6***	***669.2***	***706.3***	***706.4***	***709.3***
Non-usable capacity (7) sc A	91.4	91.4	112.5	99.7	99.7	120.2	115.2	115.2	141.4	128.5	128.5	153.0
sc B	*91.4*	*91.4*	*112.6*	*100.6*	*100.6*	*120.9*	*119.4*	*119.4*	*146.3*	*138.1*	*138.1*	*167.0*
Of which, mothballed capacity sc A	10.4	10.4	11.1	9.3	9.3	10.3	8.8	8.8	9.4	10.4	10.3	11.7
sc B	*10.4*	*10.4*	*11.1*	*9.3*	*9.3*	*10.3*	*8.8*	*8.8*	*9.4*	*10.4*	*10.3*	*11.7*
maintenance and overhauls (fossil fuel power stations) (8) sc A	8.8	8.8	49.3	10.9	10.9	48.1	5.8	5.8	34.7	6.2	6.2	35.0
sc B	*9.0*	*9.0*	*49.4*	*11.0*	*11.0*	*48.2*	*6.1*	*6.1*	*35.1*	*6.6*	*6.6*	*35.6*
outages (fossil fuel stations) (9) sc A	18.8	18.8	17.4	19.3	19.3	17.8	9.6	9.6	8.1	9.6	9.6	8.1
sc B	*18.8*	*18.8*	*17.3*	*19.4*	*19.4*	*18.0*	*9.8*	*9.8*	*8.3*	*10.0*	*10.0*	*8.4*
system services reserve (10) sc A	32.5	32.4	31.7	33.7	33.7	32.8	34.1	33.9	33.3	35.2	35.2	34.4
sc B	*32.5*	*32.4*	*31.6*	*33.8*	*33.8*	*32.9*	*34.5*	*34.4*	*33.5*	*35.9*	*35.8*	*34.9*
Reliably available capacity (11=6-(7+8+9+10)) sc A	**454.1**	**453.8**	**400.5**	**466.4**	**466.4**	**415.2**	**476.7**	**476.9**	**428.5**	**479.0**	**479.0**	**426.5**
sc B	***454.1***	***453.8***	***400.5***	***470.9***	***470.9***	***420.0***	***491.8***	***491.8***	***446.0***	***515.7***	***515.9***	***463.4***
Load (12)	**374.5**	**382.9**	**329.9**	**389.5**	**398.0**	**343.3**	**404.7**	**412.2**	**356.7**	**438.3**	**446.3**	**390.7**
Remaining capacity (13=11-12) sc A	**79.6**	**70.9**	**70.6**	**76.9**	**68.4**	**71.9**	**72.0**	**64.7**	**71.8**	**40.6**	**32.7**	**35.8**
sc B	*79.6*	*70.9*	*70.6*	*81.5*	*72.9*	*76.7*	*87.1*	*79.7*	*89.3*	*77.2*	*69.4*	*72.4*

3.1.1. Evolution of the generating capacity over 2006 –2015

A significant growth in generating capacity (+52 GW) is expected over this period.

The increase of renewable generating capacity is + 45 GW [+100%] in scenario A and + 57 GW [+141%] in scenario B for reference time January 11:00. This evolution is mainly due to wind power projects.

In scenario A, **the rhythm of conventional thermal power stations commissioning is estimated as decreasing over the period.** For 2006-2015 + 11 GW of conventional thermal plants are expected as certain *[+37GW in scenario B].*

The part of nuclear is slightly decreasing over 2006 and 2015, -5.8GW (from 19% to 16% of net global capacity in UCTE) *[-4.3GW in scenario B].*

Most of the difference between scenario A and scenario B results :

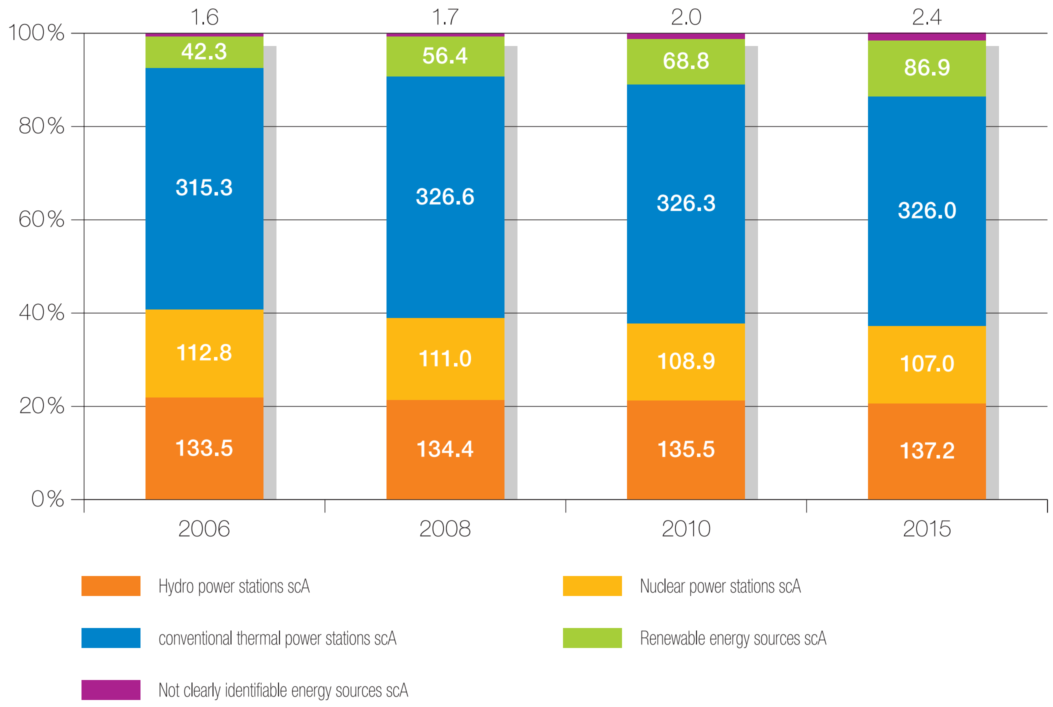
- from an increased development of renewable energy sources: 15% of the generating capacity in 2015 representing more than 100 GW [13% in scenario A],
- from a stronger increase of conventional thermal plants commissioning
- from additional developments of nuclear stations.

Table3 UCTE-Power Balance, Generation capacity mix evolution Results in %

	Generating Capacity in 2006[5] (GW)	2006 - 2008	2008 - 2010	2010 - 2015	*2006 - 2015*
Hydro power stations – Scen. A	**133.5**	**0.6%**	**1.1%**	**1.5%**	***2.1%***
Scenario B	***133.5***	*0.8%*	*2.0%*	*4.6%*	***5.4%***
Nuclear power stations – Scen. A	**112.8**	**-1.6%**	**-3.6%**	**-3.6%**	***-5.1%***
Scenario B	***112.8***	*-1.6%*	*-3.6%*	*-2.2%*	***-3.8%***
Conventional thermal power stations – Scen. A	**315.3**	**3.6%**	**1.4%**	**-0.2%**	***3.4%***
Scenario B	***315.4***	*4.9%*	*5.8%*	*6.7%*	***11.9%***
Renewable energy sources – Scen. A	**42.3**	**33.3%**	**38.9%**	**54.0%**	***105.3%***
Scenario B	***42.3***	*36.5%*	*47.1%*	*75.8%*	***140.1%***

[5] NGC in 2006 for January 11:00 reference time

Figure 1 **Evolution of the generation capacity mix from 2006 to 2015 -Results in GW Scenario A, reference time 11:00**



3.1.2. Evolution of the reliably available capacity and remaining capacity

3.1.2.1. *Period 2006 -2008*

The increase in reliably available capacity (+12 GW) from January 2006 to January 2008 **only represents 50% of the increase in UCTE generating capacity due to the poor contribution of wind power to reliably available capacity**.

The increase observed for load at reference time over the same period (+15 GW) is higher than the increase in reliably available capacity.

As a consequence, RC decreases over 2006 to 2008 from 79.6 GW to 76.9 GW in scenario A for reference time January 11:00 [increase to 82.3 GW in scenario B].

Same results are observed for reference time January 19:00: from 70.9 GW to 68.4 GW [increase to 72.1GW in scenario B].

Only for reference time July 11:00 an increase of RC is noticeable: from 70.6 GW to 71.9 GW over 2006-2008 [77.5 GW in Scenario B].

In order to assess the level of security over the next years, the following characteristics of the UCTE system should be kept in mind:

- **There is a significant sensitivity of the load to the temperature ; it can be estimated at more than 3400 MW /°C in winter and 2200 MW / °C in summer** ;
- the random nature of the “reliably available capacity” which results from the forced outages of the thermal plants and from variations of the inflows in the hydro power plants. **According to the expertise of the TSOs, the standard deviation of each of these factors can be estimated between 2500 and 3000 MW** ;

- in addition there is a significant correlation between low temperature and low inflows in the hydro plants as a result of anticyclonic meteorological conditions. In the future these periods should also be characterised by a low contribution of wind power generation.

In this period RC is 25 to 30GW higher than the ARM. This margin allows facing a cold wave leading to temperatures up to 10°C below normal temperature, which would lead to a load increase of 34 GW, while leaving another 25 to 40GW to face real peaks of each country and unfavourable availability of generating units.

3.1.2.2. *Period 2008 – 2010*

The generating capacity of the UCTE increases from 630 GW in January 2008 to 641 GW in 2010.

12 GW are renewable energy sources. These commissioning result from plans engaged by members of European Union to fulfil the requirements of European Directive on Renewable. (21% of consumption has to be covered by renewable energy sources in 2010).

As seen by TSOs renewable capacity represents 69 GW in 2010.

For UCTE, load is expected to increase with the same trend as 2006-2008 period: +1.9% in winter, +2.2% in summer.

The additional reliably available capacity does not cover the additional load over the period.

With these hypothesis, the variation of the RC is –9% in Scenario A and + 5.1% in Scenario B.

So, **RC is decreasing from 2008 to 2010 by 5 GW in winter and 1 GW in summer in scenario A .**

In 2010, Remaining capacity for Scenario A and B is still higher than ARM (by 20 GW in January and 22 GW in July).

That means that the investments in generation today firmly decided or planned are sufficient to meet this condition in 2010. But the system security is slightly degraded over the period from 2008 to 2010.

When drawing this conclusion, two uncertainty factors must be taken into consideration :

- **it is still possible to decide new investments for this time horizon. Additional capacities estimated for scenario B are 20 GW higher than in scenario A.**
- **decommissioning may occur during the period especially as a result of the effects of new environmental requirements on the oldest fossil fuel plants**

3.1.2.3. *Period 2010 – 2015*

2015 target is too far from nowadays to give a precise plan of commissioning generating units.

However, this forecast exercise shows a strong increase of renewable generating capacity is expected from 2010 to 2015: +18GW in Scenario A *[+30 GW in Scenario B*].

The overall increase of global generating capacity is only 17 GW.

As seen by TSOs, in 2015, generating capacity of renewable energy (excluding hydropower) may then represents about 13% of net global capacity *[14% in Scenario B].*

This assessment results on a light increase of reliable available capacity over the period about from 477 to 479 GW in winter; and on a small decrease from 428 to 426 GW in summer period.

Load increase is expected to be 1.8% in winter and 2.0% in summer.

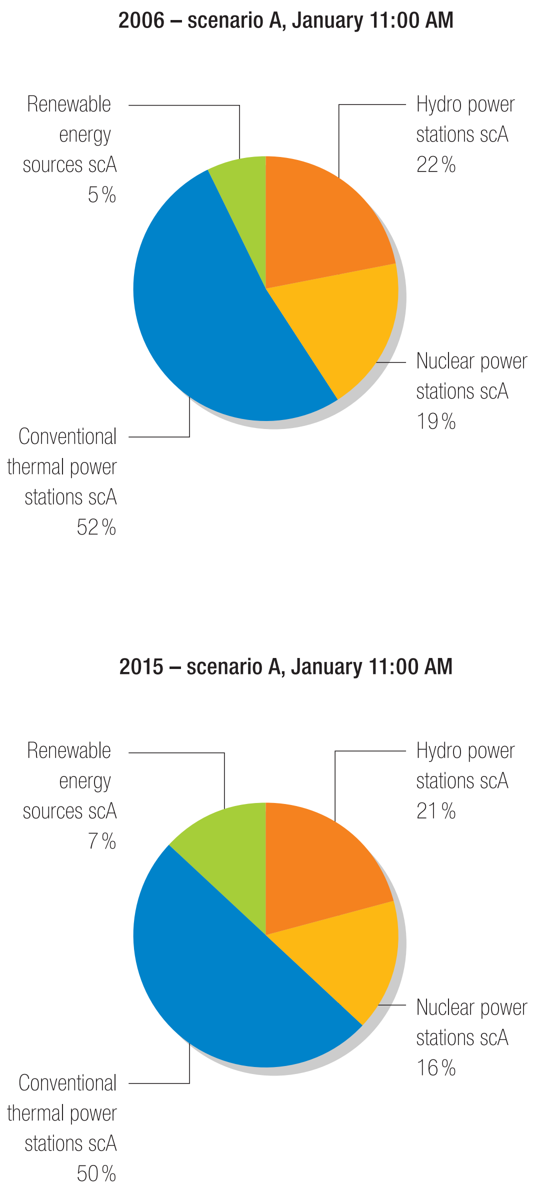
As a consequence, the fall of the remaining capacity identified over 2008 to 2010 is reinforced from 2010 to 2015.

In 2015, RC is only 41 GW in January 11:00, 33 GW in January 19:00 and 36 GW in July 11:00 in Scenario A *[79 GW for Jan. 11:00, 72 GW for Jan.07:00 and 75 GW for July 11:00 in Scenario B*].

Around 11 GW would be necessary in scenario A to meet the ARM at this time.

Generating capacity mix in 2015 for scenario A & B are shown in figures below:

Figure 2 Generating capacity mix in 2015



Note: these graphs show the evolution of the UCTE **power** generating capacity mix over 2006 – 2015. To have the effective share of each type of **energy** production it is necessary to focus on the effective productibility. For such a view, it is necessary to consider the annual load factor of the considered source, not treated in this forecast report.

Figures 3-1 to 3-3 show expected remaining capacity (for scenario A "Conservative" and scenario B "Best estimate"), from 2006 to 2015, in January and July. It can be compared to 5% of UCTE Generating Capacity + margin against peak load, which can be considered at UCTE level as a reasonably low risk of shortfall.

Figure 3-1 **Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00**

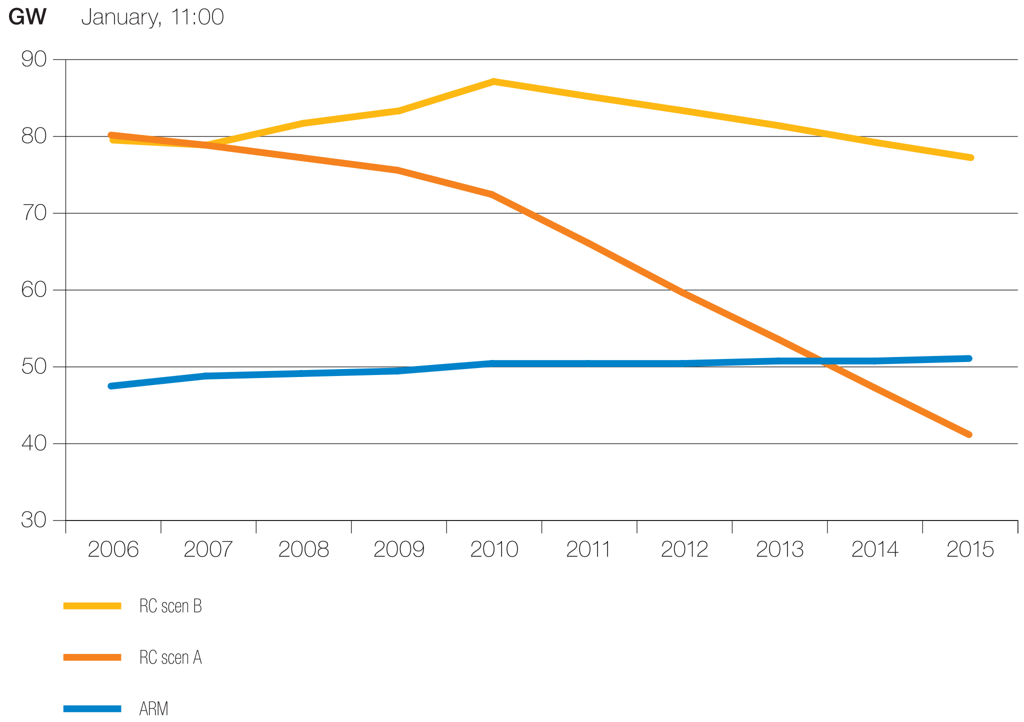


Figure 3-2 **Remaining capacity against Adequacy Reference Margin – January 19:00** **Results in GW**

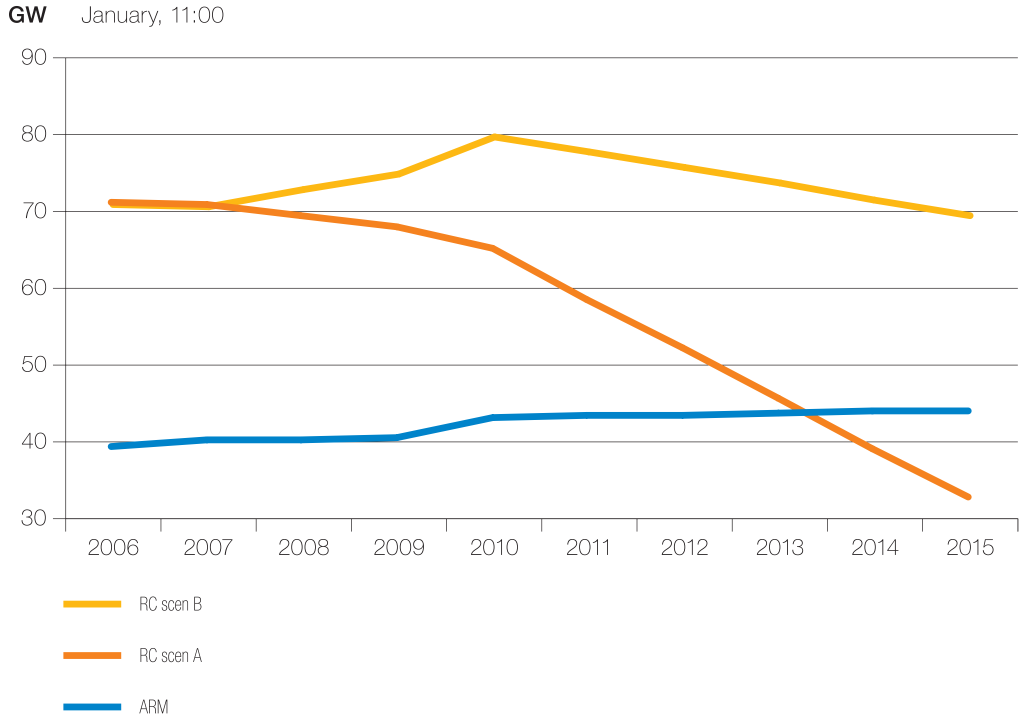
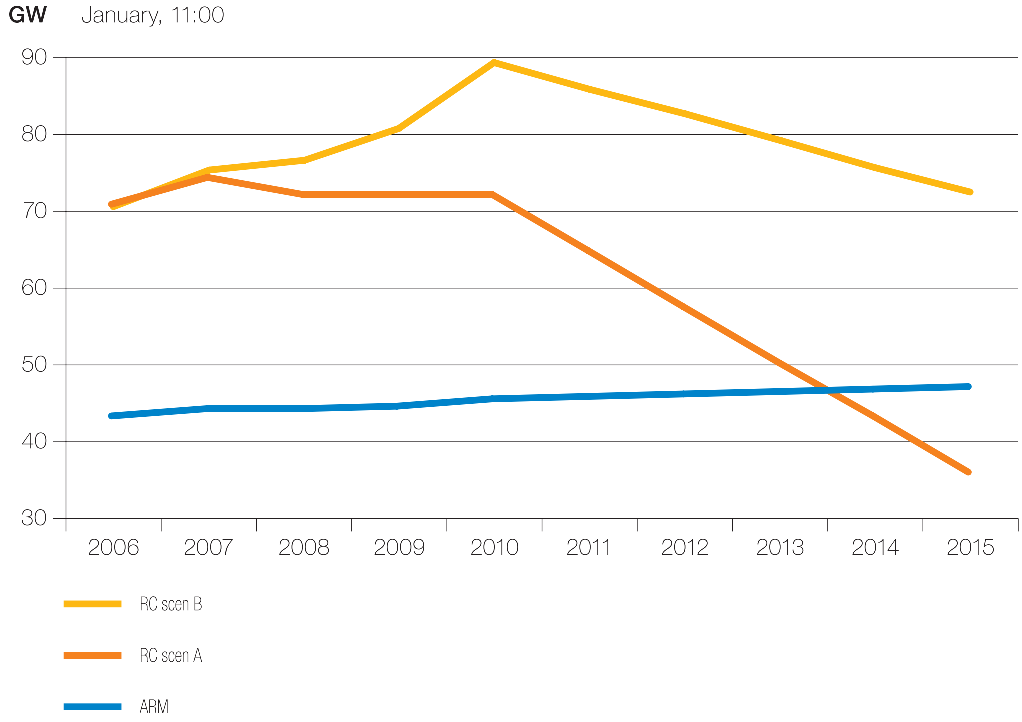


Figure 3-3	Remaining capacity against Adequacy Reference Margin – July 11:00	Results in GW



3.1.3. *Peak load and Load reduction measures*

The use of load reduction measures at peak load is a way to balance the system and ensure the reliability.

Nowadays this possibility is more and more used when prices are at the highest.

For the first time, these data have been collected for each country. However, there were not integrated in margin calculation.

In 2006, **at least 6 GW can be shed at peak load** at UCTE level.

Table below is presenting national peak loads and the existence of load reduction measures for each country.

