

Design of tradable white certificates schemes involving various EU Member States

EuroWhiteCert final workshop

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Feasibility of tradable white certificates (TWC) systems involving various EU Member States

Main documents produced :

- **Certification guide** - Supply side: measurement and verification of energy efficiency projects
- **Work package 4.1 report** : past experience and guiding principle in M&V
- **Work package 4.2 report** : Creation of a database of supply of certified projects (modelling the Offer side)
- **Work package 4.3 report** : Demand side: identifying alternative market participant types and structuring the demand side
- **Work package 4.4 report** : Estimates of potential benefits and costs of white certificates

The certification of TWC

Lessons from the data base

- First of all, what may happen in a reasonable time frame is a system common to a few countries, not a “unified market” of 25 or 27 countries.
- The recent directive on Energy Efficiency and Energy Services gives common basis for energy saving accounting common to all EU countries.
- The recent green book on Energy Efficiency mention explicitly the possibility of a TWC market common to various EU countries.
- The existing TWC systems started to diverge.
- For instance some consider there are target populations or target zones, with a bonus that other countries will not recognise.
- Some systems use TWC to promote cogeneration or renewables.
- Some systems use TWC to generate fuel switch by introducing conversion coefficients.

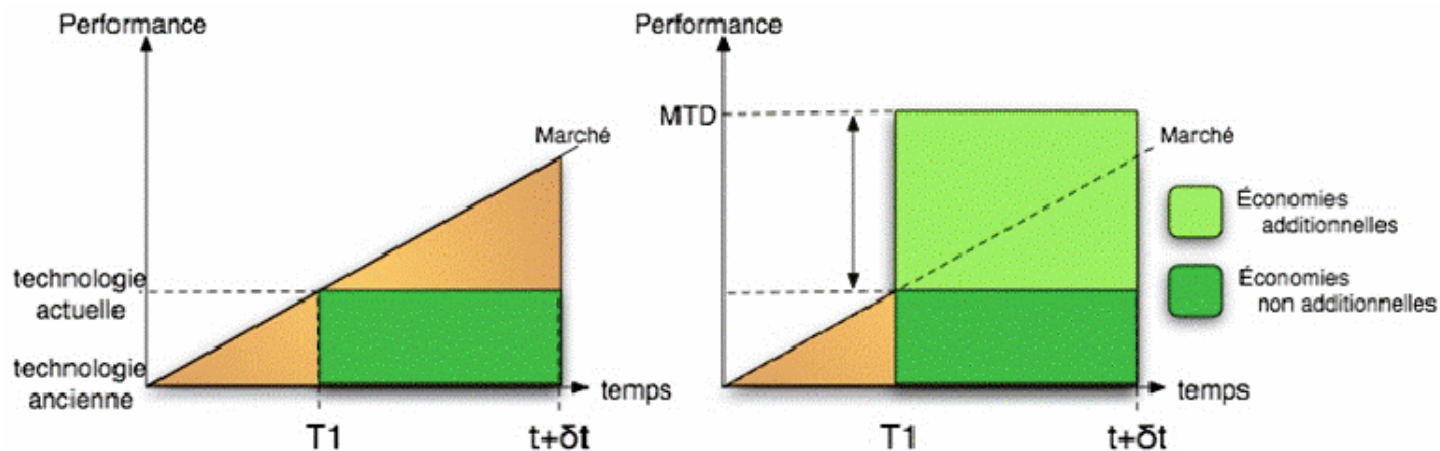
How to measure something “missing”? What is an energy saving? How long will it last?

- Ex post certification costs hundreds of hours, which may be a very high source of expenses for small projects, up to 20%.
- The potential domain of excellence of « ex post » systems is large savings and large investments.
- The ex-post certificates could be awarded only year after year, which is penalising for the investor.
- On the opposite checking of TWC delivered ex ante may cost a few hours
- To lower “transaction costs”, TWC should be awarded ex-ante and in only one package.
- Before the project starts, the energy saving attributed to it, is already calculated and set.
- Those estimates vary depending on a limited number of identifiable parameters

Who can certify savings?

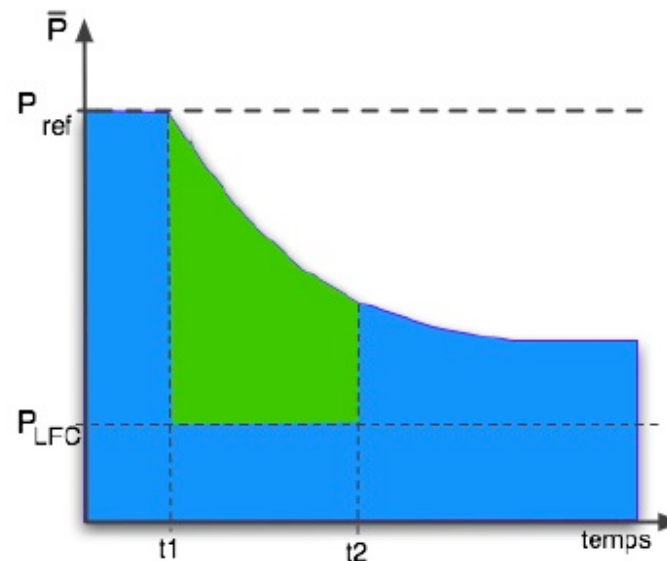
- There is a need for one single regulator establishing certification rules and solving conflicts.
- There is also a need for a single register but there is room for many traders, if they find market opportunities.
- The regulator and the register will become transnational if the TWC become transnational.
- There is a need, project by project, for an “independent body”, or better” a body acting independently” from the people who will receive the TWC. It’s like a quality system : not everything should be checked by the independent body, but the management system should be checked and part of the realisations.
- This can remain national if a common standard is established.

