

White Certificates: the Italian experience gained in Regulation, Monitoring and Verification and Electricity Market Contexts

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The Regulator's experience

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Key messages and conclusions

1. **Basic design choices are key in determining:**

- the **outcomes** of the mechanism (trends)
- the main **regulatory challenges** and **trade-offs**

2. **Regulation needs to look for a balance** between apparently conflicting goals (e.g.: economic efficiency, simplicity, low transaction costs, robustness of energy savings/"efficiency integrity")

3. **White certificates are not a panacea:** they do not guarantee *per se* the achievement of both efficacy (targets) and economic efficiency

4. **White certificates do not work *in a vacuum*:**

- they need to be complemented by other policy actions aiming at overcoming barriers to e.e.
- the coexistence of different policy tools **requires a strong policy coordination** effort at the institutional level in order to avoid over-

incentives and alteration of market forces and signals (which, in turn,



Major steps of the scheme

- ◆ **First** operational tradable certificates scheme specifically focused on end-use energy efficiency to be designed and implemented **world-wide**
- ◆ **Legislative framework** introduced in 2001; **regulatory framework** developed throughout 2002-2004 via consultation of all interested parties (plus revision of the legislative framework); **fully operational since January 2005; extended and revised** in December 2007
- ◆ Definition of technical and economic rules + administration + monitoring and enforcement of the whole mechanism under the **Regulator's (AEEG) responsibility**



The basic (initial) structure and key features

- ◆ **Demand driver:** annual primary energy saving targets on (major) electricity and natural gas **distributors**; 2005-2009
- ◆ **Supply-side:** fully open-ended; “50% constraint”; only “hard” measures; early actions; eligible parties include “energy service providers” and companies controlled by DNO
- ◆ Ex-post accreditation of annual savings + conventional average 5 year lifetime;
- ◆ **Trading:** central element; no authorisation needed; spot market + OTC
- ◆ Possible cost-recovery mechanism
- ◆ **Penalty system:** two-year grace period linked to the relative performance



Major regulatory choices and criteria

◆ Major regulatory choices:

- rules for **projects design, development and evaluation (M&V)** as well as for the **issuing of EECs**
- rules for the functioning of the **EECs market** (jointly with GME)
- definition of **sanctions** for non compliance
- criteria and rules for **cost-recovery**

◆ Main criteria driving those choices:

- **simple** and **transparent** rules and procedures (easy start up; low TC)
- **certain** and **reliable** reference framework for operators
- promotion of **economic efficiency** and **technological innovation**
- **consumer** protection and promotion of **competition**
- final decision always based on a thorough **consultation** of all interested parties



Examples of (relative) regulatory trade-offs (1)

1) Exploiting the **economic efficiency potential of a MBI**

ASKS FOR

Diversity of technological and cost options → **a broad scope**
(eligible measures and parties)

BUT

A broad scope inevitably entails **high(er) administration costs** (e.g. limits the scope for robust simplified M&V approaches)

→ **Trade-off between economic efficiency and accuracy/robustness?**



Examples of (relative) regulatory trade-offs (2)

2) Robust M&V rules

INEVITABLY MEANS

High(er) administration costs

→ Trade-off between economic efficiency and accuracy/robustness?



Examples of (relative) regulatory trade-offs (3)

3) Exploiting the **economic efficiency potential of a MBI**

ASKS FOR

No regulatory action likely to interfere with the market, e.g.:

- flat (i.e. technology-neutral) tariff contribution
- no pre-determined penalty

BUT THIS COULD LEAD TO:

- risk of windfall profits (average cost)
- risk of speculative behaviours and market turbulence



From general criteria to regulatory action (1)

◆ Economic efficiency and innovation:

- ➔ Wide **access to the supply-side** of the market (all DNO; wide definition of **energy service providers**)
- ➔ **Market** rules and procedures designed to regulate **access** to the marketplace, to guarantee market **transparency**, **security** of market deals as well as market **liquidity and flexibility**
- ➔ Tariff contribution: **not a pass-through** but a “**standard allowed cost**”; **technology neutral** (i.e.: flat)
- ➔ **No pre-defined unit penalty** (pox reference price)
- ➔ **Strong additionality** in energy saving M&V (**dynamic** baseline)
- ➔ **M&V rules and procedures** (SI) aiming at robustness as well as at limiting administration costs (cf. following slides)



From general criteria to regulatory action (2)

◆ Simplicity, certainty and reliability - AEEG's M&V Approach:

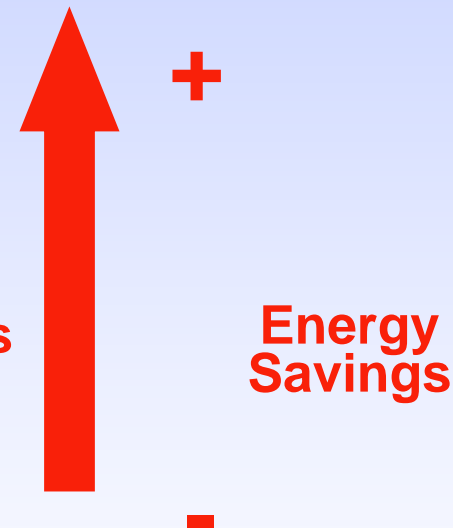
What is “special” about M&V of energy savings?

- you can not measure energy savings at the meter
- you have to measure the energy savings via a comparison of the energy consumption *before* and *after* the project
- in some cases the “before the project” scenario is not known (data, new installations) and you need to make assumptions (“project baseline”; cf. following slide)
- in other cases the “before the project” scenario is known, but you need to net out the impact on consumption trends of variables other than those on which the energy saving project have an influence
- in other cases measuring everything is not cost-effective



◆ **Technological baseline setting (options other than the “real” baseline when it is not known):**

- **average installed**
- **average sold**
- **average offered on the shelves**
- **technology that meets mandatory standards**
- **BAT**



◆ **The baseline is dynamic → need for regular updating (deemed savings)**



AEEG approach to M&V

◆ 3 types of M&V methods:

- 1) **deemed** savings (no on-field measurement)
- 2) engineering **estimates** (partial on-field measurement)
complexity
- 3) energy **monitoring** plans (subject to pre-approval)



project/M&V

◆ **Market Transformation measures** (e.g. information campaigns, training programs) are eligible **only if they are associated to “hard” measures**

- provided they meet specific qualification requirements they entitle the hard measure to a **5% “premium”** on the amount of certified energy savings

◆ **Only additional savings are considered**, i.e. over and above spontaneous market trends and/or legislative requirements

◆ Deemed savings and engineering methods developed with the **technical support of CESI and ENEA**



AEEG approach to M&V: deemed savings

◆ Main Characteristics:

- **totally *ex-ante*** (→ certainty of results, limited “risk”)
- **simplified energy savings calculation** (both for users and AEEG)
- **limited reporting documentation** to be provided
- **simplified control and certification** procedures (both for users and AEEG)

◆ **Suitable for** projects for which expected savings and reasonably well understood and direct measurement would therefore be not cost-effective

◆ For each type of project **a specific amount of saved energy is defined *ex-ante*** for each installed unit (toe/unit/year)

◆ **Assumptions are made on a number of variables** (e.g. baseline, working conditions and working hours)

◆ **Default factors are used for: free-riding (net-to-gross**



AEEG approach to M&V: engineering estimates

◆ Main Characteristics:

- relatively simplified energy savings calculation
- reduced reporting documentation to be provided
- simplified control and certification procedures

◆ **Suitable for** projects whose saving impact is quite well understood but varies depending on a limited number of identifiable parameters (e.g. number of working hours).

◆ For each type of project a **specific evaluation algorithm** is defined, with pre-defined values for some parameters **while other parameters have to be measured case by case**

◆ **Default factor for net-to-gross ratio**

◆ **Measurement of persistence**



AEEG approach to M&V: Energy Monitoring Plans

◆ Main Characteristics:

- direct/indirect measurement of energy usage before and after the project
- extended documentation to be provided for *ex-post* validation and certification
- extended control and certification procedures

◆ Suitable for projects whose energy performance crucially depends on variables and parameters that change from case to case and is therefore less predictable

◆ Methodological proposal to be developed for each project according to pre-determined criteria and format (es.: measured parameters; (possible) calculated parameters and methods of calculation; major assumptions; adjustments; additionality;



AEEG approach to M&V: the Information System

◆ AEEG has developed an internet-based information system that allows:

- on-line registration to the system for eligible parties
- on-line “guided” submission of project proposals and requests for certificates
- on-line monitoring of project proposals/requests status for project developers
- automatic issuing of certificates for “deemed saving projects” following the positive verification of the first request (every three months)
- information exchange between AEEG and ENEA on evaluation process
- information exchange between AEEG and GME for the issuing of certificates (e.g.: AEEG authorisation to GME)
- monitoring of the overall development of the mechanism