Precise volumes are not available for some countries because they result from contracts between suppliers and customers whose amount is not known by TSO's or because the efficiency of these measures have not yet been tested.

Table 4 | **UCTE-Power Balance, peak load and load reduction measures** **Results in MW**

	Peak load 2005	**Load Reduction Measures**			
Country			**2006**	**2010**	**2015**
BE[6]	13707	Yes	200	200	200
DE	77200	-	-	-	-
ES	43378	Yes	2000	3000	3000
FR	86024	Yes	3900	3000	3000
GR	8321	-	-	-	-
IT	53606	-	-	-	-
SI	1991	Yes	n.a.	n.a.	n.a.
HR	2900	-	-	-	-
MK	1487	-	-	-	-
CS	6781	-	-	-	-
LU	993.7	-	-	-	-
NL	15601[7]	Yes	n.a.	n.a.	n.a.
AT	9019	-	-	-	-
PT	8528	-	-	-	-
CH	9738	-	-	-	-
CZ	10157	Yes	n.a.	n.a.	n.a.
HU	6012	Yes	n.a.	n.a.	n.a.
PL	21350	-	-	-	-
SK	4349	-	-	-	-
BA	1946	-	-	-	-
RO	8508	Yes	n.a.	n.a.	n.a.
BG	6502	-	-	-	-
UA-W	1024	Yes	45	45	45
UCTE			**6145**	**6245**	**6245**

[6] For ELIA, several load schedding contracts with industrial customers are in force. The estimated contribution is 200MW. These contracts are part of the reserve for system services.

[7] For TenneT network, representing about 90% of total load.

3.2. Comparison with last year's report

In UCTE System Adequacy Forecast 2005-2015, ARM feature was not respected from 2011 in scenario A. In UCTE SAF 2006-2015 the mismatch between RC and ARM is expected from 2013-2014.

Table 4 shows differences between SAF 2004, 2005 and 2006 results.

It appears **significant differences between the exercises, even in the short term**.

➢ **In 2006**

The Generating Capacity is 8 GW higher than in the 2005 forecast. Thus RAC strongly increases by 9GW for SAF 2006-2015.

At the same time **the Reference Load decreases by approx. 4 GW in 2006** compared to last year forecast. It is closed to the level forecasted two years ago.

Finally, Remaining Capacity in SAF 2006-2015 is higher than in SAF 2005-2015 by approx. 14GW in 2006.

Such increase can be observed all over the period 2006 – 2015.

Table 5 Comparison between results of SAF 2004-2010, SAF 2005-2015 Results in GW and SAF 2006-2015 for Scenario A, January 11:00AM

		2006	2008	2010	2015
Generating Capacity	SAF 2004	590.0	609.6	624.6	-
	SAF 2005	597.9	616.7	633.4	652.5
	SAF 2006	605.6	630.1	641.6	659.5
Reliably Available Capacity	SAF 2004	434.0	449.4	455.9	-
	SAF 2005	444.2	454.8	463.8	465.0
	SAF 2006	454.1	466.5	476.9	480.1
Load	SAF 2004	373.6	388.7	403.9	-
	SAF 2005	378.4	393.1	406.5	439.8
	SAF 2006	374.5	388.6	403.4	438.3
Remaining Capacity	SAF 2004	60.5	60.6	52.0	-
	SAF 2005	65.8	61.7	57.3	25.2
	SAF 2006	79.6	76.9	72.0	40.6
Margin against the daily peak load	SAF 2004[8]	*23.5*	*23.4*	*23.7*	-
	SAF 2005	17.2	17.7	18.4	19.2
	SAF 2006	16.8	17.4	17.8	17.7
ARM = 5%NGC + Margin against the daily peak load	SAF 2004	53.0	53.8	54.9	-
	SAF 2005	47.1	48.5	50.0	51.8
	SAF 2006	47.1	48.9	49.9	50.6

Whereas changes in long term results are understandable due to the uncertainties at this time horizon, they are more surprising in the short term.

By comparing SAF 2006-2015 to SAF 2005-2015 we can notice that individual countries have consolidated their forecasts either by integrating additional generating capacities or by a lower estimation of load.

[8] For SAF2004-2010: Margin against the monthly peak load

This phenomenon is particularly verified in Spain, Romania and Italy, and at a lower extend in Belgium, France, Germany and Greece.

Il reflects that uncertainties also affect the short term situation : some can be considered as normal - for example the load evolution depends on the growth of economy - some other results from the lack of precise information given to the TSO's either on commissioning/decommissioning or on the maintenance program of the generating units.

The following remarks highlight these aspects.

Spain: the main reason to have new values compared to 2004 is related with the approval in January 2005 of the Spanish CO2 Emissions Plan 2005-2007, that established the individual limits for all the generators, both new and old ones. After 2008 forecasts are needed again.

Considering that producers declarations are not precise one year before commissioning declaration, it is very difficult to identify the realistic projects. So, estimations of generating capacity could be re-evaluated over years.

For decommissioning there is no certain decision. There is no official way to collect information for decommissioning plants.

Italy: the value of installed capacity compared to previous forecast is rising. The main reason is the growth of transmission grid according to the program document of development that the company is held to prepare every year for the three year ahead. The new lines on operation permits to avoid congestions and to connect new power plants already authorized otherwise impossible to put in service with a full efficiency.

France: the differences from last year data results from a lower load forecast and an improved RAC resulting from integration of the actual maintenance plan which is more optimized than last year estimation based on statistical data.

- **Period 2010-2015**

When comparing with the 2004-2010 forecast exercise, we can observe that ARM was not met from 2009 on.

As a result it can be observed that the expected reliability of UCTE system has improved over the last three years.

It could be considered as a first sign that market mechanism would deliver appropriate signals for investment decision.

But these changes in generation figures, especially in the short term, can also reflect uncertainties in TSOs knowledge of the generation projects. In addition, decommissioning could negatively affect this positive evolution of margins.

Then it is obviously to early to draw any definitive conclusion on the efficiency of market mechanism.

3.3. Analysis of remaining capacity at national and regional levels

3.3.1. Remaining Capacity

The detailed results concerning remaining capacity for scenario A “Conservative” are displayed in table 3 hereafter :

Table 7 **Remaining capacity Scenario A “Conservative”** **Results in GW**

	2006			2008			2010			2015			SAF 2005-2015
	3rd Wednesday			3rd Wednesday			3rd Wednesday			3rd Wednesday			For 2010
	January		July	January		July	January		July	January		July	January
	11:00	19:00	11:00	11:00	19:00	11:00	11:00	19:00	11:00	11:00	19:00	11:00	11:00
BE	0.9	0.2	3.5	0.4	-0.3	3.1	0.0	-0.7	2.8	-1.3	-2.1	1.3	-1.9
DE	8.4	8.9	7.2	9.6	9.7	8.2	8.7	8.9	7.7	4.1	4.2	1.2	5.5
ES	14.0	10.7	9.6	13.4	10.7	9.9	11.7	8.3	6.9	6.2	2.9	0.3	8.3
FR	14.7	12.2	10.0	11.8	9.5	9.6	10.5	8.5	8.8	5.2	3.5	3.4	12
GR	1.7	1.3	1.2	2.0	1.6	1.4	2.1	1.7	1.8	2.8	2.3	1.4	1.9
IT	8.4	8.3	9.5	11.9	11.6	11.6	11.5	11.2	11.8	5.8	5.8	5.0	6.3
SI	0.0	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	0.1	-0.2	-0.2	-0.2	0.1
HR	0.8	0.6	1.0	1.0	0.8	1.2	0.8	0.6	1.1	0.2	0.0	0.6	0.9
MK	-0.4	-0.4	-0.2	-0.8	-0.9	-0.6	-1.4	-1.4	-1.2	-2.6	-2.7	-2.4	0.1
CS	0.1	-0.1	0.8	0.0	-0.2	0.7	-0.1	-0.2	0.4	-0.5	-0.7	-0.1	0
LU	0.8	0.5	0.4	0.7	0.8	0.7	0.6	0.8	0.7	0.5	0.7	0.6	0.6
NL	1.0	1.2	1.4	0.7	0.9	1.1	0.5	0.7	0.9	-0.6	-0.4	-0.2	-0.9
AT	5.3	5.4	5.0	4.6	4.8	4.4	5.3	5.4	7.5	4.3	4.4	6.6	4.2
PT	1.7	1.8	1.7	1.8	1.9	1.5	2.0	2.1	1.8	0.1	0.3	-0.2	1.1
CH	3.1	3.7	4.7	2.9	3.5	4.6	2.3	2.9	4.1	1.8	2.4	3.6	2.3
CZ	2.7	2.6	2.3	2.6	2.5	2.1	2.0	1.9	1.8	1.5	1.4	1.4	2.2
HU	0.3	0.2	0.2	0.3	0.1	0.2	0.3	0.1	0.2	0.7	0.5	0.6	0.8
PL	8.8	7.8	6.1	8.7	7.2	7.2	11.2	11.2	11.5	10.3	9.3	10.6	8.9
SK	1.1	1.0	1.1	0.2	0.1	0.2	-0.3	-0.4	-0.2	-0.9	-1.0	-0.7	0.1
BA	0.9	0.8	1.1	1.0	0.8	1.1	0.9	0.7	1.0	0.7	0.5	0.8	0.9
RO	3.2	3.0	2.1	3.0	2.7	2.0	1.9	1.6	1.1	0.2	-0.2	-0.3	1.3
BG	1.4	0.9	1.2	0.6	0.2	0.8	0.7	0.2	0.7	1.6	1.1	1.8	2.1
UA-W	0.6	0.5	0.6	0.7	0.6	0.7	0.8	0.7	0.7	0.8	0.7	0.7	0.7
UCTE	**79.6**	**70.9**	**70.6**	**76.9**	**68.4**	**71.9**	**72.0**	**64.7**	**71.8**	**40.6**	**32.7**	**35.8**	**57.5**

3.3.2. Remaining Capacity and Adequacy Reference Margin

The remaining capacity represents 10-15 % of the total generating capacity for the whole UCTE system between 2006 and 2010 but only 5% to 7 % in 2015.

Figures below show the comparison between the RC and the national ARM in 2010 and 2015 (for winter and summer reference time), detailed by country for scenario A. Countries have been classified according to the generation adequacy assessment methodology: countries whose ARM is related to "5% of NGC", and those whose ARM is related to "10% of NGC" due to the higher sensitivity of these systems to random factors (temperature, hydro conditions, wind, large plant unavailability…).

Figure 4-1	**Remaining Capacity minus ARM (margin against peak load + 5% (or 10%) of the generating capacity), Jan. 2010 11:00 – Scenario A**

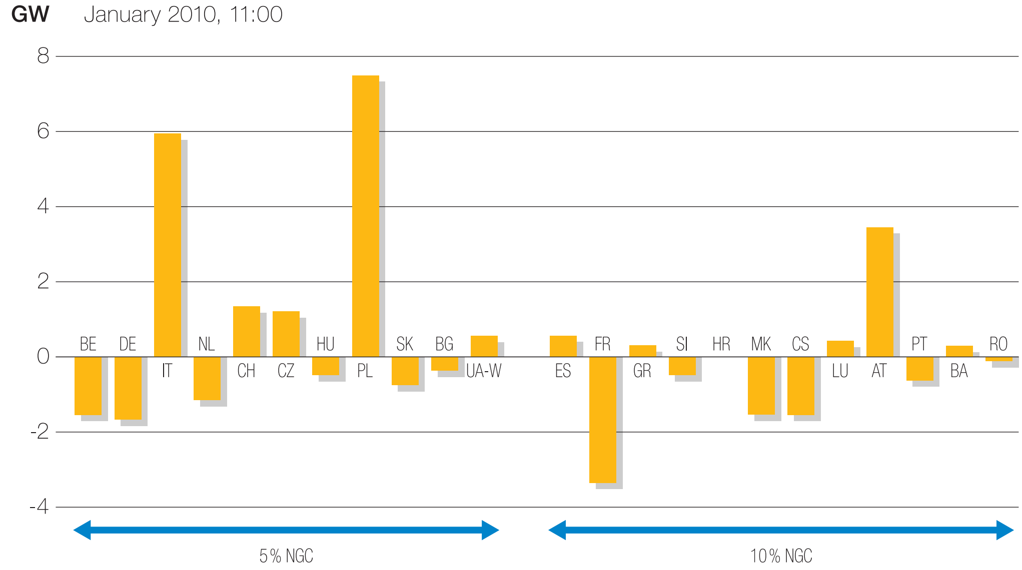
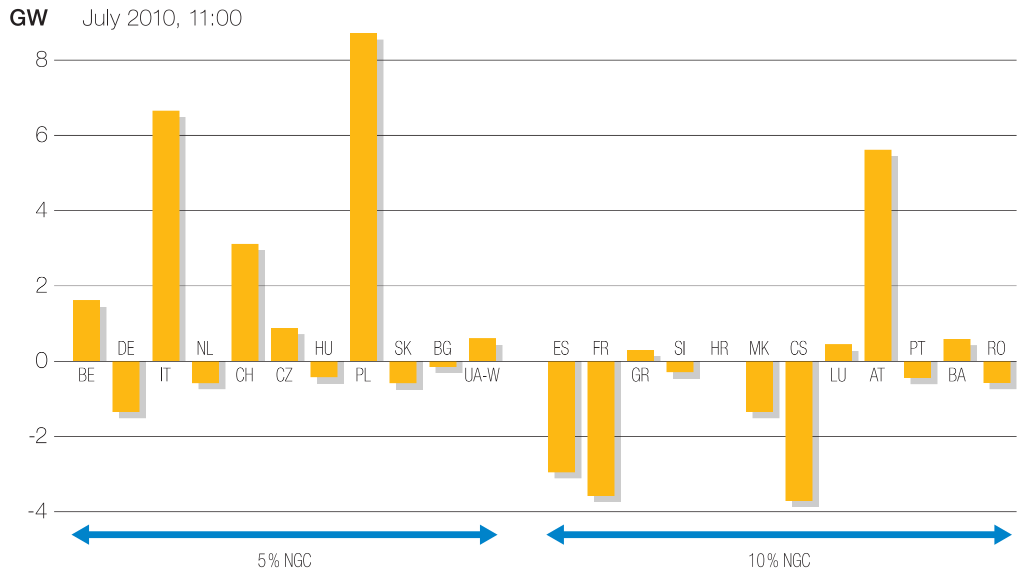


Figure 4-2	**Remaining Capacity minus ARM (margin against peak load + 5% (or 10%) of the generating capacity), July. 2010 11:00 – Scenario A**



In 2010, indicative ARM is not met in half of the UCTE countries. Nevertheless in some cases ARM can be an stronger objective than the feature used for the national generating adequacy assessment.

Figure 4-3	**Remaining Capacity minus ARM(margin against peak load + 5% (or 10%) of the generating capacity), Jan. 2015 11:00 – Scenario A**

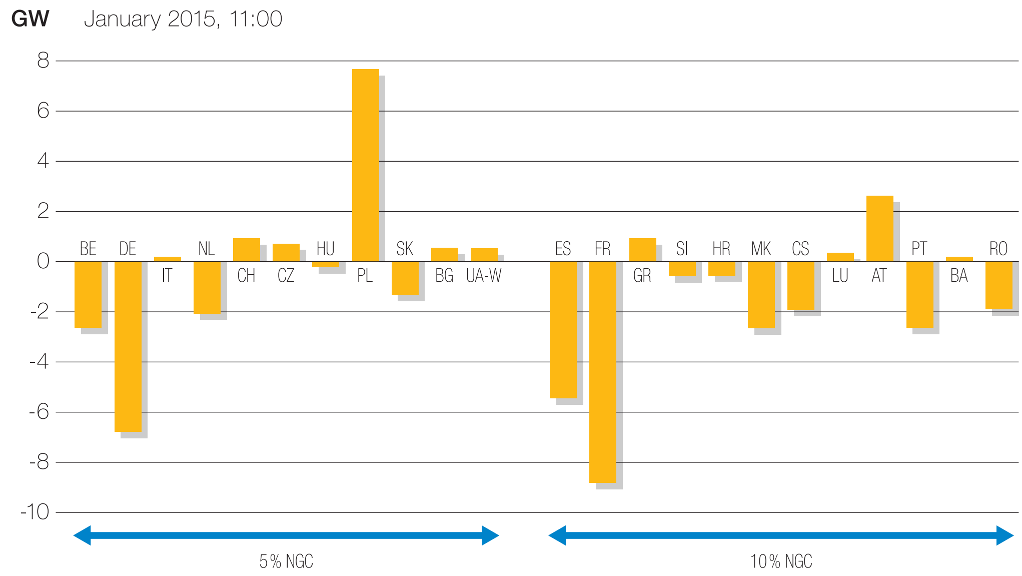
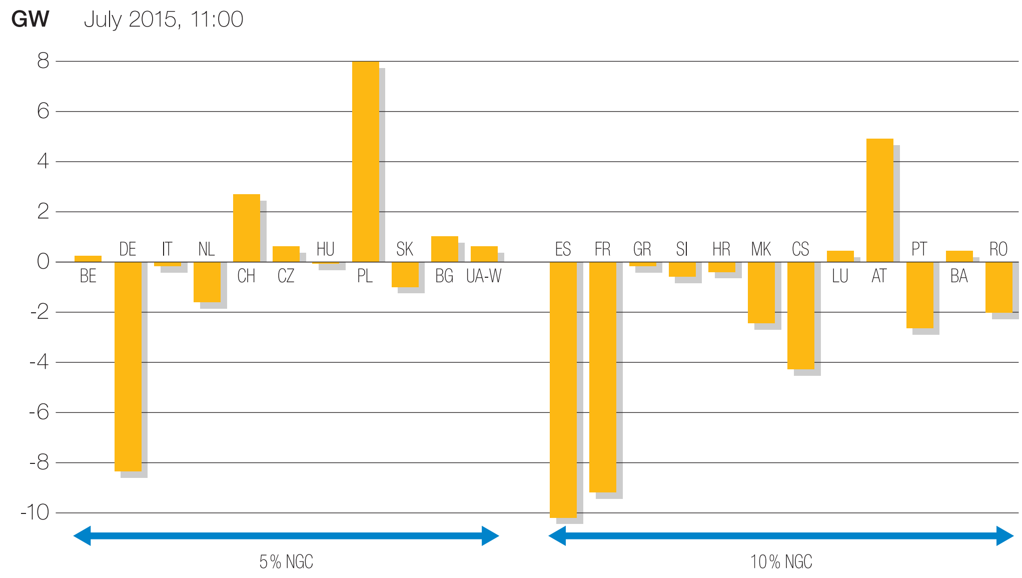


Figure 4-4	**Remaining Capacity minus ARM(margin against peak load + 5% (or 10%) of the generating capacity), July 2015 11:00 – Scenario A**



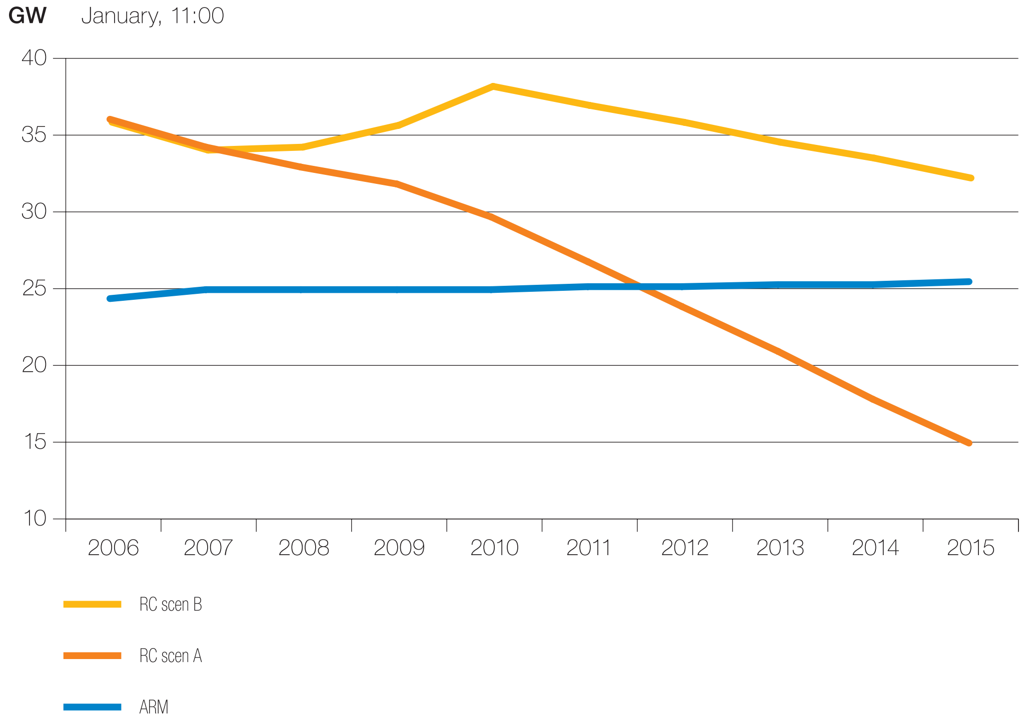
In 2015, indicative ARM is not met for most of UCTE countries, which is not surprising as scenario A is considered.

3.4. Analysis by geographical blocks

Considering the role that the interconnected transmission system plays for the reliability of some national systems, the situation of different geographical blocks is analysed below (see representation in Figures 6-1 to 6-4 for 2006, 2008, 2010 and 2015).

Main UCTE Block: *BE, DE, FR, SI, HR, LU, NL, AT, CH, BA*

Figure 5-1 Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00



<u>2006-2008</u>

From January 2006 to 2008, generating capacity increases by 8 GW (among which 6 GW from renewable energy sources), mainly thanks to commissioning in Germany (+3.9 GW). It contributes to an increase of only 1.7GW of reliably available capacity.

The annual average growth for load is 1.3% in winter and in summer over that period.

As a consequence, RC is decreasing from 36 GW in 2006 to 33 GW in 2008.

For this block, ARM is met by approx. 8 GW in 2008.

