Market Design: The missing Jigsaw-Piece for financing the Energy Turnaround

Presentation at the Conference of the German-French Office for the Energiewende (DFBEW)

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About Compass Lexecon
Compass Lexecon Global

One of the world's leading economic consulting firms, Compass Lexecon provides law firms, corporations, and government clients with clear analysis of complex issues.

- **175+** PhDs
- **2** Nobel Price Laureates
- **84%** Of Fortune 100 companies advised
- **+70** European countries advised

Compass Lexecon Energy

- **Electricity**
- **Gas**
- **Emissions**
- **Heat**

Compass Lexecon offices

We have worked on cases in these countries

Additional countries where we speak the official language (excluding jurisdictions without a competition authority)

Compass Lexecon Energy Services:

- Market modelling
- Regulation
- Strategy
- Contract design
- Environment and decarbonisation
- Competition & State Aid
- Transactions
- Disputes
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FTI-CL’s senior energy experts are supported by a team of 50+ experienced consultants.

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FTI-CL’s senior energy experts are supported by a team of 50+ experienced consultants.
1: The challenge
2: The solution so far
3: Even more challenges – input costs are rising and RES cannibalise themselves
4: A silver lining – RES are in the money now and PPAs are booming
5: We need a new market design and five hypothesis
1: The Challenge

Historic emissions and projections for Europe

Net-emissions in MtCO2

- Historic emissions
- Already implemented national policies
- Proposed policies of the Fit-for-55 package
- Target of Fit-for-55, compatible with 2°C target
- Net-zero target for 2050 without reliable pathways yet

Target of Fit-for-55, compatible with 2°C target

Historic emissions

Net-zero target for 2050 without reliable pathways yet
1: The Challenge

800 bn€ investments needed in power generation in next decade

Private investments in energy assets can play key role in recovery

Source: CL analysis based on Platts, Country NECPs and CL Intelligence
European Commission - Final Report of the Sector Inquiry on Capacity Mechanisms
CEEM – Capacity Remuneration in power markets: an empirical assessment of the cost of production
CEER - 2nd CEER Report on Tendering Procedures for RES in Europe

Step-up in investment needed to make decarbonisation a reality

Capacity additions in Europe based on the regulatory framework when the decision was taken
2: The Solution so far

Support schemes for utility-scale RES

Capacity remuneration mechanisms

Most countries have **tendering or long term contracts** to support investment in **clean technologies or conventional plants**
3: Even more challenges – Input costs are rising

**Inflation rate** (IMF World Economic Outlook 2022)

- European Union
- Belgium
- Germany

**Costs, wind turbines**

Technology cost trends (IEA)

- Annual change (%)
- Prices (2015 baseline)

**Costs, solar PV modules**

- Annual change (%)
- Prices (2015 baseline)

+ increasing supply chain bottlenecks
3: Even more challenges – RES cannibalise themselves

Cannibalisation rate per technology (%) – decreasing market value with increasing renewable penetration

Solar PV

Onshore wind
4: A silver lining – RES are in the money for now

Comparison of market values and LCOE estimates for Germany.

Sources: Netztransparenz (2022): Marktwertübersicht; Fraunhofer (2021): Gestehungskosten für Strom aus erneuerbaren Energien
4: A silver lining – PPAs are booming

Two main segments:
- New build (often in ADDITION to support scheme)
- after support scheme runs out

Strong development of PPAs in the last years

Will PPAs be able to solve the challenge? ...

- RES are largely in the money right now
- Existing installations likely have some good years ahead

- Rising financing and equipment costs
- Rising cannibalisation rates
- Delays with permitting
- Uncertain wholesale price outlook
- Balancing and default risk

....maybe not fully yet.

Figure 1 PPA Announcements 2013-2021 (GW contracted capacity); Re-Source (2021) https://resource-platform.eu/buyers-toolkit/

Commission recommendations on how to foster PPAs was published last week
5: We need a new Market Design

System needs

Variable energy
Variable renewables at least costs

Flexible energy
Balance renewables

Firm energy
Stable base for system adequacy

Spatial coordination

Markets needed to provide system needs

Dimension: time

- Short-term flexibility markets for large and small players
  - minutes
  - hours

- Non-locational day-ahead market
  - days

- Long-term market to cover investments
  - years

Dimension: spatial

- Locational long-and short-term price signals
  - minutes
  - hours
  - days

PPAs are part of the solution, by providing a long-term market
### FIVE THINGS WE NEED TO DO

<table>
<thead>
<tr>
<th>Planning of system needs</th>
<th>Competition “for” the market though long term contracts</th>
<th>Competition “in” the market</th>
</tr>
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<tbody>
<tr>
<td>1) Add an integrated planning function that considers risk exposure (Ukraine) and network and generation together</td>
<td>2) Foster the market for PPAs</td>
<td>4) Flexibility markets for all participants</td>
</tr>
<tr>
<td>3) Add compatible support schemes</td>
<td></td>
<td>5) Don’t break the existing day-ahead and intraday markets</td>
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**Investment (years ahead)**

**Operations (days /hours ahead)**

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EXAMPLES OF COMPASS LEXECON’S PUBLIC STUDIES ON MARKET DESIGN (selection)

Elia: Towards a Consumer-Centric and Sustainable Electricity System
Link

Elia: Final report on Elia’s findings regarding the design of a scarcity pricing mechanism for implementation in Belgium
Link

IEA-RETD: Electricity Market Design and RE Deployment
Link

Toward the Target Model 2.0. Policy Recommendations for a Sustainable EU Power Market Design.
Link
EXAMPLES OF COMPASS LEXECON’S PUBLIC STUDIES ON DECARBONISATION (selection)

FORATOM: Pathways to 2050: “Role of nuclear in a low-carbon Europe” report

Decarbonisation scenarios to 2050 of the Finnish economy for Sitra

Impact of financial actors on the European carbon market

Decarbonisation scenarios of the EU economy to 2050 for ENEL Foundation
Appendix: Solving the Trust Issue

Before Investment

Investor is in **better position** → holds the funds

Government needs to create **stable framework** = Market Design

Market Design
- Protection for investors against arbitrary decisions
- Incentives for efficient investment

After Investment

Investor is **exposed**
- capital has been “sunk”

Government could be **opportunistic**:
- simply close the facility (“Atomausstieg”, “Kohleausstieg”)
- reduce returns (cases in Italy, Spain, France …)
Appendix: The new Markets can be hybrid

An initial typology of ‘hybrid markets’ depending on the extent of quantity coordination and long term contractual arrangements

**Ontario/Canada:** Centralised procurement & centralised LT counterparty combined with short-term competitive markets

**Brazil:** Obligations for retailers and big industrial consumers to contract long term with centralised procurement

**Chile:** Obligations for retailers and big industrial consumers to contract long term (joint/centralised long-term procurement for retailers, decentralized procurement for big industrials)

**Proposal for California/USA (Wolak 2021):** Obligations for retailers to contract long term

**France:** Short-term mandatory planning of system needs (PPE) + LT contract RES tenders + decentralised capacity obligations (CRM) + distributional schemes (e.g., ARENH)

**Spain:** State-backed solvency guarantees for RES PPAs with electro-intensive consumers

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*Prototypes: comprise hybrid design elements but added on top of one another without sufficient coordination or holistic approach from the start
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