

Pan-European Grid Development: Long-Term System Needs and Cross-Border Flexibility

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Introduction

In a fast-changing geopolitical environment, our coordinated power system is the backbone of the Internal Energy Market.



Introduction to ENTSO-E

500.000 km of transmission lines

520 million citizens

- ENTSO-E, established in **2009**, represents **40 TSOs from 36 countries**
- Represents TSOs at the European level.
- Helps TSOs implement and monitor common rules and EU legislation.
- Enhances cooperation among members



Security of **power system**



Optimal functioning and development of **electricity markets**



Climate-neutrality by 2050



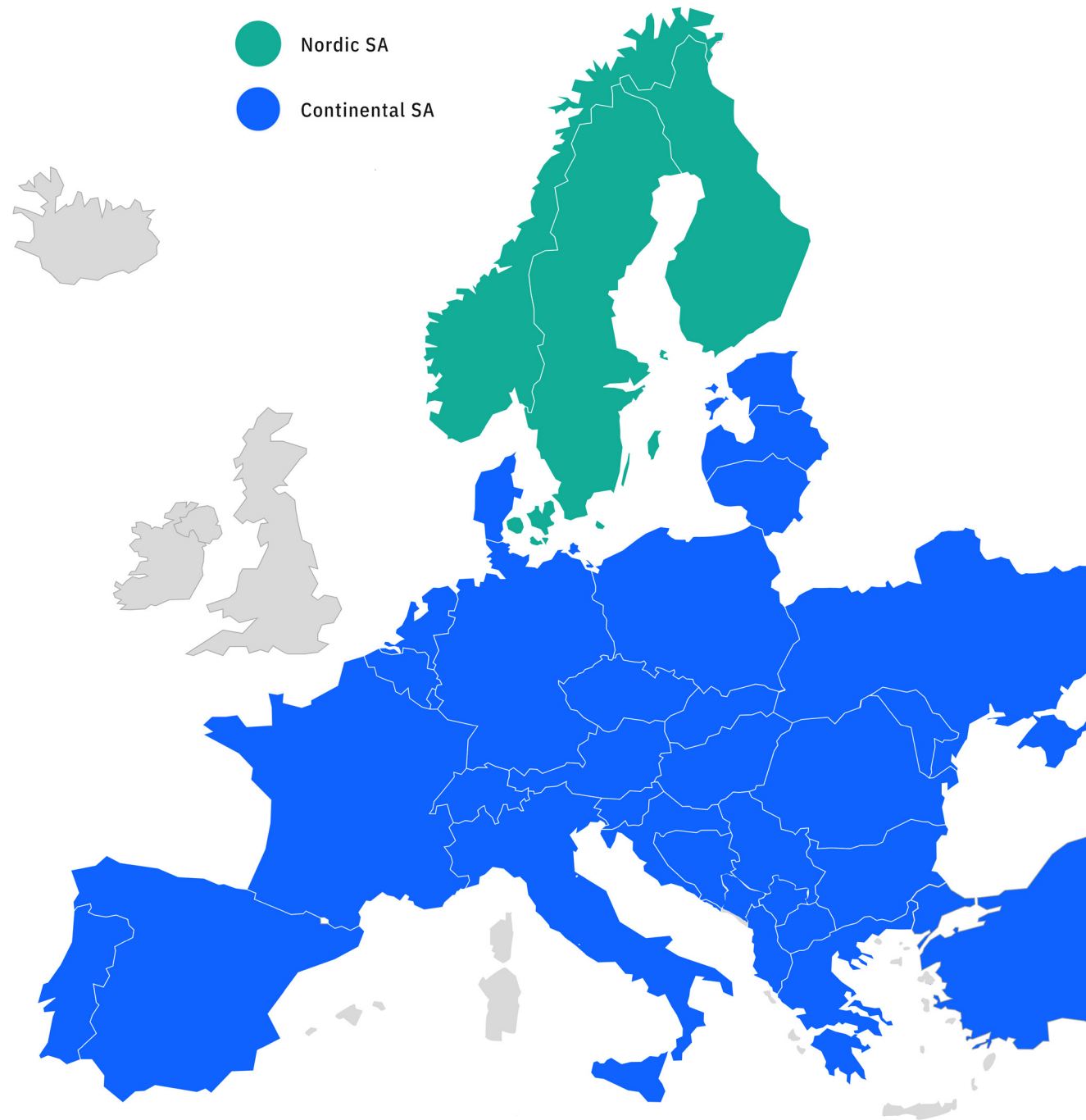
A Pan-European grid system

Critical Issue:

How do we build Pan-European grid development fast enough to secure our future?



