FUTURE-PROOF THE ELECTRICITY MARKET DESIGN

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Brussels, 1st December 2015
A level playing field for all resources, in all markets

Conventional generation

Decentralized generation/Prosumers

Renewables

Demand Response

Storage

Competition in the market
On a level playing field
To provide energy, flexibility, capacity

Customers’ participation and empowerment
Ensuring operational integration of RES

Operational and commercial integration of RES is necessary, both in the market and grid aspects

Operational integration through:

- **Responsibility** of generators for:
  - Selling in the market (directly or via aggregators)
  - Balancing (costs of imbalances)

- **Same obligation** for all generators for:
  - Grid connection / usage (fees)
  - Dispatch / Grid access (no priority)

Commercial integration through:

- State Aid Guidelines provide a framework for RES support schemes
- The evolution from Feed-in Tariffs to Feed in Premium is a first step towards more market oriented support schemes
A new paradigm for European electricity systems

Power systems with broad generation variations from intermittent renewables need both firm capacity ("back up") and flexibility resources.

**RES load factors vary greatly** (Germany, year 2014)

In Germany, end 2014 wind and solar achieved over 35GW of power while the minimum is <5GW.

The **range of uncertainty** is around 30GW while peak demand is around 90GW.

Graph: Bruno Burger, Fraunhofer ISE; Data: EEX Transparency Platform /
Make sure that customers participate through demand response in all markets including in capacity markets.

Day-ahead/ Intraday markets/ Balancing

- A capacity market is an additional market place where both demand and supply can compete.

Example from PJM capacity market in the US

Source: Data from power exchanges

What does a capacity market do?

- In energy-only markets part of the investment costs and fixed costs of power plants are recovered through uncertain price spikes in situations of system stress.
- A capacity market transforms this “scarcity element” into a more stable revenue stream that remunerates the availability of the needed capacity.
- It reduces the risk profile of generators, storage operators and demand response providers and reduce the capital cost.

* As in the EURELECTRIC price study, Assumes 40:30:30 energy/networks/taxes & levies shares.
Enabling consumers’ participation with demand response

Increasing taxes & levies in customers’ bills hamper their ability to respond to energy prices

Other limiting factors include:
Lack of smart meters  Lack of dynamic pricing  Lack of market access
A future-proof market design values the needed energy, flexibility and capacity.

**ENERGY**
- Efficient dispatch
- Forward, day-ahead, intraday markets
- Ongoing market integration

**FLEXIBILITY**
- Short term system adequacy
- Day ahead, intraday and balancing, ancillary services
- Ongoing market integration

**CAPACITY**
- Long term system adequacy
- Capacity market
- National initiatives…going towards more integration?
Energy and flexibility: Implement no regret options

NO REGRET!

Integrated forward, intraday, day-ahead markets

Efficient balancing and ancillary services markets

Improved design of balancing and intraday markets

Future proof market environment for flexible assets, storage, demand response
Many European countries have moved ahead with capacity mechanisms

- **BE**: Strategic reserves
- **GB**: Centralised capacity auction
- **IE & NI**: Capacity payments since 2007
- **FR**: Decentralised capacity obligations
- **ES**: Capacity payments for new units (level of support reduced in 2012)
- **PT**: Capacity payments for new units (reduced in 2013)
- **DE**: Improved EOM and strategic reserves
- **FI**: Strategic reserve contracts for the period 2015-2017
- **SE**: The government has proposed to prolong the strategic reserve until 2025
- **DK**: One-off tender Strategic Reserve for eastern Denmark
- **LT**: Capacity payments since 2011 until end 2015
- **PL**: Operational and strategic reserves
- **RO**: Capacity market
- **GR**: Centralised capacity auction for capacity/flexible capacity under consideration
- **RU**: Capacity market with price restrictions. Long-term capacity supply agreements for obligatory investments
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**How do member states ensure security of supply?**

- Energy-only market
- Implemented Capacity market
- Strategic reserve
- Under analysis
- Outside the EU,
Key step: System adequacy assessed at least at regional level

- Close cooperation among involved TSOs, NRAs and governments
- Analysis of the location of “firm capacity”
- System adequacy assessments should also include economic viability checks
To maximise cost-efficiency and market orientation, any capacity mechanism should follow a set of fundamental design features

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<tr>
<th>Objective</th>
<th>Product</th>
<th>How?</th>
<th>Geography</th>
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<tbody>
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<td>• Security of supply</td>
<td>• Remunerate availability/firm capacity, demand response, storage</td>
<td>• Market-based</td>
<td>• Open to cross-border participation, and ideally common sourcing at regional level</td>
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<td>• Technology neutral: generation/demand response/storage</td>
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<td>• Open to new/existing plants</td>
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Capacity markets should ensure that only the capacity strictly needed for long-term system adequacy is maintained or delivered. They should not provide a safeguard for poor investments or power plants that are not competitive.
Backup
The completion of the Internal Energy Market is fundamental to accomplish this transition in power systems in a cost-efficient way.

All market developments head towards completing the Internal Energy Market:

- Implementation of the Third Energy Package
- Integration of wholesale markets across all timeframes
**2030 Framework for Climate and Energy**

**Agreed Headline Targets**

- **2020**
  - **- 20%** Greenhouse Gas Emissions
  - **at least - 40%** Greenhouse Gas Emissions

- **2030**
  - **20%** Renewable Energy
  - **at least 27%** * Renewable Energy consumption
    - *implies 45% RES in power mix
  - **20%** Energy Efficiency
    - **at least 27%** (indicative) Energy Efficiency
      - *to be reviewed by 2020, having in mind an EU level of 30%
  - **10%** Interconnection
  - **15%** Interconnection

*Note: All targets are indicative unless marked with an asterisk (*) indicating a specific review date or level.*
The growth of renewables, which is necessary to pursue the European targets, brings a new reality to power systems.

Over 150GW of solar and wind installed in 10 years

Low carbon generation leading the way (EU 28, 2013)

The total electricity production in 2014 amounts to 3025 TWh, RES contributing to this total with 28%.

Sources: EWEA, Solar Power Europe
A new paradigm for European electricity systems

There is **increased market uncertainty for all market players**

**CCGTs revenues fell drastically**

**CCGT load factors decrease (2009-2013)**

Source: GlobalData

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Source: Crédit Suisse Utilities Big Book: H1 2015

Source: GlobalData
Meeting the security of supply challenge

- Desired level of security of supply politically determined
- Government interventions hindering scarcity prices (price caps)
- Uncertainty in terms of frequency and sustainability of price peaks: lack of visibility
- Increasing market uncertainty for all market participants

Reliable investment signals that value capacity availability needed
Blackouts are no fun for anyone