

# Tennet

An introduction



17-07-2014 – 'Staying Connected'

# Agenda

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1. TenneT at a glance
2. Organisation
3. Our role as TSO
4. Vision, mission
5. Challenging environment
6. Development of a North-West European market
7. Outlook
8. Questions?



# TenneT at a glance





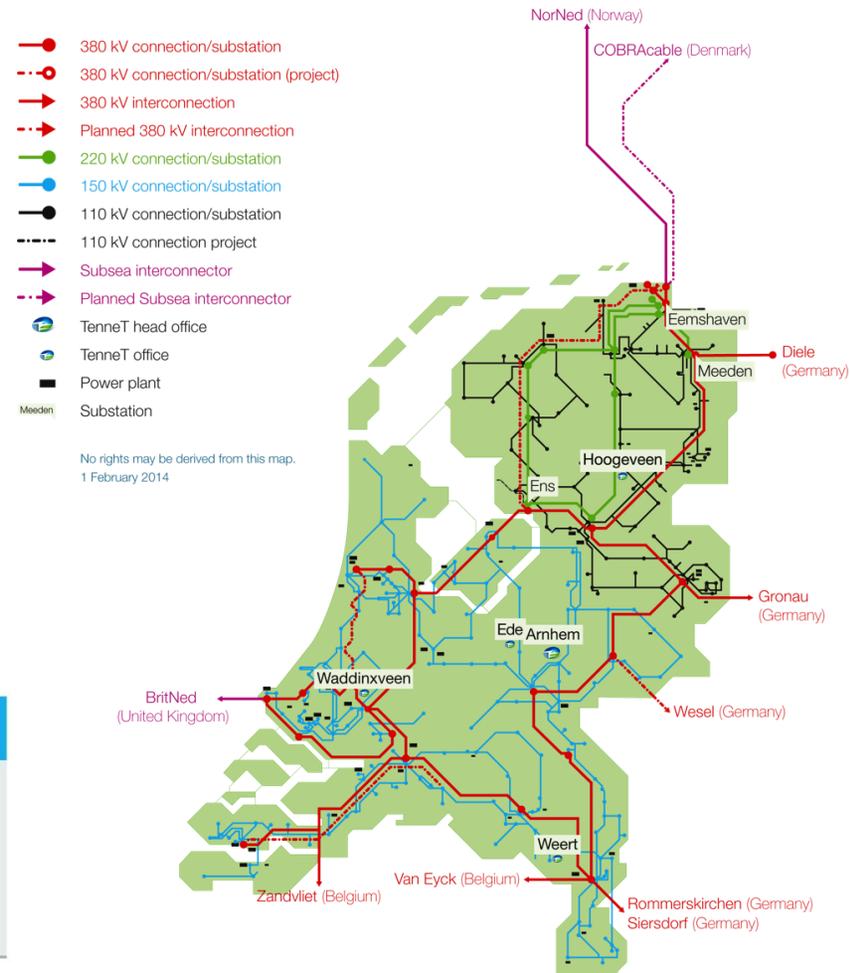
# TenneT at a glance

## Netherlands

- 1,321 employees
- Underlying revenue (2013): EUR 643 million
- Assets (2013): EUR 3,765 million
- Imports (2013): 33,253 GW
- Exports (2013): 15,016 GW

### Our grid – TenneT TSO B.V.

Total length	10,051 km
Number of transformer substations	319
Number of customers	16.7 million



