

Conference Summary Record

ELEMENTS OF A NEW TARGET MODEL FOR EUROPEAN ELECTRICITY MARKETS
Towards a Sustainable Division of Labour between Regulation and Market Coordination
8-9 July 2015, Université Paris-Dauphine, Salle Raymond Aron (2nd Floor)

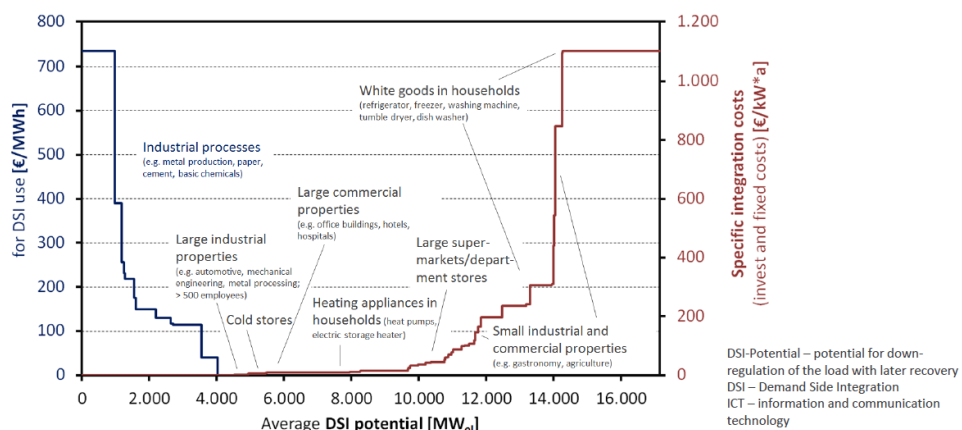
The high-level conference was organised in five sessions over one day and half by an organisation committee consisting Jan Horst Keppler, Dominique Finon, Fabien Roques and Manuel Baritaud. It brought together a good representation of European and American academics. Its guiding question was “given the state of European electricity markets do we need a target model (TM) 2.0 and how should it look like?” While the question itself remained ultimately unanswered, there was consensus that new structures area rapidly emerging that one may be able to refer may be TM 1.0 with institutional adaptations and transformed by new technologies. These changes include explicit or implicit capacity remuneration mechanisms (CRMs), VRE curtailment, zonal pricing where unavoidable, increasing demand response among other. Furthermore, it is now clear that nobody, neither at the theoretical nor at the practical level, has an overall vision of this brave new electricity world. European electricity markets are a very sophisticated and increasingly uncoordinated process of muddling through with high stakes and high risks.

Key findings may be best conveyed in bullet form:

Market design

- There may be a need to move from SRMC to average-cost pricing as a means of entering the “zero-marginal-cost society” without subsidies (i.e. back to central planning). This does not mean abandoning competition altogether. The provision of long-term supply at average cost could be supplied by competitive tendering.
- Excess procured thermal capacity (e.g. in the UK) leads to lower wholesale prices, higher subsidy payments and, within a fixed budget for renewables, less capacity being built
- Excess procurement exacerbates the “missing money” problem and locks the market into a Single Buyer solution.
- The demand-side is increasingly capable of making a contribution to system balancing:

Cost-potential curve for Demand Side Integration in Germany



Methodology: **Bottom-up** for process technology: extensive inquiry of companies and associations of all relevant industries, service providers

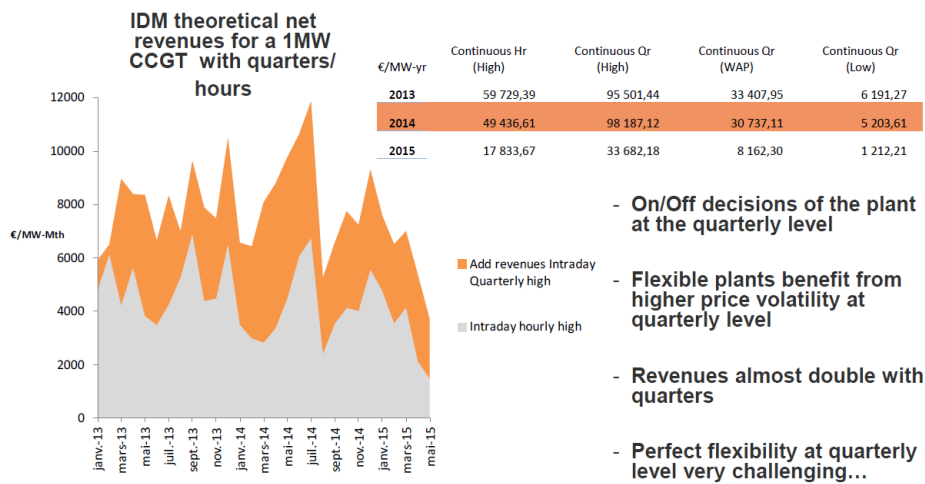
Top-down for cross-sectional technologies: analysis of energy balances and sector statistics, identification of required ICT components for each industry and size range

