

ENTSO-E's Ten Year Network Development Plan

Overview

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The TYNDP 2014 package delivers...

...a vision for the development
European extra high
voltage grid

- Non-binding
- Updated every 2 years
- Based on a generation adequacy outlook
- ... and common market and network studies

...a comprehensive
document suite that
includes

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



ENTSO-E 10-YEAR NETWORK
DEVELOPMENT PLAN 2014
PROJECT FOR CONSULTATION

DRAFT
V8 - 24.02.2012

Regulation (EC) 714/2009
Regulation (EC) 347/2013

The Ten-year Network development plan at a glance

Identification of all challenges in building the necessary infrastructure

Transparency

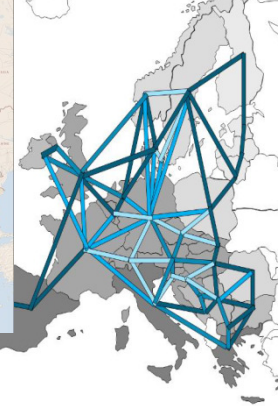
Standard
Cost Benefit Analysis
for all projects

Stakeholders'
involvement

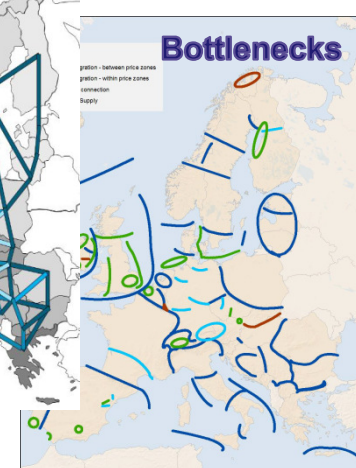
TSO cooperation
platform



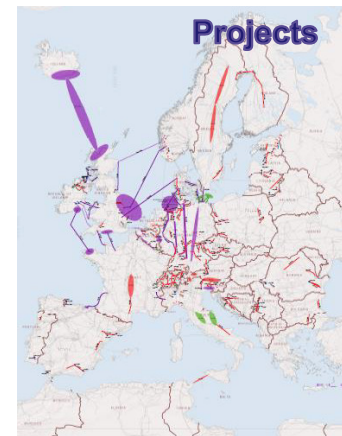
Market prices



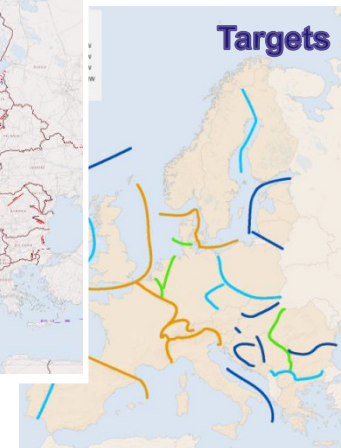
Bottlenecks



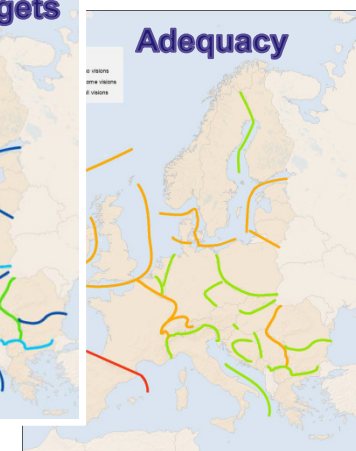
Projects



Targets



Adequacy



The TYNDP 2014 capitalizes upon and improves past work

TYNDP 2010

- ENTSO-E proactively publishes the pilot TYNDP
- Bottom-up approach
- 2020 scenarios
- No 3rd party projects incorporated
- ENTSO-E significant effort to create and run the TYNDP process with all its 41 members

