



Energy Efficiency Good Practices in industry: the EIEEP platform

Simone Maggiore & Anna Realini (RSE), Dario Di Santo, Livio De Chicchis & Francesco Mori (FIRE)

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Anna Realini, RSE S.p.A.

Agenda

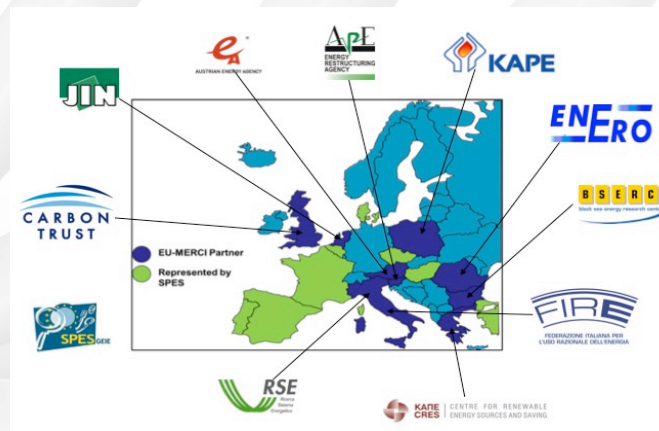
- The EU-MERCI Project
- EU Policy Background
- Building the database
- “Good Practices” selection
- Key Performance indicators
- Database analysis
- The EIEEP Platform
- Conclusions

The EU-MERCI project

EU-MERCI: EU coordinated **M**ethods and procedures based on **R**ead **C**ases for the effective implementation of policies and measures supporting energy efficiency in the **I**ndustry.

RSE role:

- Project coordinator (Simone Maggiore)
- Enabler: i.e. data provider
- WP 4 Leader– «Elaboration and assessment of data» (Anna Realini)



EU Policy Background [1/2]

Energy Efficiency Directive (EED) (2012/27/EU)

The main goal of EED is for all EU countries to use Energy with higher efficiency, in the overall Energy chain, from producers to final consumers.

Industrial Emissions Directive (IED) (2010/75/EU)

This directive recalls previous ones (IPPC) and puts BAT (Best Available Techniques) as technological reference for the emission limits. Competent authorities use these references for their authorization procedure (e.g. AIA)

Strategic Energy Technology Plan (SET-Plan)

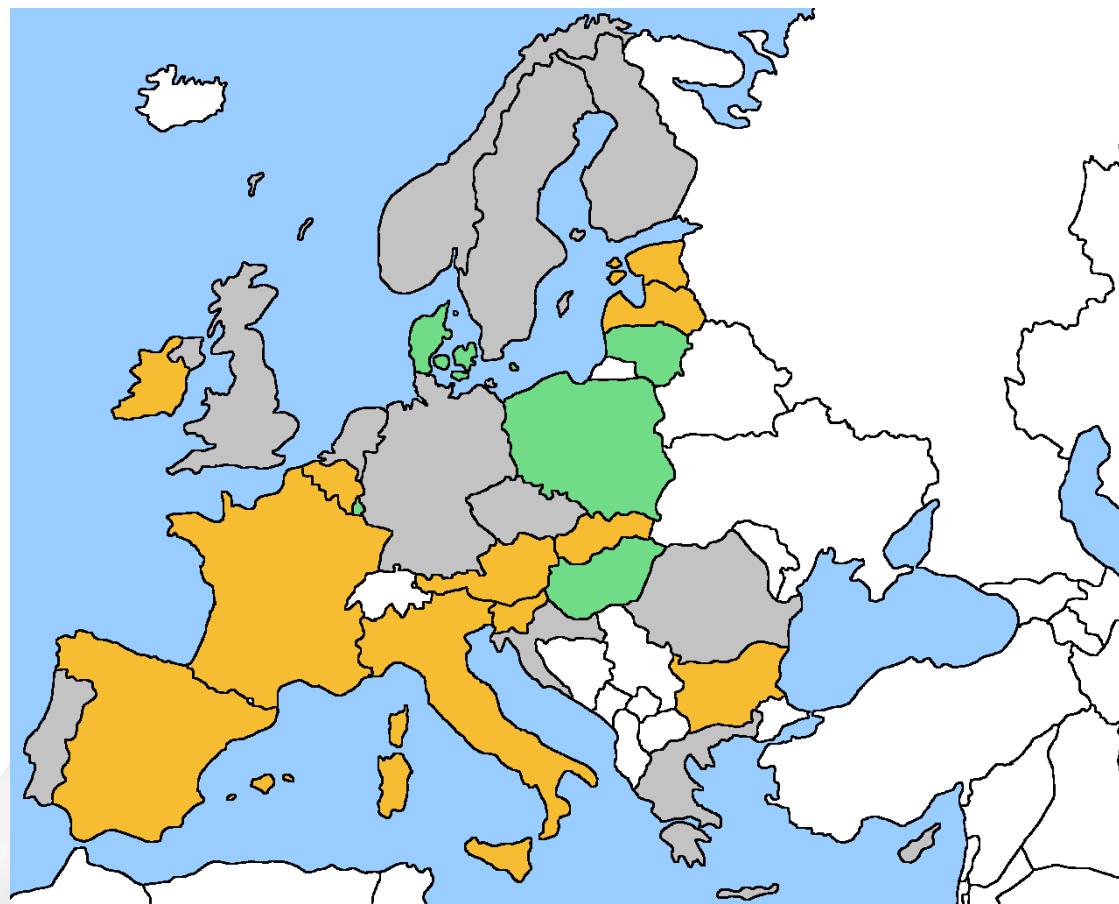
Among the key actions , number 6 is «**Energy Efficiency in Industry**», that is mentioned also in:

