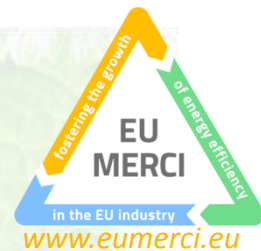


EU MERCI

EU coordinated **ME**thods and procedures based on **Rea**l **Cas**es for the effective implementation of policies and measures supporting energy efficiency in the Industry

Fostering the growth of energy efficiency in the EU industry



Energy Efficiency in the Italian Industry: Trends and Potential

**A bottom-up study based on the analysis
of Italian white certificates data**

Claudio Zagano (RSE)

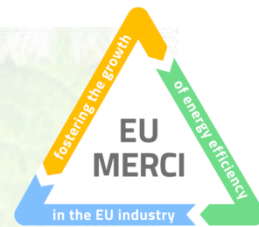
EU-MERCI - Final Conference

London – January 23rd, 2018

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



About RSE



Ricerca sul Sistema Energetico - RSE SpA, is a joint stock company, whose unique shareholder is the Italian national grid operator GSE SpA.

<http://www.rse-web.it>



The mission of RSE is to carry out publicly funded national and international programs in the fields of electrical power, energy and the environment. RSE is financed by the Italian Electricity System Research Fund of the Italian Economic Development Ministry, and international funded research programs and contracts, on electro-energy sectors.

RSE studies cover the following:

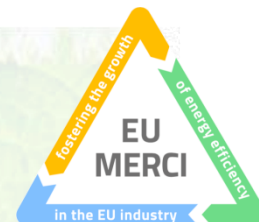
- technical, economic, organizational and institutional aspects associated with the sustainable development of the Italian electrical power network and related infrastructures
- safe and effective use of primary sources of energy
- power generation, transport and distribution and end-use energy efficiency



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



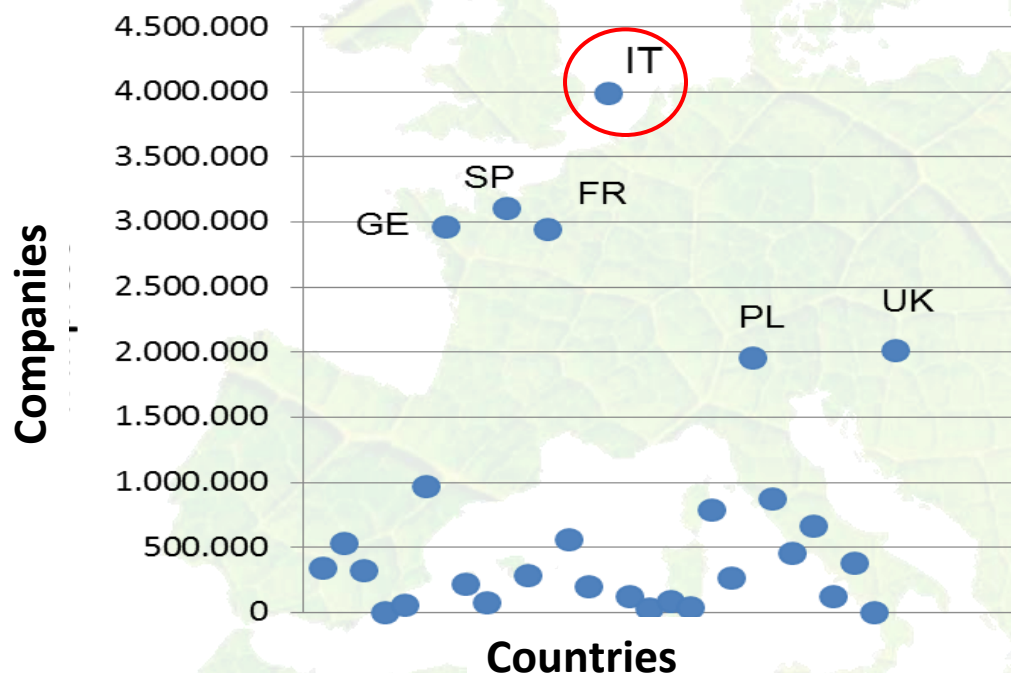
Industry in Italy



The Italian industrial sector is responsible for **21% of final energy consumption**.

