



Eirgrid Annual Conference

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Pan European Challenges in Electricity A TSO perspective

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entsoe





Outline

- European Energy Policy and the 3rd Legislative Package
- ENTSO-E: Main drivers for setup
- General TSO challenges, current and future work
- Focus on the 10 Year Network Development Plan
- Focus on the Off-shore Wind Energy Development



European Energy Policy and the 3rd Legislative Package

- Build on three core objectives
 - Sustainability
 - Competitiveness
 - Security of Supply
- 3rd IEM Package
 - Improve conditions for competitiveness and market integration
 - Reinforced Pan-European Regulation: ACER
 - Reinforced Pan-European TSO cooperation: ENTSO-E



TSO challenges in line with European 2020 targets and 3rd Energy package

- Support the Internal Electricity Market in Europe
- Encourage the market penetration of renewable energies
- Maintain security of supply
 - Generation adequacy
 - Long-term

ENTSO-E structure designed to respond to these challenges

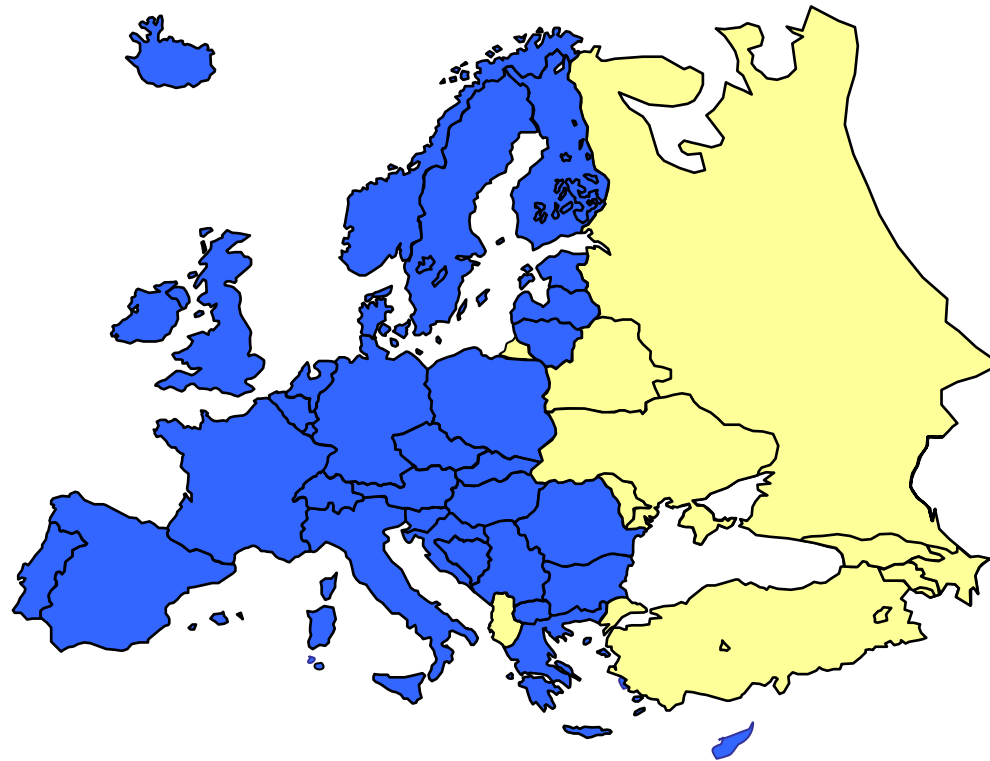


ENTSO-E tasks

- **Amended Regulation on conditions for access to the network for cross-border exchanges in electricity**
- *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, including a European generation adequacy outlook, every two years*
 - *Work programme, annual report, summer/winter outlooks, monitoring*

