Planning the energy transition – The European perspective

ENTSO-E's Ten-Year Network Development Plan (TYNDP)

entsoe

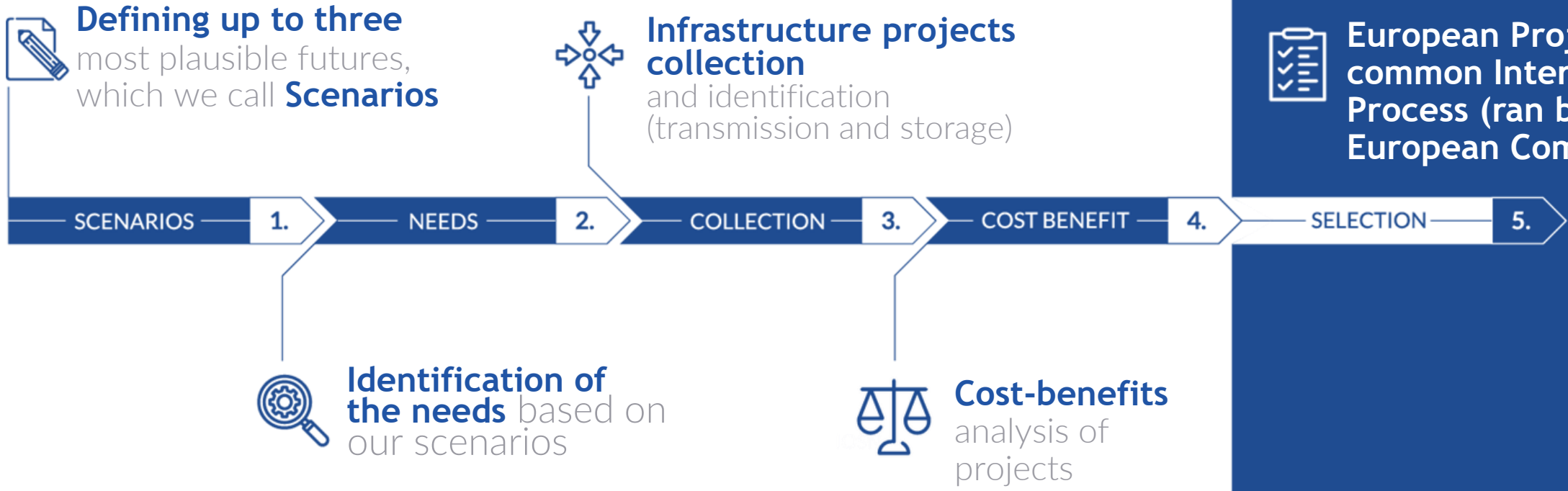
Reliable Sustainable Connected

What is the role of ENTSO-E?

