

Introduction to Energy Companies Obligations and White Certificate Schemes

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Introduction

- **Market-based instruments** (MBIs) are public policies which make use of market mechanisms (some with transferable property rights) to distribute the burden of a public policy.
- In the **energy sector MBIs** have been used to promote RES-E and to cut harmful emissions (e.g. CO₂, SO₂, NO_x quotas coupled with permit/allowance trading).
- Theoretically MBIs **minimize cost for society** for reaching a certain target (static efficiency) and create incentives to innovate and improve performance (dynamic efficiency).
- These instruments could be of mandatory or voluntary nature

De-regulation and EE: creating compliance markets

A possible market-based policy portfolio (compliance market) oriented towards end-use energy efficiency could comprise

- **Energy-savings quota** (**obligation**) for some category of operators (distributors, suppliers, consumers, etc.). The **quota** is achieved by energy **savings** associated to energy efficiency **projects**.
- Projects savings verified **by an independent authority (e.g. the regulator)**
- At the end of the period the **subject under obligation** must have **savings** related to projects to show compliance
- In some scheme the saving are **certified by means of the so-called “white” certificates** (certificates for energy savings), ;
- In some scheme the savings or the certificates or the quota **could be traded**;

Definitions

- **Energy company obligations:** schemes where an energy saving target is imposed on energy suppliers (retailers) or distributors, very seldom on generators (in the US also know as EERS).
- **White certificates:** the energy savings are certified.
- **Tradable white certificates:** in this case there is trading (among obliged subject or among obliged and eligible subjects).

Nature of tradable white certificates

- A white certificate is both ***an accounting tool***, which proves that a certain amount of energy has been saved in a specific place and time, and a ***tradable commodity***, which belongs initially to the subject that has **induced the savings** (implemented a project) or **owns the rights** to these savings, and then can be traded according to the market rules, always keeping ***one owner at the time***.
- As for renewable electricity certificates (a.k.a. green certificates), the value of the white certificate is different from the economic value of the saved energy (Euro/kWh). It is determined by the demand and supply (linked to the ambition of the energy saving target and to the cost of saving energy)
- In principle white certificates can also be established for a **voluntary market** (this is happening in the US).

Justification/rationale for implementing suppliers obligations or white certificates schemes

In countries where suppliers obligations or white certificates are already in place it is found that justification/rationale for implementing energy companies obligations or white certificates schemes (as an alternative to other energy efficiency policy instruments) typically is:

- Higher cost-effectiveness in the achievement of given saving targets;
- Creation of incentives to privately finance energy efficiency (ESCOs, etc.);
- Saving of public money (if compared with classical subsidies for energy efficiency);
- Avoidance of energy price distortion between sectors (if compared with energy taxes);
- Avoidance of the very high transaction costs typically caused by the introduction of energy performance standards;
- Higher consistency with liberalized energy markets;

Design features of Energy Company Obligations and Tradable White Certificate schemes (TWC)

- A rather strict focus on savings in **energy end-use**;
- **Binding and meaningful energy saving targets** expressed in energy units;
- Provisions to ensure that energy savings are **additional** to a well specified baseline;
- Extensive **monitoring and verification** systems by independent organisations;
- Inclusion of **penalty systems** for breaching regulation and non-achievement of targets;
- Provisions to promote or even mandate **transparency and harmonisation** in energy efficiency project and programme assessments, thereby paving the way for the tradability of certificates;
- Creation of Certificates which could be made tradable with a limited set of additional regulations.

Key features

The key elements of suppliers' obligations and white certificates schemes:

1. The **creation and framing** of the demand (government set the **overall target** and the rules for its **apportioning to obliged actors**). Targets are expressed in absolute values (then apportioned according to different rules) or as percentage of energy sales.
2. Institutional **infrastructure** and processes (such as measurement and verification, checking compliance, etc.) to support the scheme.
3. A system of **sanctions** in the case of non compliance
4. The **cost recovery** mechanism, in some cases (optional).
5. The **tradable instrument** (certificate) and the rules for issuing and trading (optional).

