INTERNATIONAL WORKSHOP ON ADVANCED REACTOR SYSTEMS AND FUTURE ENERGY MARKET NEEDS

Session 2. Electricity markets

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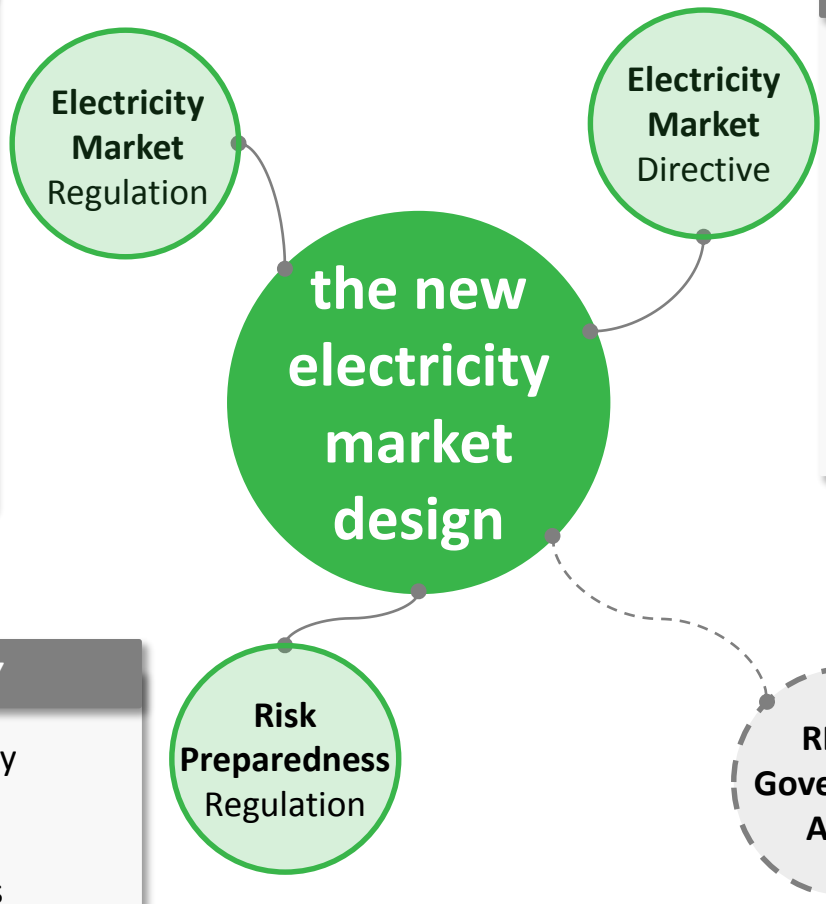
The “New Electricity Market Design” requires a strong interlinkage between several legislative proposals

WHOLESALE MARKETS

- General rules for the wholesale market
- Integration of Renewables
- Network Access and congestion management
- Resource adequacy, capacity mechanisms
- Roles of TSO & DSO
- Regional Cooperation
- Network Codes and guidelines
- Third Country Participation



RETAIL MARKETS & CONSUMERS

- Active customers (including, Self-generation and energy communities)
- Billing, Retail pricing & Dynamic pricing
- Disclosure of Energy Sources
- Tasks of DSO
- Electromobility
- Storage ownership

SECURITY OF SUPPLY

- Methodology for adequacy assessments
- Risk Preparedness Plan
- Electricity Crisis Situations
- Evaluation and Monitoring
- Regional Cooperation

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Clean Energy Package sets key principles for well-functioning short-term markets

Key principles for i**ntegrated** forward, intraday, day-ahead **markets**

Some **market distortions** are **removed**

e.g. exit low price caps and allow scarcity pricing

RES

Key principles for **market integration**

Balancing responsibility

Priority dispatch and re-dispatch

Congestion management & curtailment

Regional system operation

Step-wise approach to RSO

More efficient use of the existing electricity infrastructure based on a non-discrimination congestion management

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Electricity market design should value 3 key products to enable the Energy Transition….

