
# UCTE POWER BALANCE FORECASTS 2002 - 2004

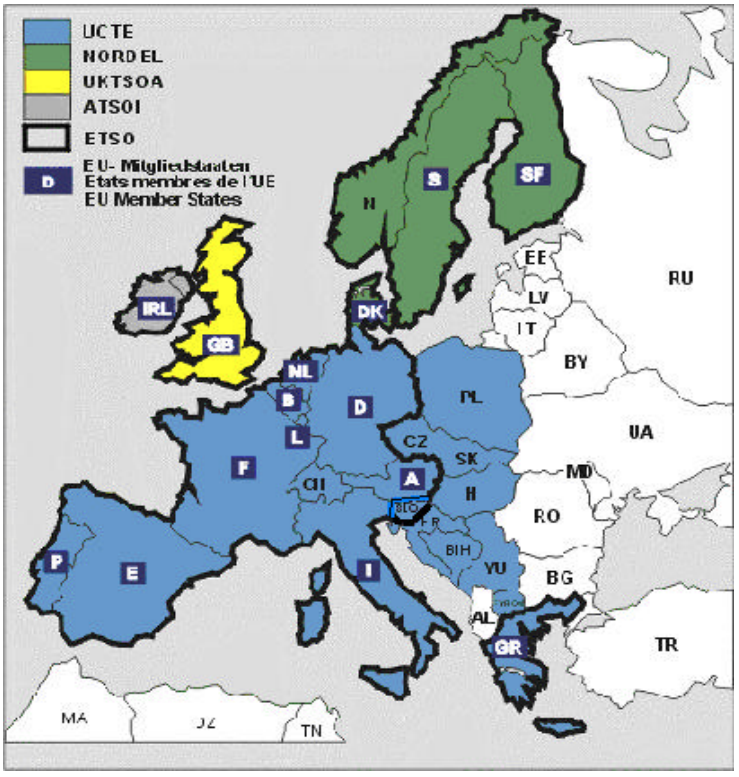
**Union for the Co-ordination of Transmission of Electricity**
**February 1st, 2002**

## What is the UCTE ?

The Union for the Co-ordination of Transmission of Electricity (UCTE) co-ordinates the interests of transmission system operators in 20 European countries. Their common objective is to guarantee 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, 400 million people are supplied with electric energy; annual electricity consumption totals approx. 2100 TWh.
As of July 2001, in accordance with the new Articles of Association, the member companies of the UCTE come from the following countries :

| | | | |
|---|---|---|---|
| **B** | Belgium | **BiH** | Bosnia-Herzegovina |
| **D** | Germany | **L** | Luxembourg |
| **E** | Spain | **NL** | The Netherlands |
| **F** | France | **A** | Austria |
| **GR** | Greece | **P** | Portugal |
| **I** | Italy | **CH** | Switzerland |
| **SLO** | Slovenia | **CZ** | Czech Republic |
| **HR** | Croatia | **H** | Hungary |
| **YU** | Federal Republic of Yugoslavia | **PL** | Poland |
| **FYROM** | Former Yugoslav Republic of Macedonia | **SK** | Slovakia |

With regard to the other members of the ETSO (European Transmission System Operators, 35 Transmission System Operators in 17 countries), the geographical extension of UCTE is represented in the picture below :




### Optimum co-operation requires joint action

Close co-operation of member companies is imperative to make the best possible use of benefits 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 in the future to set standards in terms of security and reliability as in the past.

### The UCTE – Security of electric power supply and promotion of competition

From the very outset of liberalisation 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 liberalisation 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.

# UCTE Power Balance forecasts 2002 - 2004

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## Executive summary

### Comparison with the previous forecasts

To identify developing trends in the UCTE, it is useful to compare the results of this forecast with those of the forecast completed in 2000. This can be applied to the years 2002 and 2003.

This year's load forecasts for 2002 and 2003 show a decrease of approximately 6 GW in January and 3 GW in July in comparison with the forecasts carried out last year.

Guaranteed capacity values for January 2002 and 2003 show a decrease of 6 GW and 8 GW, respectively, compared to the forecasts carried out last year. Concerning July, the decrease is 6 GW for 2002 and 10 GW for 2003.

**As far as the remaining capacity is concerned, estimated values decrease approximately by 1-2 GW.**

### System security and operation

**In this year's forecasts, the expected remaining capacity stays substantially stable over the period from 2002 to 2004. This is a significant point for the UCTE system security.**

Remaining capacity in UCTE appears sufficient to ensure the system security: it represents approximately 9-10% of the generating capacity. As Figure A/1 and Figure A/3 show, the 5% "security criterion" (remaining capacity > 5% installed generating capacity) is generally respected in the UCTE countries.

Some countries like Belgium (from 2002), Germany (from 2002), Hungary (from 2004) and Italy (from 2002) do not reach this "security criterion". However, these countries consider that their national system security will not be at risk thanks to the use of interconnection capacity, new generating capacity and long-term import contracts and participation contracts in power plants located out of the national territory.
Indeed, if taking into account imports and exports is not relevant when analyzing the whole UCTE system, this is not the case when analyzing countries one by one.

**In fact, interconnection capacity does not seem to be an obstacle to both the UCTE whole system security and the security of the countries in terms of system adequacy.**

Nevertheless, in the new framework of the European electricity market, in addition to its contribution to system security, the interconnected network should also ensure the fluidity of the exchanges by an economic optimization of the European system, based on market mechanisms.

The actual interconnected networks are not completely designed for this function. **It is the reason why, even if networks seem well dimensioned to ensure system security, it cannot be excluded that, due to market phenomena, some congestion points could appear in the interconnected network.** These congestion points cannot be identified by comparing the exportable/importable capacity with the remaining capacity.

At last, it also should be retained, that this estimate is probably optimistic, since information available to TSOs on the commissioning of new facilities are more accurate than that available on decommissioning

## 1. Foreword

In the framework of the deregulation of the European electricity market, the UCTE Power Balance forecasts will be useful to Transmission System Operators (TSOs) for maintaining network security and promoting conditions for market operation.

The UCTE Power balance forecasts aim at:

- providing TSOs who cooperate within UCTE with a prospective view of supply reliability developments throughout the network;
- providing all European electricity market players with an overall view on system load evolution, as well as on the resources available to satisfy the system load.

In response to developments in the European electricity market, UCTE introduced in 2000 fundamental methodology changes in the preparation of the Power balance forecasts. It has been necessary to adapt the applied methodology to take the conditions to obtain the requisite data into account. The methodology for the 2001 Report remains the same. In the light of competition, the entry of new players on the market, the creation of electricity power exchanges and new contractual relationships with customers, it will no longer be possible to obtain certain data regarding the management of generating facilities or future contractual exchanges, with the same precision as in the past.

Moreover, some recently established TSOs, and those who still have to be established, will not have access yet to all the information to which they are entitled.

TSOs are no longer able to obtain exchange forecasts reliable enough for the completion of the three-year power balance forecast. Consequently, it has been decided to carry out the power balance without taking into account imports/exports.
Therefore the methodology is based upon the data available to TSOs. For more details about the methodology, the reader can also refer to the document ”Methodology of the Power Balance” (April 2000) available on the UCTE web site (www.ucte.org).

A comparison is drawn between the load and the guaranteed generating capacity of 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).

The resulting balance will represent, if positive, a potential capacity for exports or, if negative, a potential need for imports. This balance will then be compared with the Net Transfer Capacity at the borders of the country concerned, as calculated by ETSO or estimated by the TSOs.

The Power Balance forecasts are based on national data available from TSOs correspondent; the first analysis consists in highlighting the capacity of each country to cover its interior load with the available national capacity (remaining capacity). Nevertheless, this approach must be supplemented by the analysis on the role which the interconnected network plays in terms of system security.

Because the 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.

For this year’s UCTE Power Balance, we have introduced into the questionnaire some complementary questions aiming at identifying particular trends of development (e.g. increasing interest in renewable sources) and changes of the institutional context (features or regulatory mechanisms designed to promote new generation, new interconnections or to increase demand elasticity, …) where TSOs operate. In order to understand the relevance of very long term forecasts of capacity adequacy, it was also asked, for a time horizon longer than 3 years, if there would be an entity in charge of checking the system security for this time horizon.

## 2. Objective and Structure

This report contains forecasts of the UCTE power balance for the period from 2002 to 2004. The overall results of the forecasts are shown in Chapters 3 and 4 of the report.
This balance corresponds to the synchronous capacity of the entire UCTE network; the selected reference points are the third Wednesday of January and the third Wednesday of July at 11 a.m.. The 2002 - 2004 forecasts include the balances of the following countries and electricity systems:

| | | | |
|---|---|---|---|
| **B** | Belgium | **BiH** | Bosnia-Herzegovina |
| **D** | Germany | **L** | Luxembourg |
| **E** | Spain | **NL** | The Netherlands |
| **F** | France | **A** | Austria |
| **GR** | Greece | **P** | Portugal |
| **I** | Italy | **CH** | Switzerland |
| **SLO** | Slovenia | **CZ *** | Czech Republic |
| **HR** | Croatia | **H *** | Hungary |
| **YU** | Federal Republic of Yugoslavia | **PL *** | Poland |
| **FYROM** | Former Yugoslav Republic of Macedonia | **SK *** | Slovakia |

* CENTREL countries in last year's report

It should be noticed that the forecasts for 2002-2004 are based upon the assumption of normal climatic conditions.

Discrepancies in relation to other national statistics may result from the fact that, for the majority of countries, the UCTE power balance does not cover the total supplied capacity, but only the part involved in the synchronous operation of public electricity systems.

## 3. Main results of the power balance

The most significant overall results of the "Power Balance Forecasts 2002-2004" 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.
More detailed results of the power balance are presented in Table A / 1-1.

In Tables 1 and 2, data for national generating capacities and system load in 2002 - 2004 are compared with the results of the forecasts for 2001, established last year, and with the retrospect for 2000.
It may be noticed that the 44.7 GW increase in national generating capacity (in January, 42.7 GW in July) for the period from 2000 to 2004 is more significant than the increase in load (37.3 GW in January, 29 GW in July).

A significant growth of 17.8 GW in generating capacity is to be noticed over the period from January 2003 to July 2004 (for a total growth of 33.5 GW between January 2001 and July 2004).
Over the period from 2002 to 2004, the remaining capacity increases at a rate of approximately +2% per annum. This increase is more important between July 2003 and July 2004 (+2.5%), mainly due to a significant increase in generating capacity vs. less than 10 GW per annum between July 2001 and July 2003).