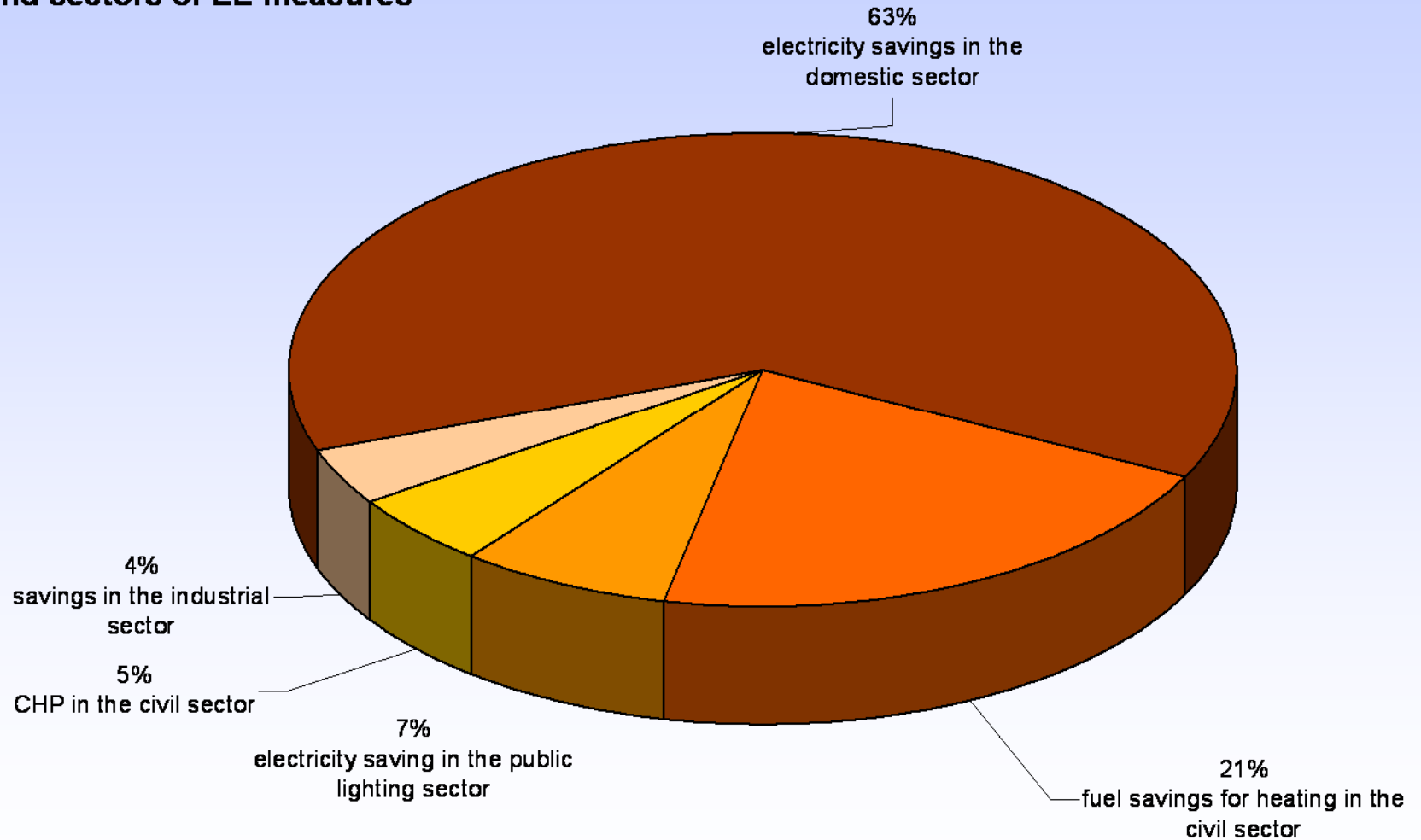
Results achieved (2005-2007)

- ◆ **2 million toe saved against a target of 1,1 million toe:**
 - **78% electricity savings; 18% natural gas savings; 4% other fuels savings**
 - **90% of savings delivered via projects for which simplified M&V methodologies exists (mostly deemed savings)**
 - **75% of savings delivered by energy service providers (including ESCOs)**
 - **significant trading, mostly OTC**
 - **growing number of information campaigns and training programs**



