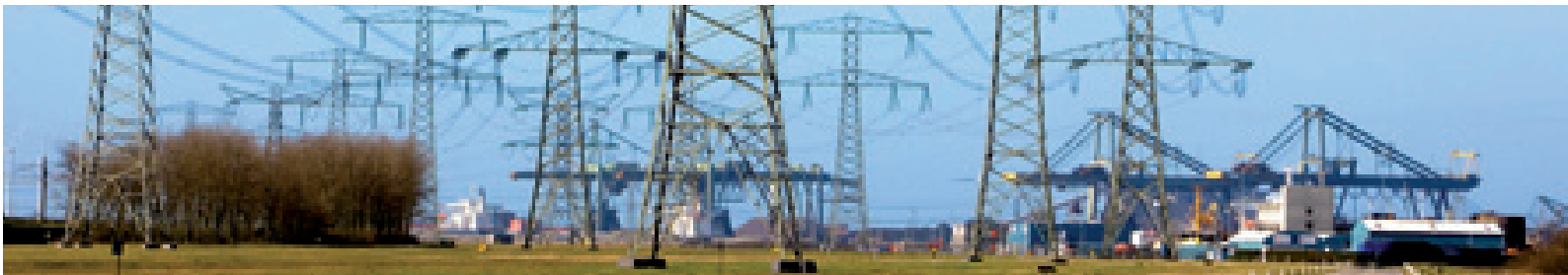


# Transmission on Balance 2007





# Full of energy

In this brochure TenneT TSO B.V. summarises its main technical operating results for 2007. Besides providing information on TenneT's infrastructural assets, the brochure also elaborates on the deployment of these assets for the purpose of electricity market facilitation.

## Full of energy – 24 hours a day

In its capacity of Transmission System Operator and independent administrator of the Dutch transmission grid, TenneT is in charge of the 'highways' of the Dutch electricity grid, which interconnects all regional grids as well as the European grid. TenneT seeks to ensure optimum service provision in support of a properly functioning electricity market in the Netherlands and Central Europe. We therefore devote continuous attention to the strengthening of the Dutch electricity market within a European perspective. We do this, among other things, by constructing a cable link to Norway, promoting market integration and developing initiatives such as a cable to the UK and an additional cross-border interconnection with Germany.

TenneT makes every effort to ensure an optimum operating performance across the board, supplying its customers with services and products in an efficient and professional manner. Our point of departure remains the need to ensure a reliable supply of high-quality electricity.

Responsibility for managing all high-voltage grids with a voltage level of 110 kV and higher was transferred to TenneT on 1 January 2008. Consequently, this is the last time the 'Transmission on Balance' report will be published in its current form. In 2008 TenneT will continue to develop a single national transmission grid which will form the backbone for electricity supplies in the Netherlands.