TYNDP 2012

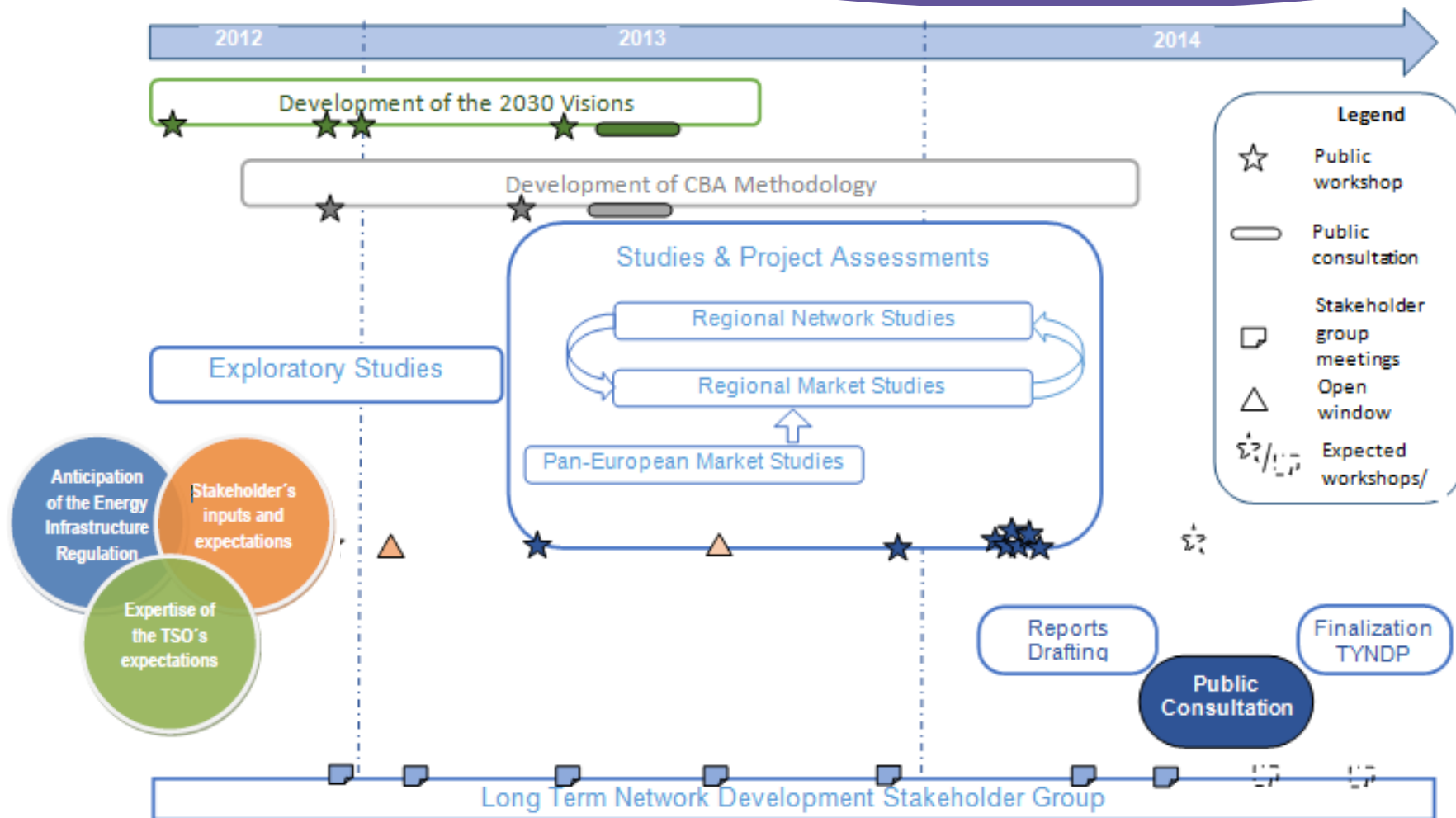
- First official TYNDP package
- Bottom-up and top down approach
- 2020 scenarios
- First call for the inclusion of the 3rd party projects (transmission)
- First assessment of the projects using the CBA methodology
- Supports the discussions on the new energy infrastructure legislation

TYNDP 2014

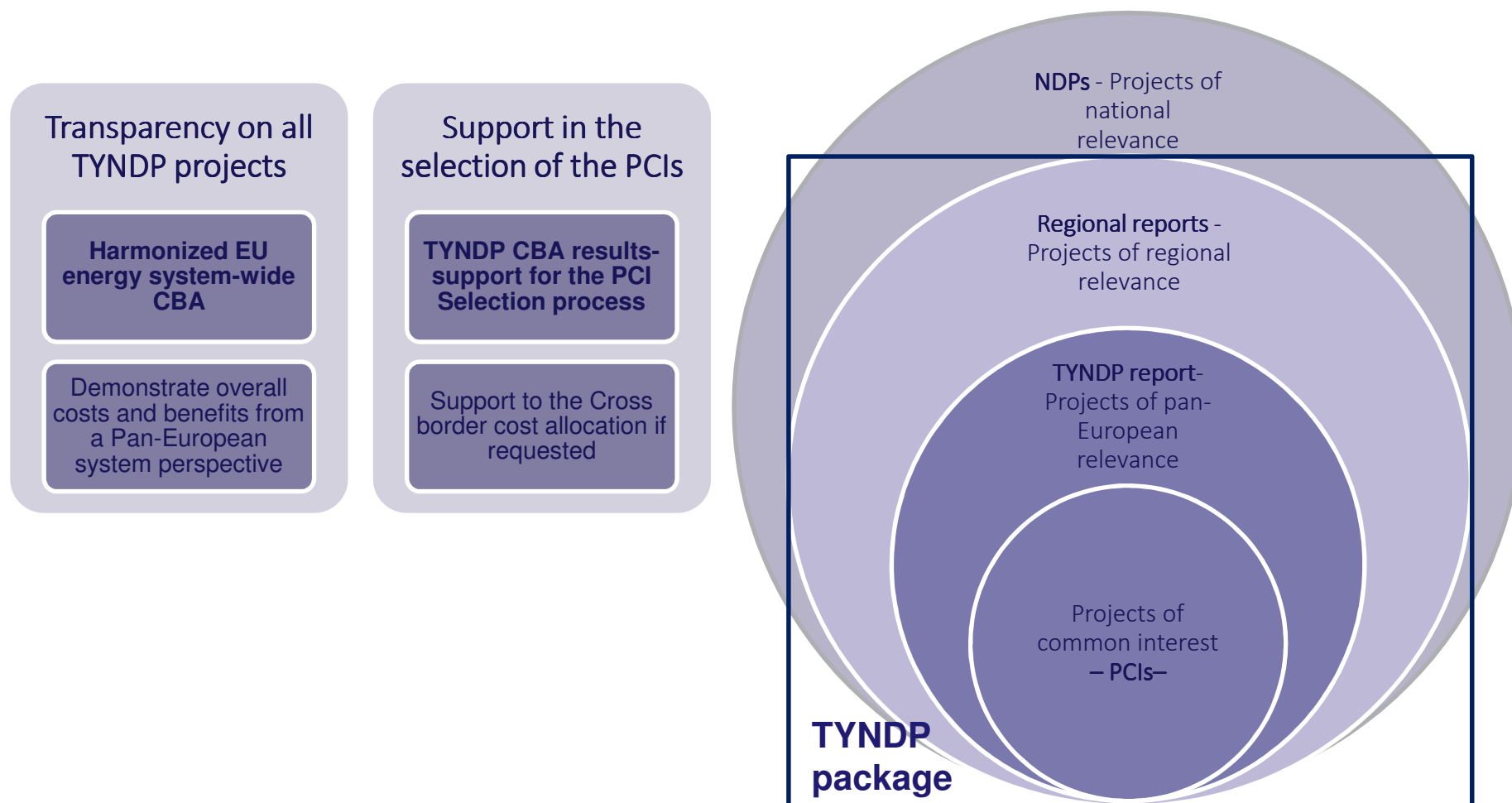
- Second official TYNDP package
- Bottom-up and top down approach
- 2030 scenarios
- Second & Third call + new procedure for inclusion of 3rd party projects (transmission & storage)
- Improved CBA methodology
- Sole basis 2015 PCI list
- Target capacities maps
- Creation of the Long-Term Development Stakeholder Group