Considering national ARM, it can be noticed that Belgium is not expected to meet the margin in winter over this period, Germany, the Netherlands and Slovenia in winter and summer.

France does not meet ARM from July 2006 to 2008 ; nevertheless according to the rules used at national level, generation adequacy is achieved over this period.

When compared to SAF2005-2015 for 2006, it appears that RC is higher by 3.5 GW in January, and 3.2 GW in July. This phenomenon is mainly due to a lower evaluation of load (-2.6 GW).

2008-2010

The increase in generating capacity is 6 GW over the period 2008 to 2010 same order as the load increase. Decommissioning in nuclear and fossil fuel power plants result in a decrease of reliably available capacity. RC is 30 GW in winter 2010 (slight decrease when compared to 2008).

RC meets ARM in summer, and in winter (at 11:00). Adequacy should be achieveded without any additional investment.

When scenario B is taken into account, it appears that extra commissioning are foreseen (+9 GW) by TSOs.

Forecasts for 2010 made in last year SAF showed a generating capacity 6 GW lower than this year's forecasts. Reliably Available Capacity is approx. 10 GW higher in winter (13 GW in summer) in this year's forecasts and load 3 GW lower. Consequently, Remaining Capacity expected for 2010 has improved by approx. 13 GW in winter, and 21 GW in summer 2010.

2010-2015

Expected commissioning are mostly renewable energy sources. Remaining capacity drops from 2010 to 2015 : it is 19 GW in winter, and 21 GW in summer.

ARM is met till 2011.

To meet the ARM in 2015, an additional 11 GW commissioning of reliably available capacity would be necessary in the main UCTE block.

Luxembourg, Austria, Switzerland and Bosnia Herzegovina are the countries that meet individually the ARM in 2015.

Specific remarks:

Belgium: in 2006, the adequacy reference margin is not respected at peak time; the remaining capacity is below 5%. So, the transport capacity is crucial to secure system adequacy.

The following measures are taken to counteract this:

- Elia is planning interconnection re-enforcement,
- Based on the CREG indicative production plan, market players are encouraged to build new power plants.

Germany: during the individual months until the year 2008, the domestic remaining capacity varies between 7% and 8% of the national generating capacity. These values are considered adequate for power plant operation reserve.

The remaining capacity will decrease significantly due to the planned shutdown of nuclear power plants. This capacity is expected to be compensated by fossil fuel power plants, but according to the philosophy of scenario A only projects have been taken into account which can be considered as sure.

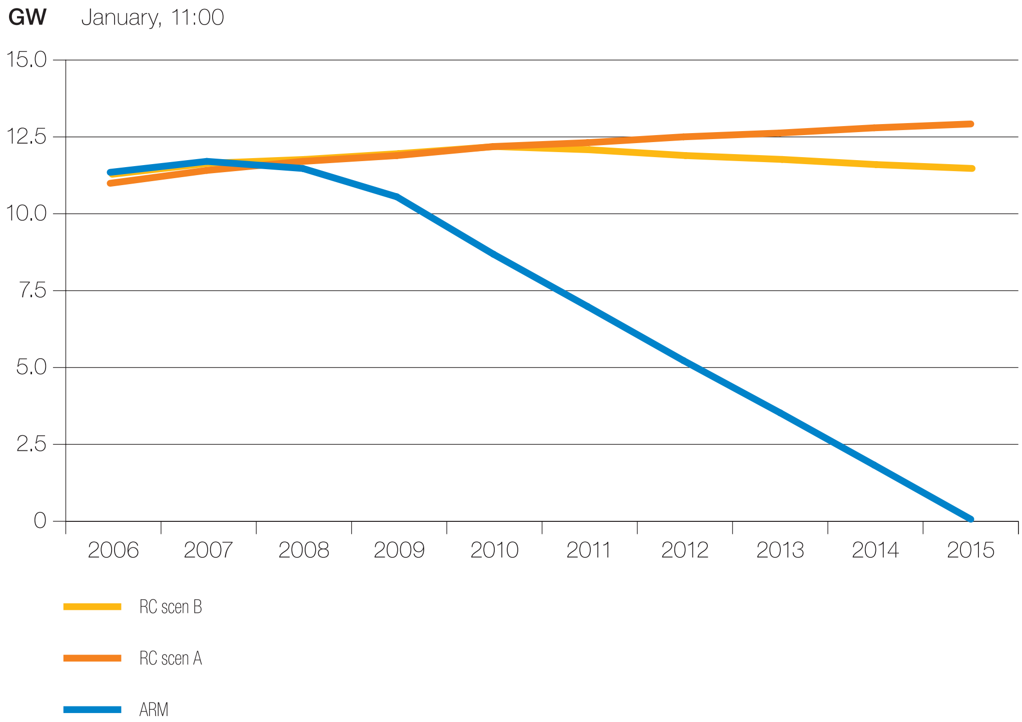
Regarding primary energies, environmental aspects and cost structures must also be taken into consideration under current frame conditions

France : the Generation Adequacy report issued mid 2005 shows a need for additional capacities between 2008 and 2010 of around 1200 to 1700MW depending on consumption growth and renewable energy sources development hypotheses.

Beyond 2010 a further 1000MW of new capacity will be required each year if demand side management initiatives are not put into practice.

Spain + Portugal

Figure 5-2 **Remaining capacity against Adequacy Reference Margin – JulyResults in GW 11:00**



<u>2006-2008</u>

Expected commissioning in the block contributes to an increase of generating capacity of 6.6 GW over the period: renewable energy sources +5 GW, conventional power stations: +1.6 GW. The increase in RAC covers the load increase.

As a consequence, RC is quite similar over 2006-2008 period.

The RC meets the **ARM (related to 10% of generating capacity that reflects the sensitivity of this block to hydro and wind conditions) in winter and in summer reference time.**

Generation and Remaining Capacity forecasts are approx. 5 GW higher than in SAF 2005-2015.

This increase is due to Spanish CO2 Emissions Plan 2005-2007. New projects are known very lately and can bring to data consolidation over the years.

<u>2008-2010</u>

From 2008 to 2010, the increase in generating capacity (+2 GW) only relies on the development of renewable energy sources. The Reliably Available Capacity decreases (-1 GW); Remaining Capacity is dropping.

ARM is not met neither in winter, nor in summer.

As compared to last year's forecasts, Remaining Capacity improves however by 2 GW.

<u>2010-2015</u>

In 2015, new commissioning do not compensate expected shut down. Reliably Available Capacity is higher than in 2010, but the increase of the load is yearly 3.2% for winter peak load, (3.4% in summer).

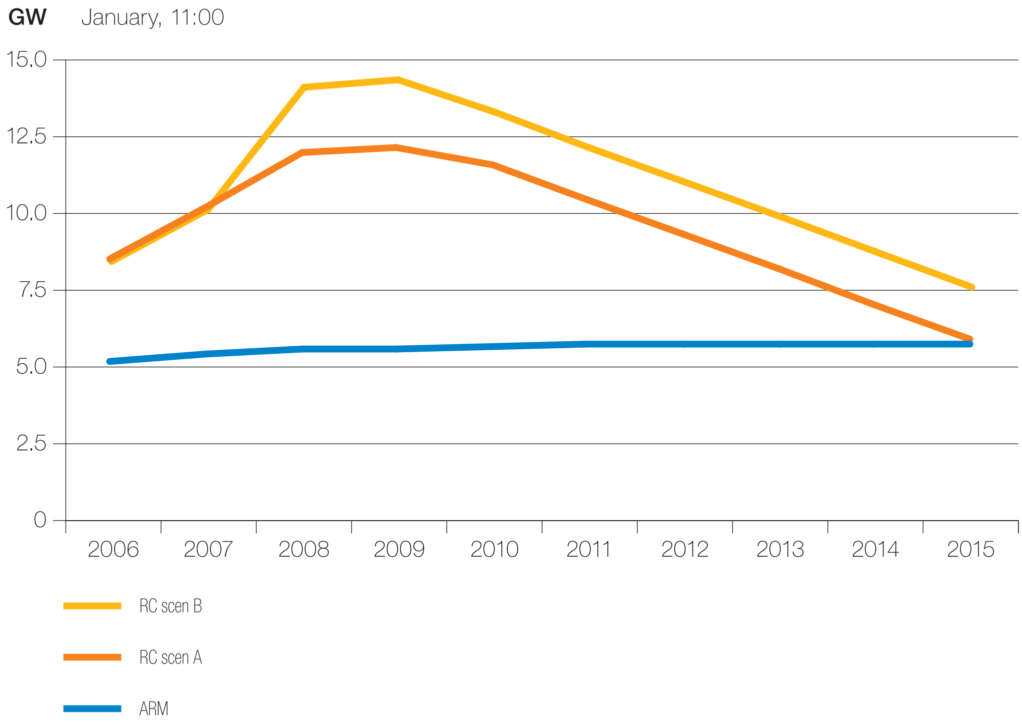
As a consequence, **Remaining Capacity could not meet ARM in 2015** and turns to zero for the block on July 11:00 reference time.

If Scenario B is considered, new commissioning not yet decided but somehow predictable would allow improving the situation. Nevertheless, **these new projects are not sufficient to achieve adequacy in summer time**.

As compared to last year's forecasts, Remaining Capacity improves by 4 GW.

Italy

Figure 5-3 **Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00**



<u>2006-2008</u>

Generating capacity in Italy should increase by 10% (+9 GW) over the period mainly thanks to commissioning in conventional power plants. These commissioning have a high contribution to Reliably Available Capacity. This will contribute to improve Remaining Capacity over the period (+3.5 GW).

Under those hypotheses, **ARM is met from 2006 to 2008**.

Specific remark :

In the recent past delays in the authorisation process to build new power plants, uncertainties coming from devolution of energy jurisdiction to regions raised fears of capacity shortage in the short term.

After the 2003 urgent actions to solve these risks has been taken and a new law was passed to streamline and give firm schedule for the authorisation procedure and the construction completion for power plants under simplified authorization. General awareness of supply disruption and the effectiveness of the provisions have succeeded.

Additional capacity for about 9000 MW – of which 7000 MW firmly available – will be recorded on line in respect to the year 2003.

In addition the Industry is moving consistently with Country's obligations from the Kyoto Protocol on Climate Change, the economic optimisation of the electric system and the constraints deriving from security of supply following maximum development of natural gas-fired CCGT (more than a half of the overall electricity generation from 2010), an increased use of renewable sources (some 22% of electricity generation in 2010) and a steady share of advanced clean coal generation (around 15% of total generation).

Also thermal solar energy will appear on the scene, basically providing additional heat to the regenerative cycle of existing thermal plants, if the prototype will succeed.

<u>2008-2010</u>

The trend expected from 2006 to 2008 should be maintained until 2010. The generating capacity increases by 2 GW (+1 GW in Renewable power Stations). Thanks to commissioning of conventional power stations, and lower non-usable capacity, the Reliably Available Capacity grows by 4.5 GW. The increase in load is covered, and Remaining Capacity is quite stable from 2008 to 2010.

ARM is met in 2010, with an extra 6 GW margin in summer.

In the previous forecast Remaining Capacity was expected at 6.3 GW in winter 2010, and 8.5 GW in summer. RC improves this year by 5 GW in winter and 3 GW in summer.

<u>2010-2015</u>

Some commissioning are expected over this period. About +0.6 GW of conventional thermal plants, +1 GW for renewable energy sources.

As a consequence, RC is dropping by 5 GW

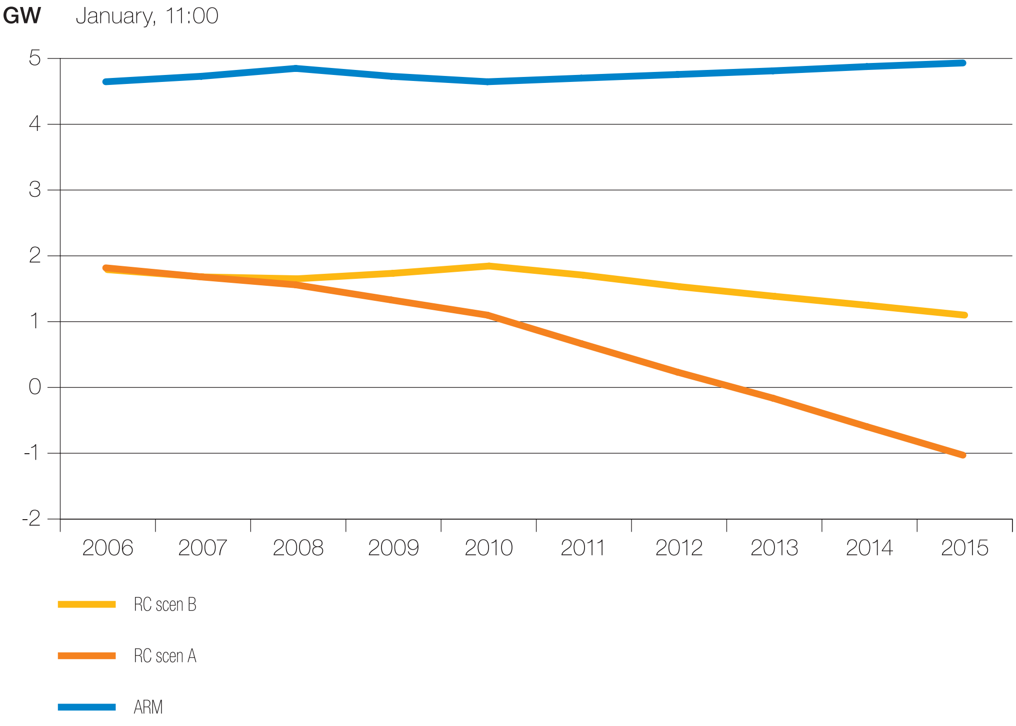
The load increases by 2.2% in winter and 2.6% in summer reference time.

ARM is just met in summer 2015.

+2GW capacity are brought by, if scenario B is considered.

South Eastern UCTE (Greece + FYROM + SCG)

Figure 5-4	**Remaining capacity against Adequacy Reference Margin – July 11:00**	**Results in GW**



<u>2006-2008</u>

In conservative scenario, a slight increase in generating capacity is expected from 2006 to 2008 (+0.2 GW in hydro, +0.7 GW in conventional thermal plants). Remaining Capacity remains at low levels, about 2 GW.

ARM is not met all over the period 2006 to 2008.

The situation of the block is representative of each national case, and shows no improvement when compared to last year's forecasts.

<u>2008-2010</u>

Generating Capacity developments (+1 GW) help to follow load increase (+0.5 GW), but do not fulfil the match to ARM. In July 2008, there is a lack of 3 GW (1 GW for winter reference time). The situation of the area will be weak if investments are not realised after 2008.

ARM is not met from 2008 to 2010.

<u>2015</u>

ARM is not met in summer 2015; an extra Reliably Available Capacity of 6 GW is needed in summer (3 GW in winter). If considering scenario B, adequacy is not respected over the period. The lack of power for scenario B is 4 GW in summer and 1 GW in winter.

<u>Specific remarks:</u>

Greece: In Greece, the construction of new power plants is expected to increase significantly the remaining capacity. Nevertheless during heavy load periods, imported electrical energy is expected to cover the peak load.

In extreme conditions (many unexpected outages, sudden increases of the load due to weather conditions etc.) where the security of the system may be impacted, the provisions of the new grid code enable the HTSO to cope with the situation.
According to them, on short term the HTSO may:

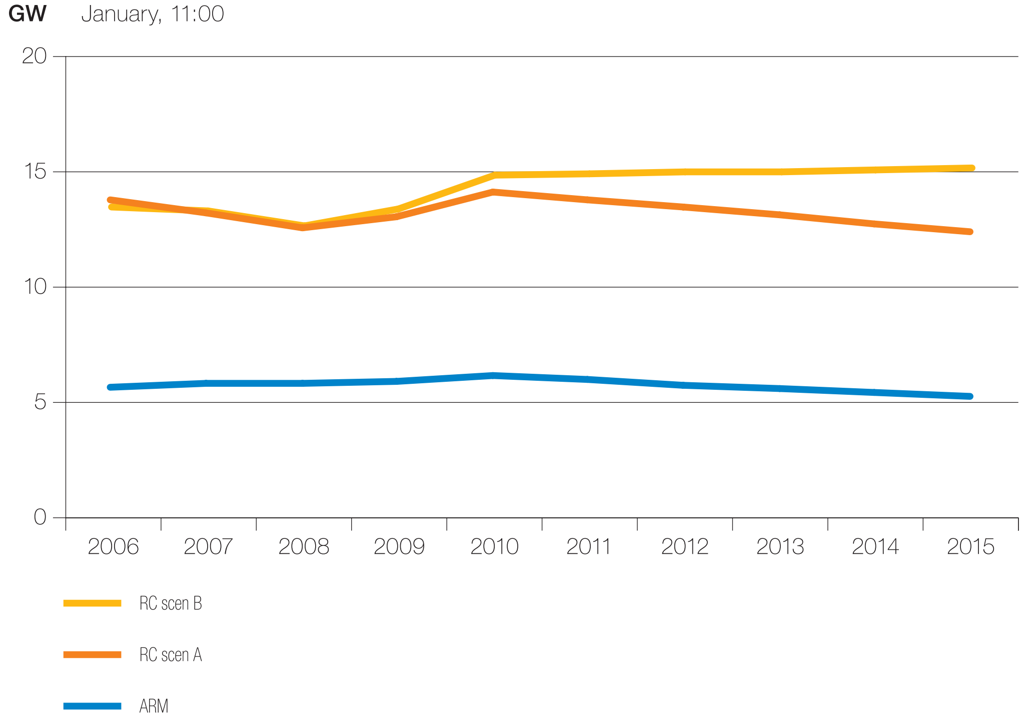
- Request additional active power from units who have a contract for reserve,
- Use the entire capacity of interconnection,
- Reduce exports,

- Request reduction of pump consumption,
- Request voluntary load reduction

Long-term market mechanism should promote the construction of new power plants and insure the system adequacy.

Centrel block

Figure 5-5 Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00



<u>2006-2008</u>

The Generating Capacity is characterised by:

- decommissioning in nuclear and in Conventional Power Stations,
- commissioning in Renewable Energy Sources (+1.5 GW).

The NGC growth is 1.5% in winter. Load increases by 3%.

The Remaining capacity remains stable over the period.

ARM is met from 2006 to 2008.

Poland is the country that brings the higher margin; other countries of the block meet the ARM, except Hungary that is slightly below the ARM (lack of 0.5GW).

<u>2008-2010</u>

From 2008 to 2010 the decommissioning of nuclear and the commissioning of Conventional Thermal Plants and Renewables energy sources contribute to an increase of Reliably Available Capacity.

The load increases only by 1 GW so RC improves during the period.

ARM is met in 2010 with a residual margin of approx. 6 GW in winter and 5 GW in summer.

In SAF 2006-2015, NGC is lower by 1.8 GW compared to estimation made for SAF 2005 – 2015.

<u>2010-2015</u>

2015 should bring some additional capacity for the block by improving the capacity of nuclear power plants(Hungary and Slovak Republic) and conventional power units (Poland and Hungary).

the ARM is met by approx. 6 GW in winter and 3 GW in summer 2015.

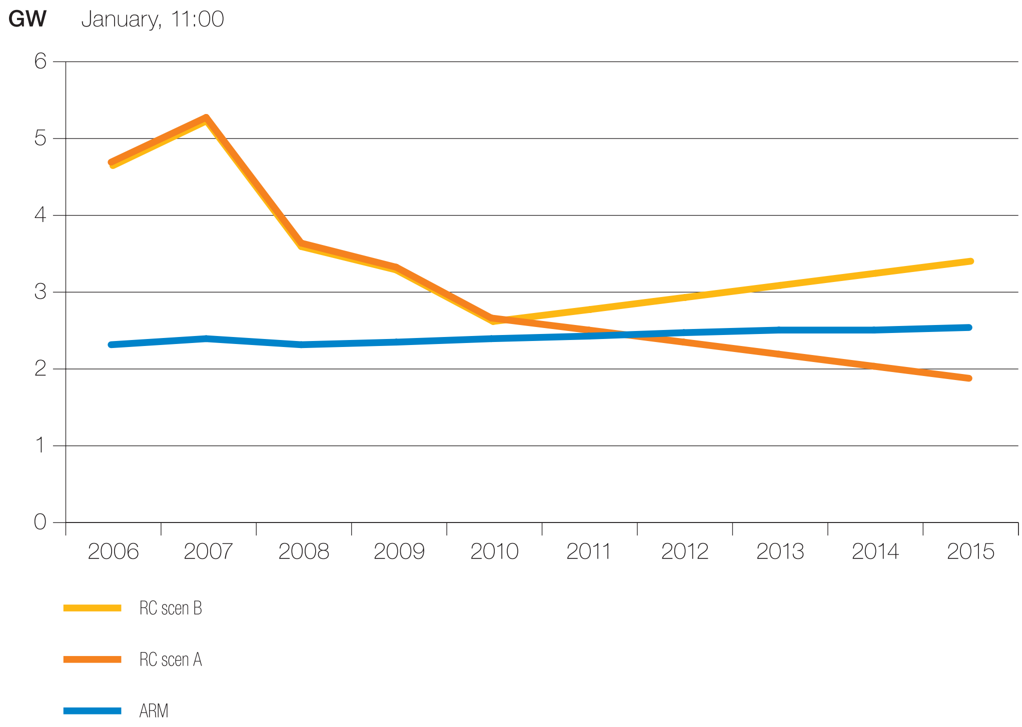
For CENTREL block, Slovak Republic and Hungary do not meet the ARM, Poland and Czech Republic meet the ARM with comfortable margin.

Specific remarks:

Hungary: for tightened situations, imports can be sufficient to meet the ARM.

Romania & Bulgaria

Figure 5-6 Remaining capacity against Adequacy Reference Margin –Results in GW January 11:00



<u>2006-2008</u>

Generating capacity is decreasing over the period.

Owing to the load increase, Remaining Capacity is decreasing, but remains high enough to meet the **ARM over the period.** This is the case for both Romania and Bulgaria.

