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White certificates as a
tool to promote energy
efficiency in industry

Dario Di Santo, FIRE

Berlin, 12 September 2016



FIRE: the association for energy efficiency



Do you need a hand in energy management?



www.fire-italia.org

The **Italian Federation for the Rational use of Energy** is a no-profit association founded in 1987 that promotes energy efficiency, supporting energy manager, ESCOs and other companies dealing with energy.

Besides the activities directed to its nearly **450 members**, FIRE operates under an implementing agreement with the Ministry of Economic Development to manage the **Italian energy manager network** since 1992.

In order to **promote energy efficiency** FIRE cooperates and deals with public authorities, energy technology and service companies, consultants, medium and large consumers, universities and associations to **promote best practices** and **improve the legislation**.

FIRE manages SECEM - an accredited body - to certify the Energy management experts according to the standard UNI CEI 11339.

FIRE: the association for energy efficiency



FIRE
can help you!



**445 members in 2014, 228 persons
and 217 organizations.**

Some members of FIRE:

A2A calore e servizi S.r.l. - ABB S.p.a. - Acea S.p.a. - Albapower S.p.a. - Anigas - Atlas Copco S.p.a. - Avvenia S.r.l. - AXPO S.p.a. - Banca d'Italia - Banca Popolare di Sondrio - Bit Energia S.r.l. - Bosh Energy and Building Solution Italy S.r.l. - Bticino S.p.a. - Burgo Group S.p.a. - Cabot Italiana S.p.a. - Carraro S.p.a. - Centria S.p.a. - Certiquality S.r.l. - Cofely Italia S.p.a. - Comau S.p.a. - Comune di Aosta - CONI Servizi S.p.a. - CONSIP S.p.a. - Consul System S.r.l. - CPL Concordia Soc. Coop - Comitato Termotecnico Italiano - DNV S.r.l. - Egidio Galbani S.p.a. - ENEL Distribuzione S.p.a. - ENEL Energia S.p.a. - ENEA - ENI S.p.a. - Fenice S.p.a. - Ferriere Nord S.p.a. - Fiat Group Automobiles - Fiera Milano S.p.a. - FINCO - FIPER - GSE S.p.a. - Guerrato S.p.a. - Heinz Italia S.p.a. - Hera S.p.a. - IBM Italia S.p.a. - Intesa Sanpaolo S.p.a. - Iren Energia e Gas S.p.a. - Isab s.r.l. - Italgas S.p.a. - Johnson Controls Systems and Services Italy S.r.l. - Lidl Italia s.r.l. - Manutencoop Facility Management S.p.a. - Mediamarket S.p.a. - M&G Polimeri Italia - Omron Electronics S.p.a. - Pasta Zara S.p.a. - Pirelli Industrie Pneumatici S.p.a. - Politecnico di Torino - Provincia di Cremona - Publiacqua S.p.a. - Raffineria di Milazzo S.c.p.a. - RAI S.p.a. - Rete Ferroviaria Italiana S.p.a. - Rockwood Italia S.p.a. - Roma TPL S.c.a.r.l. - Roquette Italia S.p.a. - RSE S.p.a. - Sandoz Industrial Products S.p.a. - Schneider Electric S.p.a. - Siena Ambiente S.p.a. - Siram S.p.a. - STMicroelectronics S.p.a. - TIS Innovation Park - Trenitalia S.p.a. - Turboden S.p.a. - Università Campus Bio-Medico di Roma - Università Cattolica Sacro Cuore - Università degli studi di Genova - Varem S.p.A. - Wind Telecomunicazioni S.p.a. - Yousave S.p.a.

Our membership include organization and professionals both from the supply and the demand side of energy efficiency services and solutions.

FIRE: the association for energy efficiency



Besides being involved in many **European projects**, listed next, FIRE implement surveys and market studies on energy related topics, **information and dissemination campaigns**, and **advanced training**.

Some of FIRE **clients** over the years: Ministry of Environment, ENEA, GSE, RSE, large organizations (such as *Centria, ENEL, Ferrovie dello Stato, FIAT, Finmeccanica, Galbani, H3G, Poste Italiane, Telecom Italia, Unioncamere*), universities, associations, energy agencies and exhibition organizers.



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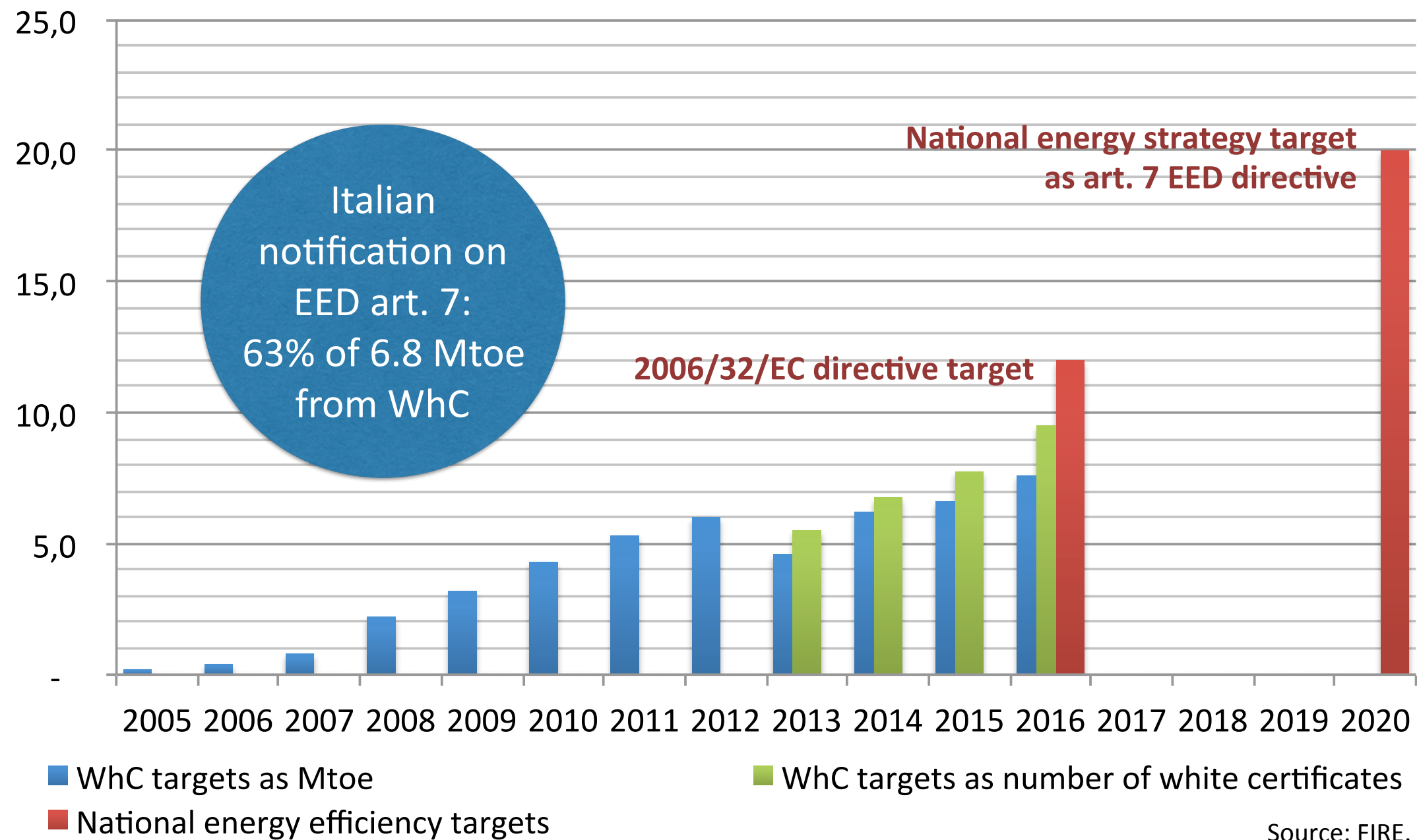
European projects on-going:



WhC and 20-20-20 Programme



**National energy efficiency targets and WhC targets
(Mtoe of primary energy and millions of certificates)**



The scheme basics: EEO + WhC trade



1 WhC = 1 additional toe
All sectors and all energy efficiency projects are allowed.

Italian WhC scheme main characteristics



- Targets from 200 ktoe in 2005 to 7,600 ktoe in 2016;
- Additionality based on market or regulatory baseline per single project or deemed saving file;
- $\approx 85\%$ of savings are metered and $\approx 82\%$ are monitoring plan projects (in 2007 $\approx 90\%$ were deemed savings);
- ESCOs have been the main actor in presenting projects both in terms of proposals (96%) and of toe (70%, whereas 25% come from companies with energy manager);
- Flexible managing agencies needed to deal with the growing proposals (13,717 RVCs presented in 2014 and 1,034 PPPMs VS ≈ 150 in 2007 and ≈ 550 in 2012);
- All energy efficiency projects in all sectors are allowed; the scheme moved from tertiary and residential sectors projects to industrial ones;
- Controls are mainly documental, but on-site controls are rising;
- Cost effectiveness is high (0.017 euro/kWh according to ENEA).