Intermediate update
of the TYNDP 2012
table of projects




The TYNDP 2014 is the outcome of a 2-year interactive process



TYNDP –the sole basis for the PCI selection - Regulation (EU) 347/2013






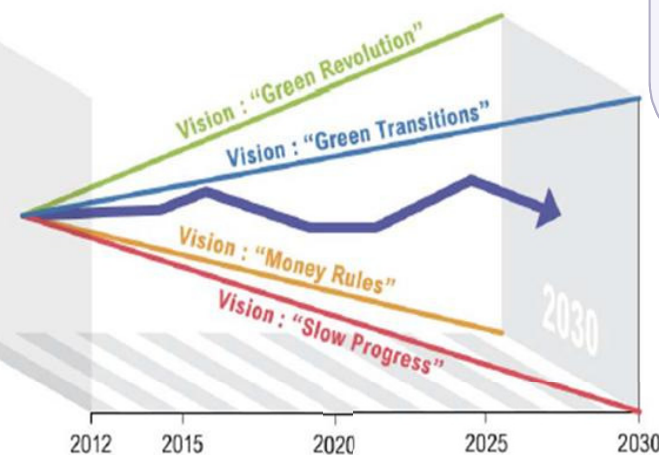
4 scenarios to frame uncertainty and build the right infrastructure




- Economic and financial conditions 
- Energy policies **EUROPEAN**
- R&D schemes **EUROPEAN**
- CO₂ prices 
- Energy prices 

**VISION 3:
“GREEN
TRANSITION”**

**VISION 4:
“GREEN
REVOLUTION”**




- Economic and financial conditions 
- Energy policies **EUROPEAN**
- R&D schemes **EUROPEAN**
- CO₂ prices 
- Energy prices 



- Economic and financial conditions 
- Energy policies **NATIONAL**
- R&D schemes **NATIONAL**
- CO₂ prices 
- Energy prices 