Well-functioning market design should value three key products

Energy	Flexibility	Capacity (availability)
Selling KWh	Adjusting to short-term variations	Firm capacity for security of supply
Markets:		
Forward, day-ahead, intraday markets	Day-ahead, intraday, balancing markets, ancillary services	Market-based capacity mechanisms where relevant

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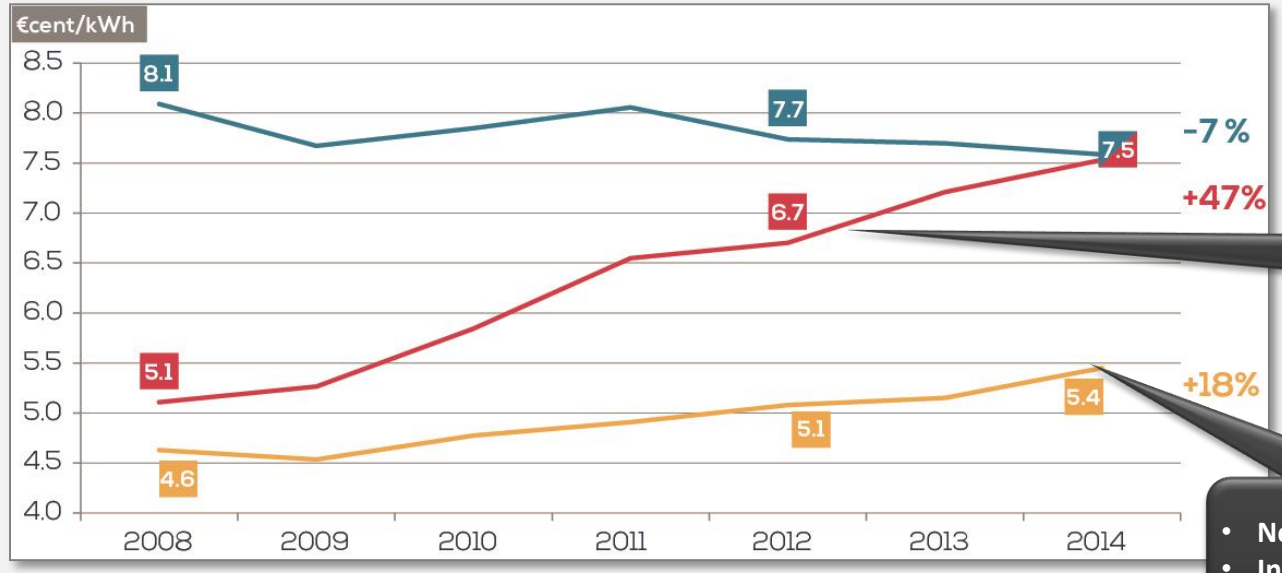
….But it is far from being an issue of wholesale markets only

Increasing penetration of (subsidized) renewables and decentralization/prosumers create other challenges downstream

Despite decreasing wholesale prices, the electricity bill for consumers has increased in Europe due to:

- **Surcharges related to RES support schemes**
- **Increased grid costs, but DSO's squeezed by net metering**

Evolution the electricity invoice in Europe: 2008-2014



- Decrease of support …
- … but new RES targets

- Need to remove net metering
- Introduce capacity term?

Source: Eurelectric (2014)

