

Conference Objective and Programme

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)

Conference Objective

Thirty years of European electricity market liberalisation have a mixed record. Despite efficiency gains and improved dispatch, competitive electricity markets in their current form have failed to convince that they can deliver superior results to regulated systems in terms of investment, security of supply and environmental performance. At the same time, technologies and behavioural modes are evolving fast. Accompanying these changes, a wealth of academic and applied research has improved understanding of individual issues but a coherent consensus model for future European electricity systems, a new target model, is still outstanding. This international conference aims at bringing together the results of current research that might become part of a New Target Model for European electricity markets in the near-future.

The need for such a New Target Model arises since current energy-only markets appear to be unable to deliver desired levels of capacity and greenhouse gas emission reductions through the deployment of low carbon equipment, even where carbon pricing exists. At current levels of demand elasticity, aligning prices on short term marginal cost will not allow new equipment to recover its fixed costs and to help to trigger sufficient investment in different types of capacity without significant reductions in the convenience and security of electricity supply. This structural issue has been compounded by the injection of RES-E at zero short-term marginal cost which led to a dramatic fall in wholesale forward prices and load factors for conventional plants. Remuneration of generators for flexibility in intraday, balancing, adjustment as well as for guaranteed capacity by new capacity mechanisms has increased as expected, but not nearly enough to compensate for revenue losses in forward markets. Improvements in the design of trading for flexibility services and the installation of capacity mechanisms are a subject of much research. However hampered by intrinsic volatility they might still not be capable of delivering desired levels of investment. Also carbon pricing has in its current form proven unable to spur investment in low carbon technologies with high fixed costs.

Increasing numbers of experts thus consider that it may be necessary to abandon the idea of marginal cost pricing in forward markets and to turn into the opposite direction, namely long-term arrangements that guarantee fixed revenue flows through a public agency, independent regulator or systems operator. Such arrangements, in particular the competitive auctioning of long-term contracts offering remuneration at average costs are particularly relevant for technologies with large capital expenditures, i.e. low carbon technologies such as renewables, hydropower or nuclear. They would be complemented by decentralised short-term coordination in competitive markets organising least-cost dispatch and the provision of flexibility and system services.

From this general vision of a New Target Model follow immediately a number of urgent questions that require intensive research and study before a deep restructuring of European electricity markets could be advanced as a serious proposal:

- In any mechanism aiming to ensure adequate levels of investment and capacity, questions are: what should be the planning procedure to assess investment needs, given external and internal uncertainties as well as endogenous dynamic effects? Appropriate modelling tools, performance criteria and institutional arrangements would all need to be determined. In terms of modelling topics such as dynamic optimisation with and without RES-E, price formation under uncertainty in the short-term flexibility markets or network optimisation all offer new and exciting research questions.
- What is the optimal design of long-term contracts for capacity and energy provision? Should auction mechanisms be technology-neutral, include implicit carbon prices or be prescriptive in terms of technology choice? Can the new long-term financing mechanisms be reconciled (a) with existing support mechanisms such as feed-in tariffs (FITs) or contracts for difference (CfDs) and (b) the working of markets for flexibility and system services? Which mix of price instruments (carbon tax), quantity instruments (ETS) or targeted support for RES-E and nuclear can best be combined with long-term capacity provision in order to achieve emission

reductions in the electricity systems at socially acceptable costs?

- The introduction of large amounts of variable renewables disturbs market operations and increases the need of flexibility services. How can one align the private and social values of flexibility provision? What would be efficient designs on the intraday, reserve and balancing markets? What would be the conditions to make new revenues with sales of flexibility services, sufficient to trigger investment in flexible resources in storage, demand response, and gas turbine?
- How shall increased needs for investment in transport or distribution due to RES-E be dealt with? What is the proper way of establishing a socially optimal level of network and interconnection capacity? To which extent can trade-offs between production and location be organised through uniform network tariffs, zonal or locational pricing? To which extent will rules for the curtailment of wind-power and PV plants during periods of over-supply be integrated in system optimisation? There remains a strong need for updated transmission planning. Theory has yet to catch up with the technical, structural and behavioural changes that modify the framework for determining optimal amounts and an efficient cost allocation for network capacity and distribution grids.
- What is the proper structure of end-user tariffs in the financing of both the fixed and variable costs of capacity, energy and the system services provided by TSOs and DSOs? What shall future *prosumers* pay for the insurance services provided by their network? Is there still a role for residential tariffs, or will retail competition by energy service providers be able to square the costs of generation and transport with customer bills? How can the demand-side be properly integrated in the working of the system?

No single conference could answer all or even a majority of these questions, which in themselves constitute a subset of the issues surrounding a New Target Model. Yet the CEEM conference on 8-9 July 2015 aims at being part of a dynamic process in which the theoretical framework for a third way between central planning and market provision will gain in completeness, depth and consistency.

Organisation

Following the conference key note speech, the workshop is organised in five sessions over one day and half. The organisers are inviting papers to each of the five sessions of the conference. The CEEM will finance participation of selected authors. A concluding roundtable will identify elements of progress towards a future Target Model 2.0 for electricity markets in the EU and the possible barriers raised by antitrust and state aids legislations.