**VISION 1:
“SLOW
PROGRESS”**

**VISION 2:
“MONEY
RULES”**

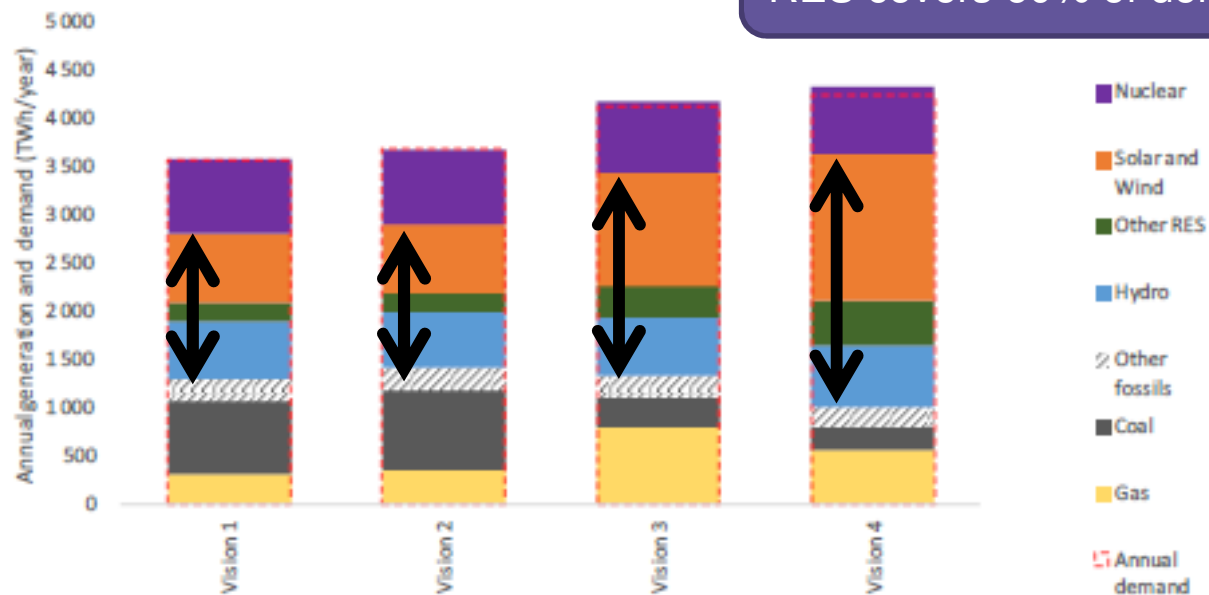
- Economic and financial conditions 
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RES development is the major driver for grid development

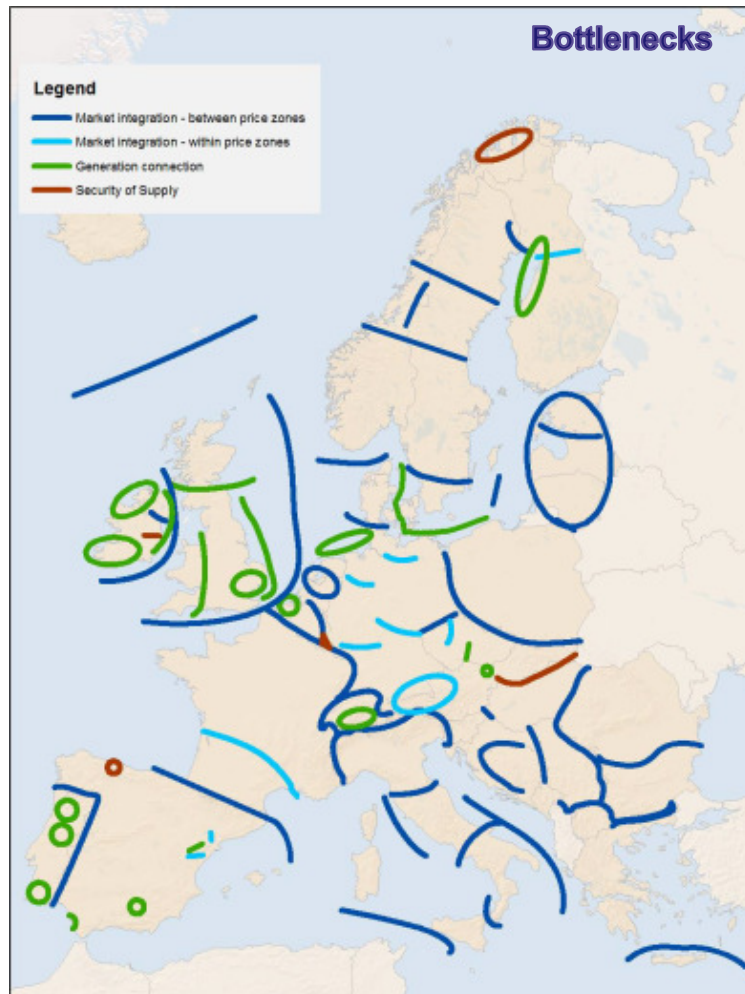
A major shift of the generation mix by 2030

Total installed capacity +30% (V1) to +90% (V4) from now to 2030
corresponding basically to added RES capacities