Insights about EEO schemes



The screenshot shows the ENSPOL website interface. At the top, there's a navigation bar with links: Home, Article 7 Insight, Country Level, Hot Topics, and Further Reference. Below the navigation bar is a large banner image of a green field with a small plant growing from a mound of soil, with the text "Knowledge sharing platform Article 7 Energy Efficiency Directive".

Below the banner, there are four main sections:

- About the platform:** This platform is part of a European funded project, called ENSPOL that focuses on exchanging knowledge and experience between stakeholders across Europe on the implementation of EEOs and alternative measures, to inform and improve the implementation of the Energy Efficiency Directive (Article 7).
- Get Involved:** Users are able to post comments, questions and information across all pages of the platform thus enabling users to share and discuss their different interests, views and information in one place. To post comments on the platform, simply sign up and / or login via your social network account.
- Conduct and privacy:** We would like that all visitors and users of the "Knowledge Sharing Platform - Article 7 Energy Efficiency Directive" have a safe, pleasant and friendly experience on the website. All users of this platform and any kind of contributions they make to the platform are therefore bound by this Code of Conduct.
- Introduction to ENSPOL and Article 7 EED:** ENSPOL is an Intelligent Energy Europe-funded project targeting the effective and proper implementation of Article 7 of the Energy Efficiency Directive in all Member States and beyond. A major objective of ENSPOL is to support the establishment, revision and implementation of robust Energy Efficiency Obligation Schemes or alternative policy.

At the bottom of the main content area, there are two buttons: "WHAT'S HAPPENING IN MEMBER STATES?" and "I'M INTERESTED IN HOT TOPICS".

The footer contains a Twitter Feed section, a Newsletter subscription form with fields for Name and E-mail, and a "Get in Touch" section with contact information: Email: contact@enspol.eu, Web: <http://www.enspol.eu>. It also includes social media icons for Facebook, Twitter, LinkedIn, and Google+, and a logo for "epsilon innovations".

At the very bottom, there is a European Union flag logo and text: "Co-funded by the Intelligent Energy Europe Programme of the European Union".



ENSPOL platform consents to navigate per country or relevant topic (e.g. additionality, M&V, savings evaluation, etc.).

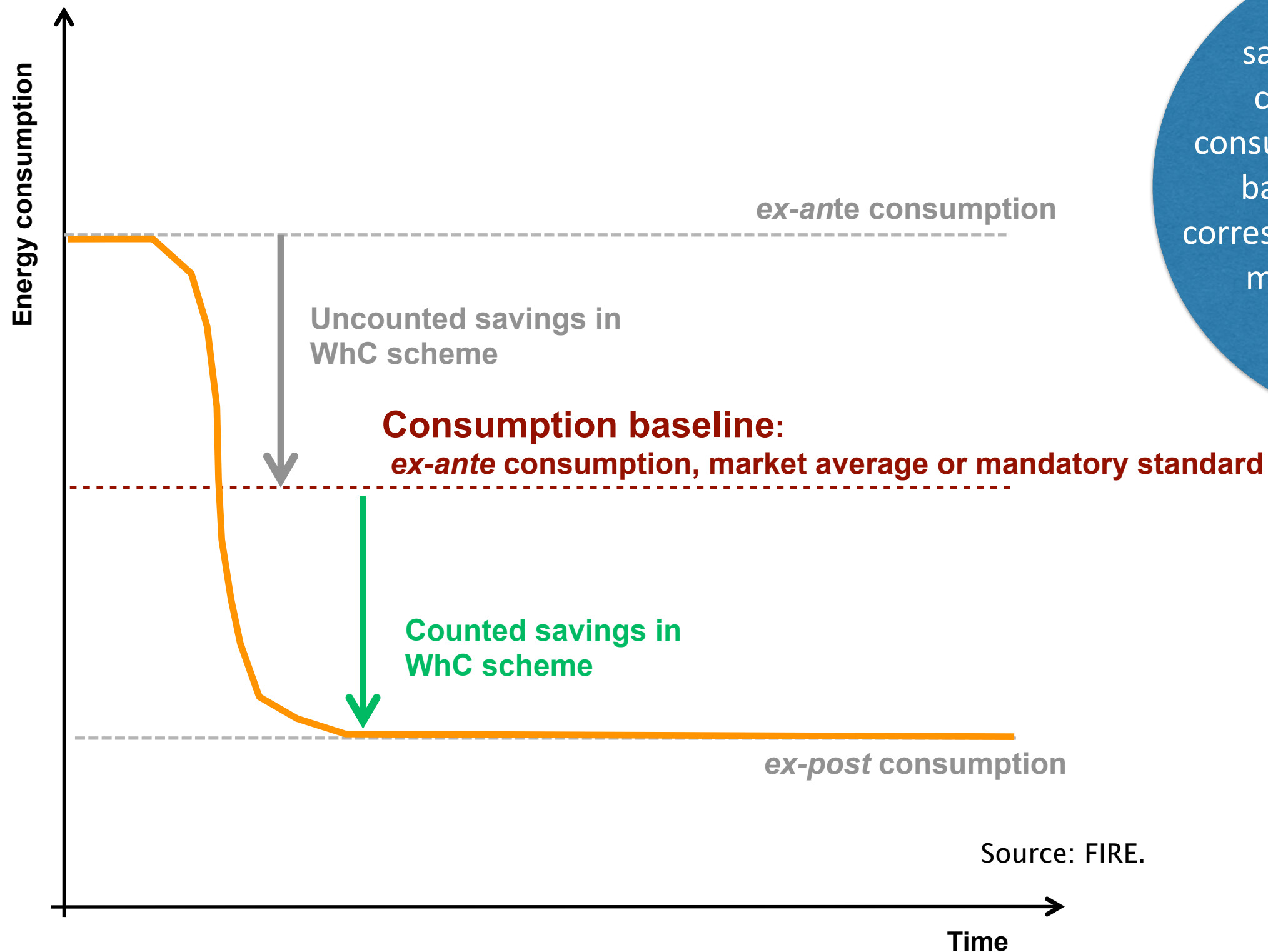
It is thus possible:

- download the reports about the existing schemes in all EU MSs;
- compare how different schemes deal with the different policy topics;
- contribute and send suggestions.