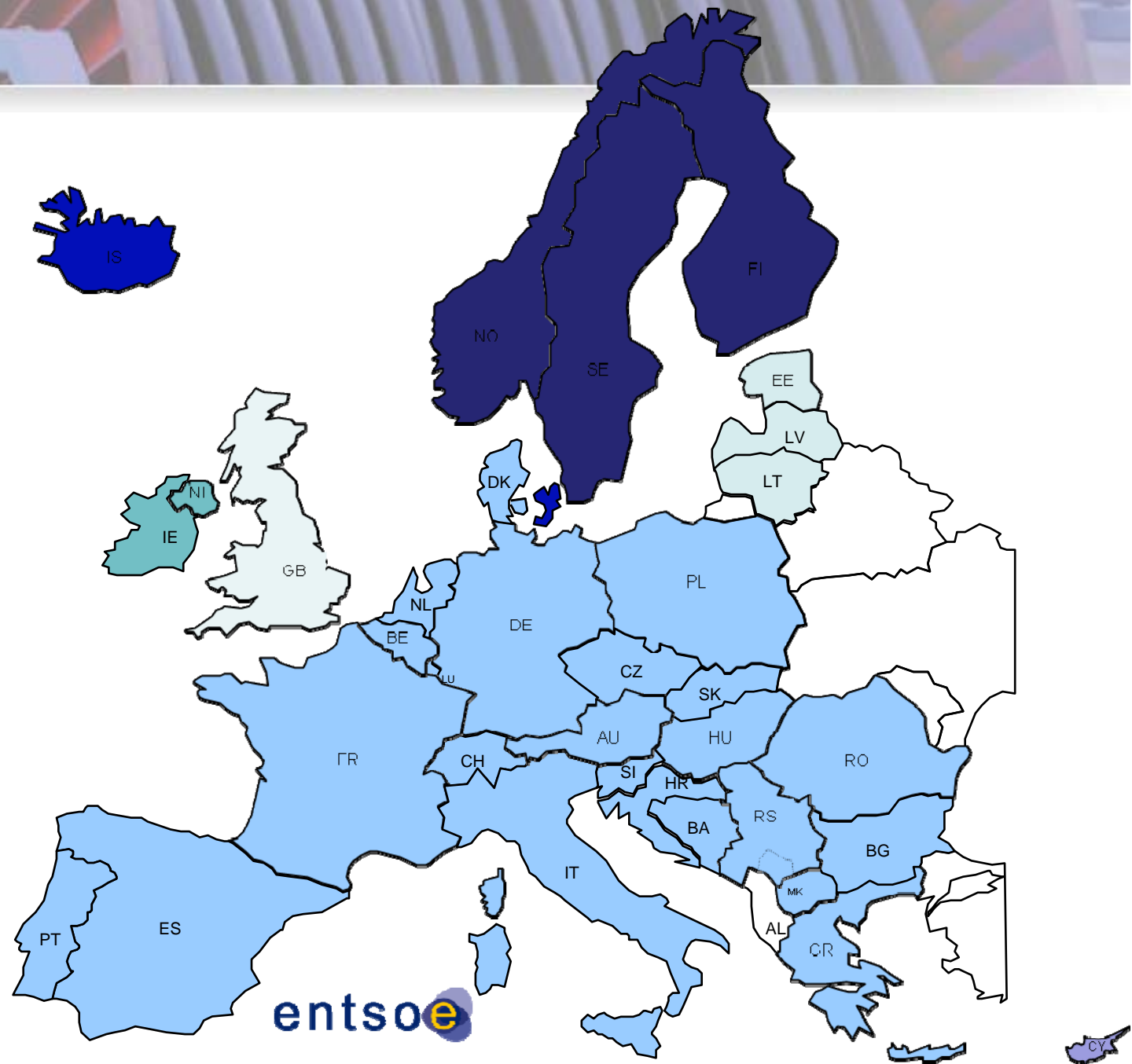
ENTSO-E : 1 July 2009, ahead of the Legislation...

