ORDEM DOS ENGENHEIROS

WORLD ENGINEERING DAY FOR SUSTAINABLE DEVELOPMENT

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In support of UNESCO
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Under the High Patronage of the President of the Portuguese Republic

O Presidente da República

Lisbon
March 4th 2024

The reinforcement of the energy interconnections and the optimization of energy markets in Europe

Marie-Line Vaiani

Engineering Solutions for a Sustainable World

Ordem dos Engenheiros

International Panel on Climate Change - Sixth Assessment Report

Lisbon
March 4th 2024
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The hope

Sixth Assessment Report | Synthesis Report

Mitigation and Adaptation Options across Systems

C.3 Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all. These system transitions involve a significant upscaling of a wide portfolio of mitigation and adaptation options. Feasible, effective, and low-cost options for mitigation and adaptation are already available, with differences across systems and regions. (*high confidence*) {4.1, 4.5, 4.6} (Figure SPM.7)

Finance, Technology and International Cooperation

C.7 Finance, technology and international cooperation are critical enablers for accelerated climate action. If climate goals are to be achieved, both adaptation and mitigation financing would need to increase many-fold. There is sufficient global capital to close the global investment gaps but there are barriers to redirect capital to climate action. Enhancing technology innovation systems is key to accelerate the widespread adoption of technologies and practices. Enhancing international cooperation is possible through multiple channels. (*high confidence*) {2.3, 4.8}

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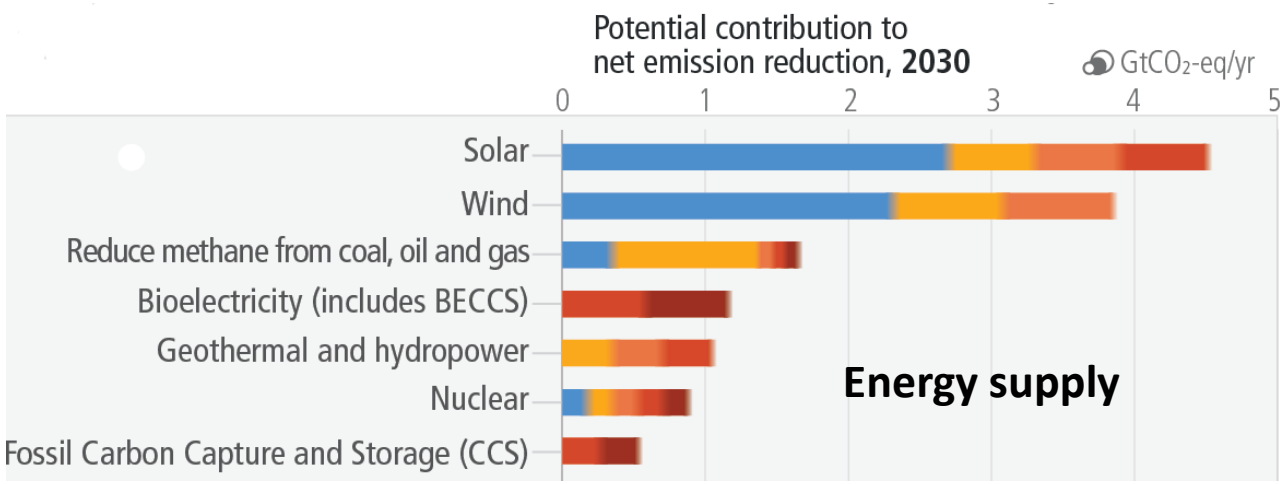
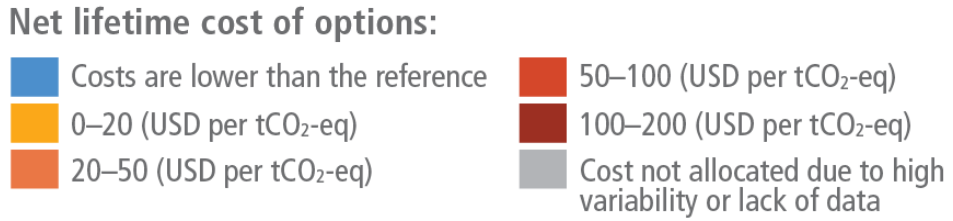
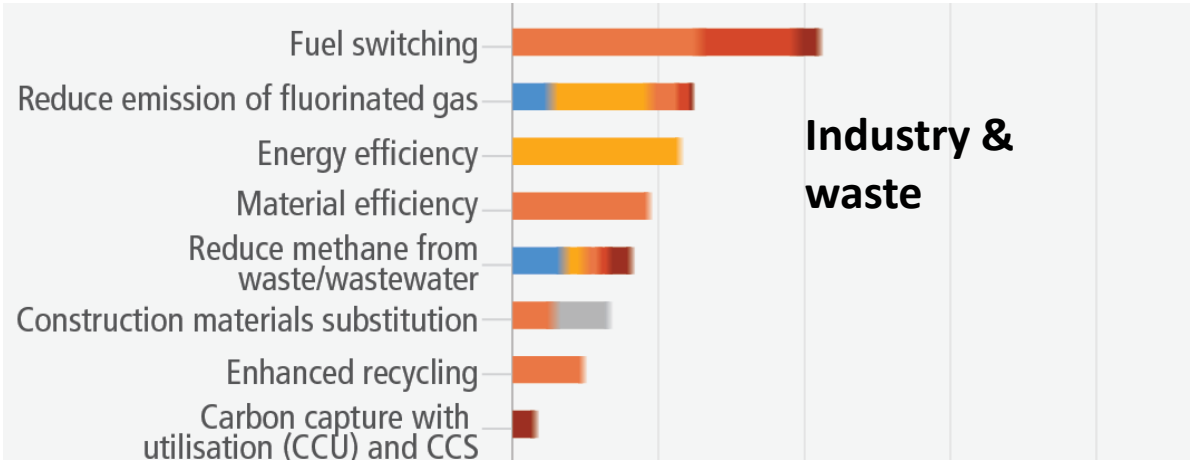
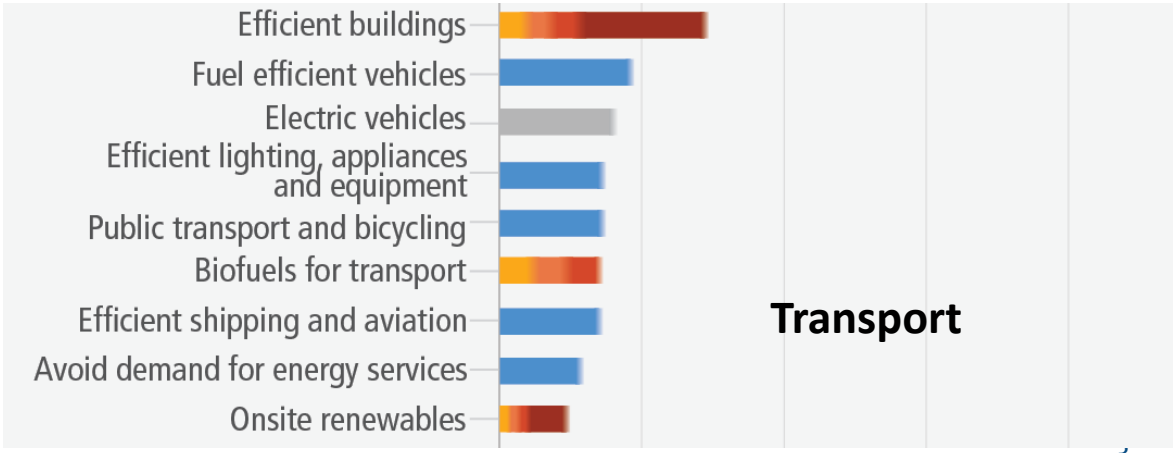