- Security
- Competitiveness
- Fairness



Bottlenecks That Threaten the Transition

88% Of TSOs face labour shortage

Target by 2030:

150,000 Km Lines

14,000 Breakers

1,900 Transformers

Supply Chain & Workforce



Financing



- ✗ CAPEX needs tripled
- ✗ CEF (*Connecting Europe Facility*) budget too small

WHAT'S BLOCKING DELIVERY?

+50% Of projects for 2030 still awaiting permits

Permitting



Planning Gaps



- ✗ Misaligned NECPs (*National Energy and Climate Plans*)
- ✗ Slow scenario approval

Operating a System of Systems

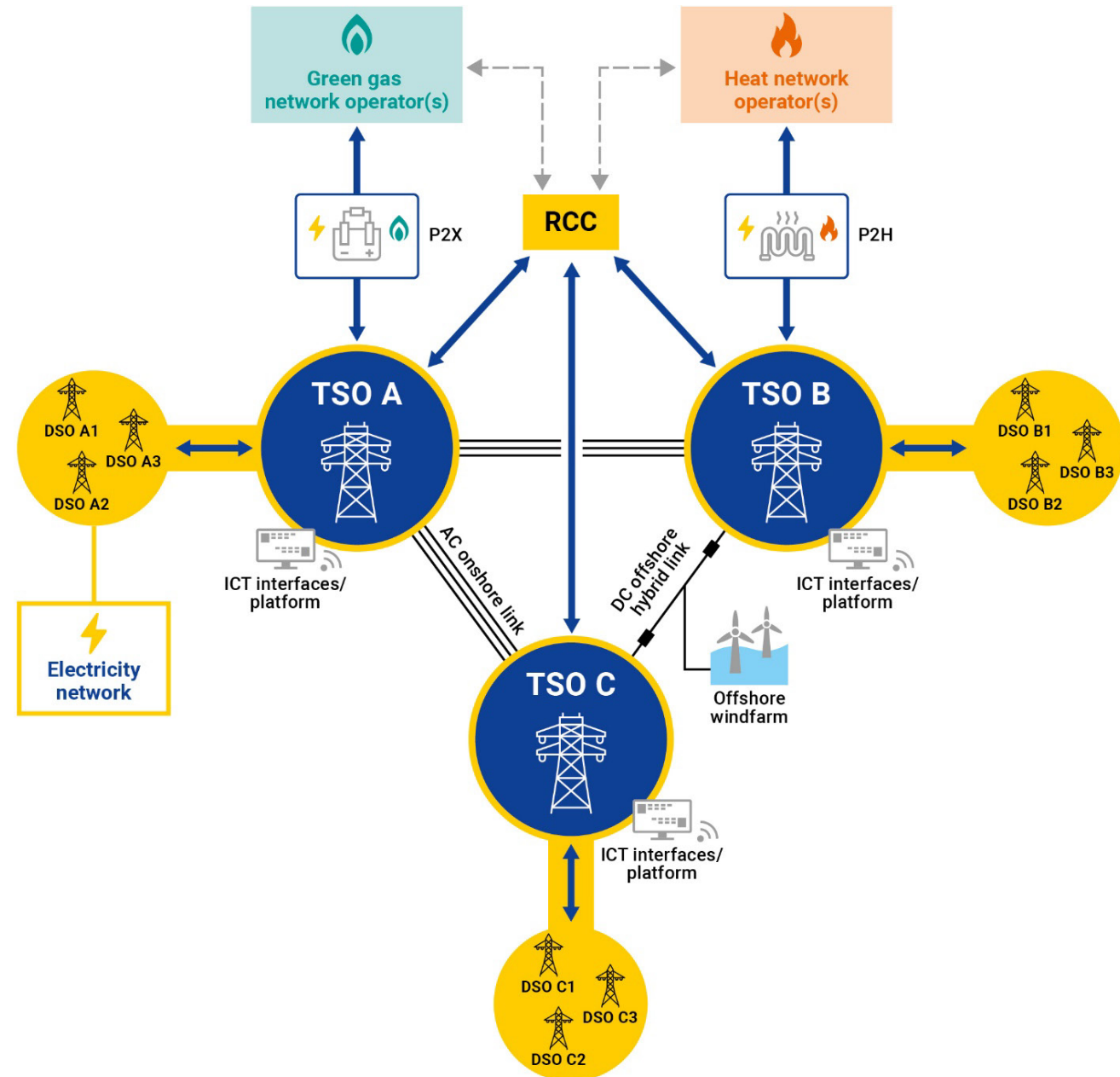
The future power system will be much more **complex** than today, with growing weather dependency, sector integration and large-scale flexibilities. It will need new approaches to **operate** it safely and efficiently.



