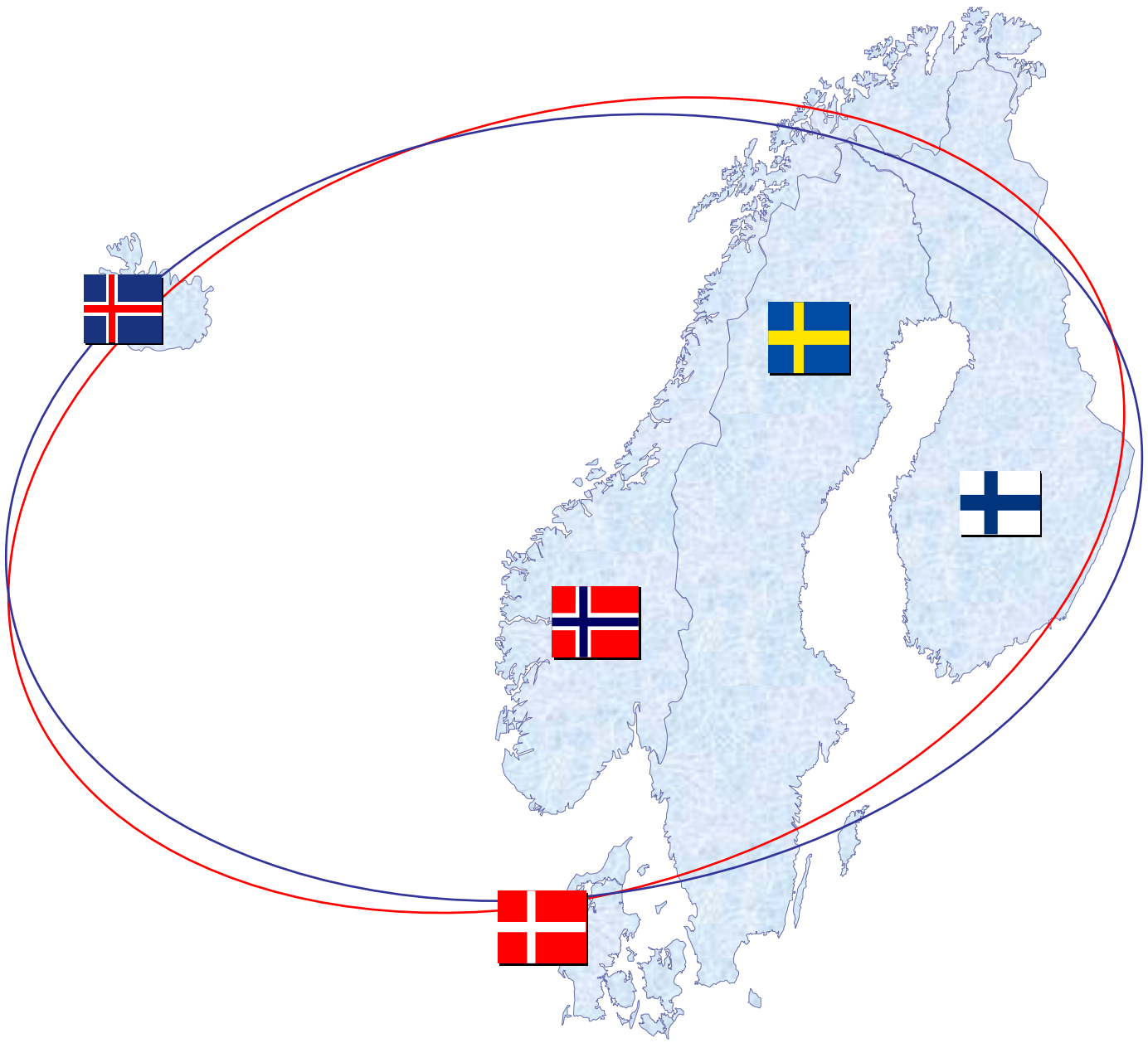
POWER AND ENERGY BALANCES

Forecast 2008



Nordel

CONTENTS

Prepared by Nordel's Balance Group june 2005

CONCLUSIONS

Both the energy and power balance in 2008 is slightly better than the former Nordel estimate for 2007. This is due to additional investments in new generation capacity, new interconnections of total 1 000 MW to outside Nordel and reduced demand forecast in Sweden.

The Nordic electricity system is able to meet the estimated consumption and the corresponding typical power demand pattern in average conditions. In long term the market is expected to maintain a reasonable balance between supply, imports and demand.

Lower precipitation or colder temperature result in higher market prices that give incentives for increased imports, demand response and investments. This is expected to maintain the balance between supply and demand in the short and long term even in extreme situations. Allocation between imports and demand response in reality depends on the prevailing market prices and available generation resources outside Nordel. The interconnection capacities are expected to enable import volumes that can meet the increased peak demand.

Some Nordic areas can be exposed to a risk for rationing or other measures because of extremely low precipitation.

Nordic transmission capacities may prevent full utilization of Nordic thermal power in certain areas. The planned reinforcements in the "five prioritised cross-sections" will improve the situation. The power balance and the internal bottlenecks in the continental Europe can have an effect on the import possibilities to the Nordic countries.

The annual energy consumption in the Nordic market is estimated to grow by 20 TWh by year 2008 (1.2%/a) from 395 TWh in 2004 (temperature corrected). In the three year period investments in power generation is expected to increase the available generation capacity and capability by 1500 MW and 10 TWh/a in average conditions.