- 2020 targets: «Bring to mass market more efficient energy conversion and end-use devices and systems, in buildings, transport and **industry**, such as poly-generation and fuel cells»
- 2050 vision: «**Achieve breakthroughs in enabling research for energy efficiency**: e.g. materials, nano-science, information and communication technologies, bio-science and computation »

EU Policy Background [2/2]

16 countries have implemented **industry-relevant EEO**:

- of which most have combined this with alternative measures.
- In 5 countries (Denmark, Hungary, Lithuania, Luxembourg and Poland) the EEO is the sole relevant EE measure for industry
- 13 countries implement alternative measures only



➔ Different methodologies for savings calculation and monitoring

Building the database: sectors selection

Selected sectors:

- Manufacture of food products – Manufacture of beverages - NACE C10-C11;
- Manufacture of pulp and paper products - NACE C17;
- Manufacture of coke and refined petroleum products - NACE C19;
- Manufacture of chemicals and chemical products - NACE C20;
- Manufacture of other non-metallic mineral products (divided into Glass, Ceramic and Cement) - NACE C23;
- Manufacture of basic metals (divided into Iron&Steel and Other metals) - NACE C24;
- Machinery - NACE C25-28.

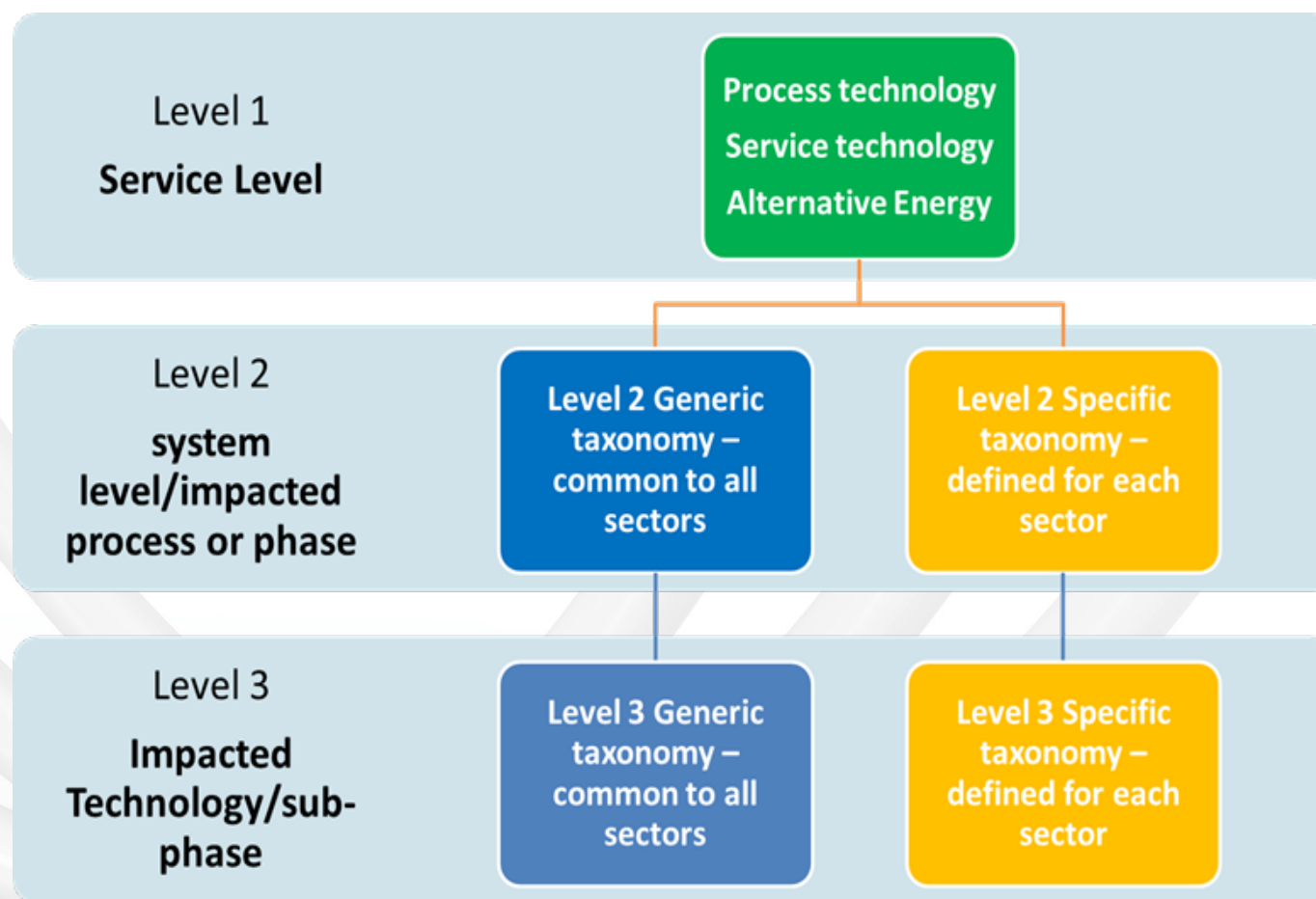
Building the database: fields selection

Minimum data fields:

