Future power market design – challenges and objectives

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Agenda

1. Special features of power markets
2. Potential objectives of markets and their design
3. Challenges for the EU and the candidates

1. Special features of power market vs. other commodities / industries

Starting expectation: wholesale price (SRMC) can set adequate price signals to remunerate investment as in other commodity markets

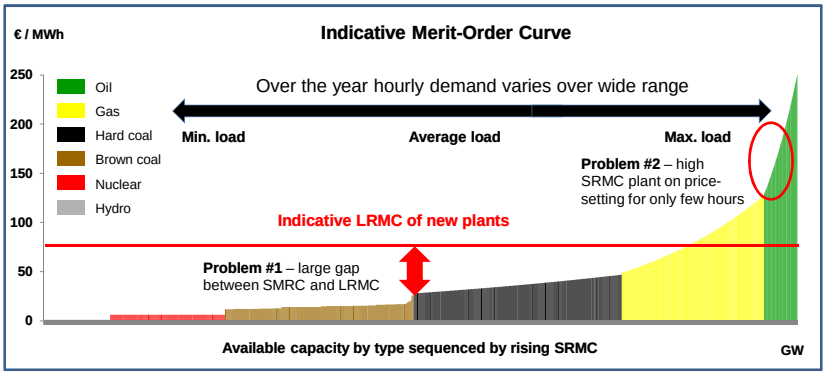
- Any additional income stream is therefore a „subsidy“ rather than essential

Special features of power markets:

- SMRC << LRMC compared with most other markets
- Expensive to store, so wide range of hourly demand levels has to be met
  - Steep end of curve only sets prices for relatively few hours each year
- An increasing share of production is non-dispatchable
- Socially and politically extremely important product
  - Multiple societal requirements: energy, security, environment etc.
  - But strong policy requirements also for other industry sectors

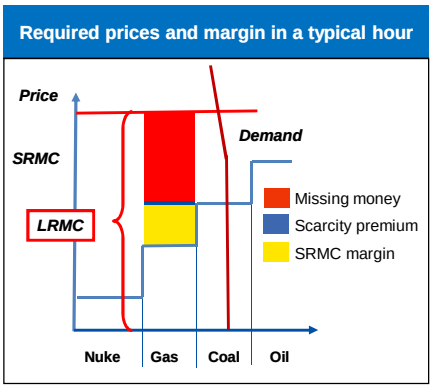
- Introduction of new technologies has often required state intervention
  - Nuclear power, then renewables; CCGTs also required help in some countries

The problems of SMRC << LRMC and wide range of hourly demand levels without renewables



- The profile of the curve is critical – in the past it was steeper
- In other commodity markets the curve is generally steeper and the far end drives prices throughout the year – not just for a few hours!

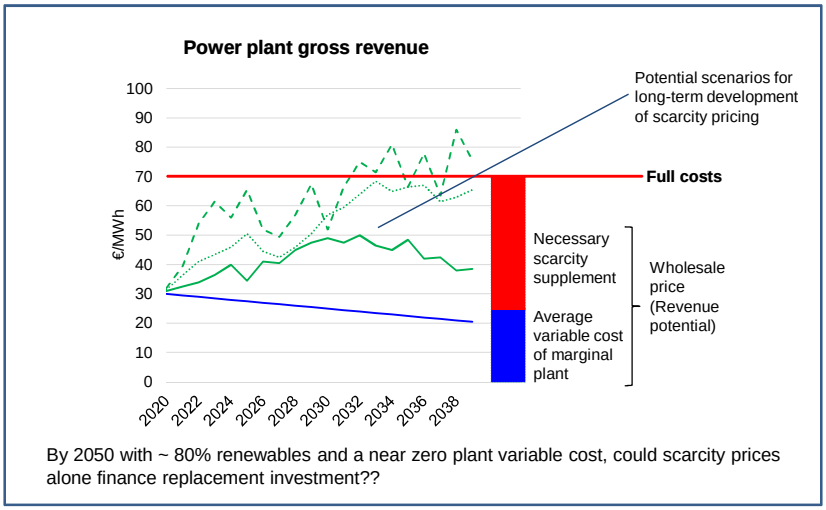
Empirical evidence for the problems even before renewables arrived in force – example Germany



- Historical price analyses show that small scarcity premia existed till 2007
- Insufficient to cover the costs and after 2007 due to oversupply no scarcity premia

Source: Author

With further declining SMRCs it is highly unrealistic that scarcity pricing will bridge gap



By 2050 with ~ 80% renewables and a near zero plant variable cost, could scarcity prices alone finance replacement investment??

