C.I.R.E.D.
CENTRE INTERNATIONAL DE RECHERCHE SUR L'ENVIRONNEMENT ET LE DÉVELOPPEMENT

The social efficiency of the RES-E instruments: The brides are not so gorgeous

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Plan

- Introduction
- Economic efficiency of the FIT and quotas system
- Environmental effectiveness
- Compatibility with the competitive regimes of electricity industry

1. Introduction

Indirect subsidisation of the new RES-E production

Pillars of the instruments:

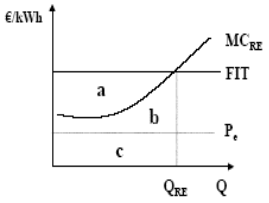
- Obligation of purchase of RES-E or RECertificates
- Supplementary paiement on a long run period
- Pass through on the consumers

To afford to developers of RES-E units and bankers for project financing
securisation of investment in order to control costs and risks

- **Exchangeable quotas supposed to be the ideal instrument: discussion**
  - Capacity for the government to control the costs
  - Incentive to control and reduce the costs of projects
  - Limitation of the costs for the consumer
  - Integration of an European market of certificates to decrease the cost of the European policy
- **There is no ideal instrument**
  - Importance of contingencies (culture, governmental preferences, compromise,type of reforms etc)
  - Answer to drawbacks: Flexibility of instruements and capacity of adaptation

Three criteria

Social efficiency: normative approach by Public Economics



- **Second best optimum :**
  - **optimal balance between costs and positive externalities (CO2, security,etc)**
- **Collective costs (b)**
  cost for consumers (a+b) *minus* the profit/rent for the RES-E producers (a)
- **Redistributive effect (rent) and acceptability**
- **Dynamic efficiency:**
  - Side-effects on industrial development
  - impulsion to technical progress

Environmental effectiveness:

- (indicator of performance: the **rate of realisation)**
- Level of the incentives and predictability
- Transactional efficiency and securization of RES-E investment (Langniss et Wiser, 2003; Finon et Perez, 2005)

Compatibility to the competitive regime of electricity industries

Caveat :
Properties of instruments in an ideal context

- Rules of connexion to grids
- Rules of paiment of balancing costs (producer RES-E, mandated buyer) and reserve costs **(2GW for 15 GW)**
- Licencing process:
  - Administrative barrier (beyond the normal administrative learning)
  - Points of veto of opponents
- Understanding the network of actors and the barriers for each technology
  - (exemple of the biomass flop: local actors in agriculture/forestry, etc.)
- Consistency of political attitude
  - Favorable policies imply:
    - » Mutualisation of costs (balancing cost from 6 to 3 €/MWh)
    - » Local citizens'financing participation

2. Social efficiency

2.1. Control of the collective cost and the developers'rent by quotas

Debate between quantity instrument and price instrument

A/ Feed-in tariffs as a price instrument

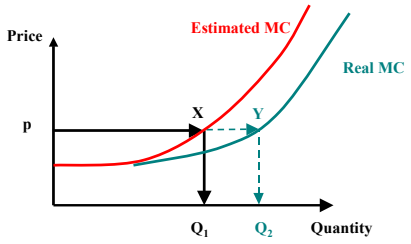
- **Feed-in tariffs may give result well beyond implicit target if the estimated curve is overcome by reality**

or below target conversely

if it is underestimated

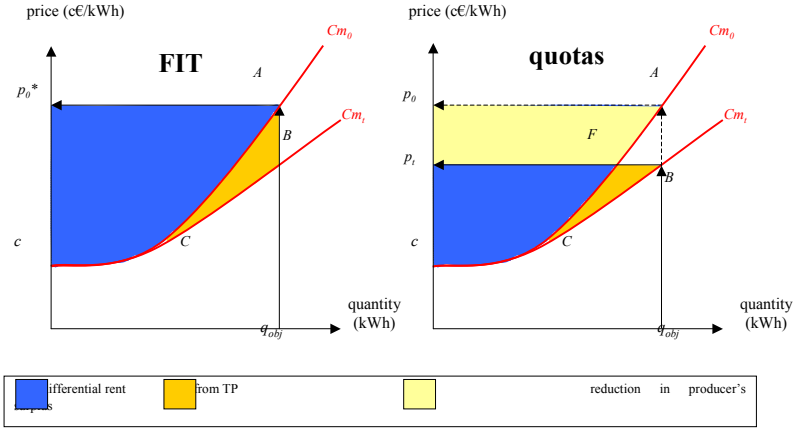
(case of some technologies as biomass FIT in spain or in France)

