

tennet 

Transmission on Balance

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Tennet

In this brochure tenner has drawn up the balance in respect of its main technical operating results for 2003. In addition to listing data on tenner's infrastructural operating assets, the brochure also elaborates on their deployment for the benefit of facilitating the power market.

This publication does not include any statistics pertaining to tenner Zuid-Holland, the acquisition of which tenner completed in late 2003.

## The Dutch high-voltage grid

31 December 2003

The overview of the Dutch high-voltage grid shows the overhead high-voltage links, of which the main transmission grid – i.e. the 380kV/220kV section including the cross-border interconnections – is administered by tenner, as are the 380kV and 220kV switching and/or transformer substations.

- 380kV tenner
- 220kV tenner
- 150kV regional grid administrator
- 110kV regional grid administrator
- ↔ 380kV cross-border interconnection
- ● ● switching and/or transformer substation
- Ens name of 380kV or 220kV substation
- 900 MVA high-voltage substation's connective capacity
- tenner National Control Centre
- ▶ grid openings
- generating unit 60-250MW
- generating unit ≥ 250MW



### Connective capacity of generating units

The generating units' 380kV and 220kV connective capacity remained unchanged in 2003.

	1999	2000	2001	2002	2003	
380 kV	3 963	3 963	3 963	3 963	3 963	MVA
220 kV	3 076	3 076	3 076	3 076	3 076	MVA

### Connective capacity of transformer units

*Inclusive of bulk consumers*

A second transformer was taken into use in Doetinchem in 2003, boosting the 380kV connective capacity to 15,100MVA.

	1999	2000	2001	2002	2003	
380 kV	13 600	14 100	14 600	14 600	15 100	MVA
220 kV	4 580	4 540	4 810	4 810	4 810	MVA

### Availability of 380kV and 220kV high-voltage grid

The availability on the connections during the first 49 weeks of [2003?] totalled 99.2% for the connected grid companies, against 98.5% on the cross-border interconnections, with realisation being kept within tenner's availability standards in both categories. The internal standard applying to the category of cross-border interconnections was exceeded as a result of the relatively greater volume of work carried out this year. The non-availability in this category was dominated by work on the German interconnection at Meeden, where the installation of phase shifters was completed. Allowance has been made in the standard for the amount of time required. Unavailability due to failure was kept within tenner's availability standard by a generous margin, with none of the failures causing supply to be interrupted.

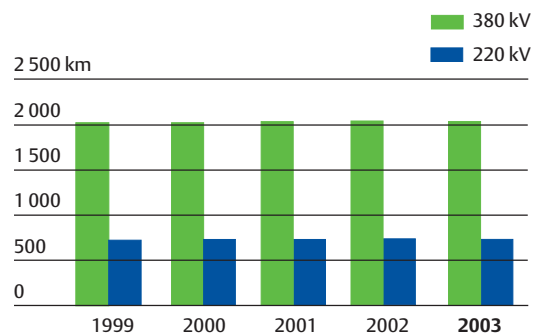
#### Non-availability of 380kV and 220kV grid

	Number of connections	Planned non-availability/ unplanned non-availability standard	Planned non-availability/ unplanned non-availability realised
Domestically	56	1,0 / 0,03 %	0,8 / 0,02%
Cross-border	10	1,2 / 0,03 %	1,5 / 0,01 %