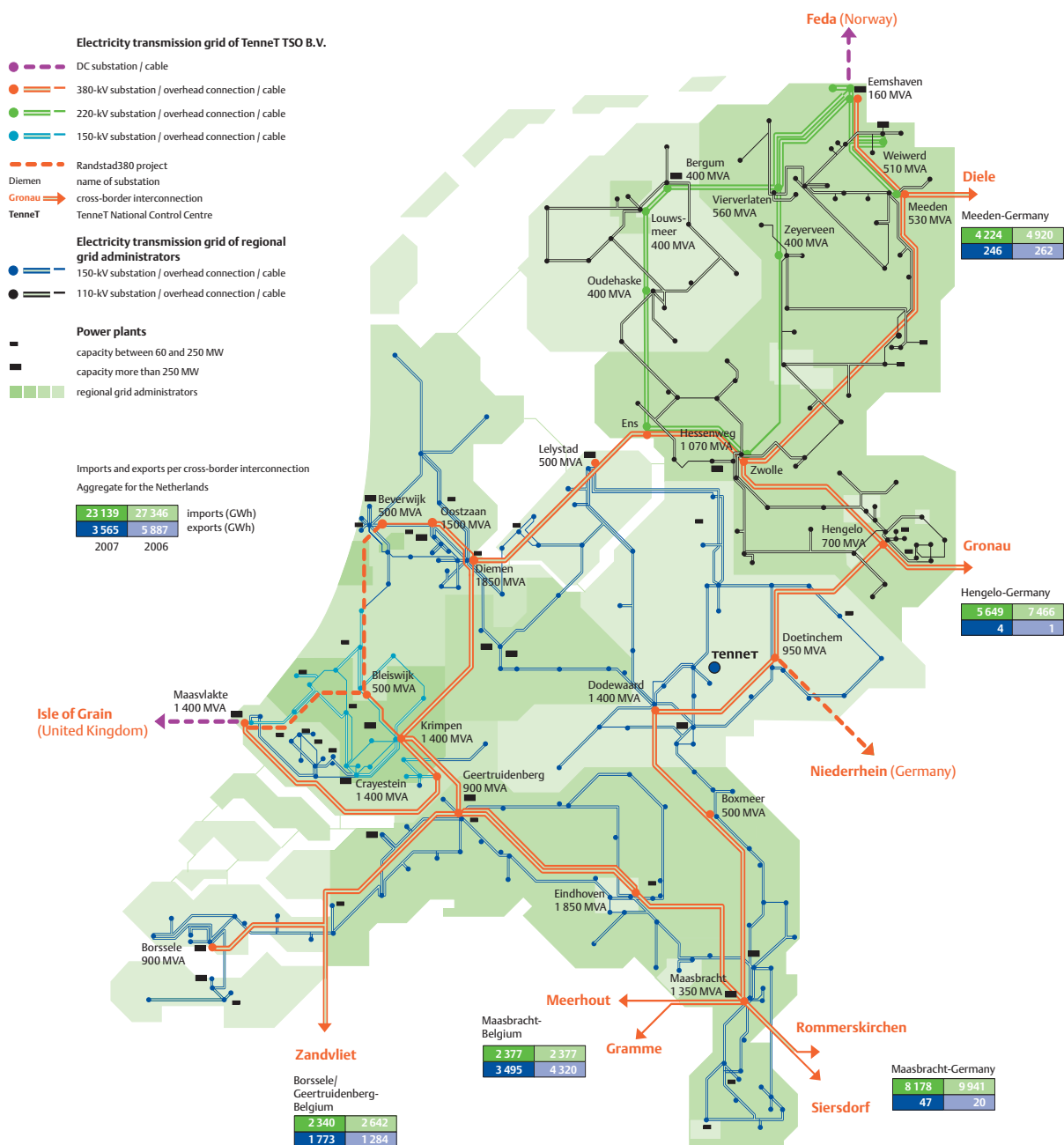


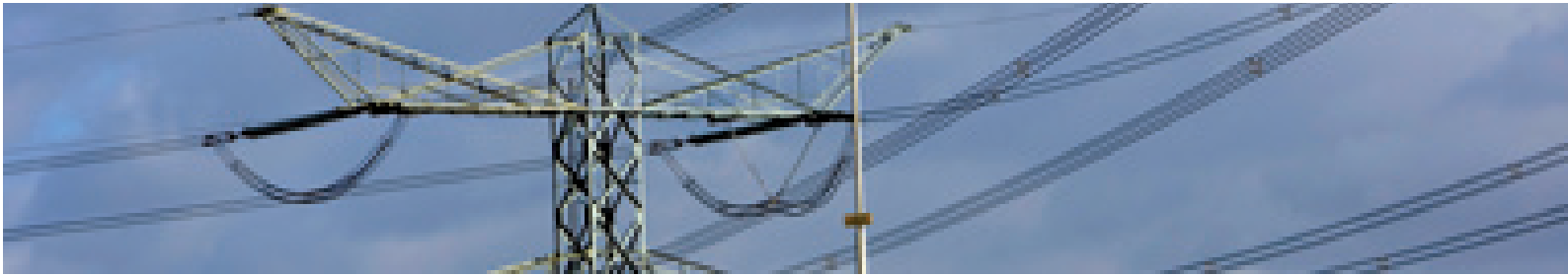
# The Dutch transmission grid

As at 31 December 2007

This overview of the Dutch transmission grid shows the high-voltage connections, of which the 380-kV and 220-kV sections, including the cross-border interconnections, come under TenneT management, as does a considerable portion of the 150-kV grid in the province of Zuid-Holland. TenneT also

manages the 380-kV and 220-kV switching and/or transformer substations shown on the map, as well as the 150-kV switching and/or transformer substations in the province of Zuid-Holland.





# TenneT transmission grid

The graphs below give an idea of the circuit lengths, the connected capacity of transformer circuits and the connected capacity of the production units in TenneT's 380-kV, 220-kV and 150-kV high-voltage grids..

