

# Project Ten-Year Network Development Plan 2012 Overview

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Ten Year Network Development Plan

Ten Year Network Development Package 2012 Workshop  
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Reliable Sustainable Connected

# ENTSOE releases the TYNDP 2012 package



A vision for the  
future  
European  
extra high  
voltage grid

- A non-binding plan, updated every 2 years by ENTSO-E
- A modeling of integrated networks
- A generation adequacy outlook

A  
comprehensive  
and synthetic  
8-document  
suite

- Ten-Year Network Development Plan report
- Scenario Outlook & Adequacy Report
- 6 Regional Investment Plans



ENTSO-E 10-YEAR NETWORK  
DEVELOPEMENT PLAN 2012  
PROJECT FOR CONSULTATION

DRAFT

V8 – 24.02.2012

In consultation  
until 26<sup>th</sup> April

# Background scenarios matching EU 2020 goals

Peak load growing by about 8% by 2020

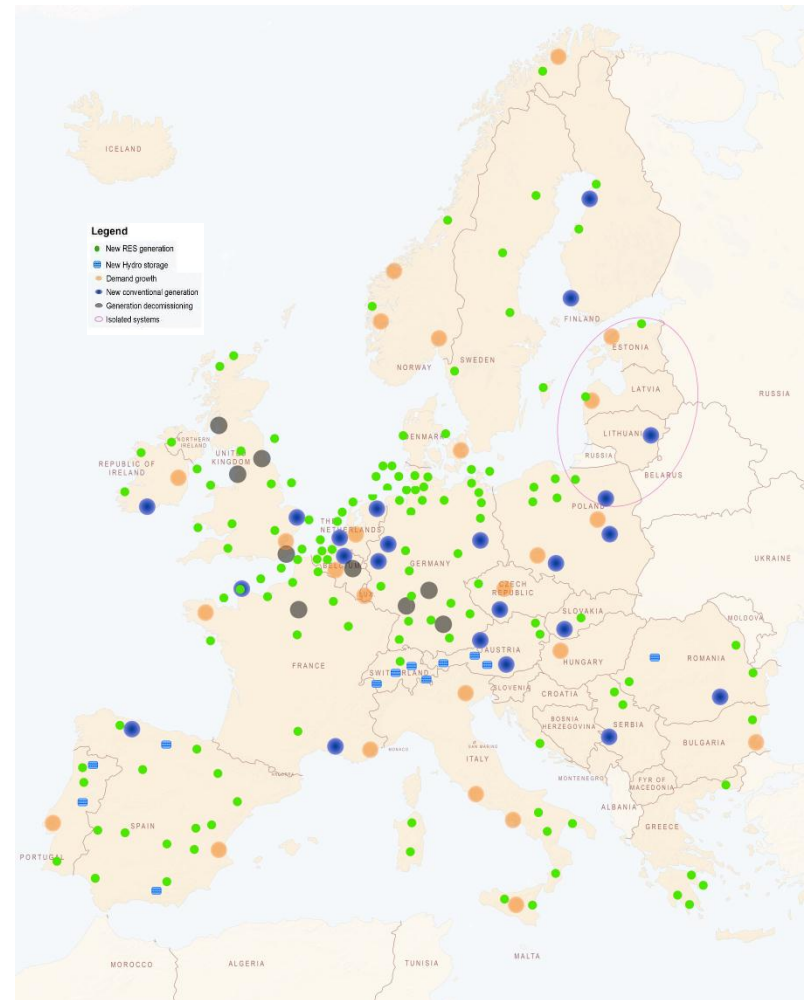
- energy efficiency, economic crisis...
- switch from fossil fuels to electricity, development of electric devices...

Renewable energies boom providing by 2020 as much as 38% of the electricity demand