The **theoretical volume of investment** by 2015 is estimated at: **€ 1.8 billion**
(EU 28 scores € 15.3 billion)

Average Specific Cost of Investment in Energy Efficiency interventions: **€ 0.07 €/toe**

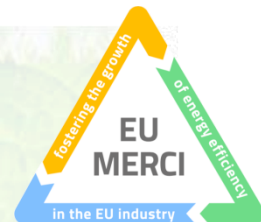


In 2010 in EU 28 there were about 24.3 million companies, of which **over 16% in Italy**

94.6% of Italian companies have **less than 10 employees**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845

Critical aspects on energy efficiency in Italian industry



Economic barriers

- ☐ < **30%** of energy efficiency projects are actually implemented (high PBT, financial risk, credit crunch,...)

Internal competition for capital: *EE is a minor issue compared to core business*

- ☐ < **15%** of investments in industrial processes are driven by EE

Regulatory barriers

- ☐ The **legislation** on energy efficiency is **constantly evolving** (complexity of the WC mechanism, heavy bureaucracy, ...)

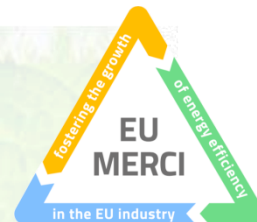
Informational barriers:

lack of knowledge and awareness about EE

- ☐ < **18%** of enterprises have an **Energy Manager**
- ☐ **Only 30%** of enterprises know **ESCos**



The driving force of the White Certificates



The incentive mechanism of the **Italian White Certificates** mainly contributed to:

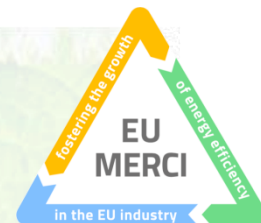
- Consider the **heat dispersed** in the processes as a doubly rewarding "**energy resource**" (energy savings + incentives).
- Reducing the level of greenhouse gas emissions: greater energy efficiency makes it possible to **use less fossil fuels** and **facilitate compliance with the emission limits**
- **Re-evaluate industrial waste** by considering them as an **alternative or additional energy source** (the promotion of the use of renewable sources is dictated by Legislative Decree 28/2011 and the EEN 9/11 guidelines that considers **energy from biomass totally as energy savings**).



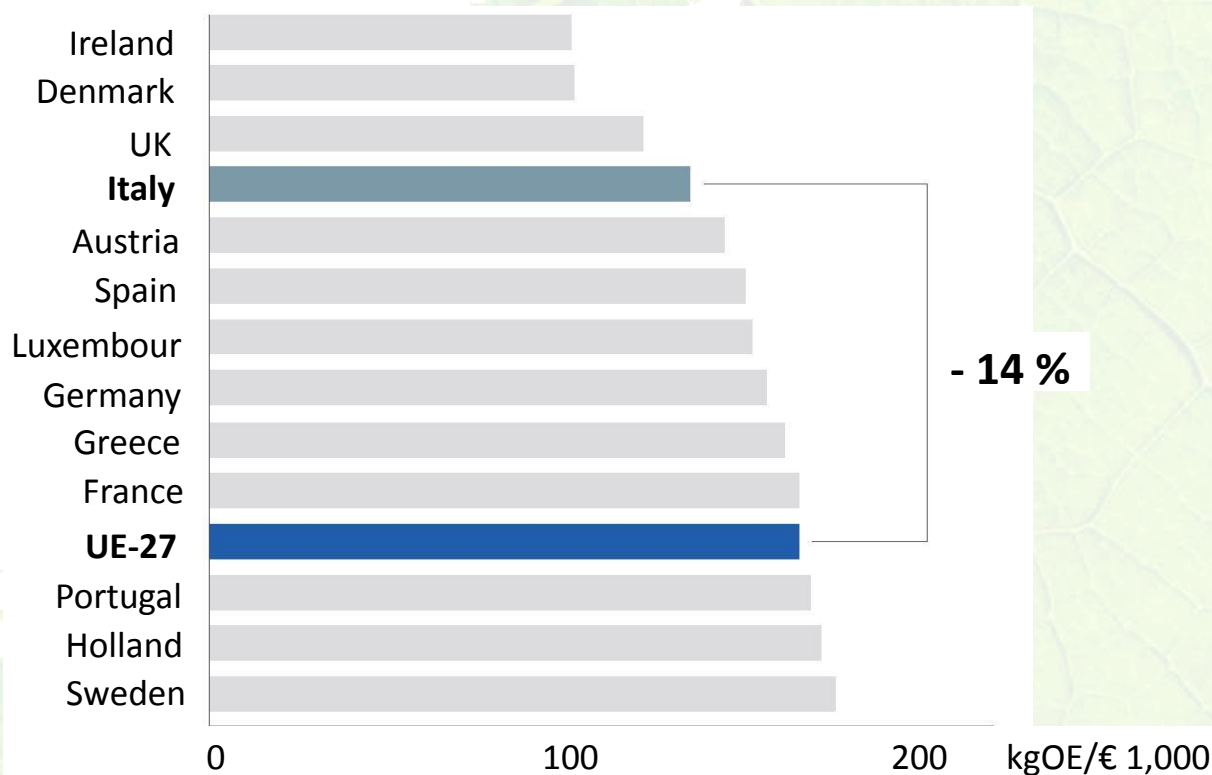
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



