Risque d'investissement et sélection d'arrangements verticaux

Le problème du développement du mix optimal

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IEA report on Investment in electricity markets (2007)

"Power companies face the risk of losing money if they make the wrong decisions, but it balanced by the incentive of making greater rate of returns if their decisions are the good ones.

Hedging risks through long term contracts could be seen as handing over these opportunities for greater to other parties

who arguably are not in such a good position to make the decisions as the power companies themselves"

CEO of Constellation Energy (september 2007) considers that in its EPR Maryland project,

"Some of the output may be sold under long term contract, but (its) project could in fact be built with all the output being sold into the wholesale market".

1. Introduction

- In the referential decentralised market model with pure producers and pure suppliers:
  - Total investment risk is borne by the producer-investor
  - Investment behaviour in generation are dominated by
    Risk management criteria rather than min. expected levelized costs

  Two problems
  - Peaking units investments are affected
  - CCGTs development are favoured to the detriment of coal plants and nuclear plants: less capital intensive and self hedged

- Problem of long term social efficiency
  - Trajectory of the equipement mix grows away from the optimal mix
  - **In particular that means : higher marginal prices for the consumers**

- One question:
  - Does the Market adapt spontaneously to search other solutions?
    Do market players develop vertical and horizontal arrangements away from the decentralised model?

1. Introduction (following)

- In fact

⇒ 1. Failure of the model of the merchant plant with spot and short term sales… and without long term : bankruptcy

⇒ 1 bis. Almost no investment is done under pure merchant plant model

⇒ 3. Almost all the Investments have been done, or are done under Long Term Contracts (LTC) or by Vertically Integrated Firms…

Why?

⇒ Because they better solve two big problems :

⇒ investment risk re-allocation away from the sole producer-investor: how to meet interest of counterparts to be hedged too?

⇒Transactional complexity associated to risk management

⇒But it remains to solve the issue of opportunism of actors

⇒(for instance large buyers do not show their interest to hedge

Only Eight Projects and Realisations of pure merchant without ex ante LT contracts in Continental Europe since 1998

- In Italy, the CCGT projects of the Swiss company EGL with a tolling contract with the parent company : the Rizziconi plant of 760 MW commissioned in 2007 and the Calenia plant of 760 MW
- In Italy, the CCGT projects of the Austrian Verbund in partnership with the Benedetti financing group (with the two Sorgenia projects of 770 MW),
- In Italy the CCGT projects of Tirreno Power project which is less archetypical because it is a joint company of different partners (Electrabel, ACEA, Verbund, etc) which some have supply business in retail sales.
- In Spain, a project of CCGTs of 1200 MW, developed by AES (71%) and Gaz de France (26%), which is backed up on a tolling contract of 24 years with GDF but without prior power sales agreements with electricity suppliers or large consumers.
- In Germany, the Concord Power project of CCGTs of 800 MW in Lubmin (Mecklembourg) promoted by Saalfel Group with no PPA relations with electricity suppliers.
- In Germany, the Soteg (Luxemburg) and Gazprom's project of CCGTs of 800 MW in Eisenhutt (Brandenberg) with non PPAs relations, but a gas agreement with Gazprom.
- **Sources: "New Power Plant Tracker" *Power in Europe*, Issue 508, September 10, 2007.**