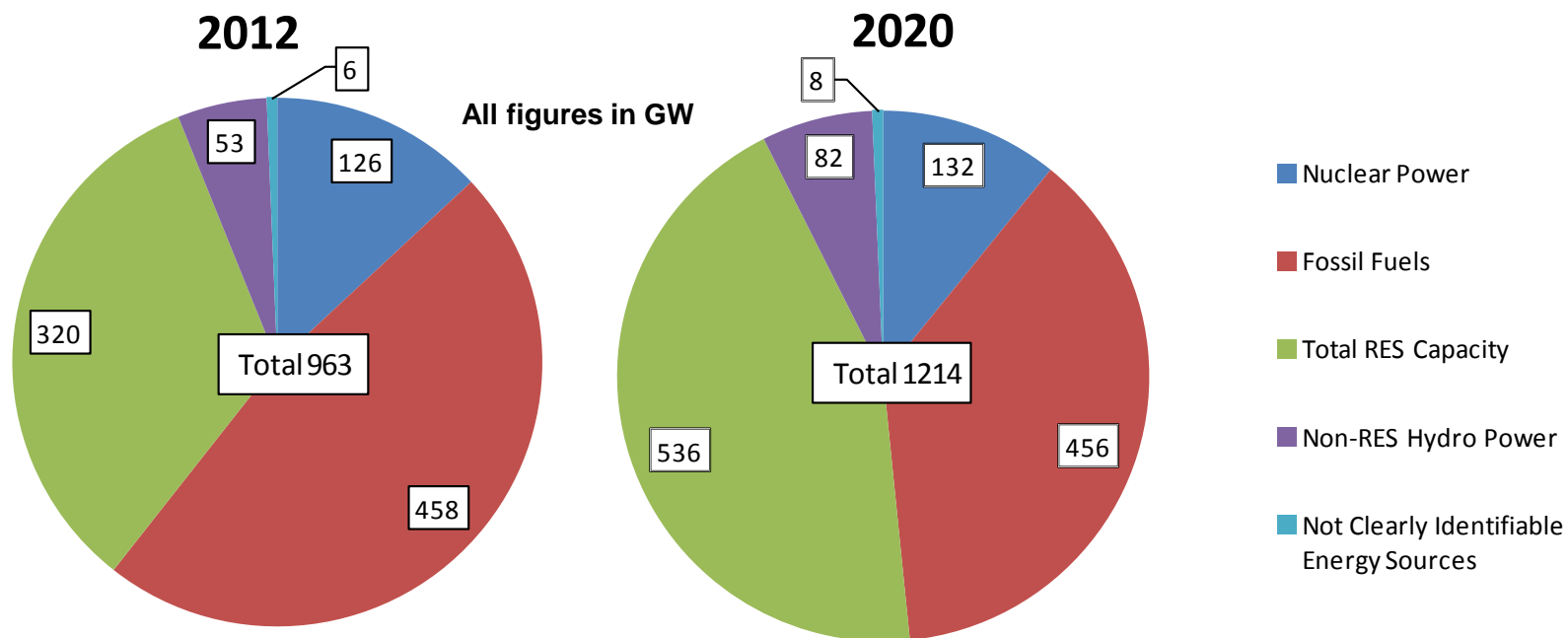
- mostly wind, photovoltaic

CO2 emissions of the power sector also sink from 26% to 57%

- Depending on the share of gas and coal-fired units in the mix



# Evolution of Generation Mix till 2020 (EU2020 Scenario)



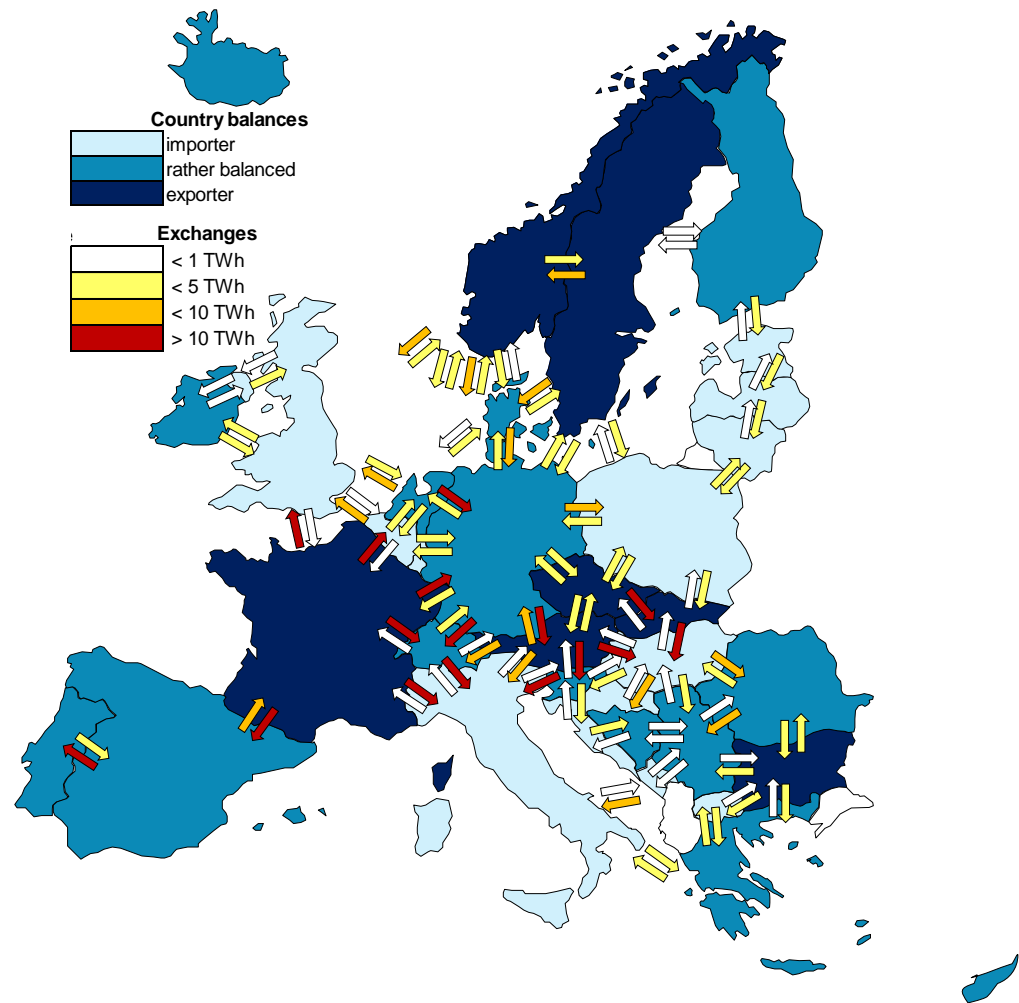