RES covers 40% of demand in V1
RES covers 60% of demand in V4

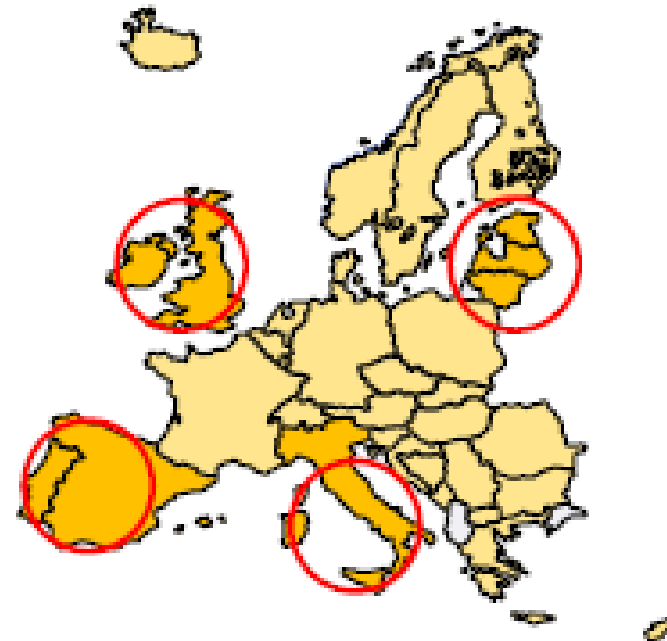


Larger, more volatile over longer distances power flows



About 100 investment needs

4 electric peninsulas



Interconnection capacity must on average double by 2030



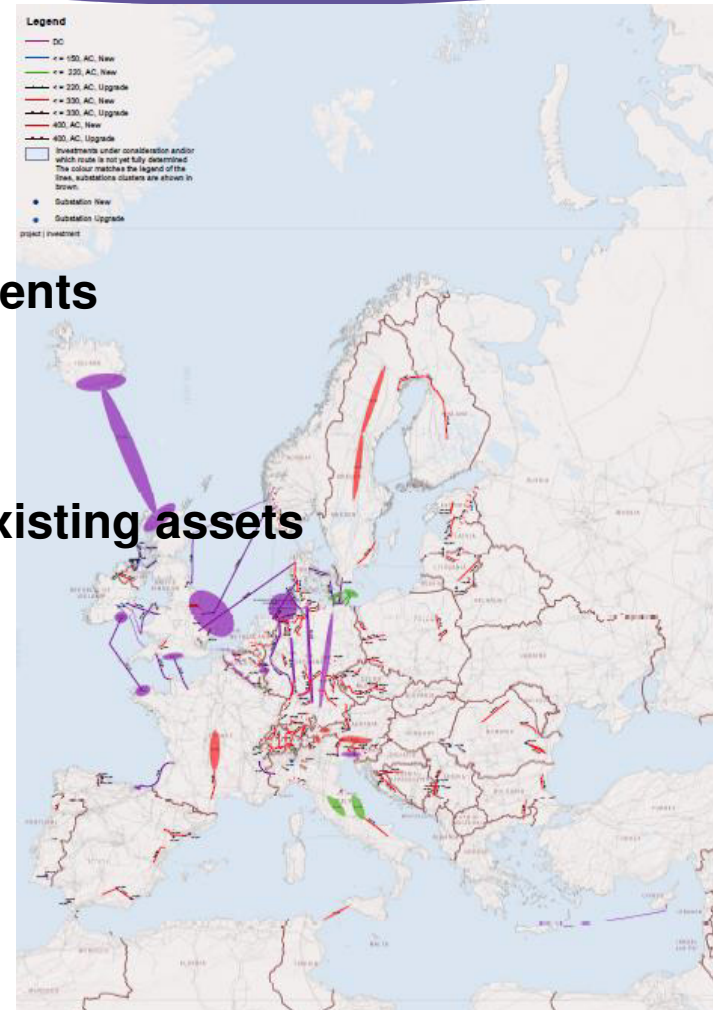
Taylor made solutions, adapted to every specific situation



50000 km of new or refurbished investments

21000 km of new HVDC lines

15% of all investments are upgrade of existing assets



€150 billion by 2030, with a positive net impact on social welfare

€150 billions for projects of pan-E significance by 2030

+ 1 to +2 €/MWh to cover investment costs

- 2 to -5 €/MWh for bulk power prices by 2030

AT	1.9	IE	2.0
BA	0.1	IS	0.0 ²⁸
BE	2.0-4.0	IT	5.9
BG	0.3	LT	0.7
CH	1.6	LU	0.2
CY	0.0	LV	0.4
CZ	1.5	ME	0.1
DE	34.8-54.2	MK	0.1
DK	3.7	NI	0.5
EE	0.2	NL	3.3
ES	4.3	NO	7.9
FI	0.8	PL	1.9
FR	8.4	PT	0.7
GB	15.9-16.2	RO	0.5
GR	2.6	RS	0.4
HR	0.2	SE	3.6
HU	0.1	SI	0.6
		SK	0.3
Total	110-150		

The TYNDP's positive environmental impact

Integration of RES up to 40-60% of total consumption

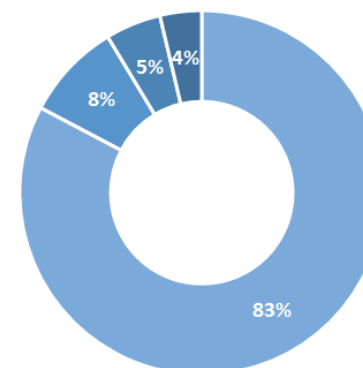
-20% of the CO₂ emissions
for the European power sector

Total grid length +1%/yr only
(vs generation of +3 to +5%/yr)