options costing 100 USD tCO_2-eq or less could reduce global emissions by at least half of the 2019 level by 2030





Energy Trilemma

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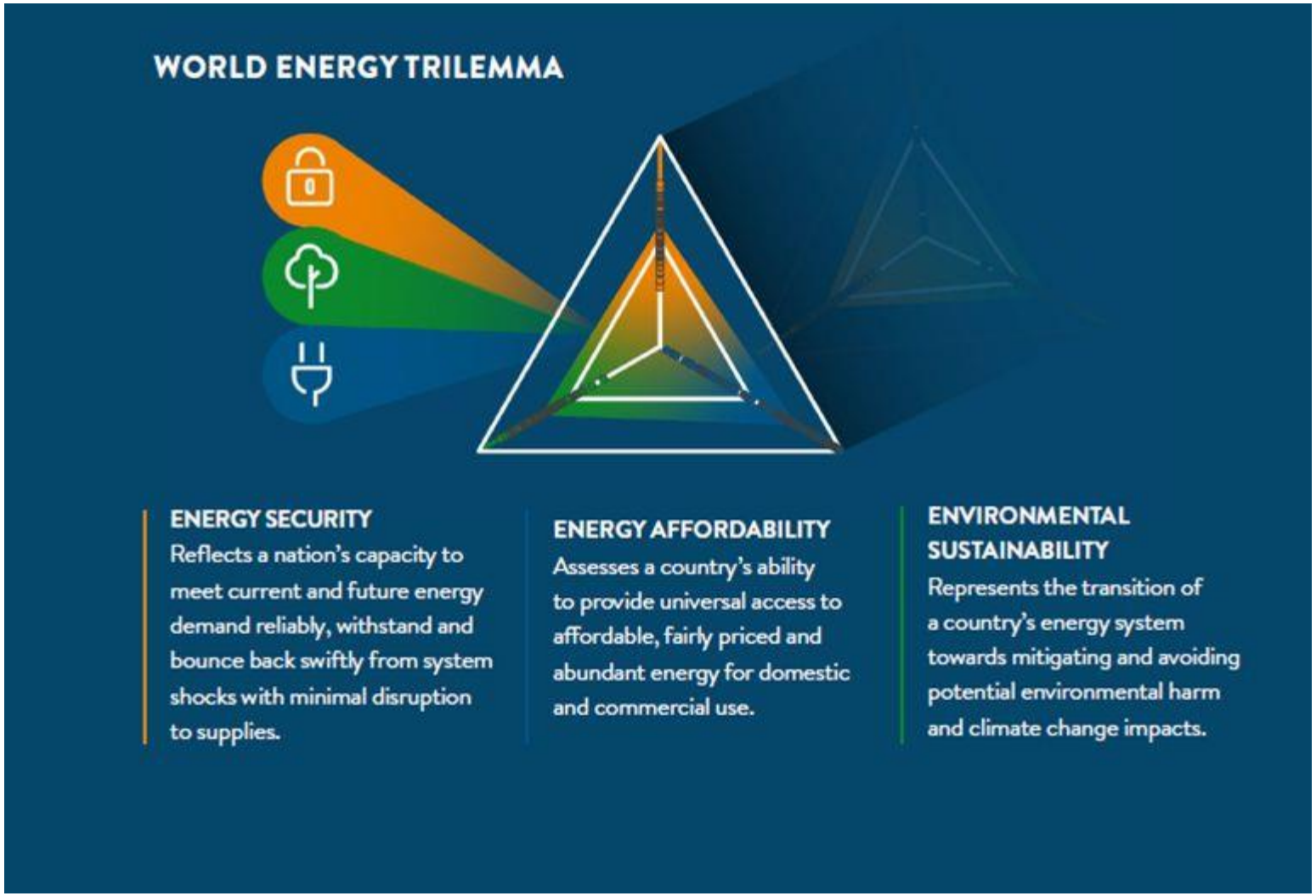
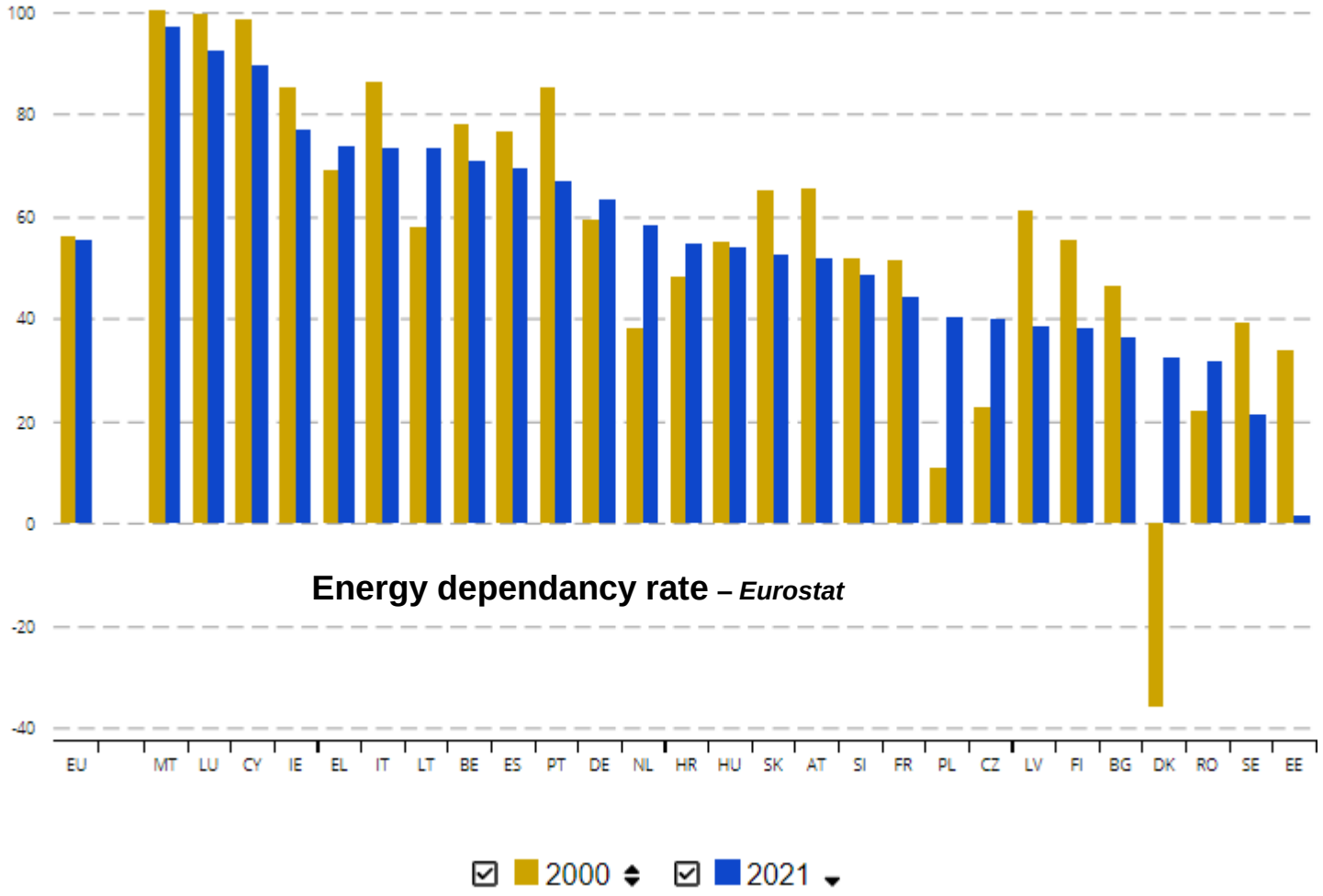


