# Ten-Year Network Development Plan and the EU Target Model for Market Integration

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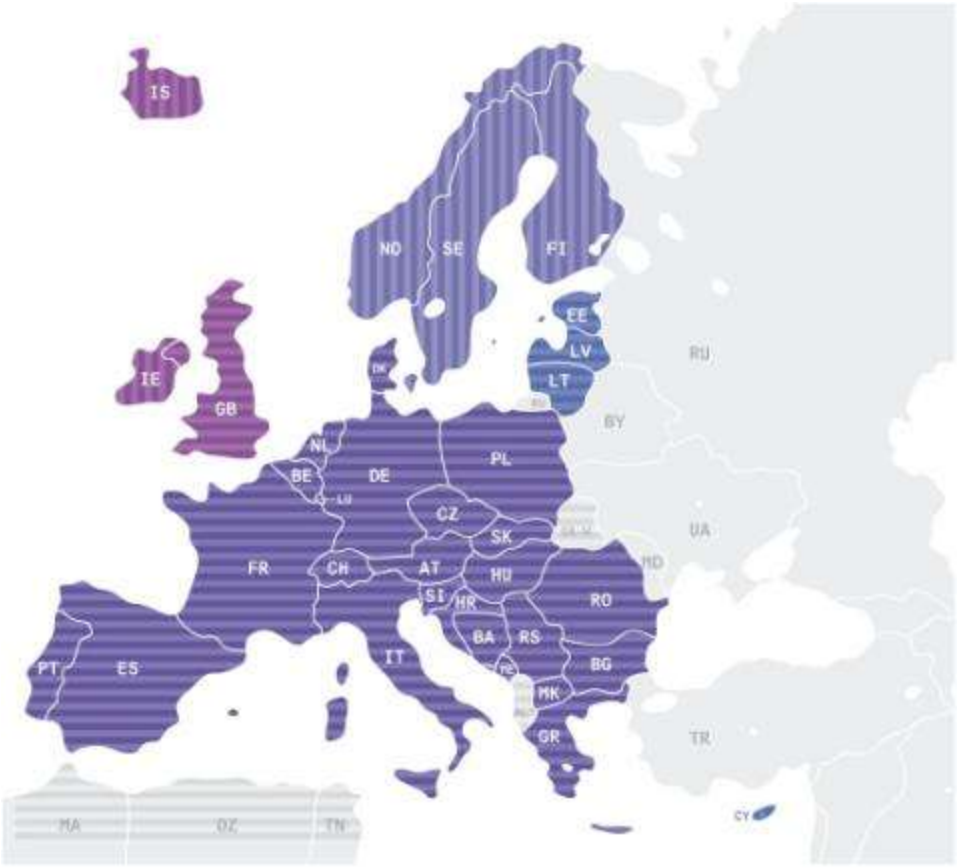
Reliable Sustainable Connected

# TSO international cooperation = ENTSO-E

- **41 TSOs from 34 countries**
- Fully operational since **July 2009**
- A trans-European network
  - **525** million citizens served
  - **828** GW generation
  - **305,000** Km of transmission lines
  - **3,400** TWh/year demand
  - **400** TWh/year exchanges

- Replaces former TSO organisations: ATSOI, BALTSO, RTSO, NORDEL, UCTE, UKTSOA

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# Regulation 714/2009– an important raison d'être for ENTSO-E

- **Article 4: European network of transmission system operators for electricity**
  - **Completion and functioning** of the internal market in electricity and cross-border trade
  - **Optimal management, coordinated operation and sound technical evolution** of the European electricity transmission network
- **Article 6: Establishment of network codes**
- **Article 8: Tasks of the ENTSO for Electricity**
  - **Network codes**
  - **Common network operation tools**
  - **Non-binding Community-wide 10-year network development plan**, every two years
  - Work programme, annual report, **summer/winter outlooks, monitoring**
- **Full implementation until March 2011**

**ENTSO-E operational much earlier because a fully developed IEM and the integration of RES demand urgent TSO action**

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# Community wide Ten Year Network Development plan

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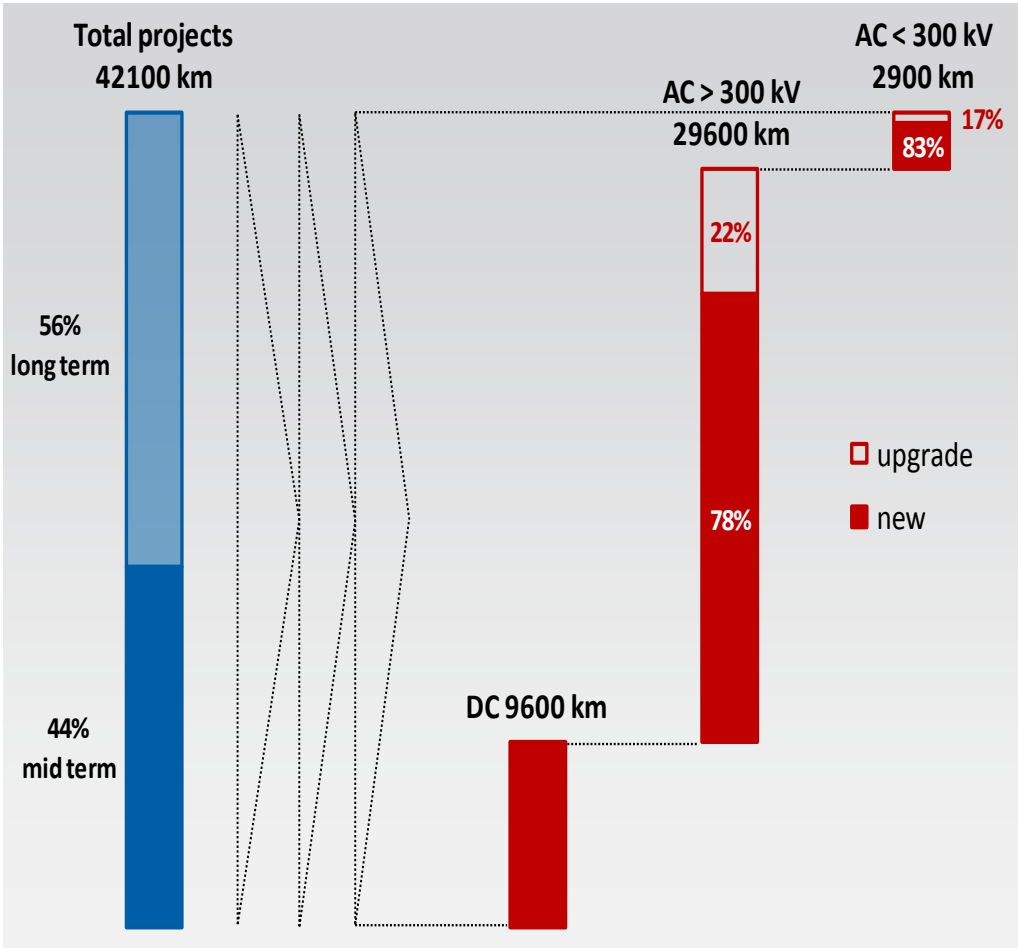
# Results of the Pilot TYNDP 2010