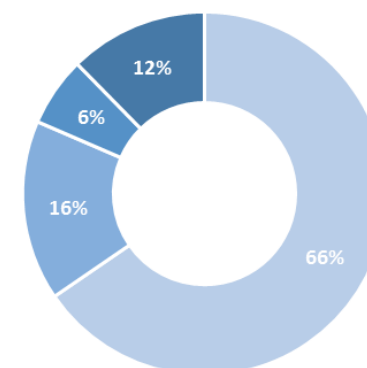
Less than 4% of routes in
urbanised areas

Less than 8% of routes in
protected areas

- Negligible or less than 15km
- 15-50km
- 50-100km
- more than 100km



urbanised areas

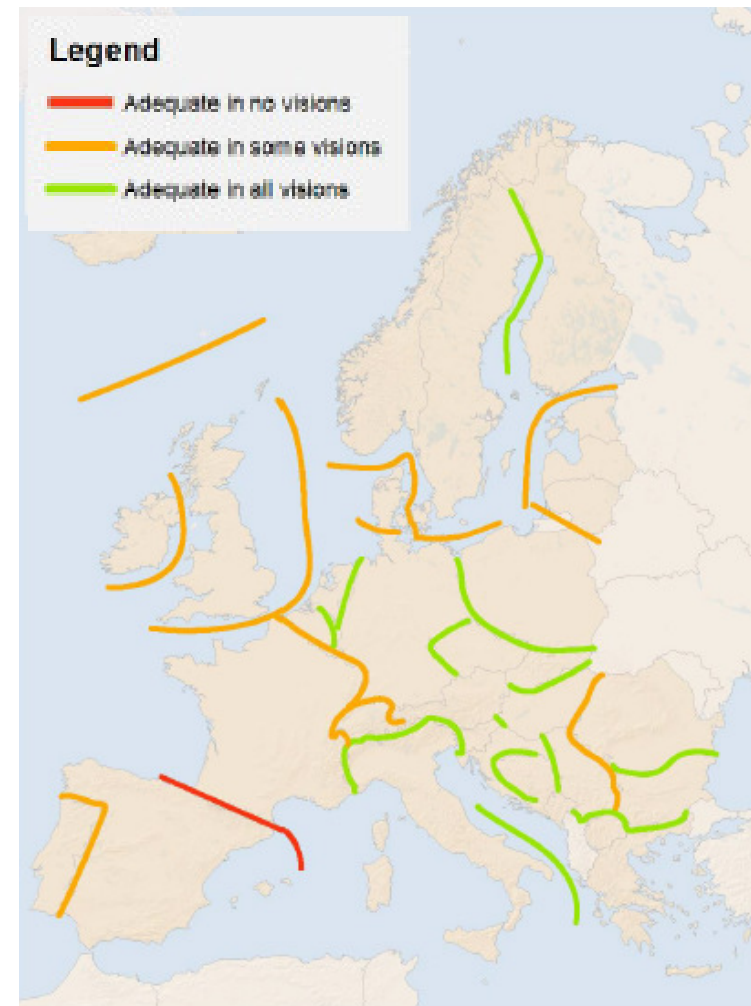


protected areas

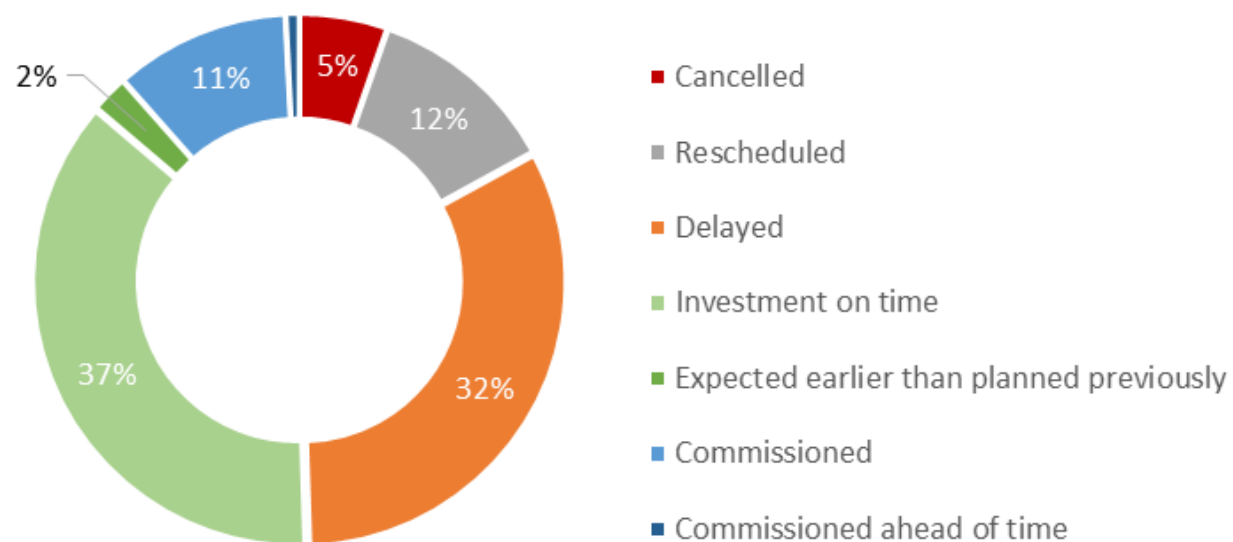
Transmission adequacy by 2030

Integration of iberian peninsula is the main concern

Solution concepts must still become tangible projects to meet highest RES development goals (Vision 4)