The growth of energy efficiency in Italian industry



Italy is among the top positions compared to that of other European countries with a similar level of development and industrialization

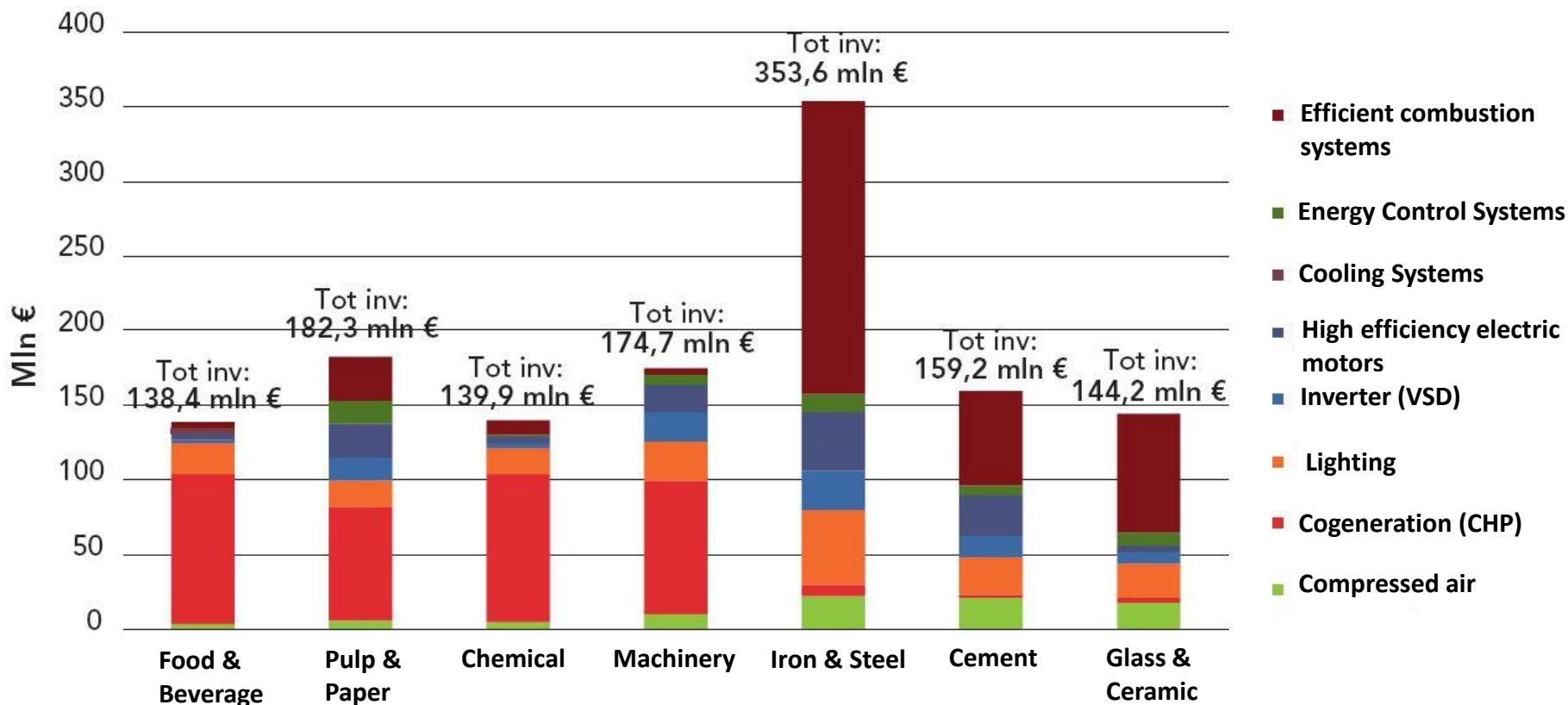


Primary energy intensity EU-27 2010, measured in kgOE/€ 1,000 GDP (source: Eurostat data)