Major design choices

- The results delivered (compliance, dominant projects and sectors) are determined the nature of the projects
 - Size of the obligation
 - Choice of primary or final energy or CO₂,
 - Obligated and eligible actors,
 - Sectors covered
 - Eligible measures and lifetimes of measures and additionality
 - Measurement & Verification of savings (M&V)
 - Cost-recovery mechanisms
 - Interactions with other policy tools.
 - Trading rules
 - Sanctions
 - Overall policy framework

System scope 2/2

- A trade-off between harnessing the **full potential of a market-based instrument** and **managing the complexity and cost** of administering the system;
- In theory the wider the scope in terms of types of projects (compliance choices) and the fewer limitations in terms of compliance routes, the greater the benefits of the scheme, especially in terms of **trading and compliance costs**;
- Wide coverage implies more **diverse marginal costs** of compliance among trading parties and greater benefits of trading;
- On the other hand, extensive scope may result in difficult and expensive administration of the scheme.

Obligated parties 1/2

- **Suppliers** (retail companies) – UK and FR
 - Strong links to the final consumer and may have the motivation to offer value-added services;
 - Uniquely placed to provide information about consumption through billing and metering processes and to inform consumers about measures on offer.
- **Distributors** (DNOs) – IT, DK and Flanders
 - More stable regulated organisations, which are natural regional monopolies and will not go out of business (as may happen with suppliers);
 - With proper tariff regulation, they do not have the strong push to sell 'more kWh', as is in the case of suppliers;
 - However they are disconnected from the end-user and thus may lack motivation to do end-use energy efficiency.

Obligated parties 2/2

- Small market actors may be excluded (at least initially);
- Target apportionment
 - Based on market share (IT and DK; market share + turnover: FR) or number of consumers (domestic only: UK);
 - Target can increase linearly (all EU schemes) or not linearly with the obliged party size.
- Grid-bound energies only versus wider scope
 - Grid-bound energies (UK, IT and Flanders) or also other regulated energy providers (FR and DK), France also non-regulated (heating oil and transport fuel)
 - Regulated versus non-regulated energy segments
 - Start smaller scale (e.g. grid-bound only) and expand scope
 - The 2011-2013 France obligation has included also transport fuel suppliers who are obligated to realise about 26% of the total target for this period (345 TWh cumac)
 - Market distortions may in principle arise when both actors regulated (e.g. suppliers of residential el. and gas in FR) and actors not subjected to price regulations (e.g. suppliers of transport fuel in FR) are put under obligation.
- Large end-users
 - Are utilities best positioned to deliver savings in an efficient manner?

Key Issues: Baseline definition in estimating savings

- The savings must be beyond current policies or market averages (additionality);
- Baseline shall be set at or above present regulation;
- Sales average and performance of the most commonly used appliance on the market “average-on-the-market” (appliances and equipment);
- Average consumption of the stock of equipment;
- Existing building stock (e.g. in insulation measures for existing buildings in France);

Baseline in Italy

- In case of either a **replacement** or the installation of new equipment, the baseline is the consumption of the average-on-the-market appliance (*the “before” situation irrelevant, early replacement not encouraged*)
- In case of **addition of an energy saving product** or component to an existing facility (VSD to a motor, thermal insulation and PV generator to a building, ...), the baseline is the energy consumption without the measure

Measurement and verification of energy savings

- **Ex-post evaluation** based on “metered” data approach may result too costly for small projects (up to 20%), but guarantees “real” savings.
- The potential domain of excellence of «ex post» metered approach is large savings and large investments, as the rate of transaction costs due to measurement and verification of savings tends to become lower.
- To lower “transaction costs” due to Measurement and verification (M&V) of energy savings, the measurement is often **ex-ante**
- Nevertheless there can be dangers associated with purely ex-ante schemes (like partial realisation of savings, poor additionality, etc.) if EE measure impact is not well understood.
- Usually the **measurement** is done by the **obliged or eligible subject**, while the **verification** is done by the **independent authority**
- If the measurement is done ex-ante, the verification could be done ex-post