**A / 1-1** | **UCTE Power balance forecasts 2002-2004 on the 3rd Wednesday** | **Results in GW**

| | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|
| | January | July | January | July | January | July |
| **National generating capacity** | GW | GW | GW | GW | GW | GW |
| 1. Hydro power stations | 119.5 | 119.5 | 119.8 | 119.9 | 120.8 | 121.1 |
| 2. Nuclear power stations | 107.6 | 107.6 | 107.6 | 106.9 | 107.4 | 107.4 |
| 3. Conventional thermal power stations | 267.1 | 269.8 | 273.6 | 275.5 | 282.0 | 284.6 |
| 4. Renewable energy sources | 15.1 | 16.6 | 18.2 | 19.8 | 21.9 | 23.7 |
| 5. Not clearly identifable energy sources | 8.7 | 8.9 | 9.3 | 9.3 | 9.5 | 9.5 |
| **6. National generating capacity (6 = 1+2+3+4+5)** | **517.9** | **522.5** | **528.5** | **531.5** | **541.7** | **546.3** |
| 7. Non-usable capacity | 73.7 | 91.0 | 75.9 | 91.8 | 80.2 | 96.8 |
| 8. Overhauls (thermal power stations) | 10.7 | 41.0 | 10.1 | 41.3 | 11.0 | 41.8 |
| 9. Outages (thermal power stations) | 17.5 | 14.7 | 17.8 | 14.9 | 18.0 | 15.2 |
| 10. System services reserve | 28.7 | 27.5 | 29.4 | 28.3 | 29.8 | 28.7 |
| **11. Guaranteed capacity (11 = 6-(7+8+9+10))** | **387.3** | **348.3** | **395.4** | **355.3** | **402.8** | **363.9** |
| 12. Load | 337.2 | 293.8 | 344.7 | 300.8 | 351.0 | 307.5 |
| 13. Margin against monthly peak load | 22.6 | 15.7 | 23.0 | 16.0 | 22.9 | 16.3 |
| **14. Remaining capacity (14 = 11-12)** | **50.1** | **54.5** | **50.7** | **54.4** | **51.8** | **56.4** |
| **Transportable capacities** | | | | | | |
| 15. Importable capacity | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |
| 16. Exportable capacity | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. |

**Table 1** | **UCTE-Power balance, 2002- 2004 forecasts** | **Results in GW**

| | Situation | Forecast | Forecast | Forecast | Forecast |
|---|---|---|---|---|---|
| **Month** | **I/2000** | **I/2001** | **I/2002** | **I/2003** | **I/2004** |
| National generating capacity | 497.1 | 512.5 | 517.9 | 528.5 | 541.7 |
| Guaranteed capacity | 357.3 | 385.5 | 387.3 | 395.4 | 402.8 |
| Load at 11:00 a.m. | 312.2 | 333.7 | 337.2 | 344.7 | 351.0 |
| Remaining capacity | 45.1 | 51.8 | 50.1 | 50.7 | 51.8 |
| **Month** | **VII/2000** | **VII/2001** | **VII/2002** | **VII/2003** | **VII/2004** |
| National generating capacity | 503.3 | 515.1 | 522.5 | 531.5 | 546.3 |
| Guaranteed capacity | 343.4 | 345.8 | 348.3 | 355.3 | 363.9 |
| Load at 11:00 a.m. | 277.6 | 289.0 | 293.8 | 300.8 | 307.5 |
| Remaining capacity | 65.8 | 56.8 | 54.5 | 54.4 | 56.4 |

For the UCTE, the comparison with the situation in 2000 reveals an increase in national generating capacity of approximately 9% over the period from 2000 to 2004 (more than 2% per annum).

Over the period from January 2002 to January 2004, in terms of variation, the increase in generating capacity (+ 23.8 GW) can also be compared to the increase in guaranteed capacity (+ 15.5 GW): it can be noticed an availability ratio of 65%, lower than the availability ratio between generating capacity and guaranteed capacity (75%). This is partly due to the effect of new renewable energy generating capacity.
As far as the load is concerned, the growth is approximately 2.2% per annum over the same period. The

significant variation between 2000 and 2001 is mainly due to the climatic conditions (real for 2000 situation, normal for 2001 forecast).
Changes in load forecasts are very limited between 2001 and 2002.

Moreover, expected remaining capacity stays substantially stable over the period from 2001 to 2004. This is an important point concerning the security of the UCTE system. In fact, it is interesting to compare this capacity with both generating capacity and margin against monthly peak load (differences between synchronous peak load and sum of non synchronous peak loads). Remaining capacity can be interpreted as the capacity that the system needs to assure 5 % of installed capacity availability (approximately 25 GW) and, at the same time, the capacity necessary to cover the "margin against monthly peak load" (approximately 23 GW in winter, over the period from 2001 and 2004).

As several countries consider that power plant operators should maintain an additional reserve of approximately 5% of the national generating capacity to assure system security, it can be concluded that this condition is respected in the UCTE system as a whole (see also Figure A3). Belgium (from 2002), Germany (from 2002), Hungary (from 2004) and Italy (from 2002), do not reach this "security criterion".

However, these countries consider that system security will not be at risk thanks to the use of interconnection capacity, new generating capacity and long term import contracts and participation contracts in power plants located outside the national territory.
Indeed, if taking into account imports and exports is not relevant when analyzing the whole UCTE system, this is not the case when analyzing countries one by one.

Changes in generating capacity and load are shown in Table 2.

**Table 2** | **UCTE-Power balance, 2002 - 2004 forecasts** | **Results in GW**

| | **Forecast January** | |
|---|---|---|
| | Variation 2000 - 2004 GW | Variation 2000 - 2004 % |
| | **UCTE** | **UCTE** |
| National generating capacity | 44.6 | 9.0 |
| Guaranteed capacity | 45.5 | 12.7 |
| Load at 11:00 a.m. | 38.8 | 12.4 |
| Remaining capacity | 6.7 | 14.9 |
| | **Forecast July** | |
| | Variation 2000 - 2004 GW | Variation 2000 - 2004 % |
| | **UCTE** | **UCTE** |
| National generating capacity | 43.0 | 8.6 |
| Guaranteed capacity | 20.5 | 6.0 |
| Load at 11:00 a.m. | 29.9 | 10.8 |
| Remaining capacity | -9.4 | -14.3 |

It may be noticed that, over the period from 2000 to 2004, the variation in load in UCTE is faster than the growth in generating capacity, essentially due to the increase of load between the situation in 2000 and forecasts for 2001.
Over the period from January 2002 and January 2004, the expected variation of 4.6% in generating capacity is comparable to the expected variation of 4.1% in load.

## 4. Detailed analysis of the power balance elements

### National generating capacity

Changes in national generating capacity of UCTE countries are shown in Table 3. 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, conventional thermal, renewable, energy sources which cannot be reliably identified) can be available from members of the Working Group.

**Table 3** | **National generating capacity on the 3rd Wednesday[1]** | **Results in GW**

| | 2002 | | 2003 | | 2004 | | Variation 2002/2004 |
|---|---|---|---|---|---|---|---|
| | January | July | January | July | January | July | January |
| **Country** | GW | GW | GW | GW | GW | GW | % |
| B | 15.6 | 15.6 | 15.5 | 15.4 | 15.4 | 15.4 | -1.4 |
| D | 106.3 | 106.8 | 108.4 | 108.3 | 109.4 | 110.0 | 2.9 |
| E | 51.3 | 53.3 | 54.7 | 55.9 | 57.2 | 58.4 | 11.6 |
| F | 111.7 | 111.9 | 112.3 | 112.3 | 112.5 | 112.5 | 0.7 |
| GR | 9.7 | 10.3 | 10.4 | 10.5 | 11.0 | 11.2 | 13.7 |
| I | 77.8 | 78.7 | 81.1 | 82.6 | 87.1 | 89.3 | 12.0 |
| SLO | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 2.7 | 0.0 |
| HR | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 | 0.0 |
| JIEL System* | 10.6 | 10.6 | 10.6 | 10.6 | 10.6 | 10.6 | 0.0 |
| L | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 0.0 |
| NL | 19.5 | 19.5 | 19.6 | 19.6 | 20.2 | 20.2 | 4.0 |
| A** | 16.4 | 16.5 | 16.5 | 16.5 | 16.5 | 16.5 | 0.5 |
| P | 9.7 | 9.8 | 9.7 | 9.8 | 10.5 | 10.9 | 7.3 |
| CH | 17.3 | 17.3 | 17.4 | 17.4 | 17.5 | 17.5 | 1.1 |
| CZ | 15.2 | 15.2 | 15.2 | 15.2 | 16.1 | 16.1 | 5.9 |
| H | 7.7 | 7.7 | 7.7 | 7.7 | 7.8 | 7.8 | 1.8 |
| PL | 33.1 | 33.4 | 33.6 | 33.9 | 33.9 | 33.9 | 2.4 |
| SK | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | -0.4 |
| **UCTE** | **517.9** | **522.5** | **528.5** | **531.5** | **541.7** | **546.3** | **4.6** |

***** JIEL System = Federal Republic of Yugoslavia and Former Republic of Macedonia

** Reserves for the German control block are included in the installed generating capacity of Austrian hydro power stations

[1] 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 conventional thermal 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:
1.wind energy
2.photovoltaics/solar energy
3.geothermal energy
4.energy from biomass and waste (e. g. biogas, damp gas, municipal waste, industrial waste, wood and waste of wood)

A significant development can be noticed in several countries, especially Germany, Spain and Italy. Renewable energy power plants and conventional thermal power stations will play a key role:

- in Spain, renewable sources rise from 2,400 MW in January 2001 to 7,000 MW in December 2004 (of which, wind stations represent 85%). Over the same period, the Spanish conventional thermal capacity increases by more than 6,000 MW, due to the commissioning of 7 major power plants;

- in Germany, generating capacity shows a growth of 6,000 MW in renewable sources (of which, wind power represent about 95%), more than 1,000 MW in hydro power stations. Concerning conventional thermal power plants, decrease of about 3,000 MW is due to shutdown of several power stations (5 major plants), only partially compensated by the commissioning of new generating capacity (3 major plants);

- concerning Italy, conventional thermal generating capacity increases from 54,359 MW in January 2001 to 66,100 MW in December 2004. Renewables rise from about 1,000 MW in January 2001 to 3,600 MW in December 2004.