**The TYNDP projects represent ~14% of existing lines**


**€ 23 to 28 billion**

**for the first five years !**

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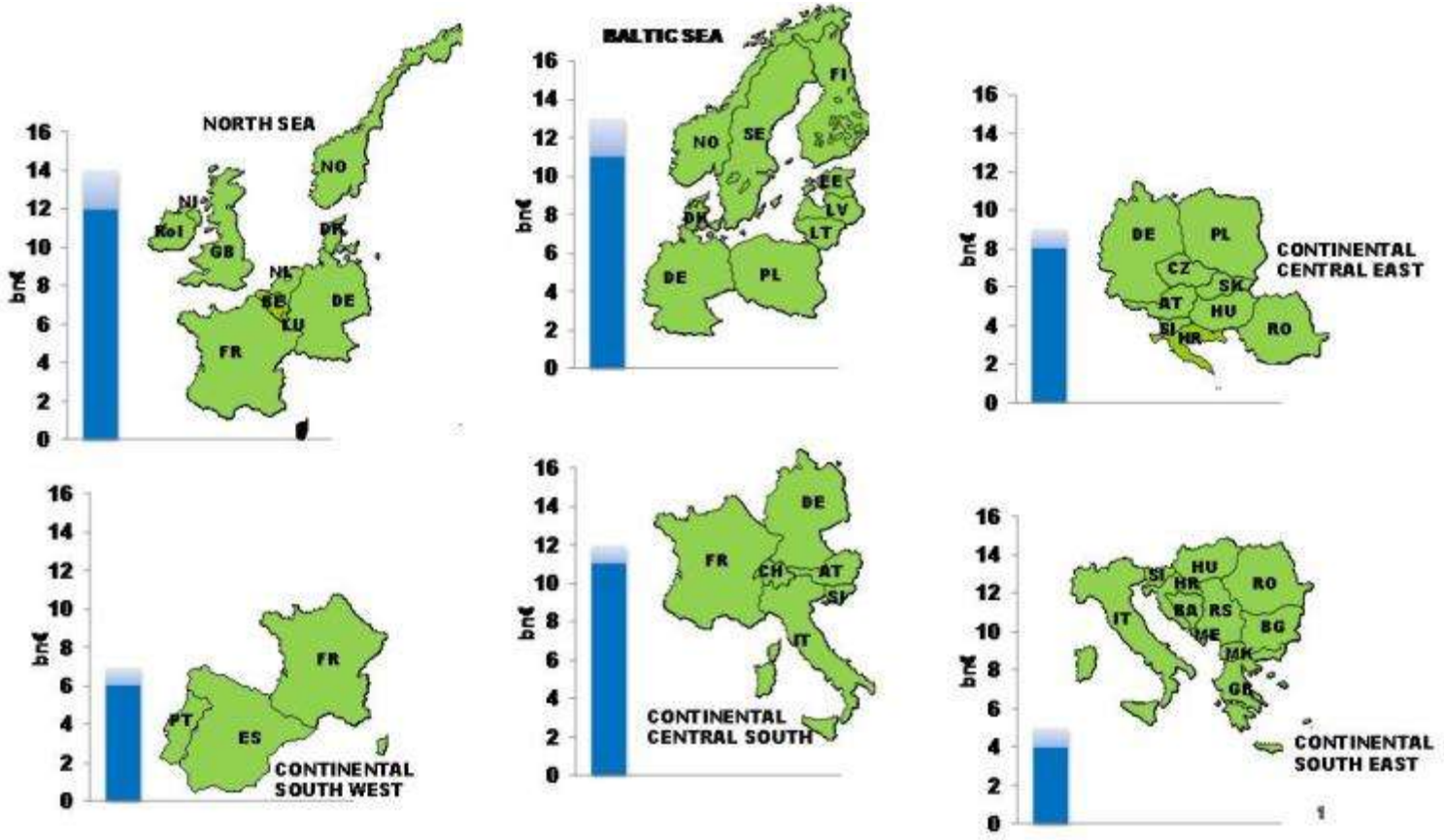
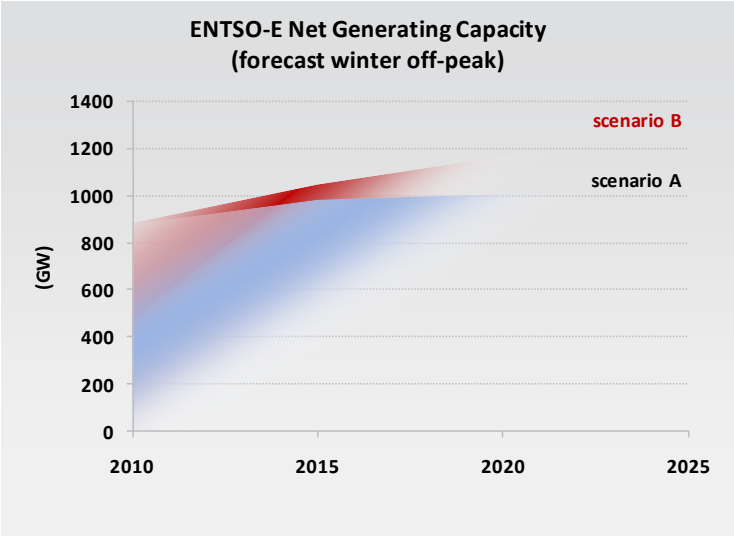
# TYNDP in figures

## Each market region is concerned



# The present 500 new investments = 25.5% RES in 2020

## Two scenarios for load and generation evolution (2025) built on available information




**25.5% RES in electricity production (2020)**
**800-1400 MtCO2 emissions (2020)**

And an appreciation of the fulfillment of EU2020 targets

**With generation adequacy maintained on both scenarios by 2020**

# The debate has now started

- **“The first 10-year network development plan (TYNDP) forms a solid basis to identify priorities in the electricity infrastructure sector”**

*EC Communication*
***Energy infrastructure priorities for 2020 and beyond***
*28 February 2011*

- **“Future infrastructure and non-binding TYNDPs should be consistent“.**

*Council conclusions on*
**Energy 2020: A Strategy for competitive, sustainable and secure energy**
*28 February 2011*

- **“Now, the TYNDP - elaborated by ENTSO-E - is an important first tool [for a clear vision for the development of integrated EU energy grids], which might need to be complemented by other instruments”.**

*working document*
**on Energy infrastructure priorities for 2020 and beyond**
*Committee on Industry, Research and Energy*
Rapporteur: Francisco Sosa Wagner

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# And « taboos » are dropping in view of the Energy Infrastructure Package

- **"It is important to streamline and improve authorisation procedures, while respecting national competences and procedures, for the building of new infrastructure; the European Council looks forward to the forthcoming proposal from the Commission in that respect."**

- **"The bulk of the important financing costs for infrastructure investments will have to be delivered by the market, with costs recovered through tariffs. It is vital to promote a regulatory framework attractive to investment".**

**Conclusions of the European Council**
4 February 2011

# Time to table proposals

- **Permitting/public acceptance**

– Avoid undue burden on TSOs: 3 - 5 year limit for final decision

– One-stop shops

– Compensation for municipalities?