Iceland is not included in the figures. The annual energy consumption in Iceland is estimated to grow by about 6.8 TWh by year 2008 (15 %/a) due to two new aluminium plants to be started by 2007.

FORECASTS 2008 AND 2008/09

Consumption/demand

The forecasted total consumption for Nordel in 2008 is 415 TWh corresponding to an average increase of 1.5 % per year from 395 TWh (temperature corrected) in 2004 which was a relatively normal year with respect to energy balance and spot price. The growth of demand varies from 0.4 to 2.1 % per year.

The peak demand is forecasted to grow to about 72 000 MWh/h by 2008/09 in average temperature conditions compared to about 65 000 MWh/h in winter 2004/05.

Generation capability

In Denmark the wind power capacity is expected to increase by approximately 550 MW. About 230 MW old oil fired combined heat and power generation (CHP) is expected to be closed. A 70 MW renovated coal unit will be put in operation in 2008 fired with coal and biomass. A few new smaller plants will be built.

In Finland the hydro power capacity will increase by approx. 50 MW, thermal power by 180 MW biomass capacity and a 100 MW gas turbine for disturbance reserves. A new 1600 MW nuclear power unit which is under construction will be in operation in 2009.

In Norway the hydro power capacity will grow by approximately 300 MW, thermal power by 200 MW and wind power by 400 MW between 2005 and 2008.

FORECASTS 2008 AND 2008/09

Generation capability (cont.)

In Sweden Barsebäck 2 nuclear unit has been shut down in 2005 but the output will be increased in some of the existing units. A new natural gas fired 260 MW combined cycle gas turbine power plant is included in the forecast. The capacity will also be increased in combined heat and power generation, approximately 350 MW, and in wind power, about 300 MW. It is also assumed that most of the oil condensing units will be available.

Interconnections

New interconnections Estlink (between Finland and Estonia) 350 MW (end of 2006)and NorNed (between Norway and the Netherlands) 700 MW (by the beginning 2008) will increase the transmission capacity to outside Nordel.

GENERATION CAPABILITY AND ENERGY CONSUMPTION 2008

Average conditions

In average hydropower and temperature conditions (see App. 1 and 2) the total generation capability exceeds the forecasted demand by approximately 3.8 %. The figure on page 7 presents the forecasted maximum available generation capability and demand forecast within the national borders in 2008. The market and contractual export/import have not been considered. The figure points out maximum export capability or minimum import need.

Norway and Finland are net importers, Sweden has some surplus.

Denmark has a considerable surplus that can contribute to the balancing of the system. Nordic transmission system prevents full utilisation of the Danish generation capability. The figures on page 7 take into account these limitations. The planned reinforcements in the "five prioritised cross-sections" will improve the situation.

Utilisation of import possibilities will reduce the use of high cost generation capacity in the Nordel region.

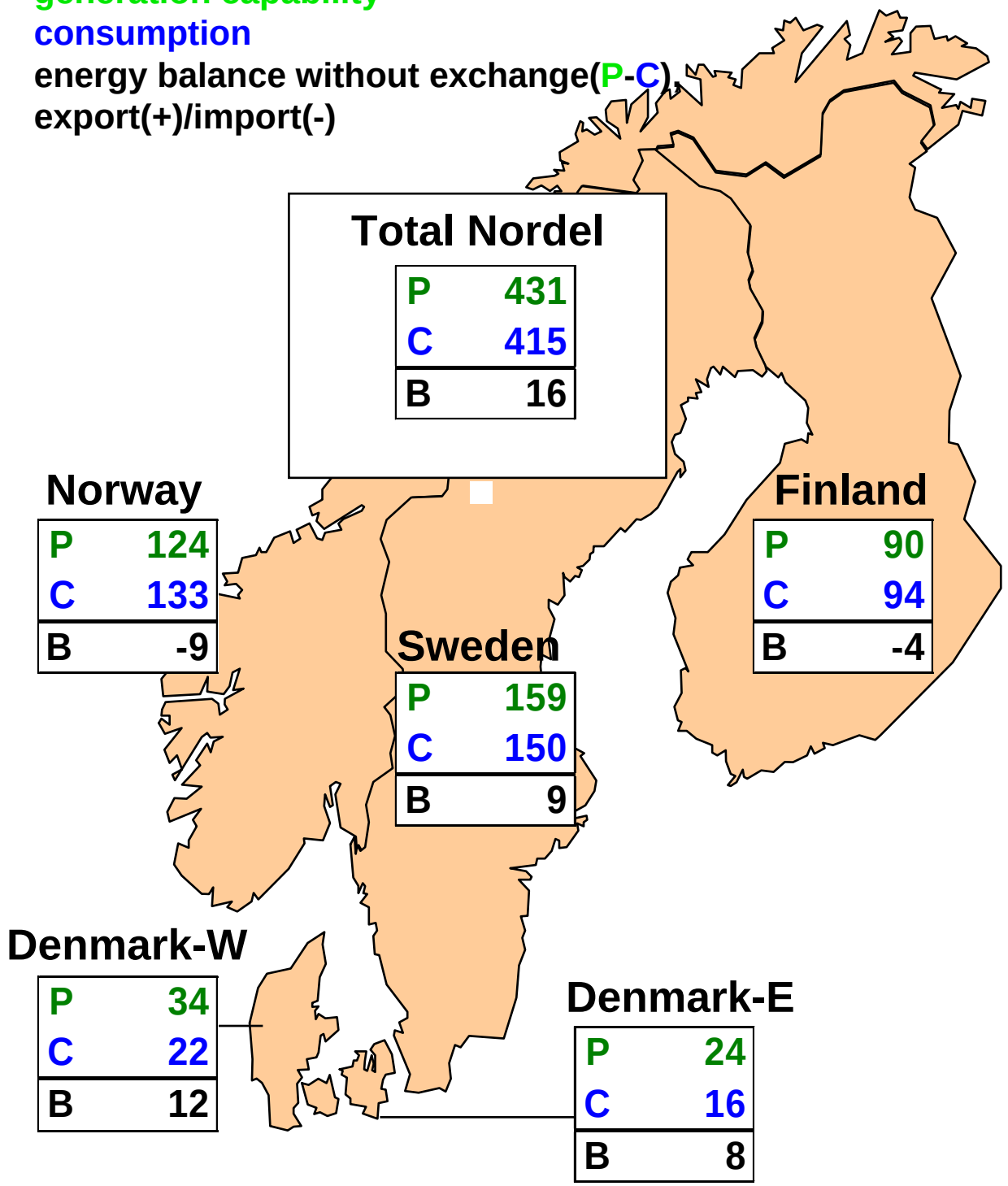
⇨ **In average conditions the Nordel system can balance well.**