One third of TYNDP 2012 investments delayed by about 2 years



A stable regulatory framework is key for grid development

Permit granting

- Procedures are lengthy and cause often commissioning delays

Financing

- A stable regulation for long term investments
- Tariffs must adapt to the energy transition goals

ENTSO-E welcomes Regulation 347/2013

positive on permitting process

Sped up procedures

one stop shop at national level

defined time lines

The TYNDP 2014 enriches the TYNP 2012 key findings

€150 billions for projects of pan-E significance by 2030
50000 km of new or refurbished grid investments

- 2 to -5 €/MWh for bulk power prices by 2030

Integration of RES up to 40-60% of total consumption
Adaptation to the major shift of the generation mix

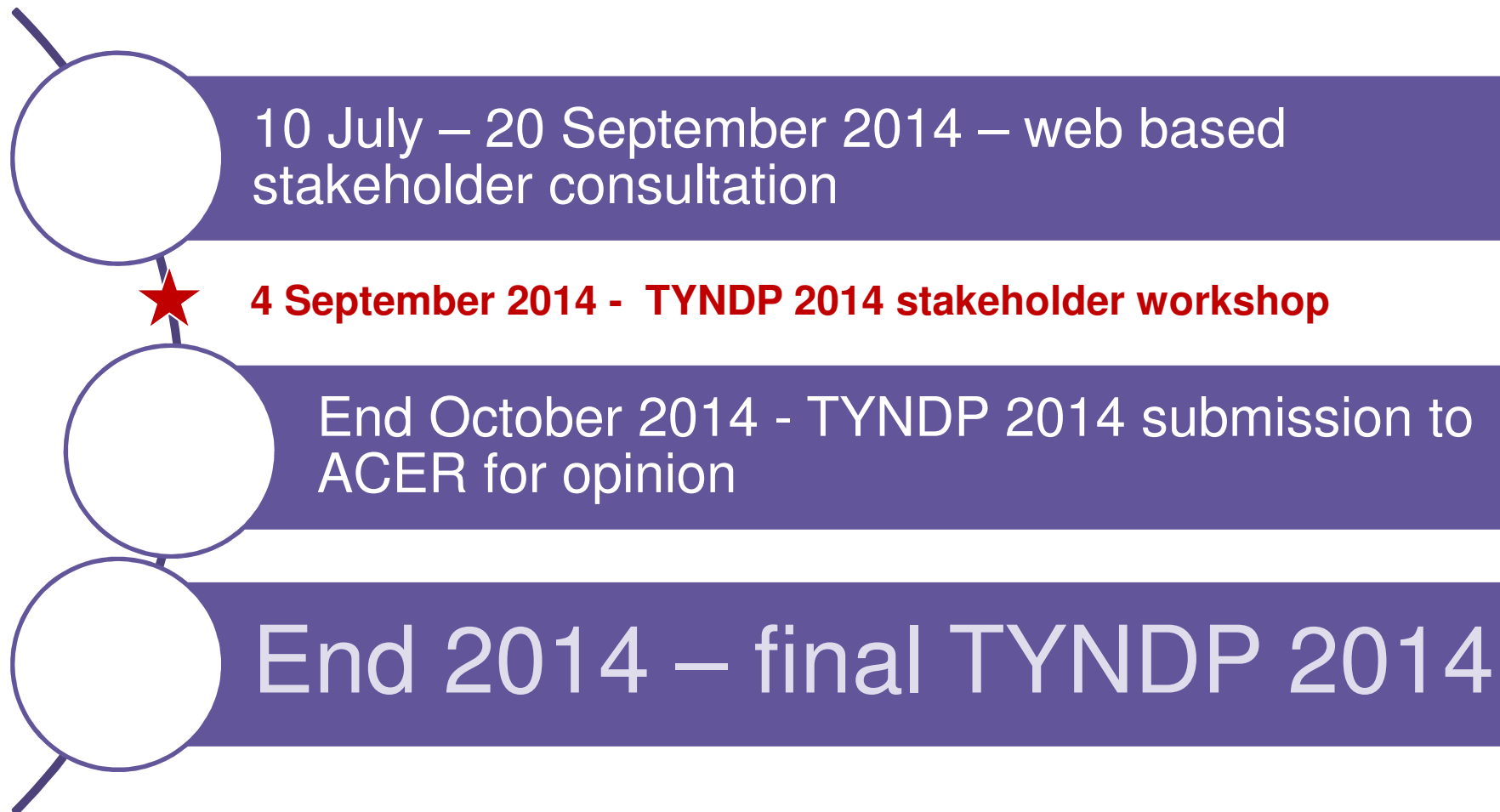
Contribution to **20% of the CO2 emissions mitigation**
for the European power sector