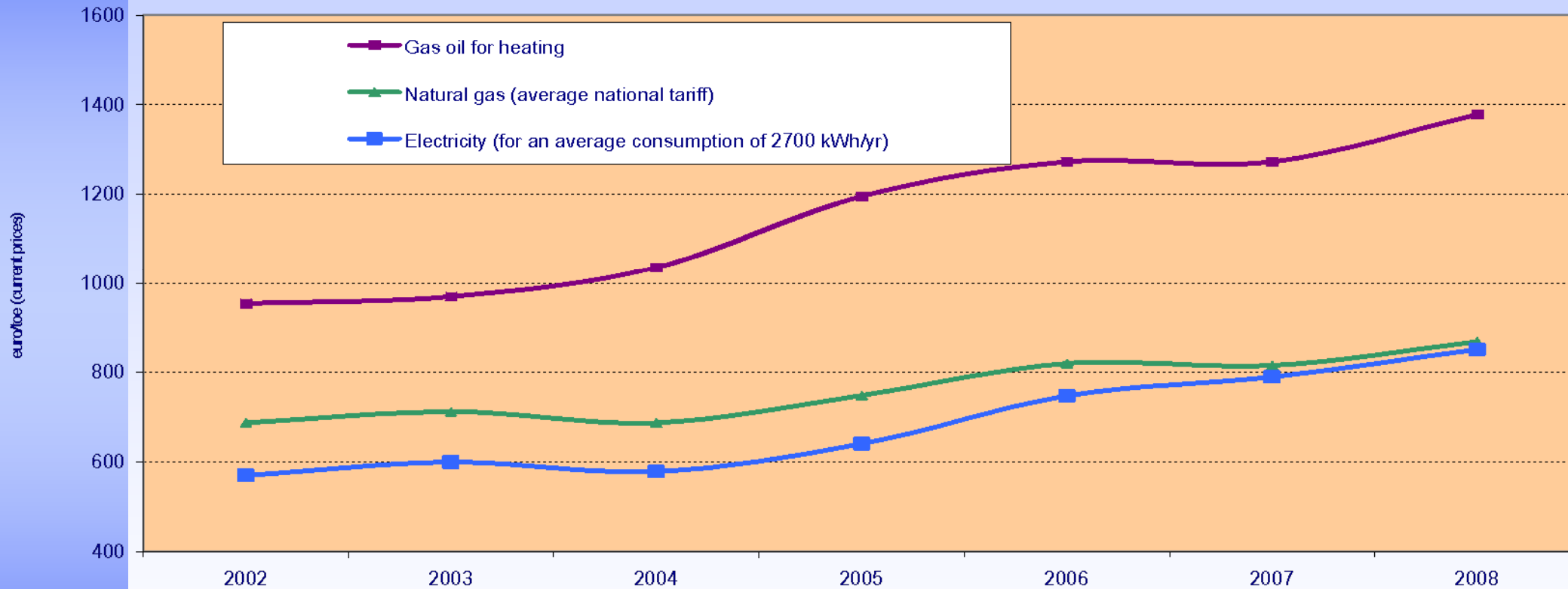
Breakdown of certified savings

Types and sectors of EE measures



Avoided energy costs for participating customers

Value of saved energy for domestic users (taxes included)