% = Percentage of time during which not available for transmission

### Circuit length

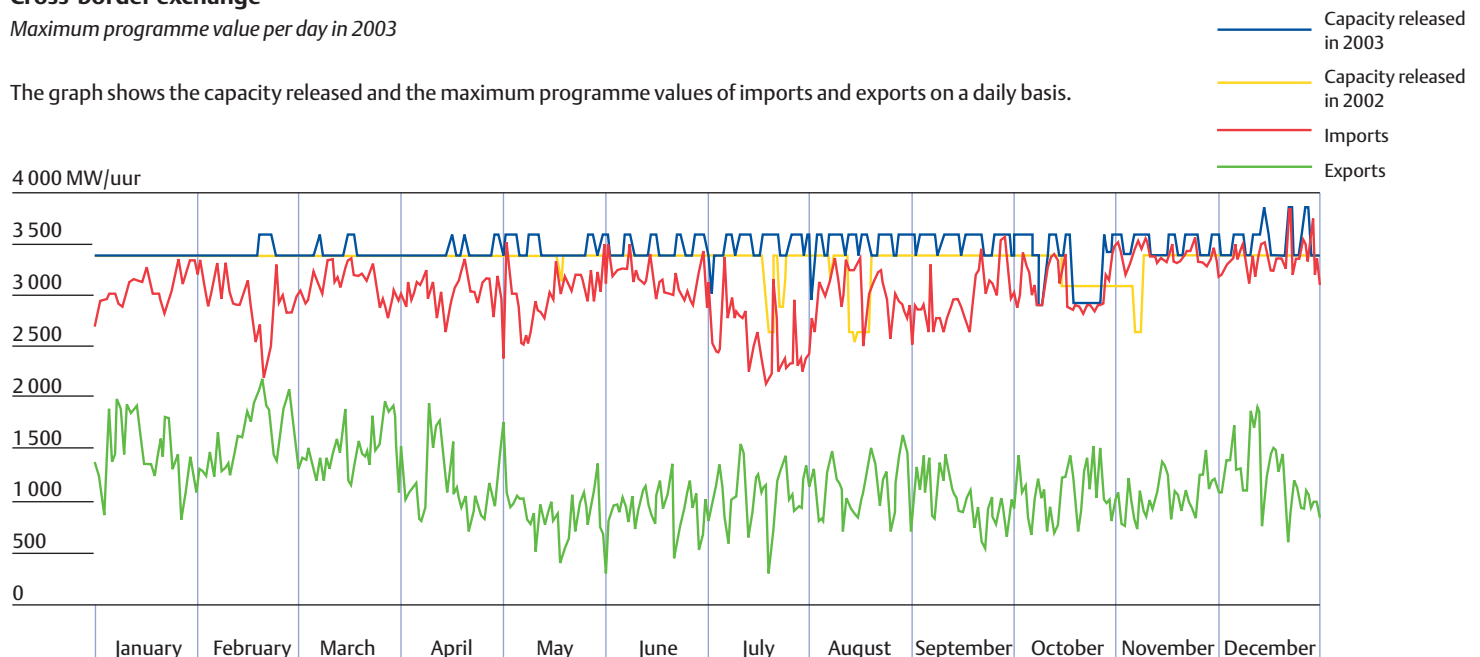
The 380kV and 220kV circuit lengths remained unchanged in 2003 at 2003 kilometres and 683 kilometres, respectively.