## Connected capacity of transformers

(including industrial consumers)

In 2007 the connected capacity of the 380-kV grid increased by 600 MVA, as a transformer at Maasvlakte substation was taken into operation and an adjustment was made to the nominal capacity of two transformers at Crayestein substation. An adjustment was also made to the nominal capacity of a 220-kV transformer at Hessenweg substation, increasing the connected capacity of the 220-kV grid by 20 MVA. The connected capacity of the 150-kV grid was also increased in 2007, as a transformer at Delft substation was taken into operation and an adjustment was made to the nominal capacity of two transformers at Leiden substation.

	2007	2006	2005	2004	2003	
380 kV	18 200	17 600	15 600	15 100	15 100	MVA
220 kV	4 830	4 810	4 810	4 860	4 810	MVA
150 kV	5 289*	5 200*	5 189*	-	-	MVA

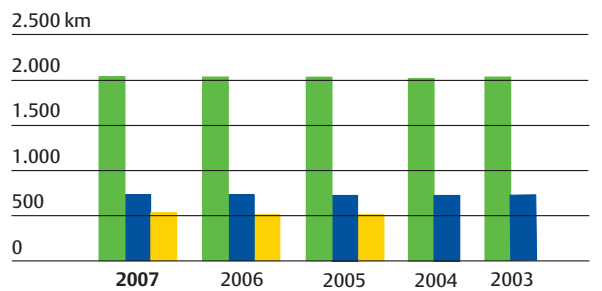
\*) transformers owned by TenneT Zuid-Holland

## Circuit length

The aggregate 380-kV circuit length amounts to 2,031 kilometres.

The aggregate 220-kV circuit length amounts to 653 kilometres.

The aggregate 150-kV circuit length amounts to 532 kilometres.



## Connected capacity of generators / power plants

The connected capacity of production units remained unchanged in 2007.

	2007	2006	2005	2004	2003	
380 kV	3 608	3 608	3 608	3 608	3 608	MVA
220 kV	3 160	3 160	3 160	3 160	3 160	MVA
150 kV	1 615*	1 615*	1 615*	-	-	MVA

\*) production capacity connected to the grid of TenneT Zuid-Holland

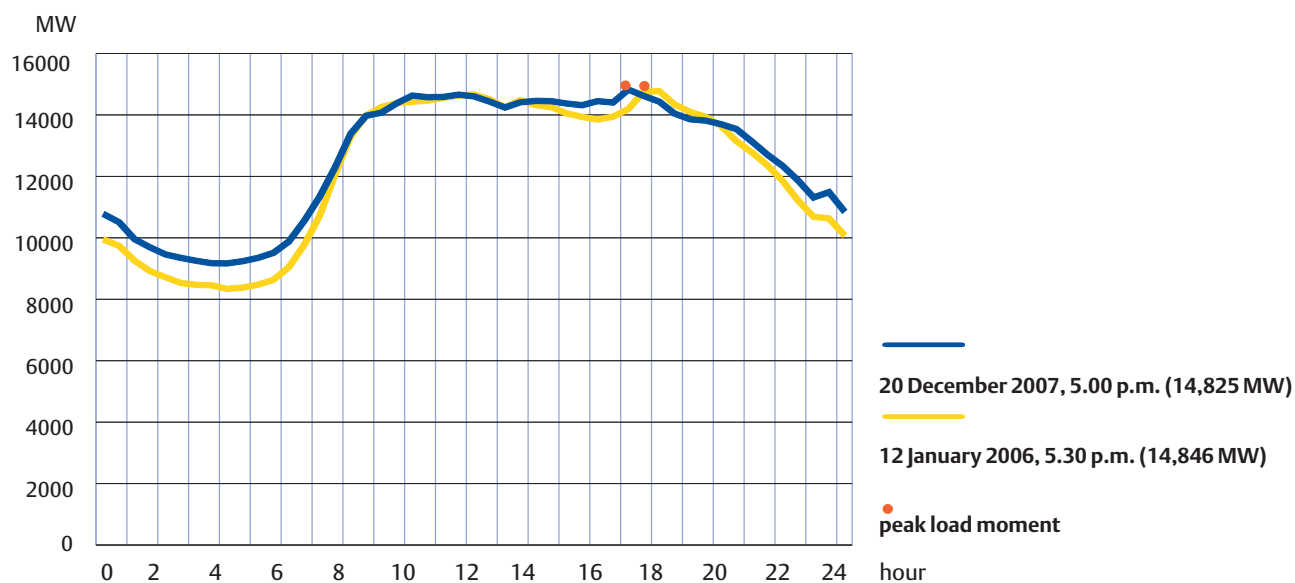


# Peak load

In 2006, the peak load occurred in January. This year's peak load occurred earlier, on 20 December. The total electricity demand at peak load moments fluctuates around 14,500 megawatts (MW).