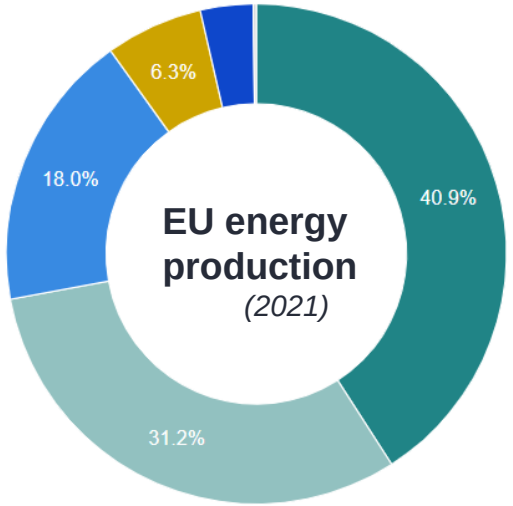
WORLD ENERGY COUNCIL

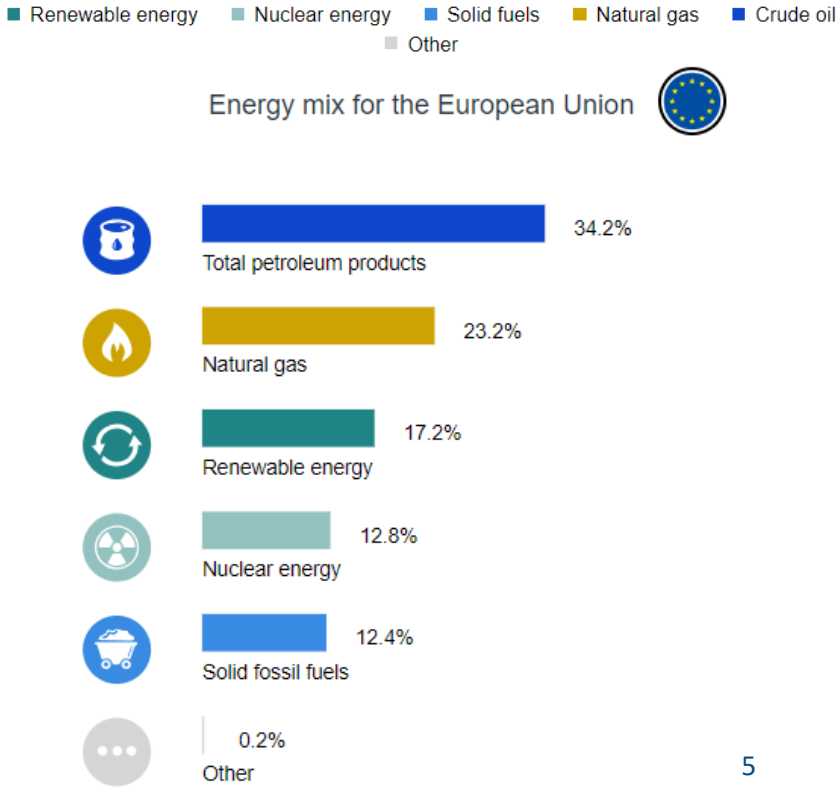
Europe : energy mix

In 2021, the EU produced around 44% of its own energy, while 56% was imported.