Measurement and Verification

3 main M&V approaches (example of Italy):

- **deemed savings** approach (saving per unitary actions fixed ex-ante) with fix default factors including adjustments for free riding, delivery mechanism and persistence: no on-field measurements required;
- **engineering approach**, fixed model with some on-field measurement;
- a third approach based on **monitoring plans**: comparison of measured or calculated consumptions before and after the project, taking into account changed framework conditions (e.g. climatic conditions, occupancy levels, production levels); all monitoring plans must be submitted for pre-approval to the authority and must conform with pre-determined criteria (e.g. sample size, criteria to choose the measurement technology, etc.).

Main compliance routes and practices adopted

In most supplier obligation schemes obligated parties are allowed or may decide to choose one of the following actions to comply with the target or otherwise pay non-compliance or under compliance penalty:

- Implement energy efficiency projects directly (IT, UK, FR, Flanders);
- Implement energy efficiency projects via daughter companies (DK, IT);
- Purchase certificates from third parties by bilateral trades or spot market (IT, FR)
- Establish partnerships with contracted installers, retailers, etc. (FR, UK, DK)
- Tender out the implementation of projects (attempted in DK);
- In DK distributors are not allowed to directly implement projects other than information and informative bills, unless these projects relate to realisation of savings in own grid

Certificate trading

- Questionable whether **trading** is a key element in national systems;
- Buoyant certificate trading is taking place only in **Italy**, where projects are implemented by **ESCOs**;
- France - **limited trading**
 - Suppliers prefer to implement the projects themselves through agreement with equipment suppliers and installers, positioning themselves as suppliers of energy services (utilities do not offer incentives, act as "*project organizers*").
- UK - certificate **trading is not a feature of the scheme** and no formal certification of attained savings takes place.
 - **Agreements with equipment suppliers** and installer to offer "standards" solutions to residential clients (not necessarily their customer base).

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General observations (1)

- **Over-compliance**, in some cases at costs below policy makers' expectations;
- Core element: the energy saving **obligation** (absolute or proportional to sales)
- Focus on **end-use sectors**, coverage of electricity and natural gas, at minimum;
- Best suited to deliver **low-cost** and **standard** energy efficiency measures, often targeting **small energy users**, lowering the transaction costs and contributing to market transformation;
- Function in both **liberalised energy markets** and whereby they target **monopolistic segments**;

General observations (2)

- Crucial importance of **measurement and verification**, strong focus on **standardised** saving values;
- **Trading** can bring added value where the targets are set sufficiently high with respect to the saving potential in the sectors covered;
- Trading may be better suited for broader systems, but even in smaller ones it reduces transaction costs;

Conclusions - 3

- Choice of primary or final energy, measure lifetime, obliged parties, eligible measures, and M&V, and cost-recovery determine the nature of the projects (e.g. many CFLs in IT and UK, none in France; building insulation in the UK, boilers in France).
- Administrative costs are a function of the simplicity of the system.

Conclusions - 4

- The three schemes are dominated by **subsidy measures**, i.e. obliged parties subsidize savings measures partially or entirely (more in the UK and less in Italy – almost none in France).
- The three schemes are dominated by measures with **standardized saving factors**, especially in the residential sector (UK scheme only in the residential sector). Transaction costs for real measurement could be very high.
- It is difficult to give ‘prescriptions’ about the optimal setup concerning the **subjects under obligation**, the **sector covered**, the **eligible parties**, or **trading** rules (no trading, bilateral transactions or exchange).
- A **liquid** market – both in terms of demand and supply – would ensure realization of the economic benefits attributed to market-based instruments. Explicit **property right** and **ownership recognition** is needed with registry and transaction databases
- The **size** of the target, **lifetime** of measures, the redemption period, banking and borrowing of certificates, and the design of non-compliance penalties all have an impact on market liquidity and stability.