- In Luxembourg, by promoting a combined heat/power plant (385 MW) in autumn 2001, the government made a significant step towards the reduction of national dependency from imports.

Over the period from 2002 to 2004, the increases in generating capacity are mainly related to conventional thermal power plants (+ 18 GW, including 10 GW in Italy and 5 GW in Spain) and renewable energy power plants (+ 8.5 GW i.e. +50 % between 2002 and 2004).

In fact, with regard to the new power plants commissioning, the most significant trends concern renewable energy (promoted by regulatory mechanisms in several countries) and conventional power plants (essentially combined cycle power plants). Among renewable energies, wind power plants represent the most important part.

As far as the nuclear power is concerned, the main development will be the commissioning of the Temelin 2 nuclear power unit in 2004 in Czech Republic.

However, it should be noticed that, while forecasts on the commissioning of new capacity have to be established sufficiently in advance (often at least two or three year in advance) according to the requirements of TSOs (because of the conditions required for connection), the same principle does not apply to decommissioning. Decommissioning dates may sometimes be notified to TSOs only few months in advance. It is therefore possible that generating capacity may be over-estimated.

- As far as France is concerned, it should be retained that, due to the lack of exhaustive information about connection of new generating capacity to the MV networks, the generating capacity from renewable energy and combined heat/power plants is an estimation based on connection demands received by the TSO from power plant operators and on information available from distributors.

- Concerning Greece, the expected generating capacity from renewable power sources is estimated on the basis of the number of Authorisations that have been issued and of information coming from Investment Grants.

With regard to forecasts carried out in 2000, for 2002 and 2003, it should be noticed that forecasts for UCTE in 2000 were higher than new forecasts, both for 2002 (+3 GW) and 2003 (+6 GW in January, + 10 GW in July).

New forecasts for generating capacity in Italy are higher than the last forecasts for 2002 and different for 2003 (probably because of uncertainty related to the projects of new commissioning). Only Austria escapes from the general trend with higher forecasts in 2001.

**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 (cogeneration, irrigation, etc.), reserve power plants which are only scheduled under exceptional circumstances, unavailability due to cooling-water restrictions, etc..

| Table 4 | Non-usable capacity on the 3rd Wednesday | Results in GW |
|---|---|---|

| | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|
| | January | July | January | July | January | July |
| **Country** | GW | GW | GW | GW | GW | GW |
| B | 0.5 | 0.9 | 0.4 | 0.8 | 0.3 | 0.7 |
| D | 15.1 | 15.0 | 16.6 | 16.5 | 17.3 | 17.5 |
| E | 9.7 | 13.2 | 10.2 | 13.7 | 10.4 | 13.9 |
| F | 12. 9 | 22.4 | 12.8 | 22.5 | 13.0 | 22.7 |
| GR | 0.4 | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 |
| I | 18.3 | 19.7 | 19.2 | 19.8 | 21.0 | 22.2 |
| SLO | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.2 |
| HR | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| JIEL | 1.0 | 1.5 | 1.0 | 1.5 | 1.0 | 1.5 |
| L | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NL | 0.3 | 0.9 | 0.3 | 0.9 | 0.3 | 0.9 |
| A | 4.1 | 2.5 | 3.9 | 2.1 | 3.8 | 2.1 |
| P | 0.6 | 1.5 | 0.6 | 1.6 | 0.7 | 1.7 |
| CH | 4.0 | 2.5 | 4.1 | 2.5 | 4.2 | 2.5 |
| CZ | 1.8 | 1.8 | 1.3 | 1.3 | 1.8 | 1.8 |
| H | 0.8 | 1.3 | 0.9 | 1.5 | 1.4 | 1.9 |
| PL | 3.1 | 5.3 | 2.9 | 4.4 | 3.2 | 4.5 |
| SK | 1.0 | 2.0 | 1.1 | 2.2 | 1.2 | 2.3 |
| **UCTE** | **73.7** | **91.0** | **75.9** | **91.8** | **80.2** | **96.8** |

In UCTE, the non-usable capacity accounts for approximately 14.5% of generating capacity in winter and 17.5% of generating capacity in summer.
There are wide variations from country to country, with the non-usable capacity ranging from a few percent up to 25% of the generating capacity.
The highest values concern Slovakia, countries like Austria, Switzerland, Italy, Spain (where hydro is a relevant part of generating capacity) and France (especially for July because of limitations in combined heat/ power plants and hydroelectric constraints in summer).
Non-usable capacity shows an increase over the period covered by the forecasts (+6.5 GW in winter and +5.8 GW in summer).
The major contribution to this growth comes from countries in which the new commissioning of renewable energy, particularly wind power, and cogeneration is more significant. From 2002 to 2004, changes in non-usable capacity are more significant in countries where changes in generating capacity are remarkable: Italy, German and Spain.
In several countries, renewable sources are part of non-usable energy, because of the stochastic behavior of the wind. On an average, 75% of installed wind power capacity ( e.g. 80-90% in Germany, 100% in France, 50 % in Luxembourg, 65% in the Netherlands, 70% in Portugal, 70-75% in Spain ) is considered as not to be usable at peak-load.
With regard to forecasts carried out in 2000 for 2002 and 2003, table 2 shows a general increase (approximately 4.5-5.5%) of the expected values, except for Greece and Croatia.

## Conventional thermal and nuclear power plant overhauls and outages

The overhauls remain stable over the considered period. Overhauls account for 2% of generating capacity in winter and for approximately 8% of generating capacity in summer.
Outages are of the order of 3 - 4%. With regard to expected outages, the data are essentially based on estimations based on past statistical values.

Both outages and overhauls expected values are slightly less significant in new forecasts than in forecasts carried out last year for 2002 and 2003. It is probably due to the market effects, inducing power plants operators to reduce overhauls periods.

## Reserve for system services

The reserve for system services is the estimated reserve capacity which is required 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 contrac tual 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 5** | **Reserve for system services on the 3rd Wednesday** | **Results in GW**

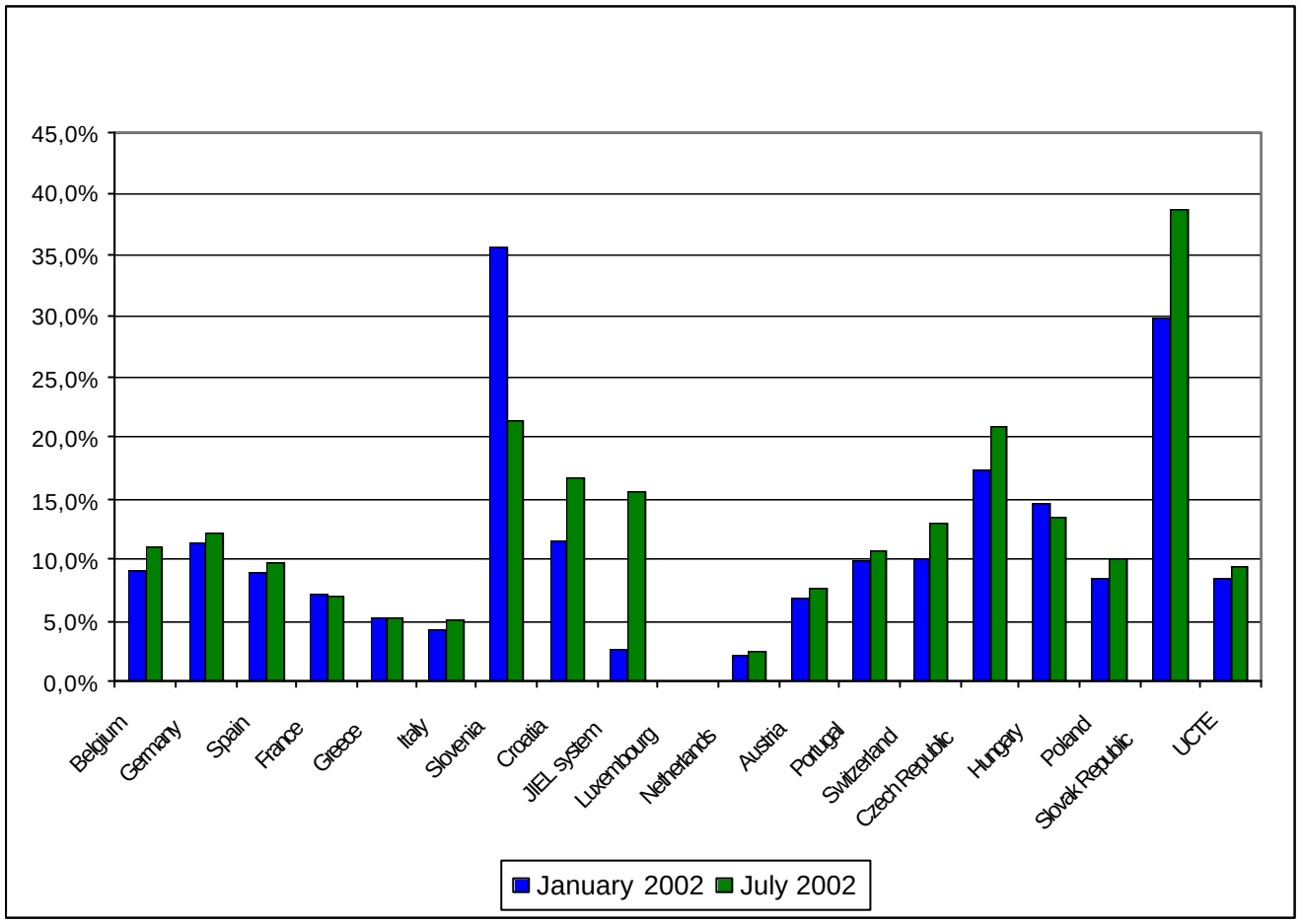
| | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|
| | January | July | January | July | January | July |
| **Country** | GW | GW | GW | GW | GW | GW |
| B | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| D | 8.4 | 8.2 | 8.4 | 8.2 | 8.5 | 8.3 |
| E | 2.9 | 2.9 | 3.3 | 3.3 | 3.5 | 3.5 |
| F | 5.1 | 3.8 | 5.1 | 3.8 | 5.1 | 3.8 |
| GR | 0.4 | 0.5 | 0.4 | 0.5 | 0.4 | 0.5 |
| I | 2.1 | 2.5 | 2.2 | 2.6 | 2.4 | 2.8 |
| SLO | 0.6 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| HR | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| JIEL | 0.2 | 0.7 | 0.2 | 0.7 | 0.2 | 0.7 |
| L | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| NL | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 | 0.4 |
| A | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| P | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 | 0.7 |
| CH | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| CZ | 1.5 | 1.4 | 1.5 | 1.4 | 1.5 | 1.4 |
| H | 0.7 | 0.6 | 0.7 | 0.6 | 0.7 | 0.6 |
| PL | 1.8 | 1.6 | 1.8 | 1.6 | 1.8 | 1.6 |
| SK | 1.2 | 1.2 | 1.6 | 1.4 | 1.6 | 1.4 |
| **UCTE** | **28.7** | **27.5** | **29.4** | **28.3** | **29.8** | **28.7** |

The reserve capacity for system services is approximately 28-30 GW for the period observed. This accounts for approximately 8.5% and 9.4% of the UCTE load, in winter and in summer respectively. Country-specific data are shown in Figure A/1.