In SAF 2006-2015, NGC is higher by 1.4 GW as load decreases by 1GW compared to estimation made for SAF 2005 – 2015.

So, Remaining capacity is estimated by +2.2GW in winter 2006 compared to latest SAF2005-2015.

<u>2008-2010</u>

From 2008 to 2010 generating capacity is expected to decrease by 0.4GW (fossil fuel power plants decommissioning). Load keeps a growth rate of 2.8% in winter and 2.7% in summer. The remaining capacity decreases by 0.9GW.

Nevertheless, **ARM is met in winter 2010. For summer reference time, the situation is tightened; RC just meets the ARM.** Investments are necessary to improve the RC on summer 2010.

<u>2010-2015</u>

Improving of nuclear power capacity in Bulgaria (+1GW) results in an increase of Reliably Available Capacity.

Load increases by 1.9% in winter and 2.5% in summer. Remaining Capacity is decreasing and **the ARM is not met in 2015.**

<u>Specific remarks:</u>

Romania: The decreasing of remaining capacity may be balanced by imports thanks to transfer capacities.

TRANSMISSION SYSTEM ADEQUACY 4

4. Transmission System Adequacy

The tables in Appendix C show the details on grid developments in the UCTE countries. The following table shows the clearly identified main developments on international interconnections between regional blocks over the period from 2006 to 2015 :

Table 8 Interconnections development

Line or equipment	Voltage level	Date of commissioning	Cross-border
Steinach – Prati	110/132 kV	2006	AT- IT
Bitola – Florina	400 kV	2006	MK – GR
S.Mitrovica – Ugljevik	400 kV	2006	CS – BA
Tarifa – Ferdioua	400 kV	2006	ES - MA
Chooz – Jamiolle – Monceau	225/150 kV	2006	BE - FR
Philippi – Turkey	400 kV	2007	GR – TR
DC Cable to Norway “Norned”	500 kV	2007 – 2008	NL – N
Second line Slavetice – Durnrhor	400 kV	2008	AT – CZ
Ernestinovo - Pecs	400 kV	2008	HR - HU
Podgorica – Tirana – Elbasan	400 kV	2008	CS – AL
Békéscsaba – Nadab	400 kV	2008	HU – RO
Stip – Cervena Mogila	400 kV	2008	MK – BG
France – Spain: eastern reinforcement	400 kV	2009	ES – FR
Valdigem – Douro Internacional – Aldeadavilla	400 kV	2009	PT – ES
Suceava – Balti	400 kV	2009	RO – MD
Skopje – Nis	400 kV	2008 – 2010	MK – CS
Nauders– Curon – Glorenza	220 kV	Before 2010	AT - IT
Bitola – Vlore	400 kV	2010	MK – AL
Timisoara – Vârset	400 kV	2010	RO – CS
Sombor – Pecs	400 kV	2010	CS – HU
Moldava or Rimavska Sobota – Sajoivanka	400 kV	2011	SK – HU
Cirkovce - Pince	400 kV	2011	SL - HU
Udine – Okroglo	400 kV	2011	SI - IT
International line to Austria	400 kV	2012	SK – AT
Lorraine – Ardennes line	400 kV	2012	BE - FR
Lemesany – Ukraine	400 kV	2013	SK – UA
Double AC Line Thaur – Bressanone through Brenner Basis Tunnel	400 kV	2015	AT – IT
DC Cable The Netherlands – United Kingdom	-	2015	NL - UK
Varin – Byczyna	400 kV	2020	SK – PL
Meliti – Bitola	400 kV	Undefined	GR - MK

As far as regional blocks are concerned, noticeable increase of exchange capacities are expected according to developments on interconnections :

- between **main UCTE** and **NORDEL** (+700MW in 2007)
- between **South Eastern UCTE** and **Turkey** (+500MW in 2007)
- between **Main UCTE** and **Centrel** (two projects for 2008)
- between **main UCTE** and **Spain+Portugal** (+1200 MW in 2009)

- between **Centrel** and **Romania-Bulgaria** (+500 MW in 2008)
- between **South-Eastern UCTE** and **Romania-Bulgaria** (in 2008)
- between **main UCTE** and **Italy** (projects around 2010)
- between **main UCTE** and **United Kingdom** (+1320 MW around 2015)

Because the UCTE system adequacy forecasts are established without taking exchanges into account, the difference between remaining capacity and ARM is a useful indicator of the “exportable” capacity of each country or, conversely, of its need for imports.

In order to evaluate the reliability of electricity systems, it is useful to compare this spread to the “transportable capacity” provided by systems at the borders of the countries or groups of countries concerned.

Net Transfer Capacity values published by the ETSO are used as a reference. However, as the transfer capacity is not available for all countries, some values are simply estimations.

Figures below show a comparison between remaining capacity in various countries in January and July 2006, 2010 and 2015, and the transportable capacity (exportable and importable).

For periods described, **if the remaining capacity is positive the country has an availability for export. This amount has to be compared to its transfer capacity**. If export capacities are sufficient, the country can evacuate its surplus. For countries whom RC is negative and lower than transfer capacities, congestions and tightened situations can appear.

For some countries, the calculation of importable or exportable capacities is not relevant due to the usual situation of the generation balance. It concerns France and Western Ukraine for imports, Greece and Italy for exports, Austria and Macedonia whose exchange capacity cannot be calculated at the country level due to their strong interconnection with the neighbouring countries.

For the whole UCTE,

Figure 6-1	**Comparison between RC and Net Transfer capacity, January 2006 11:00**

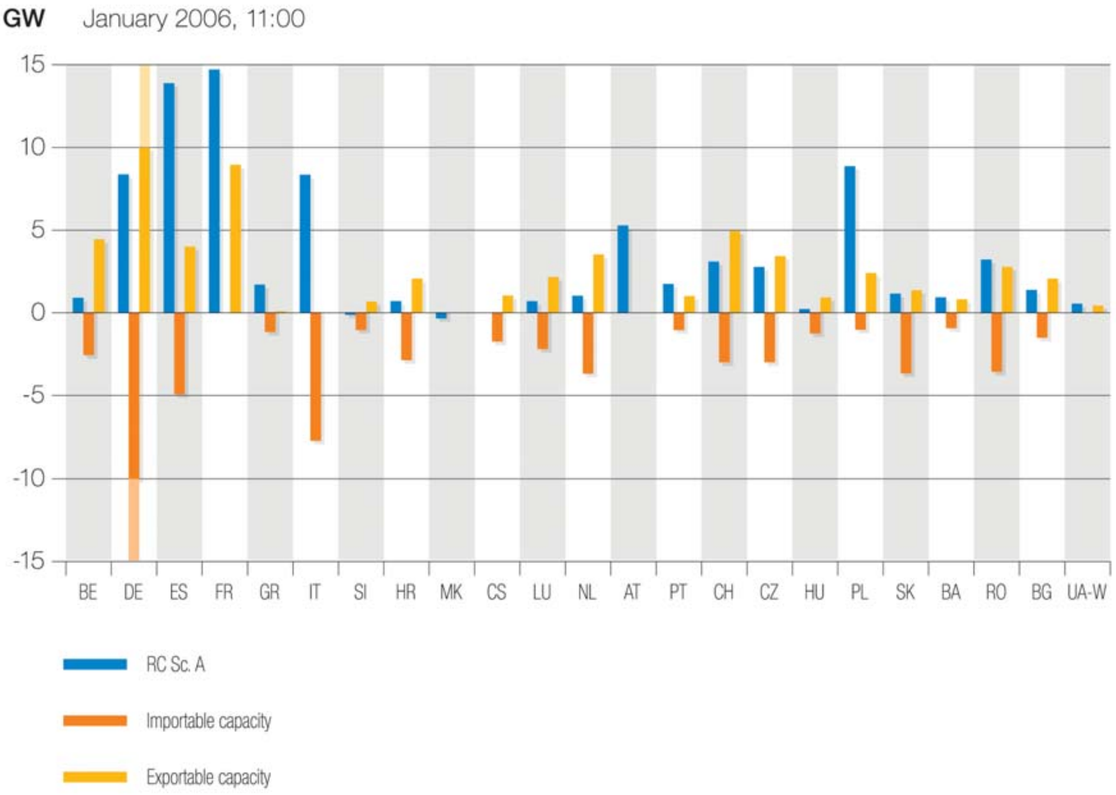


Figure 6-2 **Comparison between RC and Net Transfer capacity, January 2010 11:00**

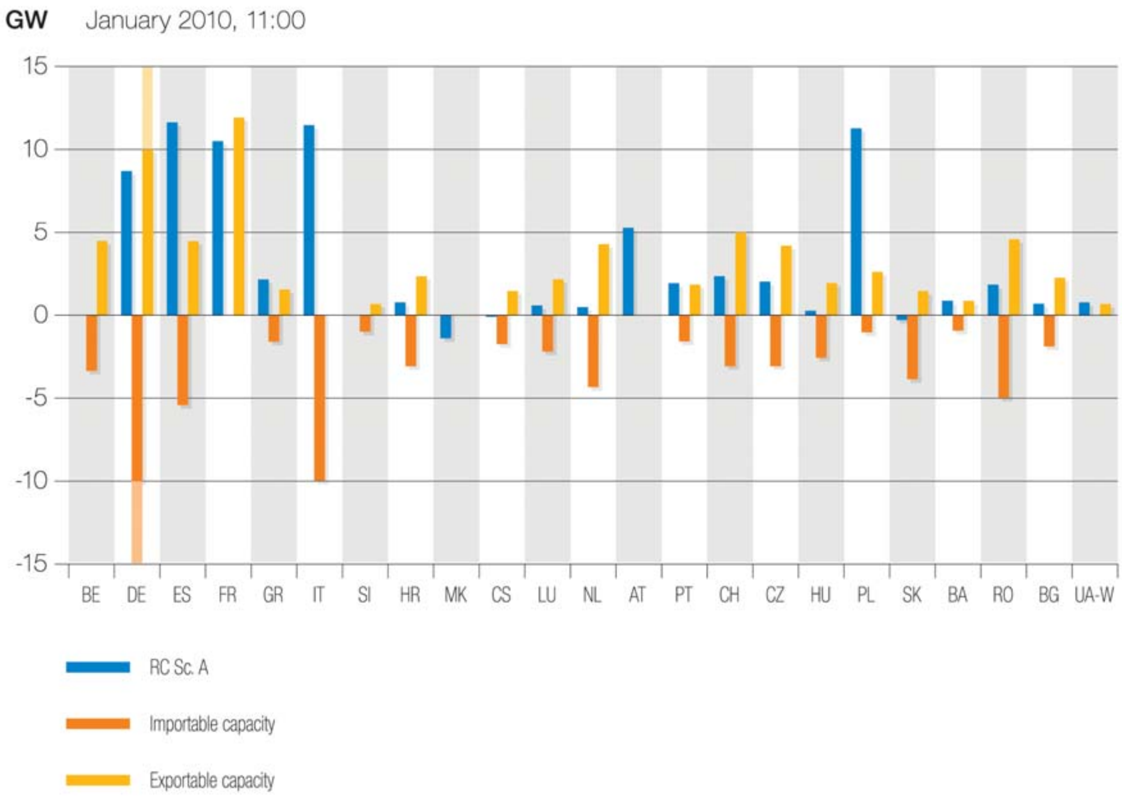
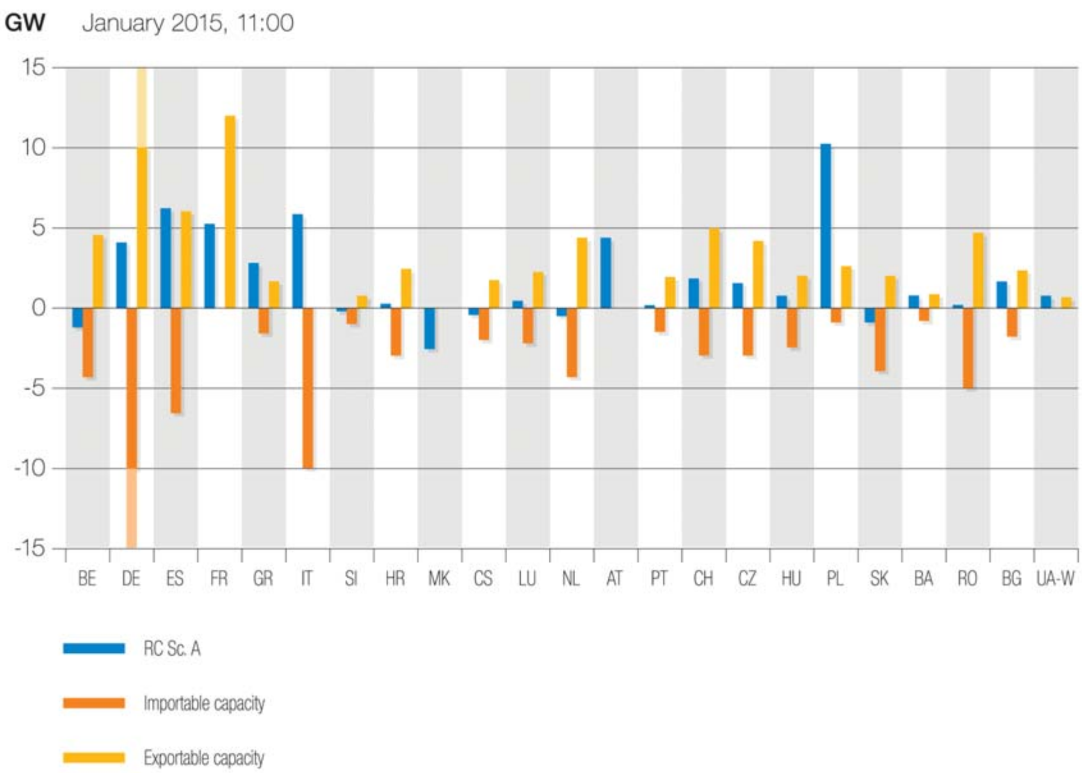


Figure 6-3 **Comparison between RC and Net Transfer capacity, January 2015 11:00**



NB: For countries that RC is positive, transfer capacities are optimised when export capacities are at less equal at RC. For e.g., France has a capacity of export that is sufficient to transmit the excess of capacity.

For countries whom RC is negative, congestions on borders can occur if transfer capacities are not dimensioned sufficiently. For e.g., Portugal can not meet the ARM and its transfer capacity with Spain is not sufficient, in 2015 to insure the reliability of the local system.

Overall, it emerges that transfer capacities do not seem to be an obstacle to system security. However it can not be excluded that, due to market phenomena (striving for the most economic use of power system resources), some congestion points could appear in the interconnected network, where transmission bottlenecks make it impossible to use available more economical electricity sources abroad (e.g.: border between IT and CH).

The constant increasing share of renewable energy sources[9] (representing 10% of UCTE generating capacity in 2010), mainly wind power, in the generation mix, will contribute to reinforce these situations.

As seen in UCTE System Adequacy Retrospect 2004 (downloadable on http://www.ucte.org) high flows are observed on cross borders lines between BE, DE, NL and LU. Main congestions wre mentioned at the borders between FR-CH-AT and Italy, within Centrel and at the borders of Centrel with Germany and Austria.

[9] Without considering hydro power stations

Figures 7-1 to 7-4 summarize the results of the power balance forecasts in different regions of the UCTE synchronous area for the 3rd Wednesdays in January at 11:00, 2006, 2008, 2010 and 2015.