FEED-IN TARIFFS



B/ Quotas as a quantity instrument

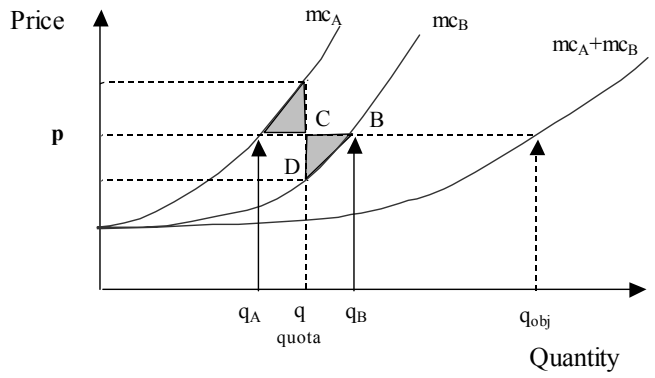
Control by the quantity: exemple of the rent derived from technological progress



Theoretical attractiveness of quotas by market incentives

1. Market pressures: competition between developers to sell to mandated suppliers

2. Optimisation by exchanges
   - between regions with different resources or with different skills (E.U.integration)
   - between suppliers-developers (or regional companies if still monopolies)



Discussion 1/
Economic efficiency of quotas versus FIT:
cost for producers

- 1. Economic efficiency **in the FIT**: **there is market pressures**
  maximizing profit and reduction of long term cost by competition for construction contracts

- 2. **In the quotas**: Importance of the risks for the developers and their lenders:

  – **Risk on the price of certificates**
    » **Volatility on a narrow maket** with **no price elasticity** up to the penallty(risk of market power)
    » **Regulatory risk** (regular assessment, change of eligible technologies as for co-firing in the UK)

  – **Risk on the wholesale energy price,**
    » on the recycled green premium
  – the opportunity cost (CO2 value, fuel value)

Need of high risk premium

Remark: importance of the design of the rules in the quota system

- **Very simple design for the FIT**
  - » (price, period of stability, term of compensation for the overcost of the mandated suppliers)
- **Complex design for the quotas/certificates and regulatory risk**
  - – Need of consistency, foreseeability and stability
  - – To avoid flaws which create barriers to entries or which disincites to invest
    - » Content of the portfolio
    - » Duration of the certificates, banking, borrowing,
    - » Ceiling and cap
    - » Long term trajectory of the quotas

Discussion 1/ Economic efficiency and equity of quotas versus FIT (following)

3. Quotas and FIT:

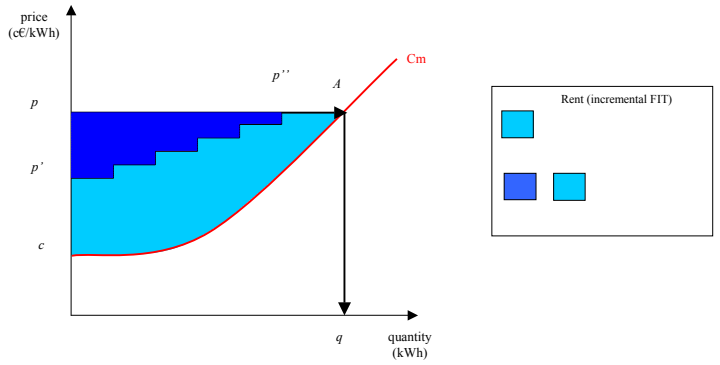
Revenus of the developers with quotas identical to those with FIT system (or higher because of multi risks)