www.article7eed.eu



Additionality



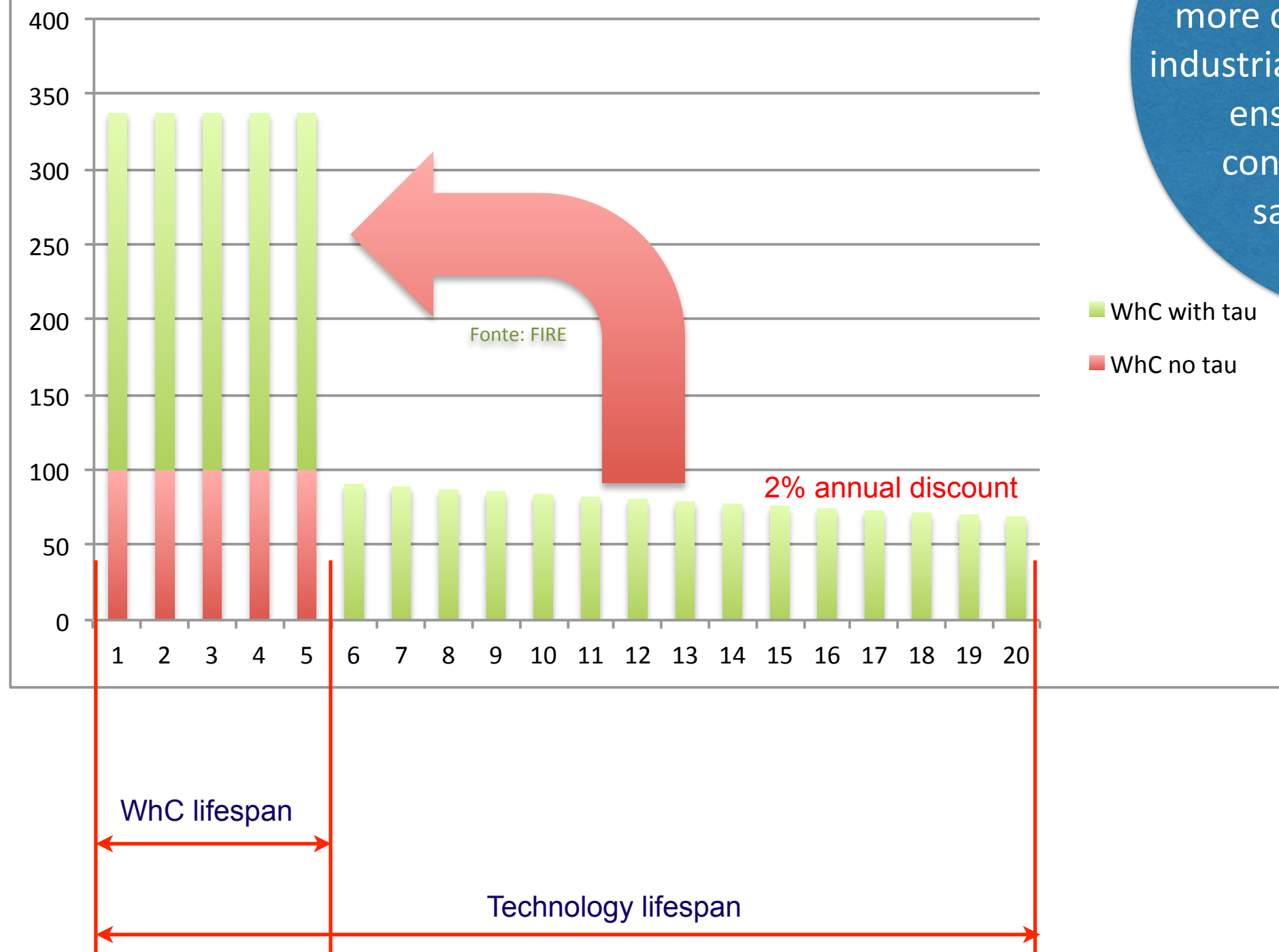
Only additional savings receive white certificates. *Ex-ante* consumption is accepted as baseline only when it corresponds or is higher than market or regulatory baselines for the specific project.

The tau coefficient



How the *tau* coefficient works

Hipotesis: annual saving 100 toe, $\tau=3,36$



The tau coefficient allows complex projects to obtain more certificates, but in the industrial sector it is difficult to ensure that a project continues to generate savings all over its lifespan.

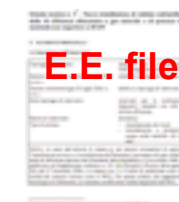
Saving evaluation methods in Italian WhC



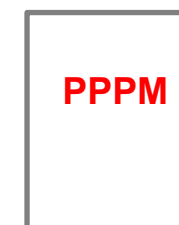
Deemed savings projects (progetti standard): the saving is evaluated with respect to the number of installed reference units (e.g. square meter, kW, number of installed units). No measures are required. Only standardized solutions can be included in a deemed saving file. The proponent presents an **RVC** once.



Scaled savings - engineering estimates (progetti analitici): the saving is evaluated with respect to some measured quantities through a dedicated algorithm defined in a dedicated file. Required meters are also indicated in the dedicated file. The proponent presents an **RVC** at least once a year.



Metered saving - monitoring plans (progetti a consuntivo): the method is similar to the previous one, but the algorithm, the baseline, the additional saving coefficient, and the needed meters should be preliminarily proposed by the applicant **PPPM** and approved from GSE (with ENEA-RSE). After the PPPM is accepted the proponent will get WhC by presenting an **RVC** at least once a year.



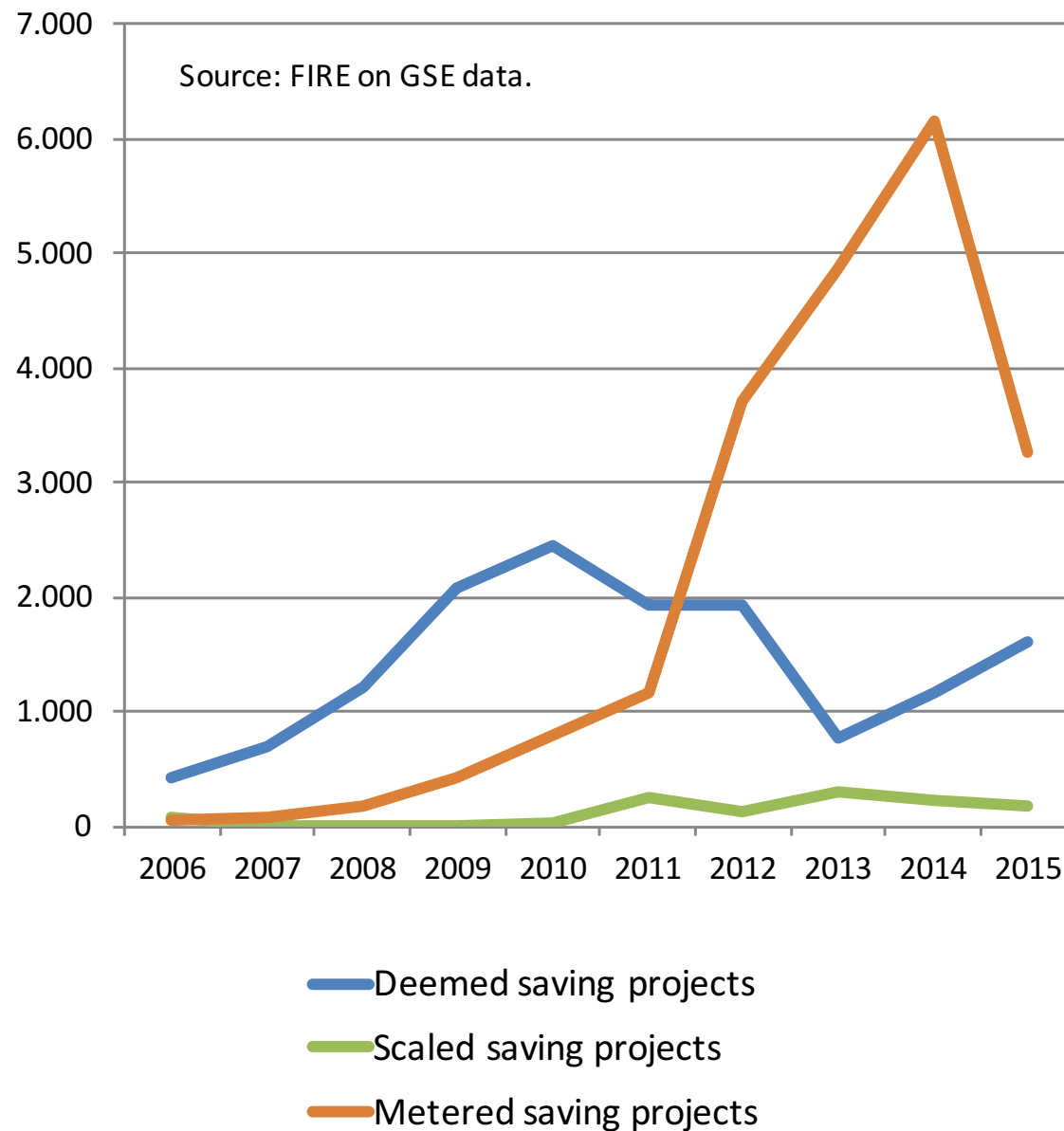
Surveyed savings: not used so far. Plans to diffuse them with new WhC guidelines.