How Italian Industry invests in EE



Investments in Energy Efficiency interventions in the Italian industrial sector in 2015

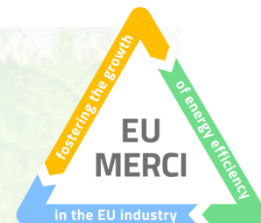


© ENERGY & STRATEGY GROUP-2016

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project



What is the savings potential that can be achieved by Italian industry through energy efficiency?

The InduCO (Indu^{Industry}-^{Consumption}-^{Optimization}) project



aims to answer this question starting from the analysis of the Italian industrial sector, its characteristics, its state of efficiency, cost opportunities and reasonable criteria of feasibility, to define the **sustainability** of energy efficiency measures and the **potential** for energy savings that can be achieved.

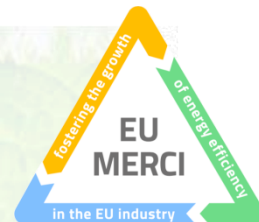
The data of the **Italian white certificates** mechanism have been fundamental to achieve this goal



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project methodology



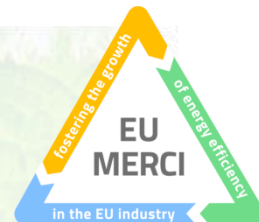
Analysis of the sample of White Certificates

- *Process analysis*
- *Consumption analysis by phase*
- *Analysis of production types*
-

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project methodology



Analysis of EE interventions

- *Cluster classification*
- *Specific consumption*
- *Savings*
- *Investment Costs of EE*
- *.....*

Analysis of the sample of White Certificates

- *Process analysis*
- *Consumption analysis by phase*
- *Analysis of production types*
- *.....*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project methodology



- *Classification*
- *Overall consumption*
- *Overall production*
- *.....*

Analysis of the industrial sector

Analysis of EE interventions

- *Cluster classification*
- *Specific consumption*
- *Savings*
- *Investment Costs of EE*
- *.....*

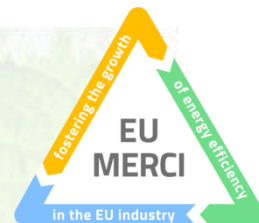
Analysis of the sample of White Certificates

- *Process analysis*
- *Consumption analysis by phase*
- *Analysis of production types*
- *.....*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project methodology



Analysis of EE interventions

Analysis of the sample of White Certificates

- *Classification*
- *Overall consumption*
- *Overall production*
- *.....*

- *Factory classification*
- *Factory consumption*
- *.....*

- *Cluster classification*
- *Specific consumption*
- *Savings*
- *Investment Costs of EE*
- *.....*

- *Process analysis*
- *Consumption analysis by phase*
- *Analysis of production types*
- *.....*

Analysis of the industrial sector

Analysis of Industry production layout



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Induco project methodology



- *Classification*
- *Overall consumption*
- *Overall production*
- *.....*

Analysis of the industrial sector

Relate the savings of each cluster of EE interventions to the consumption of each type of Factory

Analysis of Industry production layout

Analysis of EE interventions

- *Investment Costs of EE*
- *.....*

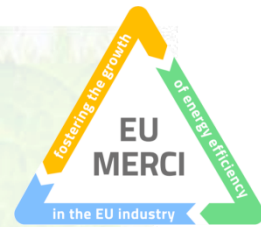
Analysis of the sample of White Certificates

- *Process analysis*
- *Consumption analysis by phase*
- *Analysis of production types*
- *.....*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Replicability of EE measures



To define as realistic as possible a replicability, some important criteria have been applied:

Technological limits

- ☐ Some devices do not allow modifications for constructive or technical reasons

Economic limits

- ☐ The propensity to apply EE interventions depends on several factors (high PBT, financial risk,...) and is characteristic of the sector operators.