Energy dependancy rate – ***Eurostat***





Europe, a climate-neutral continent by 2050

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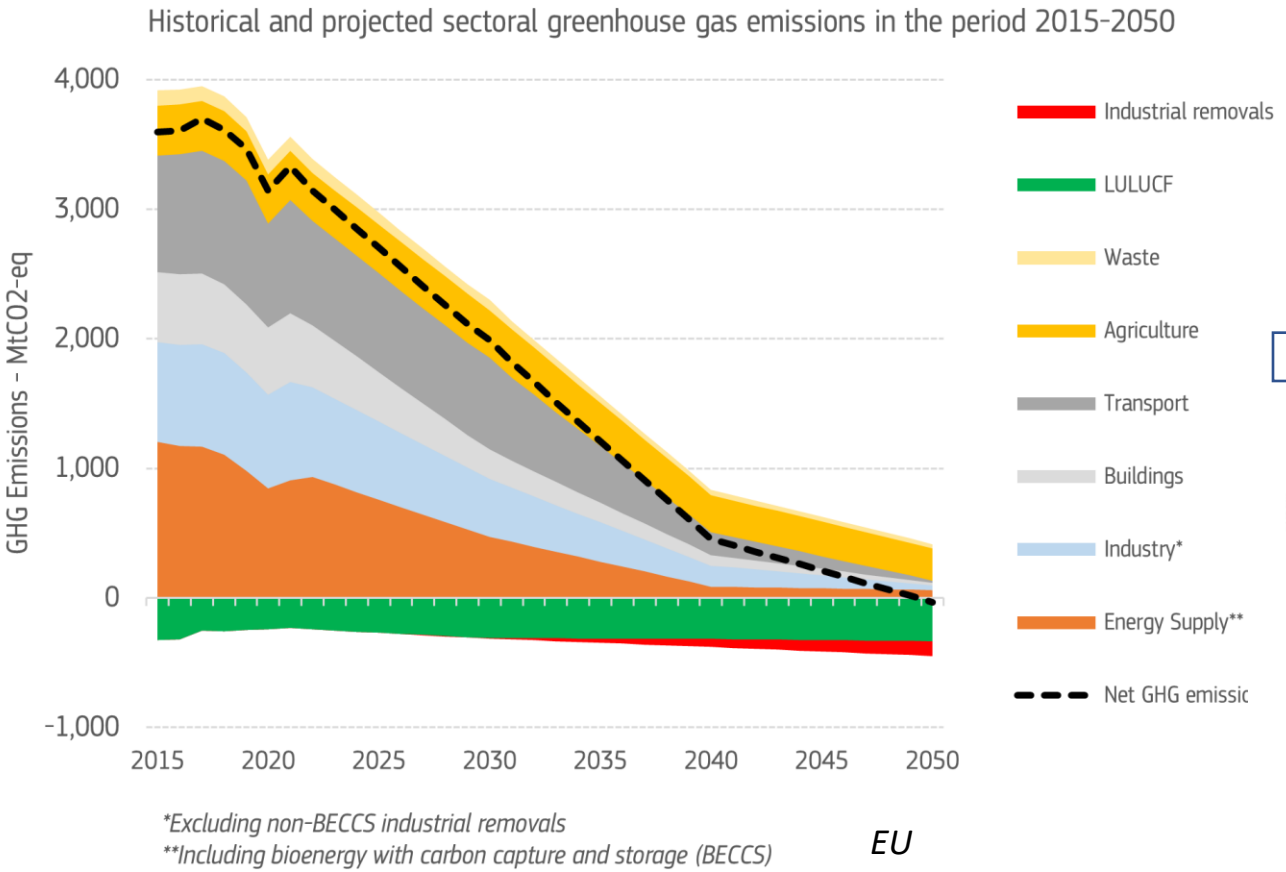
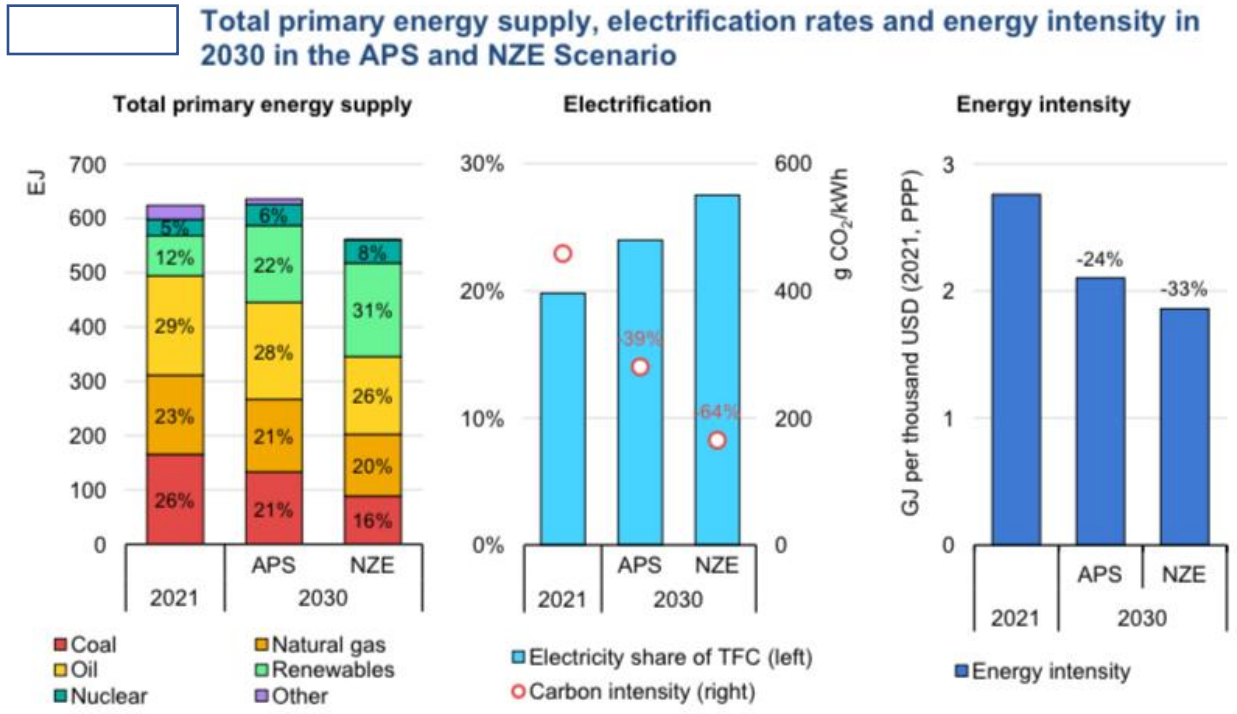