GENERATION CAPABILITY AND ELECTRICITY CONSUMPTION 2008 [TWh]

No exchange between areas

Average conditions

P - generation capability
C - consumption
B - energy balance without exchange(P-C), export(+)/import(-)



ESTIMATED ENERGY MARKET BALANCE 2008

Extremely low hydropower generation

A year with an extremely low hydropower generation could result in a reduction of about 42 TWh in hydropower generation compared to average conditions. This means a deficit of at least 26 TWh that has to be covered with import and/or demand response in case the other forecasts remain unchanged.

The *Estimated Energy Market Balance* on page 9 illustrates the estimated physical exchanges between areas with an expected demand response of 14 TWh and 10 TWh lower thermal generation compared to the maximum generation capability (page 7). The lower thermal generation is due to cheaper import to the area and transmission bottlenecks in the Nordic system.

⇨ **In a hydro-based system the market price can temporarily be very high during dry years. The market should function well and adapt the demand to meet balance.**

⇨ **The demand response and new import from Estonia and the Netherlands will help the situation in the Nordic area.**

⇨ **Nordic transmission capacities may prevent full utilisation of Nordic thermal power in certain areas. The power balance and the internal bottlenecks in the continental Europe can have an effect on the import possibilities to the Nordic countries.**

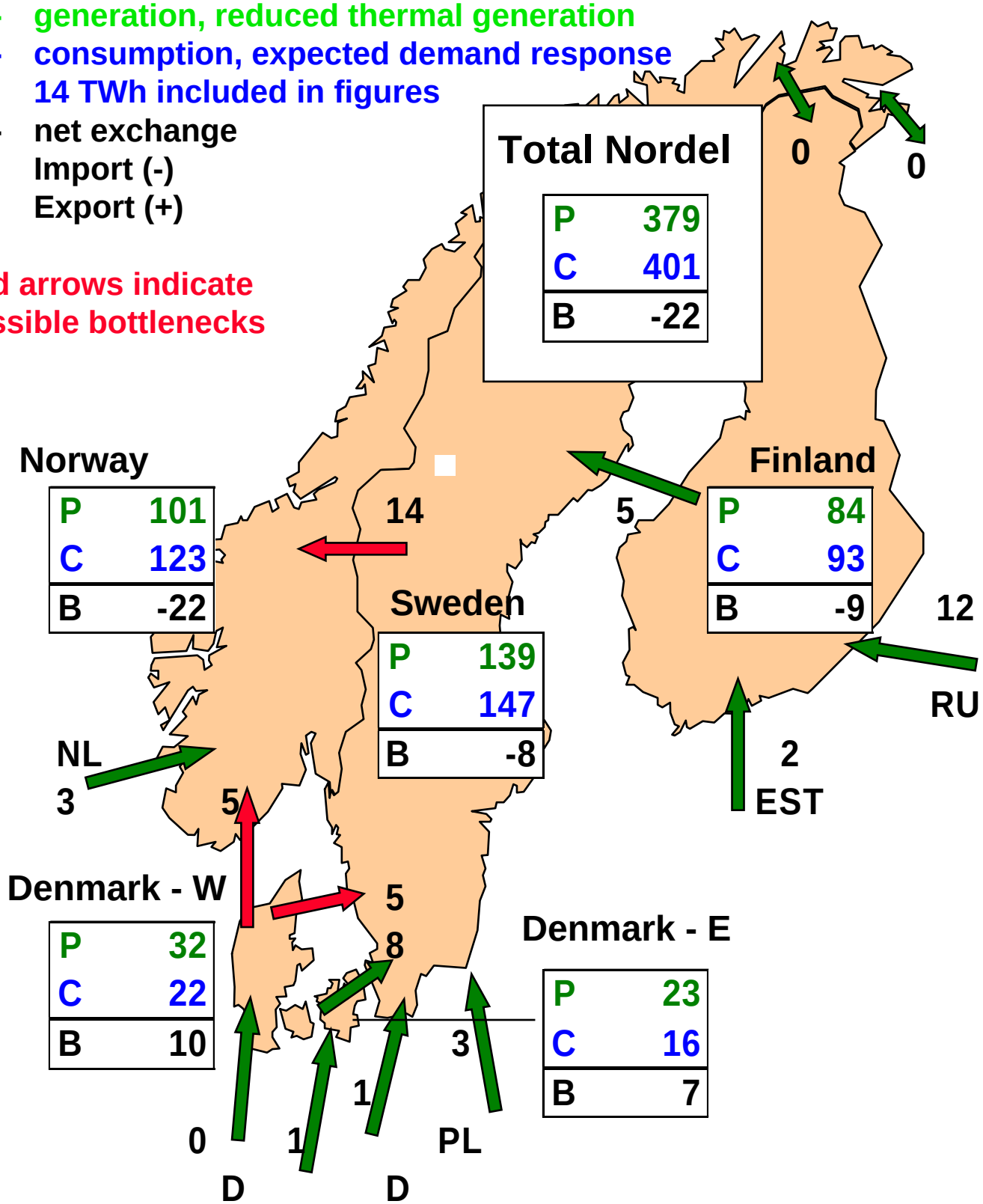
⇨ **For part of the Nordel system it is possible that the market cannot maintain the balance and the situation may lead to various forms of rationing or other measures to be carried out in the market.**