- Sector - NACE Code (up to 4 digits where available);
- Location (country);
- Company Size (Small, Medium, Large);
- Full textual description of the adopted measure;
- Taxonomy (process allocation, 3 levels)
- Energy carriers involved in the measure (from 1 to 5);
- Baseline of the consumptions (where available, specific to the process or plant);
- Achieved savings;
- Overall cost of the implemented measure or project;
- Cumulative amount of incentives granted to the measure or project.

Building the database: taxonomy

Taxonomy is useful to have a full description of the EE measure that allows to perform statistical analyses of the database.



"Good Practices" Selection [1/2]

"Best Practice"

A method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means.



Technically feasible ?



Economical?

"Good practice"

It is a technique or a methodology that, through experience and research, has been proven to reliably lead to a desired result with the minimum use of resources.



EFFICIENT



**ECONOMICALLY
FEASIBLE**



**TECHNICALLY
FEASIBLE**

“Good Practices” selection [2/2]

3-way approach for “Good Practices” selection:

- Statistical analysis of the sector data-set → number of occurrences of a measure in the data-set (replicability in different countries)
- KPI identification and calculation → objective measurement of the performances
- Engineering expertise → technical appeal of the Energy Efficiency measures (not trivial)



ENERGY EFFICIENCY MEASURES RANKING

“GOOD PRACTICES” IDENTIFICATION

Key Performance Indicators

Technical KPIs → Energy Performances:

- Primary Energy Savings (PES) [toe]
- Energy Consumption Improvement (ECI) [%]
- Energy Intensity Reduction (EIR) [toe/k€]

Economic KPIs → Economic Performances:

- Simple Payback-time (PBT) [y]
- Cumulative Cash Flow (CCF) [€]
- Share of Project Cost Subsidized (SPCS) [%]

Advanced KPIs (environment, RES, etc):

- Renewable Energy Use (REU)
- Cost of Energy Savings (CES)
- Cost of Carbon Savings (CCS)