There are substantial variations, ranging from less than 5% to more than 30%. The highest values are indicated for Slovenia and the Czech Republic, Slovakia and Hungary: in these countries, where the peak load is less than 10 GW, the reserve capacity is determined by the rating of the largest generating units, which is greater than as equal to 1 GW.

In larger systems, the reserve capacity for system services represents between 7% and 9% of the load.

**Figure A / 1** **System services reserve versus load**




With regard to forecasts carried out in 2000, a low increase (less then 2%) of the expected total reserve values for system services can be noticed, for 2002 and 2003.
The amount of system reserves is computed according to requirements defined in documents like the Grid Code and, in general, according to the UCTE recommendations.

- With regard to Austria, the ”second” and ”minute reserve” include also system reserves devoted to the German control blocks.
- In Switzerland the constitution of the various reserves for each TSO is fixed in the directives of the Swiss Commission for Interconnected Operation. These rules are currently not published but are in accordance with the rules fixed by UCTE.
- Values for the Czech Republic include Regulating Power up to 5% (of the load) for the daily Power Balancing.
- In the Netherlands part of system reserves is available as ”sheddable” load.

**Guaranteed capacity**

Guaranteed capacity is obtained by deducting non-usable capacity, overhauls, outages and system reserve from the national generating capacity.
Guaranteed capacity represents the capacity which is available to power plant operators and electricity traders for meeting their clients’ demand.

| Table 6 | Guaranteed capacity on the 3rd Wednesday | Results in GW |
|---|---|---|

| | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|
| **Country** | January GW | July GW | January GW | July GW | January GW | July GW |
| B | 12.8 | 11.5 | 13.0 | 11.5 | 13.0 | 11.8 |
| D | 77.3 | 71.7 | 77.9 | 71.5 | 78.1 | 71.9 |
| E | 37.7 | 35.9 | 40.2 | 37.5 | 42.3 | 39.6 |
| F | 84.4 | 68.9 | 85.4 | 69.3 | 84.8 | 69.4 |
| GR | 8.4 | 9.1 | 9.0 | 9.3 | 9.6 | 10.0 |
| I | 52.2 | 51.0 | 54.3 | 54.2 | 57.9 | 57.8 |
| SLO | 2.0 | 1.9 | 2.3 | 1.9 | 2.3 | 1.9 |
| HR | 3.4 | 3.1 | 3.4 | 3.1 | 3.4 | 3.1 |
| JIEL | 8.4 | 6.4 | 8.4 | 6.4 | 8.4 | 6.4 |
| L | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| NL | 17.1 | 16.5 | 17.2 | 16.6 | 17.8 | 17.2 |
| A | 11.6 | 11.9 | 11.9 | 12.4 | 12.0 | 12.4 |
| P | 8.4 | 7.2 | 8.3 | 7.1 | 8.9 | 8.1 |
| CH | 12.4 | 13.5 | 12.4 | 13.6 | 12.4 | 13.7 |
| CZ | 11.5 | 8.6 | 11.9 | 8.4 | 12.4 | 8.9 |
| H | 5.7 | 4.8 | 5.8 | 4.8 | 5.4 | 4.3 |
| PL | 26.8 | 20.9 | 27.1 | 22.2 | 27.5 | 22.2 |
| SK | 5.6 | 3.9 | 5.1 | 3.9 | 5.0 | 3.7 |
| **UCTE** | **387.3** | **348.3** | **395.4** | **355.3** | **402.8** | **363.9** |

The guaranteed capacity within the UCTE shows an increase of 15.5 GW from 2002 to 2004. This value can be compared with the increase in the national generating capacity (approximately 24 GW).

In addition to the customary reductions associated with maintenance and outages, it appears that a proportion of this additional installed capacity cannot be classified as completely usable for electricity producers.

It may be noticed that values for January 2002 and 2003 show a decrease of 4.2 GW and 6.2 GW, respectively, compared to the forecasts carried out last year. Concerning July, the decrease is 3.6 GW for 2002 and 7 GW for 2003 (the most significant changes relate to Germany).

## Load

The load values shown in the table7 correspond to normal climatic conditions. The load in the UCTE countries shows an increase of 13.8 GW between January 2002 and January 2004, as well as an increase of 13.7 GW between July 2002 and July 2004. This represents, in winter, a growth of 2.3 % from 2002 to 2003 and of 1.8 % from 2003 to 2004. In the summer, the increase is approximately 2.3 % per annum over the period under investigation.

These values show a decrease compared to forecasts carried out last year: the expected load values decrease from 340.8 GW to 337.2 GW for January 2002 forecast, and from 294.9 GW to 293.8 GW for July 2002 forecast. The global trend hides differences between countries (e.g. there is a significant growth in the forecast for Italy).

It should be noticed that, in specific countries, the reference points selected (third Wednesday of the month at 11 a.m.) do not correspond to the monthly peak load. There are significant discrepancies in relation to this monthly peak in some countries: 3-4 GW in Germany, 3 GW in Spain, approximately 1-2 GW in France, Italy and Poland.

This factor must be taken into account when analyzing the results for the capacity available in each country.

| Table 7 | Load at 11 o'clock on the 3rd Wednesday | | | | | | Results in GW |
|---|---|---|---|---|---|---|---|
| | 2002 | | 2003 | | 2004 | | Variation 2002/2004 |
| Country | January GW | July GW | January GW | July GW | January GW | July GW | January % |
| B | 12.6 | 10.5 | 12.9 | 10.7 | 13.1 | 10.9 | 4.2 |
| D | 73.5 | 67.0 | 74.2 | 67.6 | 74.2 | 67.9 | 1.0 |
| E | 32.0 | 30.2 | 33.1 | 31.2 | 34.0 | 32.0 | 6.3 |
| F | 71.9 | 54.6 | 73.3 | 55.7 | 74.7 | 56.7 | 3.9 |
| GR | 6.7 | 8.5 | 6.9 | 8.9 | 7.1 | 9.4 | 6.4 |
| I | 48.9 | 49.0 | 50.8 | 51.0 | 52.5 | 53.0 | 7.4 |
| SLO | 1.7 | 1.4 | 1.7 | 1.4 | 1.8 | 1.5 | 4.4 |
| HR | 2.6 | 1.8 | 2.7 | 1.9 | 2.8 | 2.0 | 7.7 |
| JIEL | 7.8 | 4.5 | 7.9 | 4.6 | 8.0 | 4.7 | 2.6 |
| L | 0.9 | 0.9 | 0.9 | 0.9 | 1.0 | 1.0 | 5.6 |
| NL | 15.9 | 15.2 | 16.4 | 15.7 | 16.9 | 16.2 | 6.2 |
| A | 8.6 | 7.6 | 8.7 | 7.8 | 8.9 | 8.0 | 4.2 |
| P | 6.7 | 6.2 | 7.0 | 6.5 | 7.3 | 6.7 | 8.2 |
| CH | 9.0 | 7.0 | 9.1 | 7.1 | 9.2 | 7.2 | 2.2 |
| CZ | 8.7 | 6.7 | 8.9 | 6.9 | 9.0 | 7.0 | 4.0 |
| H | 4.9 | 4.2 | 4.9 | 4.2 | 4.9 | 4.3 | 0.1 |
| PL | 20.8 | 15.5 | 21.0 | 15.7 | 21.3 | 15.9 | 2.4 |
| SK | 4.0 | 3.1 | 4.3 | 3.1 | 4.3 | 3.1 | 7.4 |
| **UCTE** | **337.2** | **293.8** | **344.7** | **300.8** | **351.0** | **307.5** | **4.1** |

## Remaining capacity

This value is obtained by deducting the reference load from the guaranteed capacity, and corresponds to the surplus of capacity, available to power plant operators.

However, this should not be classified as an over-capacity. In practice, power plant operators need to have reserve capacity available in addition to the capacity for system service reserve. This capacity is required by power station operators to guarantee the reliability of supply to their clients, and compensate, for instance, longer power plant failures.

As specified in chapter 3, several countries consider that power plant operators should maintain an additional reserve of approximately 5% of the national generating capacity. This "security criterion" is in general respected in UCTE countries over the period from 2002 to 2004. The system security seems not to be degraded over the three next years.

A surplus, after the deduction of this additional reserve capacity for power plant operators, represents a potential capacity for export.

Long-term export contracts must be deducted from the surplus of available capacity in order to determine the capacity which is really available to power plant operators and electricity traders.
Conversely, in case of long-term import contracts, power plant operators and traders dispose of a larger surplus of available capacity.

However, market conditions can change this approach.

Remaining capacity is almost unchanged over the period from 2002 to 2004; it accounts for approximately 15% and 19% of the reference load for January and July, respectively. Figures for ex-Centrel countries are however different: in these countries remaining capacity represents 29% of the load.
Remaining capacity also represents 9-10% of the UCTE generating capacity (17% and 13% in ex-CENTREL in January and July, respectively).