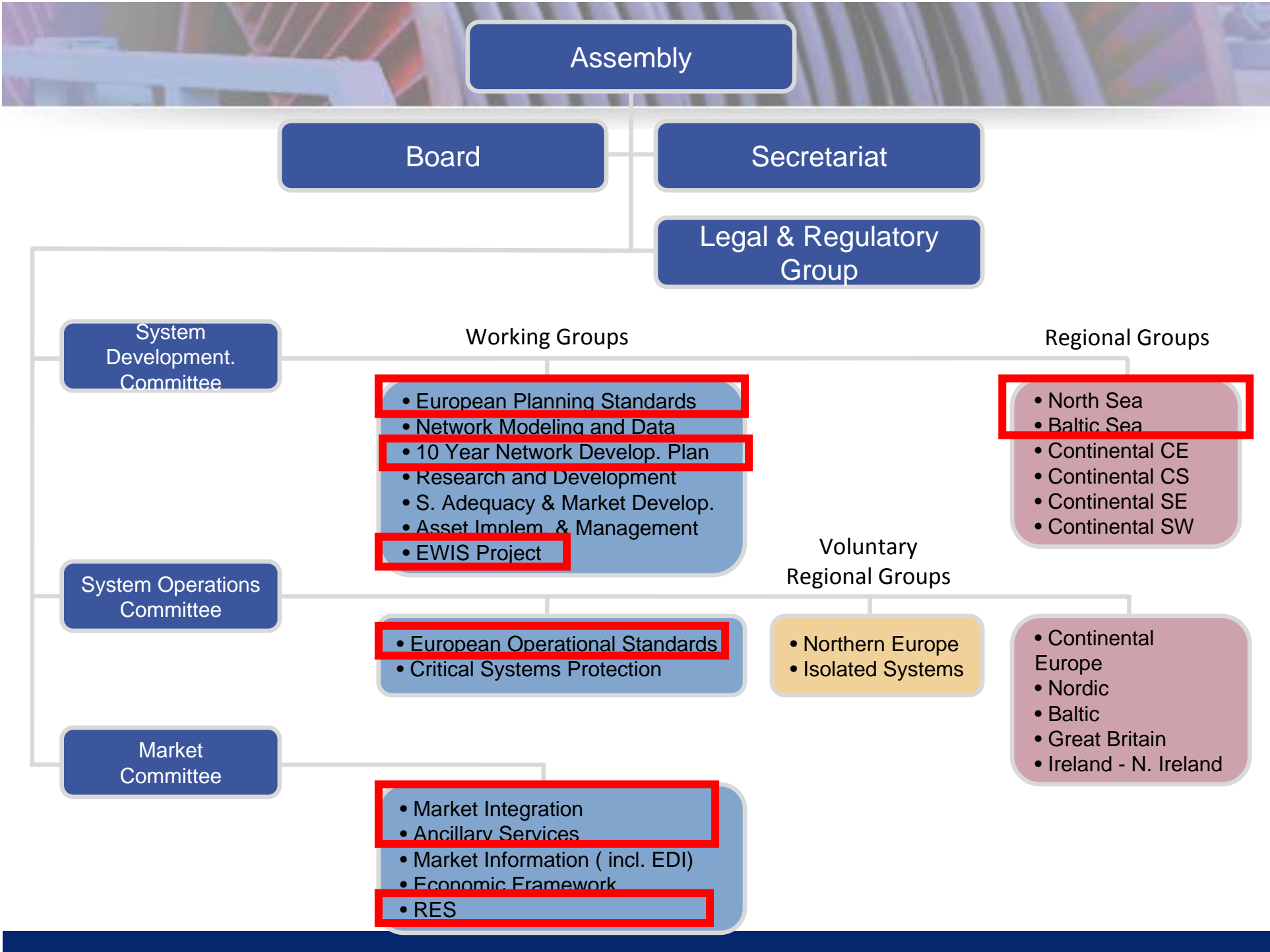
- Represents 42 TSOs from 34 countries, responsible for bulk transmission of electric power on main high voltage electricity networks
 - ~500 million citizens served
 - 650 GW generation
 - 230.000 km V-HV lines
 - 1.500.000 km MV-LV lines
 - Demand: 3.000 TWh/year
 - Exchanges: 300 TWh/year
 - Investments by 2030 for T&D: ~500G€
- Replaces former TSO organisations: ATSOI, BALTSO, ETSO, NORDEL, UCTE, UKTSOA