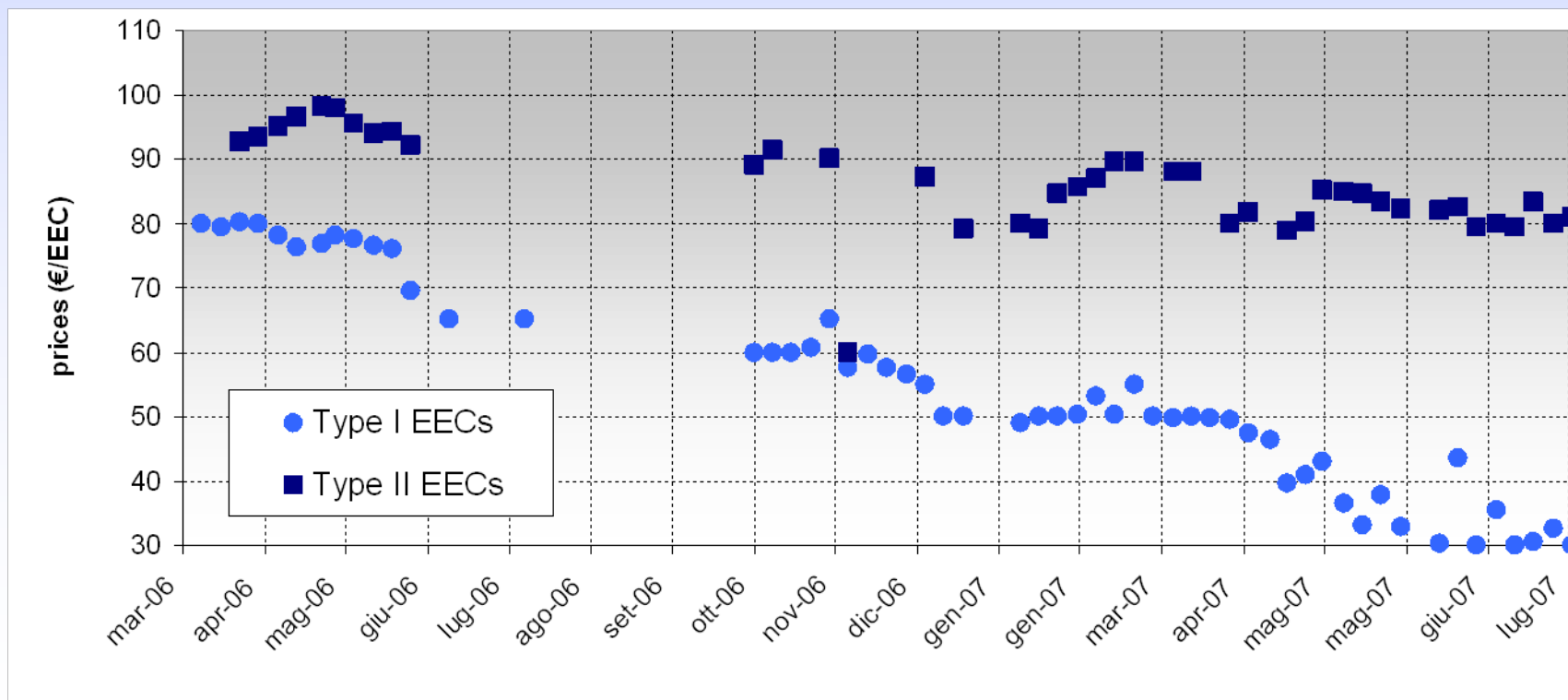
cf. tariff contribution = 100 euro/toe → **large**
“private” economic gains

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Spot market prices (2005-2006)

Before the legislative and regulatory changes introduced since December 2007



Summary of emerging issues

1. **Supply surplus**
2. **Drop in market and OTC prices**
3. **Limited transparency of trading** due to the prevalence of OTC as opposed to spot market trading



... and possible explanations

◆ Supply surplus:

- assignable target 22% lower than national targets; early actions (27% of certified savings); M&V rules

◆ Drop in market prices: what would you have reasonably expected?

- lack of targets for the post-2009 period
- prevailing short-term strategies on the supply side and possible market power on the demand-side → market structure
- lack of confidence on the penalty system

◆ Relative preference for OTC trading: not a failure of the system but a regulatory weakness

- opportunity to conclude forward contracts and/or to buy large quantities of certificates in one shot OTC as compared

Autorità per l'energia elettrica e il gas



Proposals from the Regulator to the Government

- ◆ **Risk of high windfall profits**; consequent need to lower the tariff contribution or, as an alternative, proposals for a Government intervention to
- ◆ Broaden the **scope of the EEO** to smaller distributors
- ◆ Revise the **apportionment rule**
- ◆ Set higher **targets for 2008 and 2009**
- ◆ **Extend the time frame** of the obligation (Directive 2006/32/CE)
- ◆ **Simplify and reinforce the penalty system** (grace period linked to absolute i.e. fixed value(s))