**Table 8** | **Remaining capacity on the 3rd Wednesday** | **Results in GW**

| | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|
| **Country** | January GW | July GW | January GW | July GW | January GW | July GW |
| B | 0.2 | 1.0 | 0.1 | 0.8 | -0.1 | 0.9 |
| D | 3.8 | 4.7 | 3.7 | 3.9 | 3.9 | 4.0 |
| E | 5.7 | 5.7 | 7.1 | 6.3 | 8.3 | 7.6 |
| F | 12.5 | 14.3 | 12.1 | 13.7 | 10.2 | 12.7 |
| GR | 1.7 | 0.6 | 2.1 | 0.4 | 2.5 | 0.6 |
| I | 3.3 | 2.0 | 3.5 | 3.2 | 5.4 | 4.8 |
| SLO | 0.3 | 0.5 | 0.6 | 0.5 | 0.5 | 0.5 |
| HR | 0.8 | 1.3 | 0.7 | 1.2 | 0.6 | 1.1 |
| JIEL | 0.6 | 1.9 | 0.5 | 1.8 | 0.4 | 1.7 |
| L | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| NL | 1.2 | 1.3 | 0.8 | 0.8 | 0.9 | 1.0 |
| A | 3.1 | 4.3 | 3.1 | 4.6 | 3.1 | 4.4 |
| P | 1.6 | 1.0 | 1.3 | 0.6 | 1.7 | 1.4 |
| CH | 3.4 | 6.5 | 3.3 | 6.5 | 3.2 | 6.5 |
| CZ | 2.8 | 1.9 | 3.1 | 1.6 | 3.4 | 1.9 |
| H | 0.8 | 0.6 | 0.9 | 0.6 | 0.5 | 0.0 |
| PL | 6.0 | 5.4 | 6.4 | 6.5 | 6.2 | 6.3 |
| SK | 1.6 | 0.8 | 0.8 | 0.8 | 0.7 | 0.6 |
| **UCTE** | **50.1** | **54.5** | **50.7** | **54.4** | **51.8** | **56.4** |

Percentages for each country in 2002 are shown in Figures A/2 and A/3.

**Figure A / 2** | **Remaining capacity / Load**

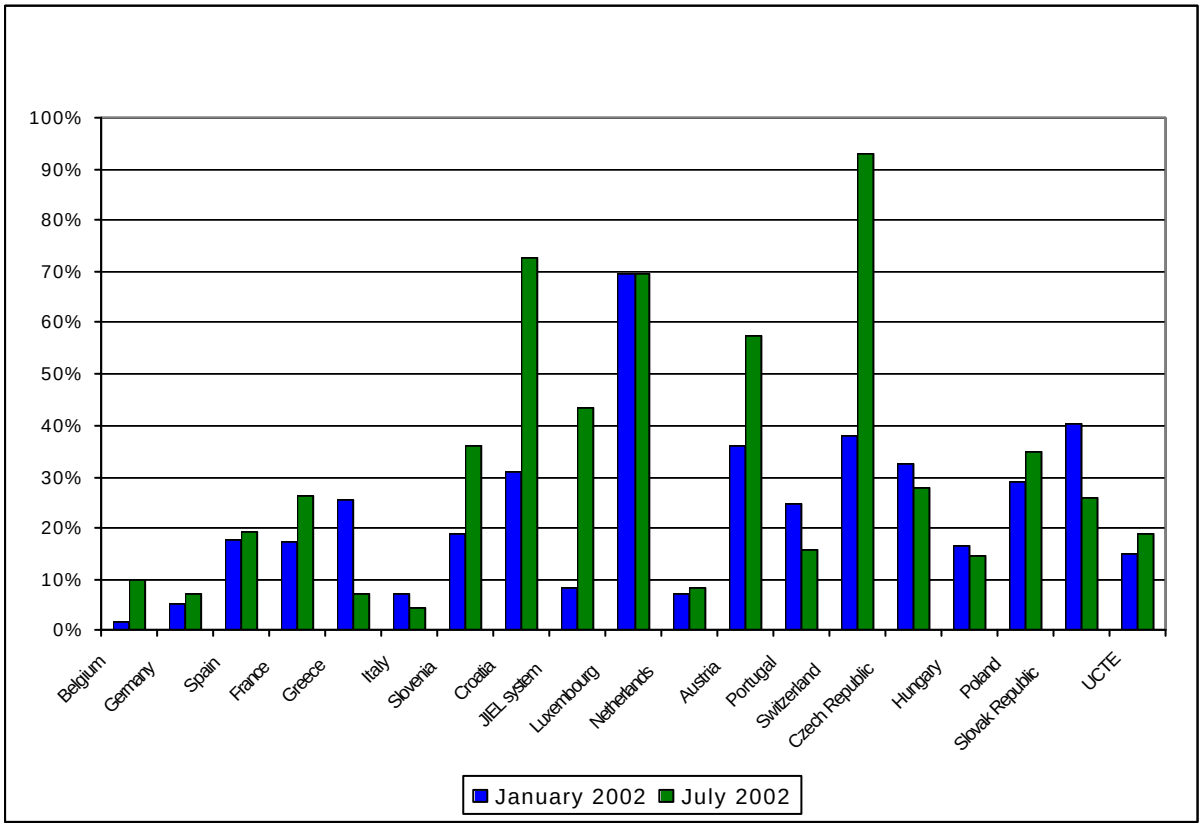
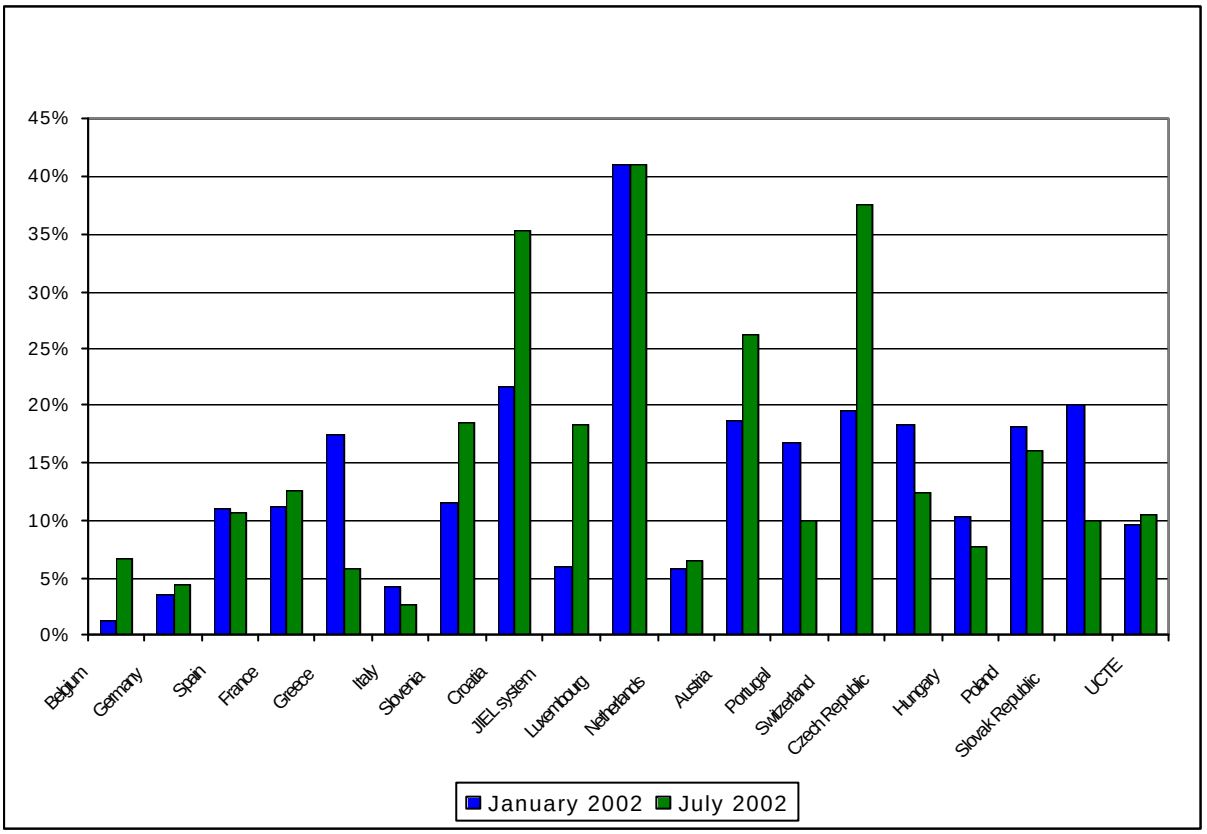


**Figure A / 3** **Remaining capacity / National generating capacity**




Several countries present peculiar situations:

1. Usually, remaining capacity represents more than 5% of the national generating capacity, except for Belgium (in summer), Germany and Italy from 2002, and for Hungary from 2003 and 2004, respectively.

2. Luxembourg is in a particular situation, where one large power plant exports control power to Germany, while demand is largely covered by imports;

3. In the Netherlands, the TSO estimates that remaining capacity is sufficient because of very significant imports (especially in the summer);

4. In Austria, about 650 MW are considered necessary (4% of generating capacity). Remaining capacity is increased by reserves for the German control block included in the installed generating capacity of Austrian hydro power stations.

5. In Spain, the TSO considers that, because of bilateral contracts for international exchanges, no supplemementary reserve is necessary.

6. In France, the TSO considers that approximately 8,500 MW (respectively 4,000 MW) in addition to the ”minutes reserve” are necessary to power station operators to be able to deal with various risks during the winter (respectively during the summer). The risk of forced outages of thermal power plants is included in this estimation. It should also be noticed that the generating companies have other means to meet this target (load-curtailment contracts, for example). Remaining capacity represents approximately 10% of national generating capacity.

7. Hungary shows a significant decrease in remaining capacity, starting from 10.4% of national generating capacity in January 2002 and dropping to 6% of national generating capacity in January 2004 ( 0.1% in July 2004, however, in the opinion of the TSO, the system adequacy will not be affected ). The same trend can be noticed in Slovakia, where, starting from 20.1% in January 2002, remaining capacity decreases to 8.8% of generating capacity in January 2004 (7.5% in July 2004).

With regard to forecasts carried out in 2000, a general decrease in the expected values of remaining capacity for 2002 and 2003 can be noticed.

**Transportable Capacity**

Because of the fact that the UCTE Power Balance forecasts have been established without taking exchanges into account, the remaining capacity will be useful as an 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 remaining capacity to the ”transportable capacity” provided by systems at the borders of the countries or groups of countries concerned.