An optimised land use: total grid length +1%/yr
Less than 4% (resp. 8%) of routes in urbanised (resp. protected) areas



Next steps

TYNDP 2014 – next steps





Appendices

Regulation 347/2013 gives a stronger role to the TYNDP

Transparency on all TYNDP projects

- ✓ Harmonized EU energy system-wide CBA
- ✓ Demonstrate overall costs and benefits from a **Pan-European system perspective**

Support the selection of **Projects Common Interest (PCIs)**

- ✓ PCI Selection process will take into account ENTSO-E CBA results in TYNDP
- ✓ (Cross border cost allocation upon request)

A tool to assess all pan-EU grid development projects

TYNDP

Projects of pan-European significance

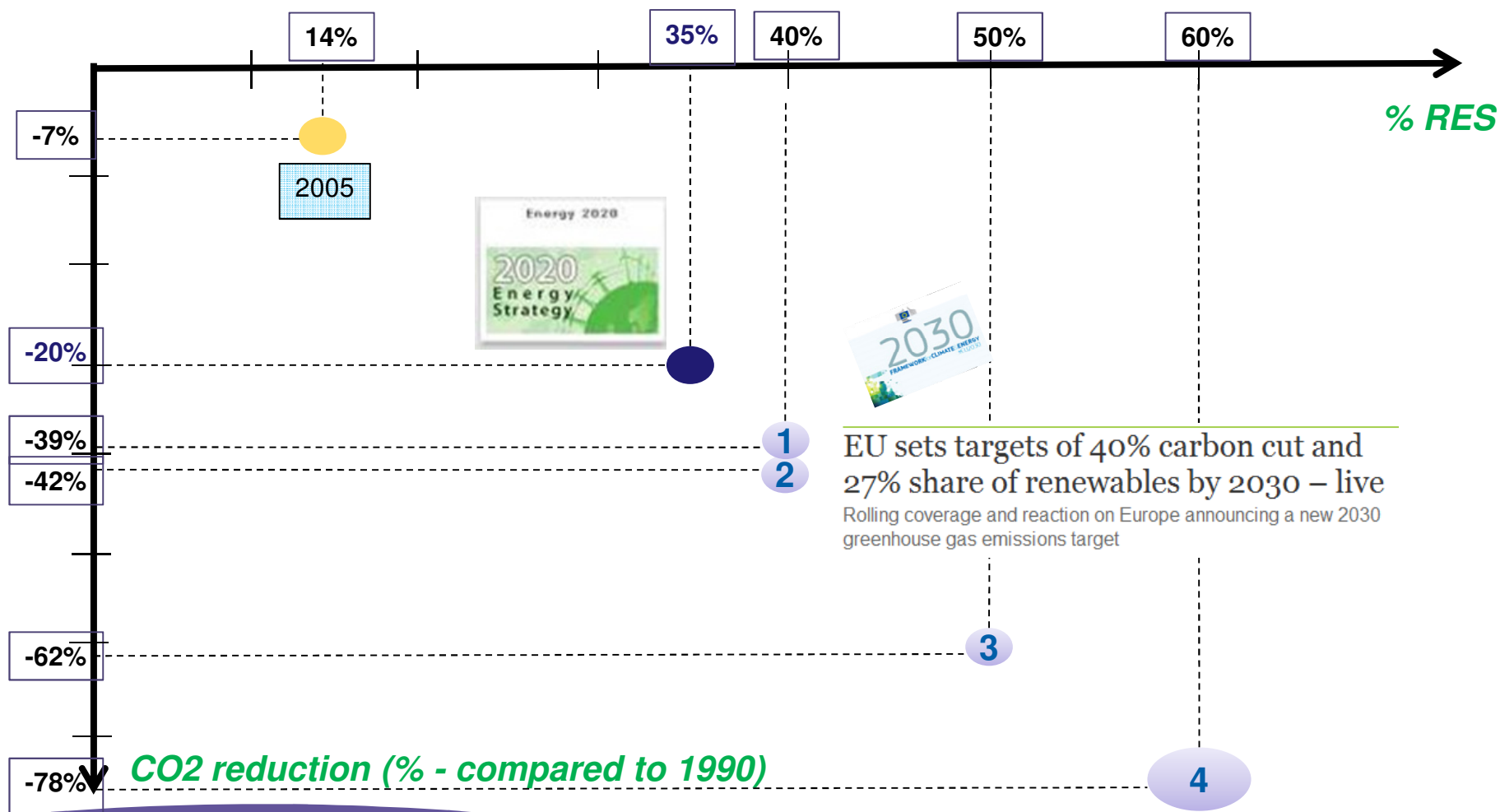
CBA =
tool to
assess all
projects

Candidate PCIs

CBA = possible
input to
decision -
making process

2030: a milestone for the energy transition on the road to 2050

RES Targets EU = total scope energy
% RES = part of electricity generation mix



On the way to 2050

E-Highways project

TYNDP 2016