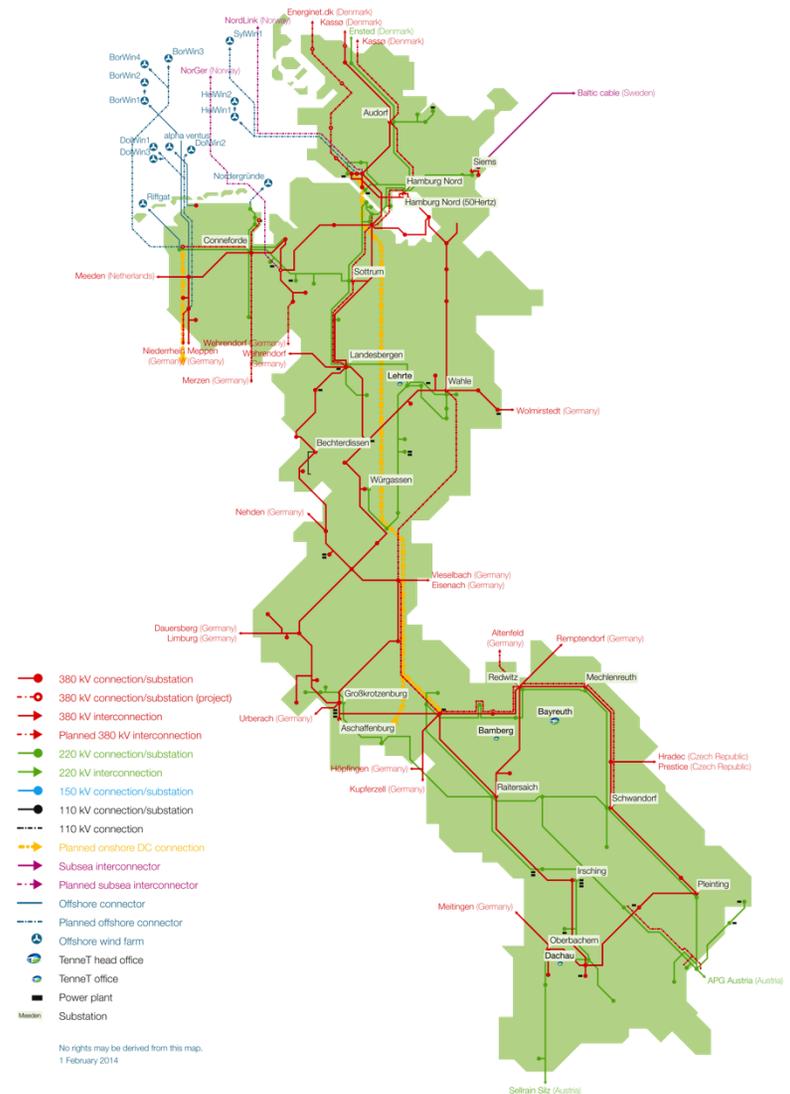
# TenneT at a glance

## Germany

- 1,275 employees
- Underlying revenue (2013): EUR 1,589 million
- Tangible fixed assets (2013): EUR 9,029 million
- Imports (2013): 51,277 GW
- Exports (2013): 44,820 GW

### Our grid – TenneT TSO GmbH

Total length	10,946 km
Number of transformer substations	121
Number of customers	20 million



# TenneT at a glance

One company, two TSOs

1998 >

TenneT integrates Dutch high voltage grids (220/380 kV)  
**Total assets 1998: EUR 550 million**



2008 >

TenneT integrates Dutch high voltage grids (110/150 kV) of Essent, Nuon and Delta



2009 >

TenneT integrates German grid operator transpower (E.ON Netz)



2010 >

Major onshore en offshore investments



2014

Towards crossparticipation?  
**Total assets 2013: EUR 11,6 billion**



<b>Total assets</b>	x 21	11.6 billion
<b>Grid length</b>	x 8	21,000 km
<b>Staff</b>	x 10	2,596