Projects by evaluation methodology



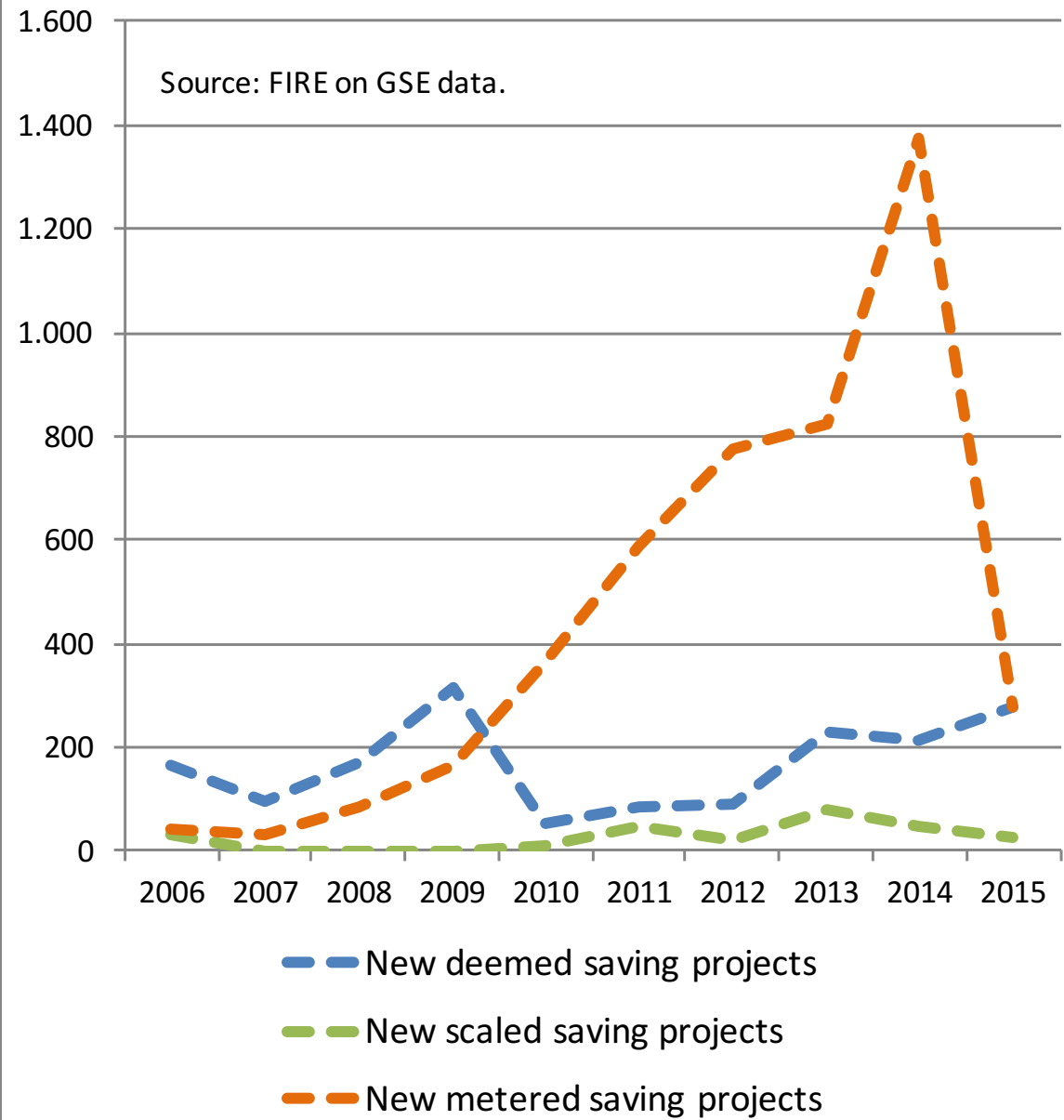
Breakdown of issued WhC by saving evaluation methodology (ktoe)

Source: FIRE on GSE data.



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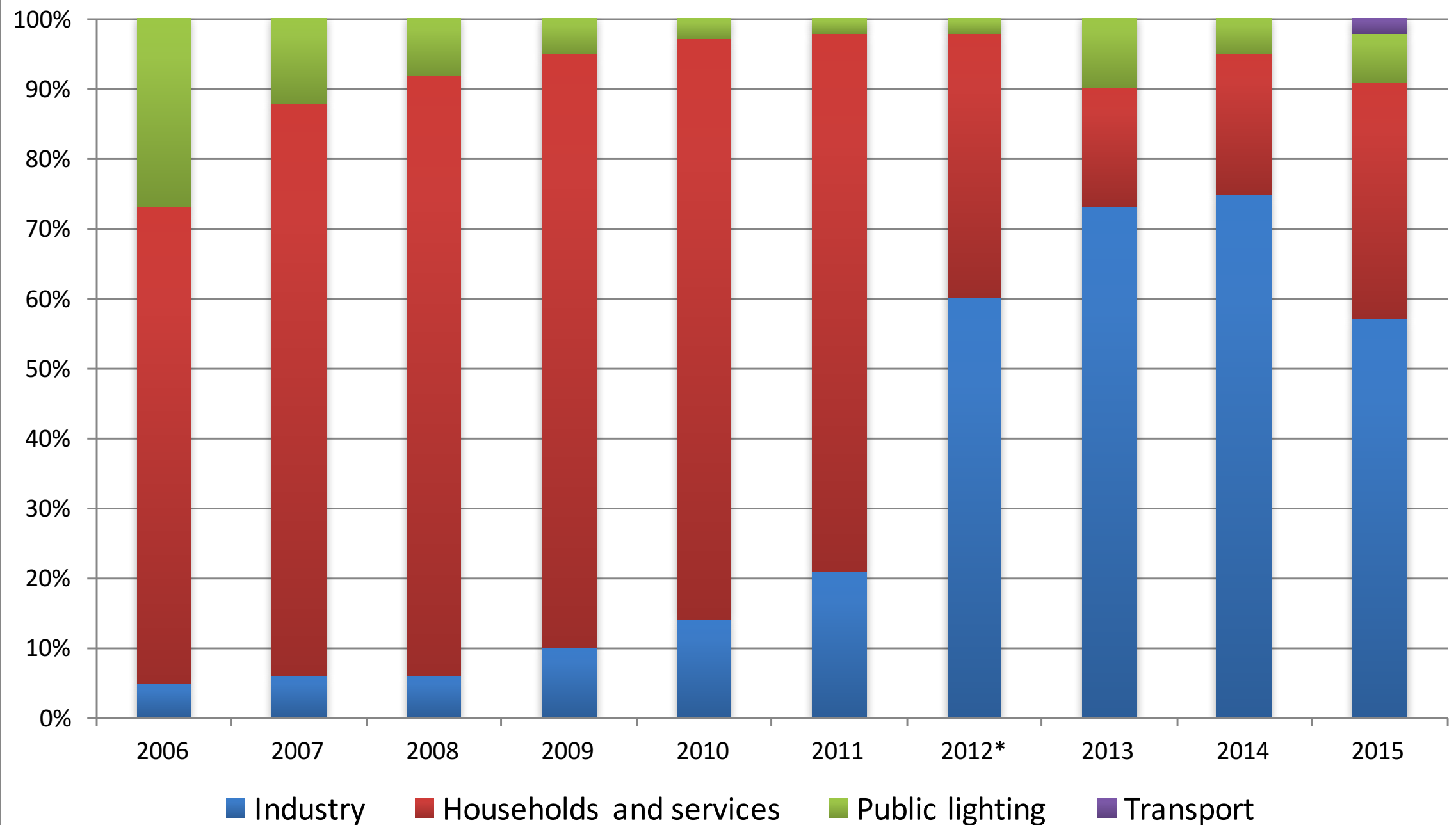
Two reasons stand behind the fall of 2015: the need to present PPPMs only for project not already running and stricter rules for application.