Conclusions - 5

In general several *flexibilities* (besides trading) are given to obligated parties to meet a mandatory energy saving target cost-effectively, i.e. :

- a) eligible measures that parties can use;**
- b) the number of eligible end-use sectors that can yield energy savings;**
- c) banking provision for surplus of saved energy or white certificates;**
- d) market engagement of non-obligated parties (e.g. ESCOs)**

Ambitious but reachable targets can trigger a more dynamic usage of all flexibilities by eligible parties and thus active behaviour in TWC markets.

We should not forget that what really matters in target-and-trade schemes is the “target” as such.

Conclusions - 6

Analysis and performance of TWC schemes is quite country- or context-specific.

For well functioning suppliers obligations and white certificates schemes, it is an absolutely prerequisite that all market actors are well informed about their operation and development.

Measures to reduce the administrative burden for both the authorities and eligible actors (e.g., clear and simple institutional framework, ex-ante M&V approach) without hampering the integrity of TWC schemes are needed.

Trading is certainly an inherent and relevant component that could add efficiency, but it is not an objective *per se* in TWC schemes.

Comparative assessments and possible integration/interaction with other energy policy instruments need further investigation.

Ambitious, gradual and realistic energy saving targets are fundamental for TWC schemes to outperform other energy policy instruments.

The background of the slide is a photograph of the European Union flag, which is a blue field with twelve five-pointed gold stars arranged in a circle. The flag is shown waving and is set against a light blue sky. The text is overlaid on the flag.

Thank you!

We welcome comments

For more information!

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<http://re.jrc.ec.europa.eu/energyefficiency>

Directive on Energy Efficiency (EED) - 1

- Article 7, paragraph 1 establish that Each Member State shall set up an energy efficiency obligation scheme for energy distributors and/or retail energy sales companies (obligated parties, transport fuel distributors could be excluded) to achieve a cumulative end-use energy savings target by 31 December 2020
- That target is to achieve new savings each year from 2014 to 2020 of 1,5 % of the annual energy sales to final customers of all energy distributors or all retail energy sales companies, averaged over the most recent three-year period prior to 1 January 2013 (energy used in transport may be partially or fully excluded). The ETS sector may be excluded.
- Energy savings achieved in the energy transformation, distribution and transmission sectors, including efficient district heating and cooling infrastructure can be included.

