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New modes of governance of low carbon investment in de-optimized power sectors:

The impossible challenge of efficiency and equity

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Conference « New target model fot the EU elec Markets »

8-9 july, 2015

- 1. Comparative effectiveness of low carbon mechanisms in power markets

- 2. Which way to monitor distributional effects?

A distributional problem appears after a threshold of low carbon technologies (capacity and energy)

  - Physical threshold at around 15% of energy and 30-40% of capacity
  - Cost threshold: € 10-20 milliards when total market revenues of production around € 30-40 billion
  - Who pays?

Part One
Effectiveness of low carbon arrangements in power markets

Farewell to the Useful former vertically integrated utility model for dealing with public policies

Area service monopoly allowed planning and programming

Monopoly License with public service obligation: geographic price equalization, social tariffs,

Nationalized monopoly: industrial policies (promotion of large sized technologies and national manufacturers)

Optimal mix investment (caveat : error of forecasting)

Blessful era of dispatchable technologies

Tariffs aligned on average cost for all the consumers
(eventually horo-seasonality with non linear tariffs with capacity price under the so called mariginalist tariff)
Inclusion of the public service obligation and industrial policy costs in the tariffs

Eventual distributional issue :
Some cross- subsidisation for large consuming industries if industrail lobbying as in some European countries

- Quite controlable if solid doctrine like LRMC tariffs in France)
- Norm of consumer protection (stronger with the PUC culture in the USA than in Europe)

US approach to decarbonisation in power sector

Why not the carbon price to trigger low carbon technologies development (RES-E, CCS, new nuclear) or less emitting one?

(Besides **market failures in matter of learning process** which was the rationale of subsidies on investment and on production either by tax credit, public subsidies and now by FIT financed by levy)

- The Clean Power Plan's EPA in the US proposes three options to states regulators
  - Cap and trade (so carbon price)
  - Baseline and credit (standard and tradable performances certificates; so an implicit carbon price)
  - Clean energy obligation (a general RPS)
- So explicit confidence to carbon pricing effects with choice 1 and choice 2
- Possibilities of success in the USA because the transitional option of gas power production (not the case in the EU)

In the European Union

- Carbon tax in some countries for non ETS sector
- ETS with grand fathering (carbon rent for the generators)
- Then ETS with auctioning

But the climate policy has de facto annexed in the EU (the famous 3x20)

- the former RES-E programs based on FIT, renewable obligation (equivalent to RPS in the USA)
- the energy efficiency programs (DSM, Energy efficiency obligation , CERT in the UK, etc.)

In fact no confidence at all in the price signal of the carbon pricing

Overlapping of instruments (with some negative trade offs)

Package of instruments covering centralized and decentralized technologies

Two functions:

- To add a support for non-mature technologies and transfer the overcost onto the consumers
- To transfer the main part of the risks on the consumers (or on the public budget)

- Feed-in tariffs
  - presently to be replaced by different types of feed in premiums,
  - auctioning for medium sized projects in the EU, but jsut for expose the RES-E producers to hourly market price
- Auctioning for long term contracts for new RES-e or large sized RES-e (France, UK, NL, DK, etc.)
- Obligation of green certificates on the suppliers (UK, Sweden, Belgium, Poland) or in the past on producers (Italy)

How to maintain incentive to control project costs and technology risks on the operators?

Incentive also to efficient operations

Farewell to the market regime model

The market model with decarbonisation public policy is in first based on planning and then on some forms of markets

- Out of market entries of RES-E (FIT, RO/RPS, auctioning)
- Need of LT arrangements for large sized low carbon technologies

Only the residual system is supposed to be optimizable by the text book approach

End use pricing

- Wholesale price (sourcing costs) +
  uniform levy for capacity +

  discriminatory levy for decarbonation policy +

  Possible discrimination of transmission costs

So Possible huge implicit cross- subsidization (under political discretion) :

Difference of end use prices between consumers

Comparison of characters of main mechanisms

Principles	Type of arrangement	Autonomy let to generators in investment decisions	Role of the current market	Public governance
Decentralized coordination: **Price instrument**	**Fixed FIT** **(with obligation of purchase)**	Freedom of timing Orientation of choice by technology FITs	No responsibility of RES producers on markets (priority access)	1. Regulator determines annual payment on long term by technology. 2.Tuning of FIT for new contracts
Decentralized coordination : **Quantity instrument**	**Clean energy obligation on suppliers** **Renewables obligation** **Renewables Portfolio Standard (RPS)**	Freedom of timing and choice of technology (in fact technology bands)	Responsibility of intermittent producers on balancing and energy markets	Regulator definition on target trajectories, On buy-out price, (penalty) on technology bands
Centralized coordination : **Auction for contracts with public agency**	**Fixed price contracts (physical)** **Contracts for difference CfD (financial)** **Variable premium FIT**	No technology neutrality (issue of learning investment) Neutrality in future	Responsibility of producers	Regulator defines timing of auction, target by technologies