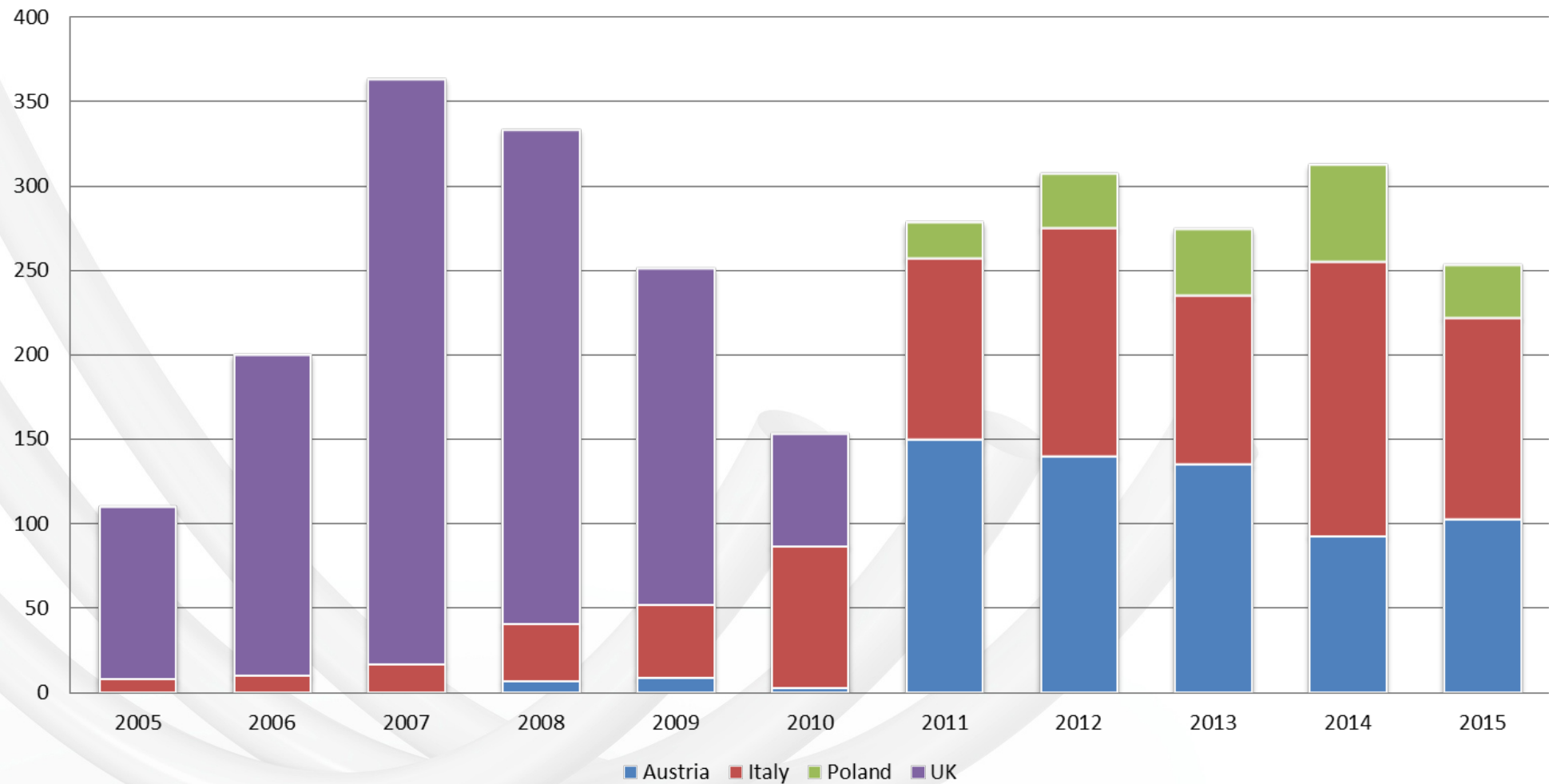
Database analysis

Goals:

- Understand the quality of the database
- Analyse similarities and differences among the different EU countries and the different sectors
- Understand how EU industry is consuming and saving energy

Database analysis - records

Number of records per year by Country



Database analysis – data availability

Baseline
consumption:
64%

Energy carriers:
96%

Investment
costs: 84%

Incentives
amount: 54%

Reference policy:
59%

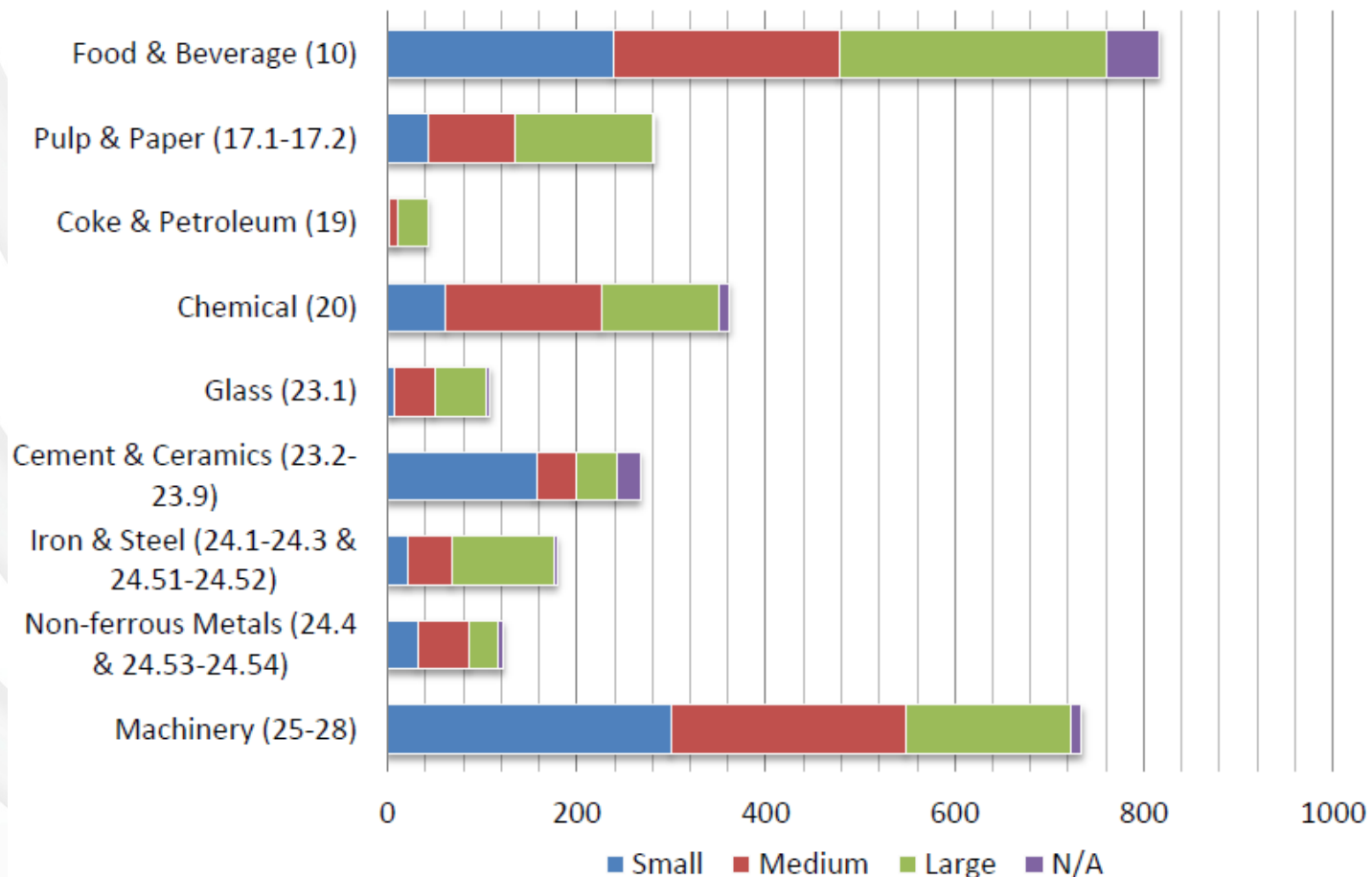
Full taxonomy¹:
26%

Different ways to collect data in incentives requests, related also to the different verification methods.