ESTIMATED ENERGY MARKET BALANCE 2008 [TWh]

Extremely low hydropower generation (1/40 years)

P - generation, reduced thermal generation
C - consumption, expected demand response
14 TWh included in figures
B - net exchange
Import (-)
Export (+)

Red arrows indicate possible bottlenecks



POWER CAPACITY AND PEAK DEMAND 2008/09

Average winter temperatures

The maximum available generation capacity exceeds the peak demand by more than 1 500 MWh/h. In addition there are import possibilities from Estonia, Germany, the Netherlands, Poland and Russia depending on market situation.

⇨ **An average winter day peak demand can be handled without any special challenges.**

POWER CAPACITY AND PEAK DEMAND 2008/09 [MWh/h]

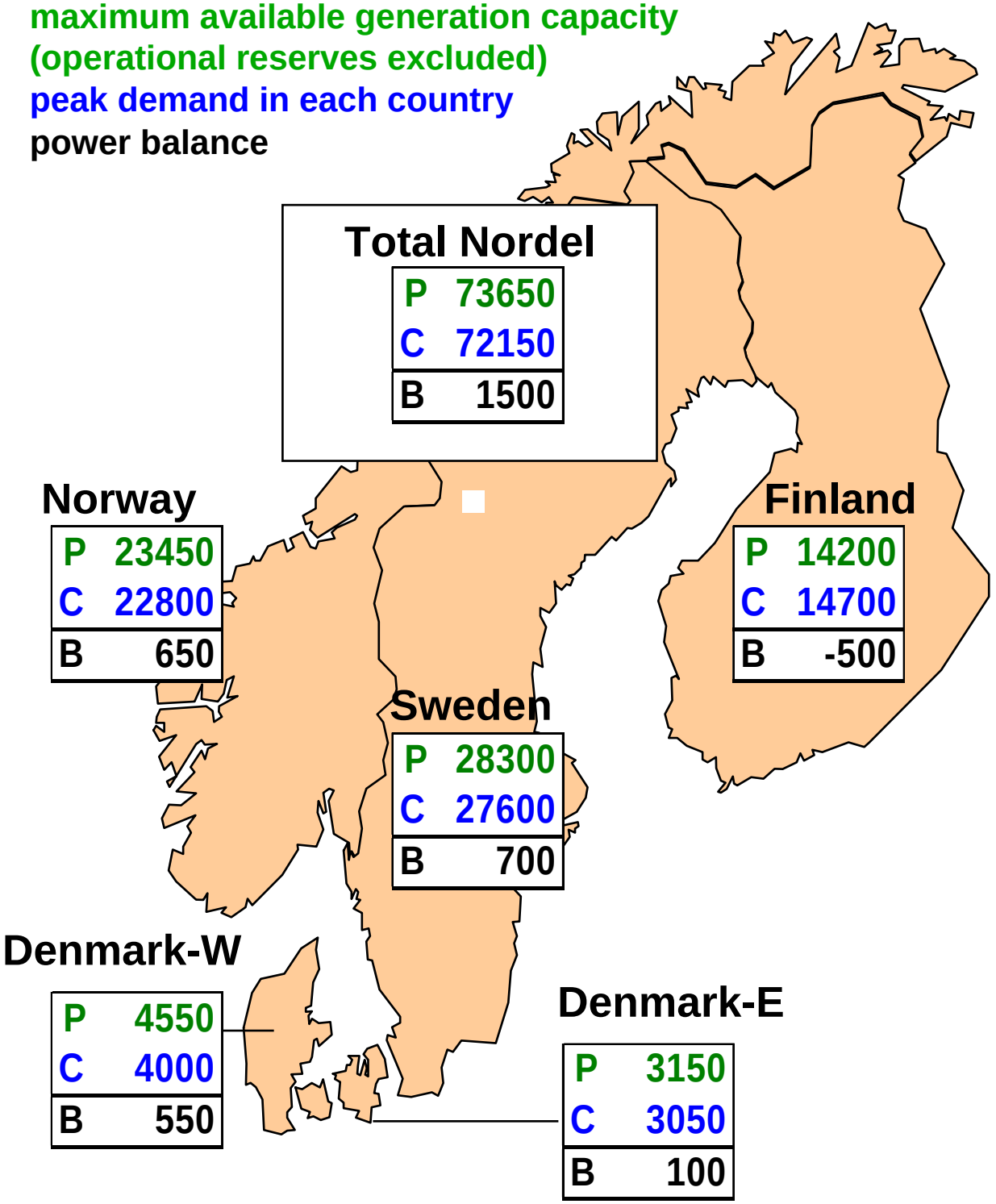
No exchange between areas

Average winter temperatures

P - maximum available generation capacity (operational reserves excluded)

C - peak demand in each country

B - power balance



ESTIMATED POWER MARKET BALANCE 2008/09

Cold winter day temperatures (Statistically every tenth winter)

The power balance is expected to come under strain in this situation. Low temperature increases the demand, on the other hand price elasticity decreases the demand.