Consequences arising from special features of the power market

- Difficult to cover full costs (new / existing plants) from wholesale market alone
  - Capacity tightness would be permanently at politically unacceptable levels
  - Risks would be very high, leading to high costs of capital and expensive supply
- Therefore plants / capacity „required“ need a second source of income
  - Renewables and thermal plants require same treatment (renewables integration!)
  - If wholesale price tends to zero, then „second“ source will be main / only source!
  - Will this continue long-term to be defined as State Aid?
- If wholesale prices / ETS will not give signals for „required“ capacity who should decide how much capacity and of what type must be available long-term?
  - Will RES targets continue until EU has reached 80% production share and then beyond to maintain this share? Can nuclear be included where acceptable?
  - What „firm capacity“ margin is desired in relation to „peak demand“ and is this determined centrally or decentrally?
  - To what extent can market-methods be used to meet these goals?

From markets to policies – how the pendulum has swung

Can the pendulum swing back, or is this too challenging given multiple requirements of sector?

2005 – Strong market approach:

- Internal Power Market
- Emissions Trading System

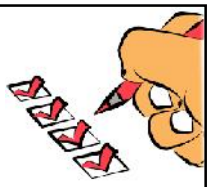
2007/2014/2016 – Strong policy approach:

- Renewables targets (but with increasing competitive approach)
- Efficiency targets (with only limited competitive approach)

2. Original and future objectives of market design in power / decarbonisation

- **Original objectives:**
  - **Wholesale market:** ensure **competitive** power for EU (focus mainly on kWh)
    - Energy as lifeblood for society – as per 1952 Coal and Steel Treaty!
  - **Emissions Trading System:** decarbonise at lowest cost – all options open
  - Did not originally include reliability – implicitly left to scarcity-pricing
- **Six headline objectives for a new market design:**
  1. Optimise system along entire supply chain with energy & capacity price signals
  2. Ensure engagement of consumers (or their agents) to pricing incentives
  3. Treat decentralised plants / storage neutrally: location vs. scale benefits
  4. Address risk-allocation with aim to minimise long-term supply costs
  5. Move towards technologically-neutral approach to decarbonisation
  6. Should work both for transition and intended future „steady-state“ situation

Necessary conditions for markets to work - and the reality



- Necessary conditions for a pure market approach:
  - Sufficient political / regulatory certainty over economic life of plant
    - Covers typically 4-5 legislative periods
  - No outside market interventions
    - E.g. no introduction of capacity without market signals
- Reality
  - Important policy objectives introduced (renewables and efficiency) to achieve goals, but hinder role of wholesale market to set investment price signals
- Question
  - Given strong emphasis on policy what should be the future role of the markets?
  - Can wholesale market achieve more than efficient dispatching of plants and providing part of the income needed for required plants?

3. Challenges for the EU…

- Recognise workable combinations of policies and markets
- Winter Package needs careful attention – will deliver best results if economic consistency of proposals are carefully checked / modified and role of markets is completely clear
- Examples from Proposal for Regulation on the Internal Market for Electricity
  - An 'energy-only market' option would see EU markets being sufficiently improved and interconnected to provide the necessary price signals to spur investments in new resources and in the right places. Then no capacity mechanisms would be required.
  - The proposal may increase administrative requirements, e.g. by bringing in a level-playing field for all technologies to participate fully in energy markets
  - Enshrines the principle that supply prices shall be market-based
  - Importance of undistorted market signals to ensure flexibility, decarbonisation and innovation
  - The decarbonisation of the electricity sector, with renewable energy becoming a major part of the market, is a core objective of the Energy Union. To support this shift .. a renewed focus on short-term markets and scarcity pricing is essential

… and for the candidates

- How can your design be made proof against political intervention – or will it be so convincing that none will be needed?
- In the US after 20 years of liberalisation the consumer costs gap between liberalised and regulated states has hardly reduced – can your model reduce the gap faster?
- Brains have been working at the problem around the world for 20 years and have not yet found a long-term solution
  - Your challenge is to do better!

Best of luck – Europe badly needs your ideas!

THANK YOU FOR YOUR ATTENTION

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