Geographic limits

- ☐ Some types of production (and the related process) depend on the particular industrial district and the local geopolitical context

Cumulability limits

- ☐ Some EE interventions can not be done on the same plant (i.e. oven revamping and oven replacement are alternative to each other)

Repeatability grade

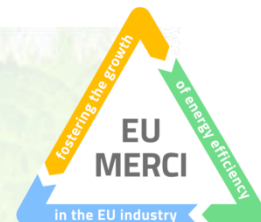
- ☐ Some interventions can be replicated in the same plant at regular time intervals (i.e. revamping, insulation, ...)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Glass industry savings potentials: electricity

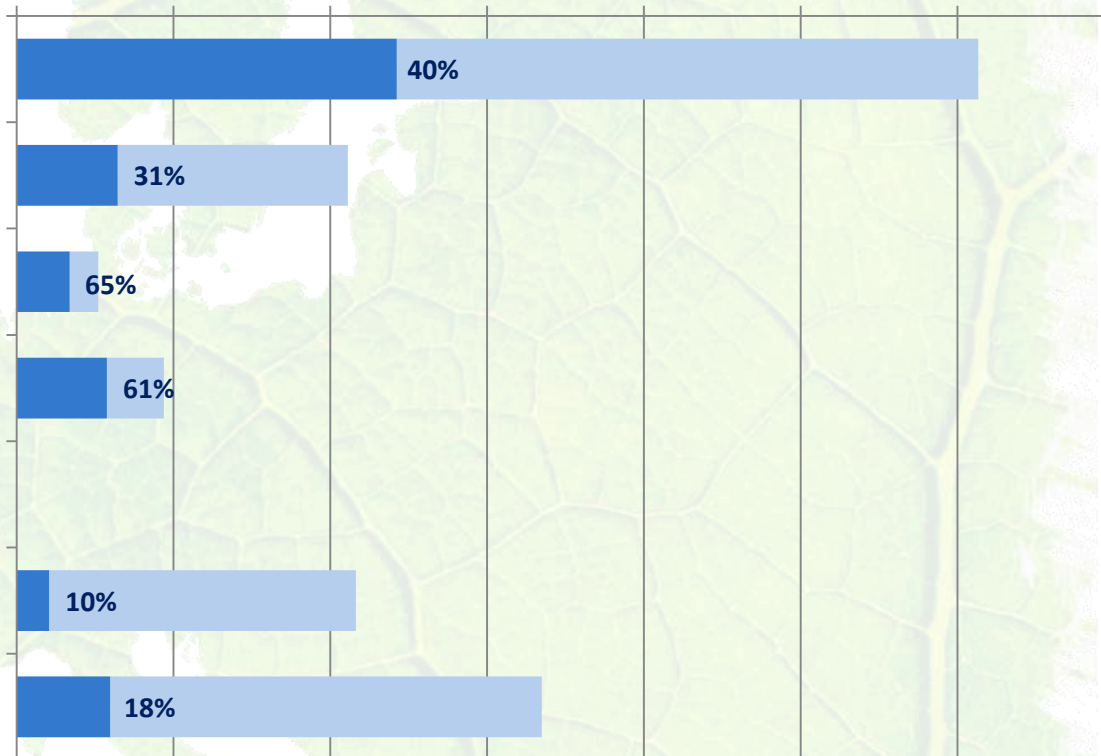


Electricity saving potentials for the glass sector

tep

0 5.000 10.000 15.000 20.000 25.000 30.000 35.000

1. Revamping of the melting furnace
2. Replacement of the existing melting furnace
3. Revamping of the melting furnace with Oxy-Fuel firing
4. Installation of a new melting furnace with Oxy-Fuel firing
5. Heat recovery
6. Inverters and high efficiency motors
7. Interventions on the production line