## Peak load

In 2007, the peak load on the Dutch high-voltage grid (meaning the production capacity including imports) observed by TenneT was measured on 20 December at 5.00 p.m. and amounted to 14,825 MW. This peak load represents a 21 MW decrease (-0.1%) compared with the peak load of 2006, and a 399 MW decrease (-2.6%) compared with 2005.







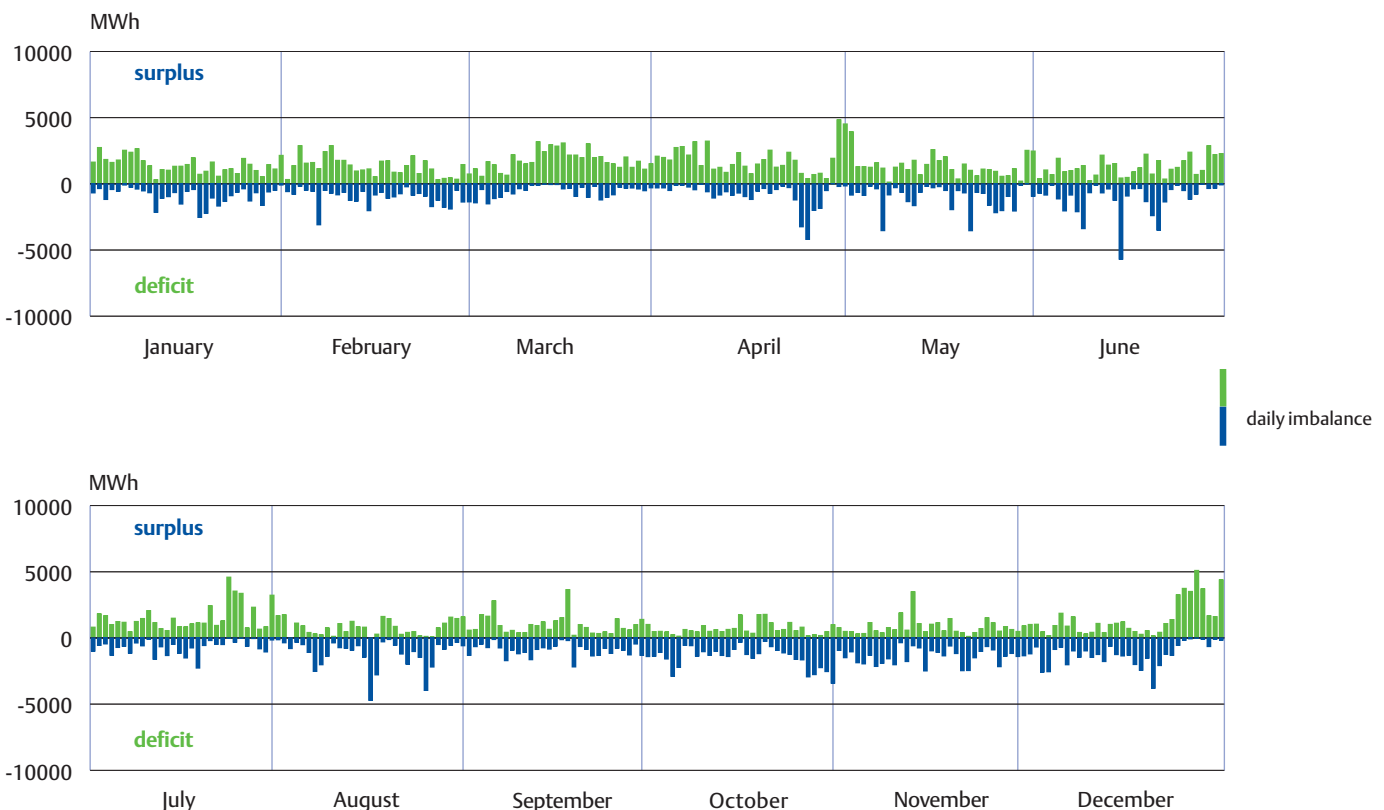
# Imbalance adjustment

TenneT is responsible for providing a secure, reliable and efficient power supply system. This means that we must safeguard and maintain the balance between supply and demand. A slight imbalance – which it is up to TenneT to control – prevails on the electricity grid at any one time. This is caused by the large number of market players, which prevents a perfect balance being struck between the demand for and supply of electricity. Nevertheless, demand and supply are