– Communication

– Improvements and streamlining for ALL projects

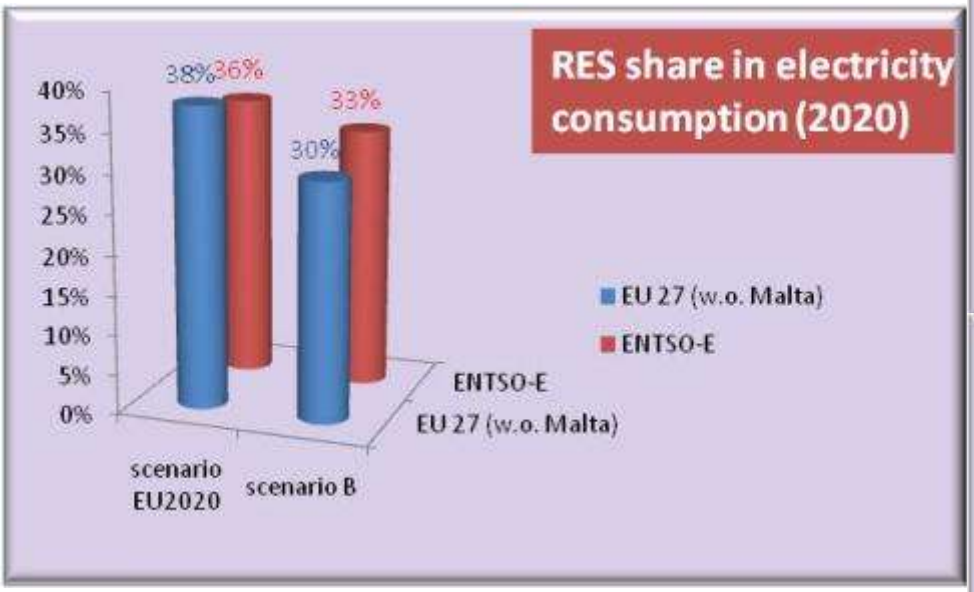
- **Investments**

– Business case for expansion investment often not stable and attractive enough

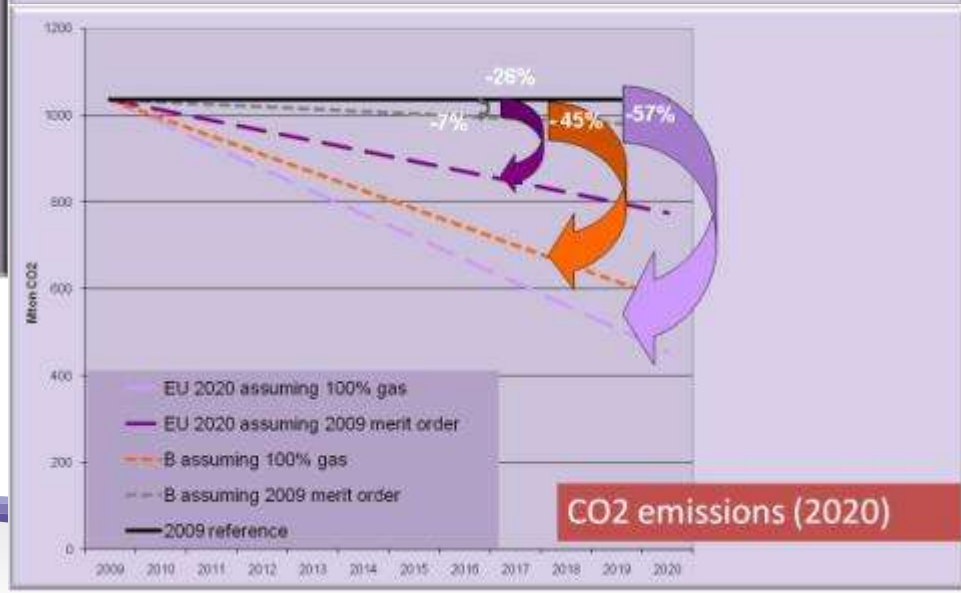
– International cost allocation !

– Innovative financing aids, partly to overcome regulatory blockages

# Way forward – TYNDP 2012 with top down scenarios





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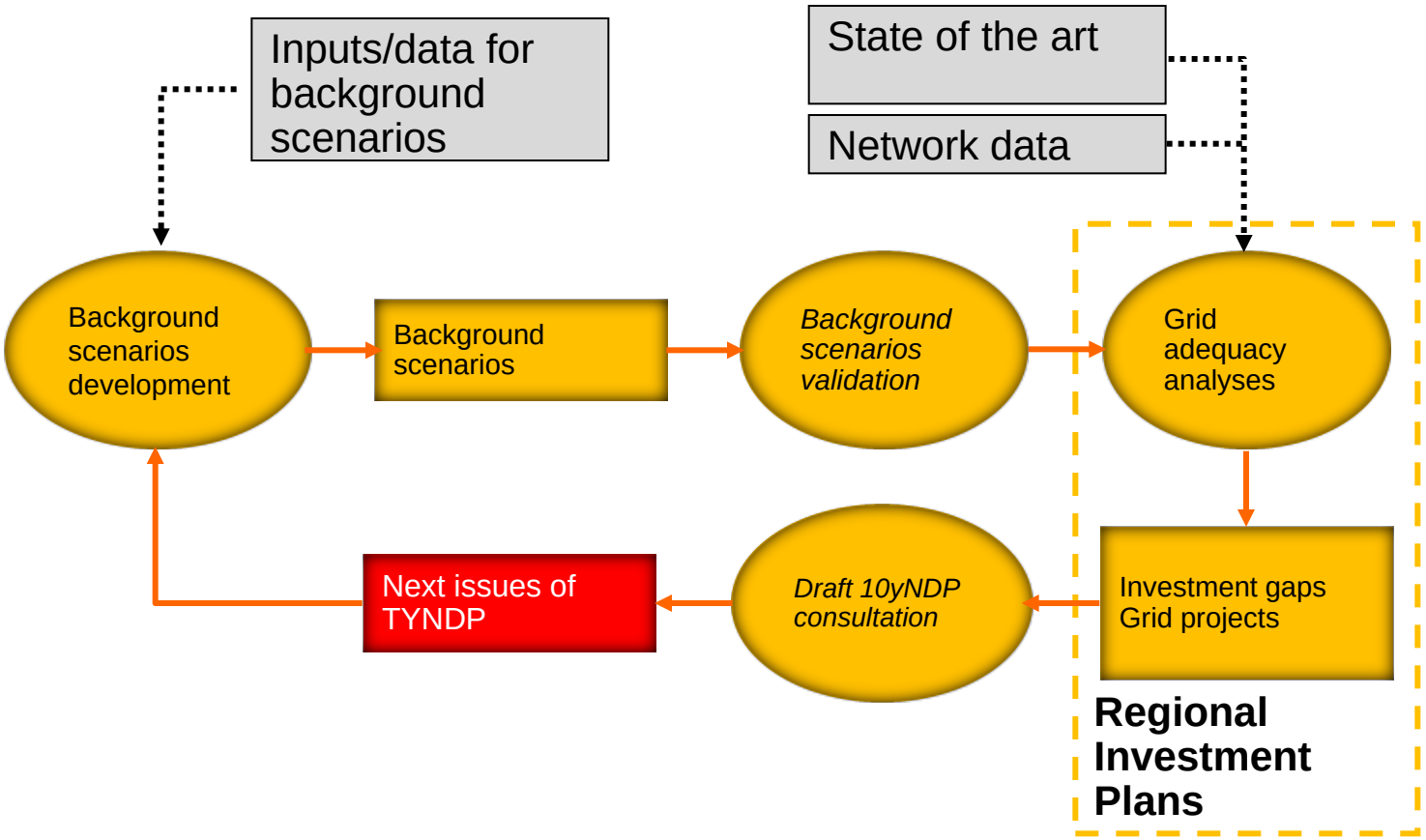
# Way forward – TYNDP 2012 built on regional plans