Conclusions - 2

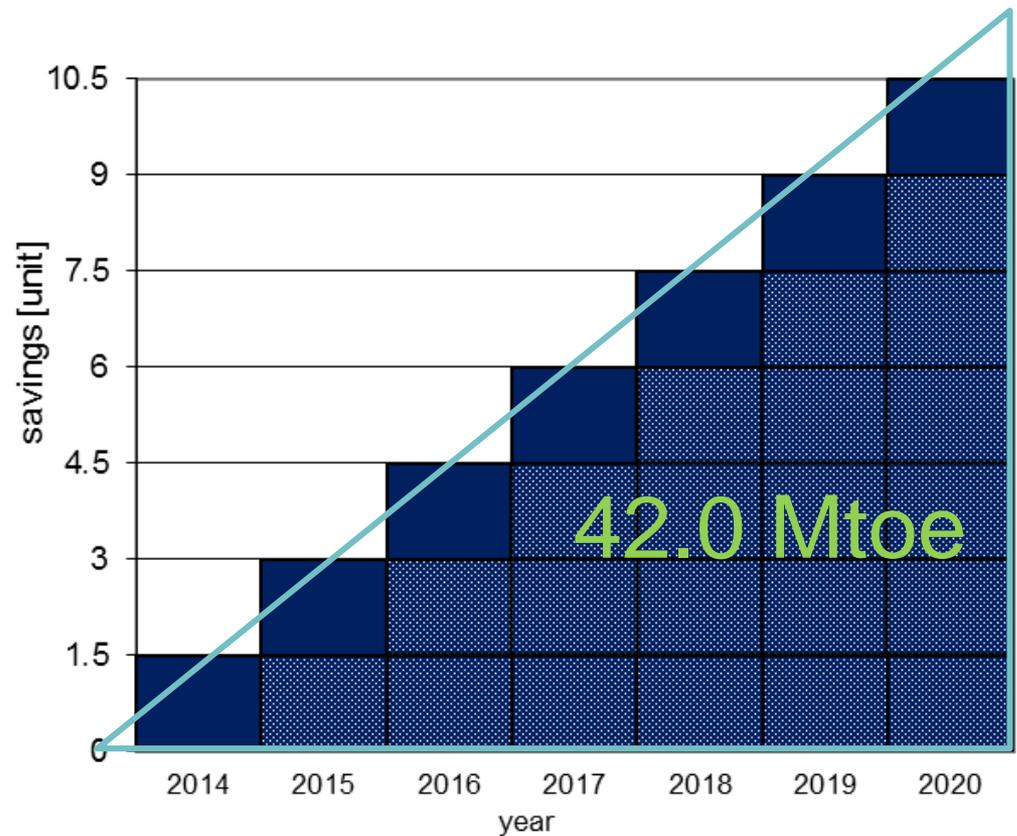
- Questionable whether **trading** is a key element, it could make the scheme more cost-effective but also adds additional costs.
- There is **limited trading in France** as suppliers prefer to implement the projects themselves through agreement with equipment suppliers and installers to position themselves vis-à-vis their clients as suppliers of energy services (utilities do not offer incentives, act as *“project organizers”*).
- Certificate **trading is not a feature of the scheme in the UK** and no formal certification of attained savings takes place, due to lack of formal certification, most suppliers using the same contractors and suppliers can only trade once they meet their own energy saving targets.
- Obligated **suppliers in the UK enter in agreement with equipment suppliers** and installer to offer "standards" solutions to residential clients (not necessarily their customer base).
- Trading is a key feature of the **Italian scheme**, where distribution companies rely on other market actor to implement projects, and these are allowed to sell the certificate on the market.

New and cumulative savings

Ex. Average distributed/sold volumes of energy, excl. transport, for 2010-11-12 equals 100 Mtoe

2014	1.5 Mtoe
2015	3.0
2016	4.5
2017	6.0
2018	7.5
2019	9.0
2020	<u>10.5</u>
Total	42.0 Mtoe

Schematic illustration



Note: there is no obligation on a trajectory

Directive on Energy Efficiency (EED) - 2

- Banking and Borrowing is allowed
- Energy obligation target and measurement can be expressed in primary and final energy
- 3 types of M&V: deemed savings, metered saving, engineering models and surveys
- Life time of the savings
- As an alternative to setting up an energy efficiency obligation schemes, MSs may adopt other policy measures to achieve energy savings, such as energy or CO₂ taxes, financing schemes and fiscal incentives, voluntary agreements

Directive on Energy Efficiency (EED) - 3

- Certain exceptions possible but limited to a total 25% of the required savings (so called '25% bundle'):
 1. Recalculate the savings with lower savings rates (1.0%, 1.25%, 1.5%)
 2. Partial or full exclusion of ETS industries from the calculation of savings;
 3. Allow supply side savings (from Article 14(4) and (5)(b) and Article 15(1) to (6) and (9));
 - policy measures for efficient district heating and cooling infrastructure
 - conversion during a substantial refurbishment to high-efficiency cogeneration of an existing thermal electricity generation installation with a total thermal input exceeding 20 MW
 - policy measures to increase the efficiency of transmission and distribution;
 - policy measures to encourage operators of installations undertaking the combustion of fuels with total rated thermal input of 50 MW or more to improve their annual average net operational rates
 4. Count energy savings from early action since 31 December 2008.
- Combinations possible but only up to 25%