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

Figures A/4 and A/5 show a comparison of the remaining capacity in the various countries in January and July 2002 with the transportable capacity (exportable and importable).
The minimum value between the remaining capacity and the exportable capacity may be interpreted as the capacity that the country concerned is able to make available to the interconnected network in order to ensure the security of the interconnected system.

It could be noticed that, in certain countries, the remaining capacity is significantly greater than the potential export capacity: this applies to Spain, Poland and France during the summer period.

On the other hand, countries with a low remaining capacity have potential need for power imports.

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, some congestion points could appear in the interconnected network.

**Interconnection developments**

In terms of interconnection development, the most remarkable changes concern :

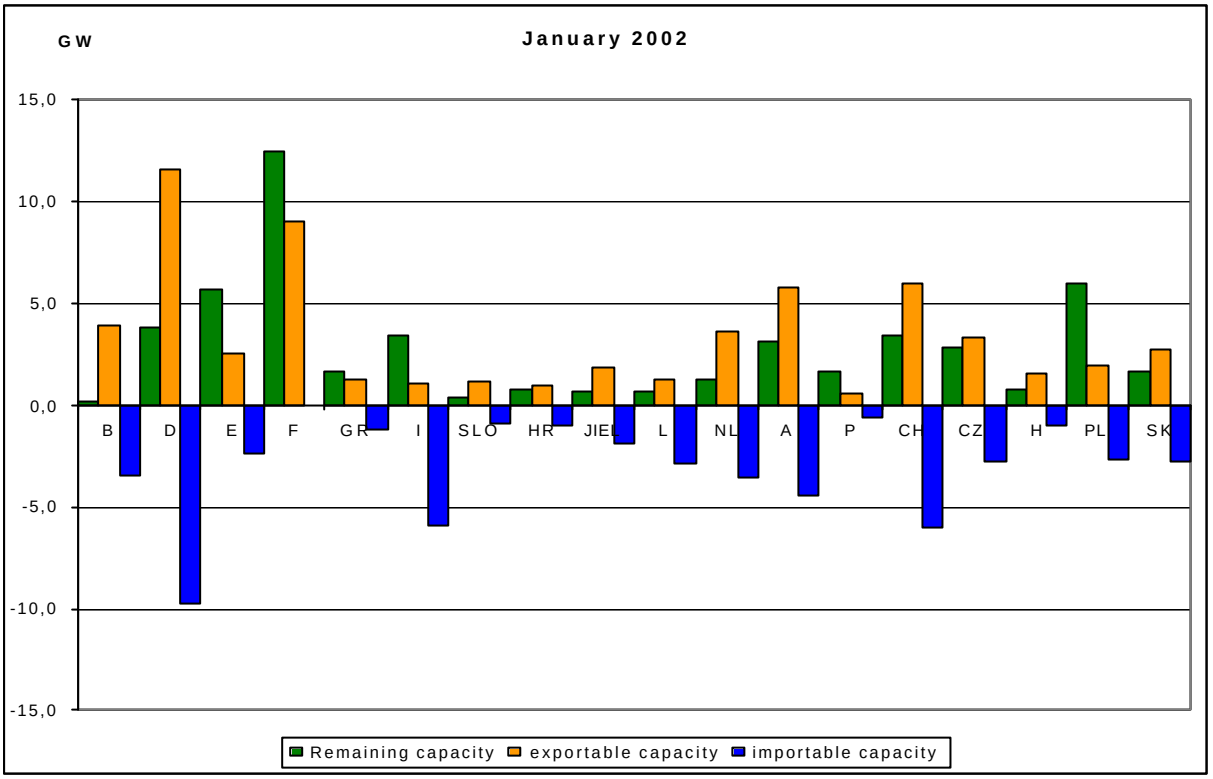
- interconnection between Spain and France from July 2002, with 200 MW additional transfer capacity from Spain to France, 300 MW additional transfer capacity from France to Spain ;

- interconnections between the Netherlands and Germany, with ca. 1,000 MW additional import/export capacity as from July 2002 by the installation of phase shifters ;

- a DC link between Italy and Greece operational from January 2002, with 500 MW additional import/ export capacity. New interconnections, from 2002 to 2004, are planned by Italy.

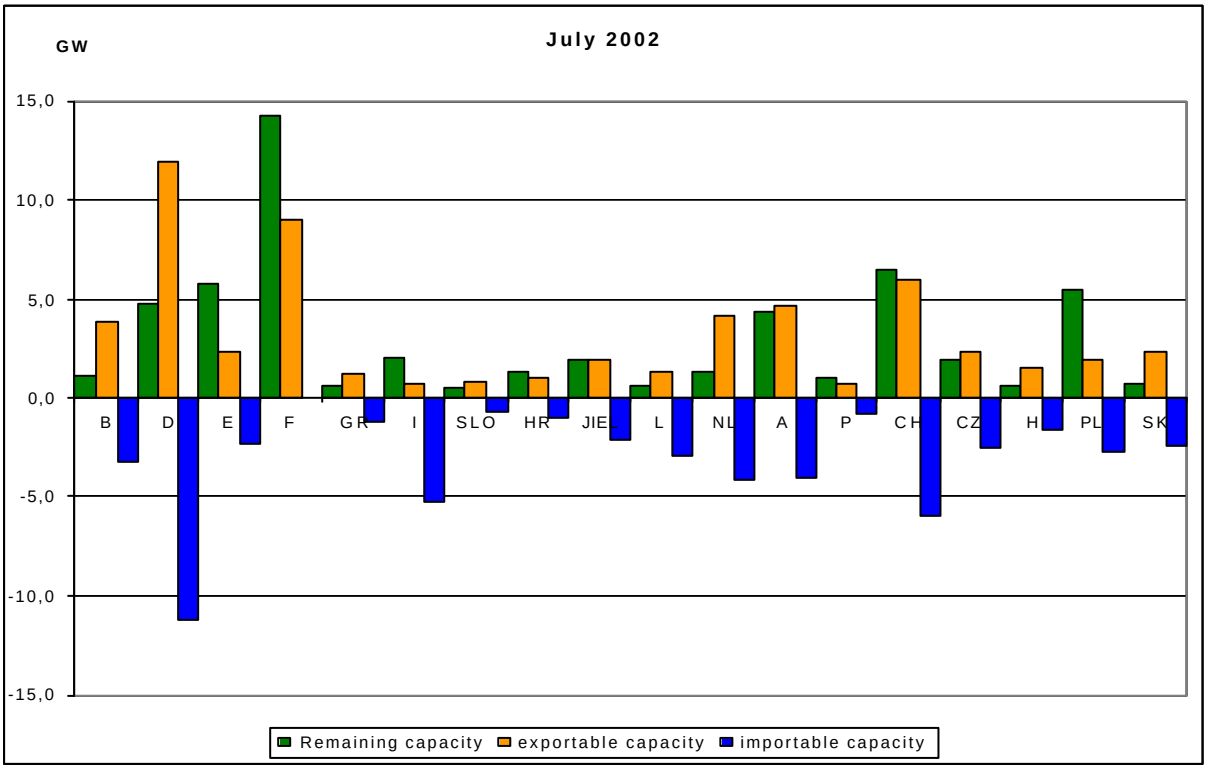
Figure 1A, 1B and 1C summarise the results of the power balance forecasts for the 3rd Wednesdays in January, 2002, 2003 and 2004 respectively, based on the data collected in summer 2001.

**Figure A / 4** **Transportable capacity, January 2002**




CH: Importable and exportable capacity fall within a range of +3GW to +6GW; these are indicative values
GR: These are indicative values. DC link (500 MW) between Greece and Italy not taken into account

**Figure A / 5** **Transportable capacity, July 2002**




CH: Importable and exportable capacity fall within a range of +3GW to +6GW; these are indicative values
GR: These are indicative values. DC link (500 MW) between Greece and Italy not taken into account