In the quotas: Higher redistributive problem than in the FIT:

: **Unequality of the cost passthrough on the different market segments**, but it is hidden problem

	Feed in tariff	Bidding	Quotas
Developers profitability	**7 to 9 c€/kWh**	**4 to 5 c€/kWh**	**7 to 8 c/kWh in the UK**
			(Source : Mitchell et al. 2004, 2005)

Advantage for FIT: flexibility of tariffs and limitation of rents



Discussion 2/ Dynamic efficiency

FIT

- ***Diversification of tariffs by degree of maturity***
- ***Induced technological progress by learning***
- Long term view of developers and Possibility of implicit partnership with national manufacturers

Quotas

- ***Specialisation on the more mature technologies***
- Need of other type of support for other technologies:

Complement with bidding or FIT

Discussion 3/
Conditions for integration of REC markets at the European level

- **Need of complete harmonisation at two levels:**
  - **1. no other forms of subsidization**
  - **2. Design of the rules of the quotas system**
    - **Content of the portofolio**
    - **period of certificates, banking, etc**

- **Not the least:**
  - **need of integration of wholesale markets**
  - **But Existence of barriers by market rules and capacity**
  - **Key importance of heterogeneity of balancing markets as a barrier**

- **Some chances to have REC markets integration at the regional level**
  - **quasi-integration of electricity markets**
    - **Nordic countries, Iberic countries, E&W-Scotland**
    - **But markets splitting on part of the year**

- **Do not forget:**
  - **differentiation of quotas per country because of the difference of resources and costs**

2. Environmental effectiveness

- FIT:
  - 1. high level of the tariffs
    - (governemental tendency to be generous
  - 2. Securization of the investment
    - Public commitment on the long term (15-20 years)
    - Backed by explicit contracts for enforcing **in some cases (Spain)**

- Quotas:
  - Monitoring by the quantity and the penalty to reach the official target
  - But Possibility of poor design and regulatory risk:
    - In particular need of very long term trajectory of increase
    - desincentive to invest if uncertainty on rules
  - No direct securization of investment as for FIT
    - Adjonction of technology and increase of certificates supply

Low transactional efficiency with the quotas

Choice of institutional arrangements between developers and mandated agents

a. Vertical integration
- b. Purchase RES-E by LT contracts with guaranteed price
- c. Purchase green certificate

- **Empirical observation :**
  - *Convergence with the lessons of transactions costs economics*
  - Choice of **vertical integration** or **long term contracts** with indepeendent (UK, Texas with RPS)
    - A way to limit investment risk and to allow borrowing and cheaper financial rate
  - **Marginal recourse to green certificates sales or purchase**

3. Compatibility with the competition regime

- **Two main issues:**
  - **Who is mandated to buy RES-electricity or certificates?**
    - Problem of « de-territorialisation » of the supply with the completnees of eligibility
    - Quotas is th e idealm instrument
  - **How to respect competition equity** (transparency, non discrimination in the bearing of the cost of obligation)?
- All the state-members will stay at a stage of oligopolistic model
  - with no legal and ownership unbundling in distribution
  - with large firms with a quasi captive market

Conclusions

- **Re-Estimation of the advantages of quotas/certificates**
  - **The « quasi lure » of the REC market**

- Two advantages of quotas
  - Compatibility with the extreme competition regime with total unbundling
  - Political acceptability by industry and regulators
    - (internalisation of the cost

- No idealization of the justification by an ideal European paradise of unique REC market
  - why to harmonize?
  - Where are the negative effects of the absence of harmonisation on the competition?

- The best recommandations :

  - To adopt flexible FIT or smart Quotas
  - To have clear reecommendations on connexion and balancing rules
  - to suppress administrative barriers
  - To cope with the « network innovation » barriers for the latecomer technology (biomasse)