forecast with the greatest possible accuracy. A system of Programme Responsibility (PR) has been developed for this purpose. TenneT receives daily Energy Programmes (EPs) from the Programme Responsible Parties (PRPs, parties that operate one or more connections to the grid) in which they indicate the amount of electricity they expect to transmit or receive the next day. TenneT continually monitors the national level of imbalance and makes adjustments where necessary.

## Imbalance of PRPs on a daily basis

The graph below shows the aggregate daily imbalance of all PRPs for the period from 1 January to 31 December 2007. The bars represent the daily positive imbalance (surplus) and negative imbalance (deficit).





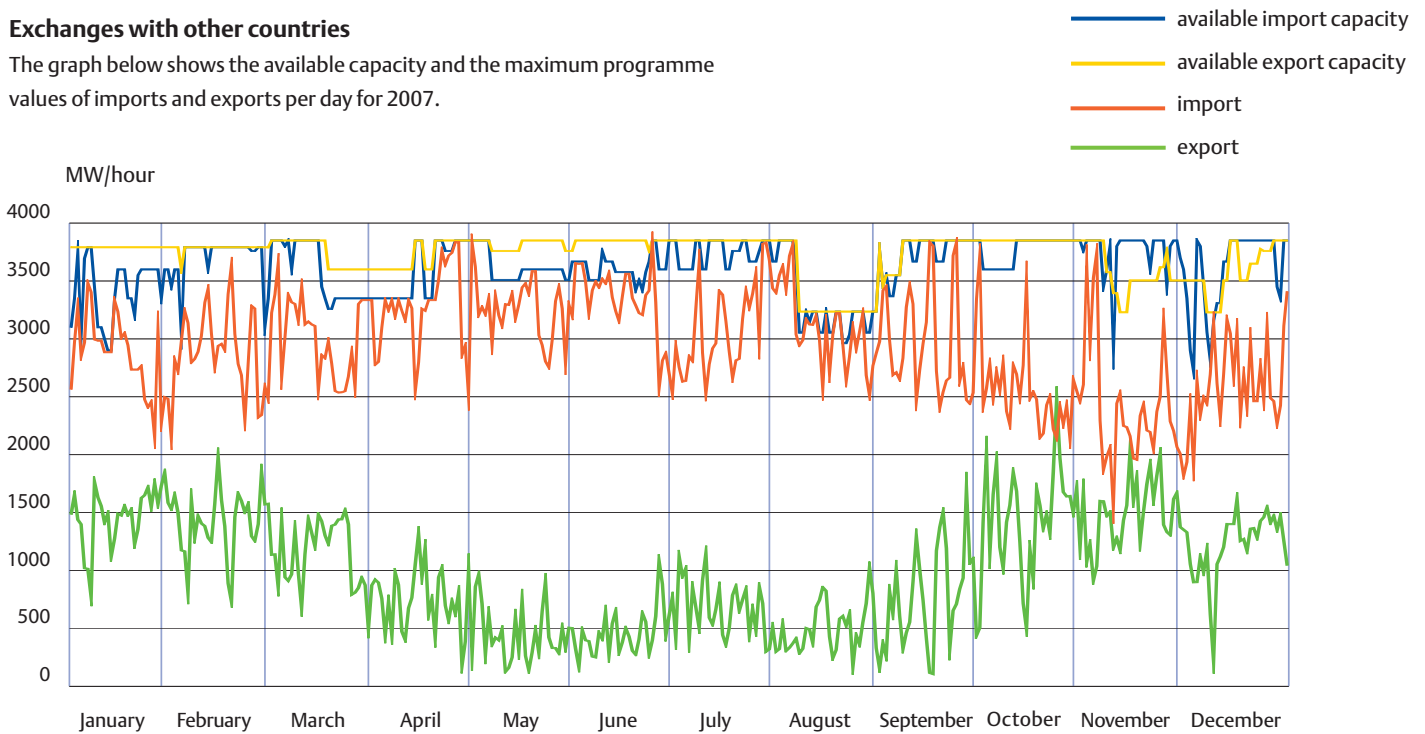
# Cross-border interconnections

Interconnections are in place at the highest voltage level (380 kV) between the Netherlands and the extended European grid. Three German-Dutch and two Belgian-Dutch interconnections ensure access to the European market. These connections are used to facilitate international electricity transactions between market parties. In view of the substantial

mutual influence exerted by interconnected international grids, the available capacity is carefully reconciled with the grid administrators in neighbouring countries on a daily basis. In recent years our country's electricity imports have exceeded its exports.