Which baseline to consider? What else has to be considered in designing an obligation of savings common to various countries?



After a small timestep there is a need to estimate again the benefit
 When the diffusion rate of a technology reaches 50-60%,
 one stops the program.
 there is no need to invest in the promotion of a technology
 already known and diffused; one already changed the market;
 there will be already a new technology to promote

Savings measured by TWC are not absolute savings but additional (in a certain country)
 They are rescaled from time to time (every three years for instance)



The key issues that a certification guide for Europe should tackle :

- Selection of the proper unit: commercial or primary energy, saved over life time or yearly, discounted or not
- Recognition of ex ante principle as the main principle
- Recognition of independence of certifiers
- Common understanding of additionality
- Namely : for which products additionality is similar between MS
- Common calculations, instead of the completely diverging methods of today
- Acceptance of common definitions for energy services having really an energy saving content

- **NO TRADE IS POSSIBLE WITHOUT STANDARDISATION FIRST**

Lessons from the data base of 50 documented case studies

Metrics for savings (primary energy, CO2, etc.)

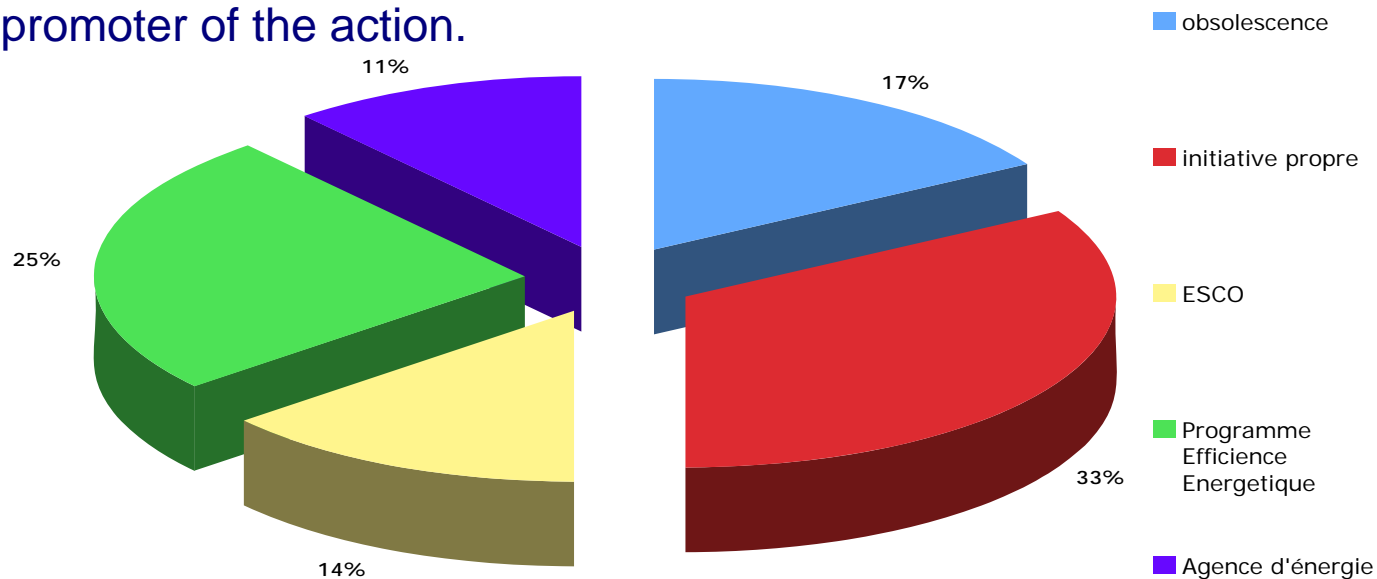
- we found practically that there is only one possibility common to all member states : commercial energy accounting
- Accounting for savings in “oil equivalent” impossible because of fuel mix for electricity generation.
- Accounting in CO2 is premature because the electricity market is not really unified
- the CO2 contents are completely different from one country to another
- from one energy company to another.
- Furthermore in the same country CO2 should then be calculated for each end use
- Energy savings and fuel switching cannot be achieved with the same tool

The offer of TWC

Lessons from the data base

Three promoters of Energy Savings: energy consumer, obliged party, an intermediary

- about half of our case studies originates from inside the energy consumer
- another half the promoters are said to be from outside.
- We don't have the same economic behaviour of actors according to the promoter of the action.