2. Flaws on the premises of the decentralised market model on long term

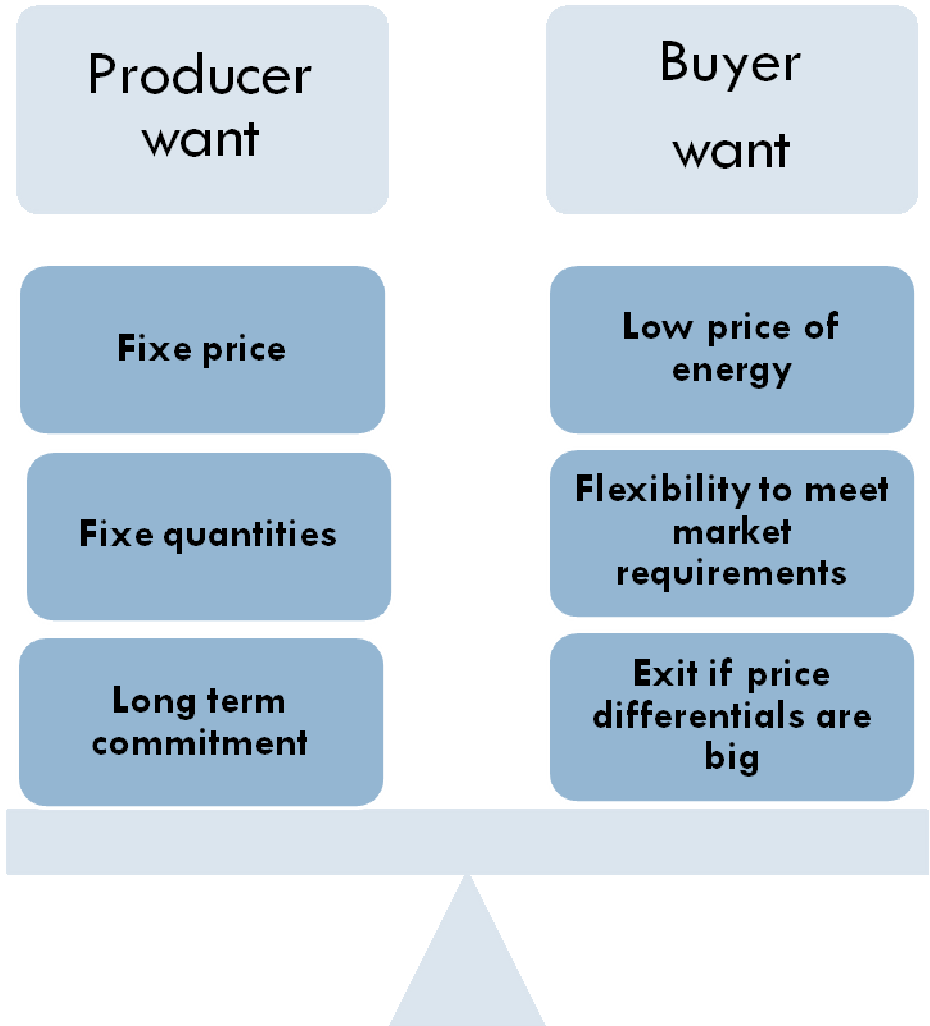
- Premise 1. Former v**ertical integration** can be replaced by **bilateral contracts and spot market relations**

- Premise 2. Besides financial hedging, interest of investors and large buyers –suppliers or large consumers-- are converging for hedging their risks

- So the suppliers and consumers which wish to hedge such risks are supposed to express their preference for technology mix and fuel diversity: e.g. direct contracting with specialised producers

- **Long term contracting** to allocate risks between producers and suppliers
  - The fixed price fixed-quantity contracts
  - Fixed price contracts
  - Tolling contracts (fuel price risk on the buyer)
  - Option contract:

In fact not so converging interests



Flaws in premise 2

- **Interests of entrants and large buyers (suppliers, large consumers) are not converging for hedging their risks**

- **Difficulties in forward contracting for suppliers and large consumers**
  - Suppliers are hesitant to contract fixed price and fixed quantities when their customers can switch to alternative providers,
  - Even commited in fixed price PPAs,
    - supplier should follow wholesale price moves (keeping market shares) ,
    - and consequently they bankrupt if price downturn (TXU-Europe case)
  - Moreover they want to adjust contracted quantities to contingencies affecting loads whereas generators do not.