# Thousands of possible situations and overall social economic welfare assessed via market studies

- 5% of generating costs saved by new interconnection

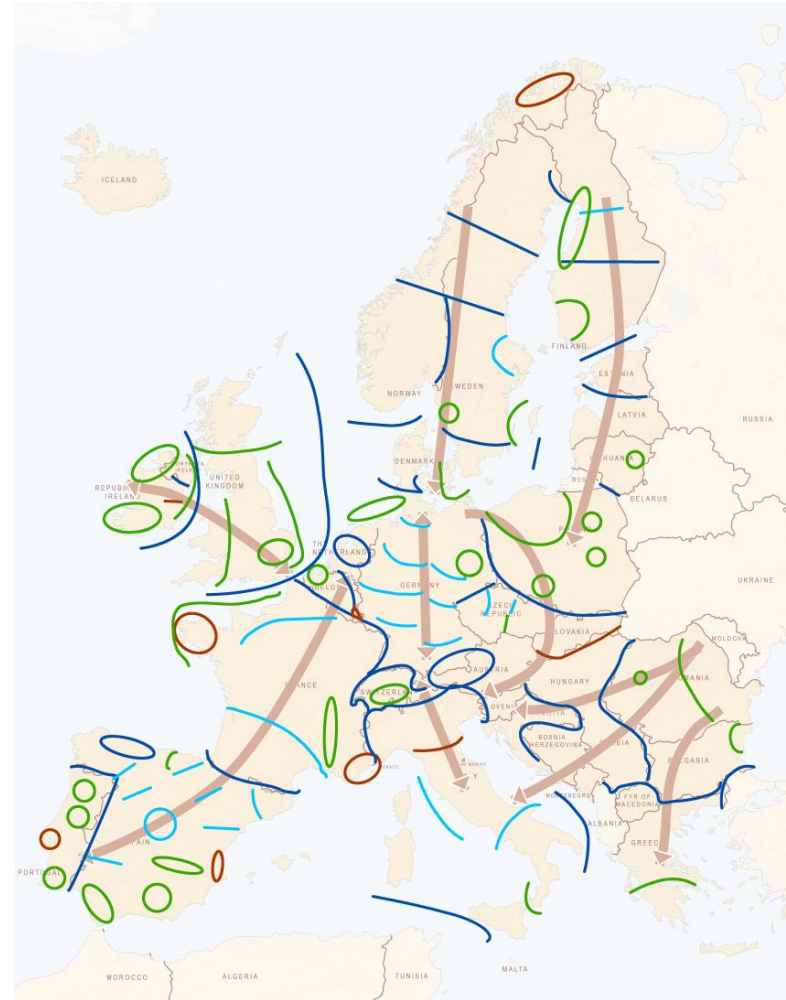


- Direct connection for 125 GW RES
- - 170 Mt/y CO<sub>2</sub> emissions savings



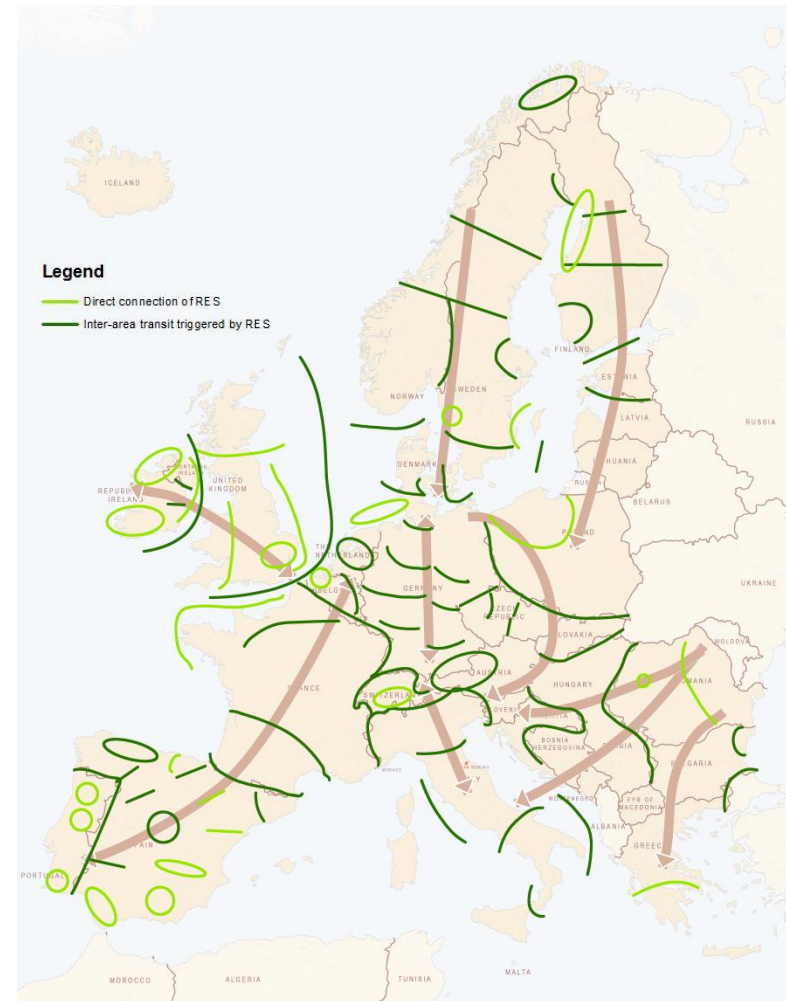
# A detailed anticipation of upcoming congestions on grid