- Electrification driven by system efficiency
- Optimal integration of all energy sectors
- Coordination of infrastructure planning
- Cooperation with institutions and stakeholders



- Aligning planning across the energy value chain
- Ensuring efficient energy flows and integrated markets
- EU's Grid Action Plan and DESAP



Priorities for Grid Development



1. Streamline Planning & Strengthen Regional Coordination



3. Facilitate Investments in Grid Infrastructure



5. Flexibility



2. Accelerate Permitting



4. Strengthen Supply Chains & Workforce

Streamline Planning & Strengthen Regional Coordination



Simplify and improve **TYNDP** and **PCI/PMI** processes.



Make scenario-building more efficient through better alignment and **harmonisation of NECPs**



Keep the current TYNDP framework, which is fit-for-purpose, but continue **targeted improvements**.



Enhance regional cooperation by refocusing **Regional Investment Plans** on:

- Technical analysis of infrastructure **gaps and solutions**.
- **Monitoring** progress of project implementation.



Accelerate Permitting



Apply existing EU laws: extend permitting exemptions to grid infrastructure connecting RES.



Simplify environmental law to make permitting procedures more effective and efficient.



Accelerate permitting by:

- Enforcing legal **deadlines**.
- Prioritising **grid-related litigation** in courts.
- Using **one-stop shops** for network permits (where effective at Member State level).



Facilitate Investments in Grid Infrastructure

Financing must be affordable



CEF ×5: stronger EU funding, dedicated envelopes for transmission.



EIB & NDB guarantees to de-risk and lower borrowing costs.



Stable, predictable regulation to mobilise private capital.



Voluntary CBCA: flexible, regional, not tied to CEF access.



Fair tariffs: transparent, cost-reflective, protect consumers.



Strengthen Supply Chains & Workforce



40% EU-made equipment by 2030 → reduce dependency



Simpler, flexible procurement rules → faster delivery



Careful HVDC standardisation → avoid bottlenecks



Net-Zero Academy for Grids → train the next generation workforce



Increase Flexibility



National flexibility assessments



Consumers and industry as active system participants



Holistic approach: fast-response and long-duration storage together with interconnectors



Digitalisation and Cybersecurity



Conclusion

Without grids, there is no transition.
Without grids, there is no secure and affordable Europe.