# Working towards a longer term

- **Transmission Grid infrastructures peculiarities:**

– Long life cycle: Decision today - Commissioning 2020 - Economic value 2020 – 2050 +

**Changing the structure of the grid is a slow process**
**Longer term approach (20 to 30 years) also needed**

- **Target Year 2050 :**

– define policy targets, underlying scenarios,

– identify candidate technologies, grid structures, R&D efforts

- **Intermediate Target Year (2030…)**

– ensure a viable path between present and long term,

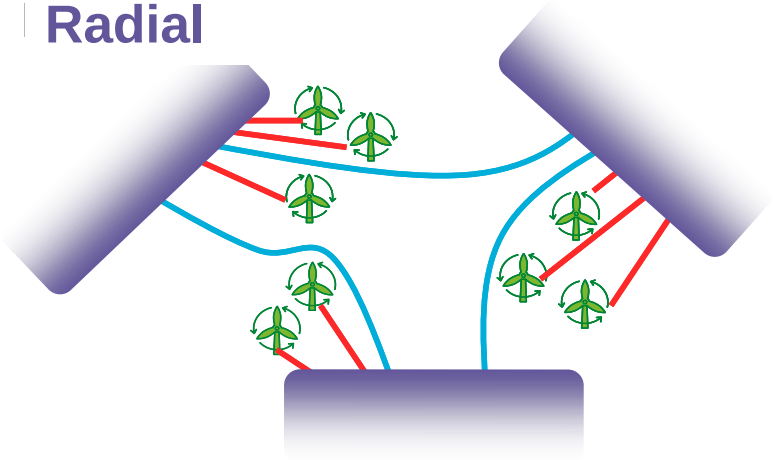
– avoid short term decisions leading to stranded investment

# Grid developments in North Sea

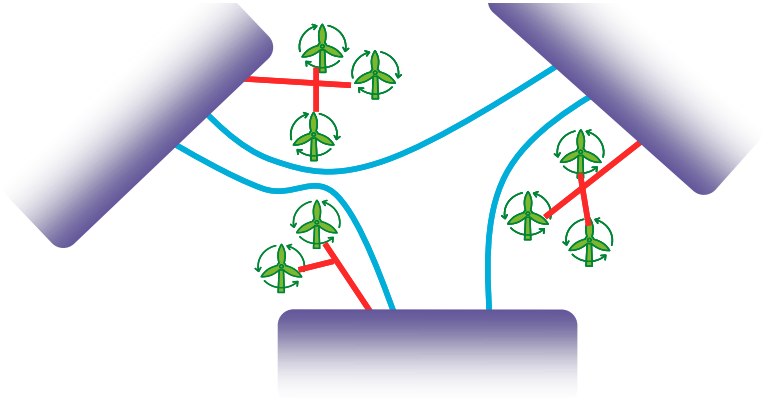
- **For 2020 updated North Seas grid analysis shows that the links identified in the pilot TYNDP are sufficient**
- **First analysis shows that 2030 offshore wind capacities (80 GW) demand new thinking**

# 2030 offshore wind capacities demand new thinking

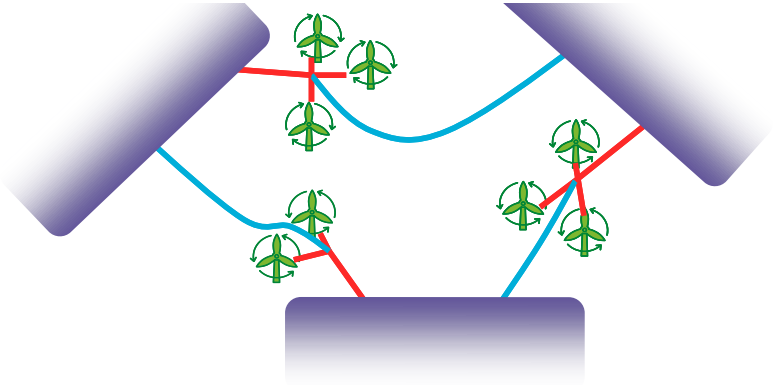
## Radial



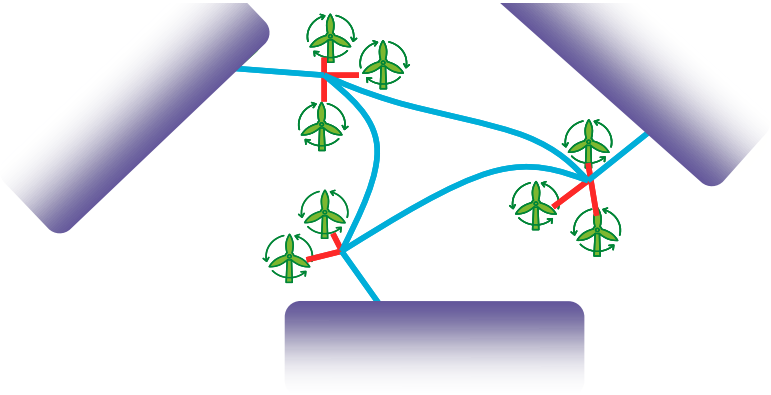
## Local coordination



## International coordination



## Fully integrated solution



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# Benefits of planning a coordinated integrated offshore grid

- **Maximising utilisation of the large scale assets required to connect the offshore wind farms**
- **Improved security of supply through flexible, controllable routes from offshore wind to demand centres/greater access to renewable generation**
- **Increased ability for cross-border trade and balancing/market integration**
- **Potential for reduced offshore infrastructure construction costs of about 10%**
- **Responsible use of limited natural and manufactured resources**
- **Improved standardisation and deliverability by reducing supply chain pressures**
- **But also: more complex than usually thought**

# Towards 2050 pan European System : the ENTSO-E study roadmap

• An ENTSO-E Study Roadmap will be available by July 2011 (after consultation process)
• Describe a comprehensive study package covering all relevant Electricity highways issues:

| Technological issues | Economical/financial issues | Political/sociopolitical issues |
|---|---|---|

In Line with the TYNDP

• In context of SET Plan, the realization of study package will be done by a large consortium (TSOs, DSOs, universities, institutes, manufacturers, …).