“The best intermediary for the project”

- a technical know how,
 - a capacity to fund on a long term,
 - a capacity to operate,
 - a special capacity to collect proofs of purchase
 - a “supply chain of TWC”.
 - The value of TWC should at least pay for the “supply chain” of collection of proofs
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- Some “Energy agencies” are project developers
 - They differ from other ESCOs in the sense that it is a semi-public body
 - projects concerning residential and tertiary buildings.
-
- In some way the obliged utilities will be in the same situation as Energy Agencies are

Very different cost sharing factors (cost sharing between customer, eligible and obliged parties)

- Three situations of market structuration
- 1. All market power on the side of eligible parties (no possibility of generation of TWC by obliged parties)
- 2. All market power on the side of obliged parties (no possibility of generation of TWC by other parties)
- 3. Shared market power (possibility of generation of TWC by eligible and obliged parties)

- situation 1, the eligible parties will obtain the most from the obliged, who will be in competition.
- situation 2, the obliged parties can offer smaller contributions, without intermediaries to their own consumer
- EEC is not far from situation 2 and we can observe in general a partial support to consumers of the type 50/50

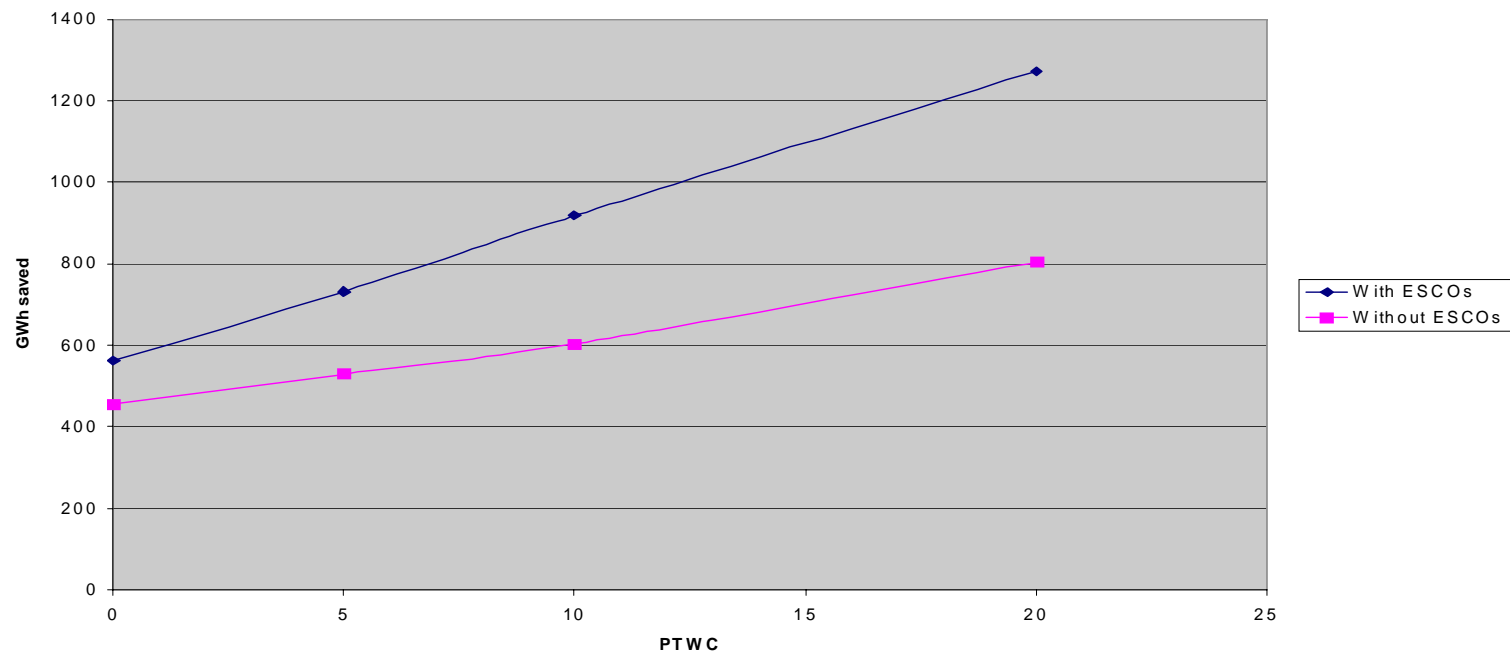
Cost sharing factors in EEC

Residential techniques under consideration	Share of total cost of EE (including TC) borne by the obliged party
Insulation of existing residential building	40 to 55%
Insulation of existing electrical water heater	80%
Fridge saver type schemes	0%
Other appliances	30 to 40%
Boiler replacement by efficient boiler	70 to 80%
Heating control upgrade	40%
CFL - direct	80%
CFL – through retail	40%