Note 1: Taxonomy availability shall be split by “generic” and “specific” taxonomy and “single case” and “combined case”: generic taxonomy, for both cases, is available for more than 95% of the cases; specific taxonomy is available for only 26% of the cases

Database analysis – company size

Company size per sector



Overall database:

SMALL: 31%

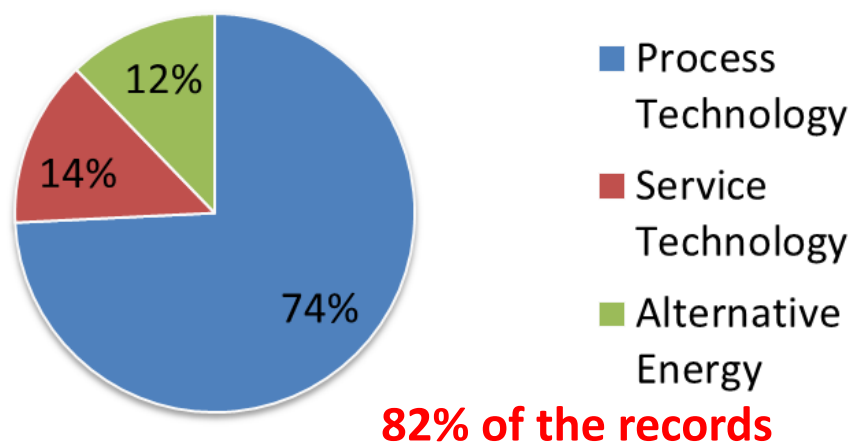
MEDIUM: 33%

LARGE: 36%

(N/As have been re-distributed proportionally)

Database analysis – taxonomy L1

L1 Taxonomy for single records

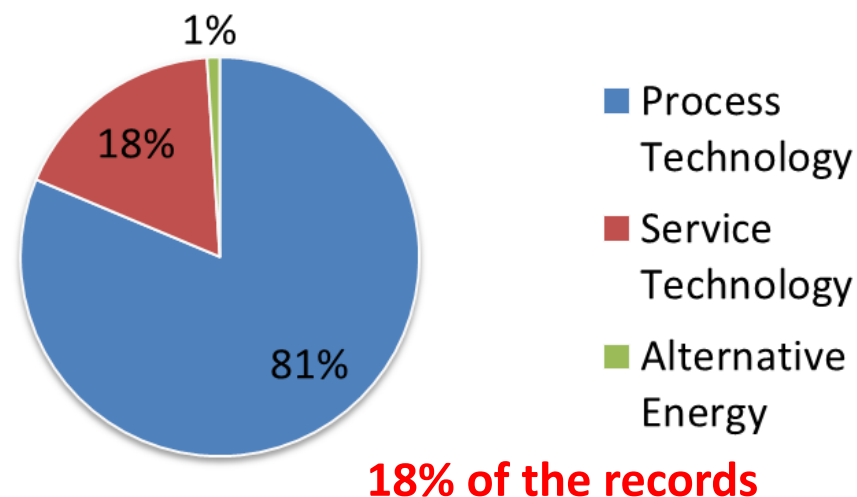


← Most measures are applied to Process

← Alternative Energy is not “energy efficiency” but it has been considered in terms of CO₂ emissions reduction