The growth of the industrial sector



Breakdown of savings among sectors (%)

(Source: FIRE on AEEGSI and GSE data; 2012 data refers only to Jan-May)



Examples of MSPs: multisectorial



Produzione industriale efficiente:

Esempi tratti dallo schema
dei certificati bianchi



Una pubblicazione FIRE su
incarico ENEA per la
competitività delle imprese

ANNO 2015

MULTISECTORAL PROJECTS

PRODUCTION OF NITROGEN ON-SITE

HEAT RECOVERY EXCHANGER FOR USE IN THE
PROCESS

HEAT RECOVERY EXCHANGER FOR USE OUT OF
PROCESS

HEAT RECOVERY WITH SAVING

COMPRESSOR CHILLER WITH MAGNETIC LEVITATION

REFRIGERATOR WITH MANAGEMENT SYSTEMS PLC

TRACTION BATTERY FOR ELECTRIC VEHICLES

MANAGEMENT OF CENTRAL AIR WITH DEDICATED
SOFTWARE

TREATMENT WITH SOLVENTS COMBUSTOR
recuperative CERAMIC

HEATING ROOMS WITH RADIANT STRIPS

LED INDUSTRIAL LIGHT AND REMOTE CONTROL
SYSTEMS

In 2015 FIRE produced a study with typical industrial EE projects that got WhC. Some solutions are no more allowed due to baseline/additionality changes.

Examples of MSPs: monosectorial



| SECTOR | MONOSECTORIAL PROJECTS | | |
|--------------------------------|---|---|----------------------------------|
| FOOD | PASTEURIZATION WITH RADIO FREQUENCY | DESCENDING FILM EVAPORATION AND CONTINUOUS CRYSTALLIZATION | ROTARY COMPRESSED AIR DRYER DRUM |
| LIME | WOOD BIOMASS OVEN | | |
| PAPER | EFFICIENCY OF CONTINUOUS PAPER MACHINE | RECOVERY FROM FIBER PRODUCTION TETRAPACK TISSUE | |
| CEMENT | USE OF SECONDARY SOLID FUELS (RDF) AS PARTIAL SUBSTITUTION FOR FOSSIL FUELS | CONTINUOUS PARTICLE-SIZE ANALYZER FREE LIME IN CLINKER | |
| CERAMIC / BRICKS | OVEN FOR TILES COOKING WITH HEAT RECOVERY | | |
| CHEMISTRY | REACTOR FOR POLYCRYSTALLINE SILICON MANUFACTURING | INNOVATIVE PRODUCTION OF POLYMERS: PET BARRIER | |
| RUBBER / PLASTICS | RECOVERY OF HEAT GENERATED BY MECHANICAL FRICTION IN TIRES PROFILING | BUBBLE EXTRUDER FOR PLASTIC FILMS | |
| WORKING NON METALLIC MATERIALS | DIAMOND CUT WIRE | <p>Main reasons behind the industrial success:</p> <ul style="list-style-type: none"> ▶ lower pay-back time and higher additionality then households and services; ▶ larger dimension of projects (best value VS knowledge and administrative costs). | |
| PETROCHEMICAL | RECOVERY OF GAS TORCH WITH COMPRESSOR LIQUID RING | | |
| LAUNDRY-SERVICES INDUSTRY | MACHINE WITH PROCESS ELECTROLYTIC BATCH WASHER | | |
| STEEL INDUSTRY | ENERGY EFFICIENT MELTING FURNACE | | |
| PRINTING / GRAPHICS | ROTARY MACHINE | | |
| TELECOMMUNICATIONS | ENERGY EFFICIENT RADIO BASES | | |
| TEXTILE | HEAT RECOVERY ON DRYING MACHINE | | |
| TRANSPORTATION | MANAGEMENT OF WASHING FOR AIRCRAFT ENGINES | AUXILIARY SYSTEM FOR THE PRODUCTION OF ELECTRICITY ON AIRPLANES | |
| GLASS | EFFICIENCY OF THE MELTING FURNACE FOR GLASS | | |

Verification process



Data requested are indicated in the deemed saving and scaled saving files or in the approved PPPM (e.g. certificates of performance, list of clients, metered quantities, planimetries and schemes, incurred costs, etc).

Each project is assessed and verified when presented

Extended documental verifications take place on a sample according to an annual verification plan produced by GSE.

Data requested can be related to the building where the project has been implemented, information on the production cycle, information on energy bills, additional information on the project aimed at verifying the compliance with the existing rules (e.g. energy certification of the building, certification of components performances, conformity with applicable standards, etc.).

The plant or building are inspected and additional documentation is verified.

On-site verifications are carried out on all projects over 3,000 toe and on a sample according to an annual verification plan produced by GSE.

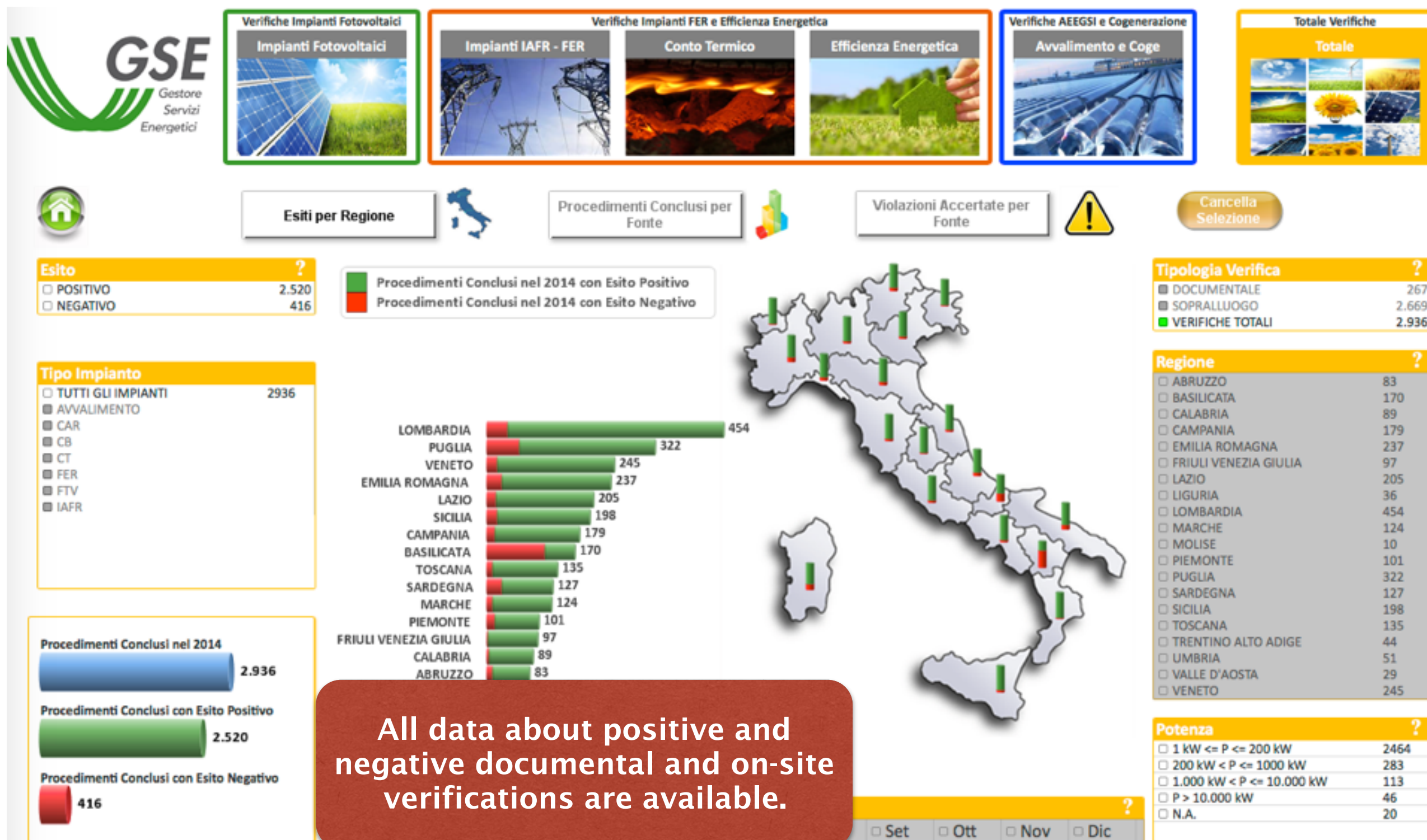
If the verification is negative, the incentive is locked and the money already received by the proponent is requested back. In the most critical cases a ban from all the incentive schemes is applied for ten years.