FIGURE 7-1

Data for January 2006

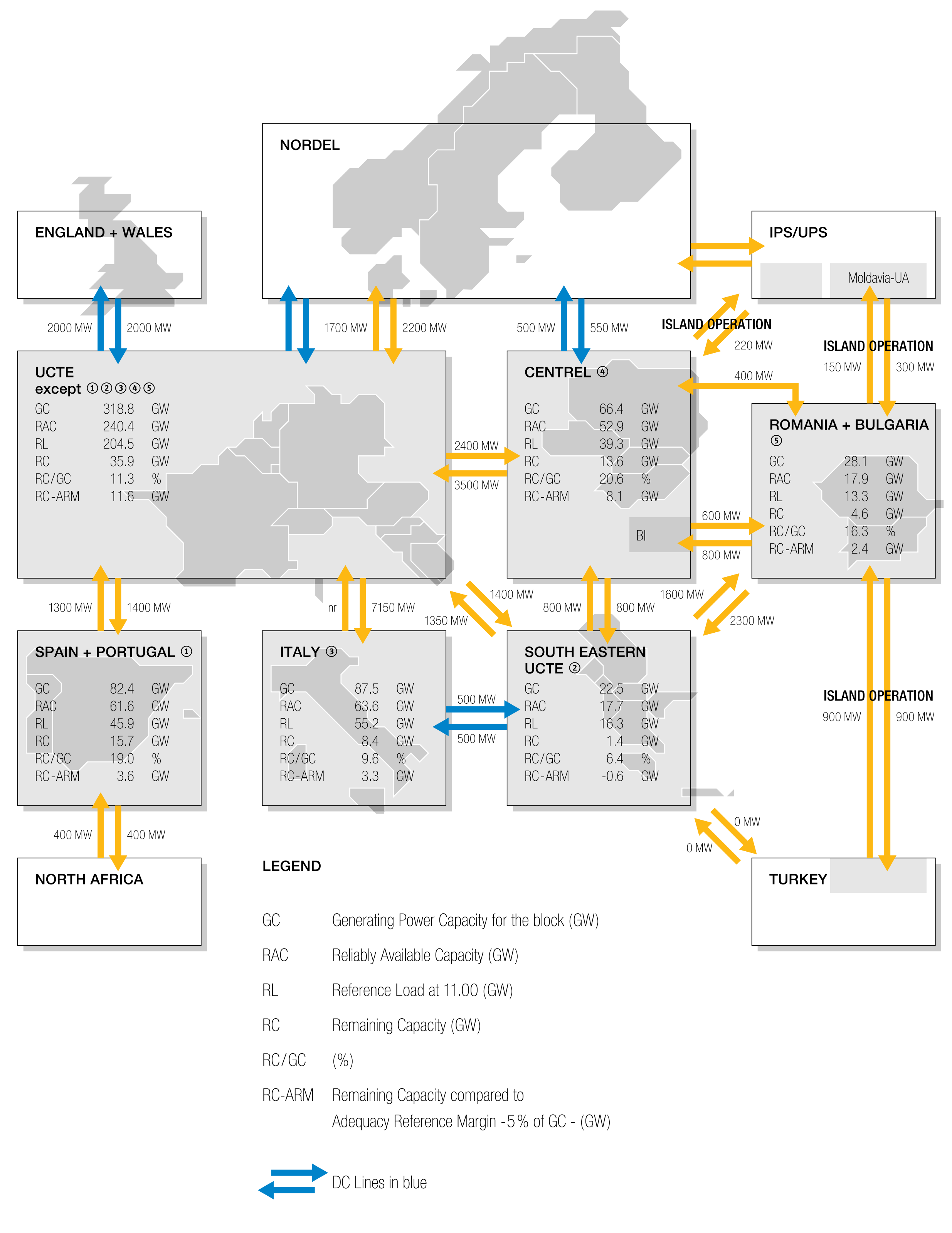


FIGURE 7-2

Data for January 2008

Only changes in transportable capacity through interconnections are indicated

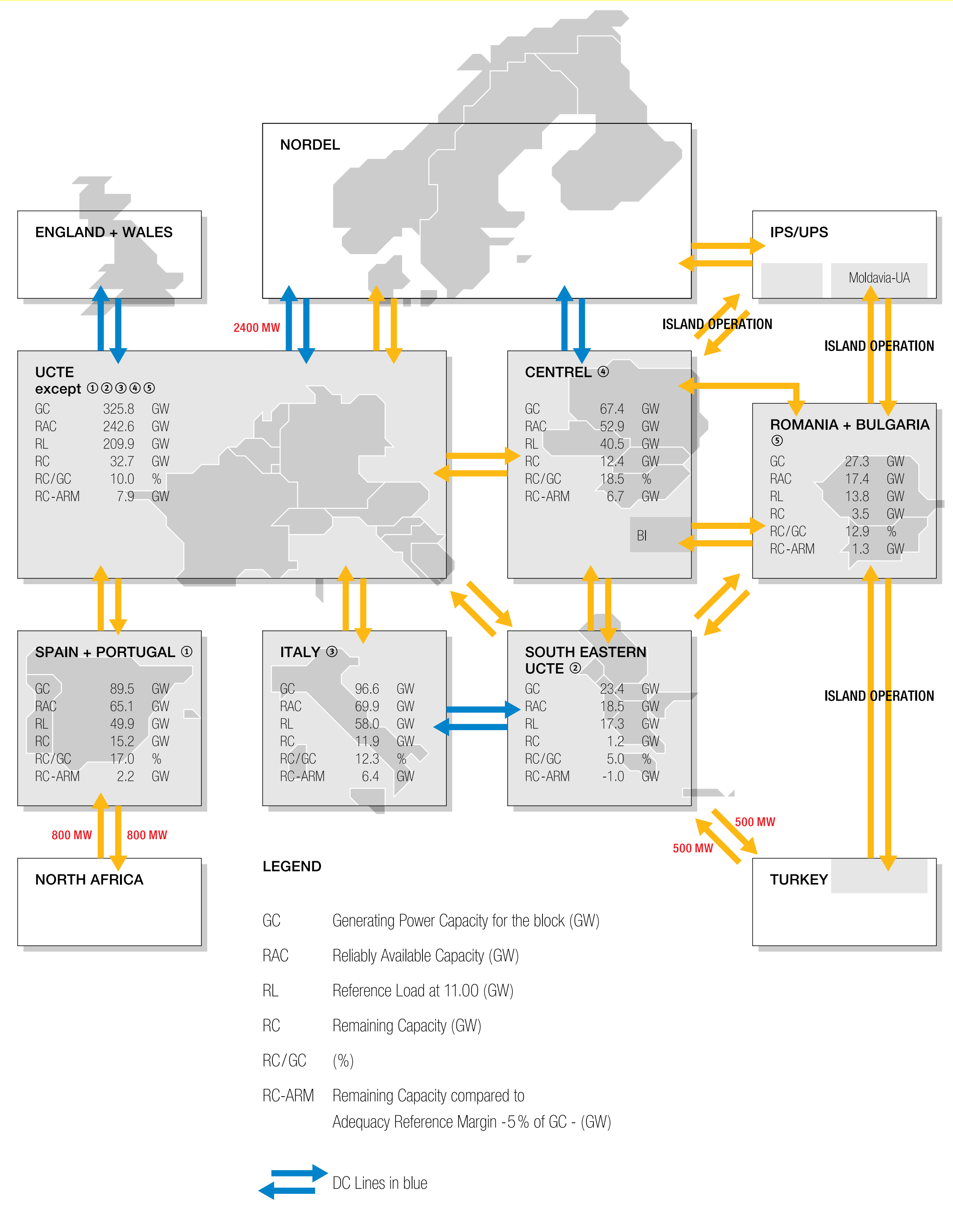


FIGURE 7-3

Data for January 2010

Only changes in transportable capacity through interconnections are indicated

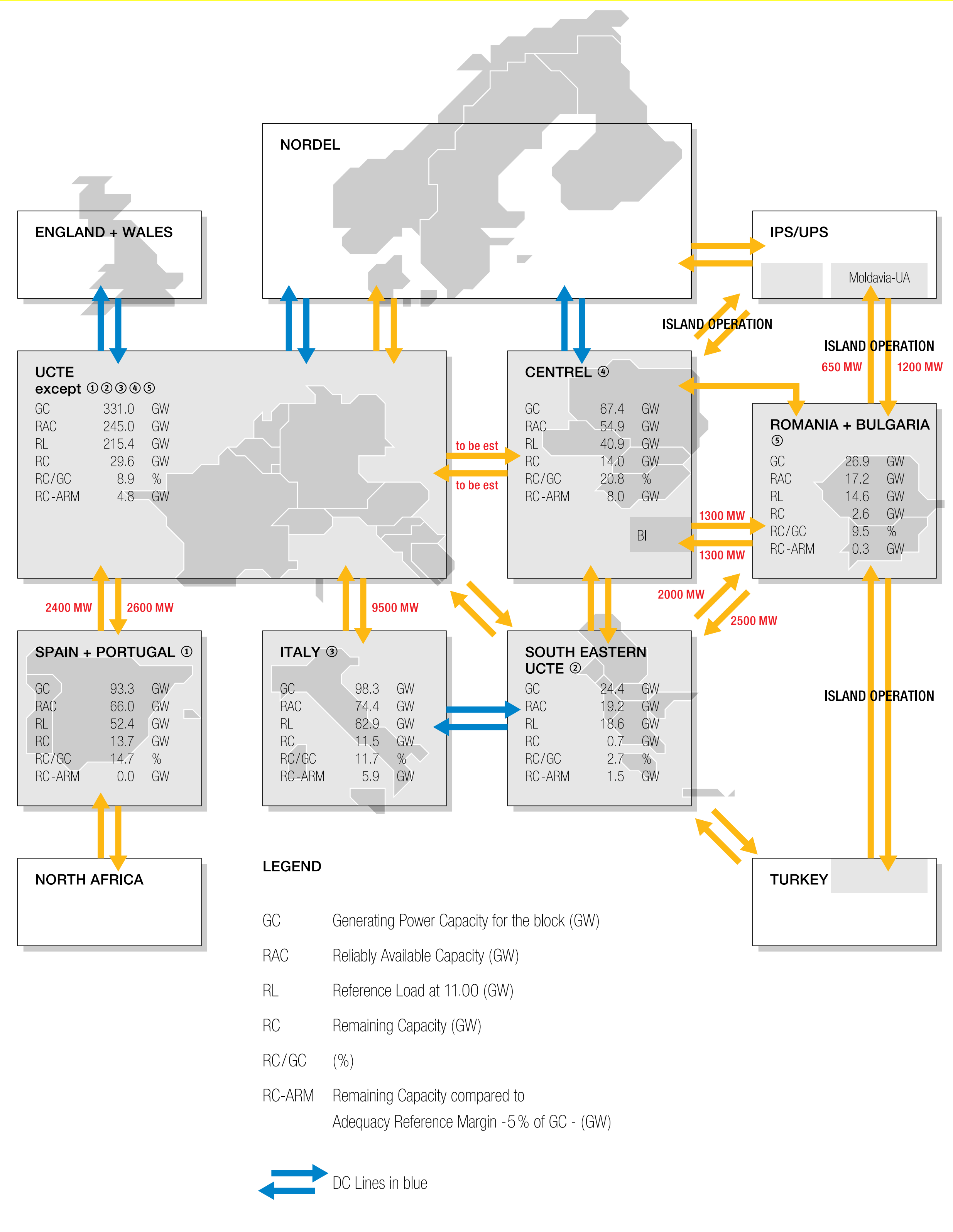
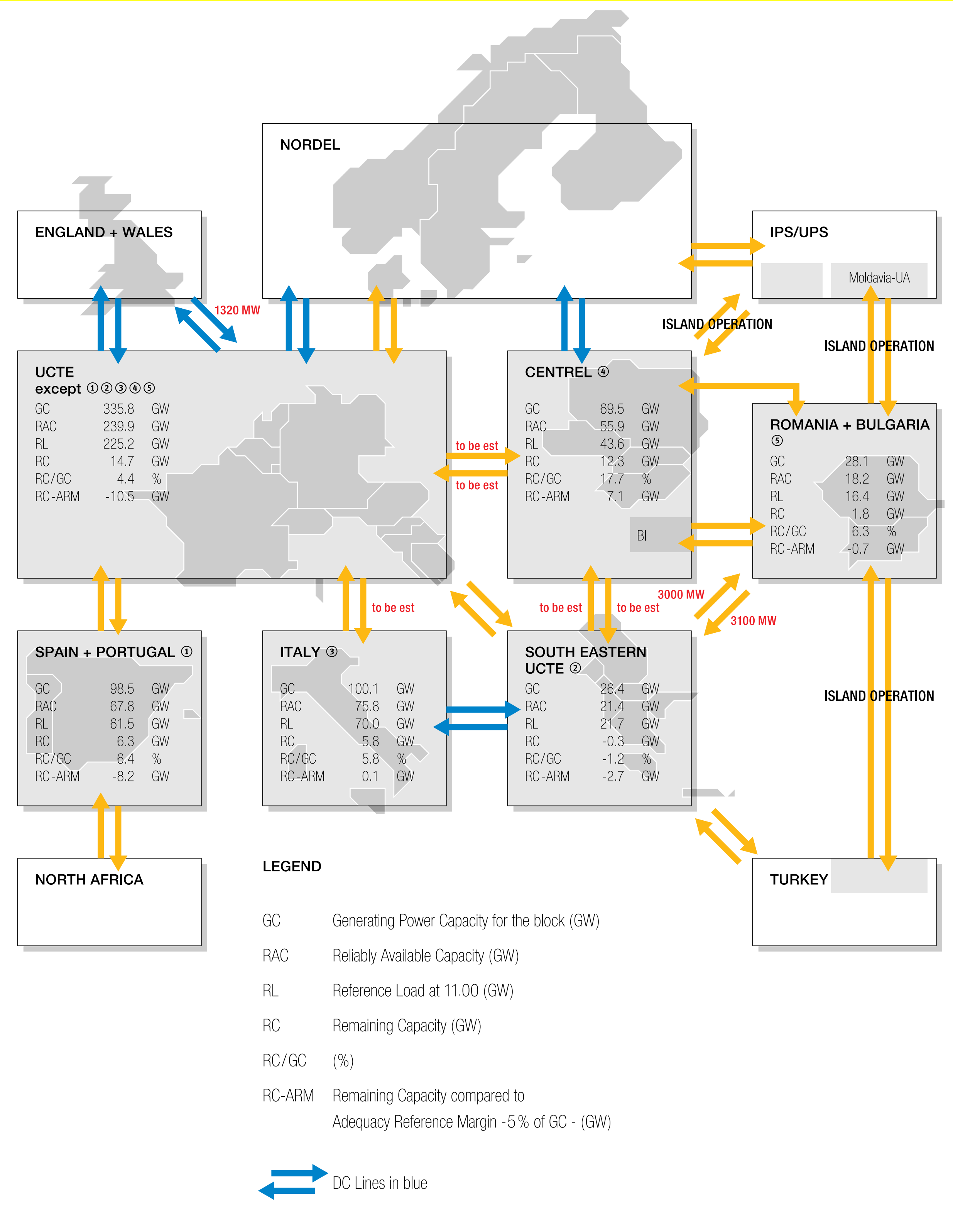


FIGURE 7-4

Data for January 2015

Only changes in transportable capacity through interconnections are indicated



APPENDIX

APPENDIX A: Detailed analysis of the power balance elements

A-1. National Generating Capacity

Changes in national generating capacities of UCTE countries are shown in Table A/1 for scenario A (conservative) and in Table A/2 for scenario B.

These values represent the maximum net available capacity from electric utility companies and auto-producers in the countries concerned by the study. The details of national capacity (hydro, nuclear, fossil fuel, renewable, energy sources which cannot be reliably identified) are available from members of the Working Group.

Table A/1 | **National generating capacity[10], scenario A** | **Results in GW**

	2006		2008		2010		2015		Variation [%] 2006 - 2008	Variation [%] 2008 - 2010	Variation [%] 2010 - 2015
	Jan 11:00	July 11:00	Jan 11:00	Jul 11:00	Jan 11:00	Jul 11:00	Jan 11:00	Jul 11:00	January	January	January
Country											
BE	16.2	16.2	16.2	16.2	16.3	16.3	15.9	15.5	0.2%	0.9%	-2.8%
DE	117.3	118.3	122.8	124.3	126.9	128.6	130.6	130.9	4.7%	3.3%	2.9%
ES	69.9	71.3	74.8	75.7	76.6	77.0	81.0	81.0	7.1%	2.4%	5.7%
FR	115.2	115.3	116.1	116.0	116.7	116.8	118.4	118.4	0.7%	0.5%	1.5%
GR	11.3	11.7	12.2	12.6	13.2	14.0	15.1	15.3	8.9%	8.4%	14.5%
IT	87.5	89.9	96.6	97.5	98.3	99.2	100.1	100.4	10.4%	1.8%	1.8%
SI	2.8	2.8	2.9	2.9	3.2	3.2	3.2	3.2	4.6%	8.0%	1.4%
HR	3.8	3.8	4.1	4.1	4.1	4.1	4.0	4.0	9.5%	1.0%	-3.9%
MK	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.6%	0.0%	0.0%
CS	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	0.1%	0.0%	0.0%
LU	1.7	1.3	1.7	1.7	1.7	1.7	1.7	1.7	0.6%	0.7%	1.1%
NL	22.0	22.0	22.4	22.4	22.5	22.5	22.4	22.4	1.8%	0.4%	-0.2%
AT	18.6	18.6	18.3	18.3	18.3	18.3	18.3	18.3	-1.6%	0.0%	0.0%
PT	12.6	13.4	14.7	15.1	16.7	17.2	17.6	17.6	17.1%	13.9%	4.9%
CH	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	0.0%	0.0%	0.0%
CZ	16.2	16.2	16.6	16.6	16.4	16.4	16.4	16.4	2.5%	-1.2%	0.0%
HU	7.6	7.6	7.8	7.8	7.9	7.9	9.2	9.2	2.4%	2.4%	15.5%
PL	32.3	32.3	33.8	33.9	34.2	34.6	35.4	33.6	4.6%	1.3%	3.4%
SK	7.7	7.7	6.6	6.6	6.2	6.2	5.9	5.9	-14.0%	-6.0%	-5.0%
BA	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	1.3%	0.0%	0.0%
RO	16.0	16.0	16.1	16.1	15.5	15.5	15.5	15.5	0.6%	-3.8%	-0.2%
BG	12.1	12.1	11.2	11.2	11.4	11.4	12.6	12.6	-6.8%	1.9%	10.3%
UA-W	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.0%	0.0%	0.0%
UCTE	**605.6**	**611.4**	**630.0**	**634.1**	**641.4**	**646.1**	**658.4**	**657.0**	**4.0%**	**1.8%**	**2.6%**

[10] Note: as specified in the methodology, "Renewable energy sources" and "not clearly identifiable energy sources" comprise capacities which, as a function of the primary energy used, do not correspond to the categories of hydro power stations, nuclear power stations and fossil fuel power stations, and which can be used for public/general supply and can thus be transported across the distribution and/or transmission networks.
"Renewable energy sources" comprise the following primary energies:
- wind energy
- photovoltaics/solar energy
- geothermal energy
- energy from biomass and waste (e. g. biogas, damp gas, municipal waste, industrial waste, wood and waste of wood)

Over the period 2006 - 2008, renewable energy power plants increase by 14 GW, while capacity for fossil fuel power plants increase by 11.2 GW.

From 2008 to 2010, the increase in capacity from renewable energy sources (+12 GW), promoted by regulatory mechanisms in many countries, becomes higher than the sum of all the other categories; **in 2015, UCTE's power generation is 17.2 GW higher than in 2010**. Decommissioning of nuclear and fossil fuel power stations contribute to a drop of **5.8 GW in nuclear capacity**.

Table A/1-1 **National generating capacity[11] evolution, scenario A, Reference time January 11:00Am** **Results in GW**

	2006 - 2008	2008 - 2010	2010 - 2015	2006 - 2015
Hydro power stations – Scenario A	**0.92**	**1.12**	**1.67**	***3.7***
Scenario B	*0.95*	*1.75*	*3.71*	***6.4***
Nuclear power stations – Scenario A	**-1.83**	**-2.04**	**-1.92**	***-5.8***
Scenario B	*-1.83*	*-2.04*	*-0.38*	***-4.3***
Conventional thermal power stations – Scenario A	**11.25**	**-0.26**	**-0.32**	***10.7***
Scenario B	*15.37*	*10.28*	*11.90*	***37.6***
Renewable energy sources – Scenario A	**14.09**	**12.42**	**18.06**	***44.6***
Scenario B	*15.47*	*15.37*	*28.45*	***59.3***
Not clearly identifiable energy sources – Scenario A	**0.09**	**0.27**	**0.38**	***0.7***
Scenario B	*0.09*	*0.32*	*0.15*	***0.6***
Scenario A	**24.5**	**11.5**	**17.9**	***53.9***
Scenario B	*30.1*	*25.7*	*43.8*	***99.6***

Specific remarks:

Belgium: As a consequence of the directive on large combustion plants, it is expected that 528 MW of coal-fired units will be taken out in 2015.
The directive on CO_2 quotas has an impact on the usage of existing fossil fuel power stations (more usage of gas fired power stations over coal fired power stations) and the construction of new fossil fuel power stations (the building of CCGT and OCGT instead of coal units). The new fossil fuel power plants considered in scenario A as well as scenario B are all OCGT, CCGT or gas-fired CHP.
Furthermore some of the existing fossil fuel power stations are refitted to biomass.

France: 3 850 MW of coal-fired units will not be retrofitted to comply with LCP emission requirements, and therefore will be subject to the 20 000 operation hours limit from January 2008 on. Some of these units are expected to be shut down before this limit is reached. All of them must be decommissioned by the end of 2015.
At first glance, CO_2 limitations are not deemed to induce any decommissioning
French Parliament passed the POPE Act ("loi Programme fixant les Objectifs de Politique Energétique" – enacting French Energy Policy) in July 2005. According to it, electricity generation from Renewable Energy Sources (RES) should cover 21% of total domestic consumption as soon as 2010 (the same target as indicated in the 2001/77/EC directive promoting RES). Due to the limited opportunities in developing new hydro or biomass plants, reaching this target needs a large development in wind capacity (approximately 14 GW).
Among the 4.8 GW of mothballed plants, 2.5 GW (four fuel-oil-fired units) are scheduled to go back in operation in 2006 and 2007 and 2008. For the others, resuming operation at any time looks highly improbable.

[11] Note: as specified in the methodology, "Renewable energy sources" and "not clearly identifiable energy sources" comprise capacities which, as a function of the primary energy used, do not correspond to the categories of hydro power stations, nuclear power stations and fossil fuel power stations, and which can be used for public/general supply and can thus be transported across the distribution and/or transmission networks.
"Renewable energy sources" comprise the following primary energies:
- wind energy
- photovoltaics/solar energy
- geothermal energy
- energy from biomass and waste (e. g. biogas, damp gas, municipal waste, industrial waste, wood and waste of wood)

Germany: The TSOs recommend to operators of large power stations optimising the commissioning and dismantlement of power stations with due respect to the load development, remaining capacity and import/export capacities.
The increase in generating capacity from renewable energy sources (in particular wind) and their availability has a growing influence on the compilation of data on the power balance forecast.
The envisaged shutdown of nuclear power plants will lead to an increase in thermal conventional generating capacity (natural gas, lignite, hard coal).

Greece: The Greek government has published a national plan for the years 2004 – 2007 aiming at reducing the emissions. The new power plants are combined cycle systems using natural gas. In addition, according to the new electricity Law, PPC is allowed to replace the old power plants with new ones but the old units, instead of being decommissioned, will be available to the HTSO to manage and use them for reserve.
The Greek government, the Regulatory Authority and the HTSO strongly support the development of RES. In order to achieve the goals set by the EU Directive on renewable the government has adopted policies aiming at the promotion of RES. Measures taken are: adopting favourable tariffs, simplifying the procedures of issuing licences for RES installations, founding the KAPE institute to do studies on RES new technologies and supervise the new RES installations, financing the investments on RES, expanding and reinforcing the power grid to ease the connection of new RES power plants and finally planning the introduction of the trade of green certificates to support the development of the RES.

The Netherlands*:* In 2003 started the implementation of MEP (Electricity Generation Environmental Quality), a government guided subsidizing program, to realise a vigorous and cost-effective promotion of environmentally safely generated electricity in the Netherlands. We can't predict at which scale will change the generation mix in the long term, but nevertheless can be concluded that there will be a progressive growth of offshore windparks up from 2008.
TenneT doesn't receive exact nor complete information about native generating units, and in particular not of units smaller than 2 MW of private or industrial owners. Therefore the given figures are an estimation of the amount of renewable energy sources and not clearly identifiable energy sources on basis of earlier investigations and on basis of information of our National Statistics (CBS).
There is some additive biomass firing in coal units, so in conventional thermal power is included an unknown amount of renewable energy sources, but we ignore the exact amount of it

Poland: Due to still unsolved issues concerning the way of complying with the requirements of European Directive (emission standards or NERP) and the Accessing Treaty (which even increases them), such consequences are not noticeable in power balances yet (generators do not provide any official information regarding any potential decommissionings).
Forecasts for energy demand, which are the basis of Polish’s energy policy, till year 2025 assumed fulfilling of share of RES in Polish energy consumption at the level of 7.5% (according to commitments in the Accessing Treaty, relating to the Directive 2001/7/EC). Total share of this kind of energy in the whole balance is very small, so the difference in consuming of individual sort of fuel, which could be ascribed to this Directive, is hardly noticed.

Portugal: the CO2 directive does not directly affect Portuguese forecast, but the expected developments in the generation allows for the compliance of the directive.
The EC 2001/80/CE directive will implicate important unavailability in the coal-fired power plants, included in this forecast. **Any deviation in the foreseen optimised plan can jeopardize the remaining capacity resulting from this forecast**.

Romania: Governmental Decision 541/2003 establishes the measures on the limitation of emissions of certain pollutants from large combustion plants. Due to this decision, beginning with 2008 it will remain in operation only those units, which meet emission reductions required, and there will be shutdown those who do not. The consequence on these decommissioning is the decrease of remaining capacity.
A significant change in the generation mix is not expected immediately, but there are certain preoccupations for the wind, solar, wave and small hydro energy development

Slovak Republic: Based on the EC 2001/80/CE Directive on large combustion plants several thermal units will be also decommissioned. It is determined by the fact that the allocation of funds for reconstruction, aimed to maintain the requirements of the Law on protecting atmosphere (Act. No. 478/2002) is evaluated as ineffective.
Decommissioning of further power units is a consequence of the political decision taken during the negotiations of the Pre-accession Treaty with the EU in which the Slovak Republic committed to stop operating two units of the Nuclear Plant V1 Bohunice, in the period 2006-2008.
Except the expected decommissioning of Slovenske Elektrarne (dominant producer), another 200 MW power capacity from independent producers will be stopped due to old-fashioned equipments.

Till year 2008, the installed power capacity of Slovakia will be reduced about 1200 MW in comparison with the present, amount that will be necessary to replace by new sources. While this represents an important power capacity, it is expected to be replaced rather by system sources than by decentralized production.

The usable potential sum up of the individual parts of renewable sources convenient for electricity production leaded the Government of the Slovak Republic to determine a minimal target of electricity production from RES to 19% in the year 2010. Among the most prospective renewable sources belongs biomass (coal burning together with wood waste, co-generation sources burning wood waste, etc.). Even taking into account the high usage of the hydro energetic potential of the Slovak Republic (in present approx. 60%), the hydro electricity production is still prospective. Having in view various reasons, the possibilities of using wind energy to produce electricity in Slovakia are to a certain extent modest.

The structure of the installed capacity in nuclear, thermal and hydro power plants is relatively equal (approx.1/3 each one). But the production of electricity from nuclear dominates in the Slovak Republic.
In the future a considerable change in generation mix is not expected in the Slovak Republic. The share of the thermal sources should not be changed significantly considering their role on system services providing.