### Cross-border exchange

*Maximum programme value per day in 2003*

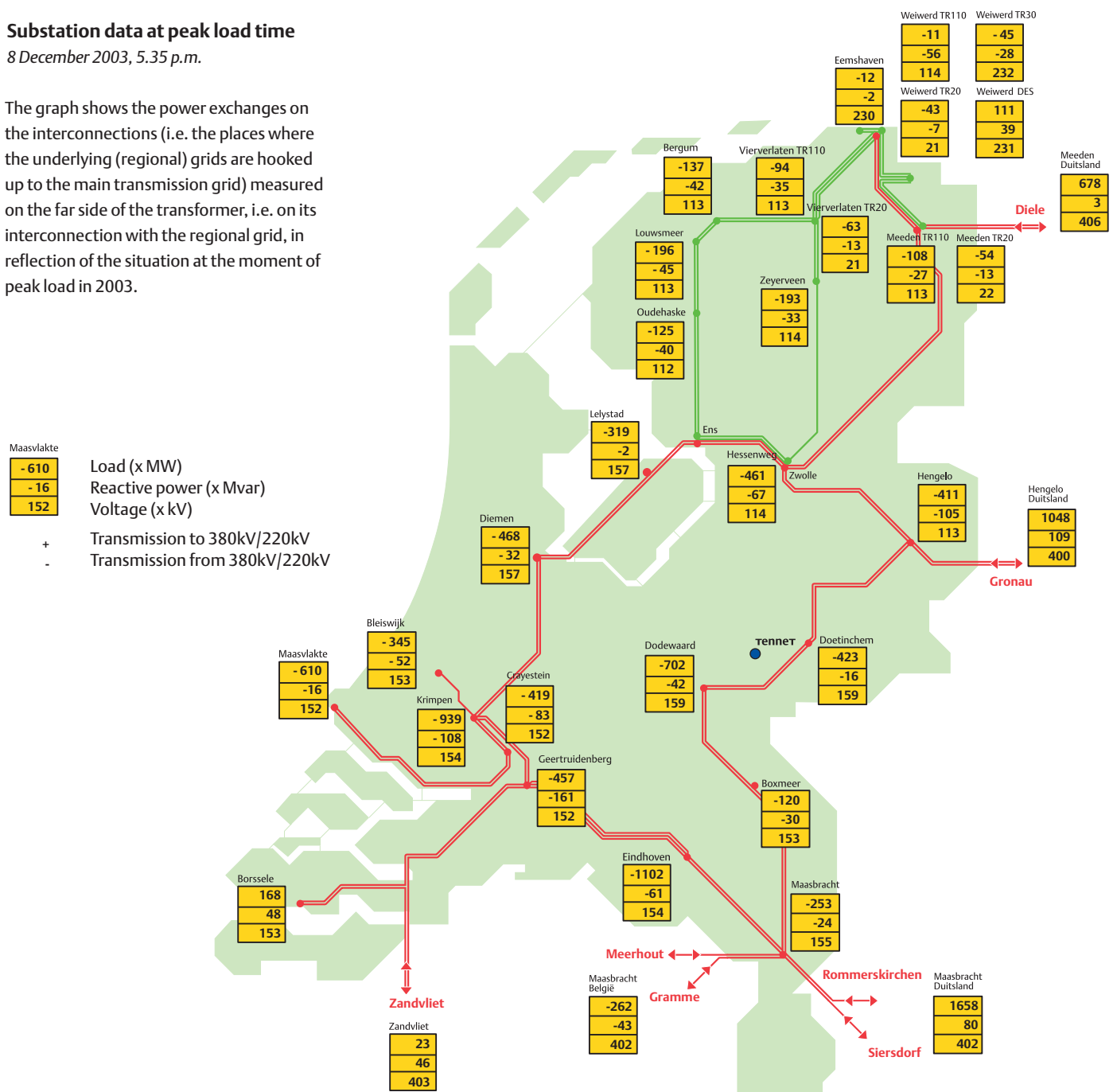
The graph shows the capacity released and the maximum programme values of imports and exports on a daily basis.



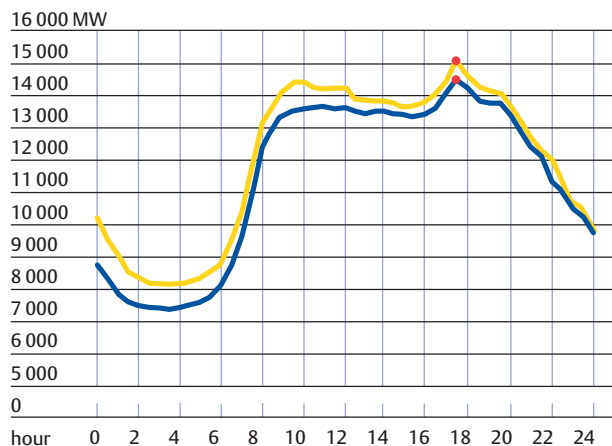
## Substation data at peak load time

8 December 2003, 5.35 p.m.

The graph shows the power exchanges on the interconnections (i.e. the places where the underlying (regional) grids are hooked up to the main transmission grid) measured on the far side of the transformer, i.e. on its interconnection with the regional grid, in reflection of the situation at the moment of peak load in 2003.