- **Also Difficulties for long term contracts for large consumers :**
  - Incentive to break a long term contracts if price downward (opportunity cost)

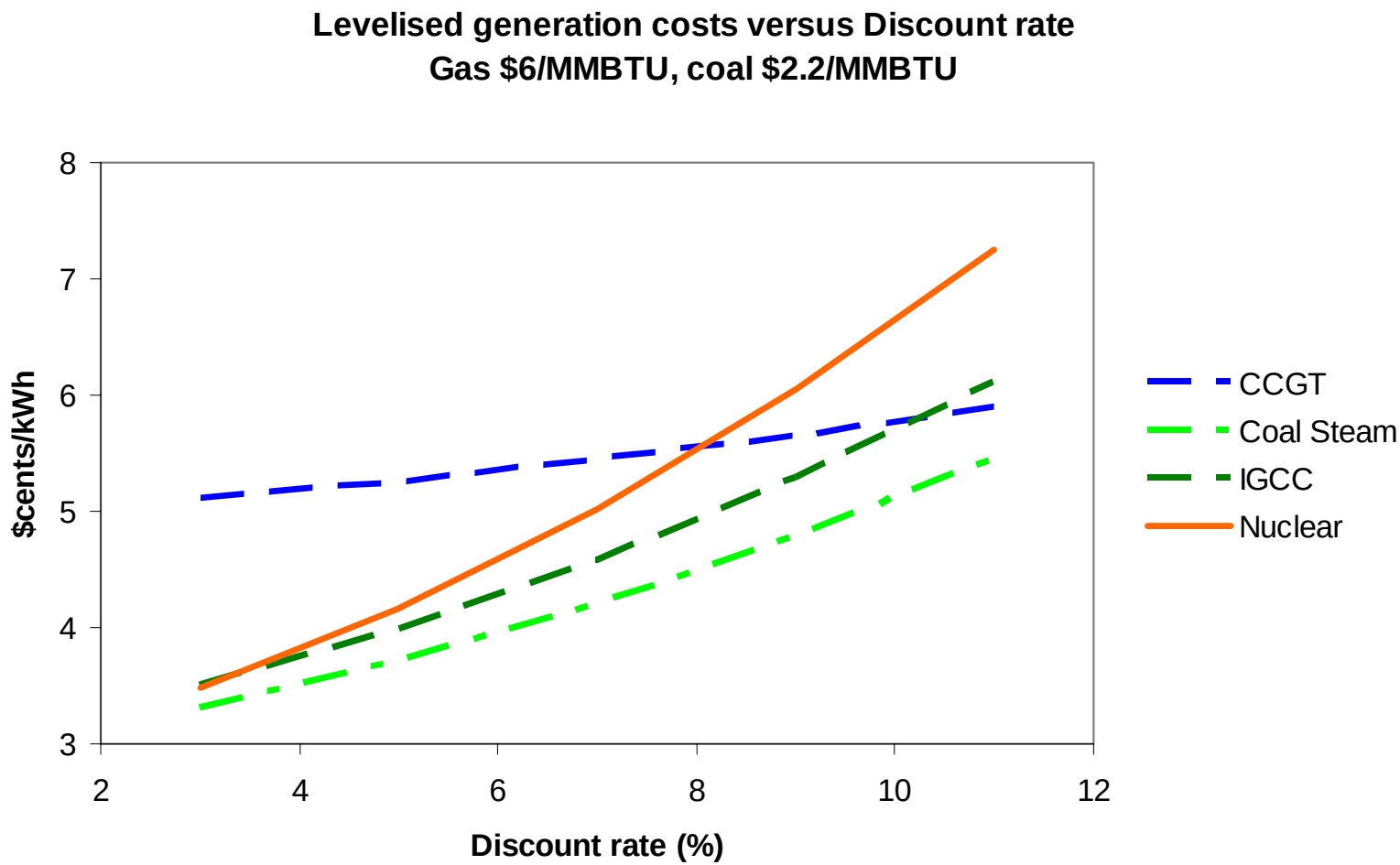
Flaws in premise 2: consequences

- Consequence: Contract duration is typically no more than two or three years, a minor fraction of the life of a plant.