Table A/2 **Additional national generating capacity, scenario B as compared to scenario A** **Results in GW**

	2006		2008		2010		2015	
	Jan 11:00	July 11:00	Jan 11:00	July 11:00	Jan 11:00	July 11:00	Jan 11:00	July 11:00
Country								
BE	-	-	0.4	0.4	1.6	1.6	1.8	1.8
DE	-	-	0.8	0.8	0.8	2.8	4.0	4.0
SP	-	-	-	-	2.6	3.2	8.2	9.2
FR	-	-	0.9	1.1	3.7	4.0	12.9	13.2
GR	-	-	-	-	-	-	0.4	0.4
IT	-	-	2.6	2.5	2.5	2.5	2.5	3.2
SI	-	-	-	-	0.8	0.8	0.8	0.8
HR	-	-	-	-	0.3	0.3	0.8	0.8
MK	-	-	-	-	-	-	-	1.1
CS	-	-	-	-	1.0	1.0	1.1	1.1
LU	-	-	-	-	-	-	-	-
NL	-	-	-	-	2.1	2.1	3.7	3.7
AT	-	-	0.3	0.3	1.7	1.7	1.7	1.7
PT	-	-	0.4	0.4	0.3	0.5	3.1	3.3
CH	-	-	-	-	-	-	-	-
CZ	-	-	-	-	0.2	0.2	0.6	0.6
HU	-	-	-	-	0.6	0.6	1.4	1.4
PL	-	-	-	-	1.2	1.1	-0.1	2.2
SK	-	-	0.2	0.2	0.5	0.5	1.5	1.5
BA	-	-	-	-	-	-	0.7	0.7
RO	-	-	-	-	-	-	1.6	1.6
BU	-	-	-	-	-	-	-	-
UA-W	-	-	-	-	-	-	-	-
UCTE	**0.0**	**0.0**	**5.6**	**5.7**	**19.9**	**22.9**	**46.7**	**52.3**

A-2. Non usable capacity

Non-usable capacity is the part of generating capacity which cannot be scheduled, for different reasons: a temporary shortage of primary energy sources (hydroelectric plants, wind farms), power plants with multiple functions, in which the generating capacity is reduced in favour of other functions (co-generation, irrigation, etc.), reserve power plants which are only scheduled under exceptional circumstances, unavailability due to cooling-water restrictions, etc..

Table A/3 | **Non usable capacity scenario A** | **Results in GW**

	2006		**2008**		**2010**		**2015**	
	3rd Wednesday		**3rd Wednesday**		**3rd Wednesday**		**3rd Wednesday**	
	Jan 11:00	**July 11:00**	**Jan 11:00**	**July 11:00**	**Jan 11:00**	**July 11:00**	**Jan 11:00**	**July 11:00**
BE	0.8	1.0	0.9	1.1	0.9	1.2	1.0	1.2
DE	22.0	24.4	25.4	28.4	29.8	32.4	37.2	39.8
ES	12.3	15.9	14.0	17.0	17.0	21.0	19.0	23.0
FR	17.5	29.1	16.9	28.7	16.5	28.4	18.7	31.4
GR	1.0	0.8	1.2	1.0	1.6	1.3	1.6	1.3
IT	12.3	13.1	13.9	14.6	19.0	19.2	19.3	19.4
SI	0.3	0.3	0.4	0.3	0.5	0.3	0.5	0.3
HR	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
MK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CS	1.2	2.0	1.2	2.0	2.2	4.4	2.2	4.4
LU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
NL	2.7	3.3	3.0	3.6	3.0	3.6	3.1	3.7
AT	2.9	2.0	2.9	2.0	2.9	2.0	2.9	2.0
PT	2.1	3.5	3.4	4.8	4.5	5.9	5.0	6.1
CH	3.7	2.1	3.7	2.1	3.7	2.1	3.7	2.1
CZ	1.8	1.8	2.2	2.2	2.2	2.2	2.2	2.2
HU	0.6	0.8	0.7	0.9	0.7	0.9	0.8	1.0
PL	1.5	3.2	2.2	3.3	1.2	5.2	1.8	3.7
SK	2.0	2.2	1.7	1.9	1.7	1.9	1.7	1.9
BA	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
RO	2.8	3.0	2.7	2.9	4.5	6.1	4.7	6.1
BG	2.7	2.8	2.2	2.3	2.2	2.3	2.1	2.3
UA-W	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.1
UCTE	**91.4**	**112.5**	**99.7**	**120.2**	**115.2**	**141.4**	**128.5**	**153.0**

Non-usable wind power capacity at peak load (January)

BE	**DE**	**ES**	**FR**	**GR**	**IT**	**SI**	**HR**	**CS**	**MK**	**BG**	**BA**	**LU**	**NL**	**AT**	**PT**	**CH**	**CZ**	**HU**	**PL**	**SK**	**RO**
85%	85-95%	92%	75%	73%	75%	60%	75%	-	nr	-	na	50%	75%	70%	73%	nr	75%	90%	75%	75%	30%

A-2-1. Fossil fuel and nuclear power plants overhauls and outages

Table A/4 | **Overhauls scenario A** | **Results in GW**

	2006 3rd Wednesday		2008 3rd Wednesday	
	Jan 11:00	July 11:00	Jan 11:00	July 11:00
BE	0.2	0.4	0.2	0.4
DE	2.3	10.5	2.3	10.7
ES	-	1.0	-	1.0
FR	-	12.6	1.6	11.9
GR	0.4	-	0.4	-
IT	3.2	3.7	3.5	4.0
SI	-	0.3	-	0.2
HR	-	-	-	-
MK	-	0.2	-	0.2
CS	-	2.0	-	2.0
LU	-	-	-	-
NL	0.8	0.8	0.8	0.8
AT	-	1.0	-	1.0
PT	-	0.4	-	0.4
CH	-	1.4	-	1.4
CZ	0.2	3.5	0.2	3.5
HU	0.2	0.5	0.2	0.5
PL	0.1	4.3	0.2	3.3
SK	-	0.7	-	0.7
BA	0.1	0.2	0.1	0.2
RO	0.8	2.4	0.8	2.4
BG	0.4	2.8	0.6	2.9
UA-W	0.2	0.6	0.2	0.6
UCTE	**8.8**	**49.3**	**10.9**	**48.1**

Table A/5 | **Outages scenario A** **Results in GW**

	2006 3rd Wednesday		2008 3rd Wednesday	
	Jan 11:00	**July 11:00**	**Jan 11:00**	**July 11:00**
BE	0.5	0.3	0.5	0.3
DE	3.2	2.5	3.2	2.5
ES	1.5	1.2	1.5	1.2
FR	3.3	2.7	3.3	2.8
GR	0.3	0.3	0.3	0.3
IT	4.0	3.8	4.4	4.1
SI	-	-	-	-
HR	-	-	-	-
MK	-	-	-	-
CS	1.0	0.5	1.0	0.5
LU	-	-	-	-
NL	0.6	0.6	0.6	0.6
AT	1.0	2.4	1.0	2.4
PT	0.2	0.2	0.2	0.2
CH	-	-	-	-
CZ	0.5	0.4	0.5	0.4
HU	0.3	0.3	0.3	0.3
PL	0.8	0.7	0.8	0.7
SK	0.2	0.2	0.2	0.2
BA	0.2	0.2	0.2	0.2
RO	1.0	0.9	1.0	0.9
BG	0.4	0.4	0.4	0.4
UA-W	-	-	-	-
UCTE	**18.8**	**17.4**	**19.3**	**17.8**

A-2-2. Reserve for system services

The reserve for system services is the estimated reserve capacity which is required one hour before real time for system operation. It is therefore the reserve capacity which is available to TSOs from power plant operators, and includes the following specific elements:

- ⇨ The "second reserve" and the "minute reserve", which are made available to TSOs under the contractual terms of the network frequency control service, using the requisite technical facilities;
- ⇨ "Other reserves", such as reserves for voltage control or the management of bottlenecks, which are managed by TSOs under the terms of contracts.

However, the reserve for system services does not include reserves for long-term outages, which are to be covered by power plant operators.

Table A/6 **Reserve for system services scenario A** **Results in GW**

	2006 3rd Wednesday			2008 3rd Wednesday			2010 3rd Wednesday			2015 3rd Wednesday		
	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00
BE	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
DE	7.5	7.5	7.3	7.5	7.6	7.3	7.6	7.6	7.3	7.8	7.8	7.4
ES	4.1	4.1	4.1	4.6	4.6	4.6	4.9	4.9	4.9	5.8	5.8	5.8
FR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
GR	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
IT	4.4	4.4	4.5	4.9	4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.0
SI	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
HR	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
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
CS	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.0	0.2	0.0	0.0	0.2
LU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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
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
PT	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7
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
CZ	1.5	1.5	1.3	1.5	1.5	1.3	1.5	1.5	1.3	1.5	1.5	1.3
HU	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
PL	1.5	1.5	1.3	1.7	1.7	1.5	1.7	1.7	1.5	1.8	1.8	1.5
SK	0.7	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
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
RO	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
BG	1.3	1.3	1.1	1.3	1.3	1.1	1.3	1.3	1.1	1.3	1.3	1.1
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	**32.5**	**32.4**	**31.7**	**33.7**	**33.7**	**32.8**	**34.1**	**33.9**	**33.3**	**35.2**	**35.2**	**34.4**

Specific remarks:

Belgium: The reserve for system services consists of 100 MW primary reserve, 800 MW minutes reserve and 450 MW other reserves.
Minutes reserve:

- 600 MW reserved by contract (150 MW secondary reserve and 450 MW tertiary reserve)
- 200 MW load shedding contracts with industrial customers

Other reserves: 450 MW additional reserve imposed on the generator that has the biggest unit (1050 MW (=biggest unit) - 150 MW secondary reserve - 450 MW tertiary reserve = 450 MW), but does not fall under the operational responsibility of Elia.

Germany: The share of German primary control reserve in the UCTE totals approx. 750 MW. Essential changes are not likely to occur. The higher share of minutes reserve and other reserves in the generating capacity in Germany as compared to other countries is attributable to the high portion of wind power which is frequently not available at peak times

Greece: The reserve is offered mainly by PPC, so we keep as a reserve all the available generating capacity to use it for voltage and flows congestions according to the financial offers submitted by the power plants.

The new power plant of HERON provides extra reserve in the area of Athens.

According to the new power exchange and grid code the power plants able to provide system reserves, except RES, must provide primary and secondary reserve. The power plants interested in providing other reserves have to sign a contract with the HTSO.

A-3. Reliably Available Capacity

Reliably available capacity is obtained by deducing non-usable capacity, overhauls, outages and system reserve from the national generating capacity.

Reliably available capacity represents the capacity which is available to power plant operators and electricity traders for meeting their clients' demand.

Table A/7 | **Reliably Available Capacity, Scenario A** | **Results in GW**

	2006 3rd Wednesday			2008 3rd Wednesday			2010 3rd Wednesday			2015 3rd Wednesday		
	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00
BE	13.3	13.3	13.1	13.2	13.2	13.0	13.4	13.4	13.1	12.9	12.9	12.2
DE	82.3	82.3	73.6	84.4	84.3	75.4	84.5	84.5	75.8	80.6	80.6	70.5
ES	52.0	52.0	49.1	54.7	54.7	51.9	54.7	54.7	51.1	56.2	56.2	52.2
FR	91.4	91.4	67.9	91.3	91.3	69.5	92.2	92.2	70.4	91.8	91.8	69.3
GR	9.2	9.2	10.1	9.9	9.9	10.8	10.5	10.5	11.9	12.4	12.4	13.2
IT	63.6	63.6	64.8	69.9	69.9	69.9	74.4	74.4	75.0	75.8	75.8	76.0
SI	2.1	2.1	1.8	2.1	2.1	2.0	2.3	2.3	2.1	2.3	2.3	2.1
HR	3.2	3.2	3.2	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5	3.5
MK	1.3	1.3	1.1	1.3	1.3	1.1	1.3	1.3	1.1	1.3	1.3	1.1
CS	7.3	7.3	5.1	7.3	7.3	5.1	7.4	7.6	5.2	7.6	7.6	5.2
LU	1.6	1.2	1.2	1.7	1.7	1.6	1.7	1.7	1.6	1.7	1.7	1.7
NL	16.9	16.9	16.3	17.0	17.0	16.4	17.1	17.1	16.5	16.9	16.9	16.3
AT	14.0	14.0	12.5	13.7	13.7	12.2	14.7	14.7	15.6	14.7	14.7	15.6
PT	9.6	9.6	8.7	10.4	10.4	9.1	11.4	11.4	10.0	11.6	11.6	9.9
CH	12.8	12.8	13.0	12.8	12.8	13.0	12.8	12.8	13.0	12.8	12.8	13.0
CZ	12.3	12.3	9.2	12.3	12.3	9.2	12.1	12.1	9.0	12.1	12.1	9.0
HU	5.8	5.8	5.3	5.9	5.9	5.4	6.0	6.0	5.5	6.7	6.7	6.2
PL	28.4	28.4	22.8	28.9	28.9	25.0	31.3	31.3	27.9	31.9	31.9	28.3
SK	4.9	4.9	4.0	4.1	4.1	3.3	3.7	3.7	2.9	3.4	3.4	2.6
BA	2.7	2.7	2.6	2.7	2.7	2.6	2.7	2.7	2.6	2.7	2.7	2.6
RO	10.5	10.5	8.8	10.6	10.6	9.0	10.0	10.0	8.5	9.8	9.8	8.4
BG	7.4	7.4	5.0	6.8	6.8	4.6	7.2	7.2	4.7	8.4	8.4	6.0
UA-W	1.6	1.6	1.2	1.7	1.7	1.3	1.8	1.8	1.4	1.9	1.9	1.5
UCTE	**454.1**	**453.8**	**400.5**	**466.4**	**466.4**	**415.2**	**476.7**	**476.9**	**428.5**	**479.0**	**479.0**	**426.5**

Table A/6 shows the increase in reliably available capacity brought by hypothesis of Scenario B.

Table A/8 | **Additional Reliably Available Capacity, Scenario B as compared to scenario A** | **Results in GW**

	2006 3rd Wednesday			2008 3rd Wednesday			2010 3rd Wednesday			2015 3rd Wednesday		
	Jan 11:00	Jan 19:00	July 11:00	Jan 11:00	Jan 19:00	July 11:00	Jan 11:00	Jan 19:00	July 11:00	Jan 11:00	Jan 19:00	July 11:00
UCTE	-	-	-	4.5	4.4	4.8	15.1	14.9	17.4	36.7	36.9	36.9

A-4. Load

The load values shown in the table correspond to normal climatic conditions:

Table A/9 **Load** **Results in GW**

	2006 3rd Wednesday			2008 3rd Wednesday			2010 3rd Wednesday			2015 3rd Wednesday		
	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00	Jan 11:00	Jan 19:00	Jul 11:00
BE	12.4	13.1	9.6	12.8	13.6	9.9	13.3	14.1	10.3	14.2	15.0	11.0
DE	73.9	73.4	66.4	74.8	74.6	67.2	75.8	75.6	68.1	76.5	76.4	69.3
ES	38.0	41.3	39.5	41.3	44.0	42.0	43.0	46.4	44.2	50.0	53.3	51.9
FR	76.7	79.3	57.9	79.5	81.8	59.9	81.8	83.7	61.7	86.6	88.3	66.0
GR	7.5	7.9	8.9	7.9	8.3	9.4	8.4	8.8	10.1	9.7	10.1	11.8
IT	55.2	55.3	55.3	58.0	58.3	58.3	62.9	63.2	63.2	70.0	70.0	71.0
SI	2.1	2.1	1.8	2.2	2.2	1.9	2.3	2.3	2.0	2.5	2.5	2.3
HR	2.5	2.7	2.2	2.6	2.8	2.3	2.8	3.0	2.5	3.3	3.5	2.9
MK	1.7	1.7	1.3	2.2	2.2	1.8	2.7	2.7	2.3	4.0	4.0	3.6
CS	7.2	7.4	4.3	7.3	7.6	4.4	7.5	7.8	4.8	8.1	8.3	5.2
LU	0.9	0.8	0.9	0.9	0.8	0.9	1.1	0.9	1.0	1.2	0.9	1.1
NL	15.9	15.7	14.9	16.3	16.1	15.3	16.6	16.4	15.6	17.5	17.3	16.5
AT	8.7	8.6	7.5	9.1	8.9	7.8	9.4	9.3	8.1	10.4	10.3	9.0
PT	7.9	7.8	7.1	8.6	8.6	7.6	9.4	9.3	8.3	11.5	11.3	10.2
CH	9.7	9.1	8.3	9.9	9.3	8.4	10.5	9.9	8.9	11.0	10.4	9.4
CZ	9.5	9.6	6.9	9.7	9.8	7.1	10.0	10.1	7.3	10.5	10.7	7.7
HU	5.5	5.7	5.1	5.6	5.8	5.2	5.7	5.9	5.3	6.0	6.2	5.6
PL	19.5	20.6	16.7	20.2	21.8	17.9	20.1	20.1	16.4	21.6	22.6	17.7
SK	3.8	3.9	2.9	3.9	4.1	3.0	4.0	4.1	3.1	4.3	4.4	3.3
BA	1.8	1.9	1.5	1.8	1.9	1.5	1.8	2.0	1.6	2.0	2.2	1.8
RO	7.3	7.5	6.7	7.6	7.9	7.0	8.1	8.4	7.4	9.6	10.0	8.7
BG	6.1	6.5	3.7	6.2	6.6	3.8	6.5	7.0	4.0	6.8	7.3	4.2
UA-W	1.0	1.1	0.6	1.0	1.1	0.6	1.0	1.1	0.7	1.1	1.2	0.7
UCTE	**374.8**	**382.9**	**329.9**	**389.4**	**398.0**	**343.3**	**404.7**	**412.2**	**356.7**	**438.3**	**446.3**	**390.7**

Table A/8 here below shows average annual increase over the periods 2006-2008, 2008-2010 and 2010-2015.

Table A/10 **Load – Average Annual Growth** **Results in %**

	2006 - 2008			2008 - 2010			2010 - 2015		
	January		July	January		July	January		July
	11:00	19:00	11:00	11:00	19:00	11:00	11:00	19:00	11:00
Country									
BE	1.9%	1.9%	1.9%	2.0%	2.0%	2.0%	1.2%	1.2%	1.2%
DE	0.6%	0.8%	0.6%	0.7%	0.7%	0.7%	0.2%	0.2%	0.3%
ES	4.3%	3.2%	3.1%	2.0%	2.7%	2.6%	3.1%	2.8%	3.3%
FR	1.8%	1.6%	1.7%	1.4%	1.2%	1.5%	1.2%	1.1%	1.4%
GR	3.0%	3.0%	3.1%	2.9%	2.8%	3.4%	3.0%	2.8%	3.3%
IT	2.5%	2.7%	2.7%	4.1%	4.1%	4.1%	2.2%	2.1%	2.4%
SI	2.4%	2.3%	3.5%	2.2%	2.2%	2.6%	2.0%	1.7%	2.9%
HR	3.2%	3.0%	3.1%	3.2%	3.0%	3.4%	3.0%	3.1%	3.0%
MK	2.7%	2.5%	3.9%	2.1%	2.0%	3.0%	1.2%	1.1%	1.6%
CS	0.8%	0.7%	0.3%	1.5%	1.5%	4.9%	1.4%	1.4%	1.8%
LU	3.0%	3.0%	2.9%	7.4%	2.4%	2.4%	1.9%	1.9%	1.9%
NL	1.3%	1.3%	1.3%	0.9%	0.9%	1.0%	1.1%	1.1%	1.1%
AT	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
PT	4.5%	4.5%	3.9%	4.1%	4.1%	4.2%	4.1%	4.1%	4.2%
CH	1.0%	1.1%	0.6%	3.0%	3.2%	2.9%	0.9%	1.0%	1.1%
CZ	1.0%	0.9%	1.3%	1.5%	1.6%	1.3%	1.1%	1.1%	1.1%
HU	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
PL	1.8%	2.9%	3.5%	-0.3%	-3.9%	-4.2%	1.4%	2.4%	1.5%
SK	1.8%	1.8%	1.8%	0.7%	0.7%	0.7%	1.6%	1.6%	1.5%
BA	0.0%	0.0%	1.7%	1.4%	2.6%	3.3%	2.1%	1.9%	2.4%
RO	2.4%	2.5%	2.3%	3.1%	3.1%	2.9%	3.5%	3.5%	3.3%
BG	1.2%	0.8%	1.1%	2.4%	3.0%	2.6%	0.9%	0.8%	1.0%
UA-W	1.6%	1.4%	2.5%	1.5%	1.4%	2.4%	1.4%	1.3%	2.2%
UCTE	**2.0%**	**1.9%**	**2.2%**	**2.2%**	**1.9%**	**2.2%**	**1.8%**	**1.8%**	**2.0%**

Load reduction measures

MW	Load Reduction Measures		
	2006	**2010**	**2015**
UCTE	6145	6245	6245

For the first time UCTE is providing information about load reduction measures. Comments above give details from individual countries.

Belgium: Several load-shedding contracts with industrial customers are in force. The estimated contribution is 200 MW. These contracts are part of the reserve for system services.

France: "Regulated tariffs" : with the EJP (standing for Effacement Jour de Pointe - peak days load shedding) and Tempo tariffs, prices are set at a very high level during 22 periods of 18 hours (from 7.00 through 13.00 the day after) for each winter (from November 1st through March 31st) and much lower at other times. The supplier decides peak days. High prices in the peak period act as an incentive to cancel consumption at that time.

These tariffs are now available to non-eligible customers, mainly in the Residential sector. The future of these tariffs and the load shedding capacity they carry is uncertain, as all customers are set to become eligible from July 1st 2007.
“Contracts with suppliers” : the 1 000 MW capacity assumed for 2006 is a prudent assumption of the amount that can be reached with a high degree of certainty. On 28th February 2005, a larger volume was reached.

The Netherlands: TenneT studied together with the Ministry of Economic Affairs on a system of price reduction for large consumers who will offer sheddable load during peak load. It was concluded that for the moment there is no necessity for such mechanism, because the amount of commercial available sheddable load is adequate.
Besides of that there are contracts for emergency power based on sheddable load that can be used eventually when reserve margins are too low

Romania: Measures for reducing load at peak periods exist in Balancing market mechanism. One supplier can have a Dispatching consumer (a consumer to whom TSO can submit an order for reduction of his consumption).

Spain: Up to now there is only the Industry Interruptible tariff (managed by TSO) but in the near future there is the intention to contract the consumers with the suppliers.

APPENDIX B: Generation adequacy feature

The table here below shows which kind of feature is used to assess the generation adequacy in the different countries. That point is interesting from the power system reliability point of view.

