

Transmission on Balance 2001



Technical operation: facts en figures

tennet



Transmission System Operator

Transmission on Balance, 2001

In this brochure tenner has drawn up the balance in respect of its main technical operating results for 2001. 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.

N.B. The results marked * are partly based on preliminary data for the month of December.

Dutch High Voltage Grid

1 January 2002

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 24 380kV and 220kV switching and/or transformer substations whose connective capacity is also shown.

- 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 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 2001.

| | 1997 | 1998 | 1999 | 2000 | 2001 | |
|--------|-------|-------|-------|-------|-------|-----|
| 380 kV | 3 963 | 3 963 | 3 963 | 3 963 | 3 963 | MVA |
| 220 kV | 3 412 | 3 076 | 3 076 | 3 076 | 3 076 | MVA |

Connective capacity of transformer circuits

Inclusive of bulk consumers

The increase in the 380kV connective capacity by 500MVA has been enabled by the commissioning of the fourth transformer substation in Eindhoven. Two spare transformers forming part of the existing 220kV grid were relocated to the Hessenweg substation in replacement of two smaller transformers, thus boosting the connective capacity locally by 270MVA.

| | 1997 | 1998 | 1999 | 2000 | 2001 | |
|--------|--------|--------|--------|--------|--------|-----|
| 380 kV | 12 600 | 12 600 | 13 600 | 14 100 | 14 600 | MVA |
| 220 kV | 4 230 | 4 580 | 4 580 | 4 540 | 4 810 | MVA |

Availability of 380kV and 220kV high-voltage grid

The availability on the connections during the first 49 weeks of 2001 totalled 99.3% for the connected grid companies, against 98.7% on the cross-border interconnections.

The maintenance work including several modification projects for the category of domestic grid companies was kept within tenner's availability standard in 2001, with the planned non-availability in respect of the cross-border interconnections including the work in relation to the construction of the transverse regulating transformer at Meeden substation in support of the Meeden-Germany connection being kept just within the corresponding standard.

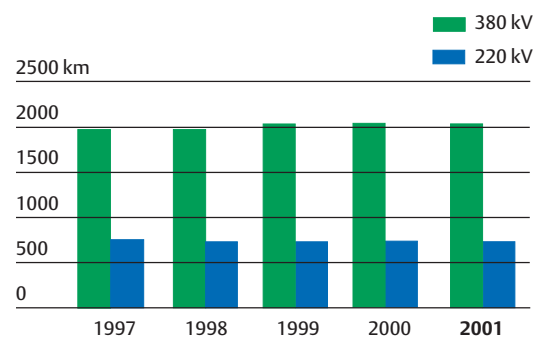
Non-availability of 380kV and 220kV grid

| | Number of connections | Planned non-availability/ unplanned non-availability standard | Planned non-availability/ unplanned non-availability realised |
|--------------|-----------------------|--|--|
| Domestically | 55 | 1,5 / 0,03 % | 0,7 / < 0,01 % |
| Cross-border | 10 | 1,4 / 0,03 % | 1,3 / 0 % |

% = Percentage of time during which not available for transmission

Circuit length

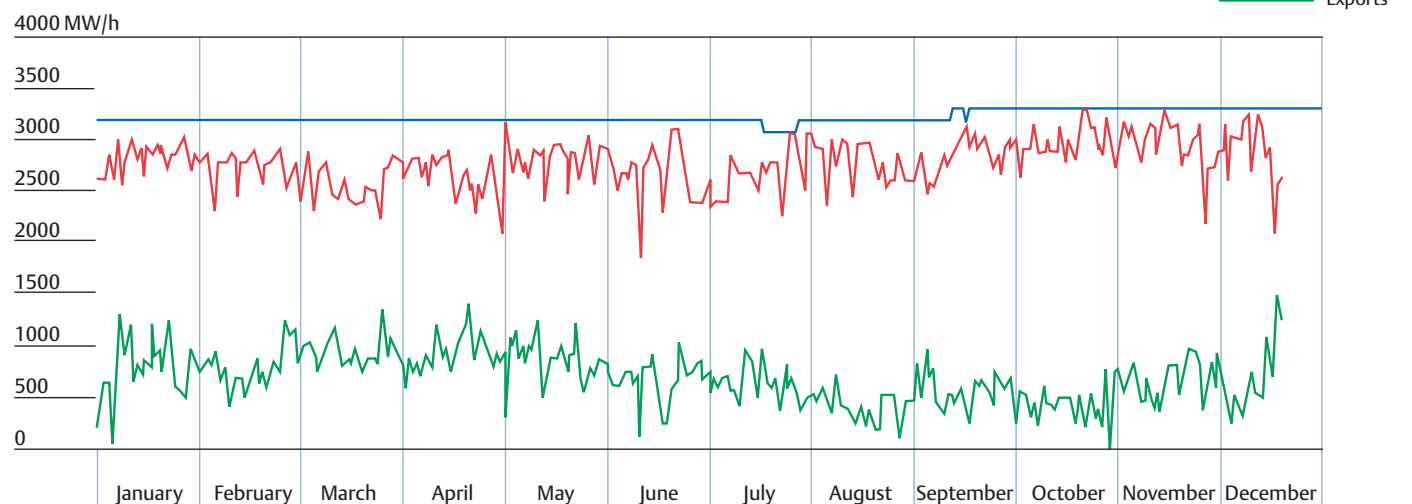
The 380kV circuit length remained unchanged in 2001, at 2,003 kilometres, as did the 220kV circuit length, at 683 kilometres.