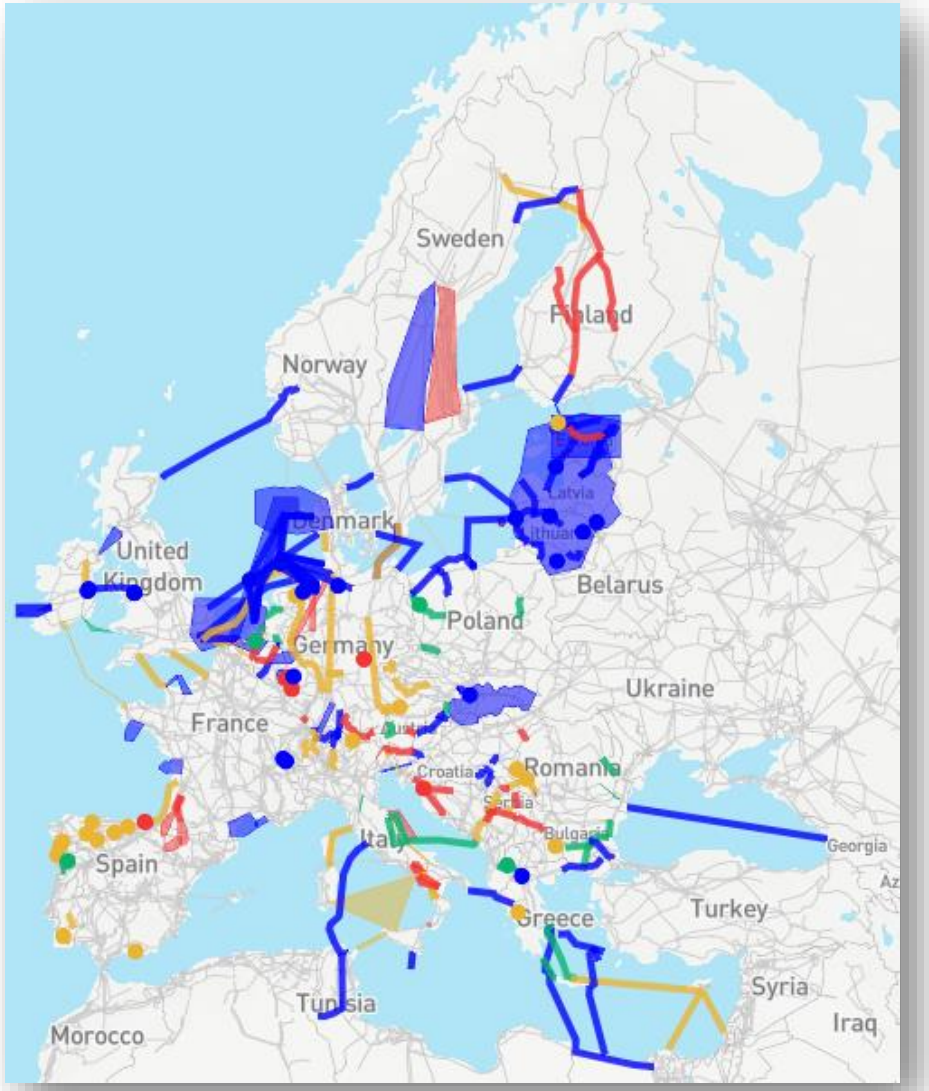
ENTSO-E fosters the cooperation among those who keep the lights on in Europe

- 39 Member TSOs in 35 countries serving 500 million citizens + 2 Observer Member
- ENTSO-E platform for cooperation on operations, markets, system development and innovation
- ENTSO-E is the common voice of TSOs in Europe

ENTSO-E's planning tool: The Ten-Year Network Development plan (TYNDP)



Pan-European Infrastructure projects until 2040



Projects assessed in TYNDP 2022

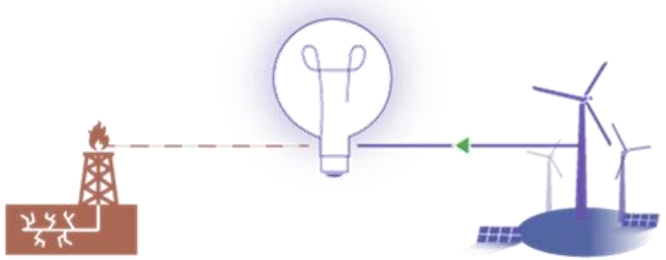
- TYNDP 2022 assessed 141 transmission projects, including 85 cross-border projects.
- 6 offshore hybrid projects (generation + transmission).
- 23 storage projects, including 15 Hydro Pumped Storage, 6 Compressed air and 2 electrochemical storage projects.

- Under construction
- In permitting
- Planned, but not yet permitting
- Under consideration

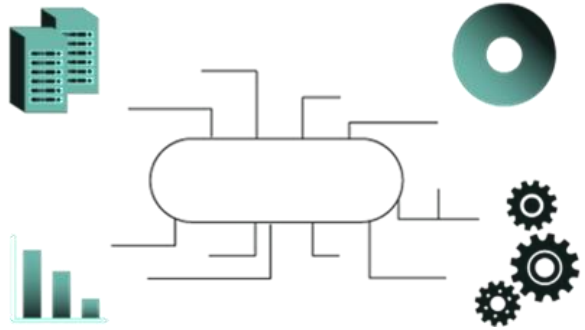
Three key messages from TYNDP

1. **Opportunities** for improving the power system exist **all over Europe**

2. Addressing system needs **reduces** Europe's **dependence** on gas-based power generation



3. **Coordinated planning** will be **needed** across sectors



Opportunities for increased cross-border transmission, storage and peaking capacity exist all over Europe

Needs for cross-border electricity transmission, storage and peaking capacity in Europe in 2040