Alternative Energy is rarely applied in combination with other technologies →

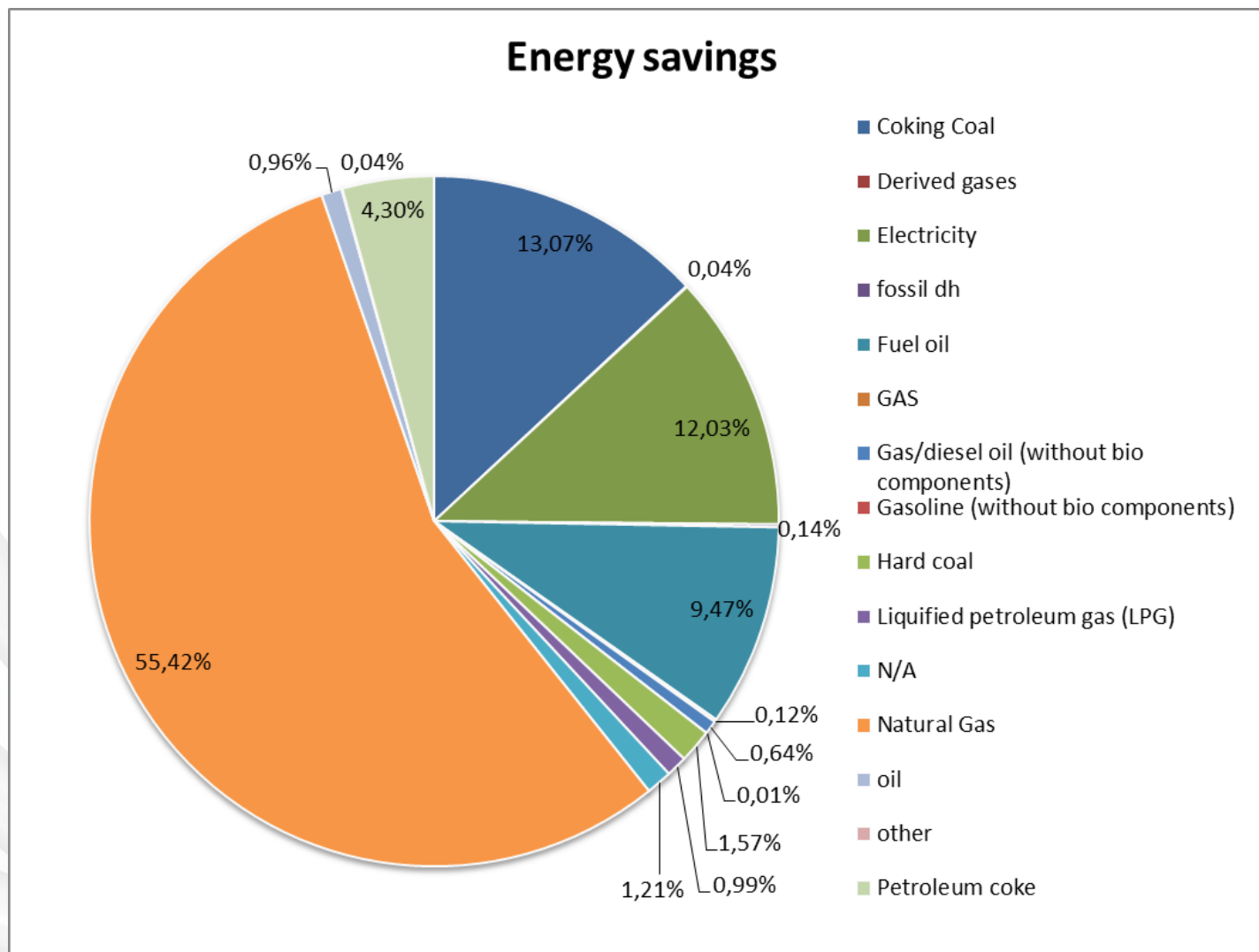
L1 Taxonomy for combined records



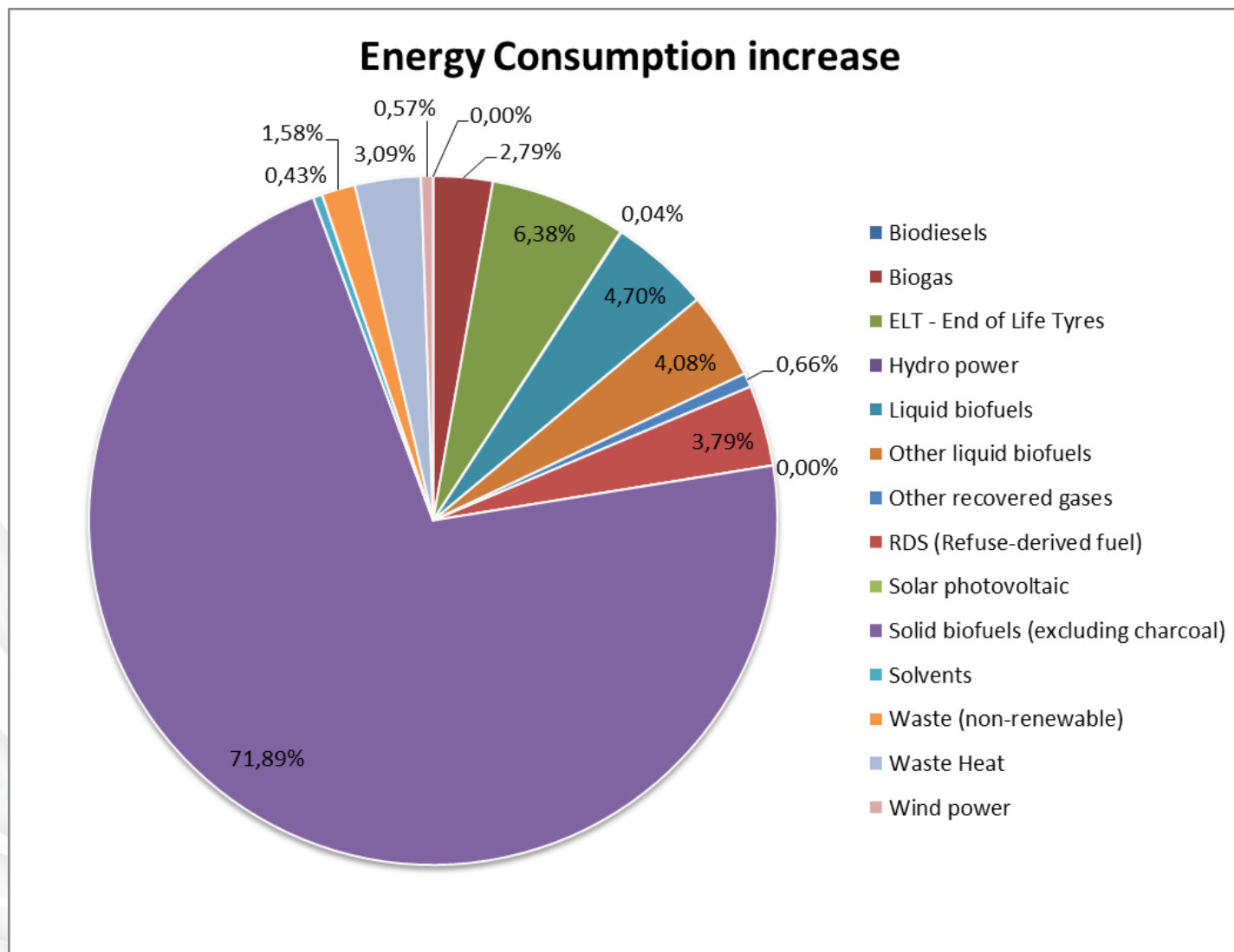
Database analysis – taxonomy L2

L2 generic taxonomy	Single	Combined
Heat Recovery and cooling	18.1%	9.1%
Process design and optimization	18.0%	16.1%
Compressed air	13.9%	16.6%
Motors and drives	13.0%	25.6%
Renewable energy sources	10.5%	0.8%
Combustion	8.0%	10.6%
Refrigeration	4.3%	5.2%
Drying, separation and concentration	2.3%	2.1%
Medium transport	1.9%	3.3%
CHP	1.7%	0.1%
Process instrumentation and control systems	1.5%	4.1%