EU



IEA

European Electricity interconnections

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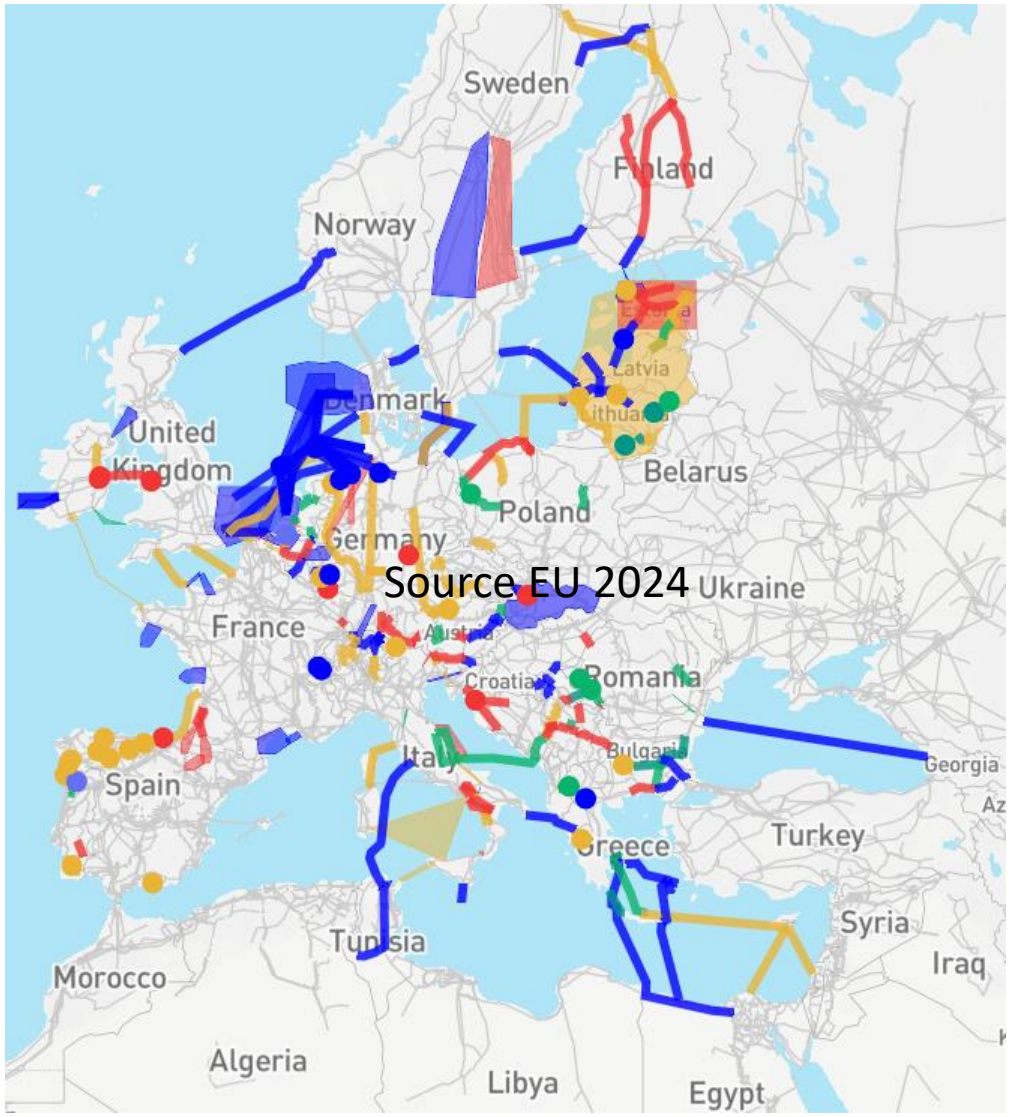
Interconnections are key for european electricity market(s)

- 305 000 km of power lines operating at the same frequency (50 Hz), more than 400 interconnections linking nearly 600 million European citizens