• First comprehensive concept on **Electricity Highways System** (also showing important corridors) is intended to be available by end 2014.

# Towards and Internal Electricity Market in Europe

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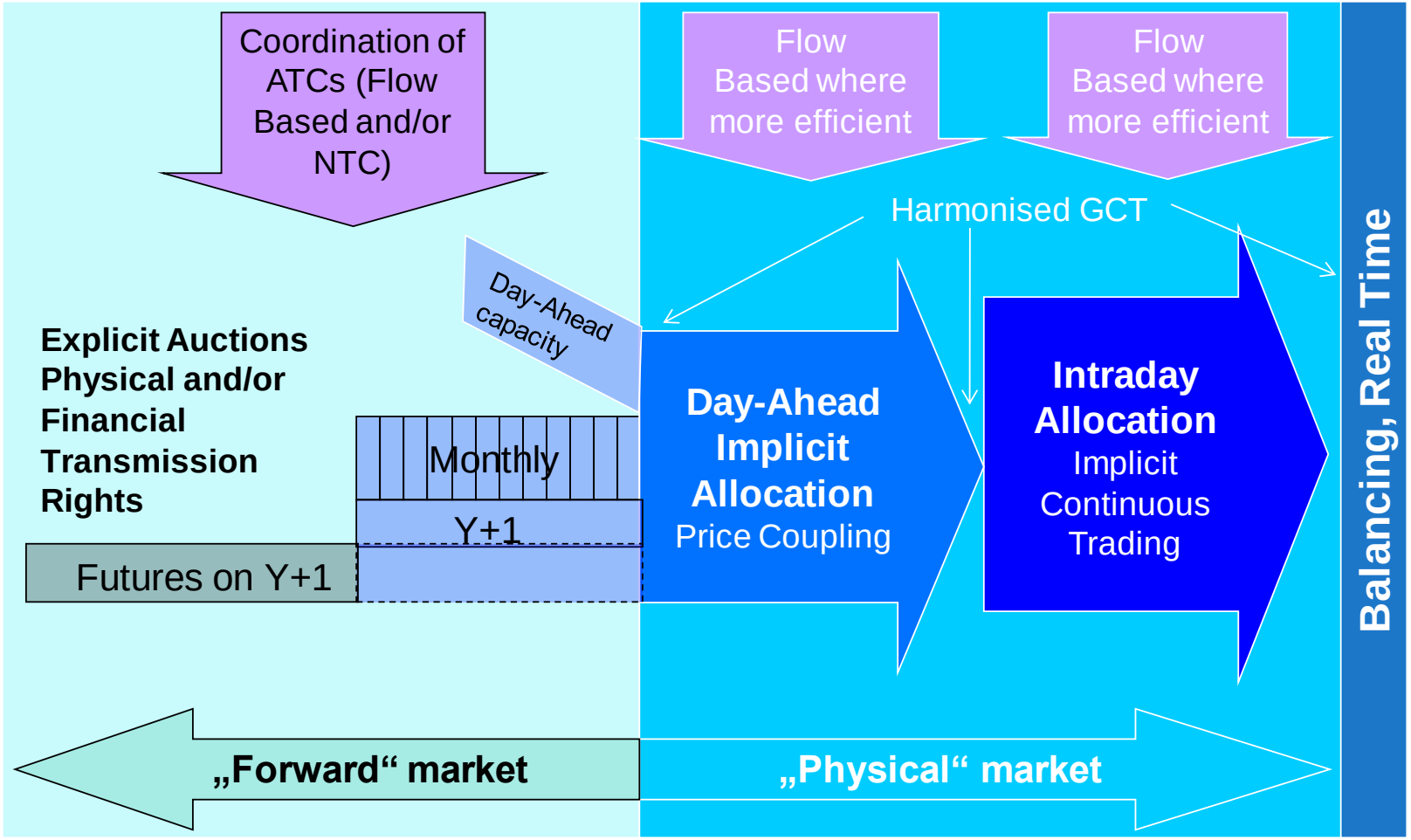
# Working towards an efficient IEM – The EU Target Model

- ENTSO-E, in collaboration with the EC, ERGEG/ACER and stakeholders, is working to implement a Target model for wholesale market design.
- The Target model, which covers forward, day-ahead, intra-day and balancing markets, as well as the calculation of cross border capacity, provides a goal for pan-European harmonisation to be implemented by 2015.
- It was endorsed by the EU Electricity Regulatory Forum in Florence in 2009.
- There is a fast evolution towards regional markets in Europe. Regional markets are a stepping stone in the process of implementing the Target model as a complement to the required top down approach (FG CACM & Network Codes)
- But implementing the Target model across Europe by 2015 remains a significant challenge.

# How EU TM has been developed: a consensual approach

- **ETSO-EuroPEX project (September 2007)**
  - *'The Forum requested ETSO and EuroPEX to write a common discussion paper before March 2008 to address the implementation of regional and interregional capacity allocation methods…'*
- **Project Coordination Group (November 2008)**
  - *'The Forum invited ERGEG to establish a Project Coordination Group of experts, with participants from EC, Regulators, ETSO, Europex, Eurelectric and EFET, involving Member States' representatives as appropriate, with the tasks of developing a practical and achievable model to harmonise interregional and then EU-wide coordinated congestion management…'*
- **Ad Hoc Advisory Group – AHAG (December 2009)**
  - *'The Forum supported ERGEG's proposal to continue the work through an Ad Hoc Advisory Group (AHAG) of all stakeholders which will assist ERGEG in overseeing the work and solving issues which might hinder progress…'*