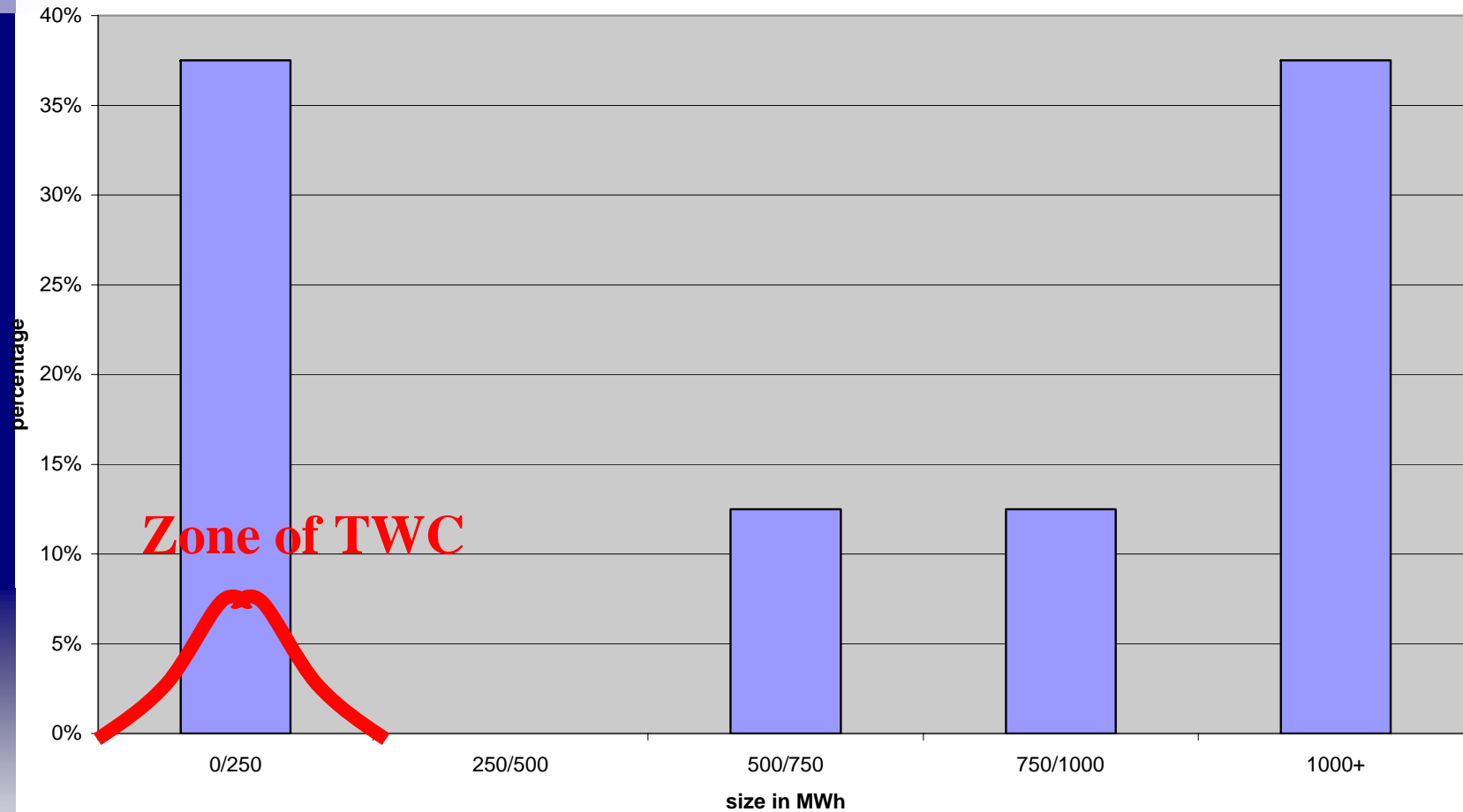
We have used a sophisticated model of TWC generation (not simply a cost sharing) but compatible with this data

Example : variation of GWh savings available in French industry, depending on market price PTWC