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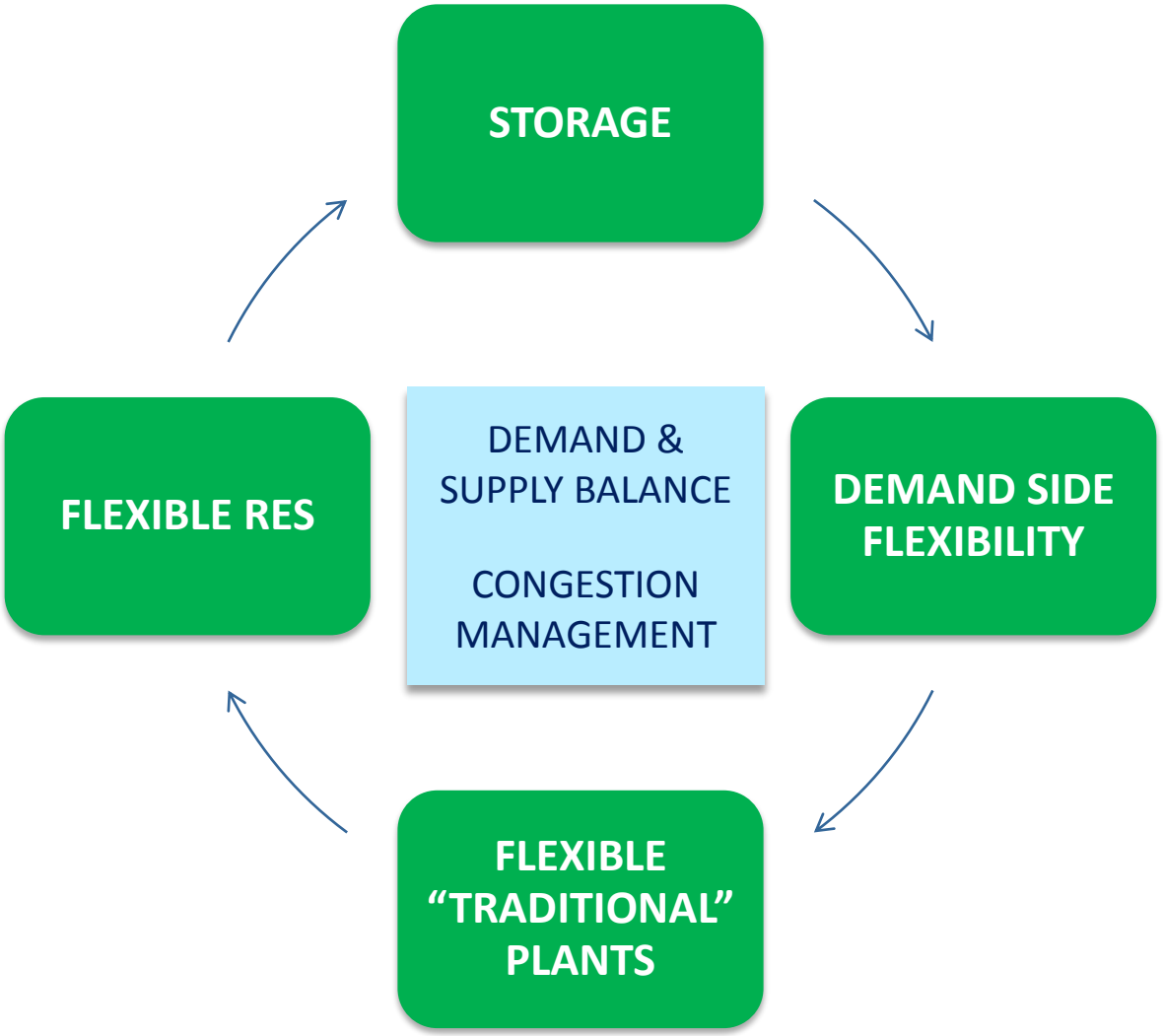
Decarbonisation and decentralisation: need to unlock flexibility resources



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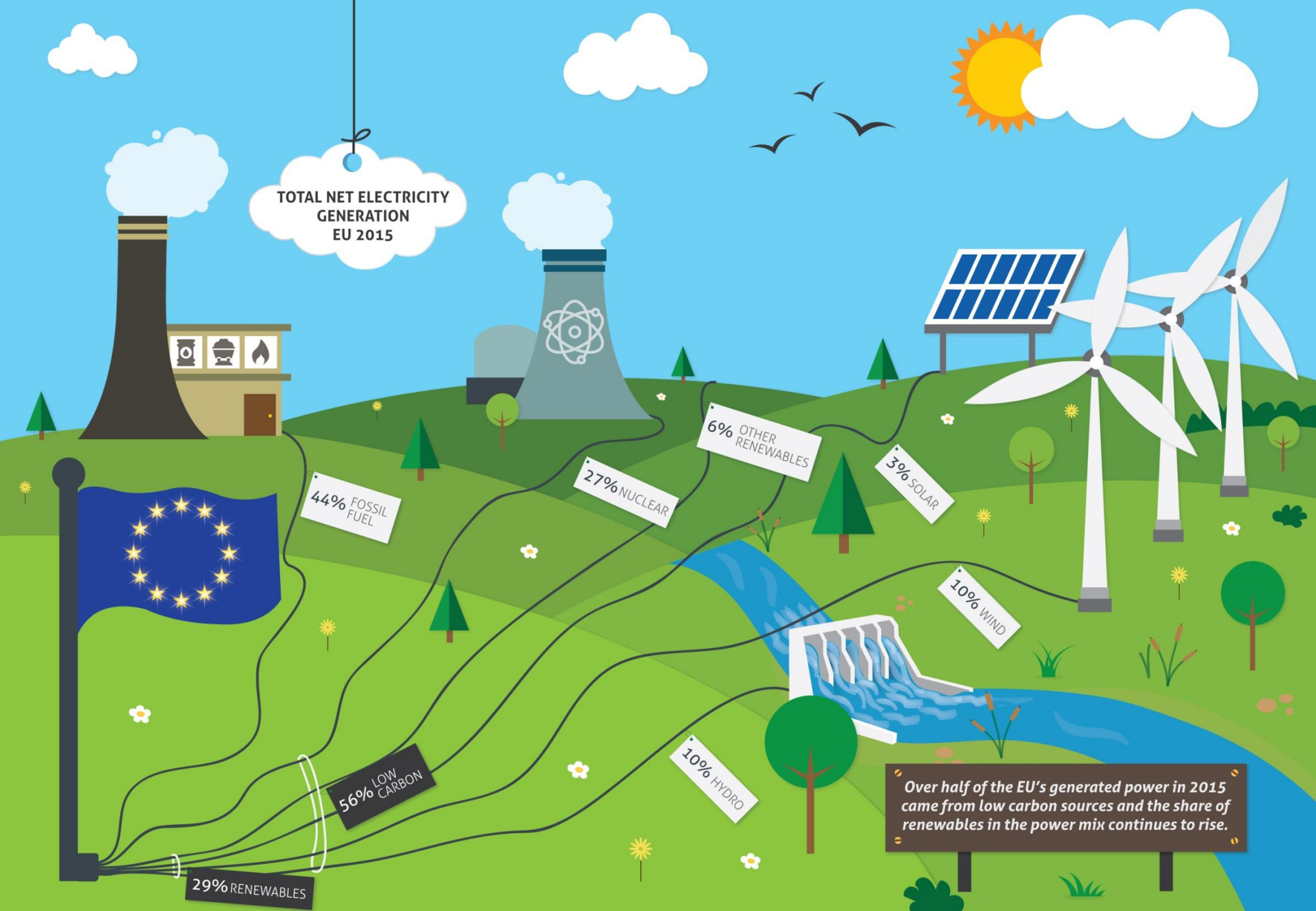
TOTAL NET ELECTRICITY GENERATION EU 2015
44% FOSSIL FUEL
27% NUCLEAR
6% OTHER RENEWABLES
3% SOLAR
10% WIND
10% HYDRO
56% LOW CARBON
29% RENEWABLES
Over half of the EU's generated power in 2015 came from low carbon sources and the share of renewables in the power mix continues to rise.