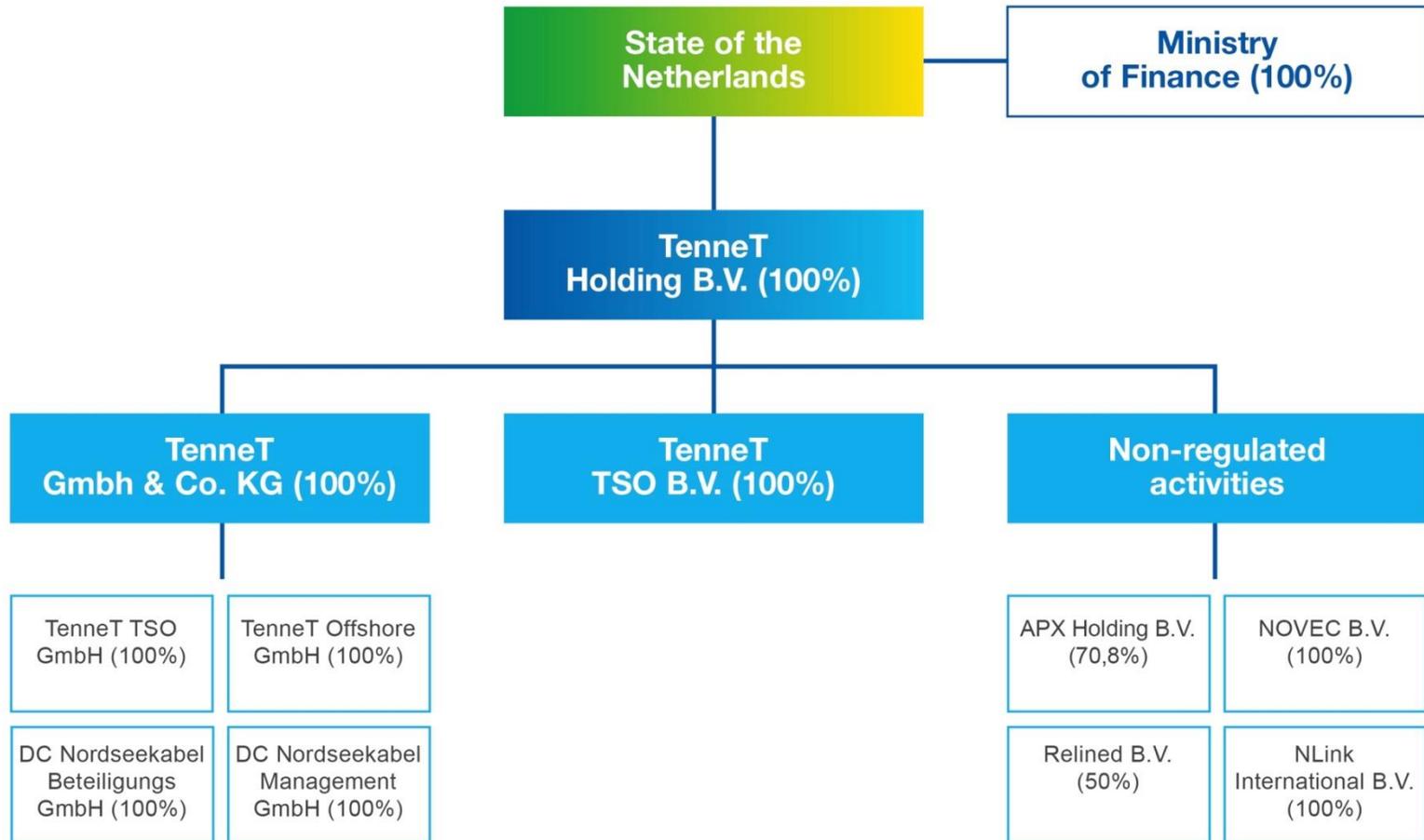


# Organisation

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# Ownership structure



# Our role as TSO



# Key tasks of a TSO

Our three key tasks:

- 1. Transmission services:**  
Constructing and maintaining a robust high-voltage grid.
- 2. System services:**  
Maintaining the balance between electricity supply and demand 24/7.
- 3. Market facilitation:**  
Facilitating a smoothly functioning, liquid and stable electricity market.



# Key tasks of a TSO

## Transmission services

- TSOs are the linking pin between electricity producers and end-users
- Key tasks and role of TSOs have changed drastically since TenneT was established in 1998.