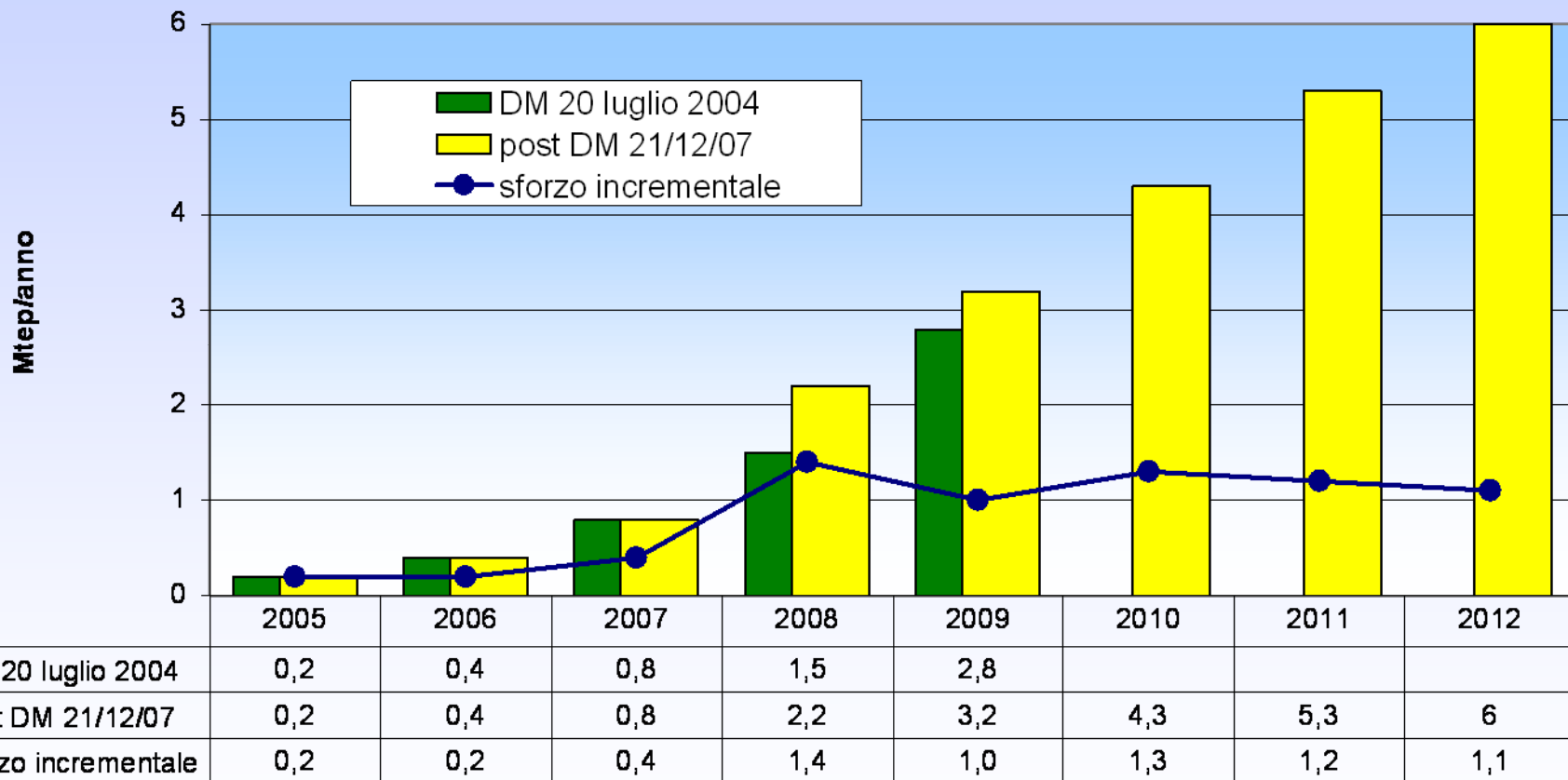


→ Recent legislative measures

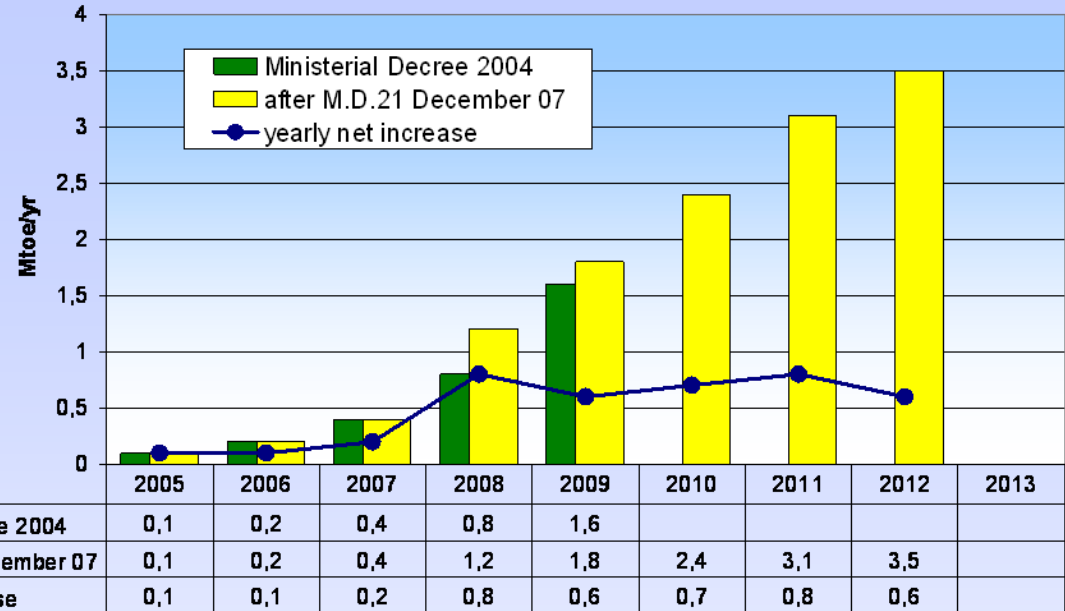
- ◆ **Energy efficiency obligation extended** to distributors serving at least 50.000 final customers (plus moving reference year)
- ◆ Revised **apportionment rule**
- ◆ Increased **targets for 2008 and 2009**
- ◆ **New targets for 2010-2012**