Cross-border exchange

maximum programme value per day in 2001

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

12 December 2001, 5.30 p.m.

The graph shows the energy 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 connection with the regional grid, in reflection of the situation at the moment of peak load in 2001.

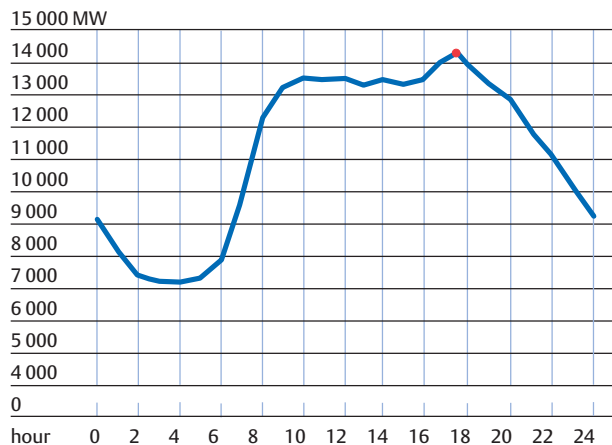
Maasvlakte
 - 607
 158
 156

load (x MW)
 reactive power
 voltage (x kV)

+ transmission to 380kV/220kV
 - transmission from 380kV/220kV



Peak load

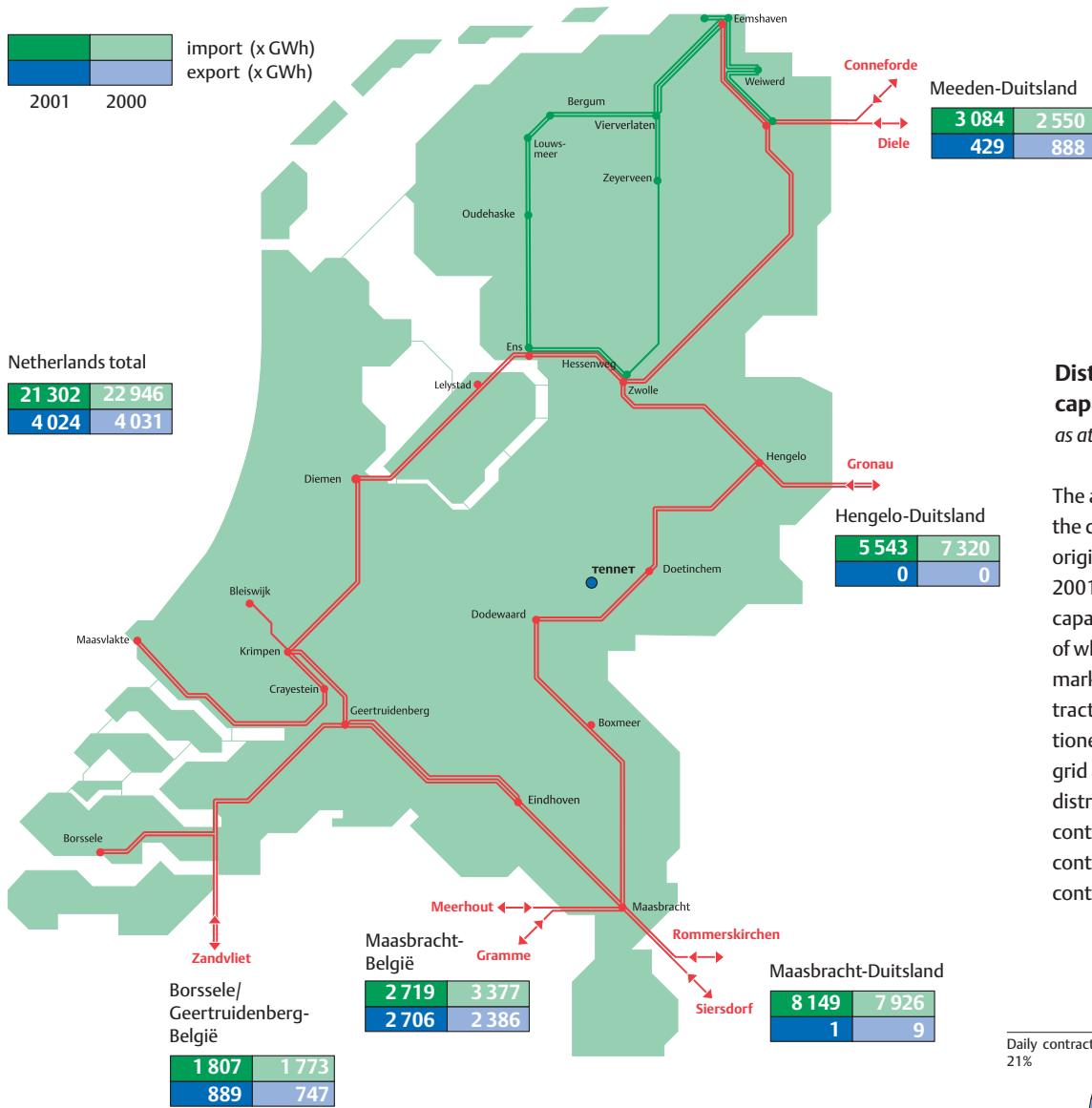


The peak load of the generating capacity plus imports which tennet recorded for 2001, in the amount of 14,242MW, occurred between 5.15 and 5.30 p.m. on 12 December 2001. As the grid administrators have been provided with more frequent measurements of the generating capacity with effect from 2001, no comparison with the peak loads from previous years can be made.

— 12 December 2001, 5.15 – 5.30 p.m. (14,242MW)
 • Peak load time

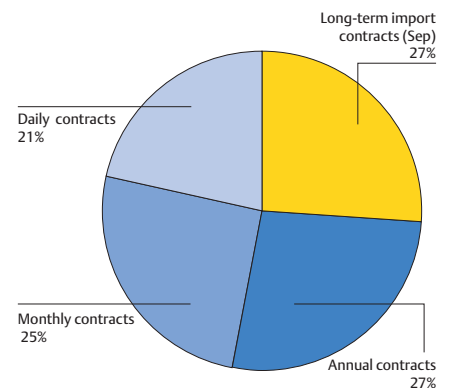
*** Imports and exports (including transit) measures per cross-border interconnection**
total for 2001 (x GWh)

The chart shows the total imports and exports as measured for 2001 of the international transmission runs, both per individual cross-border interconnection and for the Netherlands as a whole, in terms of GWh.



Distribution of net import capacity for 2001
as at 31 December 2001