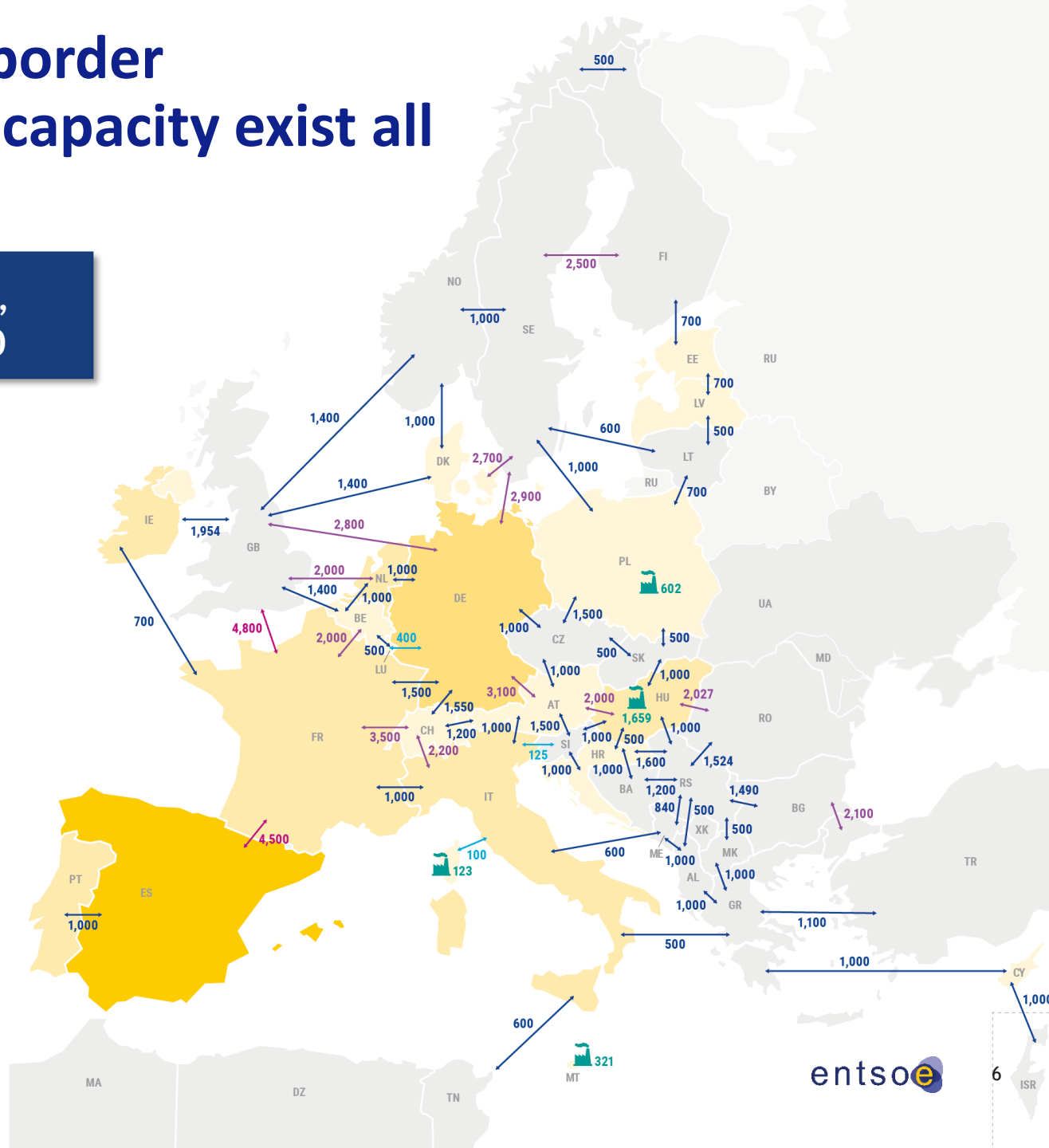
CROSS-BORDER CAPACITY INCREASES NEEDS IN MW (ADDITIONAL TO THE STARTING GRID 2025)

- < 500 MW
- 500 → 2,000 MW
- 2,000 → 4,000 MW
- > 4,000 MW

STORAGE NEEDS IN MW (ADDITIONAL TO BATTERY CAPACITIES IN NT2030 AND TO 2040 CAPACITIES FOR OTHER STORAGE TECHNOLOGIES)