Larger, more volatile power flows, over longer distance across Europe

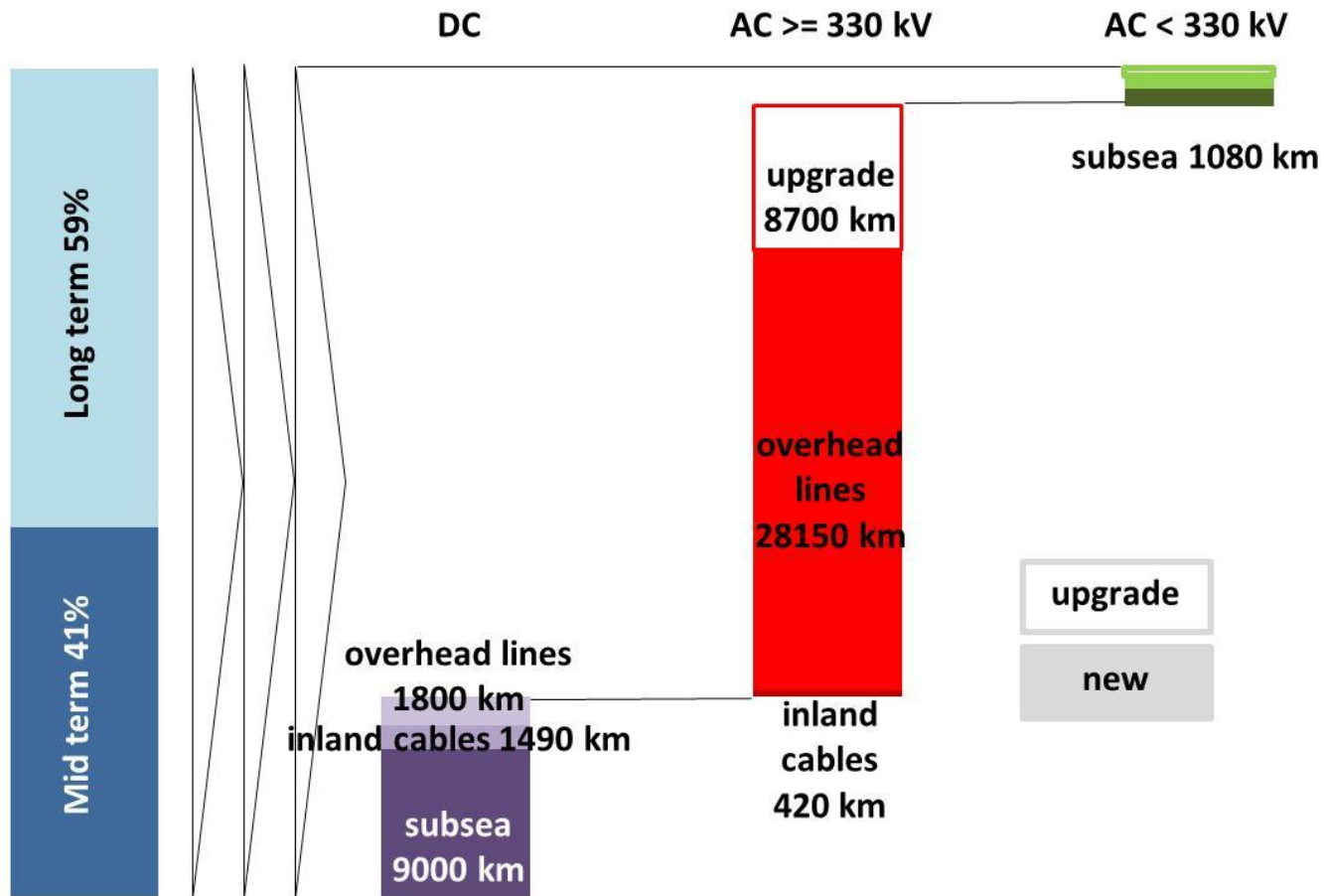


# Renewable generation triggers 80% of investments needs

Larger, more volatile power flows, over longer distance across Europe



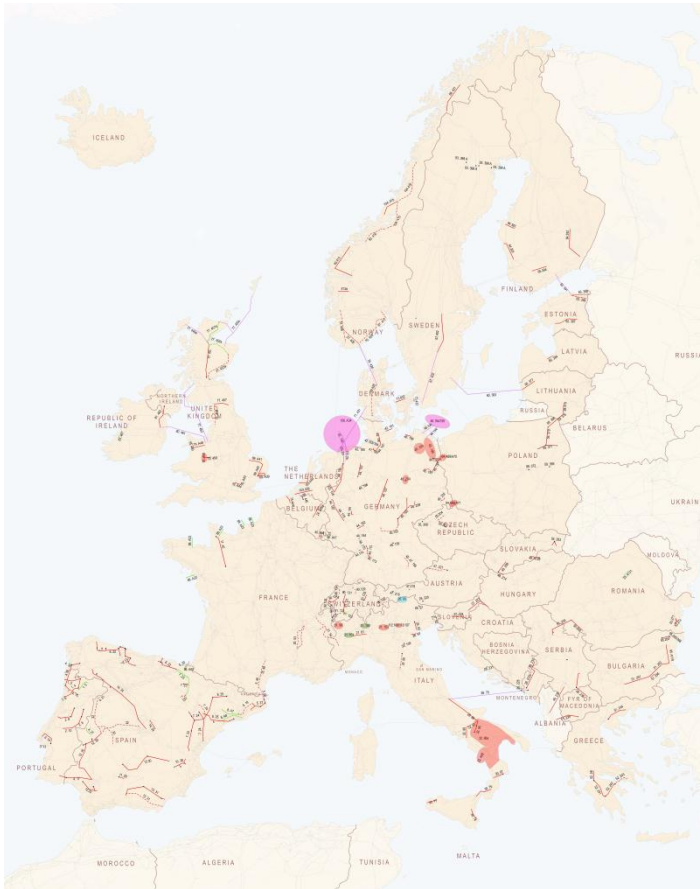
# More than 50000 km of grid corridors to build or refurbish