Source: FIRE.

Public reports on verifications



<http://bancadativerifiche.gse.it>



Verification process



Updated
vales: 42% of
PPPMs and 7% of
RVCs presented in
2015 were
rejected!

| Proposals | PPPM | Requests of certificates | Total |
|---|------------|-----------------------------|---------------|
| Verification completed | 752 | 10,037 | 10,789 |
| <i>Approved</i> | 467 | 9,622 | 10,089 |
| <i>Rejected</i> | 261 | 251 | 512 |
| <i>Other (suspended, retired or not receivable)</i> | 24 | 164 | 188 |
| Under verification | 247 | 728 | 975 |
| Total | 999 | 10,765 | 11,764 |

Source: FIRE on GSE data. 2015 proposals updated by April 2016.

The main issues incurred in the verification and control process are:

- ▶ requests for additional information and/or documentation not listed in the deemed saving and scaled saving files or in the PPPMs;
- ▶ request for proof of CAPEX of the project and the cost of energy for PPPMs;
- ▶ issues linked to the shared responsibilities;
- ▶ issues related to the closure or modification of plants prior the end of the technical life.

Targets VS savings and certificates



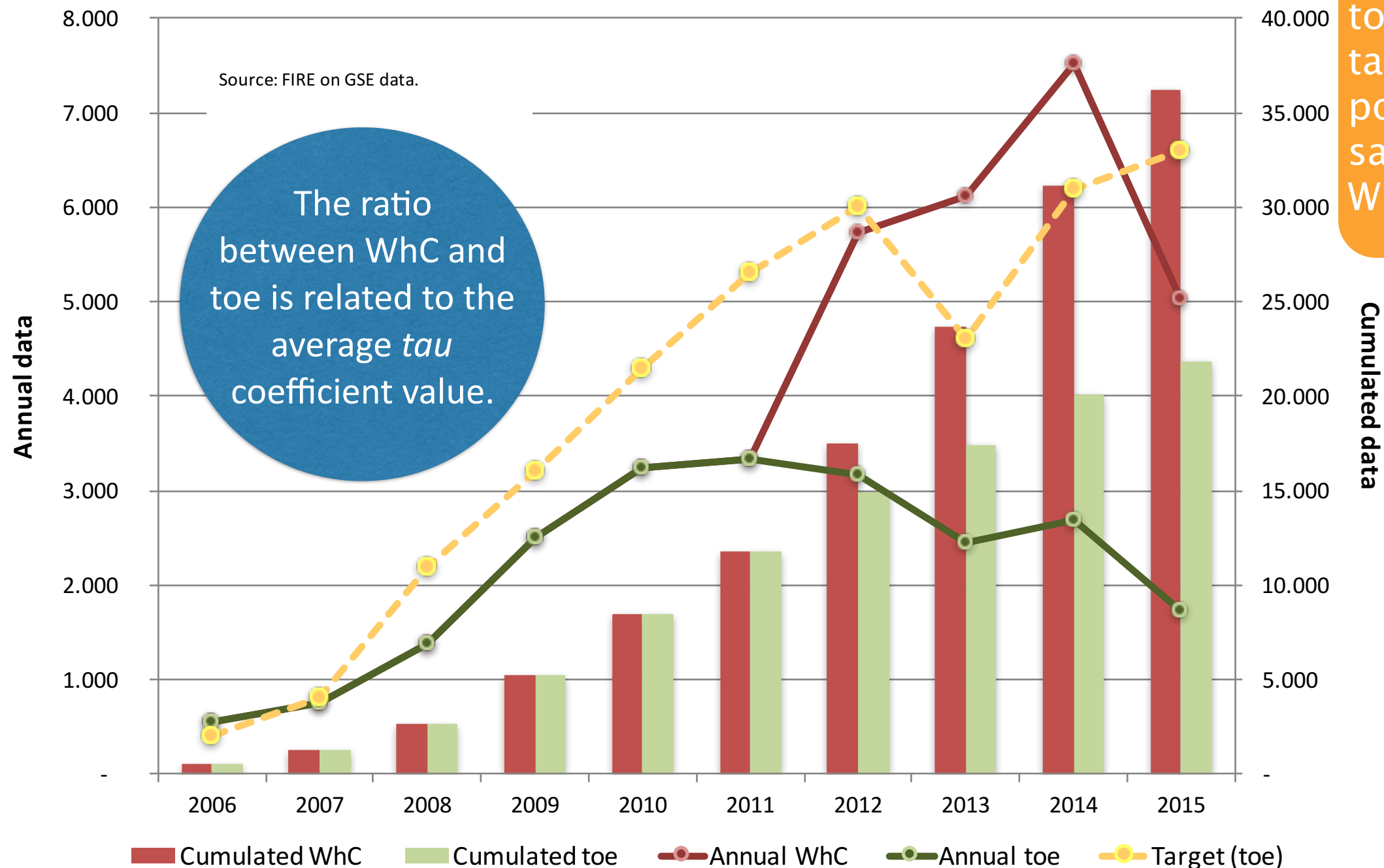
Annual and cumulated savings, certificates and targets

(data in thousands)