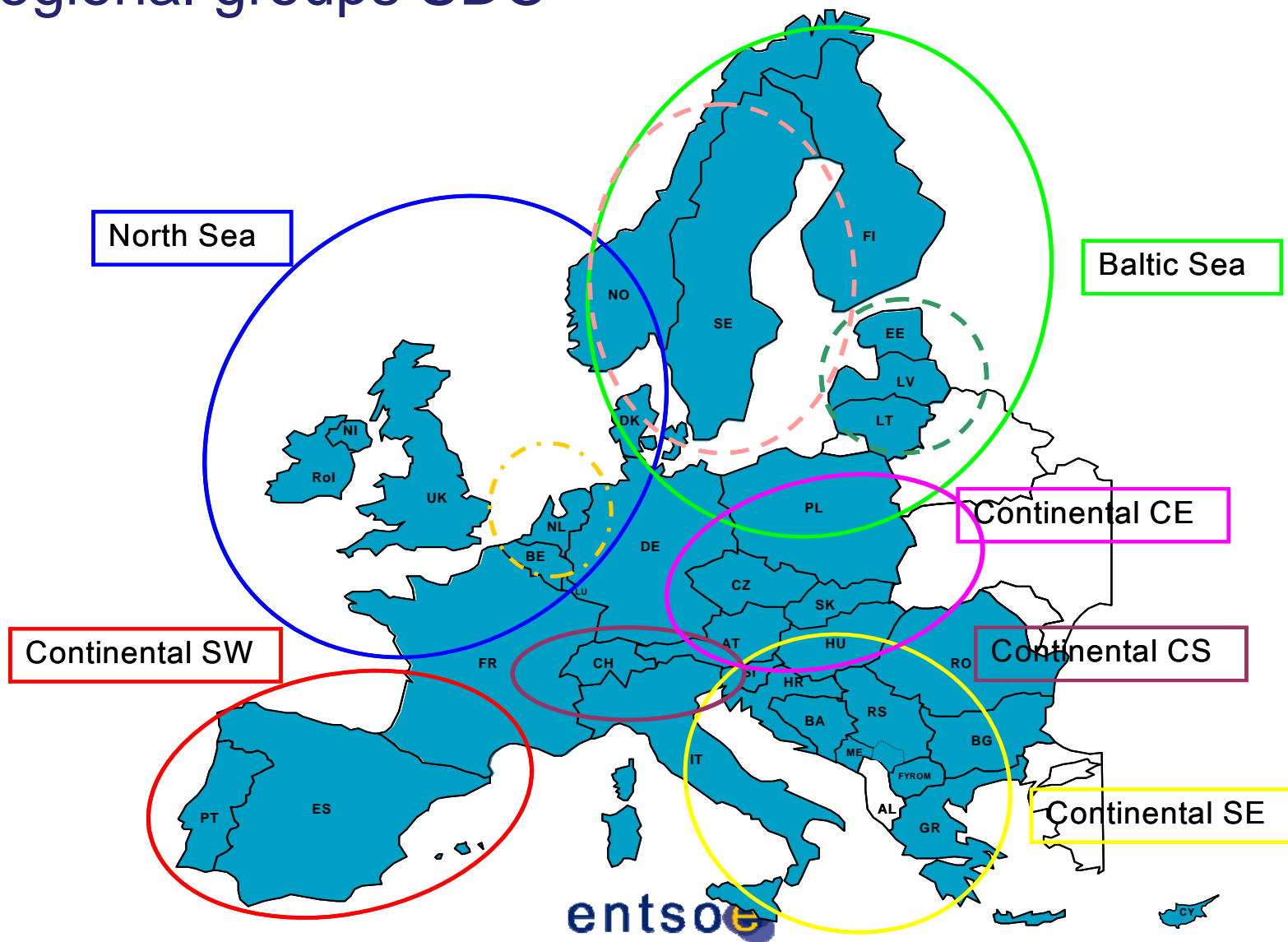
ENTSO-E

42 members,
34 countries,
8 regional
markets,
5 synchronous
regions





Regional groups SDC





Focus on the 10 Year Network Development Plan





The TYNDP in the Regulation

- A non-binding plan, updated every 2 years
 - Regulators to check consistency with National DP
- A vision for the future European HV grid
 - “Derived from reasonable needs of system users”
 - A generation adequacy outlook (5/15 years)
 - A modelling of integrated networks
 - Assessment of most probable power flow patterns, investment gaps and investment projects
 - A review of barriers to increase capacities



Strong stakeholders' expectations: the TNDP shall...