In order to illustrate the physical transmissions between areas an estimated balance has been made, page 13. The demand forecast includes 600 MWh/h of price elasticity in Finland and Sweden. Additional demand resources can be available in the Norwegian Reserves Options Market (RKOM) for meeting the peak demand.

The balance indicates that the Nordic system has to import 1900 MWh/h.

Finland, Norway and Sweden are deficit areas which will be balanced by import from neighbouring areas. Denmark has the potential for a surplus and transit from Germany. Import from Russia is 1 400 MWh/h. The remaining 500 MWh/h is assumed to come from Estonia, Germany and Poland. The NorNed interconnection is not needed to support the peak load situation.

It is assessed that on a cold winter day it is not possible to use the maximum import capacity from Germany and Poland. In Poland there is a surplus of capacity but because of bottlenecks it cannot be fully used.

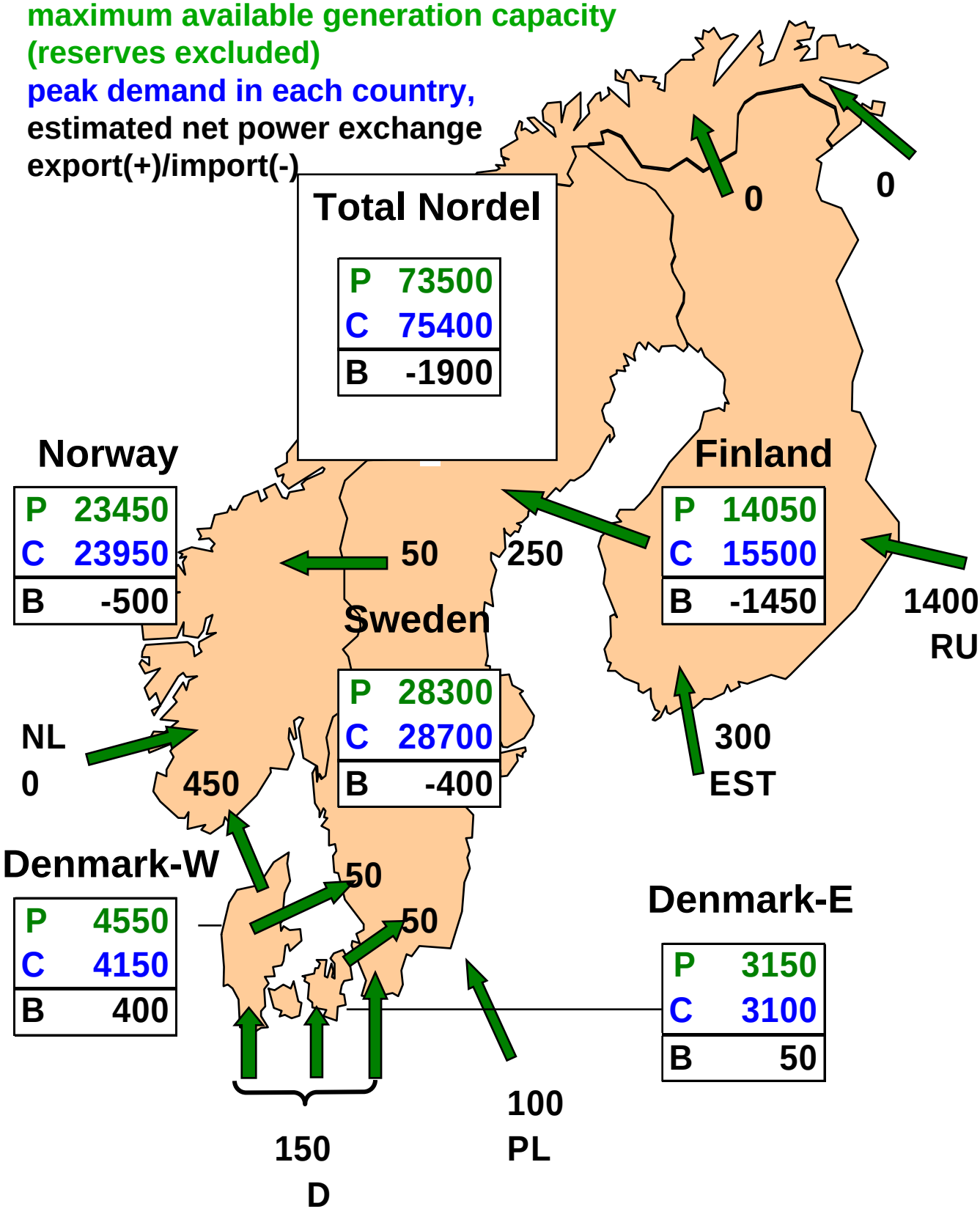
In Germany the power balance is assessed to be more stressed and the import possibility from Germany will be reduced in the coming years. It is estimated that there is still enough capacity for export to Nordel in 2008/09. It is important to analyse the development.