Country	Deterministic or probabilistic	Mandatory standards on generation adequacy
BE	Probabilistic, (LOLE, 16 hours/year)	The indicative production plan which is a prospective study on adequacy that falls under the responsibility of the regulator (Commission for Electricity and Gas Regulation – CREG)
DE	Deterministic for primary control power; Probabilistic approach used by the TSOs	“Transmission Code” requirements
ES	Deterministic	“Operation procedures” requirements
FR	Probabilistic, (10% of probability of loss of load within one year, fairly consistent with a LOLE of 4/year)	No mandatory standard but agreement with the Ministry in charge of Energy
GR	Deterministic for the short term, probabilistic for the medium and long term	Operation code, Power Exchange Code and the “Authorisations Regulation for Generation and Supply” requirements
IT	Both	-
SI	Deterministic	“System Operating Instructions for The Electricity Transmission Network” requirements
HR	Deterministic	“Annual Energy Balancing Plan” and internal documents on system operation
JIEL	-	-
LU	-	-
NL	None, left to the market on the basis of “price produces supply”	“National system code” requirements
AT	-	No mandatory standards
PT	<u>Probabilistic</u> ⇨ LOLE - less than 2.5% of the months ⇨ LOEP (in dry hydro conditions) - below 0.4% of total consumption <u>Deterministic</u> Reserve Margin enough to cover the following simultaneous contingencies: ⇨ Higher peak load due to severe temperature conditions; ⇨ Extreme lack of primary energy (wind, hydro, other) ; ⇨ Forced outage of the most rated hydro and thermal unit.	No mandatory standards, but the probabilistic feature used in long-term generation adequacy studies was established by the Ministry of Economic Affairs.
CH	Deterministic	No mandatory standards – shared responsibility between the Federal Ministry of Energy, the cantonal ministries and the Power Utilities
CZ	Deterministic – for the TSO’s short term operational planning Probabilistic – for the long term planning	No mandatory standards
HU	Probabilistic, LOLE	Middle & Long Term Forecast Plan
PL	Deterministic	“Polish Grid Code” requirements
SK	Deterministic	Requirements resulting from operation.
BG	Probabilistic, LOLP and LOLE optimal value calculation	-
RO	Deterministic for short term (“largest unit”), probabilistic for medium and long term (LOLE	“Grid Technical Code” requirements

	and LOLP)	
UA-W	-	Guide-lines for power system stability; operating rules for Transmission network and Power stations.
CS	Deterministic	-
BA	-	"ZEKC Book of Rules and obligations" requirements

APPENDIX C: Transmission grid development

Main UCTE

Belgium

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Second circuit line Avelgem-Avelin	380 kV	2005	
Installation of a phase shifter in Monceau		2006	
Jamiolle – Monceau	220 kV	2006	Upgrade of the 150kV line
Installation of supplementary transformers	380 / 150 kV	2008 - 2012	
Installation of a phase shifter in Zandvliet and two phase shifters in Van Eyck	380 kV	2007	
Construction of Lorraine – Ardennes line	380 kV	2012	No detailed planning available
Second circuit of line Gramme – Massenhoven-	380 kV	2012	No detailed planning available

All these investments will increase the import capacity of Belgium.
Indicative non-binding figures for reference grid situation in winter:

- + 700MW in 2005
- + 800 MW in 2006
- +1000MW in 2012

Germany

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
SS Goldshöfe, substitution of the 220-kV-SS	380 kV	end of 2007	
SS Niederstotzingen, substitution of the 220-kV-SS	380 kV	end of 2007	
SS Dellmensingen, upgrading of the 220-kV-SS to 380 kV	380 kV	end of 2010	
OHL Goldshöfe-Niederstotzingen, upgrading of line operation from 220 kV to 380 kV	380 kV	end of 2008	single circuit, AC line, 76 km
OHL Dellmensingen –Niederstotzingen upgrading of line operation from 220 kV to 380 kV	380 kV	end of 2008	single circuit, AC line, 67 km
SS Metzingen, upgrading of the 220-kV-SS to 380 kV	380 kV	end of 2007	
OHL section Reicheneck-Rommelsbach, additional connection of SS Metzingen to 380 kV-grid	380 kV	end of 2006	single-circuit section, AC line
SS Wendlingen, upgrading of the 220-kV-SS to 380 kV	380 kV	2015	
SS Mühlhausen, upgrading of the 220-kV-SS to 380 kV	380 kV	2009	
OHL section Neckarrems-Mühlhausen, two connections of SS Mühlhausen to 380 kV-grid	380 kV	2007	two single-circuit sections, AC line
SS Pulverdingen, enlargement	380 kV	end of 2012	
OHL Oberjettingen-Engstlatt	380 kV	2006	single circuit, AC line, 34 km
SS Trossingen, upgrading of the 220-kV-SS to 380 kV	380 kV	end of 2008	
Krümmel – Görries	380 kV	2007	double line, 75 km, AC
Lauchstädt – Vieselbach	380 kV	2008	double line, 80 km, AC
Vieselbach – Altenfeld	380 kV	2010	double line, 80 km, AC
Altenfeld – Redwitz (E.ON Netz)	380 kV	2010	double line, 60 km, AC

Neuenhagen – Bertikow/Vierraden	380 kV	2010	double line, 100 km, AC
Ganderkesee – St. Hülfe	380 kV	2011	double line, AC
Diele - Niederrhein	380 kV	2015	double line, AC

Due to the upgrading of large parts of the 220 kV grid and the new development of 380 kV lines, impacts on NTC values have to be expected but are not specified yet. Some of the new lines will be necessary for the expected additional grid feed-in of renewable energy sources (mostly wind) which has to be transported from the North of Germany to the West and South of Germany (high demand regions).

Nevertheless further needs will exist in some regions.

The German transmission system operators (TSOs) have already made appropriate preparations before the EC regulation 1228/2003 on network access conditions for cross-border exchanges in electricity became effective on 1st July 2004. These preparations included in particular:

- The commitment to apply market-oriented solutions in the event of network congestion pursuant to Article 6, section 1 of the EC regulation,
- The obligation to use the proceeds from congestion for one or several of the three objectives mentioned in Article 6, section 6 of the EC regulation,
- Different publication and information duties,
- Information of the Federal Ministry of Economics and Labour and of the regulatory authority (German Federal Network Agency) about the application of the regulation, and support with a view to ensuring transparency in the application and functioning of the EC regulation.

The TSOs have assured that a market-based procedure (explicit auction) will be applied at interconnectors susceptible to congestion (i. e. at international interconnecting lines towards Denmark, the Netherlands, the Czech Republic, Poland as well as to France and to Switzerland since the beginning of 2005).

At the border with Austria, there are currently no relevant market procedures installed as the available interconnecting capacity on the German side is sufficient at the present time; for this reason, there has no congestion been defined and published to date.

Slovenia

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
2x 400 kV Krsko - Bericevo	400 kV	2008	
2x400 kV Cirkovce - Pince	400 kV	2011	
2x400 kV Okroglo - Udine	400 kV	2011	

The first double line will solve some internal congestion problems.

Internal 220 kV line Podlog – Bericevo should be substituted with 400 kV line. Interconnection lines to Hungary and to Italy are under the consideration.

Croatia

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Ernestinovo - Pecs	400 kV	2007/2008	Double circuit line
Zagvozd - Plat	220 kV (400 kV)	2007	Double circuit line
Vodnjan - Plomin	220 kV	2007	Double circuit line

Tie line Ernestinovo – Pecs will increase NTC value between Croatia and Hungary. Both lines together with internal lines Zagvozd – Plat and Vodnjan – Plomin will make Croatian transmission system stronger by reducing constraints and avoiding or mitigating potential congestions.

Luxembourg

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Schifflange – CFL Berchem	220kV	Oct. 2006	2*220kV
Moulaine – Sotel	220 kV		

The Netherlands

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Static VAR equipment at two locations	380 kV	2005	
Upgrading of 150 kV line Maasvlakte-Westerlee	380 kV	2008	2 x 1645 MVA
Construction of substations Westerlee	380 kV	2008	
Upgrading of 150 kV line Diemen-Velsen	380 kV	2005/2006	2 x 1645 MVA
Construction of substations Oostzaan and Velsen	380 kV	2005/2006	3 X 500 MVA and 1 x 500 MVA
DC-cable to Norway	500 kV	2007/2008	1 X 700 MVA

The static-VAR equipment will better the performance of the entire 380 kV network under varying import/export condition.

Some regional reinforcements will be done after these projects.
TenneT has agreed with the neighbouring TSO's to exchange more online information. This will enable all TSOs to have a clear overview of the relevant parts of each TSO-network and thus be of benefit for congestion and security management purposes. Besides of that will be developed a regional approach with the neighbouring TSO's which will enable a better forecast and management of congestions

Austria

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Südburgenland - Kainachtall	380	2008	Double circuit AC, 3000MVA
Steinach – Prati (IT)	110kV – 132 kV	2006	PST double circuit AC
400kV transmission through the Brenner pass tunnel	400kV	2015	Double circuit, AC, 2*1000MVA or 2*1500MVA
Nauders – Curon – Glorenza (IT)	220 kV	2010	Single circuit (cable – OH), AC

380kV transmission line from Südburgenland to Kainachtal will lead to an increase of NTC towards CZ, H and slowenia and to a decrease of congestion costs.

In next years, will be projected:
Interconnections
- 380kV line from Lienz (A) to Cordignano (I) (AC, double)
- additional 380kV line Wien-Südost (A) – Györ (H)

Within Austria:
- St. Peter to Salzach (upgrade from 220kV to 380kV)
- Salzach – Tauern (upgrade from 220kV to 380kV)
- Ernsthofen substation (upgrade from 220kV to 380kV)
- St. Peter substation (upgrade from 220kV to 380kV)
- Zell/Ziller – Westtirol (upgrade from 220 to 380kV)
- Bisamberg substation (upgrade from 220kV to 380kV)
- Lienz – Obersielach (double circuit, 380kV)

France

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Avelgem – Avelin - Mastaing	400 kV	2005	Second circuit
Boutre- Broc Carros	400 kV	2007	AC line
Lyon-Chambery	400 kV	2007	75 km, AC line, double circuit
New line in the French grid : Vigy-Marlenheim	400 kV	2008/2009	AC line, double circuit (one of them operated at 225 kV), 3x570 mm², 115 km
France – Spain : eastern reinforcement	400 kV	2009	

Spain and Portugal

Spain

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Tarifa -Fardioua	400	2006	
Antiñano-Tineo	400	2006	
Magallon -Serna	400	2006	Double circuit
Palo-Antiñano	400	2006	
Mezquita-Morella	400	2006	Double circuit
Mezquita-Fuendetodos	400	2006	Double circuit
Bescano -Vic	400	2006	
Bescano -Sentmenat	400	2006	
Segovia-Tordesillas	400	2006	
Arcos Sur-Roda	400	2006	
Arcos Sur-Cabra	400	2006	
Antiñano-Soto De Ribera	400	2006	
Palo-Pesoz	400	2006	
Pesoz-Tineo	400	2006	
Abanto -Guenes	400	2006	
Bescano -Massanet	400	2006	Double circuit
Antiñano-Tabiella	400	2006	
Cabra-Roda	400	2006	
Meson D.V.-Puentes G.R.	400	2006	Double circuit
Ayora-Pinilla	400	2006	
Moraleja -Segovia	400	2006	
Boimente -Pesoz	400	2007	Double circuit
S.S.Reyes-Cereal	400	2007	

Tordesillas-Cereal	400	2007	
Santa Llogaia-Bescano	400	2007	
Aparecida-Tordesillas	400	2007	
Aparecida-Trives	400	2007	
Muruarte -Vitoria	400	2007	
Cabra-Guadame	400	2007	
Plana-Morella	400	2007	
Cabra-Guadame	400	2007	
Guenes -Ichaso	400	2008	
Abanto -Ichaso	400	2008	
Bescano -Baixas	400	2009	

Portugal

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Reinforcement of capacity in existing lines	220 &150	2005/2006/2007	Increase in transmission capacities of existing lines
Paraimo substation 400/220 kV	400/220	2006	400/220 kV substation
Line Pego Batalha	400	2006	81 km single circuit
Line Valdigem-Bodiosa-Paraimo	400(220)	2006/2007	120 km single circuit
D. Internacional substation	(400/)220	2008	400/220 kV substation, initially with only 220 kV
Line Valdigem-D. Internacional -Aldeadavila	400	2009	95 km single circuit
Line Valdigem-Recarei	400	2009	66 km double circuit

All the new elements mentioned above will have a positive influence in the interconnection capacities. Nevertheless, there are a lot of other reinforcements in the network, with less relevant impact in interconnection capacities

Italy

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Trino-Lacchiarella	380kV	M/L	Single circuit line
Turbigo – Rho	380kV	2006	Single circuit line
Voghera _ la Casella	380kV	S/M	Single circuit line
Udine – Redipuglia	380kV	2006	Single circuit line
Cordignano – Lienz	380kV	M/L	Single circuit line
Venezia Nord – Cordig.	380kV	M/L	Single circuit line
Udine – Okroglo	380kV	M/L	Double circui line
Redipuglia Padriciano	380kV 220kV	S/M	PST
Sorgente-Rizziconi	380kV	2006	Second AC link
Sardegna – Continente	380kV	2008	AC plus DC line
Matera – S. Sofia	380kV	M/L	Single circuit line
Piossasco – Grand'lle	380kV	M/L	Single circuit line
La Casella_S.Rocco	380kV	M/L	Single circuit line
Substations	380-220 kV	S/L	New Substations
Lines	380-220 kV	S/L	1430 Km of total lenght
Transformers	380-220 kV	S/L	13 GVA of total power

JIEL and Greece

Greece

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**	**Comments, Impact on the interconnections and on congestions (increasing the NTC, by reducing or increasing constraints, by decreasing congestion costs, …)**
EHT LAGADA	400KV	2007	3 bars, 400kv	
EHT N.SANTA	400KV	2007	3 bars, 400kv	
EHT KORINTHOS	400KV	2008	3 bars, 400kv	
EHT LAMIA	400KV	2010	3 bars, 400kv	
LINE MELITI - BITOLA	400KV	undefined	UPGRADE TO 400KV	
LINE PHILIPPI-TURKEY	400KV	2007	DOUBLE CIRCUIT AC LINE, 208 KM	
LINE AMYDAIO-PHILIPPI	400KV	2007	DOUBLE CIRCUIT AC LINE, 101 KM	
LINE KOUMOUNDOUROU - KORINTHOS	400KV	2008	DOUBLE CIRCUIT AC LINE, 72 KM	
LINE TRIKALA –AG. DIMITRIOS	400KV	2011	DOUBLE CIRCUIT AC LINE, 127 KM	

The new tie lines and the upgrade of the existing ones will increase the total NTC value. The reinforcement of the 150kv grid, the installation of capacitors and other devices will have a positive impact on the system security.

Some of these new commissionings or upgradings are part of the scheduled extension of the 400kv grid to the southern part of the country and the reinforcement of the 150kv grid in Peloponnese and in Eastern Macedonia and Thrace.

Serbia and Montenegro

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Subotica 3-Sombor 3	400 kV	2005/2006	Single circuit AC line, length of app. 40 km
Sombor 3-S.Mitrovica	400 kV	2010	Single circuit AC line, length of app. 90 km
SS 400/110 kV Jagodina 4	400 kV	2006/2007	2x300 MVA
SS 400/110 kV Sombor 3	400 kV	2007/2008	2x300 MVA
SS 400/110 kV Beograd 20	400 kV	2006/2007	2x300 MVA
Podgorica(SCG)-Tirana(AL)-Elbasan(AL)	400 kV	End of 2007	Single circuit AC line, length of app. 198 km
Nis(SCG)-Skopje(FYROM)	400 kV	End of 2009	Single circuit AC line, length of app. 195 km
S.Mitrovica(SCG)-Ugljevik(BA)	400 kV	End of 2005	Single circuit AC line, length of app. 70 km
SS 400/110 kV Leskovac	400 kV	End of 2009	1x300 MVA
SS 400/110 kV Vranje	400 kV	End of 2013	1x300 MVA
Sombor(SCG)-Pecs(HU)	400 kV	End of 2010	Single circuit AC line, length of app. 70 km

Macedonia

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Bitola(MK)- Florina(GR)	400	2006	40 km, 1420 MVA
Stip(MK) – C.Mogila(BG)	400	2007	150 km, 1420 MVA
Skopje(MK) – Nis(SCG)	400	2008-2010	195 km, 1420 MVA
Bitola(MK) – Vlore (Al) + DC link to Italy	400	2010-2015	230+80 km, 1000 MVA

These new lines will have a direct impact on the interconnections: The NTC will increase, the constraints will be reduced, there will not be congestions on the interconnections between Macedonia and the neighbours.

Macedonia is an importing country, so new generation capacities are required

ETSO congestion management method is in function in the region.

Centrel

Poland

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Line Tarnow_Krosno	400 kV	(planned)2005	Single, AC
Line Olsztyn_ Matki	220kV	(planned)2006	Single, AC
Line Ostrow_Plewiska	400kV	(planned)2006	Single, AC
Line Ostrow_Rogowiec; Ostrow_Trebaczew	400 kV	(planned)2008	Double, AC

These commissionnings increased operational flexibility of substation Krosno after connection of the line from Tarnów.

During 2005 PSE – Operator together with TSOs of its neighbouring transmission systems introduced common coordinated auction procedure. In auction process TSOs allocate available transmission capacity on profiles PSE-CEPS-SEPS-VET to market participants.
Further improvements to the auctions system are foreseen and under development.

Hungary

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Győr-Szombathely	400 kV	2006-2007	Double circuit, AC line
Szombathely-Hévíz	400 kV	2008-2010	Double circuit, AC line
Békéscsaba-Nadab (Oradea) (RO)	400 kV	2008	Double circuit, AC line
Győr-Szombathely	400 kV	2006-2007	Double circuit, AC line

Czech Republic

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
2nd line Slavetice – Durnrohr V438	400 kV	2007	on the common towers with the existing line V437
the line V454 Cechy Stred – Bezdecin	400 kV	2008	on the common towers with the 220 kV line V209

Slovak-Republic

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
Lemesany - Moldava	400 kV	2010	double circuit line
Krizovany - reconstruction, 400/110 kV transformation	400 kV	2010	
Lemesany - reconstruction, 400/110 kV transformation	400 kV	2007	
Medzibrod - 400/110 kV, with line to substation Medzibrod	400 kV	2010	double circuit line
Gabcikovo - V. Dur	400 kV	2013	double circuit line
Lemesany - Vola - V. Kapusany - Ukraine (border)	400 kV	2013	double circuit line
International line to Austria (border)	400 kV	2012	double circuit line

Varin - reconstruction, transformer, compensation	400 kV	2010	
Senica - upgrading to 400 kV, transformer	400 kV	2012	
Varin - Byczyna (PL)	400 kV	2020*	double circuit line
Moldava or Rimavska Sobota - Sajoivanka (HU)	400 kV	2011**	double circuit line

* - only proposal of the SEPS, without final standpoint from PSE,SA (Poland). The project could be conditioned by realisation of the potential new power sources in northern part of Slovak Republic

** - commisioning date is informative only. The main precondition for the realisation of this line is real future operation of the line Lemesany - Moldava

Above-mentioned projects will have positive impact on the NTC and on operation of the power system (quality and reliability of supply).

Based on information from operational section, SEPS will continue with replacement of all old equipments in line with short and long term development plans.

Romania and Bulgaria

Romania

Line or Equipment name	Voltage Level	Commissioning Date	Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)
OHL Gutinas - Bacau upgrading of line operation from 220 kV to 400 kV	400 kV	2006	55 km, single circuit, AC line
Bacau – Roman upgrading of line operation from 220 kV to 400 kV	400 kV	2006	59 km, single circuit, AC line
Roman – Suceava upgrading of the line operation from 220 kV to 400 kV	400 KV	2006	99 km, single circuit, AC line
OHL Oradea - Nadab	400 kV	2007	85 km, single circuit, AC line
OHL Nadab (RO) – Bekescsaba (HU)	400 kV	2007	30 km, double circuit, AC line
OHL Nadab – Arad	400 kV	2007	30 km, single circuit, AC line
OHL Portile de Fier II - Cetate	220 kV	2008	30 km, double circuit, AC line
OHL Suceava (RO) – Balti (MO)	400 kV	2009	150 km, single circuit, AC line
OHL Suceava – Gadalin	400 kV	2010	260 km, single circuit, AC line
OHL Portile de Fier I – Resita	400 kV	2010	117 km, single circuit, AC line
OHL Resita – Timisoara (actually operating al 220 kV, double circuit)	400 kV	2010	73 km, single circuit, AC line
OHL Timisoara - Arad (actually operating al 220 kV, double circuit)	400 kV	2010	54 km, single circuit, AC line
OHL Timisoara (RO) – Vârşeț (Serbia Montenegro)	400 kV	2010	~ 60 km, simple circuit, AC line

The direct impact of commissioning the new internal lines is practically the elimination of the internal congestions at the load forecast level.
The investments in new interconnection lines increase the Romanian transfer capacities of import with the main UCTE block.

The development of our nuclear generation capacities will require reinforcements in the transmission network.
The commisioning of the 3-rd generation unit in Cernavoda NPP require the commisioning of a new OHL 400 kV between Medgidia and Constanța or Medgidia and Isaccea.

The continuation of the nuclear program will also require new OHL but, since they will be most probably not be located in Cernavoda, this will be established according with the location of the generation units.

The congestion management is achieved by:

- Half year studies which recommend the network topology, meshing measures in the distribution network, automata measures and production constrains;
- The harmonization of annual, monthly, weekly maintenance programs of transmission lines and of production units;
- The harmonization of overhaul programs of significant lines with the interconnection partners;
- The calculation of borders (bilateral) NTCs coordinated in the Romanian interface that can be aggregated and used simultaneously without endangering the security of transmission grid.
- The yearly and monthly allocation of transmission capacities only upto the limit imposed by NTC; The allocation is based on bilateral conventions with interconnection partners; The. Romanian part allocates 50% of ATC by explicit auctions;
- TEL participation at UCTE DACF (day ahead congestion forecast) including exchange of forecasted models and N-1 verification in the D-1 day for the D day; detecting congestions; providing measures (meshing / unmeshing in the distribution grid, commissioning and automata logic) and system constraints (maximum/minimum production for some zones).
- The congestion is managed on the Balancing market. Using this mechanism, we pay the price of congestion at the more economically and technically suitable units. An offer is submitted for each unit and if we need this unit, we must pay the amount of the offer.