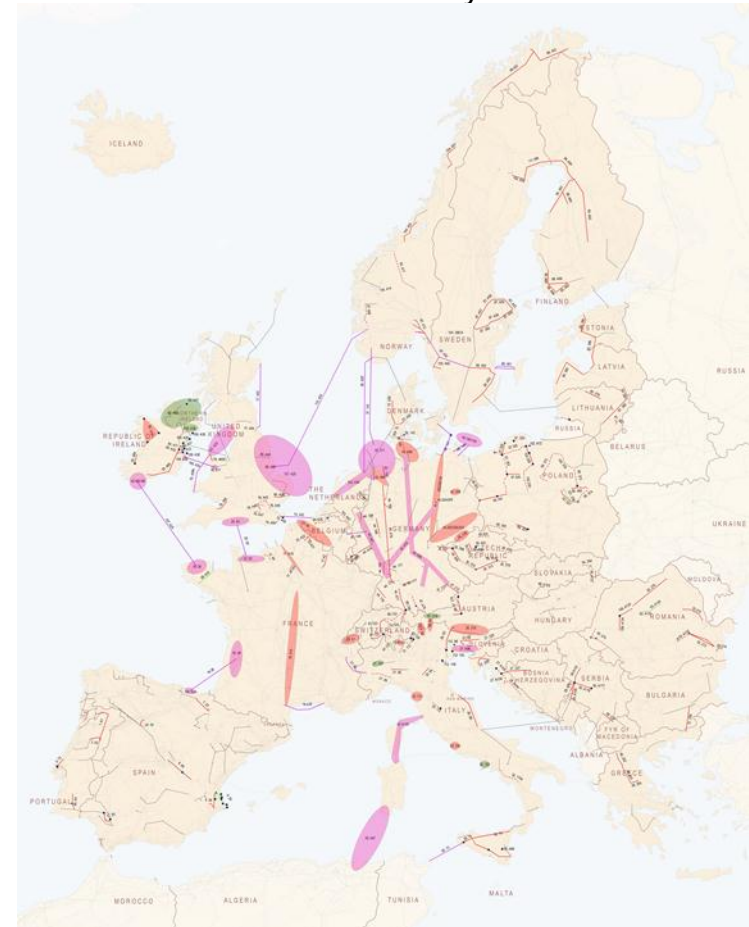


# Investment is required all over Europe

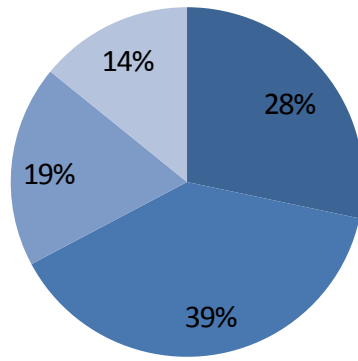
By end 2016



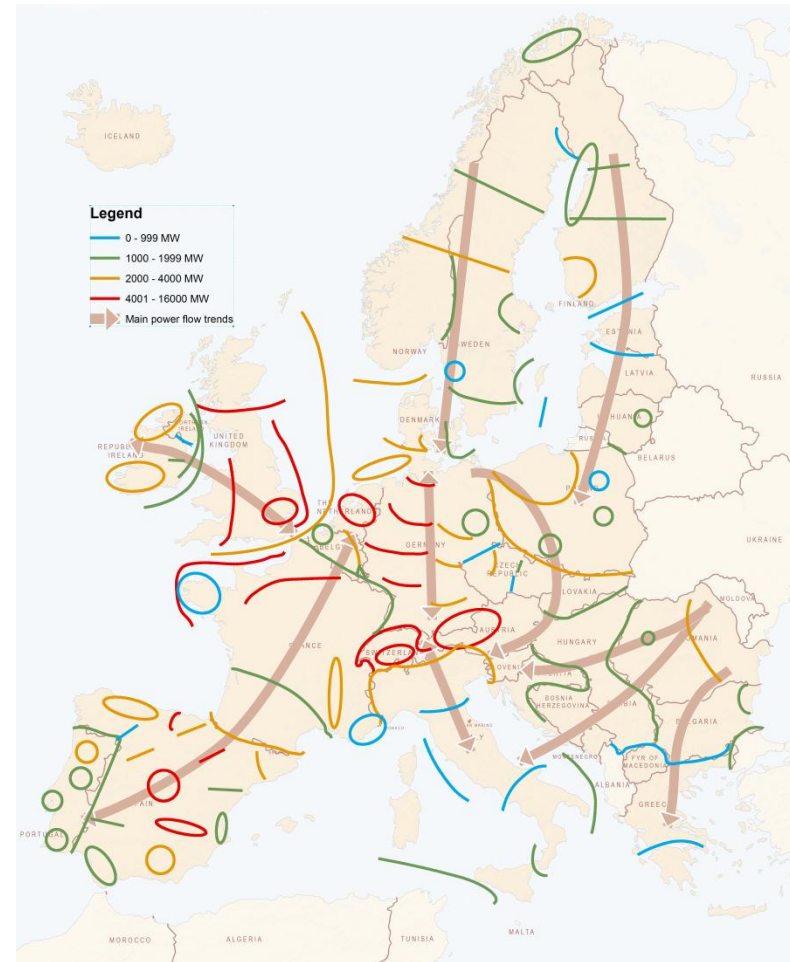
2017 and beyond



# Appropriately adapted grid transfer capability development

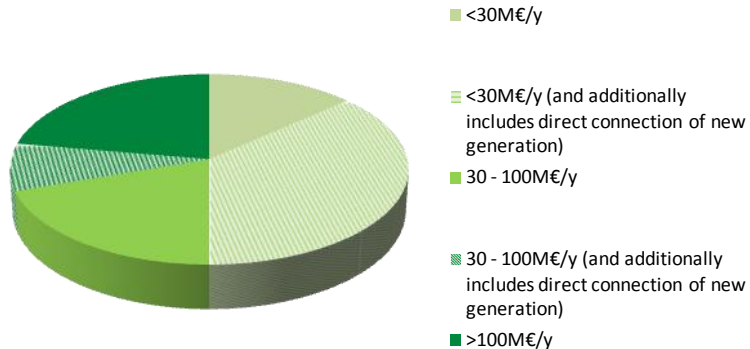


- < 1 GW
- 1.0-1.9 GW
- 2.0 to 3.9 GW
- 4 GW & beyond

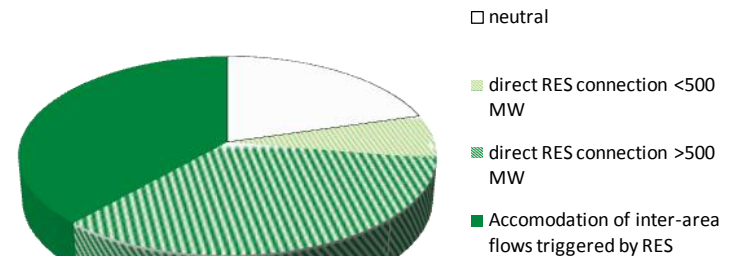


# A direct support to the European Energy policy goals

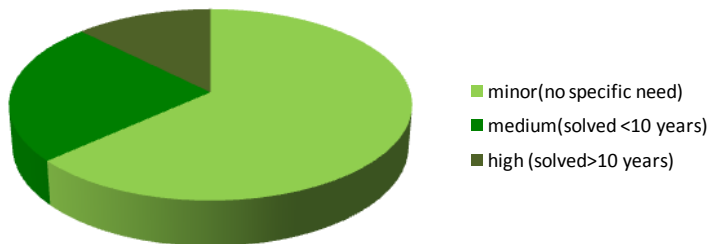
## Social and economic welfare



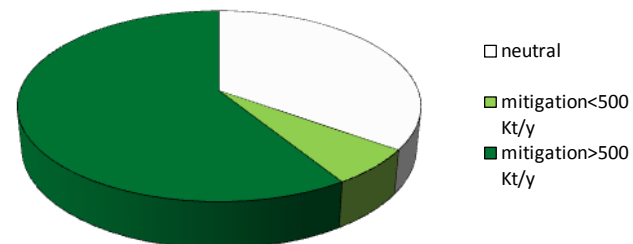