# The 2015 Target Model for the IEM

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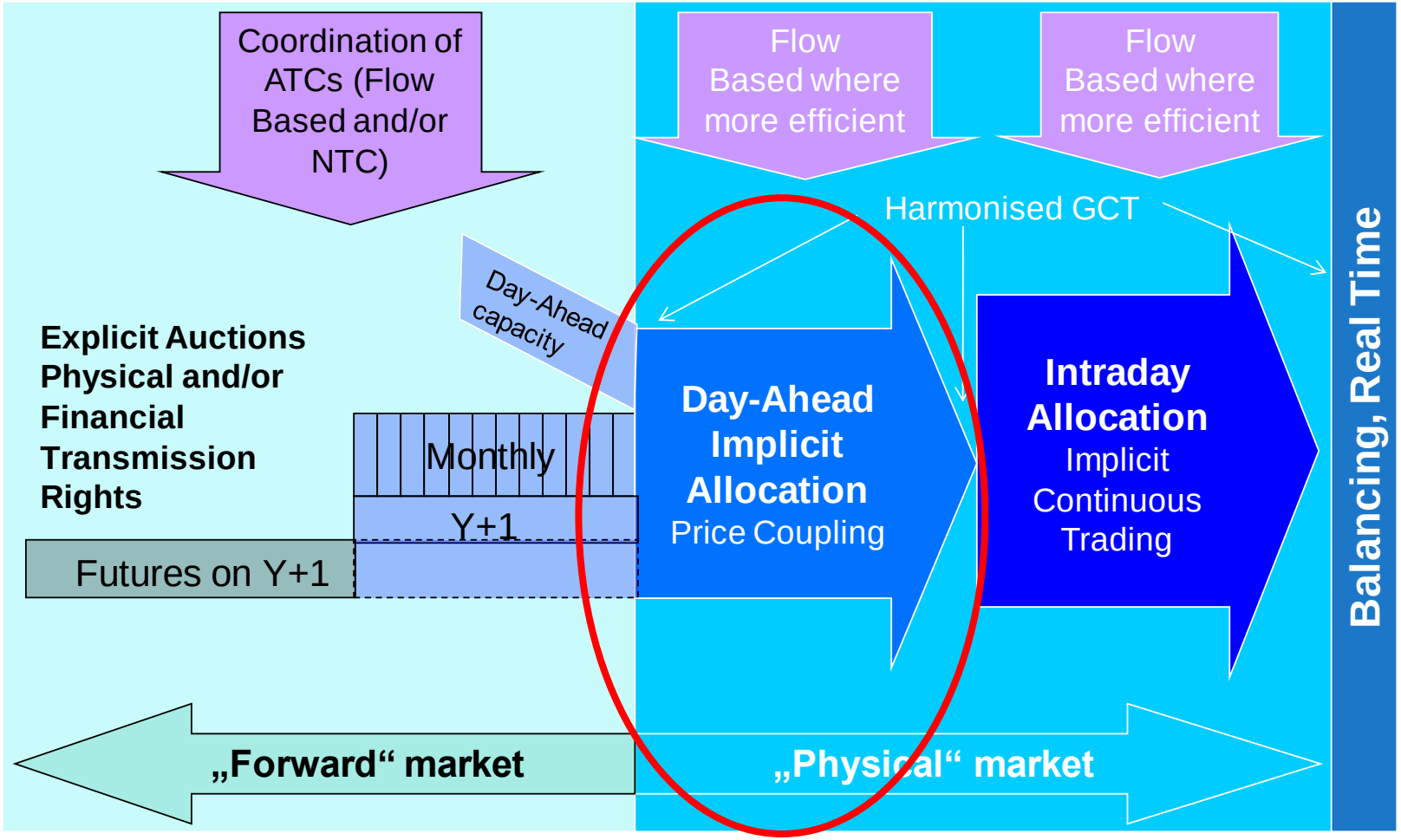
# Day-Ahead Market - Target Model

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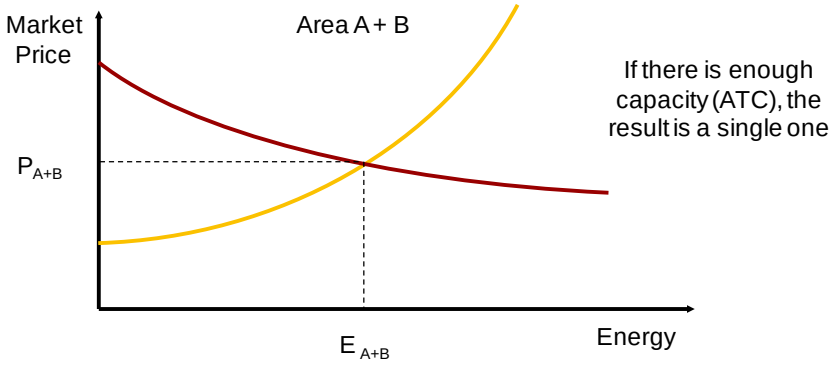
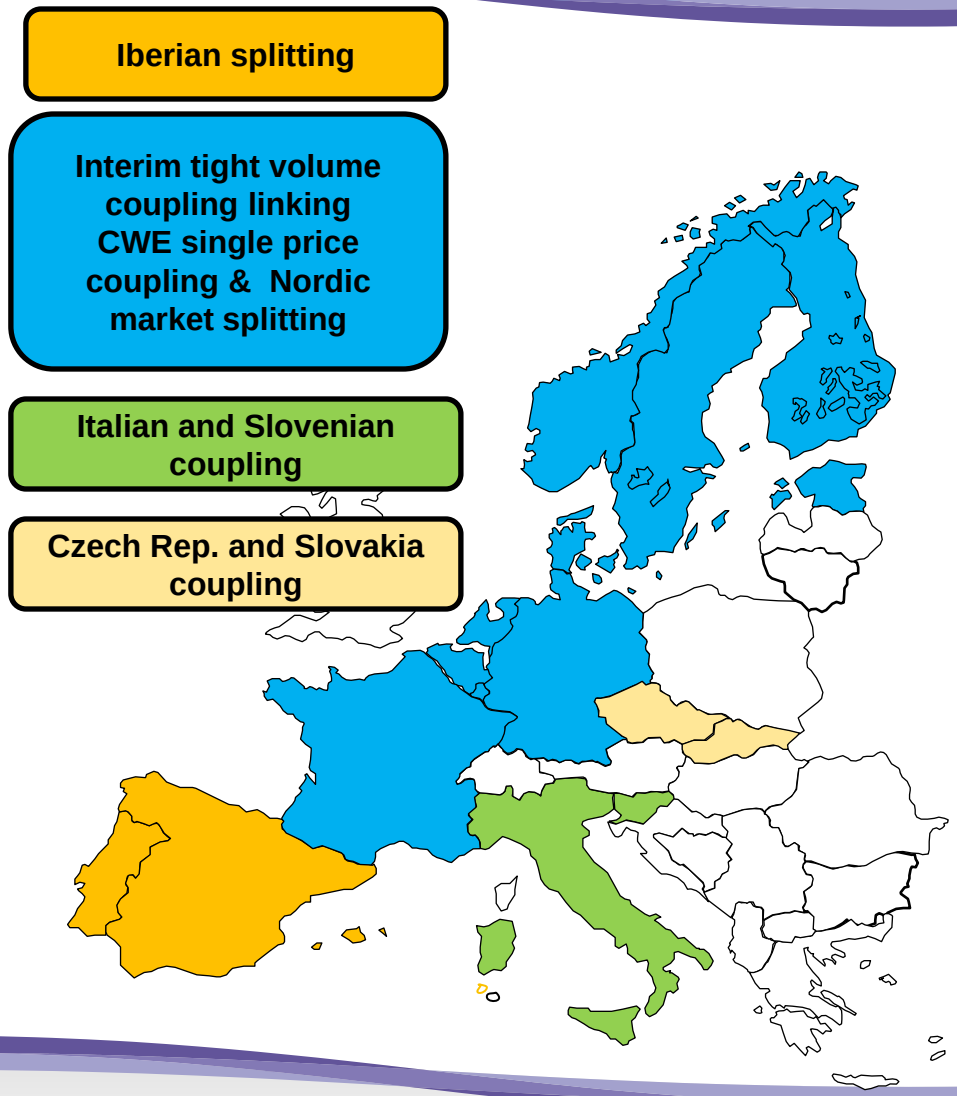
# Day-Ahead Market Target Model