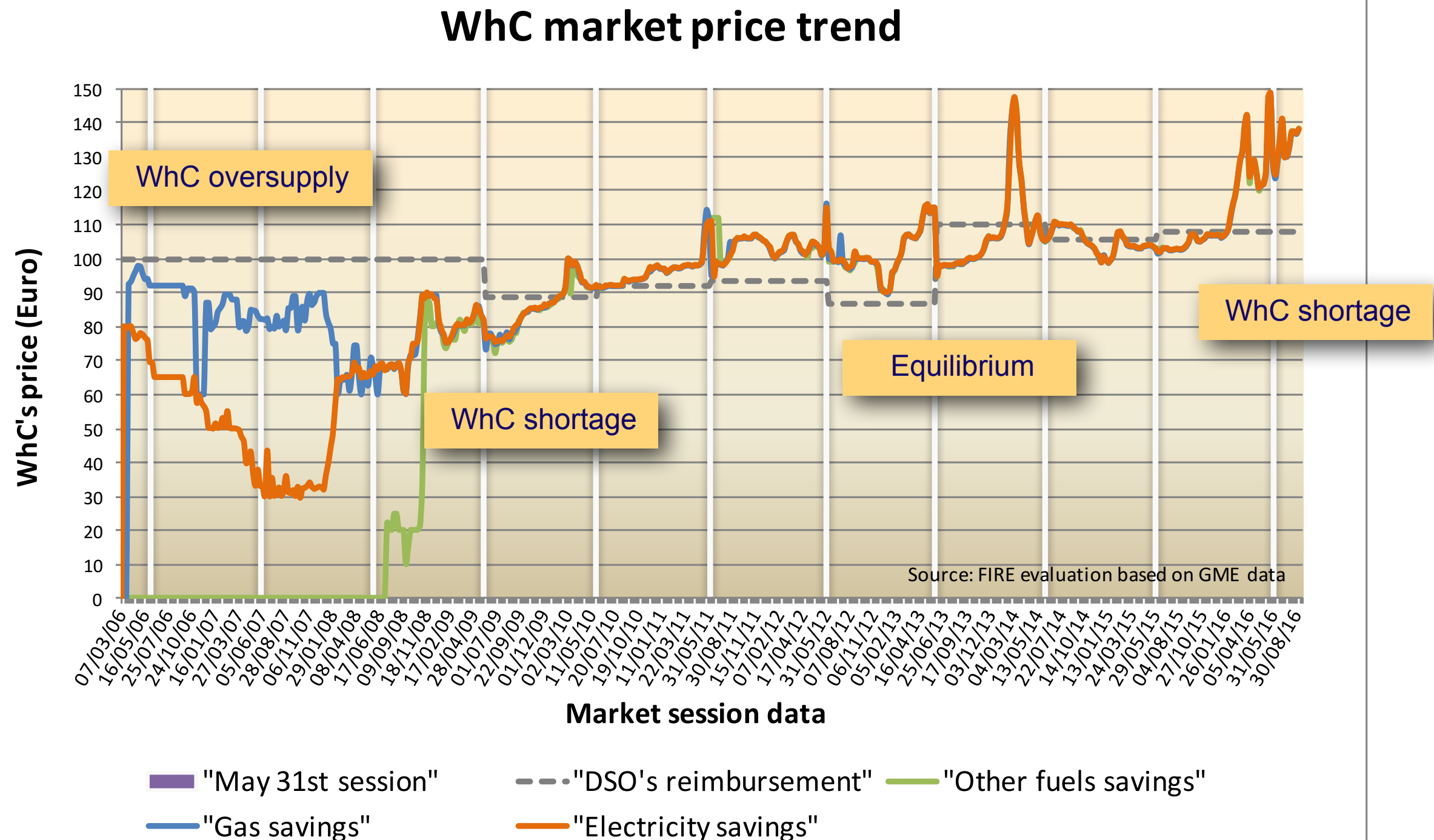
Source: FIRE on GSE data.

The ratio between WhC and toe is related to the average *tau* coefficient value.

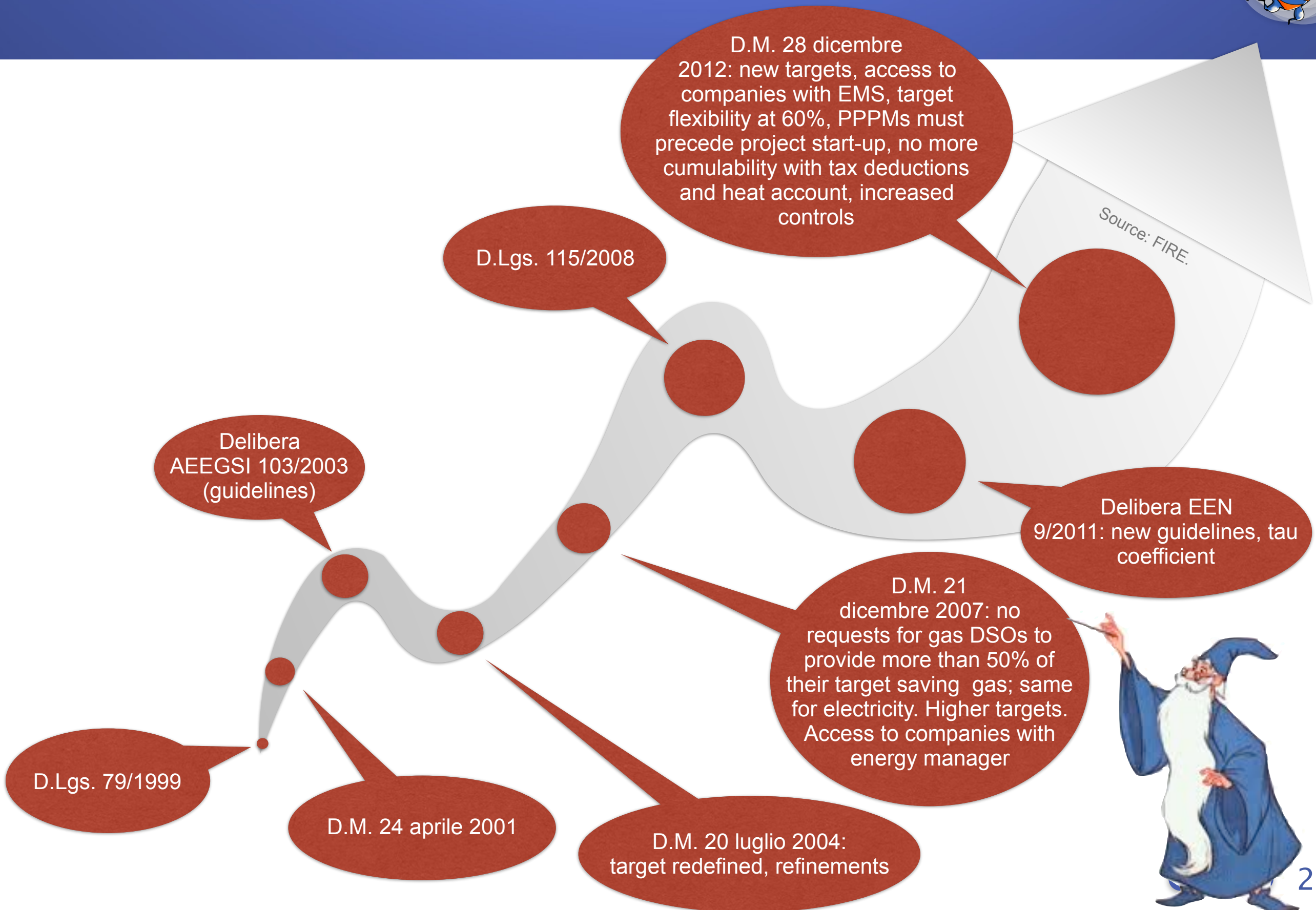
Increasing difficulty to reach the toe targets, even if it is possible to consider savings not linked to WhC to that purpose.