- ◆ Removal of the **“50% constraint”**
- ◆ Introduction of an automatic **adjustment mechanism in case of over-supply**
- ◆ **New market actors on the supply side**
- ◆ **Banking extended from the first to the second regulatory period**



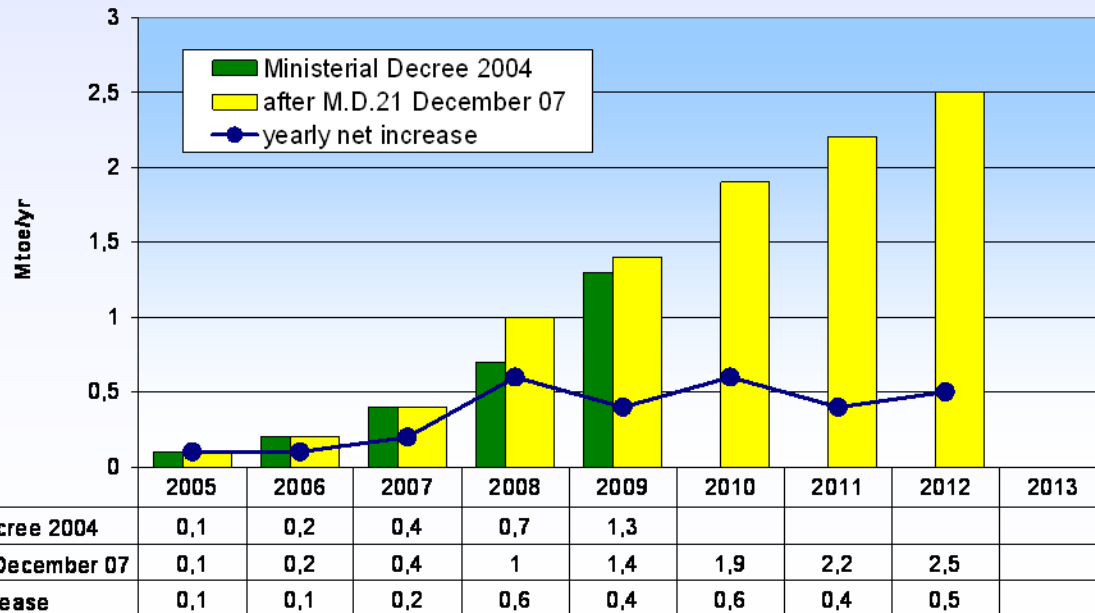
Confronto tra obiettivi nazionali TOTALI (elettrico + gas)