### Past

- Stable, predictable (price-driven) energy generation
- Maintenance and (limited) replacement
- Focus on technology
- Local markets, separate price zones
- National focus and regulation

### Present

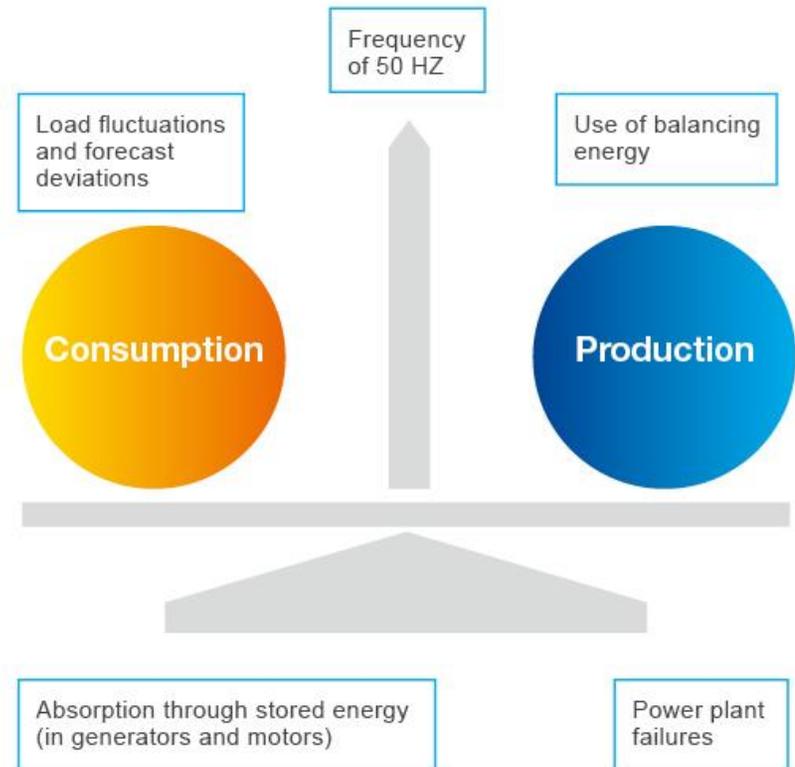
- Fluctuating energy generation (solar/wind)
- Large-scale new construction
- Technology and market
- North-Western European market, price convergence
- Grid planning and regulation at European level