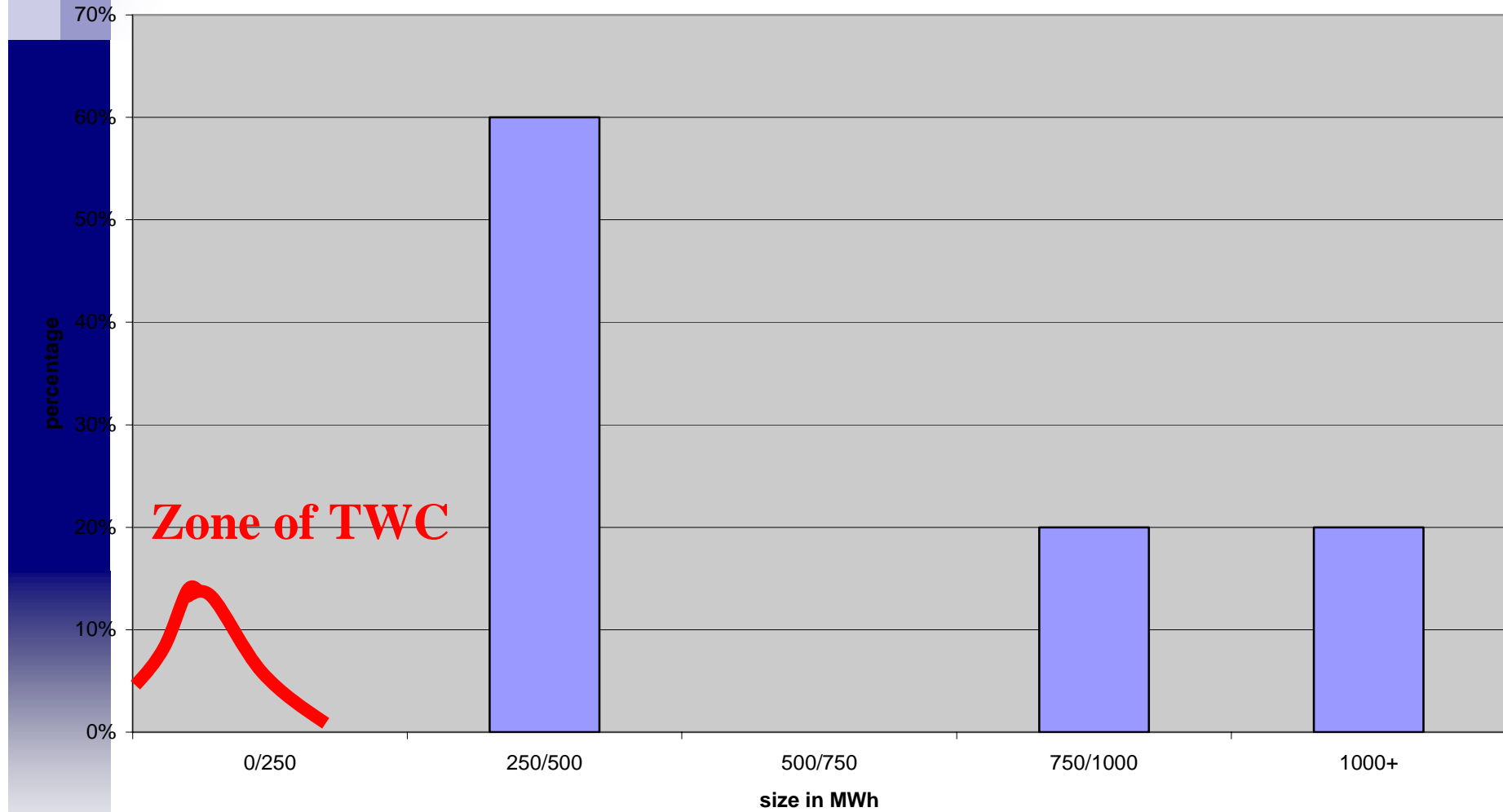
Influence of ESCOs and TWC price



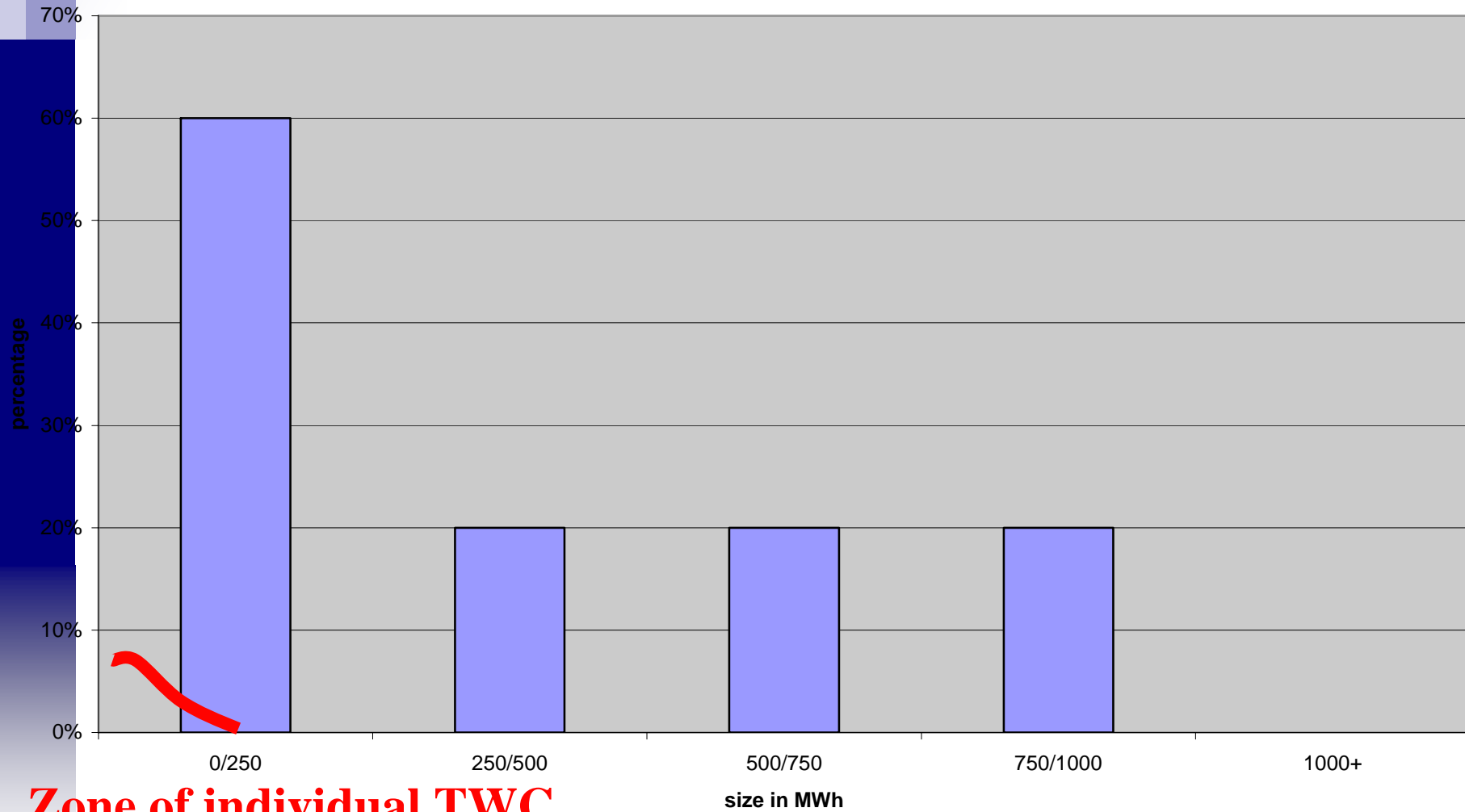
Most industrial projects have to be cut into pieces to be certified