**Figure 1A** | **Data for January 2002 ( without DC links Italy-Greece, Ireland and Scotland )**

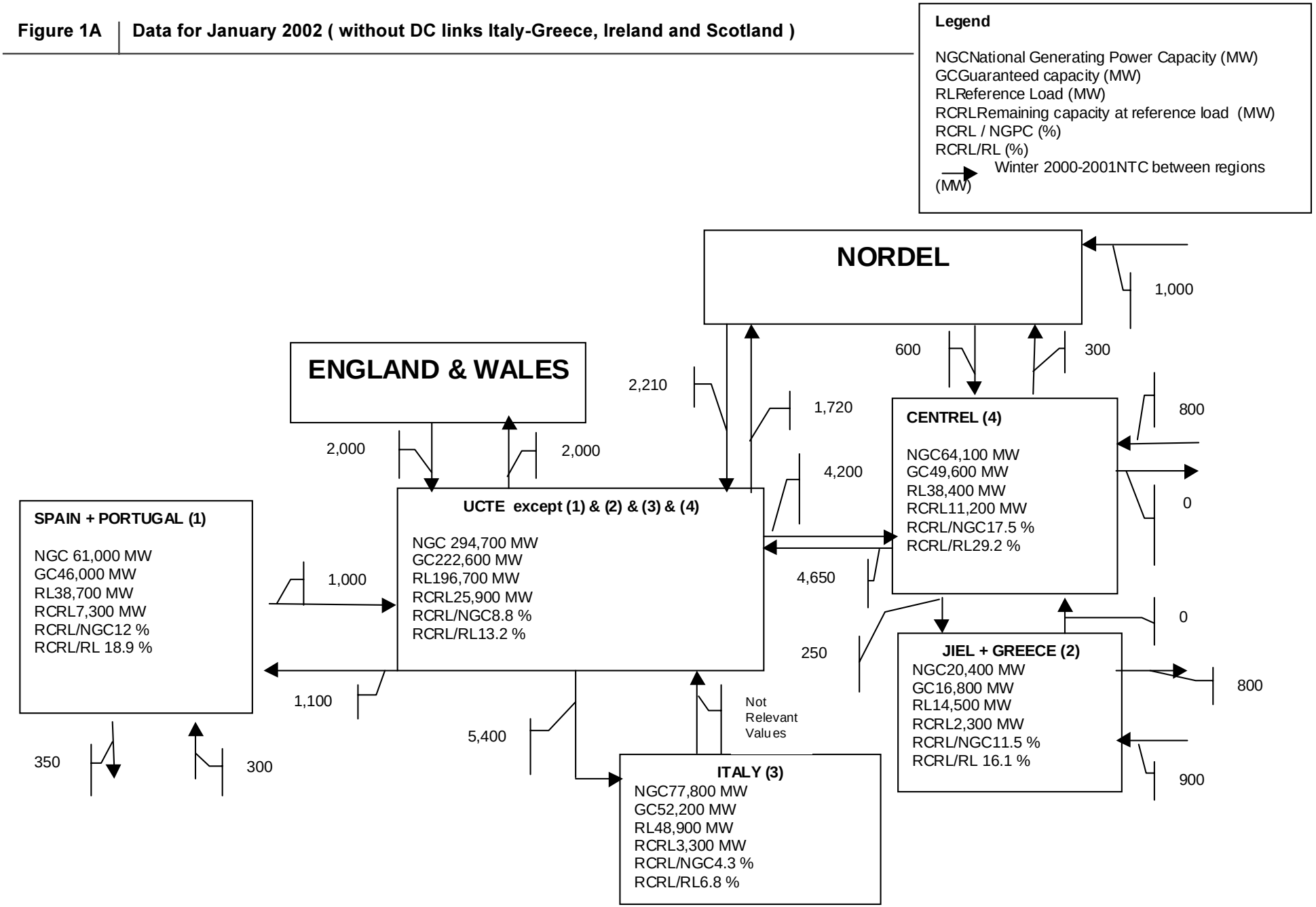
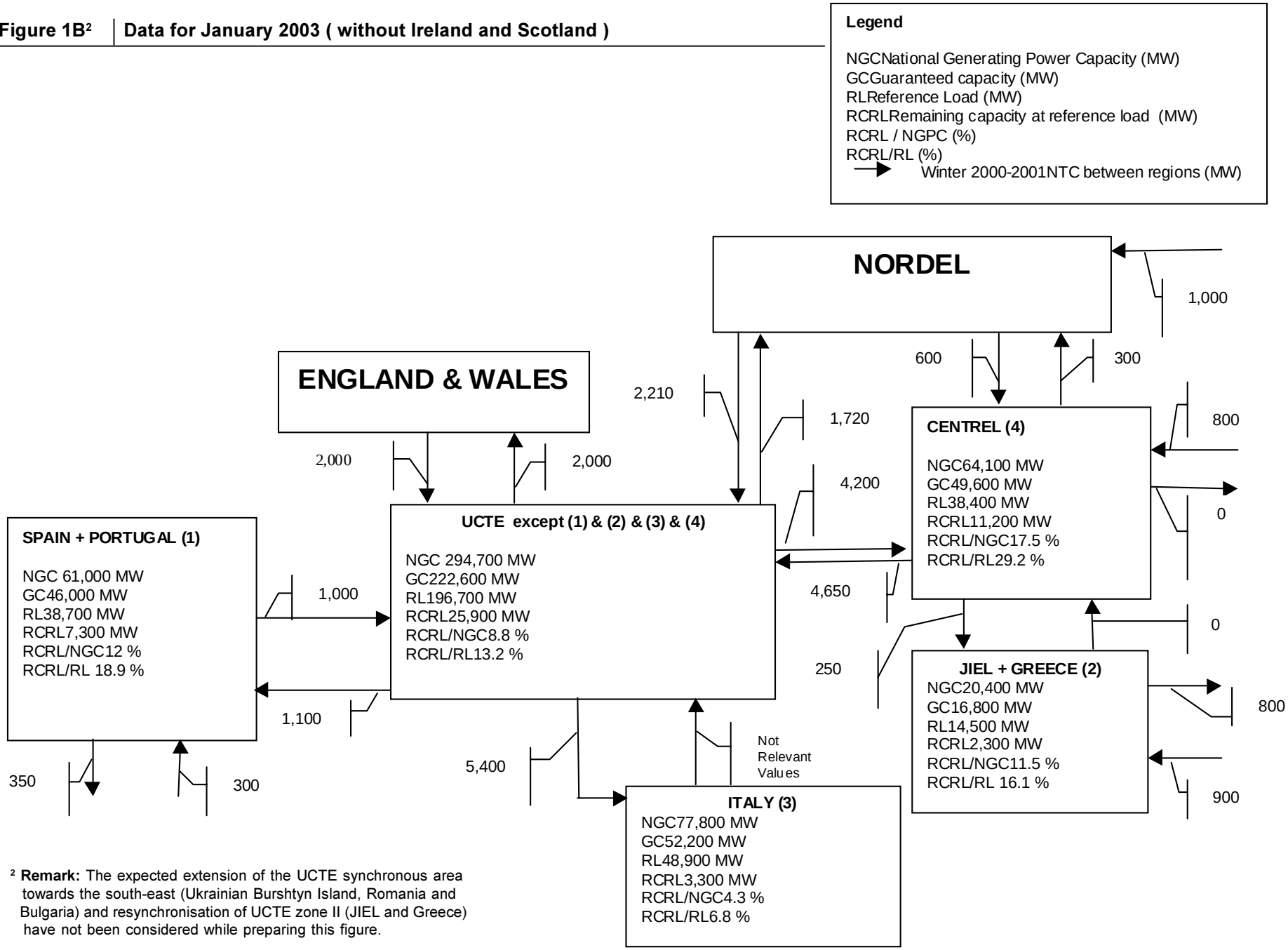
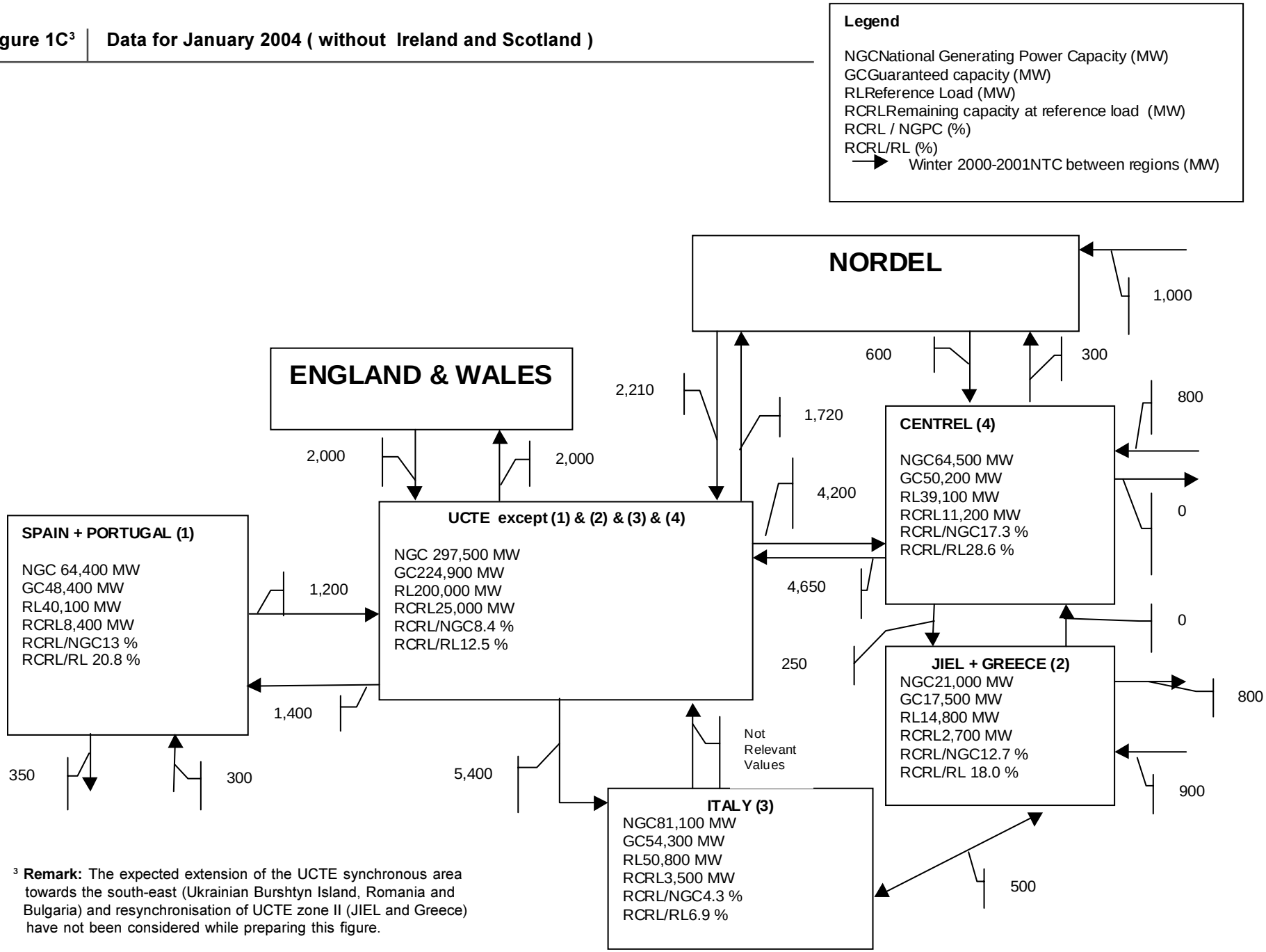


**Figure 1B[2]** | **Data for January 2003 ( without Ireland and Scotland )**




[2] **Remark:** The expected extension of the UCTE synchronous area towards the south-east (Ukrainian Burshtyn Island, Romania and Bulgaria) and resynchronisation of UCTE zone II (JIEL and Greece) have not been considered while preparing this figure.

**Figure 1C[3] | Data for January 2004 ( without Ireland and Scotland )**




[3] **Remark:** The expected extension of the UCTE synchronous area towards the south-east (Ukrainian Burshtyn Island, Romania and Bulgaria) and resynchronisation of UCTE zone II (JIEL and Greece) have not been considered while preparing this figure.

## 5. Supplementary remarks

### Exceptional trends

In several countries there is a governmental support to renewable sources, mainly due to European institutional s environment framework. Consequently, renewable sources and combined heat/power plants will be a considerable part of new generating capacity in UCTE.

As far as nuclear power is concerned, it could be retained that in Germany the first impact of the new law on nuclear power will be in 2003, with the planned shutdown of a 630 MW nuclear power plant.