ESTIMATED POWER MARKET BALANCE 2008/09 [MWh/h]

Available production, estimated export/import

Temperatures corresponding to a ten years winter day

P - maximum available generation capacity (reserves excluded)
C - peak demand in each country,
B - estimated net power exchange export(+)/import(-)



Appendix 1

ENERGY

Purpose

The purpose of this presentation is to give a picture of the energy balance for each country and the whole Nordic electricity market. Focus is set on generation capacity and need for import from the neighbouring countries outside Nordel.

Definitions

***Low precipitation* = There is a probability of 10 % to obtain energy below the estimated value.**

***Extreme low precipitation* = There is a probability of 2.5 % to obtain energy below the estimated value (1 out of 40 years)**

Fundamentals

The exchange between the Nordel countries are market based. Hence it is the spot price that decides flow directions and volumes. The exchange between the Nordel countries and its neighbours is developing towards a market based operation.

The method does not necessarily indicate possible problems in certain areas.

Forecasted consumption/demand includes demand response during extreme dry years.

Consumption/demand includes network losses.

Appendix 2

POWER

Definitions

Available capacity **= installed capacity - unavailable capacity - reserves**

Reserves **= frequency controlled momentary and fast disturbance reserves.**

Peak Demand **= maximum one hour load in temperature circumstances with occurrence probability one winter during respectively two and ten years, denoted as an average winter day and a cold winter day.**

Ten years winter. **The peak demand is based on a temperature that has an occurrence of one out of ten years in each country separately.**
A simultaneous peak demand in all the countries at a working day has an occurrence probability less than 7 %.

Fundamentals

Estimated power exchange takes into account limitations both in transmissions and generations capabilities. The method does not necessarily indicate possible problems in certain areas.

Unavailable capacity is based on experiences from earlier peak demand situations. Minimum unavailable hydropower is approximately 14 % (6500 MW) of installed capacity.

Nuclear power output is supposed to be 100 % of full capacity.

Availability of other thermal power is reduced by e.g. forced outage rate, max heat production in combined heat and power plants, use of fuel other than oil etc.

The available wind power with a probability of 90% is approx. zero.

Demand forecast for ten years peak load includes demand response.

Nordel has recommended common fast disturbance reserves. From a total of 5 200 MW (3 200 MW in production capacity and 2 000 MW in dispatchable load) it can be reduced to a minimum of 600 MW in a connected system without severe bottlenecks before load shedding is executed. The recommended reserves have been subtracted from available production capacity.

Appendix 3.1

ENERGY
Retrospect 2004

Total consumption in 2004 was 390.9 TWh (380.4 TWh in 2003). The temperature corrected consumption was 395.6 TWh. At the beginning of 2004 and again in August-September reservoir levels were very low but higher than in 2003. Long time median level was reached in May and again at the end of the year. The Nord Pool spot price was stable throughout the year.

Demand increased in all countries. The biggest increase of demand was in Norway (7.0 TWh) due to suppressed demand in 2003. Demand increased in Finland by 2.2 TWh while Denmark and Sweden showed only minor changes.

The total production in 2004 was 379.3 TWh (363.3 TWh in 2003). The hydro power production was 184 TWh (163 TWh), wind power 8 TWh (6 TWh), thermal power excluding nuclear was 91 TWh (100 TWh) and nuclear power was 97 TWh (87 TWh).

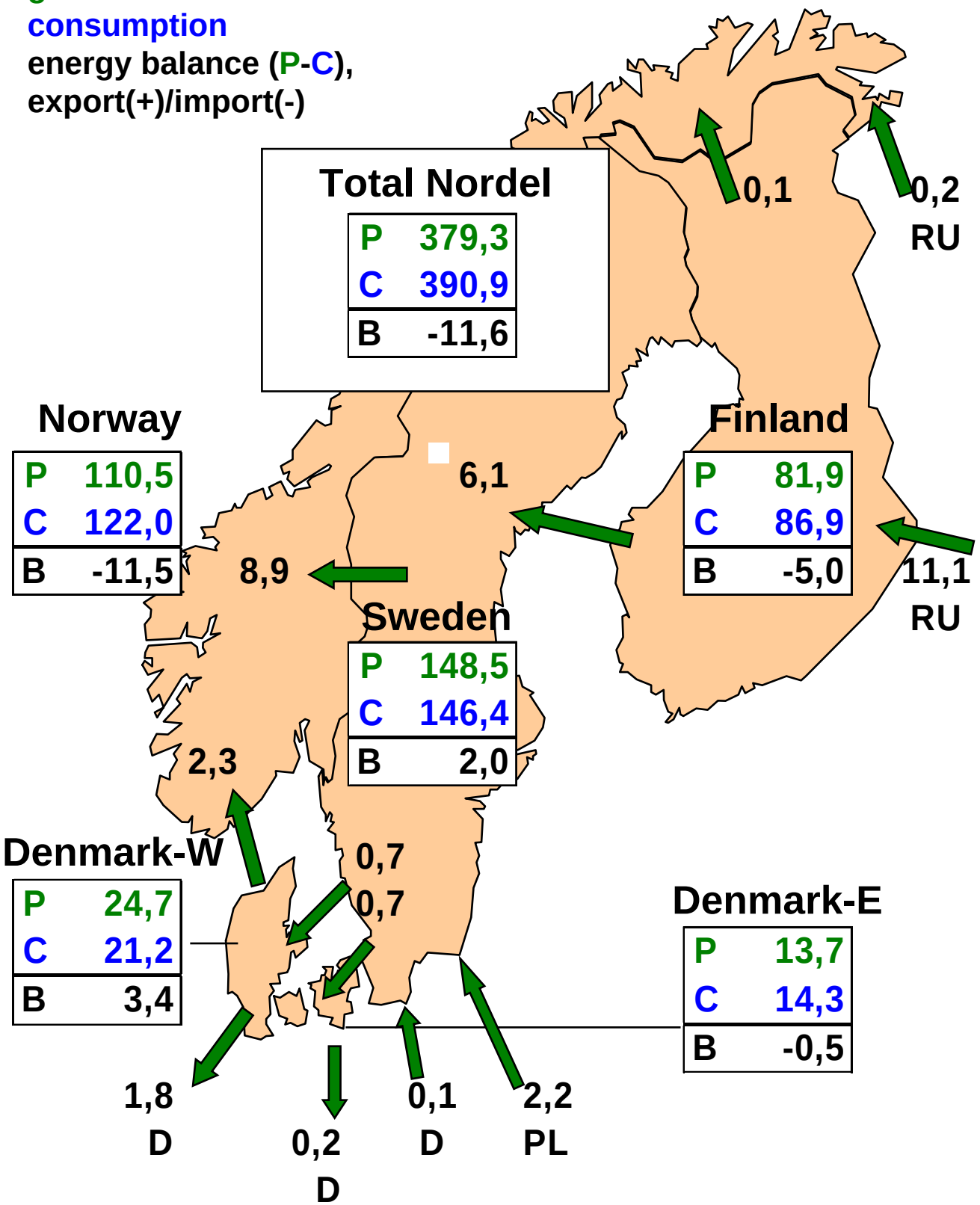
In 2004 the Nordel countries together had a net import of 11.6 TWh (17.1 TWh in 2003). The import was from Russia 11.3 TWh, Poland 2.2 TWh while there was net export of 1.9 TWh to Germany.