- Indexation of price on the wholesale price

- Consequence : it leaves pure generators exposed to substantial risk
  - 1. therefore they are required to pay **higher costs for capital**
    - **(Risk aversion of lenders)**
  - 2. Suboptimal investment in capital intensive projects
    - Disinterest for coal plants, nuclear plant, renewable
  - 3. They still prefer CCGT : low capital intensiveness and self hedged management

Sensitivity of generating costs to cost of capital



3. The need of adaptation of the decentralised market model

- Tool box of Transaction cost economics : Williamson (1985; 1996)
  - Three classical options for managing transactions :
    - Spot Market Contract
    - Long term Contract
    - Vertical Integration
  - How to develop specific assets (coal CCS, nuclear) which could reduce costs comparatively to standard technology (CCGT here)?
  - How to secure investment in specific asset with risk of opportunistic behavior (OB)?
  - Use tools and contractual provisions to obtain credible commitment:
    - hostages & safeguards to mitigate risk of OB

3.1. LT contracting with large consumers

- Joint venture around a capacity development and operation
  - *Ex : EU chemistry*
  - **The hostages in the set of contracts can be**
    - the common asset,
    - the co-production of two products : heat and power (in excess of the indistrialosts needs),
    - Use of by-product
- Horizontal association: cooperative of large consumers & suppliers
  - Ex : *Finnish TVO consortium:* **a cooperative which sell by long term PPA at cost price to its members**
  - Hostage: common ownership
- Virtual Power Plant solution
  - *Ex: Exeltium*
  - Hostage : the initial payment
  - *No link to a specific equipment; no exposition to operational risk*

	Contribution to investment	Technical and commercial shared risk	Governance Issue	Margin over Cost to be accepted by consumers
Consortium producers – industrial consumers	High	High	High	Low
Consumers cooperative of production	High	Medium (depending on the terms of PPAs)	Medium	Low to medium
Long term VPP	Medium	nil	Low	Medium (depending on competition)

3.2. LT contracting between new production and suppliers with a large base of core consumers:

- Such a base of sticky consumers give creditworthiness to suppliers
- The historic LSEs in US markets (Joskow , 2006, Chao, Oren et Wilson, 2008):
  - Provision of the last resort supplier is a powerful way to keep customers for historic supplier
  - In the US, banks lend money to IPPs with long term contract with historic LSEs
  - In Europe the inactive consumers base
- No jump or a come back to consumer franchise for small consumers (Green 2002, Newbery , 2004: Ropkof, 2007)):
  - (Cost pass-through)
  - But difficulties of regulation : tendering for sourcing

3.3. The alternative of vertical integration to LT contracts

Less governance cost than set of LT contracts

- Perspective of the generators : control of the volume risk
- Perspective of suppliers :
  - Need of physical hedging of suppliers (Centrica, other UK suppliers)
  - More manageable than complement to long term contracts as coverage

The case of the vertical re-integration in the UK

- Advantage to displace the profitability along the value chain in relation to changes in economic context

3. 3. (Followed)
Combination of vertical integration and portfolio of assets

- Portofolio of different types of assets:
  - the producer share the risks between generation asserts at the place of the consumers

- Better financing conditions:

  - Corporate financing instead of project financing

- Pre-existing large sized vertical and diversified companies

  - Scale economies in risk management

  - Eventually use of power market to increase the price-cost

  margin in order to make investment attractive by anticipation of scarcity

4. A brief conclusion : an application to nuclear investment in liberalised markets

Market risk and nuclear investment: Who can bear the risk?

- Merchant nuclear investment is risky
- Some consumers (e.g. electricity intensive) might prefer stable elec. prices
  - **hold shares in nuclear companies**
  - **sign long-term nuclear contracts**
    - **Finland: future EPR output sold at production cost to TVO shareholders**
- **Consortium of historic suppliers and independent producer**
  - **South Texas Project**
- Large vertical companies with strong balance sheet
  - **can finance new plant with own cash flows and transfer (part of) the electricity price risk to consumers**
  - **Vertical integration and ‘sticky consumers’**