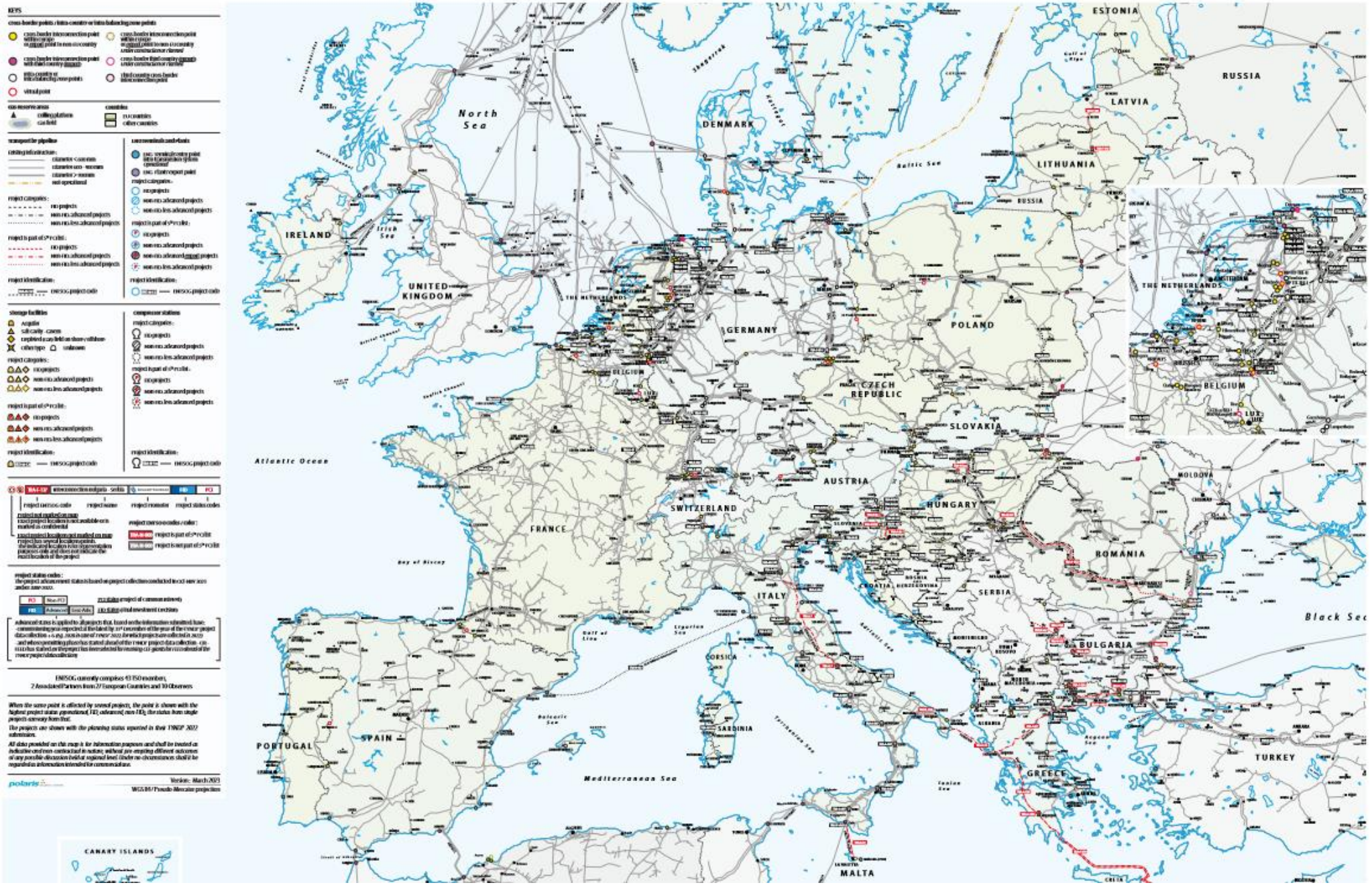
- Managed in real time by TSO, interdependence provides security of supply across the continent with each operator having access when needed to power-generation capacities located outside of its borders

Growing electrification, develpment of renewables, increasing flexibility challenges => development of electricty interconnections are a priority for Europe