- < 1,000 MW
- 1,000 → 5,000 MW
- 5,000 → 10,000 MW
- > 10,000 MW

CO_2-FREE PEAKING UNIT NEEDS PER COUNTRY IN MW



How addressing system needs benefits Europe

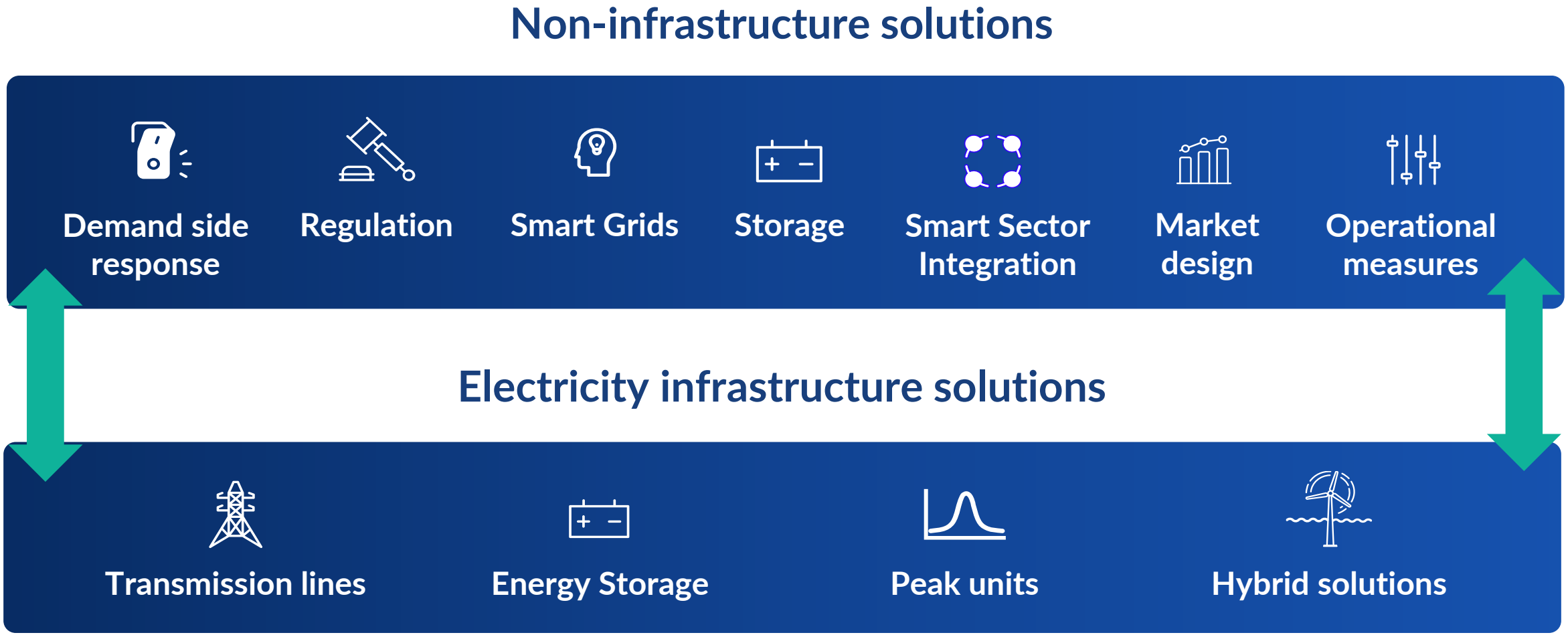
What would happen in 2040 if…
We stopped investing in the power system in 2025?

- EU Energy bill rising to **132 Billion euro per year**
- System **instability** and risk of **blackout**
- **78 TWh of renewable energy curtailed each year**
- **Dependence on gas with 366 TWh** of gas-based power generation per year
- **Grid not sufficient** → Leads to no decarbonisation

What would happen in 2040 if…
We addressed system needs?

- **Investing 6 Billion euro per year cuts generation costs by 9 Billion each year**
- **Ensuring stability** and security of electricity supply in Europe, with 1.6 TWh of avoided energy-not-served
- **Avoiding the curtailment of 42 TWh** of renewable energy each year
- Gas-based power generation is **reduced by 75TWh per year**
- **Grid welcoming the expected development of renewables** → CO2 emissions cut by 31Mton per year

Coordinated planning will be needed across sectors



Our values define who we are, what we stand for and how we behave.
We all play a part in bringing them to life.

EXCELLENCE

We deliver to the highest standardss. We provide an environment in which people can develop to their full potential.

TRUST

We trust each other, we are transparent and we empower people. We respect diversity.

INTEGRITY

We act in the interest of ENTSO-E

TEAM

We care about people. We work transversal and we support each other. We celebrate success.

FUTURE THINKING

We are a learning organisation. We explore new paths and solutions.

We are ENTSO-E