# Key tasks of a TSO

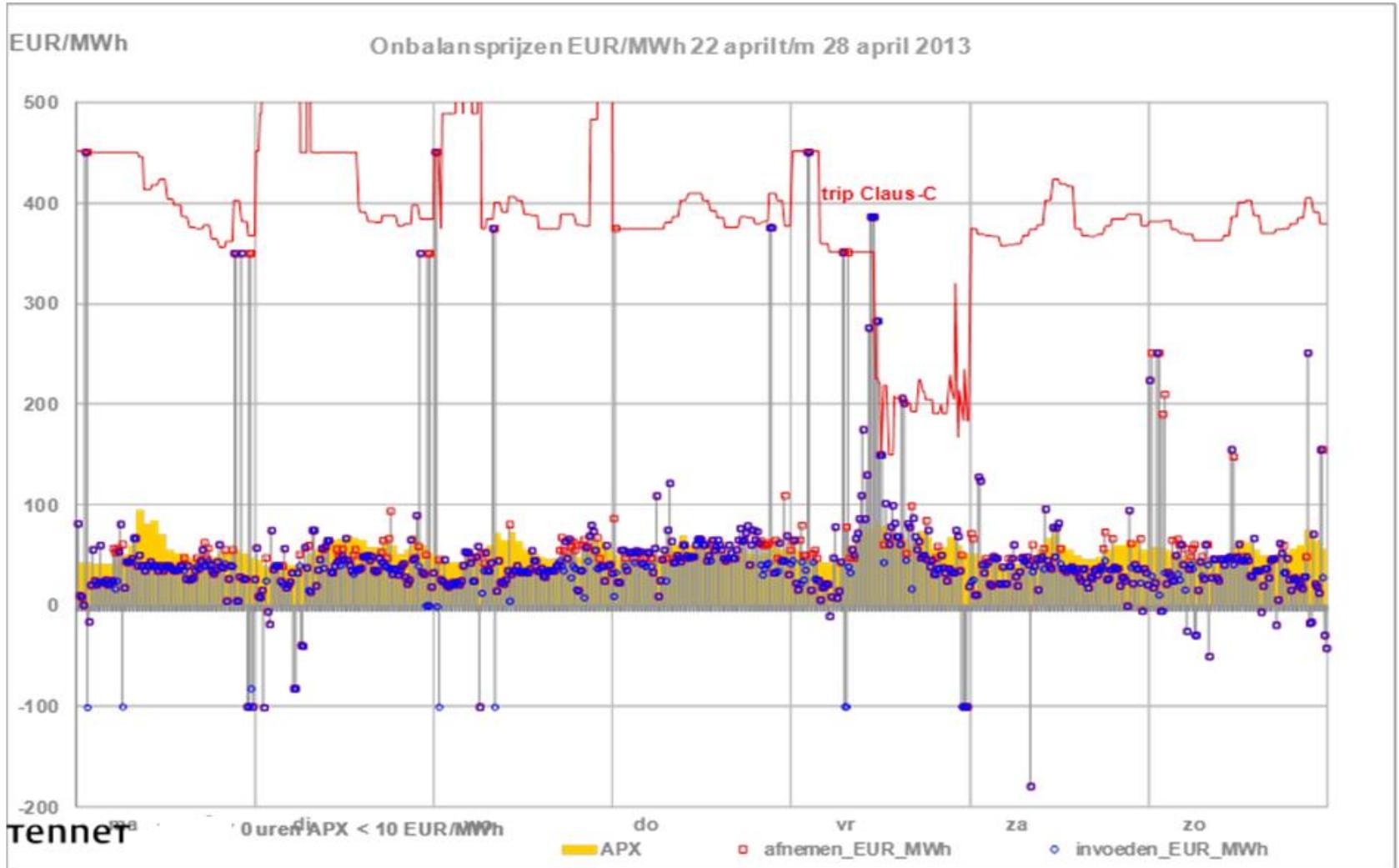
## System services

- To ensure grid stability, the amount of electricity produced has to correspond precisely at all times to the amount of electricity consumed.
- TSOs ensure that electricity is transported from producers to consumers without causing congestion.



# Key tasks of a TSO

## Example of imbalance prices



# Key tasks of a TSO

## Market facilitation

- TenneT actively contributes to the further integration of the European energy market and the development of a North West European electricity market (NWE)
- Customers profit from price convergence with neighbouring countries
- TenneT actively participates in international organizations to shape the future integration of the European electricity market