## Peak load



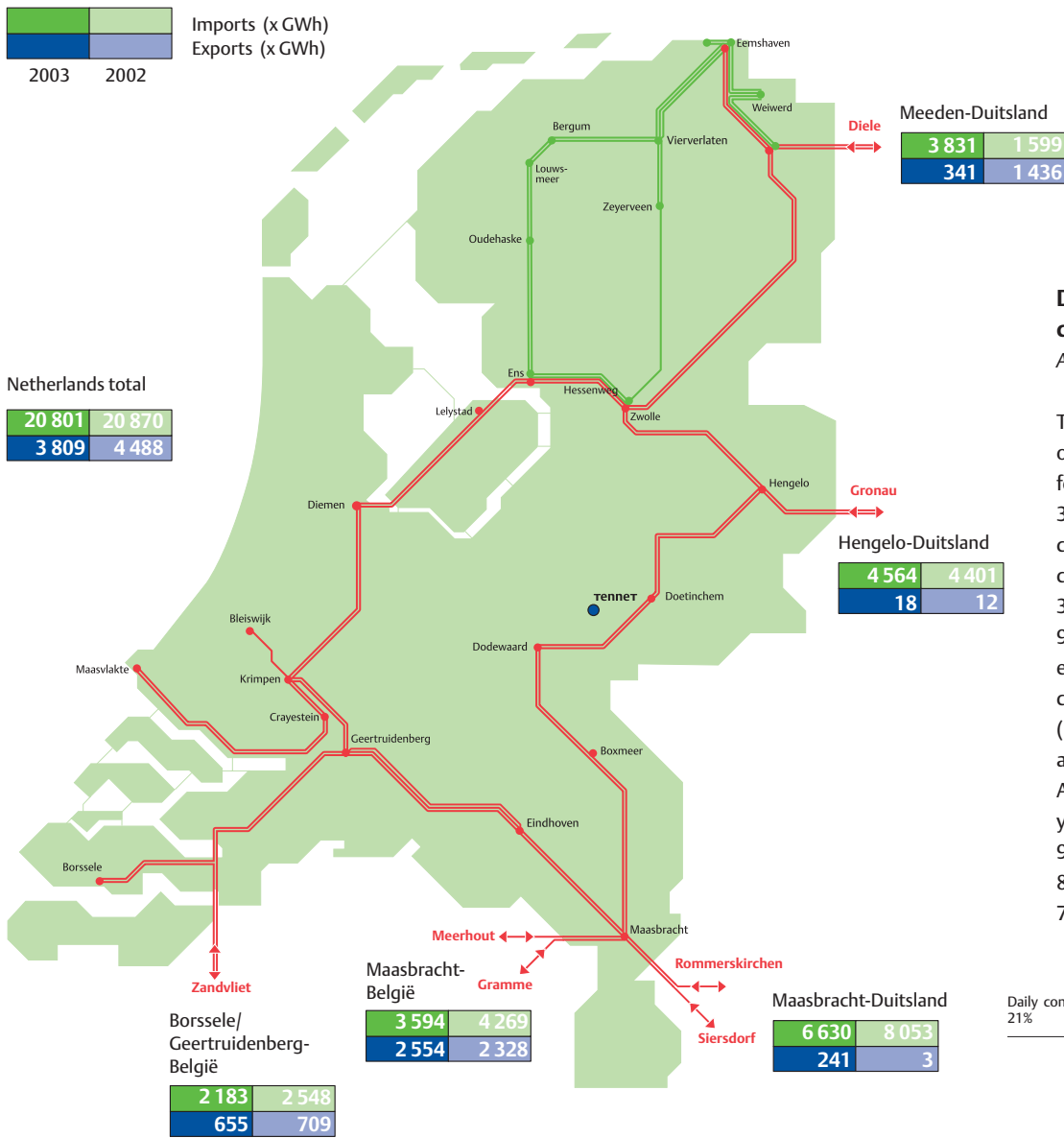
The peak load of generating capacity plus imports which tenet recorded for 2003, in the amount of 14,469MW, occurred between 5.25 and 5.35 p.m. on 8 December 2003, turning out 557MW lower than the previous year's record (minus 3.8%). (As the grid administrators have been provided with more frequent measurements of the generating capacity (> 60MW) since 2001, no comparison can be made with the peak loads for the years prior to 2001.)