- Priority should be given to market reforms focussed on future private investment. Any

emphasis on scarcity pricing, however, increases risks for private investment and thereby the cost of capital.

- The UK process for administering contracts for difference (CfDs) set prices very high and may have over-estimated the cost of capital. However, the principle is sound. All low-carbon investment needs long-term contracts (e.g., as is implicitly already the case with FITs) as there is no credible future for a sufficiently high corrective carbon tax.
- The provision of system services (minute reserves, reactive power, inertia, frequency control...) will make up an increasingly large share of revenues of dispatchable producers. Thermal plants are also likely to have flexibility capabilities (e.g. ability to ride through high frequency changes) in excess of their current warranty limits, which may open discussions with suppliers.

A flexible plant can increase revenues significantly on the quarterly market

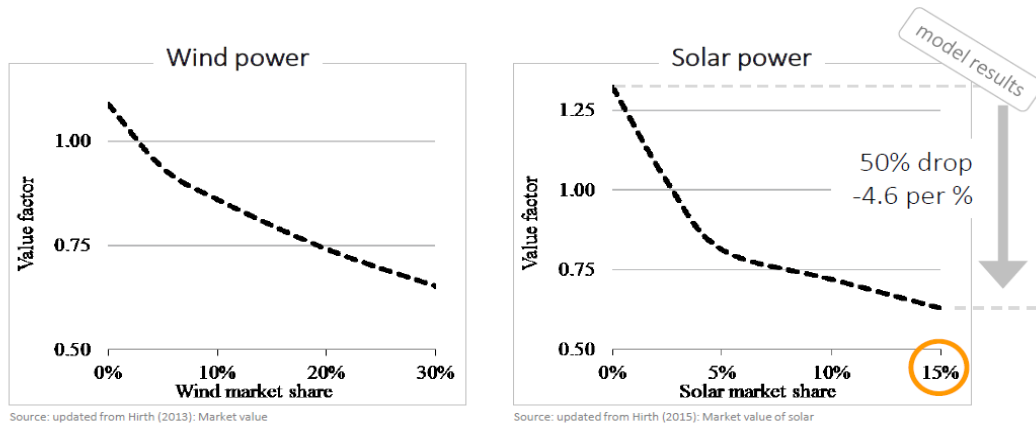


- There is poor connection between the wholesale and retail markets, which prevents consumer preferences being correctly addressed at the production level. Against the background of consumer lethargy, the possibility of collective switching initiatives and putting out the default supplier/tariff to tender were suggested.

Renewables

- The indirect consequence of subsidies – transferring the main risks to consumers/taxpayers – is often overlooked as governments are effectively single buyers with RES subsidies.
- ROCs have proved too expensive in the UK and carried high market risks. Feed-in tariffs for RES production leads to auto-correlation and declining market values of production. subsidies should be for capacity and then dispatched on a SRMC basis. These factors are more important than balancing costs.

The value drop of wind and solar power as penetration increases (model results)



The value factor of wind power decreases from ~1.1 at low penetration to ~0.65 at 30% market share (1.5 points per point market share).