Principles	Type of arrangement	Advantages	Limitations
Decentralized coordination: **Price instrument**	**Fixed FIT(with obligation of purchase)**	Simple and adaptative Effective	1. Risk of overcapacity by technology 2.Exposure to regulator capture risk 3.A bit less incentive to operational efficiency
Decentralized coordination : **Quantity instrument**	**Clean energy obligation** **Renewables obligation** **RenewablesPortfolio Standard (RPS)**	Less rent than with FIT Revelation of informations Total cost control by buy-out price Supposed to control installed capacity	1.Addition of market risks (wholesale energy , certificate price 2.Risk of illiquidity of exchanges if vertical arrangements 3.Risk of regulatory capture(Banding) 4. No respect of the capa . obj.
Centralized coordination : **Auction for contracts on LCTs**	**Fixed price contracts or** **CfD (financial contracts** **Variable premium FIT**	1.No asymmetry of information on price 2.With CfD, Revenue stability on long term (difference with fixed Premium FIT)	Difficulty with price reference for strike price Transaction cost

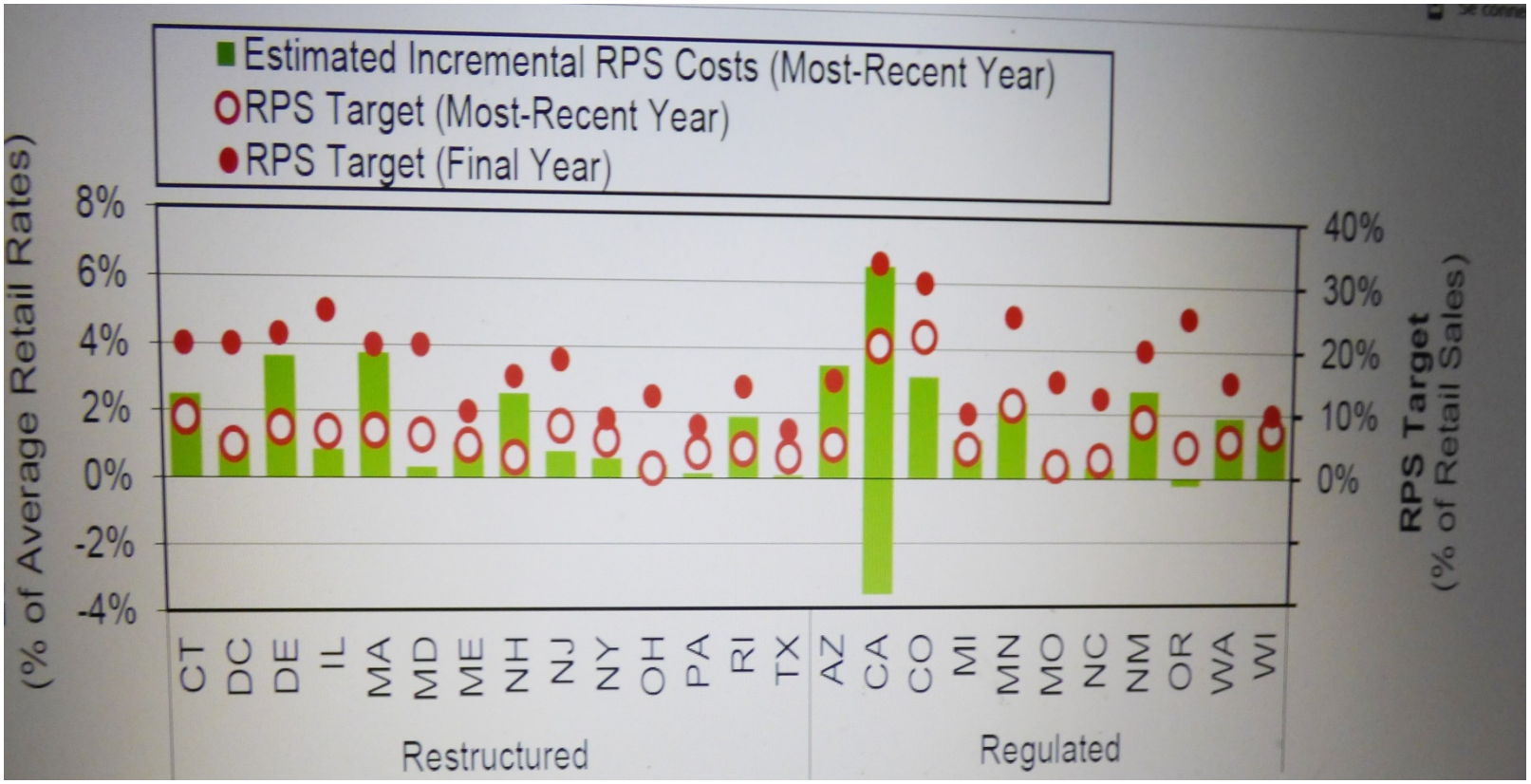
Part 2. The monitoring of distributional effects