Appendix 3.2

ENERGY BALANCE 2004 [TWh]

Retrospect

P - generation
C - consumption
B - energy balance (P-C), export(+)/import(-)



Appendix 4.1

POWER BALANCE
Retrospect 2004/2005

Synchronous Peak Demand
2 March 2005, hour 8-9 a.m. CET

Peak demand this winter was 65 100 MWh/h, while a peak demand with a ten years temperature was estimated to 73 700 MWh/h. The total maximum winter peak demand 2000/2001 was 69 000 MWh/h which is the all time high peak demand in the Nordel system.

The operation of the Nordel system was in general normal during the peak load situation

The temperatures during the winter peak 2004/2005 were near average winter temperatures in the Nordic Countries.

Compared to estimated peak demand for ten years winter the difference was between 9% and 21% in the individual areas.

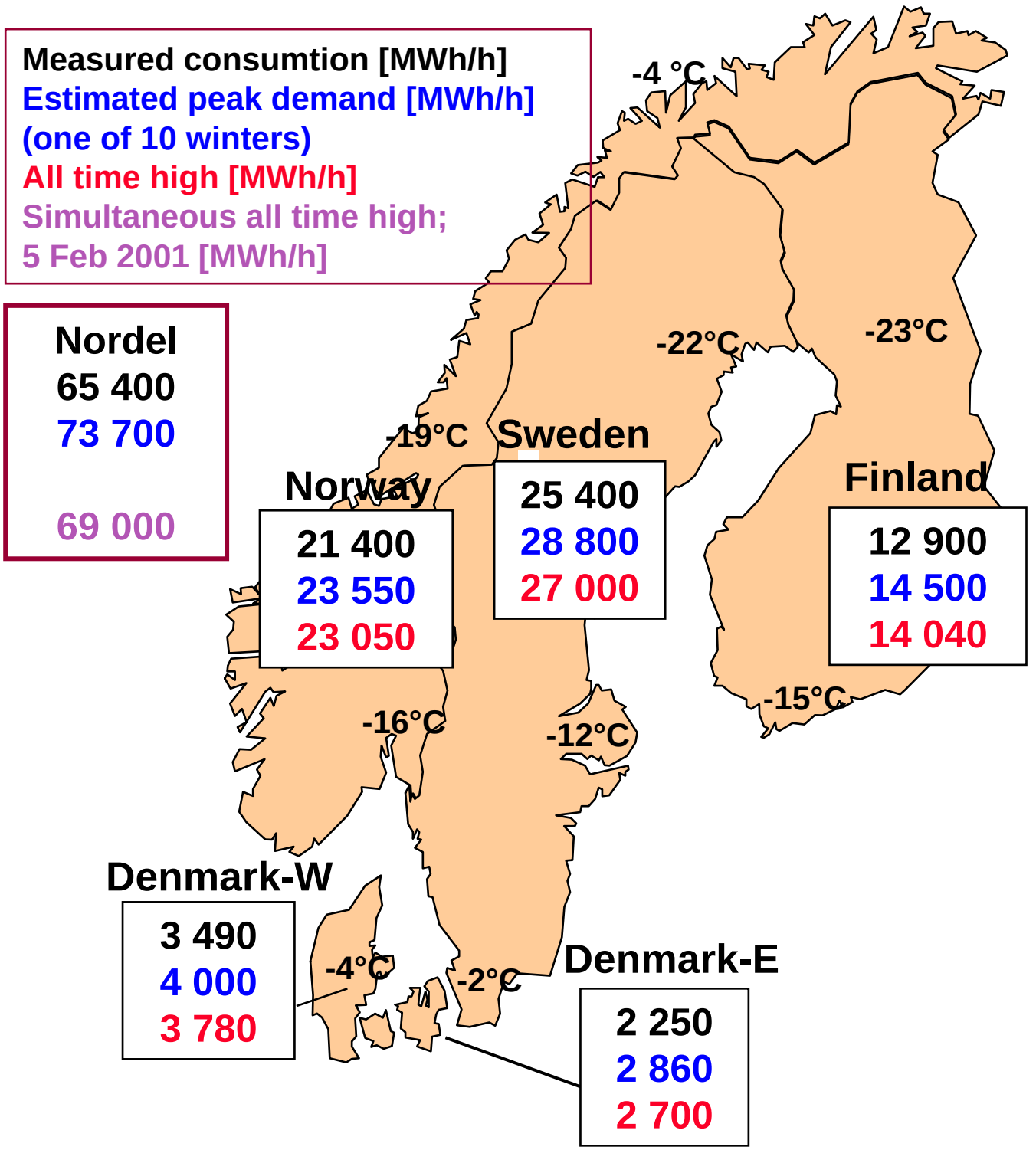
Country specific peak demands

The different nordic countries had their peaks between January 25 and March 3, 2005. The sum of the individual peaks was 2,1% higher than the synchronous peak.

Appendix 4.2

PEAK LOAD 2004/2005
IN THE TOTAL NORDEL AREA

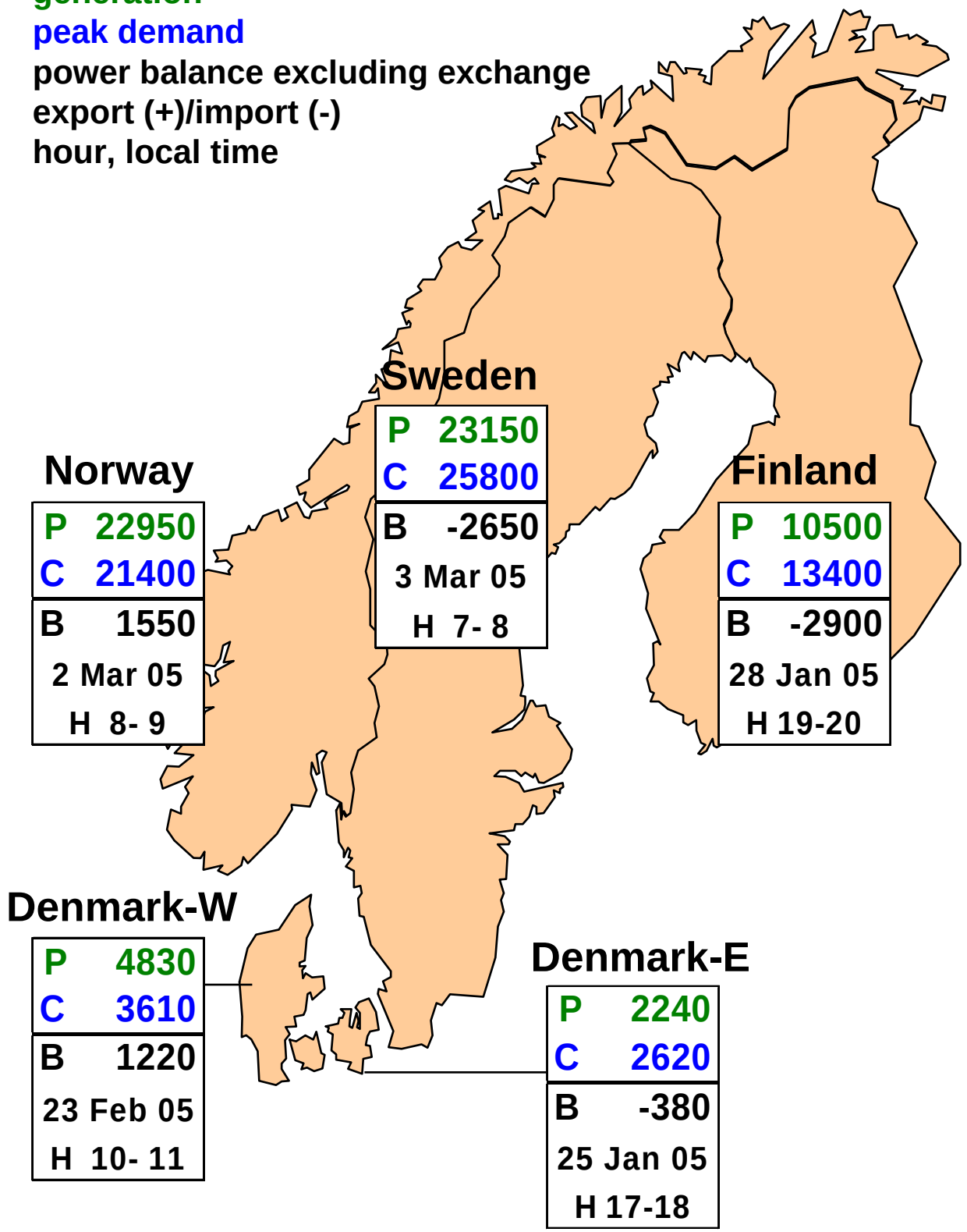
Measured on 2 March 2005, 8 a.m. - 9 a.m. (CET), estimated 1 in 10 years and all time high



Appendix 4.3

COUNTRY SPECIFIC PEAK DEMAND 2004/05 [MWh/h]

P - generation
C - peak demand
B - power balance excluding exchange
export (+)/import (-)
H - hour, local time



Appendix 5

AVAILABLE CROSS BORDER TRADING CAPACITIES 2008, MW