The contribution of nuclear power to Europe's low carbon energy transition

The European power sector is undergoing radical change. Renewable energy sources, distributed generation and demand response are playing increasing role in the power system.

Reduced demand, rapid increase in variable RES with low variable cost, and a drop in the wholesale electricity prices, has affected the business case for power generation, whether new or existing.

In this new energy system, decentralised and centralised large-scale systems will depend on each other.

Nuclear power can play an important role in solving the challenges of this new, more diverse, energy system, providing the reliable baseload supply necessary to ensure generation adequacy.

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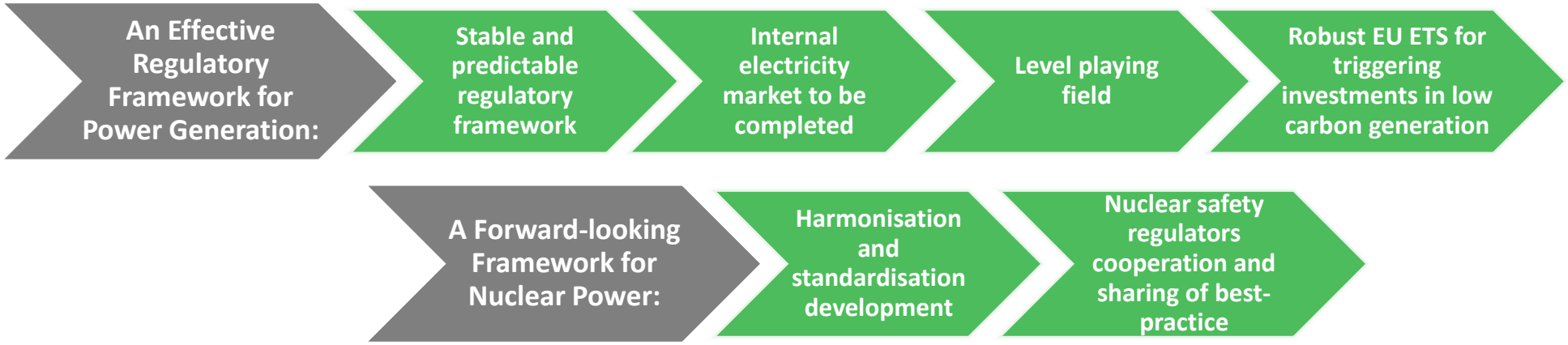
Ensuring nuclear power's contribution to Europe's energy transition



Key messages

- Nuclear energy contributes to the three major energy policy objectives of the European Union: **security of supply**, **decarbonisation** and **competitive energy prices** in Europe.
- Therefore, a continuing contribution of nuclear power should be part of Europe's low-carbon energy transition, and this will need a a **more positive EU policy framework** .
- Investor confidence through price signals that reflect long-term needs and policy objectives, require a **market-based environment** and a strengthened, well-functioning **ETS system**, which are key elements to trigger investments in low-carbon generation technologies, including nuclear power generation.

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