■ Electricity savings already achieved, tep

■ Electricity savings still achievable, tep

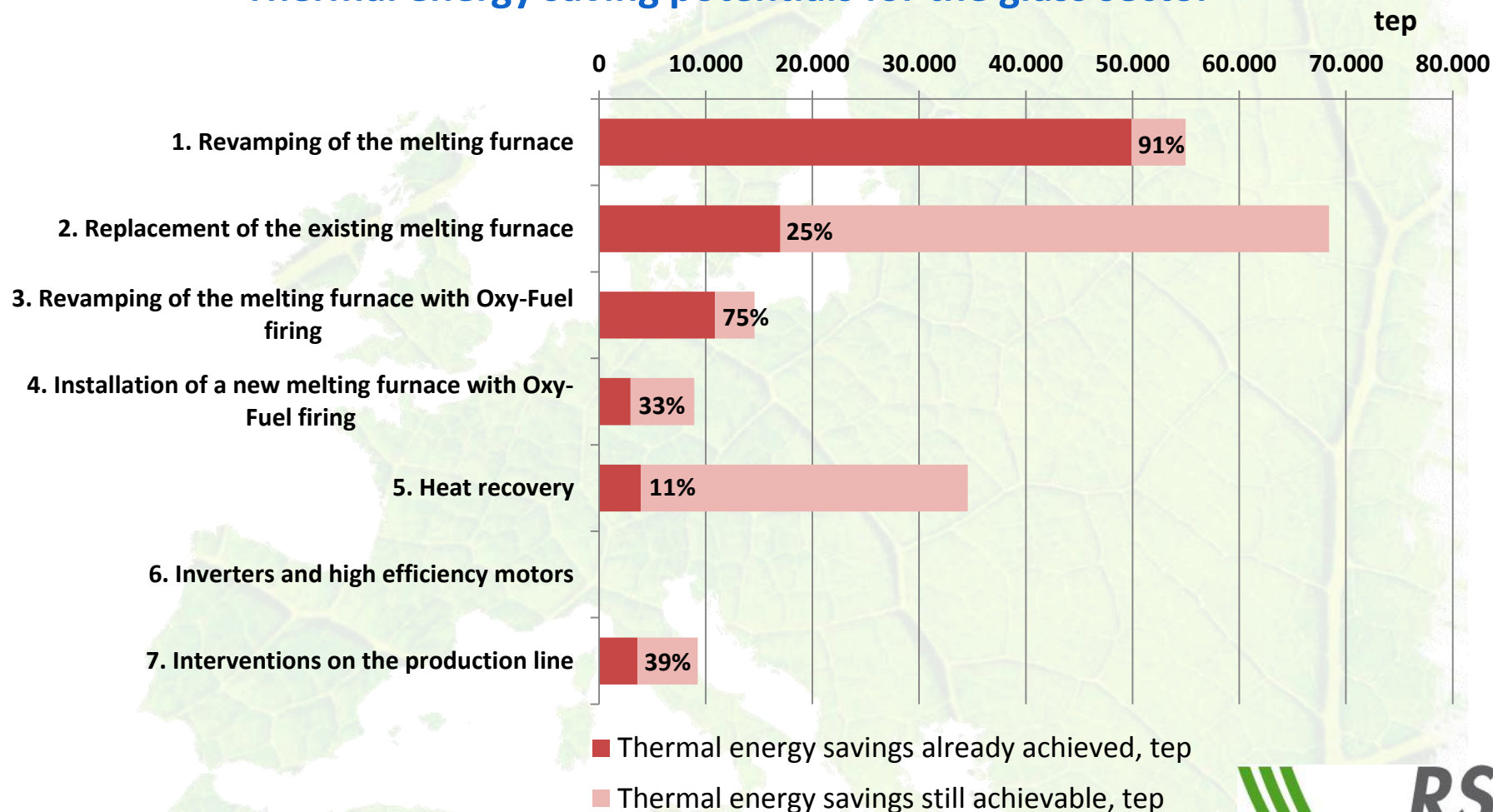
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Glass industry savings potentials: Thermal energy



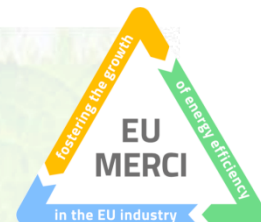
Thermal energy saving potentials for the glass sector