TWC are targetted on the large number of medium size non residential buildings

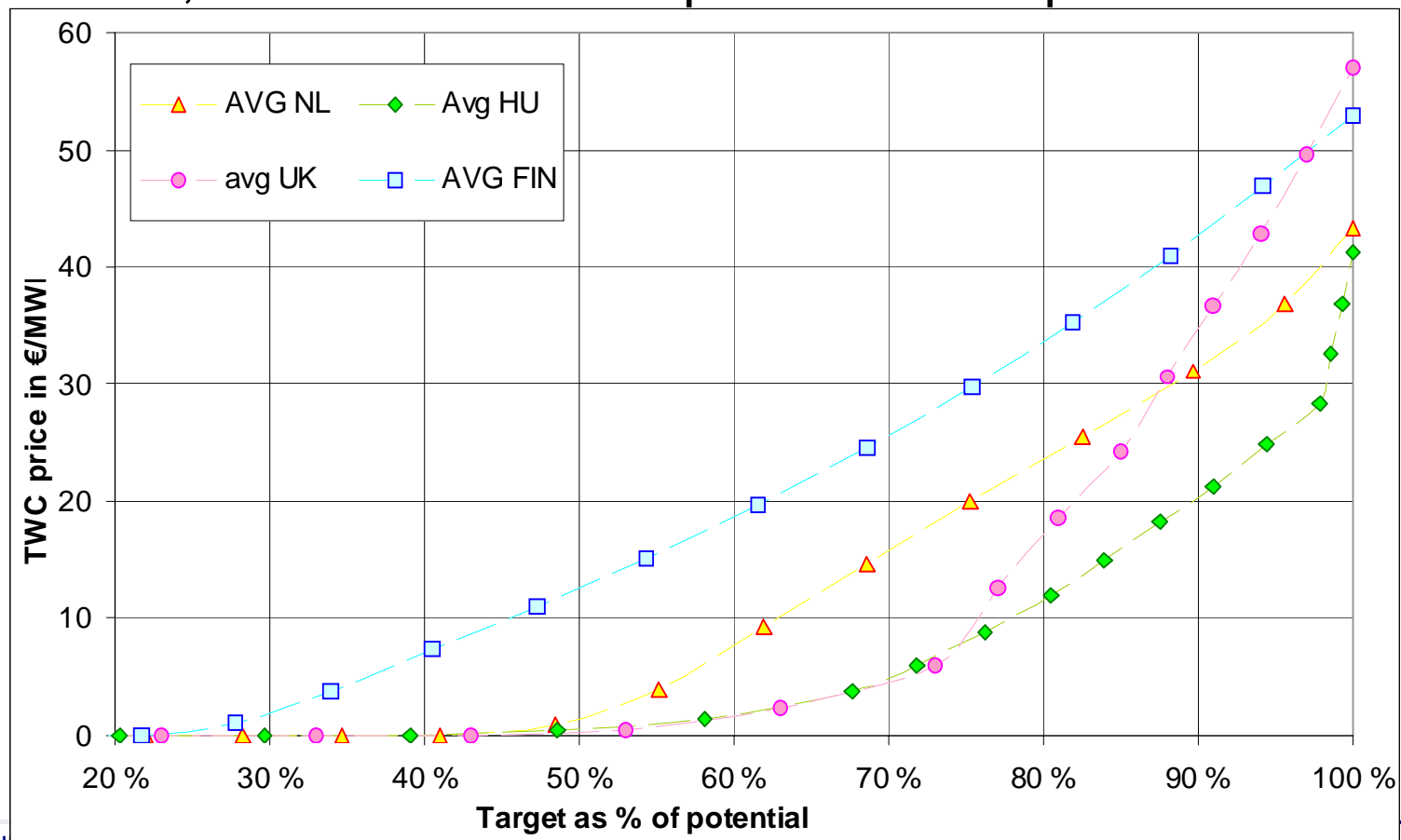


In residences hundred of users have to be aggregated to make one TWC project



Zone of individual TWC

In most countries the target needs to be above a substantial share (60%) of the overall estimated potential, in order to ensure positive TWC prices



Estimated energy saving potentials (GWh) for a low and a high case and the parts (85%) addressable by TWC system (GWh and % per year and commitment period)

Low	B	B + O.I.	85% B	85% B+O.I	% / year	% / period
Finland	330	433	281	368	0,32 %	1,94 %
Hungary	590	651	502	554	0,45 %	2,71 %
Netherlands	1000	1182	850	1004	0,39 %	2,35 %
UK	2320	2855	1972	2426	0,26 %	1,58 %
EU25	20973	25266	17827	21476	0,39 %	2,33 %
High	B	B + O.I.	85% B	85% B+O.I	% / year	% / period
Finland	1000	1311	850	1114	0,75 %	4,48 %
Hungary	590	651	502	554	0,41 %	2,45 %
Netherlands	2900	3427	2465	2913	0,96 %	5,78 %
UK	6000	7383	5100	6275	0,55 %	3,32 %
EU25	46735	56302	39725	47857	0,80 %	4,77 %

The demand of TWC

Consortium members identified and selected respondents from the six respondent groups

- Energy distributors and suppliers,
- Large energy consumers,
- State authorities in charge of subsidy disbursement,
- Business entities that have entered into voluntary agreements,
- Businesses or other entities maintaining a green image,
- Financial institutions active in energy efficiency

Energy distributors and suppliers

- the most obvious buyer of white certificates
- While energy price is still the major argument to gain new customers, building customer loyalty with the provision of added-value services is gaining importance
- most suppliers – both currently under saving obligation, or put in a hypothetical situation of being obliged to assist their customers to save energy – would rather implement projects themselves
- they would only consider purchasing certificates if they face a serious threat of undercompliance.
- In countries where no saving obligations are in place suppliers emphasised that cost neutrality in terms of both investment costs and foregone sales
- in general positive incentives are preferred that will allow suppliers to make higher profit by saving a kWh rather than selling.