## RES integration



## Security of Supply



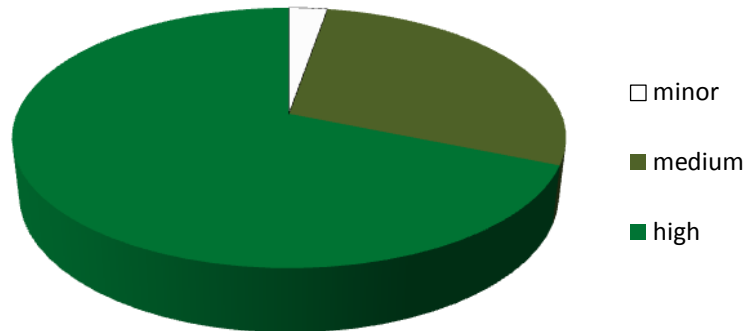
## CO2 mitigation



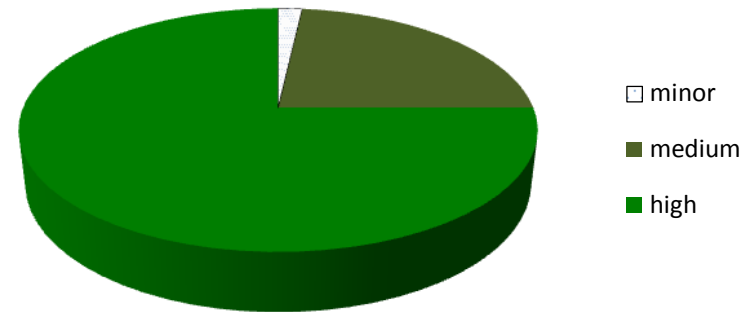
# Projects with high technical performances



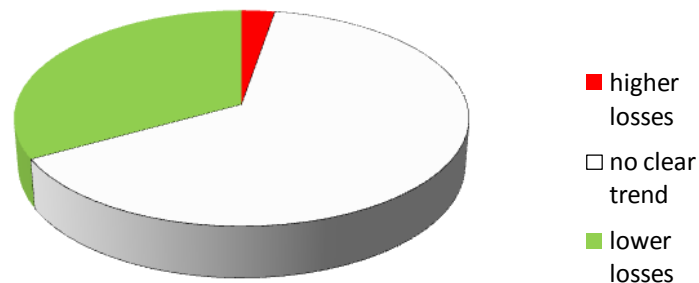
Technical resilience



Flexibility



Losses variation



Additional investment reduces overall losses... ceteris paribus



# About €100 billion in the coming 10 years

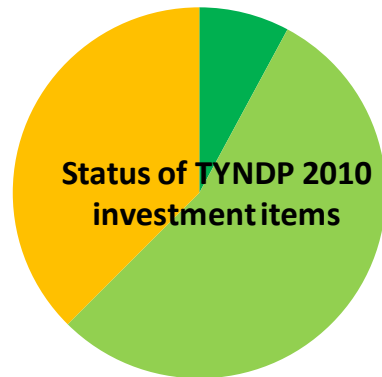


- €100 billion investment on grids...
- $\approx 1.5\text{-}2$  €/MWh in Europe over the 10-year period,
- $\approx 2\%$  of the bulk power prices,
- $\approx$  less than 1% of the total end-users' electricity bill

	billion €		billion €
Austria	1.1	Ireland	3.9
Belgium	1.9	Latvia	0.4
Bosnia-Herzegovina	0.0	Lithuania	0.7
Bulgaria	0.2	Luxembourg	0.3
Croatia	0.2	Montenegro	0.4
Czech Republic	1.7	Netherlands	3.3
Cyprus	0.0	Norway	6.5
Denmark	1.4	Poland	2.9
Estonia	0.3	Portugal	1.5
Finland	0.8	Romania	0.7
France	8.8	Serbia	0.2
FYROM	0.1	Slovakia	0.3
Germany	30.1	Slovenia	0.3
Greece	0.3	Spain	4.8
Hungary	0.1	Sweden	2.0
Iceland	0.0	Switzerland	1.7
Italy	7.1	United Kingdom	19.0