- **Implicit auctions (single price coupling algorithm)**
- **Marginal pricing principle**

  - Requirement: a single energy market at both sides of the interconnection
  - The capacity is used by the whole market by allocating the most efficient bids in both sides of the interconnection until the limit of the interconnection is reached:
    - Same price at both sides: the limit of the interconnection is not reached
    - Two price areas: the limit of the interconnection is reached and the market is "split"



# Current status of day-markets integration

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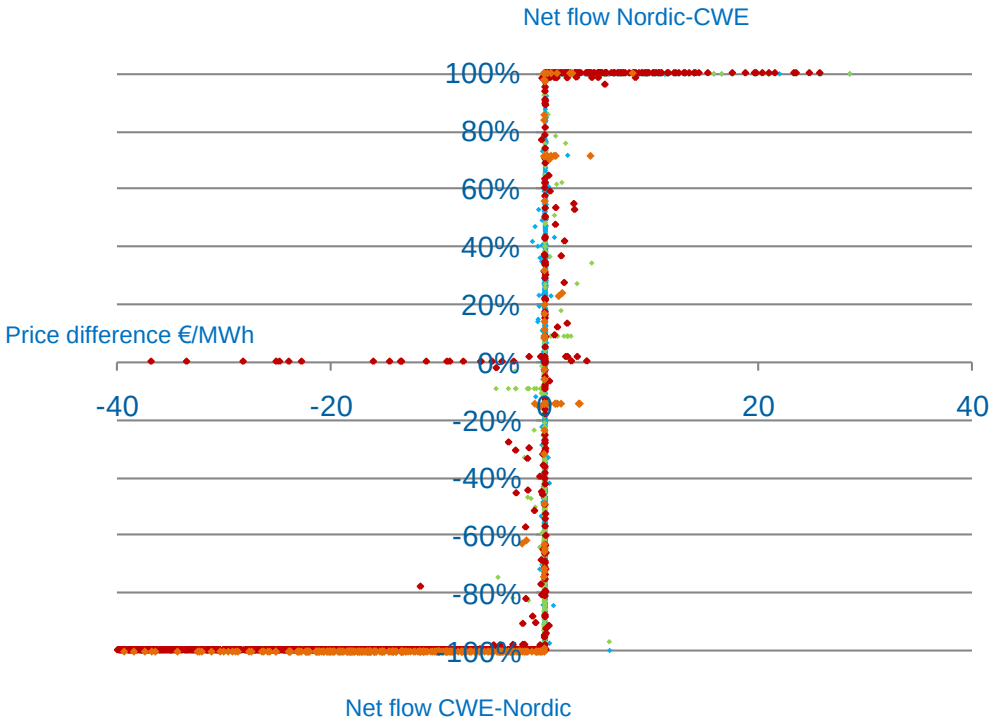
# Progress through active TSO/PX cooperation

## Case: North-West Europe




Source: EMCC

- 9 Nov. 2010: Simultaneous start of price coupling in CWE and interim tight volume coupling (ITVC) between CWE and Nordic regions
- 12 Jan 2011: NorNed joined
- Robust results with 96% correct flows (till end-January)

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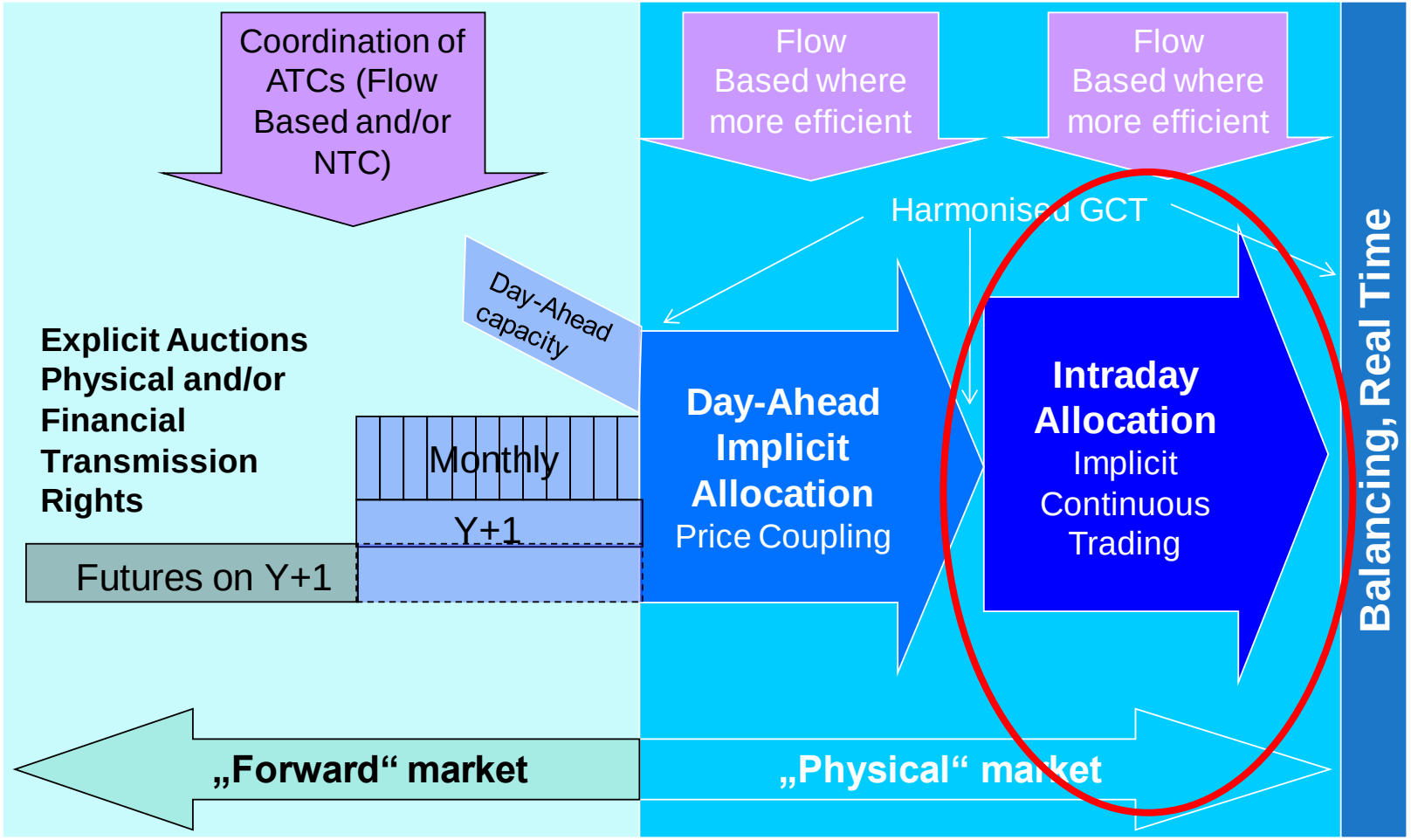
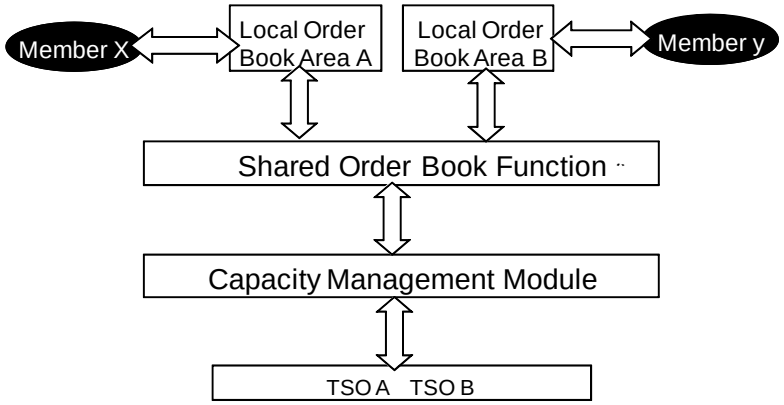
# Intraday Market - Target Model