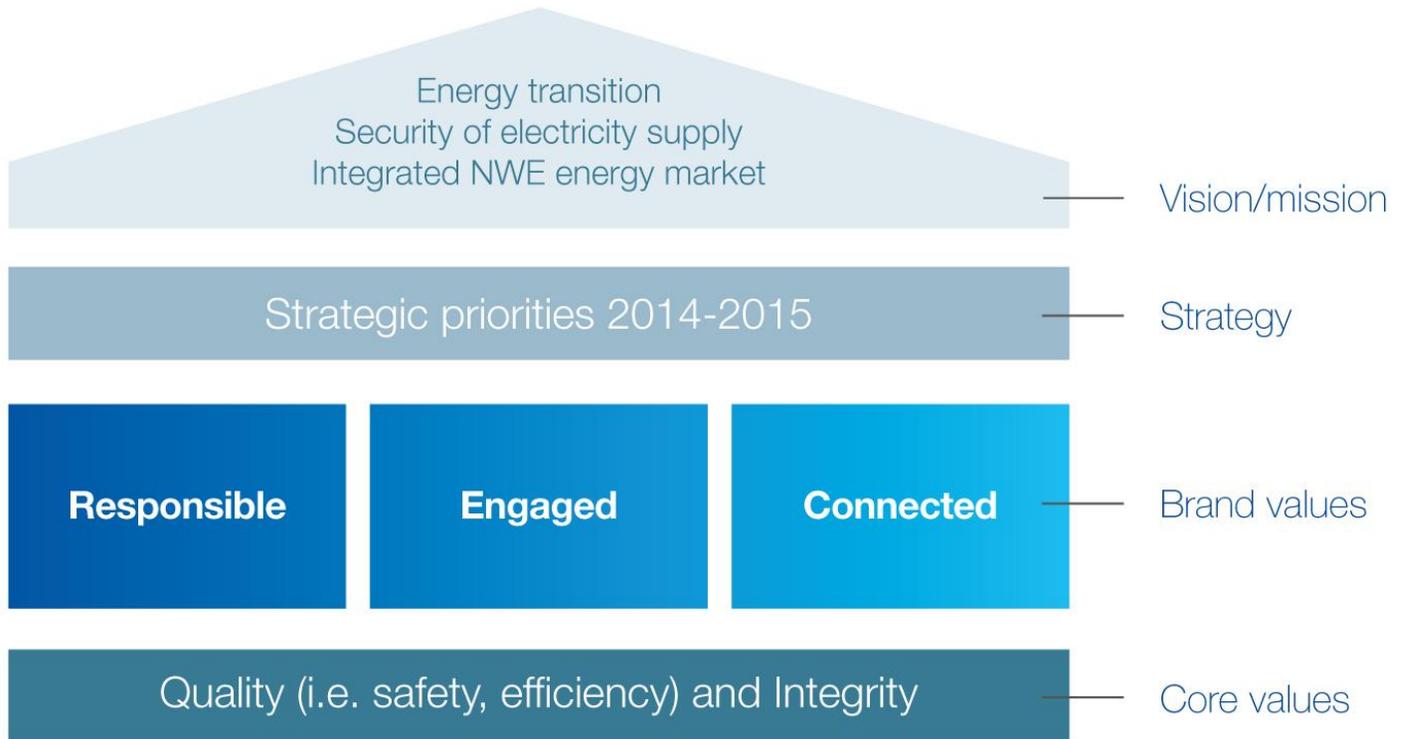


# Vision and mission



# Value proposition

## Overview value propositions for stakeholders



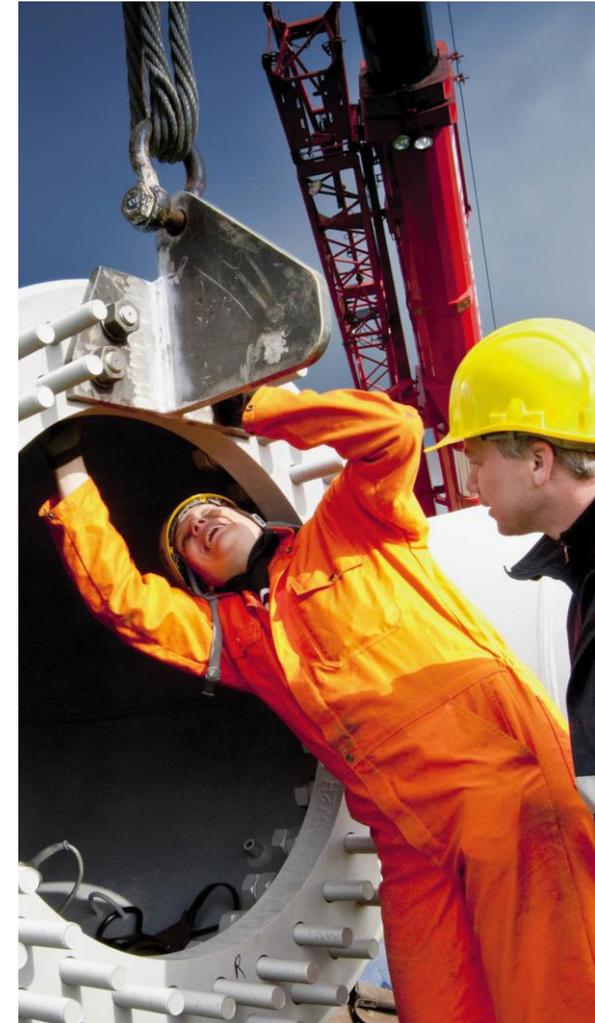
# Vision

Our society has committed to the **large-scale introduction of renewable energy**. Generation of renewable energy is changing the dynamics of supply.