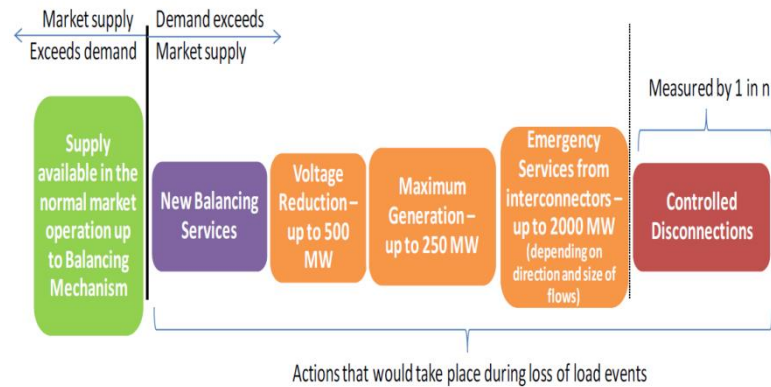
The value factor of solar power decreases from ~1.3 at low penetration to ~0.6 at 15% market share: (4.6 points per point market share).

- Locational signals are missing to co-ordinate and optimise decentralised generation.
- Rising RES (and also DC interconnections) will increase the share of Non-Synchronous Supply and may eventually create frequency stability challenges, although the recent experience of dealing with the solar eclipse proved that the current system is quite stable.
- Theoretical modelling (independent of political constraints!) shows the the economically optimal quantity of wind would be typically 20%
- Curtailment of RES will become an increasingly important instrument for system optimisation and investors should take this into account. What does this tells us about the system value of a resource when the most efficient thing from a system point of view is to shut it down (at least at certain hours)?

Capacity markets

- The low wholesale prices are simply a problem of excess capacity and one solution proposed was an exit auction. A sharp recover in revenues would then be enjoyed by those whose capacity remained in operation. Nonetheless, before paying people to destroy useful dispatchable capacity, one might question the wisdom of paying people to provide additional variable capacity of much lower system value. The idea of exit auctions smacks of desperation and just shows how far we have moved from any form of rationality. That said, if the objective is to keep dispatchable operators in business then it is a CRM (for the remaining capacity) in disguise.
- Determining the capacity boundary with precision is difficult as the slide below shows:

What does “Loss of load” mean? Alternative actions in UK that cost less than new capacity

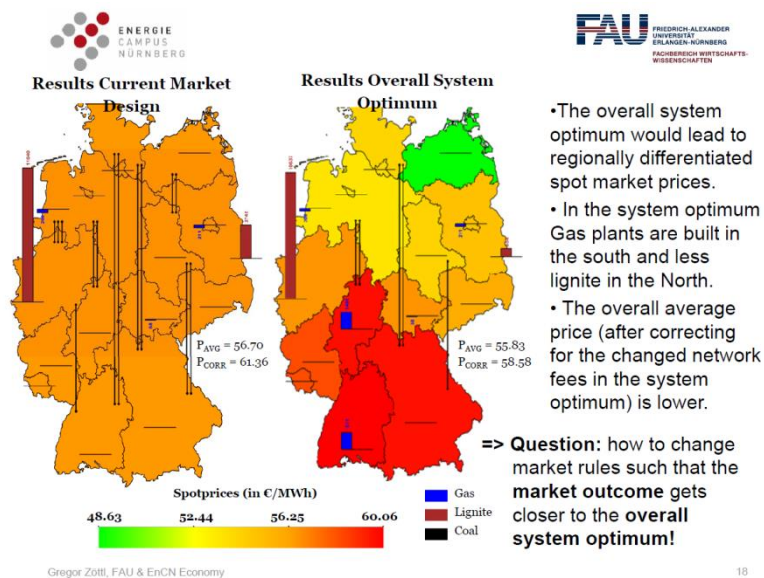


These actions have lower cost/value than £17/kWh

- The UK capacity auction process demonstrated its superiority over administrative decisions – the auction cleared at 40% of the expected price. There were however a number of very disappointed bidders and mutterings about the quality of supply. Future auctions must pay attention to this.

Nodal pricing

- Its absence is potentially responsible for more overhead lines being built than would be otherwise necessary. Still, determining what is an efficient level of transmission capacity is a tough question. Participants argued that operating at a slight surplus of transmission capacity under a regulatory system, reducing transactions costs and preserving a common liquidity pool, may make sense in the bigger picture. The exception is where local constraints prevent building new lines and growth in VRE requires allocating capacity more efficiently:



The Last Word

- Ontario and British Columbia have kept the Public Company as a monopoly and avoided all of the above. Certainly, too simple as general solution but useful benchmark. The key question is whether European efforts to reform the current market design go far enough to avoid serious capacity issues forcing wholesale system change at some later point.