### Status of deregulation and special remarks

The status of electricity market deregulation is not homogeneous over the UCTE countries.
Some significant information should be retained:

- Powernext created in July 2001 will manage power exchange in France from early 2002;
- market deregulation is already implemented in Greece from February 2001;
- in Croatia, the new electricity act will be applied from January 2002;
- as far as the energy sector is concerned, according to Polish Government declaration, Poland will be ready for accession to the EU on December 31, 2002;
- in Austria, by the newest electricity Act, all consumer will have free choice of their supplier from October 1st 2001.
- In Italy, the new Electricity Market will be operational from January 1st, 2002.
- In the Netherlands TenneT became the independent Transmission System Operator on January the 1st 2001.
- Spain and Portugal have agreed to create the Iberian Electricity Market from January the 1st, 2003. Consequently, Spain will make power balance forecast together with the Portugal.
- In Switzerland, the new law on the Opening of the Electricity Market was approved by the parliament on December 15th 2000. Before its implementation a formal approval of the population is necessary be cause a referendum against the law was started. The vote on the law will take place in June 2002.
- In Hungary at present, MVM Rt. is the License Holder of TSO functions, and MAVIR Rt. performs system control according to a bilateral Agreement. From January 1st, 2003 – when the new Electricity Act (Act Nr.CX/2001) takes into force – MAVIR Rt. shall be the licensed TSO.
- In Slovakia the new company SEPS a.s. (former division of Slovenské elektrárne a.s.) has been established as a new legal body and officially nominated as a Slovak TSO from 1 January 2002.

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 |
|---|---|---|---|---|
| **B** | Royal decree, May 5th, 2000 | Consumers > 20 GWh eligible from December 31, 2000, effective from the beginning of 2002 | Consumers > 10 GWh eligible from December 31, 2002 | All consumers from January 1st 2007, with schedule differences at regional level (e.g. Flanders July 2007) |
| **D** | Law, dated April 25th, 1998 | 100 % | 100 % | 100 % |
| **E** | 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%)<br>July 1st 1999, consumers > 2 GWh/year (i.e. market opening of 39%)<br>October 1st 1999, consumers > 1 GWh/year (i.e. market opening of 42%)<br>July 1st, 2000, consumers connected to > 1 kV networks (i.e. market opening of 54 %)<br>January 1st, 2003, all consumers (100%) |
| **F** [4] | Law 2000-108 February10th, 2000 | by February 2000: 16 GWh/year/site (i.e. market opening of about 30% | by February 2003 at the latest: 9 GWh/year/site (i.e. market opening of about 35%) | - |
| **GR** | Law 2773/99 February 2001 | By February 2001, HV/MV consumers (market opening of about 34%) | | |
| **I** | Law 1999-79 March 16th, 1999by | 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 |
| **SLO** | | | | |
| **HR** | | | | |
| **FYROM** | | | | |
| **L** | Law July 24th, 2000 | By February 19th, 1999: Consumers > 100 GWh<br>By January 1st, 2001: Consumers > 20 GWh | By January 1st, 2003: Consumers > 20 GWh and Distributors > 90 GWh | By January 1st, 2003: Consumers > 1 GWh and Distributors > 1 GWh |

[4] The status of eligible consumer is reviewed every two years.

| | | | | |
|---|---|---|---|---|
| **NL** | 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 (renewables), (relative small groups)<br>By January 2004, all other consumers, households (i.e. market opening of about 35 %) |
| **A** | | | | |
| **P** | | | | |
| **CH** | Autumn 2002 if new law accepted | Consumers > 20 GWh and suppliers (20% of energy supplied to end consumers) (i.e. market opening of about 30%) | Consumers > 10 GWh and suppliers (40% of energy supplied to end consumers) (i.e. market opening of about 50%),<br>3 years later | 100% 6 years later |
| **CZ** | January 1st, 2002 Law 458/2000 | Since January 2002, sumers > 40 GWh/year/site | Since January 2003, consumers > 9 GWh/year/site | Since January 2005, consumers >100 MWh/year/site<br>Since January 2006, all consumers |
| **H** | 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 experience gained | |
| **PL** | 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%)<br>From January 1st 2002, final consumers >10 GWh/year (i.e.market opening of about 40%)<br>From January 1st 2004, final consumers >1GWh/ year (i.e. market opening of about 46%)<br>From January 1st 2004, all consumers (i.e.market opening of 100%) |
| **SK** | January 1st, 2002 (Edict No. 562/ 2001to the Energy Maw No. 70/1998) | from January 1st, 2002: consumers > 100 GWh/year | from January 1st, 2003: consumers > 40 GWh/year | from January 1st, 2004: consumers >20GWh/year<br>from January 1st, 2005: consumers > 9 GWh/year |

**Long-term (>3 years) system adequacy**

In several countries the long-term system adequacy is checked. It is the case

- in Belgium, where the Regulator is in charge of this kind of study;
- in France where the TSO provides long-term system adequacy studies to the Ministry of Industry, in charge of the Long Term Investment Plan (authorization procedure and call for tenders system for new capacity);
- in Spain, where the National Energy Commission plays this role;
- in Greece, where the Ministry of the Development and RAE provide long-term energy planning;
- in the Netherlands, where the TSO is responsible for the long-term (7 years) transmission system ad equacy, under the control of the Regulator. This planning also stimulates attention for system adequacy.
- In Portugal, a public entity is in charge of checking long-term system adequacy;
- In Poland the Ministry of Economy provides the State Energy Policy Guidelines intended to formulate a long term (> 15 years) forecast on the energy system development.
- In the Czech Republic, according to the energy law, the market operator is in charge to provide long-term power balance studies.
- In Switzerland, the Federal Office of Energy will ask for a regular report from the new Swiss TSO concerning the system adequacy.
- In Slovakia the Regulator will ask the TSO for a periodic report on the long term transmission system development.

The table below resumes the information about long-term system adequacy checking and the information about the possibility for TSOs to own power plants for system security (as system reserve):

| Country | Long-term system adequacy checked by | TSO allowed to own power plants | TSO owner of power plants |
|---|---|---|---|
| **B** | The Belgian regulator (Creg) | No | No |
| **D** | Not checked | Yes | No |
| **E** | National Energy Commission | No | No |
| **F** | TSO provides long-term (10-15 years) system adequacy studies. Ministry of Industry provides Long-Term Generation Investment Plan | No | No |
| **GR** | TSO provides long-term Demand Forecasts and submits proposals for system development to the RAE.The Ministry of Development and the RAE provide long-term energy and system planning | No | No |
| **I** | TSO provides Demand Forecast (covering next 10 years) | No | No |

| | | | |
|---|---|---|---|
| **SLO** | Ministry of Economy | No | No |
| **HR** | HEP Development Department | Yes (HEP, State-owned vertically integrated company) | Yes (HEP, State-owned vertically integrated company) |
| **FYROM** | ESM Development Department | Yes (ESM,the National Company) | Yes (ESM,the National Company) |
| **L** | TSO checks the long-term interconnection capacity by the Regulator | Yes | No |
| **NL** | TSO is responsible for the transmission system adequacy | No | No |
| **A** | Not checked | Yes | No |
| **P** | Public Entity | No | No |
| **CH** | Federal Office of Energy based on report of the Swiss TSO | No | No |
| **CZ** | Market Operator | No | No |
| **H** | TSO, controlled by the Regulator | at present: Yes from January 1st, 2003: No | at present:Yes from January 1st, 2003: No |
| **PL** | Ministry of Economy | Yes | Yes (PSE is the main shareholder of Pumped Storage Power Plants) |
| **SK** | TSO controlled by the Regulator | No | No |

**Features and/or regulatory mechanism to promote new generating capacity**

Specific mechanisms are not implemented yet, except for renewable energy and combined heat/power plants due to the significant governmental support: it is the case in France, Germany, Austria, Netherlands, Luxembourg, Poland, Italy and Greece.

**Features and/or regulatory mechanism to promote demand elasticity**

Non-mandatory contracts between producers and consumers already exist in Germany, France and Portugal. New market mechanisms will play a significant role to promote demand elasticity, in the next years: a Balancing Market (large consumer allowed to bid) will be operational from January 2002 in France. In the Netherlands, the current approach is that the market will regulate itself.

## 6. Conclusion

### Comparison with the previous forecasts

To identify developing trends in the UCTE, it is useful to compare the results of the forecasts for this year with those of the forecasts completed in 2000. This can be applied to the years 2002 and 2003.

As indicated in the previous chapters, this year's load forecasts for 2002 and 2003 show a decrease of approximately 6 GW in January and 3 GW in July in comparison with the forecasts carried out last year.
Guaranteed capacity values for January 2002 and 2003 show a decrease of 6 GW and 8 GW, respectively, compared to the forecasts carried out last year. Concerning July, the decrease is 6 GW for 2002 and 10 GW for 2003.
As far as the remaining capacity is concerned, estimated values decrease approximately by 1-2 GW.

### System security and operation

In this year's forecasts, the expected remaining capacity stays substantially stable over the period from 2002 to 2004. This is a significant point for the UCTE system security.

Remaining capacity in UCTE appears sufficient to ensure the system security: it represents approximately 9-10% of the generating capacity. As Figure 1 and Figure A3 show, the 5% "security criterion" (remaining capacity > 5% generating capacity) is generally respected in the UCTE countries. Belgium (from 2002), Germany (from 2002), Hungary (from 2004) and Italy (from 2002) do not reach this "security criterion".

However, these countries consider that system security will not be at risk thanks to the use of interconnection capacity, new generating capacity and long-term import contracts and participation contracts in power plants located out of the national territory.

Indeed, if taking into account imports and exports is not relevant when analyzing the whole UCTE system, this is not the case when analyzing countries one by one.

In fact, interconnection capacity does not seem to be an obstacle to both the UCTE whole system security and the security of the countries in terms of system adequacy.

Nevertheless, in the new framework of the European electricity market, in addition to its contribution to system security, the interconnected network should also ensure the fluidity of the exchanges by an economic optimization of the European system, based on market mechanisms. The actual interconnected networks are not completely designed for this function. It is the reason why, even if networks seem well dimensioned to ensure system security, it cannot be excluded that, due to market phenomena, some congestion points could appear in the interconnected network. These congestion points cannot be identified by comparing the exportable/importable capacity with the remaining capacity. At last, it also should be retained, that this estimate is probably optimistic, since information available to TSOs on the commissioning of new facilities are more accurate than that available on decommissioning.

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