At the same time, dependence on electricity continues to increase. This **demands continuous reliability**.

To cope with these developments, the **European electricity market must be integrated further**.

**Sound market design, technical and operational innovation, storage solutions and adequate grid capacity** are all required to continue to match supply and demand across borders.



# Mission

To provide **security of electricity supply in the markets we serve**, and to pursue, as a leading Transmission System Operator, the **development of an integrated and sustainable North West European electricity market.**



# TenneT strategy ->2020

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- Ensuring a continuous supply of electricity, any time and anywhere, 24 hours a day and seven days a week.
- Offering an excellent price/quality ratio.
- Responding to energy-related developments in society and contributing to the achievement of energy-related objectives.
- Actively promoting European market integration through targeted investments.
- Creating value for our shareholders.



# Challenging environment



# EU energy policy

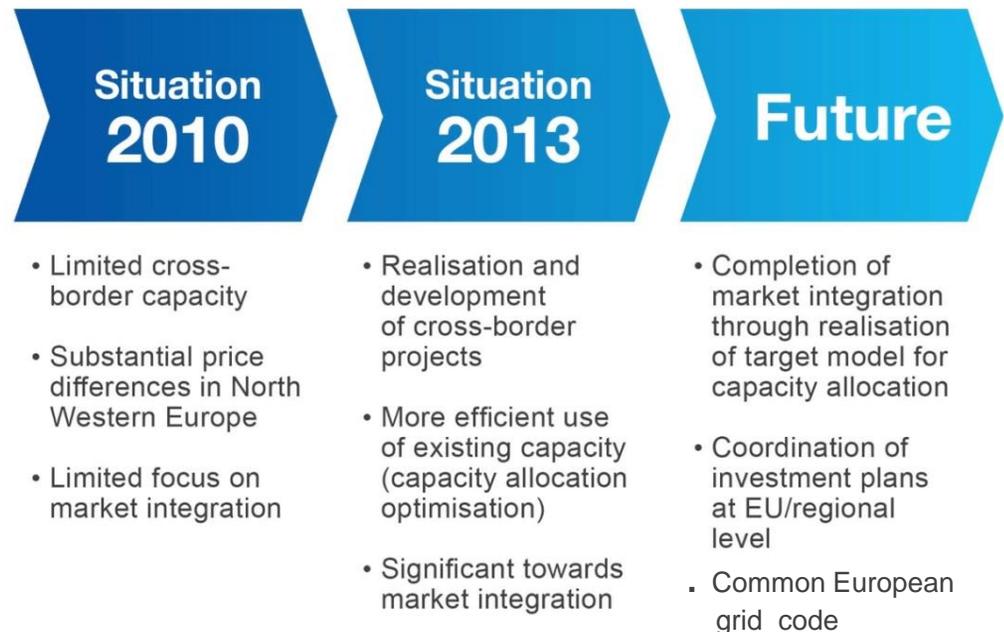
## Ever-increasing interconnectivity

European Union goals:

- Reliable electricity supply at competitive prices
- Level playing field for industry and consumers
- Extended market for the integration of renewable energy

## European market integration

### Overview of developments



# EU energy policy

The EU has set ambitious targets for renewable energy

Different approaches in different member states:

- The Netherlands: Goal of 16% renewables by 2023 (Energy Agreement)
- Germany: Goal of 80% renewables by 2050 (energy transition and phase-out of nuclear energy)



# Challenging environment

## Investments needed

- TSOs have to invest billions of euros in grid expansion and updating of existing grids to safeguard future capacity:
  - EU investments (forecasted): EUR 140 billion
  - TenneT investments (forecasted):
    - Netherlands: EUR 5 billion
    - Germany: EUR 11 billion (EUR 7.5 billion for offshore projects)

TenneT expects to invest approximately EUR 16 billion over the next ten years, which is more than the total value of our asset base in 2013 (EUR 11.6 billion).