# Intraday Market Target Model




**European intraday target model for Inter-Regional cross-border intraday (XBID) capacity allocation and energy trading based on implicit continuous allocation (continuous trading) (*)**

- **Market parties shall have continuously real time information on:**
  1. All bids of participating local order book ID platforms filtered using available XB capacity.
  2. Updated available trading capacities between all price/delivery areas.
- **The relationship between SOB function and CMM will be one-to-one.**

**(*) Where appropriate, specific National/Regional ID trading solutions may be developed**

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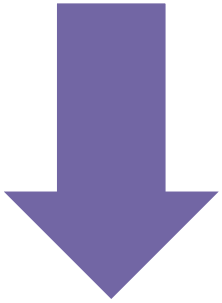
# From regional to pan-European markets

- **The 3rd package creates a coherent framework to move from regional to pan-European markets, involving:**

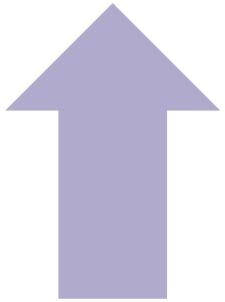
  1. **A Target Model for market integration**
  2. **Binding Network codes**
  3. **Clear governance guidelines that support the codes**
  4. **Regional co-ordination, led by TSOs and NRAs, which drives the process "bottom-up"**

- **Together, they create the momentum necessary to move towards a single market.**



**A clear target model and binding network codes provide top-down impetus.**

**Coordination between TSOs & regulators at regional level provide bottom-up focus.**



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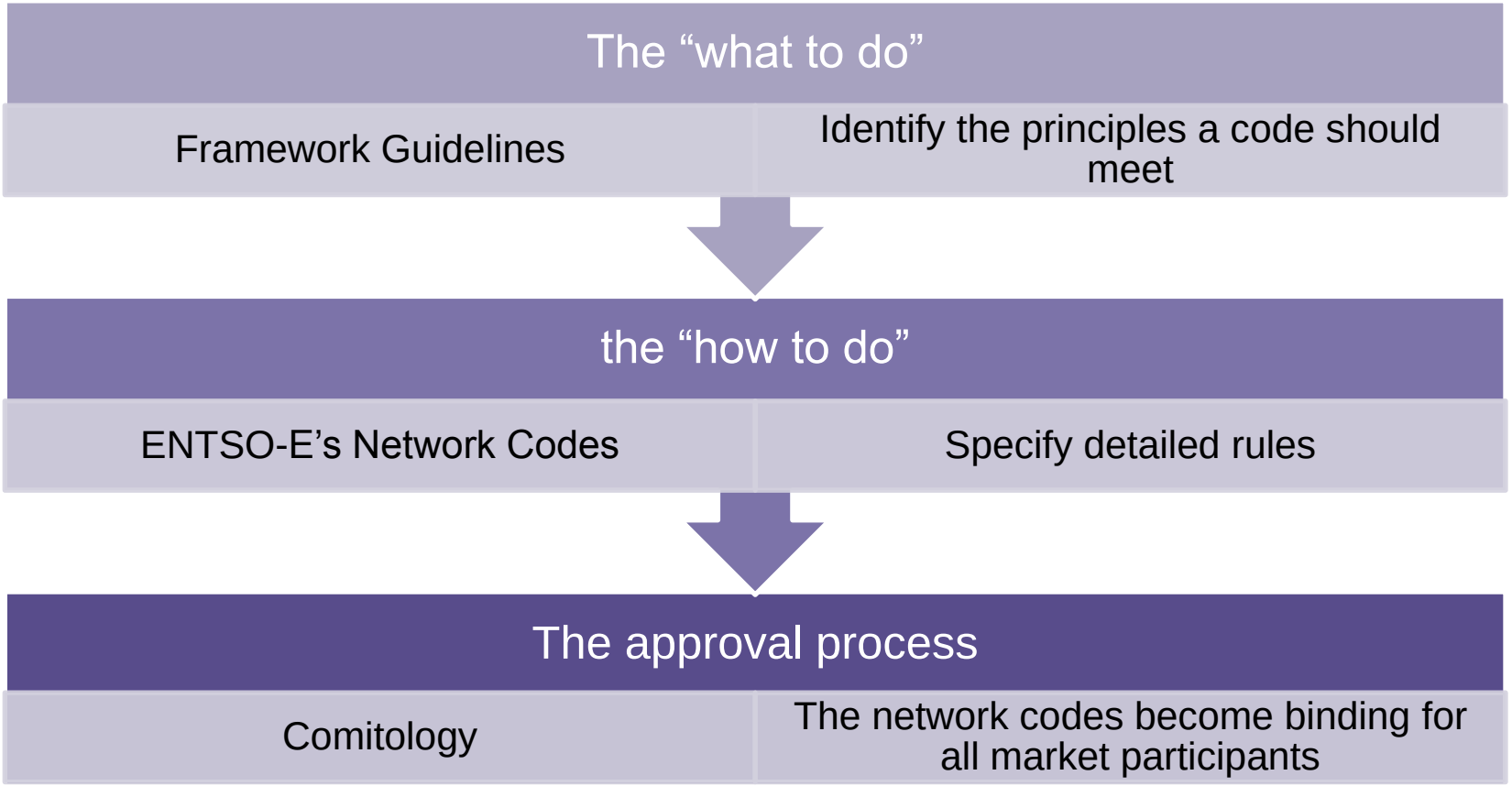
# Key parts of the network code process



# Conclusions

- **SoS and RES development taken by EU policy call for:**
  - **Massive development of transmission grids, both between and within countries**
  - **Further integration of the European markets through the implementation of the target model**
- **ENTSO-E's first Ten-Year Network Development Plan has been a timely initiative that has enabled the policy debate**
  - **Permitting and public acceptance are key issues ; without radical changes policy objectives will not be met**
  - **A huge financial effort requires new financing tools and regulatory stability**
- **Network codes are the vehicle for the creation of a single electricity market in Europe**

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**Thank you for your attention !**

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