TWC as a tool for public policies, namely in combination with subsidies

- result-oriented subsidy is granted based on energy saved.
- In practice linking subsidy distribution to certification of savings goes against the common logic of investment-based support.
- Local authorities need a minimum price guarantee to generate TWC and that could be a more efficient use of public funds than direct subsidies
- employing certificates as a tool to optimise the performance of subsidy schemes and voluntary agreements,
- employing white certificates by companies that want to build green image, by large consumers and by finance institutions.

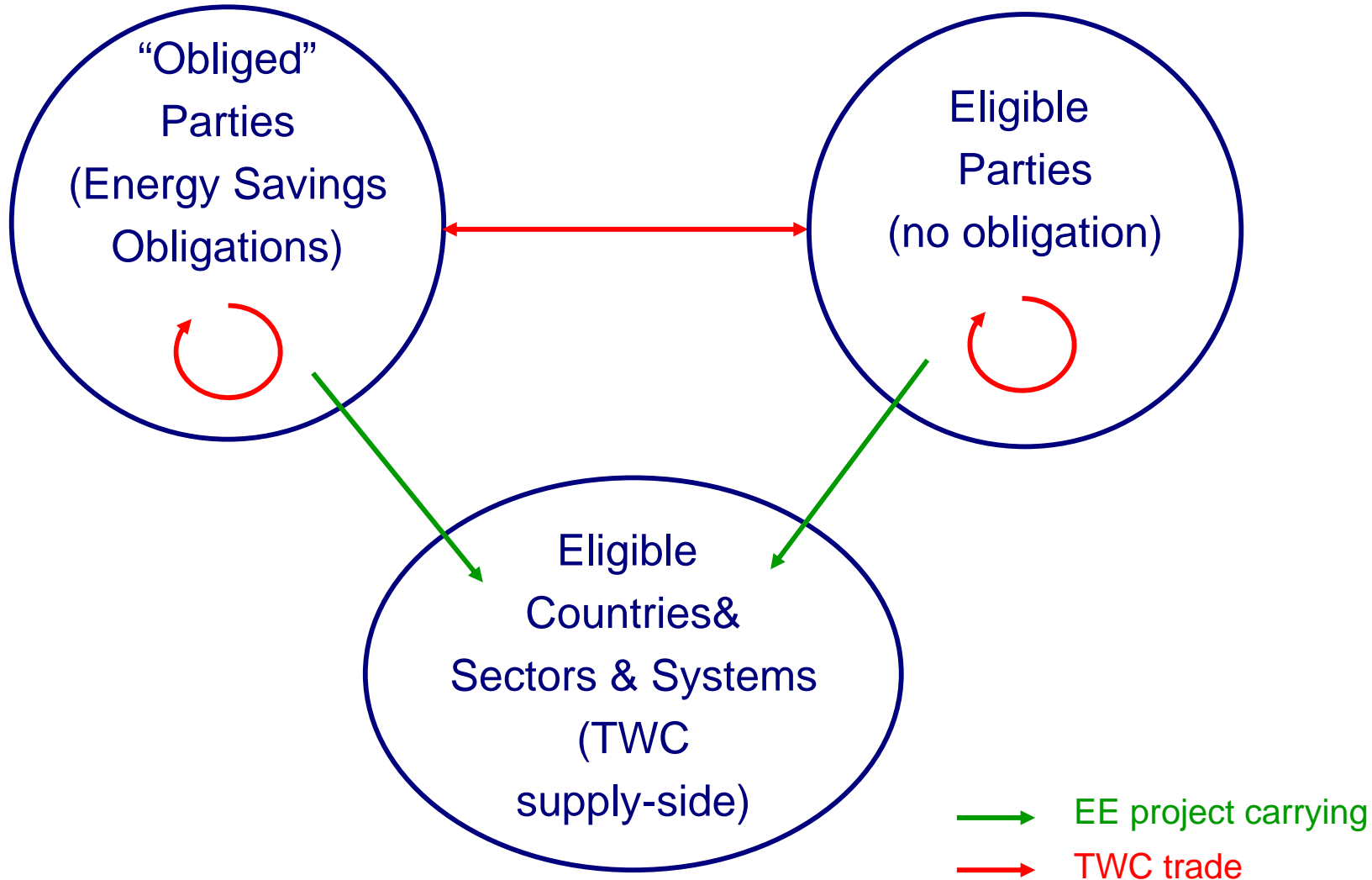
Non obliged parties

- White certificates can in principle be introduced as a verification tool in the framework of voluntary agreements, or parties under voluntary agreements can be allowed to buy certified
- For companies that want to build a green image : an instrument for measuring the financial effects and CO2 savings of energy efficiency projects
- The prospects of offering climate neutral products were emphasized: either as own product of the company or as a service to other companies who want to offer their products with the added bonus of climate neutrality.
- Finally, certified energy savings could contribute to increased credibility and lower project risk for finance institutions. TWCs can thus be submitted as collateral

«For the time being the possibility to elicit demand for white certificates outside the scope of formal energy saving obligations appears insignificant »

EU market of TWC?