The aggregate net import capacity on the cross-border interconnections originally amounted to 3,200MW in 2001. On 11 September the import capacity was stepped up to 3,350MW, of which 900MW (27%) had been earmarked for long-term import contracts, with the remainder being auctioned off by the relevant (national) grid administrators. The contractual distribution was as follows: annual contracts, 900MW (27%); monthly contracts, 849MW (25%); and daily contracts, 701MW (21%).



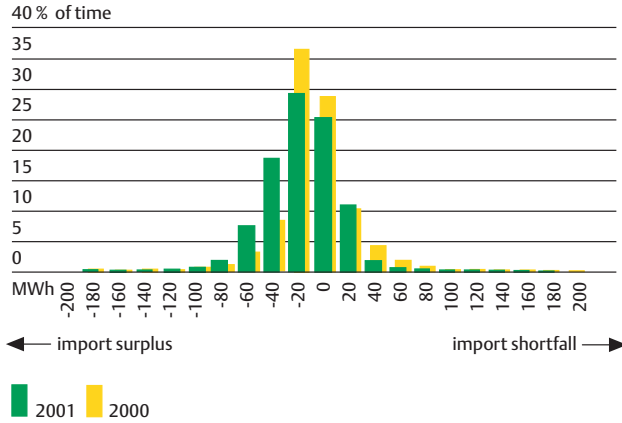
*** Transmission runs, cross-border interconnections in 2001**
x GWh

| | Programmes | | | | Cross-border interconnection measurements | Transit |
|---------------------|------------|-----------------|-----------------------------|------------------|---|---------|
| | programmes | transit set-off | UCTE programme compensation | programmes total | | |
| Imports 2001 | 20 372 | 0 | 75 | 20 447 | 21 302 | 855 |
| Imports 2000 | 19 048 | 0 | 45 | 19 093 | 22 946 | 3 853 |
| Exports 2001 | 3 111 | 0 | 58 | 3 169 | 4 024 | 855 |
| Exports 2000 | 133 | 0 | 45 | 178 | 4 031 | 3 853 |

*** Involuntary exchange between the Netherlands and other countries**

hourly values 2000/2001

The discrepancy relative to the exchange programme involving other countries turned out at nil (= balanced) for 24.6% of the time. By way of illustration, an involuntary exchange in the amount of minus 60MWh occurred for 7.9% of the time and an involuntary exchange in the amount of plus 40MWh, for 2% of the time.



*** PRP (Programme Responsible Party) imbalance per day**

1 January to 14 December 2001 inclusive

The chart 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 and negative imbalance.