141 projects in TYNDP 2022 of ENTSO-E



European gas interconnections



Projected CO2 infrastructures – 2030

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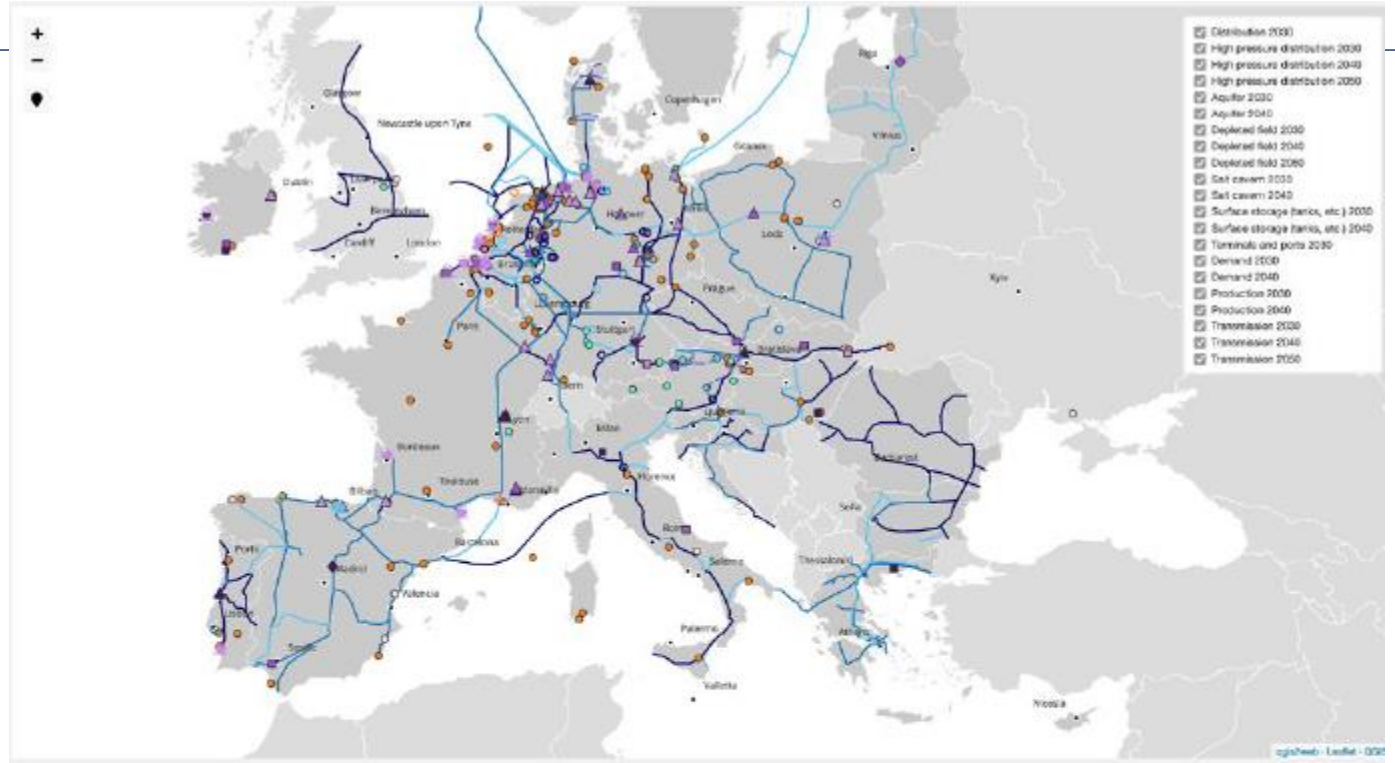
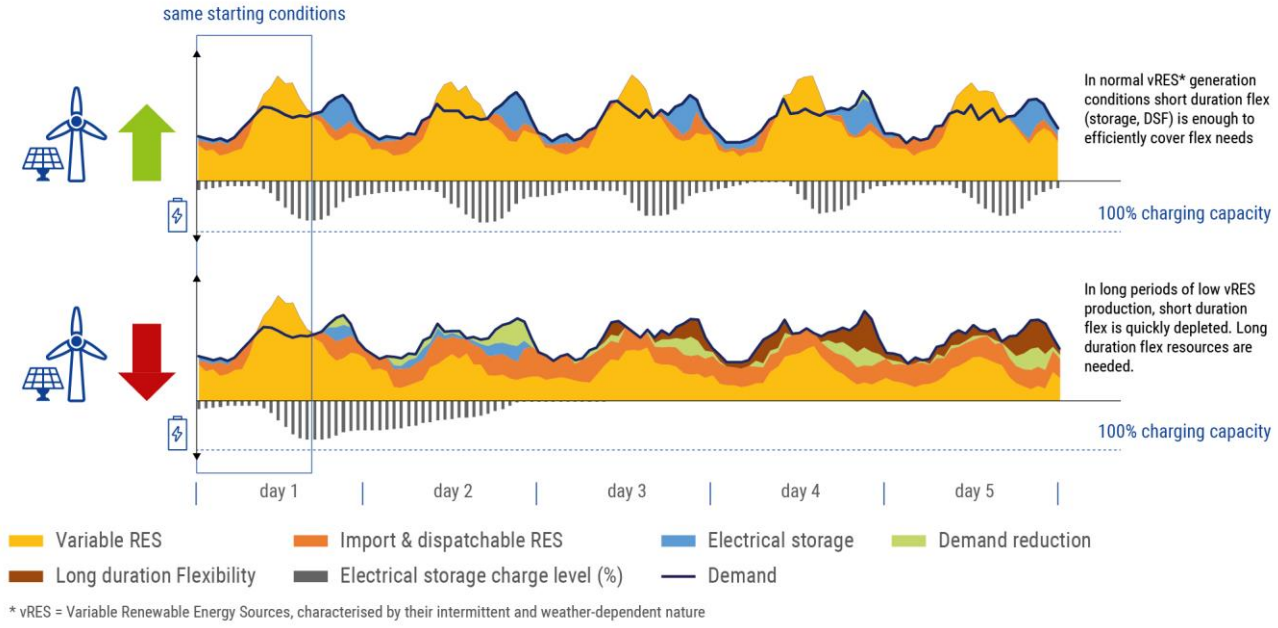
Source EU 2024