Total ENTSOE perimeter	104
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# Evolution compared to TYNDP 2010



- ahead of schedule
- on track
- delayed

Social acceptance and permitting issues result in one third of TYNDP 2010 investment items to be delayed

21% of investment items are new ones in the TYNDP 2012 package

- regular turnover

Commissioned

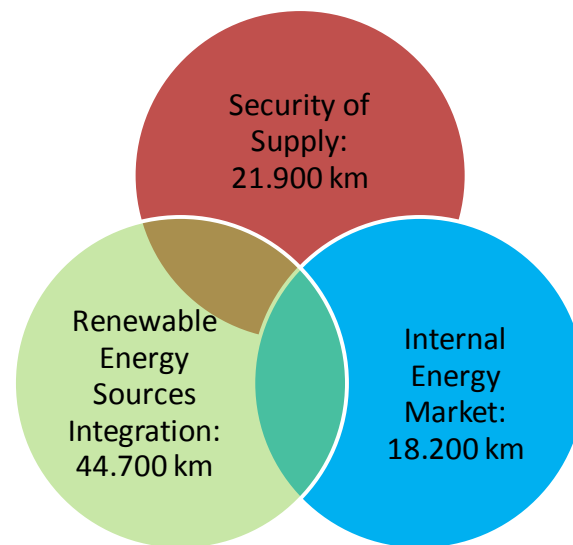
TYNDP 2010

**TYNDP 2012**  
**# 100 projects**

**Reg. Inv. Plans 2012**

# A relatively limited network growth answering major challenges

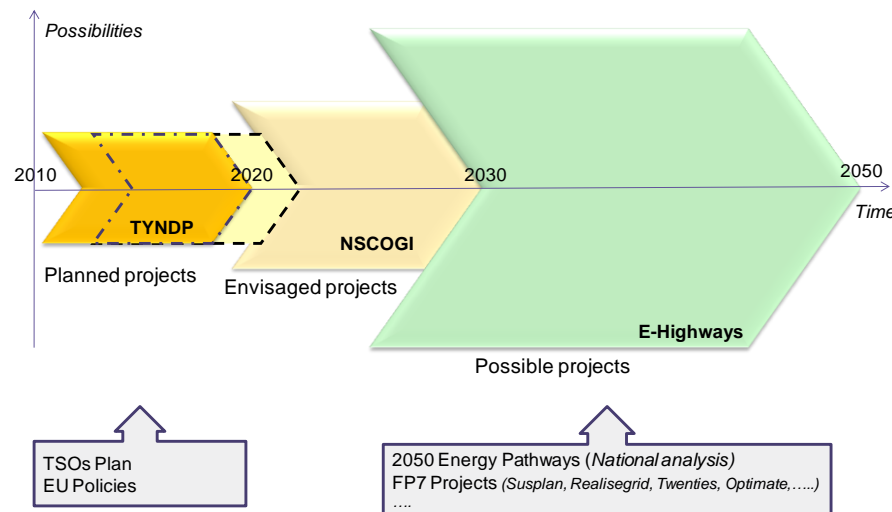
- Grid length development is only +1.3%/yr despite a major upcoming shift in generation mix
  - 1/3 of the present generation capacity to be build in the coming decade (i.e. +3%/yr)
  - Peak load growth +1.7%/yr
- A strong support to EU energy policies with efficient resources commitment



# Reliable, adaptable and robust investments



- An anticipation of thousands of diverse situations
- An analysis of most frequent situations, and extreme ones
  - Peak hours winter/summer
  - High, unbalanced renewable generation across Europe
- Use of novel or unconventional technologies ↔ Smartgrids
  - Several world premieres
  - ENTSO-E R&D program
- First step toward Electricity Highways 2050





# A 10-year plan to meet EU 2020 goals



> 100 projects, 51 500 km, approx. €104 bn of investments

- Notwithstanding non pan-European significance projects

+1.3% per year grid length development despite a major upcoming shift in generation mix to accommodate wider, stronger, more volatile power flows

- One third of the present generation capacity to be built in the coming decade (i.e. +3% per year)

A solid basis for the Project of Common Interest selection

Social acceptance is still the major challenge!

- One third of TYNDP 2010 investment projects are delayed because of longer than expected authorization procedures