# Development of a North-West European market



# Development of an electricity market in North-West Europe (NWE)

## Benefits:

- Increase social welfare
- Enhance security of supply
- Increase market efficiency
- Facilitate integration of renewable energy in the grid

## Development of NWE market

### CWE region

Population	172.0 million
Installed capacity	305,400 MW

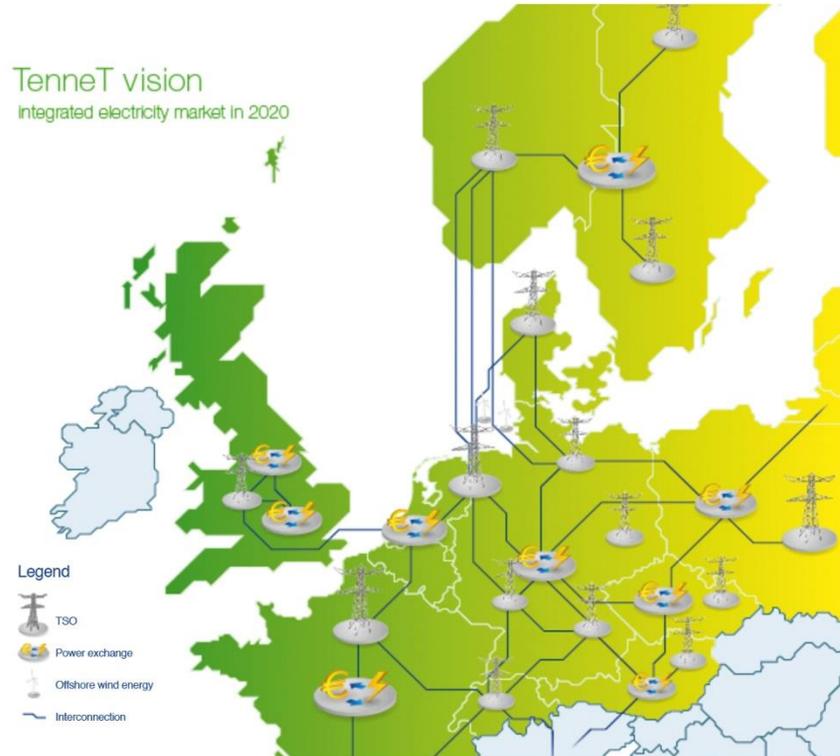
### Nordic region

Population	24.9 million
Installed capacity	97,500 MW

### United Kingdom

Population	61.8 million
Installed capacity	81,100 MW

TenneT vision  
integrated electricity market in 2020



# Development of an NWE market

## Cross-border interconnectors

- BritNed cable to the United Kingdom
- NorNed cable to Norway
- Planned NordLink cable linking Germany to Norway
- Planned cable to Denmark (COBRACable)
- Interconnector linking Doetinchem in the Netherlands to Wesel in Germany



TenneT contributes to the development of an integrated NWE electricity market by interconnecting countries.



# Outlook



# Strategic Outlook

## Summary

### Challenges

- Large-scale introduction of renewable energy
- EU's energy policy goals and differing approaches in national policies

### Our contribution

- Solid and future-proof electricity grid
- Connecting OWFs to the grids
- Technological and operational innovation

TenneT ensures a safe, reliable and uninterrupted supply and pursues the development of an integrated electricity market in North-Western Europe.



# Questions?





[www.tennet.eu](http://www.tennet.eu)

TenneT is Europe's first cross-border grid operator for electricity. With approximately 21,000 kilometres of (extra) high-voltage lines and 36 million end-users in the Netherlands and Germany, we rank among the top five grid operators in Europe. Our focus is to develop a North-west European energy market and to integrate renewable energy.