WhC spot market price trend



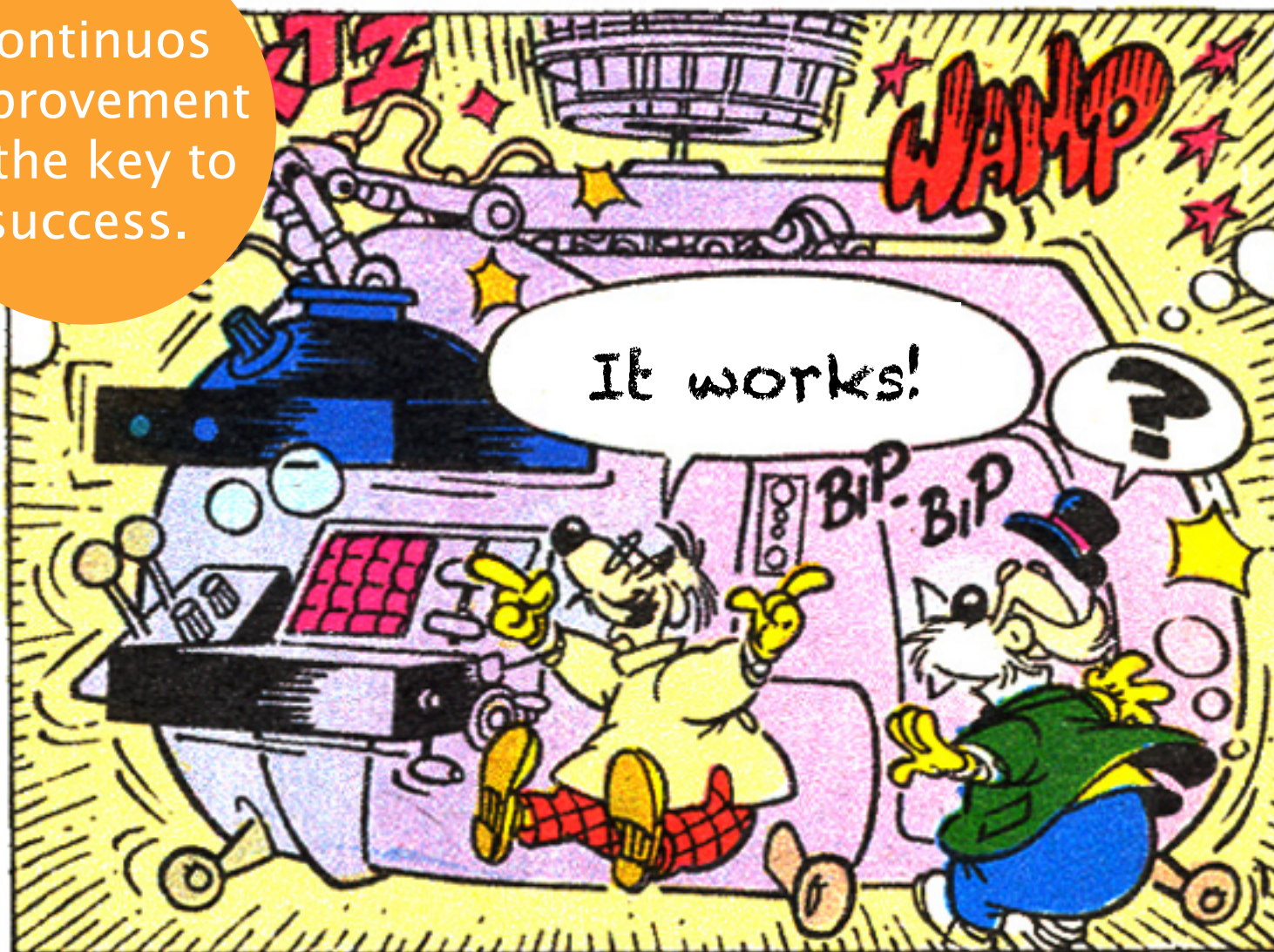
Towards the new WhC guidelines



Towards the new WhC guidelines



Continuous improvement is the key to success.



Some directions from MiSE for the new guidelines, to be issued in few months:

- no more tau coefficient;
- new evaluation methodology (simplified monitoring plans with sample measurements) and surveyed savings;
- stricter evaluation of *ex-ante* consumption;
- new rules for responsibilities with ESCOs as proponents;
- pay-back time minimum requirements;
- increased controls.

New guidelines to be introduced in order to improve the scheme (cost effectiveness, additionality/materiality, saving assessment, support to complex projects, etc.).

The most important lesson learnt is that such a scheme can not be born perfect, but it needs continuous care and also some imperfections should be accepted during transitions.

Conclusions about the Italian WhC scheme



Pros:

- flexibility;
- capacity, being capable of covering a good percentage of the national targets;
- support to an energy efficiency market development;
- support to policy making, due to the huge number of valuable data collected through PPPMs;
- reliable and wide data and statistics, due to the assessment of metered energy savings.

Cons:

- high complexity, worthy the effort only in case of ambitious targets;
- appreciable results require a long time vision;
- need of an enlarging management structure and care to avoid unmanageable peaks in the verification activities;
- information and support activities are vital to ensure the success of the scheme.



Good practices in industry: EU-MERCI

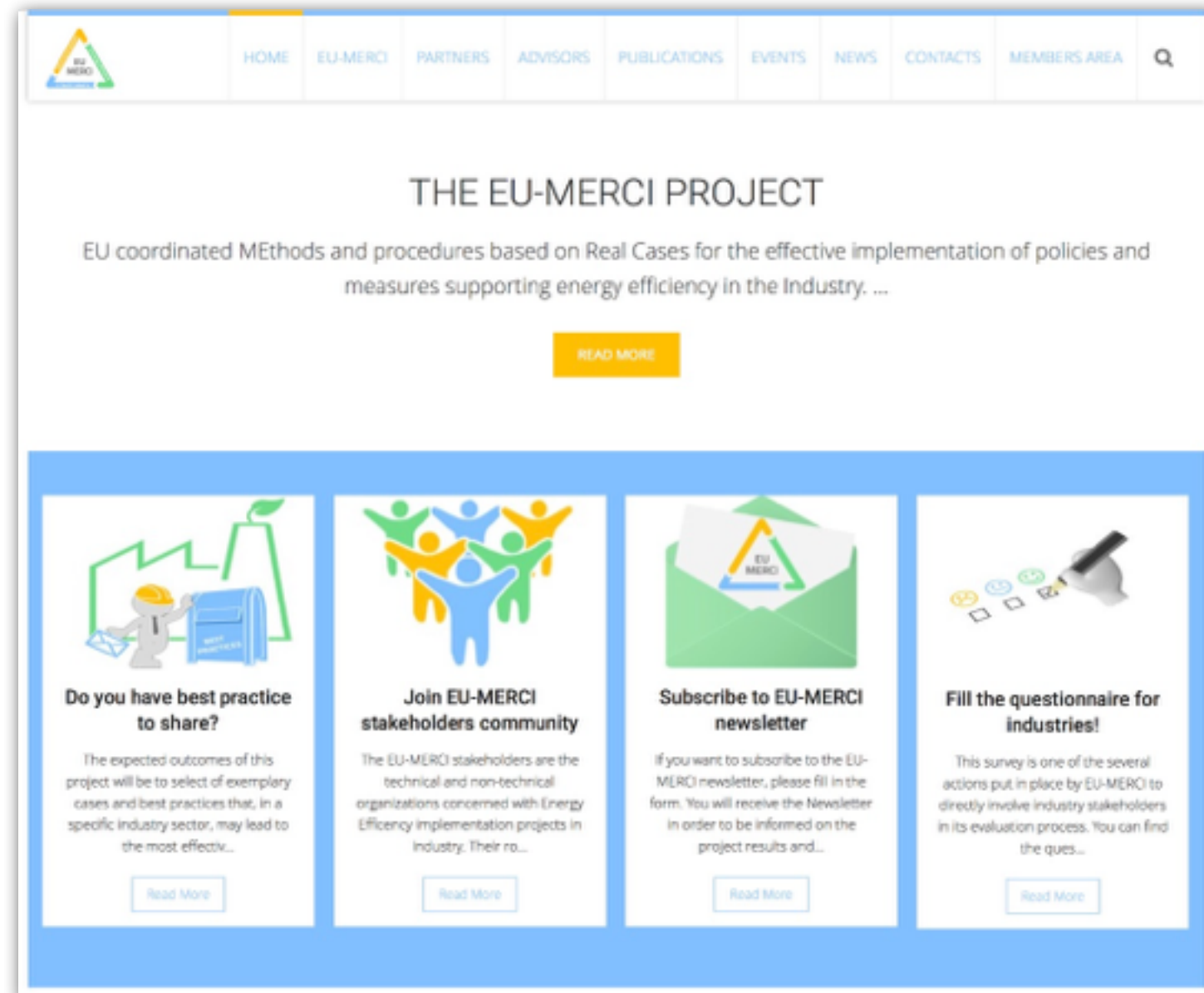


The EU-MERCI project is dedicated to the sharing of best practices in the industrial sector.

Presently it is possible to:

- share your good practices;
- join the EU-MERCI community;
- complete the EU-MERCI survey;
- subscribe to the newsletter;

From 2017 on it would be possible to access the good practices repository.



www.eumerci.eu





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