- Who pays? Management with endemic practices related to the historic norms of consumers protection

- Development of cost containment practice

The debate is not yet appeared in the US because the yet limited costs of the RPS and DSM in the bills

source NREL, May 2014



But great awareness to protect the consumers by the PUCs

The exemplary recycling of the carbon rent in the Californian ETS with free allowances:

Utilities receive free allowances

But are required to auction them and rebuy it

→ Reveal the cost of the allowances to be passed through in the tariffs

All auction proceeds have to be paid back by utilities to customers through flat “climate credits” ($35/semester in 2014)

More than offset price increase to low-income households

Who pay in Europe?

Before reforms the cost of the public service obligation and the industrial policy imposed to utilities was internalized in the budget of the utilities

After reforms and decarbonisation polcies (ETS introduction in 2005)

1. The carbon rent is remained in the hands of generators (even the emitting ones)

   No investment at all in low carbon equipment (CCS fro instance)

2. In general small consumers (households ans SMEs) pay in each EU-member for the FIT costs

2 bis When it is a RO obligation, more difficult to observe who pays

- But alignement of the market price offers on the buy-out price penalty whatever the price of the certificates (in the UK and Nordic countries for instance)

Who pay?

	Germany	Italy	France	Spain	UK
Households and SME	62€/MWh Explicit in the bill	36€/MWh SME more than households	8 €/MWh for RES+CHP CSPE explicit in the bill	Most charge than indus-try	Uniform levy to be added to the present RO cost and CERT cost of the suppliers Non explicit in s contracts
Energy intensive industries	0.5€/MWh (5% of the total cost)	0 ?	Free tax threshold of 7 GWh/y		

The need of cost containment procedure

	Present total costs	Explicit cost containement with cap	Payment by discriminatory levies	Partial non payment of
Germany	€20 billion per year	€ 20 billion	Yes	
Spain	€11 billion per year (21% with CHP)	?	Yes ?	Transformation tariff deficit in a restructured fund in 2009 (funded by 10% of bills) Tax of 7% on the electricity utilities (2013)
Italy	€12 billion	€ 12.5 billion	Yes	
France	€5.5 bilion (with CHP)	Not yet	Partly	Govt debt to EDF : 2.5 billion
UK (without the Renewable obligation)	£5.3 billion	£ 7.6 billion in 2020	Uniform levy to be added to the RO cost of the suppliers	

Procedures of cost containment are in development

The UK case of the levy control

(Levy funded expenditures on FIT, CfDs and Warm front, but not RO, and CERT

- Cost transparency (regular publication of anticipated cost)
- Control of the increase with definition of a cap
  - Need of credible scenarios of development of different measures to make cost anticipation
  - To test the interactions between options (for instance CfDs for large RES-E, nuclear, feed in tariff for small technologies)
    - Scenarios within the cap and scenario outside the cap
  - Methods based on a model of investment choices andn market simulation (strike price)

- Creation of a board for the control of expenses but not the outcomes
- (for instance, no advice to give about the selected CfDs and their costs) :

  Question mark : what would happen with the nuclear CfDs if the cap will stay fixed in the future?
  One HP contract CfD = 4.5 billion

- Some self adaptation : if above the cap, decrease of the Feed in tariffs

- Could it serve as a commitment?

Alternative : to control FIT premium by a cap + limit of installation per year and techno (Germany, Spain)

As a conclusion

From an Institutionalist perspective:

The effectivenesss of a regulatory and organisational model depends upon:
1/ **its internal consistency** and **2/its coherence with the institutional environment** (competition rules, soft laws) (Aoki, 2004).

- Is there still a consistency?
- all the market coordinations are defintively distorted for short term and long term coordination
- Increasing discrepancy between market price and LRMC/average costs
  - Illustrative case In Germany households and SMEs pay a RES-E levy higher than the energy cost

  No more normative reference (compass is there but no more magnetic North)
- Competition policy regulator likes his compass but there is no more North

A test about the redistributive question

Second best theory (Lipsey et Lancaster, 1956) is it valuable?

Ramsay Boiteux approach about the charge to be supported by different group of taxpayers or consumer groups : **charge inversly porportional to price elasticity**

Could it be a justification? The magnetic North has disapppeared

Constant exposure to lobbying pressures and kabbalist interpretations of the competition law at the EU level