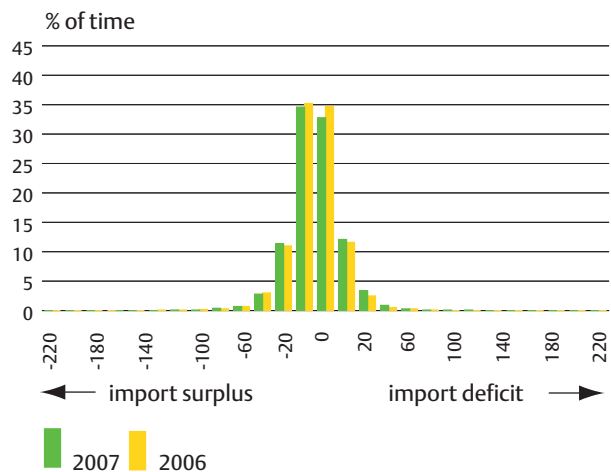
## Exchanges with other countries

The graph below shows the available capacity and the maximum programme values of imports and exports per day for 2007.



## Inadvertent exchanges between the Netherlands and other countries

The diagram on the right shows (in terms of hourly values) the differences in physical energy flows relative to the exchange programme with other countries. The difference relative to the exchange programme with other countries was less than 20 MWh for 67.4% of the time. The national standard for inadvertent exchanges (less than 100 MWh) was not achieved for only 0.5% of the time. The standard was therefore maintained for 99.5% of the time.



# Security of supply

The Dutch transmission and distribution grid is one of the most reliable in Europe. The average annual outage duration in our country is exceptionally low: only 30 minutes per connection. Through our grid administration operations we ensure that power transmission across our grids is possible virtually regardless of circumstances. In 2007, one disruption occurred in the 150-kV grid.

## Transports cross-border interconnections 2007

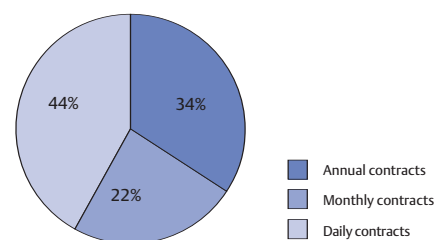
in GWh	Programmes		Measured values	Cross-border inter-connections
	programmes	compensation as part of UCTE programmes	total of programmes	
<b>imports 2007</b>	<b>21 764</b>	<b>44</b>	<b>21 808</b>	<b>23 139</b>
imports 2006	25 607	52	25 659	27 346
<b>exports 2007</b>	<b>4 196</b>	<b>23</b>	<b>4 219</b>	<b>5 565</b>
exports 2006	4 187	13	4 200	5 886

## Distribution of net import capacity in 2007

As at 31 December 2007

The maximum import capacity in 2007 amounted to 3850 MW. On several days in the period from January to March and October to December, the import capacity was lower than 3850 MW in connection with expected high wind power production in Germany. On most days in August, moreover, the import capacity also fell below 3850 MW in connection with restrictions imposed by E.ON Netz (planned non-availability on the Diele-Conneforde cross-border interconnection).

Distribution 2007



## Failure indicators

In 2007, one interruption of the supply of energy occurred in the 150-kV grid.

	2007	2006	2005	2004	2003
<b>380kV/220kV</b>					
• failures	11	17	39	14	16
• interruptions		2	0	0	0
• amount of energy not supplied (MWh)		194	0	0	0
<b>150 kV</b>					
• failures	6	24	20	17	19
• interruptions	1	2	1	1	0
• amount of energy not supplied (MWh)	1	792	151	141	0

## Details of interruption

Location: Alblasserdam  
 Start: Friday 20 April 2007, 3.34 p.m.  
 Number of customers affected: 1  
 Scope: 9 user minutes

**TenneT TSO B.V.**

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Arnhem, February 2008