Three double sided markets + degrees of freedom in projects definition



The different type of actors, taking part into the system, could be simulated or played by a human actors (role game).

Involving human players, especially if they are possible further actors of such a system, allows :

- to represent non-rational behaviour and to show their consequences on the functioning of the system;
- to analyse financial or industrial strategies implemented during the “game”.

Different scheme designs can be tested by playing many simulations sessions : the analysis of the changes of behaviour player allows to evaluate the relative efficiency of each design.

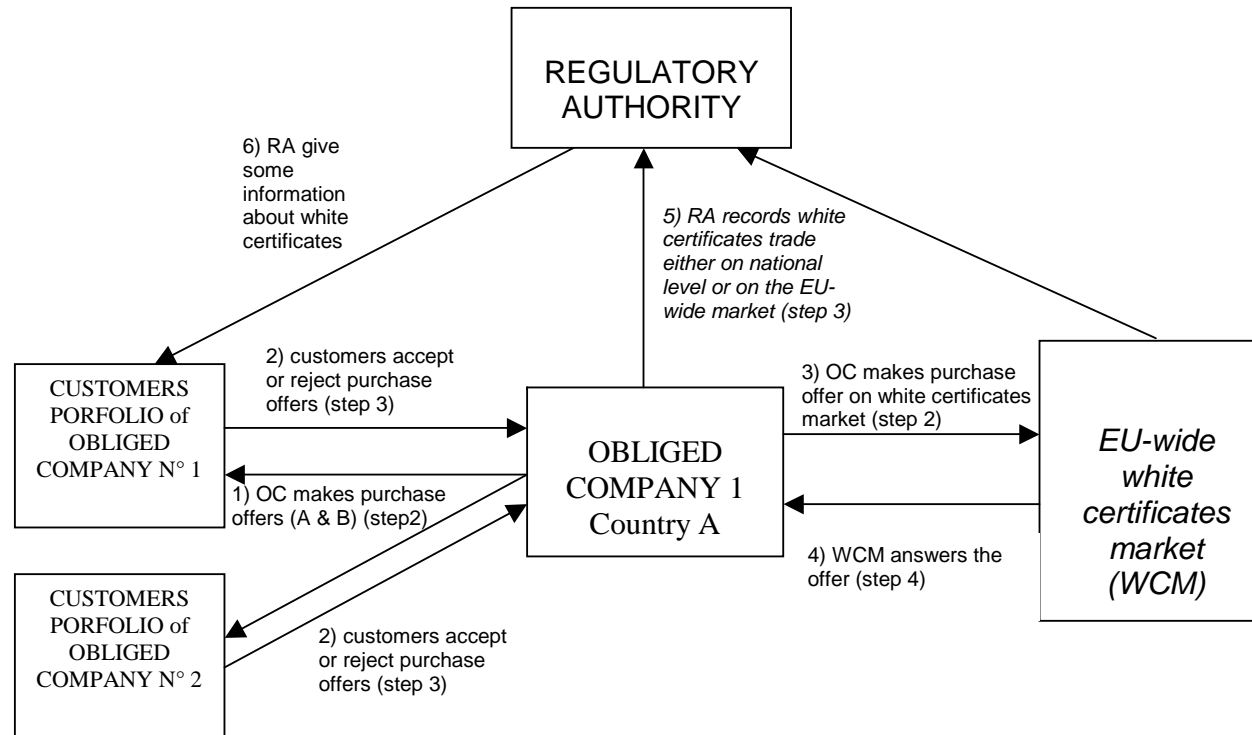
Drawing the features for simulating a white certificates scheme



- The 1st phase : 3 years ;electricity, industry and local authorities
- Orders and trade daily by email between the human players and a referee
- Time scale : one turn (one worked day) = one quarter

Market design features	Session 1	Session 2	Session 3
Eligible energy	Electricity		
Eligible sector	Industry	Industry	Industry & Local authorities
Eligible EE project	Standard actions		
Energy savings	Yearly	Yearly	Cumulated over lifetime
Eligible parties	Obligated parties only	Owner and ESCO only	Obligated parties only
Obligated parties	Countries		Energy providers
Eligible parties	No voluntary actors		
Obligations level	~0,2 % of national electricity consumption		3 % of eligible sector electricity consumption
Penalties	50 €/MWh		
Guaranteed minimum price	no		25 % of average market price
Banking	No (no further compliance period)		
Type of market	OTC (bilateral negotiations)	EU-wide spot market fed by surpluses from eligible parties	EU-wide spot market fed by sale offers from obligated parties

EWC 3 simulation



Main outcomes of EWC3 simulation :



Players who reach the lowest cost for TWC have :

- purchased by their own customers (lowest transaction costs)
- purchase regularly (nearly same amount each quarter)
- do not purchase on the market

Energy savings have to be considered as a flow that TWC can increase, not as a stock.

- ⇒ ***The market could not be fed sufficiently (not enough liquidity) : less than 9% of the total issued TWC have been exchanged on the market.***
- ⇒ ***Despite NMS can provide low cost TWC, their flows are insufficient in comparison to the energy savings target.***
- ⇒ ***Member States and utilities are looking for the positive externalities of Energy savings, not only for the realisation of obligations at low costs***
- ⇒ ***Specific applications : balancing between countries; higher efficiency in using subsidies (lever effect); etc.***