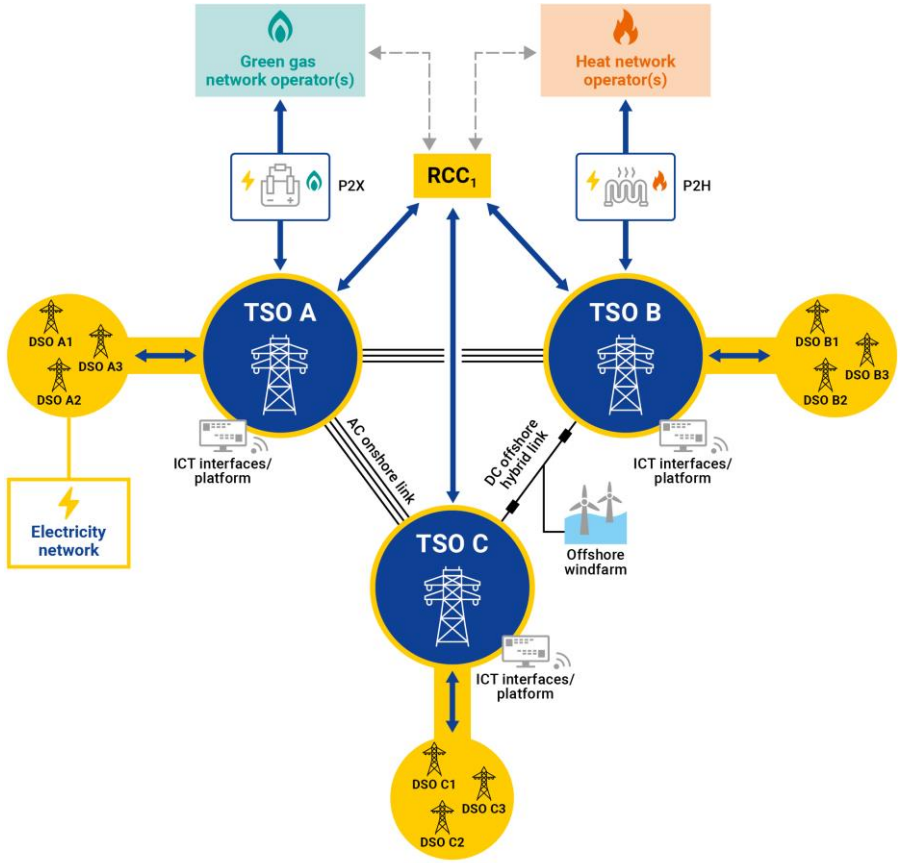
European H2 interconnection projects



Source European Clean Hydrogen Alliance

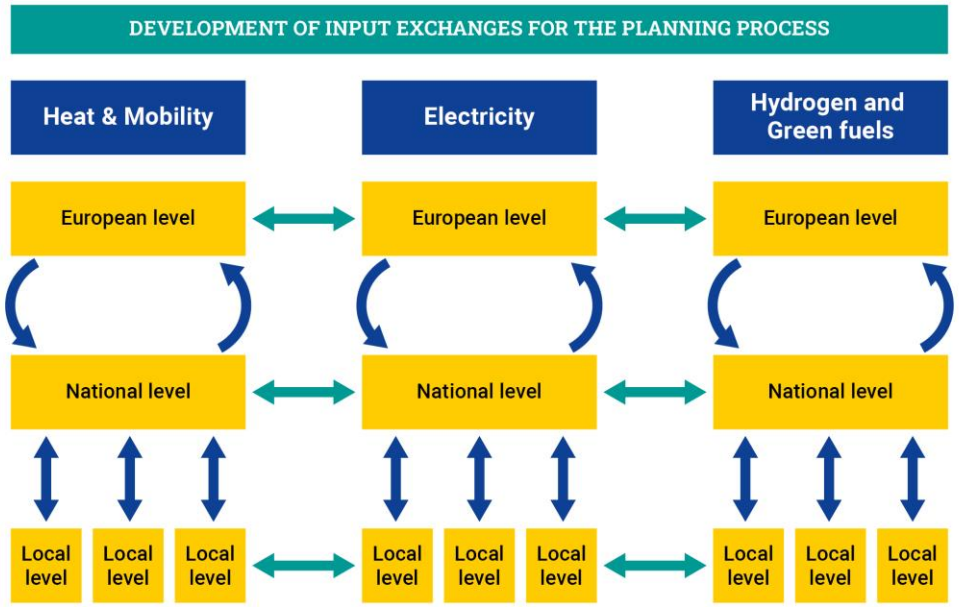
Energy interconnections : challenges

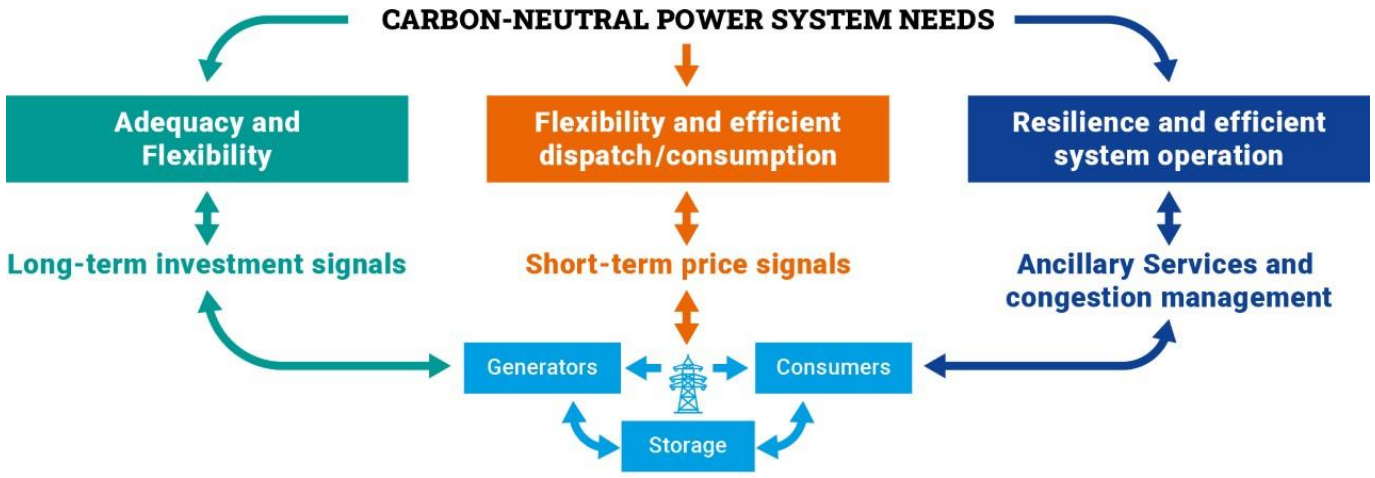




Source ENSTO-e

Energy market optimizations





Renaissance of european industrial policy
Green deal Industrial Plan

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- Launched 1 February 2023
- Complements the Green Deal and the REPowerEU packages, to support the EU‘s ambitions to reduce net greenhouse gas emissions by at least 55% by 2030
- Substantial funding available
- Four pillars:

  i) a predictable and simplified regulatory environment
  - → Net-Zero Industry Act, including simplified and fast-track permitting
  - → Critical Materials Act
  - → Reform of electricity market

  ii) speeding up access to funding
  - → including relaxing of state aid rules

  iii) enhancing skills
  - → Net-Zero Industry Academies

  iv) open trade for resilient supply chains
  - → Free Trade Agreements and Clean-Tech Net Zero Industrial partnerships

Renaissance of industrial policy
European industrial Alliances

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European Industrial Alliance on SMALL MODULAR REACTORS

2024 : Facilitate and accelerate the development, demonstration, and deployment of SMRs in Europe by the early 2030s.

European Solar Photovoltaic Industry Alliance

2022 : Scaling up EU manufacturing of competitive, innovative, and sustainable solar PV products as well as diversifying international PV value chain components and supply raw materials.

RLCF Alliance

2022 : boosting production and supply of renewable and low-carbon fuels in the aviation and waterborne sectors

EUROPEAN RAW MATERIALS ALLIANCE | ERMA

2021 : build resilience and strategic autonomy for Europe's rare earth and magnet value chains. Identify investment possibilities in raw materials value chain, while addressing sustainability and social impact.

European Clean Hydrogen Alliance
Kick-starting the EU Hydrogen Industry to achieve the EU climate goals

2020 : support large-scale deployment of clean hydrogen technologies by 2030. Promote investments and stimulate clean hydrogen production and use.

EUROPEAN BATTERY ALLIANCE | EBA250

2017 : creating a competitive and sustainable battery cell manufacturing value chain in Europe

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Thank you

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