Bulgaria

Line or Equipment name	**Voltage Level**	**Commissioning Date**	**Main Characteristics (single or double circuit line, length, AC lines or DC lines, …)**
Chevena mogila – Dubrovo (MK)	400 kV	2008	AC single circuit line

APPENDIX D: Exceptional trends, deregulation of the market and impact on forecasts

D-1. Exceptional trends

In several countries (Germany, Italy, France, Slovenia, Poland…) there is a governmental support to renewable sources, consistent with European environmental goals. Consequently, renewable sources and combined heat/power plants form a considerable part of new generating capacity in the UCTE.

Some significant information should be retained:

Austria : Serious congestions in the Austrian network occure on the three 220kV lines from the north to the south of Austria. Since 2001 the N-1 criterion was repeatetly violated especially in the winter season during the night, although strong congestion management measures were taken.

As in the last years, also 2005 has been characterized up to now 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 resulted in congestions in the transmission grid of Verbund-APG. Verbund-APG had to take counter measures in order to reduce these congestions. At present this is done by redispatching of power plants (including restrictions for pumping) and special switching in network operation.

Due to the decommissioning of another thermal power plant in the south by mid 2006 and the further increase of wind power and biomass-production in the north the above mentioned bottlenecks will become even more critical.

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, additional congestion management measures will have to be taken. In this context the installation of three phase-shifting transformers is planned by the end of 2006. This measure will allow 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.

Greece: The Greek Government in close cooperation with the bodies involved in energy matters issued Laws, legislative decrees and new power exchange and grid codes in order to comply with the corresponding EU directives concerning the electricity market deregulation, the reduction of the emissions, the promotion of RES. The new legislation, the new electricity market, and the liberalisation of the trade of natural gas will give incentives to those who are really interested in investing in the electricity sector.

The new grid and power exchange code is coming into force gradually resulting in important changes as far as the electricity market is concerned.

The introduction of the new code mainly includes:

1. A Day Ahead Market and in the future a market for reserves
2. A full reconsideration concerning the market prices, methods of calculation, North – South market splitting in heavy load periods
3. Fundamental changes concerning the definitions of the imbalances.
4. Introduction of a capacity availability market via the trade of capacity certificates issued by the generators and held by the suppliers, to promote the construction of new power plants. The HTSO is the operator of the capacity availability market.

Germany: The law concerning the primacy of renewable energies and the Co-generation Act for CHP (combined heat production), decided three years ago, entail an increased development of wind power and the obligation to guarantee network access and feed-in of power generated from renewable energy sources at any time, and to secure the production of existing co-generation plants. The consensus achieved about the remaining life of nuclear power stations has led to additional effects as results of the scheduled shutdown of nuclear plants over the period covered by this year's forecast.

The Netherlands: The joint TSO-auction of the cross-border transmission capacity serves well to manage eventual cross-border congestion by forehand
The Dutch Government imposed a stimulation program for renewable by subsidising and certification of renewables.

Poland: New “Energy Policy for Poland until 2025” was adopted in January 2005. It specifies main aims of the energy policy including provision of the national energy security, increase in competitiveness of the economy and its energy efficiency, and environment protection. This document mentions a nuclear option for Poland as possible after 2020 due to the requirements of the energy diversification and limitations in the greenhouse gas emissions.
Draft law on the national long-term supply contracts is still under legislation process in Poland and is expected to have final approval by the European Commission.
Issue of the year 2008 relating to the stringent ecological limits on pollutants emissions implicates larger investment needs in the new or modernised power generation sources.

Romania: *To promote generation based on renewable sources, starting with 2005 Romania introduced a new mechanism according to the suppliers are committed to purchase a certain quota from renewable energies with purpose to sell it to their own consumers. In other words all suppliers must buy a certain number of Green Certificates consist in this mandatory quota from renewable energies. Green Certificates are pricing based on market mechanisms: either bilateral contracts concluded between producers and suppliers or centralized market operated by Romanian Electricity Market Operator.*
The mandatory quotas established by Romanian Energy Regulatory Authority addressing mainly small hydro power plants (<10 MW, built or refurbished in 2004 and later), biomass and wind are shown hereafter:

Quota [%]	Year
0,7	2005
1,4	2006
2,2	2007
2,9	2008
3,6	2009
4,3	2010

To be in line with the target intended by Romania in its effort to adhere to EU, the quotas from renewable energies (including not only above mentioned but also all hydro power plants) represent about 30% from gross domestic consumption for 2010.
It’s expected that the above-mentioned quotas will be changed[1].

Slovak Republic: Slovenska elektrizacna prenosova sustava, a.s. - SEPS, a.s. mission is to ensure electricity transmission from the main producers, as well as electricity imports, exports, and transits via the Slovak territory.

The new energy legislation package (The Energy Act, the Heat Act and the Regulation Act) is valid from on 1st of January 2005. In consequence a consecutive secondary legislation is developed at the present. New documents for electricity transmission system operation and for new definition relationship between SEPS, a.s and other market players are prepared now too.

Operation licences issuing, regulatory framework approval, electricity prices and tariffs approvals as well as cross-border capacity allocation methods approval become among main responsibilities of the Regulatory Authority.

The Energy Act redefined competences of individual decision makers. Responsibilities of the Ministry of Economy are namely authorisation to build new capacities and to release decree on technical rules for access to the grid and secure system operation.

With regard to the new energy legal framework adopted till now, SEPS, a.s. will implement all new legal rules to the following documents and publish them on its website site www.sepsas.sk :

- Grid Code
- Dispatch Order for Control of the Power system of the Slovak Republic
- Commercial conditions of SEPS, a.s.

New Governmental Decision on Energy Market Rules was approved upon Regulatory Authority proposal in April 2005. These rules will be being consequently incorporated into Commercial conditions of SEPS, a.s. On-coming Grid Code and Dispatch Order for Control of the Slovak Power system are amended in accordance with UCTE Operation Handbook in 2005.

In compliance with the new Energy Act Ministry of Economy will adopt new Energy Policy of the Slovak Republic at the end of 2005. This Energy Policy will lay stress on the energy saving, security of supply and environment protection.

D-2. Deregulation of the market and impact on forecasts

The status of electricity market deregulation is not homogeneous over the UCTE countries.

Some significant information should be retained:

Germany: As a result of unbundling (required by law) between generation, transmission and distribution, the flow of information concerning power balance data has been interrupted to a large extent between TSOs and power station operators. Individual items of the power balance have been based on model calculations and estimations of TSOs for their respective control area. The German power balance values are obtained as aggregate value by adding up the individual values of TSOs concerned. In order to obtain a realistic representation of renewable energies, the German data on the UCTE power balance forecast 2005-2015 comprise estimated and forecast values of TSOs for plants < 1 MW, which were largely not included in the German power balance data dating back more than 5 years. This means that the large coherence of data about the generating capacity and peak load with official statistics does not longer exist, as plants < 1 MW were not (or only insufficiently) taken into consideration by these statistics. This should be noted when making comparisons with former power balances.

Greece: The new legislation affecting the electricity market deregulation (new grid and power exchange code, liberalisation of the trade of natural gas, policies promoting the RES) is expected to give a real boost concerning the function of the electricity market and the investments in the electricity sector. This trend has an impact in this forecast especially in scenarios concerning the years after 2010 when the new market will be fully in function, most of the planned developments and reinforcements of the transmission system will have been realised, hoping that the market participants who already have expressed a real interest in investing will construct their units.
For the years 2006-2008 most of the power units scheduled for commissioning are already under construction while those scheduled for commissioning after 2008 will participate in tendering procedures. The new power units included in this forecast, scheduled for commissioning after 2008 are generation authorization holders, and they have been taken into account in our long-term plan for transmission system development. Nevertheless, the actual amount of installed capacity necessary to cover the lack of energy for the coming years will be gradually determined and the power units will participate in tendering procedures with the obligation to get ready for commissioning before the specified deadlines. According to the Law the most recent tendering procedures will require installed capacity of 900 MW with possible extension to 1300MW.

The Netherlands: Tennet only observes market-transactions and it's problematic to become adequate information from market players about the actual and future power plant availability. To overcome this lack of information we are bettering in co-operation with the government a plant-availability monitoring system.

Macedonia: The Macedonian power sector have been under the responsibility of the electric utility “Elektrostopanstvo na Makedonija-ESM”, a vertically integrated state-owned company which has monopoly over all significant functions in the sector (up to 31st December 2004). Electricity sector is undergoing restructuring in order to increase the efficiency and respond to the EU Directives. After the unbundling of ESM, there are 2 separate companies:

- MEPSO - system operator, grid owner and market and market operator, joint stock state-owned company
- ESM – company that will hold the rest of former ESM assets and deal with generation and distribution.

The principal responsibility for policy-making and governance in the electricity sector rests with Ministry of Economy. The Energy law (September 1997) amended later, defines the legal framework of the energy sector. In December 2002, the Energy Law was modified in order to establish a Regulatory Commission for Energy of Republic of Macedonia – ERC.
The ERC regulates the whole energy sector and have to promote the competitive energy market. ERC establishes the prices and tariff systems according prescribed methodology, gives licences for performing activities in energy sector, protects energy users rights and participates in disputes settlement.

These all activities are according to the European Directive and decisions of the Athens Forum (REM) – to have an open market in the whole region till 2015.

Switzerland: A draft of a new law for the opening of the Swiss electricity market is available and the discussion between the concerned parties will start in autumn 2005.

Poland: the Polish government in June 2005 adopted the new state's ownership policy programme in relation to the power sector in Poland. Further consolidation of generation and distribution companies is under way.
With the aim of the full implementation of the new IEM Directive, the amendments to the Polish Energy Law, adopting the Act to the requirements of the Directive 2003/54/EC and EC Regulation 1228/2003 were adopted on 4 March 2005. The main legal changes include: introduction of a supplier of last resort and universal service, increase in the regulator's tasks, unbundling provisions for the system operators, including compliance programme. The aim of these amendments was to make further convergence and harmonisation of the Polish market rules with the EU model.

On 1 July 2004 a company PSE-Operator SA commenced its activities as a Polish Transmission System Operator on the basis of its transmission licence and by taking over the obligations in this respect from the Polskie Sieci Elektroenergetyczne SA. PSE-Operator SA has been established within the structures of the PSE SA holding as a legally unbundled company, according to requirements of the Directive 2003/54/EC.

Romania: Since the July 1st , 2005 a new framework to trade electricity is in operation.
First of all, there is a bilateral contracts market comprising both regulated contracts concluded by the producers with the suppliers of captive consumers and contracts negotiated by signatory parties.
Apart from this, the electricity can be traded through a centralized spot market that offers the possibility to balance the contractual commitments one day before the delivery day. This voluntary market is operating in conditions of competitiveness, transparency and equidistance and it aims to provide the reference price for other electricity commercial transactions.
Since the July 1st, 2005 a mandatory balancing market and an ancillary services market are opened which meet the needs of the TSO and distribution network operators[1].
In the new market mechanism there is the possibility to have a bilateral contract without regulation. This contract is simply signed between two producers / suppliers and must only be notified to the TSO for scheduling purposes. We have a voluntary power exchange and a mandatory balancing market. On this last one, every producer / supplier will buy / sell theirs imbalances. The mechanism to calculate the imbalance is quite complex; it uses the day ahead schedules and month after metering information.

Slovak Republic: Due to its geographic location the Slovak Republic is significantly involved in electricity transits, especially in the north-south direction (from Poland to Hungary), as well as in east- west direction.

Existing 400 and 220 kV connections with the Czech Republic, Hungary, Poland and Ukraine are fully loaded with electricity exchanges among the states mentioned above and have a significant share in electricity marketing in the Central and South -European region.

On all cross-border profiles the auction or allocation mechanism is used for cross-border transmission capacities allocation. The yearly auctions and periodical monthly auctions were realized in 2005. Daily auctions are already realised for the CEPS/SEPS profile. For Ukrainian profile (from March 2005) and for Polish profile (from April 2005) daily allocation mechanism is implemented.
In 2005 SEPS, a.s. as a full member of ETSO participates in CBT mechanism.

The table below gives the information about the opening degree (eligibility for consumers) in electricity markets in UCTE countries:

Country	**Date of beginning of deregulation process**	**1st threshold**	**2nd threshold**	**other threshold**
Belgium	Electricity Law of April 29nd 1999 Flemish Electricity Decree of 17 July 2000 Brussels Electricity Decree of 19 July 2001 Walloon Electricity Decree of 12 April 2001	January 1st, 2001 **Federal :** All high-voltage customers > 20 GWh January 1st, 2002 **Flemish Region** : All high-voltage customers > 1 GWh November 27nd, 2001 **Brussels-Capital Region**: All high-voltage customers > 20 GWh October 4nd, 2001 **Walloon Region**: All high-voltage customers > 20 GWh	January 1st, 2003 **Federal :** All high-voltage customers > 10 GWh January 1st, 2003 **Flemish Region** : power for connection purposes **=** 56 kVA January 1st, 2003 **Brussels-Capital Region**: All high-voltage customers > 10 GWh January 1st, 2003 **Walloon Region**: All high-voltage customers **=**10 GWh	July 1st, 2004 **Federal :** All final customers connected to a transmission network July 1st, 2003 **Flemish Region** : All customers July 1st, 2004 **Brussels-Capital Region**: All professional customers July 1st, 2007 **Brussels-Capital Region**: All customers July 1st, 2004 **Walloon Region**: All professional customers January 1st, 2007 **Walloon Region**: All customers
Germany	Law, dated April 25th, 1998	100 %	100 %	100 %
Spain	Electricity Act November 27th 1997	January 1st 1998, consumers > 15 GWh/year (i.e. market opening of 27 %)	January 1st 1999, consumers > 5 GWh/year (i.e. market opening of 33 %)	April 1st 1999, consumers > 3 GWh/year (i.e. market opening of 37 %) July 1st 1999, consumers > 2 GWh/year (i.e. market opening of 39 %) October 1st 1999, consumers > 1 GWh/year (i.e. market opening of 42 %) July 1st, 2000, consumers connected to > 1 kV networks (i.e. market opening of 54 %) January 1st, 2003, all consumers (100 %)

France[12]	Law 2000-108 February 10th, 2000	By February 2000: 16 GWh/year/site (i.e. market opening of about 30 %)	By February 2003 at the latest: 7 GWh/year/site (i.e. market opening of about 35 %)	1st of July 2004: all customers excepted residential
Greece	Law 2773/99 February 2001	By February 2001, HV/MV consumers (market opening of about 34 %)	1.7.2004: all consumers connected to the mainland interconnected system other than householders	1.7.2007: all consumers connected to the mainland interconnected system
Italy	Law 1999-79 March 16th, 1999	By January 1st 2000: 20 GWh/year/site (i.e. market opening of about 25 %)	By January 1st 2002: 9 GWh/year/site (i.e. market opening of about 38 %)	By January 1st 2003 : 0,1 GWh/year/site
Slovenia	Date of the beginning of deregulation is October 1999 with the Energy Law. On January 2003 the electricity market will be opened up to 60%.			
Luxembourg	Law July 24th, 2000	By February 19th, 1999: Consumers > 100 GWh and Distributors > 800 GWh By January 1st, 2001: Consumers > 20 GWh and Distributors > 800 GWh	By January 1st, 2003: Consumers > 9 GWh and Distributors > 90 GWh	By July 1st 2004: all non-household consumers. By July 1st 2008 all the consumers
Netherlands	Electricity Law, July 1998	By January 1999, big consumers > 2 MW (i.e. market opening of about 30 %)	By January 2002, 35 kW < middle consumers < 2 MW (i.e. market opening of about 35 %)	By July 2001, all consumers of certified green energy (renewable sources), (relative small groups) By January 2004, all others consumers, households (i.e. market opening of about 35 %)
Austria	Electricity Act (ElWOG), 1998	Partial opening of the market	October 1st 2001 : 100% of the electricity market is liberalised (Amendment to the Electricity Act)	
Portugal	Law 213/98, September 15th, 1998	By January 1st 1999, consumers > 30 GWh (i.e. market opening of 27 %)	By January 1st 2000, consumers > 20 GWh (i.e. market opening of 29 %)	By January 1st 2001, consumers > 9 GWh (i.e. market opening of 33 %) By January 1st 2002, all consumers connected to > 1kV network (i.e. market opening of 44 %)
Switzerland	Not applicable	Not applicable	Not applicable	Not applicable
Czech	January 1st, 2002	Since January 2002,	Since January 2003,	-From 1st January 2004 : for all consumers with

12 The status of eligible customer is reviewed every two years.

Republic	Law 458/2000	consumers > 40 GWh/year/site	consumers > 9 GWh/year/site	continuous measurement (one-hour meter readings) of the electricity consumption (other than householders) -From 1st January 2006: for all consumers (other than householders) -From 1st January 2006 : for all consumers
Hungary	January 1st, 2003 Act of CX/2001 (Electricity Act)	From January 1st, 2003: consumers >= 6.5 GWh (33-35 % of total consumption)	Will be decided according to the accession to EU and experiences gained	
Poland	Energy Law, April 10th 1997	Till August 6th 1998, final consumers > 500 GWh/year (i.e. market opening of about 16 %)	From January 1st 1999, final consumers > 100 GWh/year (i.e. market opening of about 28 %)	From January 1st 2000, final consumers > 40 GWh/year (i.e. market opening of about 33 %) From January 1st 2002, final consumers > 10 GWh/year (i.e. market opening of about 40 %) From January 1st 2004, final consumers > 1 GWh/year (i.e. market opening of about 46 %) From December 5th 2006, all consumers (i.e. market opening of 100 %)
Slovak Republic	January 1st 2002, Edict No. 562/2001 to the Energy Law No. 70/1998, this was replaced by Edict No. 548/2002 and 549/2002	Since January 2002: consumers > 100 GWh/year	From January 2003 on: consumers > 40 GWh/year	From January 2004 on: consumers > 20 GWh/year from January 2006 on: consumers > 0 GWh/year ; all consumers except household
Romania	Government Emergency Ordinance no. 68/1998; in July 2003 the Romanian Parliament adopted a comprehensive Energy Law (no 318/2003) including all former changes	Government decision (GD) no. 122/2000: competitive market up to 10%	GD no. 982/2000 : competitive market up to 15% GD no. 1272/2001: competitive market up to 25% GD no. 48/31.01.2002: competitive market up to 33%	The market will open at 40% by the end of 2003, at 80% by 2006 and 100% by 2008.

D-3. Other Remarks

Germany: At the end of June, the German legislative assemblies Bundestag (Parliament) and Bundesrat (Federal Council) agreed on a revised Energy Industry Act that came into force on 13 July 2005. One year after the original deadline determined in the EU Electricity Directive of 2003, a regulation authority has been installed. Its main task will be to ensure transparent and non-discriminatory access to the grid system to all market players. The subsequent regulations on grid fees and grid access were also passed in July. All grid fees will have to be examined and approved by the regulatory authority beforehand (so-called ex-ante regulation). Future regulation through incentives will be developed during the coming year 2006. It is to encourage grid operators to increase efficiency; savings are to be passed on to customers. Regulation competences have been shared among federal and regional regulatory authorities. The former will be responsible for major grid operators, the latter for smaller distribution companies with less than 100,000 customers.

The Netherlands : The given values of the Netherlands cover the total generation in the country and are no longer limited to values of power connected to the HV-grid.

Poland: Under EC Regulation 1228/2003 the system of coordinated auctions was agreed with the neighbours at the end of 2004, modifying the previous cross-border capacity allocation system.
The current coordinated congestion management mechanism is designed as explicit cross-border co-ordinated capacity auction on the borders of Poland, Germany, Czech Republic ans Slovakia to be valid in the year 2005 on the basis of the principles agreed with the neighbouring 5 TSOs. Further improvements to the auction system are foreseen and under development.

Romania: Licensed producers that own generating units on renewables or in cogeneration may ask qualification for priority production. In the case of dispatching cogeneration production units, this qualification offers several rights, such as:

- Signing contracts for available power at TSO disposal;
- Considering some priority productions in dispatching and in selecting offers on the balancing market.

On the Centralized Market for Allocating International Interconnection Capacity the allocation is realized through auctions for import and export. The auctions are organized for monthly and yearly periods and for each auction period, for each border and for each direction (import and export). The respective determined and agreed NTC values are published on the website.

The Green Certificate Market, which is opening in 2005, will assure the function of the obliged quotations for suppliers to promote energy from renewable sources. The value of the green certificates represent a supplementary profit received by the producers for “clean energy” which they deliver in the network. The energy price is determined on the energy market. The supplementary price received for sold green certificates is established on a parallel market, where are traded the benefits to the environment.

During 2006-2008 period, a generation capacity mechanism will be implemented and it will come into commercial operation as availability contracts. The capacity payments would only be made for available capacities. In contrast to reserve contracts, capacity payments are meant to ensure that sufficient capacity is available to the wholesale market. The capacity remuneration schemes normally pay for installed capacity available “today” in order to provide long-term signals for investing in new capacity required “tomorrow”. The capacity remuneration mechanism should support (or at least nor interfere with) the competitive market and promote efficiency.

Slovak Republic: The Energy Act (Act. No. 656/2004) and Regulation Act (Act. No. 658/2004) reflect relevant EU Directives to the full extent. These acts were coming into force on 1st of January 2005.

According to the new Energy Act since 1st of January 2005 electricity market is opened for all customers except households. Households become eligible customers since 1st July 2007 (in compliance with Directive 2003/54/EC).

Since 1st January 2005 price of basic electricity is deregulated (except for households). Ancillary services prices are and will be further regulated.

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