An Empirical Delineation of the European Market for Electric Power Generation

By A. Bousquet, C. Cazals, M. Ivaldi and N. Ladoux

Discussion by Natalia Fabra

The Economics of Energy Markets

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Overview and Discussion

- The title suggests (or: this reader is biased to interpret) that the paper is about:
  - Delineating the relevant market for electricity in Europe
  - The relevant market as the set of countries or technologies, whose (electricity) prices can be raised jointly profitably
- This topic is high on the European energy agenda:

Neelie Kroes' remarks on Energy Sector Competition Inquiry (10/1/2007)

There is an absence of cross-border integration and cross-border competition. Incumbents largely keep to their traditional markets, and rarely enter other national markets as large scale competitors… energy prices for commercial users vary significantly from Member State to Member State. These differences are not eroded through import competition… Incumbents stick to their home markets.

Overview and Discussion

- Even the paper is not about what the title suggests, it addresses an important topic:
  - To which extent the different electricity production technologies are substitutes to one-another (at the investment stage)
- Methodology:
  - Estimation of production functions with different functional forms: CES, nested CES and Generalized Leontief
  - Focus on the elasticity of substitution, "a measure of the ease with which the varying factors can be substituted for others" (Hicks, 1932)
- Results:
  - Nuclear and thermal capacities are substitutes, while they are both complements to hydro capacity

Overview and Discussion

- Coexistence of different technologies is intrinsic to electricity:
  - Capacity constraints to existing technologies
  - Diversification as a hedge strategy
  - Role in security of supply
- ….and poses the biggest regulatory challenge:
  - Different technologies, with extremely different cost structures, compete to supply the most homogenous good one can ever imagine:

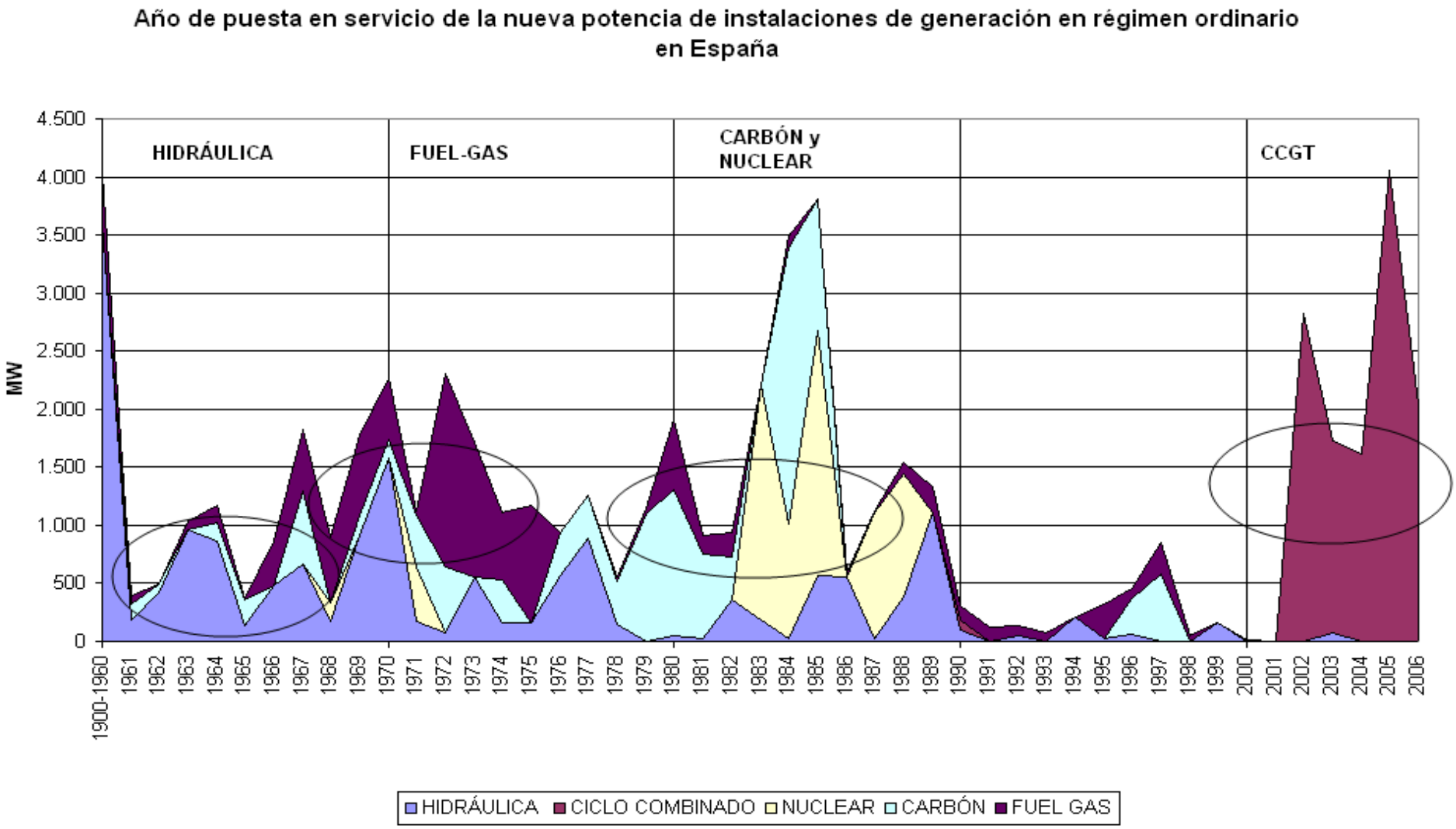
How best to design trading arrangements so as to induce an efficient dispatch, avoid excessive rents, and promote efficient investments (both in terms of quantity and technology mix)?

  - Without constraints on how much can be invested on each technology, competition at the investment stage would just absorb windfall profits, but….

Overview and Discussion

- At the investment stage, the choices available to investors are limited. Currently,
  - Opportunities to invest in hydro capacity are exhausted
  - For political reasons, nuclear isn't an option in most places
  - For environmental reasons, coal is not an option either
  - …CCGTs seem to be the only viable alternative.
- In every point in time, the market chooses a single technology: coexistence arises because of the long life of assets, not because of substitution possibilities

Investments by technology type in the Spanish Electricity Market 1960-2005



Overview and Discussion

- What is the life of these assets?
  - In order to identify substitution possibilities (if any), one would have to analyze longer time horizons
- Results may be contaminated by very different (across countries and across time) regulatory regimes
- The parameters of the production function need not be constant across time:
  - Have you performed the estimations with different time frames?
- Renewable resources are playing an increasing role
- Need to distinguish coal-fired from CCGTs/oil plants

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