- 8 December 2003, 5.25 – 5.35 p.m. (14,469MW)
- 10 December 2002, 5.25 – 5.35 p.m. (15,046MW)
- Peak load time

## Imports and exports (including transit runs) measured per cross-border interconnection

x GWh

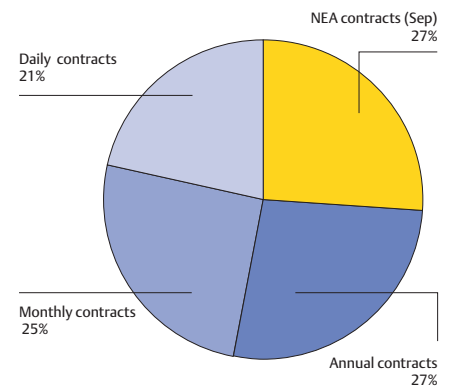
The chart shows the import and export totals (x GWh) as measured for the international transmission runs, both per individual cross-border interconnection and for the Netherlands as a whole.



### Distribution of net import capacity for 2003

As at 31 December 2003

The aggregate net import capacity on the cross-border interconnections for the whole of 2003 totalled 3,350MW. Where operating conditions allowed the import capacity was upped to 3,600MW and 3,850MW, respectively. A total of 900MW (representing 27%) was earmarked for long-term import contracts, with the relevant (national) grid administrators auctioning off the remainder. Availability was as follows during the year under review: annual contracts, 900MW (27%), monthly contracts, 849MW (25%), and daily contracts, 701MW.



Distribution has been based on an import capacity of 3,350MW.

### Transmission runs across cross-border interconnections in 2003

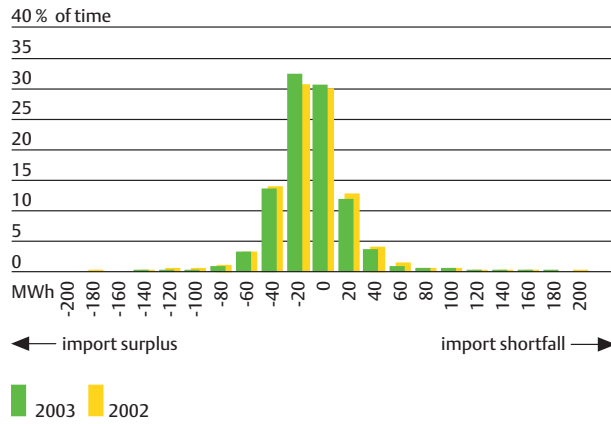
(x GWh)

	Programmes			Measurements on cross-border interconnections
	Programmes	UCTE programme set-off	Total programmes	
<b>Imports 2003</b>	<b>22 060</b>	<b>21</b>	<b>22 081</b>	<b>20 801</b>
Imports 2002	22 974	16	22 990	20 870
<b>Exports 2003</b>	<b>5 028</b>	<b>61</b>	<b>5 089</b>	<b>3 809</b>
Exports 2002	6 514	94	6 608	4 488

## Involuntary exchange between the Netherlands and other countries

Hourly values, 2002/2003

The discrepancy relative to the exchange programme involving other countries turned out at less than 20MWh for 64.1% of the time whereas the national standard of 100MWh was not achieved for 0.8% of the time (approximately 90 hours).



### PRP (Programme Responsible Party) imbalance per day 1 January to 12 December 2003 inclusive

The graph shows the average daily imbalance per hour (as MWh/h) for all PRPs together, with the bars reflecting the balance per day, this being the discrepancy between the positive imbalance (surplus) and the negative imbalance (shortfall).