Organisation and Selection Committee

Jan Horst Keppler (Scientific Director- CEEM, Université Paris-Dauphine), Dominique Finon (Scientific Counsellor- CEEM, and CIRED-CNRS), Fabien Roques (Partner- Compass Lexecon and CEEM), Manuel Baritaud (Senior Energy Analyst, IEA)

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Programme

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)

Wednesday, 8 July 2015

9h00 to 10h20 Session 1 Welcome, Key Note and Introductory Presentation

Jan Horst Keppler (Scientific Director- CEEM, Université Paris-Dauphine) and Dominique Finon (Scientific Counsellor- CEEM, and CIRED-CNRS): Background and Objectives of the Conference

Key Note Speech

David Newbery (Research Director-Cambridge Electricity Policy Research Group, and Research Fellow-Imperial College London): "UK Electricity Market Reform: Intelligent Market Decarbonisation or Back to Central Planning?"

Introductory Presentation

Fabien Roques (Partner, Compass Lexecon and CEEM): "Key Questions Concerning the Restructuring of European Electricity Markets with Respect to Risk Management and Long-Term Coordination"

10h20 to 10h50 Coffee

10h50 to 12h40 Session 2 What Can We Learn from the Modelling of Electricity Markets with and without Policy Interventions?

Erik Delarue (Research Fellow, KU Leuven): "Facilitating Renewables Integration through Demand Response: a Modeling Approach"

Lion Hirth (NEON / MCC / PIK, Berlin): "The Optimal Share of Variable Renewables: how the Variability of Wind Power and Solar Power Affects the Welfare Optimal Deployment"

Kai Hufendiek (Institute for Energy Economics and the Rational Use of Energy, Universität Stuttgart): "A Cost Effective Mix of Flexibility Options for Integrating a High Share of Variable Renewables"

Miguel Vasquez (Professor of Economics, Universidade Federal Fluminense, Brazil): "Electricity Auctions with Integer Decisions"

12h40 to 14h00 Lunch

14h00 to 16h00 Session 3 New Directions for Capital-Intensive Investments in Electricity Markets

Lawrence Ausubel (Professor of Economics, University of Maryland): "Forward Capacity Auctions and Electricity Market Design"

Andreas Ehrenmann (GDF Suez-Engie) and Yves Smeers (Université catholique de Louvain): "Investment and Early Retirement with Incomplete Markets for Risk: the Need for Long-Term Contracts"

Manuel Baritaud (Senior Energy Analyst, IEA): "Market Designs and Allocation of Risks for Low Carbon Investment"

Dominique Finon (Scientific Counsellor- CEEM, and CIRED-CNRS): "Efficiency vs. Distribution, Decentralised Obligations vs. Centralised Auctioning: Who Pays the Difference between Price and Long Term Costs?"

16h00 to 16h30 Coffee

16h30 to 18h30 Session 4 Security of Supply, Flexibility Provision and Capacity Mechanisms

Jan Horst Keppler (Scientific Director- CEEM, Université Paris-Dauphine): "First Principles, Market Failures and

Endogenous Obsolescence: the Dynamic Approach to Capacity Mechanisms”

Mike Hogan (Senior Advisor, The Regulatory Assistance Project): “Capacity Mechanism and Flexibility Products for Power System Reliability: Could We Mix Capacity Revenues and Flexibility Revenues for Investment Triggering?”

Charles Verhaeghe (Senior Economist, Compass Lexecon): “Towards a European Approach to Capacity Mechanism: the Introduction of Cross-Border Participation in Capacity Mechanisms”

Philippe Vassilopoulos (Head of Product Design, EPEX SPOT): “Value of Flexibility on the German Electricity Market and Compare Revenues for a Typical Power Plant on the Day-ahead and Intraday Markets (hourly and quarterly)”

20h00 Conference Dinner with Philippe Torrion, Groupe Executive Director, Director of Innovation Strategy and Planning (EDF)

Thursday, 9 July 2015

9h00 to 10h50 Session 5 Interconnection, Transport and Locational Signals in the Presence of Large-scale Variable RES-E

Gregor Zöttl (Professor of Economics, University of Erlangen Nuremberg): “Transmission and Generation Investment in Electricity Markets: the Effects of Market Splitting and Network Fee Regimes”

Friedrich Kunz (Senior (Post-Doc) Researcher, DIW Berlin): “FTR Allocations to Ease Transition to Nodal Pricing: An Application to the German Power System”

Mark O’Malley (Professor of Electrical Engineering, University College Dublin): “Integration of Variable Renewables: What the Market Can Do to Help or Hinder?”

10h50 to 11h10 Coffee

11h10 to 13h00 Session 6 A More Active Role for Distribution Grids and Demand

Cajsa Bartusch (Researcher, Division of Industrial Engineering & Management, Uppsala University, Sweden): “Policy and Regulatory Implications of Distribution System Operators’ Economic Incentives to Promote Demand Response”

Patrice Geoffron (Director- CGEMP, and CEEM, Université Paris-Dauphine) and Cédric Clastres (Assitant Professor, PACTE-EDDEN, University Grenoble-Alpes and CEEM): “Smart Grids And Flexibility Provision: Which Specific Value Of Flexibility Services By Decentralised Demand-Response Products In Active Distribution Grids?”

Dan Roberts (Director, Frontier Economics): “DNOS, Cost Reflective Distribution Tariffs and Optimising Demand Side Response”

Anna Creti (Professor of Economics, And CEEM, Université Paris-Dauphine): “The Protection of Consumers by Last Resort Tariffs: Who Has to Pay for System Transformation?”

13h00 to 13h30 Session 7 Concluding Roundtable on Elements of a Target Model 2.0 for the European Electricity System

Manuel Baritaud (IEA), William D’haeseleer (University of Leuven Energy Institute), Dominique Finon (CEEM and CIRED-CNRS), Jan Horst Keppler (CEEM, Université Paris-Dauphine), Fabien Roques (Compass Lexecon and CEEM).