- “Present a clear development framework”
 - “Show how much capacity is needed and when”
 - “Develop numerous background scenarios”
 - “Derive power flows patterns from market studies”
 - “10yNDP all encompassing”
 - “Open the eyes of decision makers”
 - “Show that political decisions have their cost”
 - “Detail the methodology”
 - “Specify the criteria”
 - “Involve stakeholders in the process”
 - ...
- “All applications for new grid connection”
 - “cost effective”
 - “Confidentiality”
 - “Merchant lines”
 - ...



Contents

- Challenges for grid development
- **Background scenarios**
 - Generation Adequacy, market analysis
- **Grid bottlenecks & weaknesses**
 - Transmission adequacy
- Planned **transmission projects**
 - Illustration of economic analyses & criteria, resilience
- Technologies for the future
- Conclusion, **toward next releases**
- Appendices

Uncertainties, even
in the short-run

Criteria depend on
local regulation



The first issue

- Based on existing material
 - Stakeholders statements in 2009
 - Review of TSOs practices, projects, ...
 - Definition of scenarios despite 2020 survey still ongoing
- A **first** attempt for the content organisation
- But a first **comprehensive** report
 - Highlighting scenario description, investments overview, technologies & barriers ... and leads for improvements
- = a **Pilot Project**, basis for further debates



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Focus on off-shore wind energy development





ENTSO-E Main points about off shore dev.

- **System Development:**
 - Onshore grid and offshore grid development have to be coordinated in time, design and adequacy of power and transmission needs
 - Overall system security has to be ensured
 - Clarity of siting and timing of wind power plants is an essential prerequisite
- **Market:**
 - Clear agreements on trading and balancing facilities are necessary
 - national targets/ European trade
 - Regulatory compatibility/clarity needed concerning:
 - RE subsidies allowing efficient use of capacity
 - Concept of prioritised grid access for sustainable generation



Further points..

- **Technology:**
 - Technical feasibility of multiterminal HVDC technology and capacity is not proven today
 - Power control & protection schemes, DC breaker have to be developed
 - No efficient grid without standardisation
- **Regulation:**
 - Interconnectors' national regulatory framework are not compatible
 - responsibilities to build, own, operate, maintain offshore grid differ
 - Allocation of costs varies under current national regulatory frameworks
 - Proactive development on an uncertain future => risks of stranded costs ?
- **Finance**
 - Incentive mechanisms for TSO to build the offshore grid ?
 - What is the business case ?
- **Supply Chain**
 - Manufacturers need plans (TYNDP) to invest in manufacturing facilities



ENTSO-E contributions

- ENTSO-E organisation allows to contribute to above issues
 - ENTSO-E internally coordinates TSO activities to
 - Develop regional and pan-european vision of grid development
 - Analyse adjustments of current market rules and regulation to apply to offshore
 - Contribute to technical and market investigations through R&D projects
 - Contribute to standardisation (through network codes and plans delivery)
- ENTSO-E will investigate the benefits and risks related to offshore grids



ENTSO-E first actions & products

- TYNDP & System Adequacy Reviews imply to develop a 20-20-20 scenario based on
 - consistent scenarios for generation (**timing and siting**) to be developed and agreed by stakeholders before grid planning
 - **political input** needed to choose the appropriate scenario, **political support** needed (national authorities)
- EWIS : the starting point and overall basis for further investigations of wind integration
- Work on pilot network code on (wind) generation connection conditions will reveal the diversity of policies for RES support and the various ways to better steer a sustainable wind development (**key importance of the Framework Guidelines due by regulators**)



CONCLUSIONS

- ENTSO-E supports the idea of developing offshore grids;
- The ENTSO-E TYNDP will look at wind generation scenarios (especially via input of the North Sea and Baltic Sea Regional Groups)
- But consistent generation and exchange scenarios have to be built and first agreed by stakeholders



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