National saving targets for the ELECTRICITY sector



National saving targets for the NATURAL GAS sector



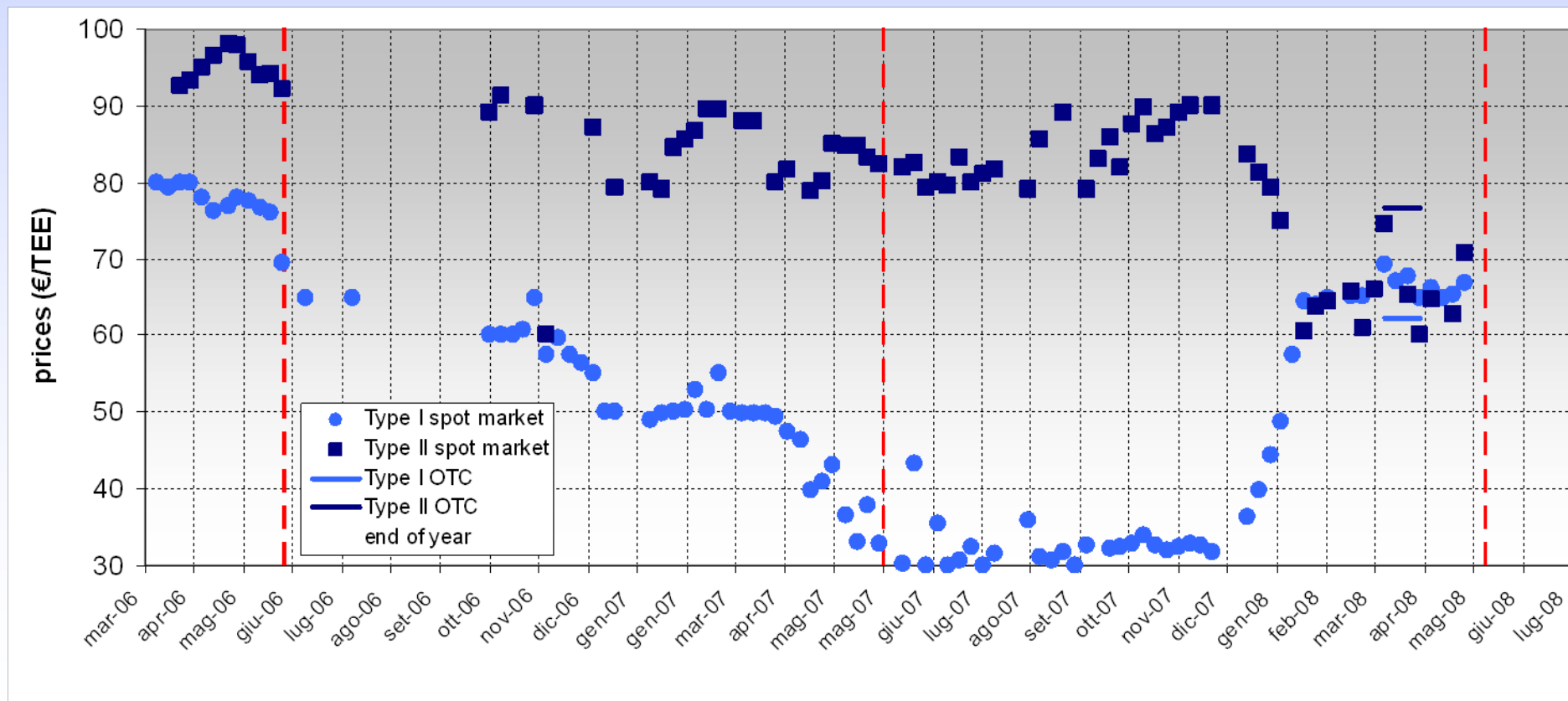
→ Recent regulatory measures

- ◆ **Updating** of deemed savings (starting from technologies that typically penetrate quickly the market and undergo swift reductions in unit cost)
- ◆ **Updating** of the conversion factor kWh saved/toe used throughout the system
- ◆ **On-site audits**
- ◆ **Introduction of minimum product and project requirements**
- ◆ **Regulation for price transparency in OTC trading**
- ◆ **Mandatory registration for OTC contracts**



The market is reacting

→ Spot market prices (2005-May 2008)



Key messages and conclusions

- ◆ **Basic design choices are key** in determining outcomes, regulatory challenges and trade-offs
- ◆ Regulation needs to **look for a balance** between apparently conflicting goals (e.g.: economic efficiency, simplicity, low transaction costs, robustness of energy savings/"efficiency integrity")
- ◆ **Not a panacea → need for:**
 - **complementary, structural initiatives** to facilitate consumers access to information as well as to credit
 - **complementary policy tools** such as energy labels and minimum energy efficiency requirements
 - **market studies and statistics** to help identify and monitor the technological baseline and to give incentives where they are more needed
- ◆ **Do not work in a vacuum → need for policy coordination in order to avoid over-incentives and alteration of market forces**



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