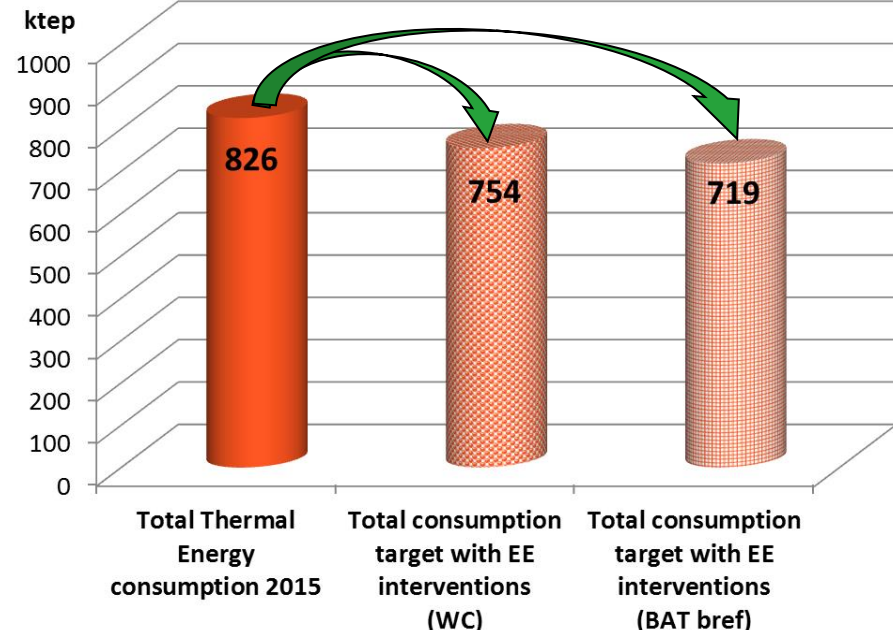
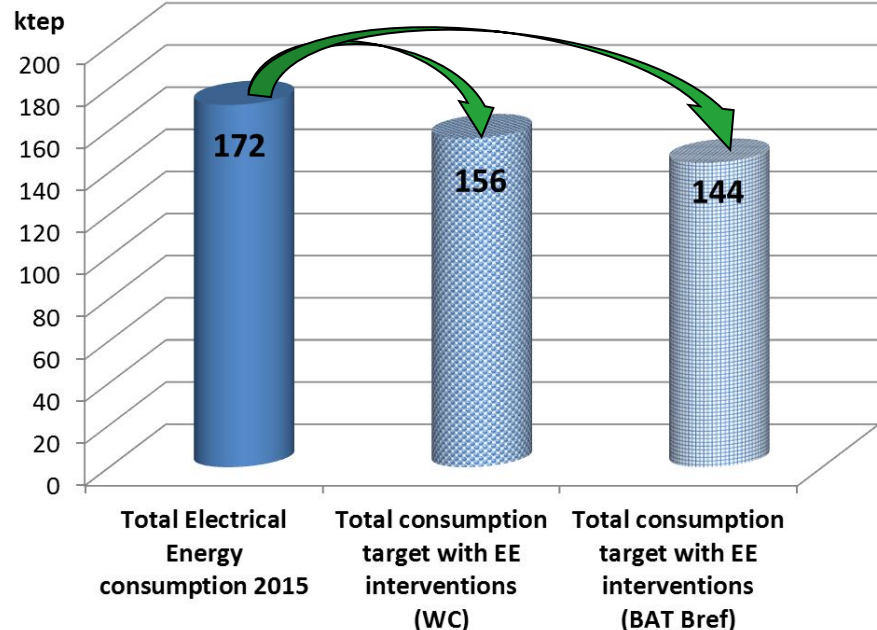
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



White Certificates Good Practice vs BAT Bref Best Practice



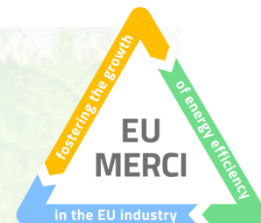
Potential reduction in electricity and heat consumption for the industrial glass sector according to the Induco project projections (White Certificates) and the Best Available Technologies (BAT Bref)



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



Wrap-up and Conclusions



- ✓ *Incentive systems such as White Certificates have shown real effectiveness.*
- ✓ *There is still much to be done to ensure that EE in industry becomes a current and consolidated practice in industrial sectors*
- ✓ *It is necessary to promote and reward the interventions that are distinguished by innovation and effectiveness*



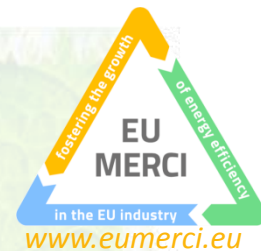
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845



EU MERCI

EU coordinated **ME**thods and procedures based on **Rea**l **Cas**es for the effective implementation of policies and measures supporting energy efficiency in the Industry

Fostering the growth of energy efficiency in the EU industry



Thank you!

Contacts



Claudio.Zagano@rse-web.it

RSE S.p.A. – Via Rubattino, 54 – 20134 Milano IT



+39 02 3992 4699



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 693845