Database analysis – energy savings



Database analysis – energy savings

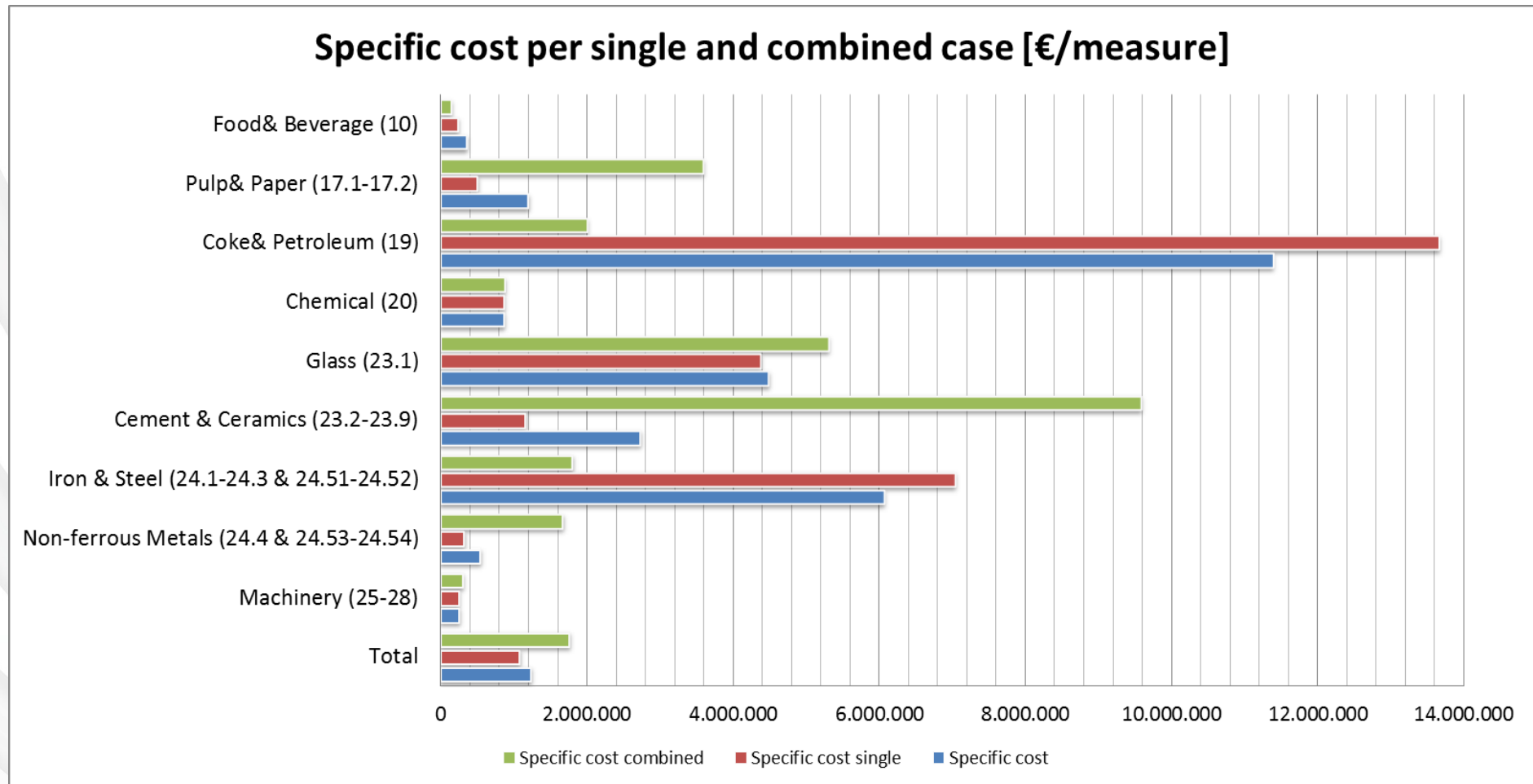


Database analysis – energy savings

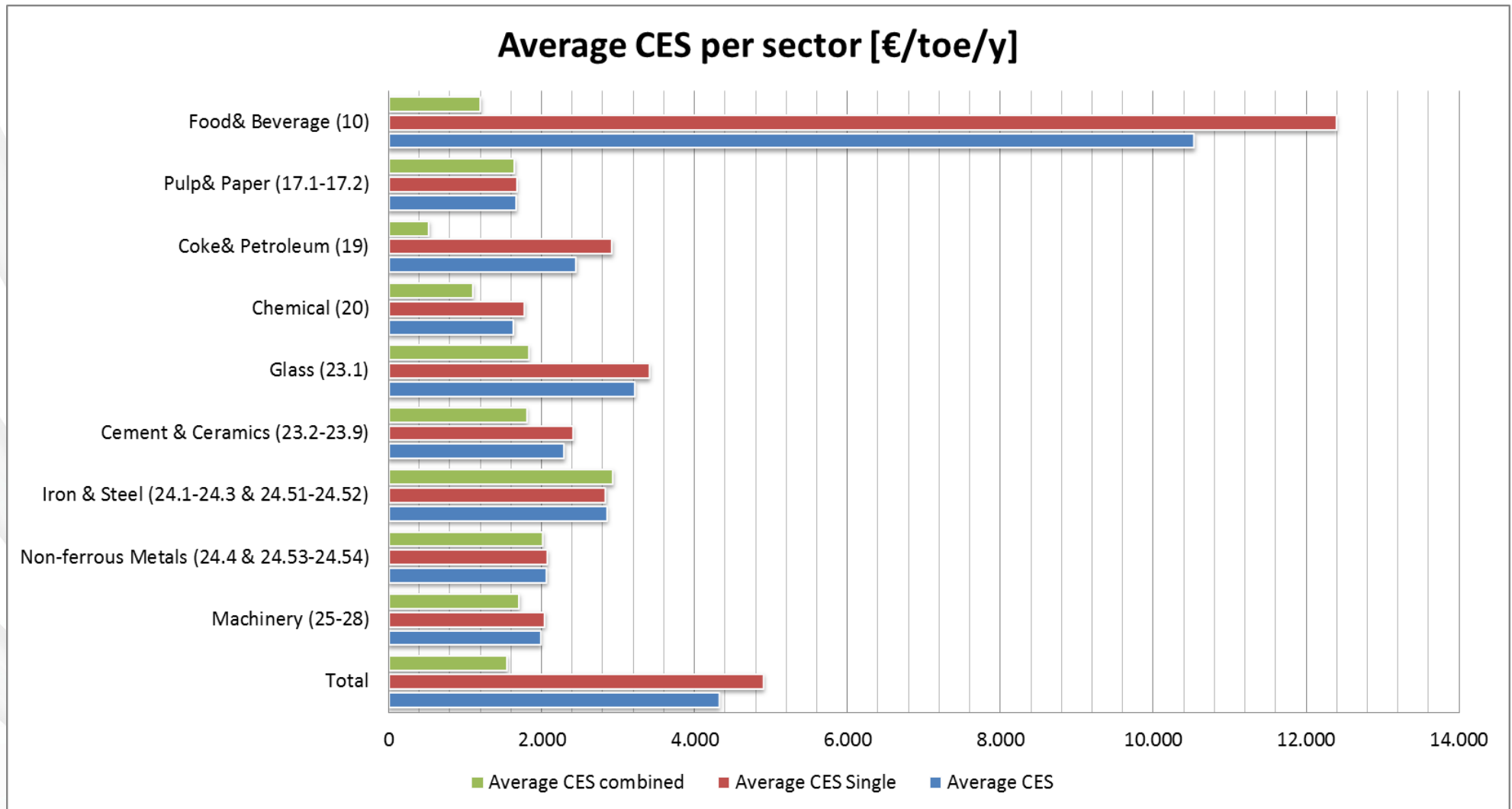
Thermal savings are, in general, much higher than electrical savings. The highest specific savings per record are in the «Coke and Petroleum» and «Iron and Steel» sectors, that have both a very high energy intensity.

Sector	Electrical savings (ktoe)	Thermal savings (ktoe)	N/A	Savings per record (toe)
Total	189	1,271	40	490
Food& Beverage (10)	25	115	0	232
Pulp& Paper (17.1-17.2)	33	115	5	422
Coke& Petroleum (19)	3	154	27	1695
Chemical (20)	35	137	6	527
Glass (23.1)	16	140	0.1	705
Cement & Ceramics (23.2-23.9)	11	128	0	341
Iron & Steel (24.1-24.3 & 24.51-24.52)	31	434	-0.04	1183
Non-ferrous Metals (24.4 & 24.53-24.54)	5	50	0.2	270
Machinery (25-28)	30	-3	2.5	119

Database analysis - costs

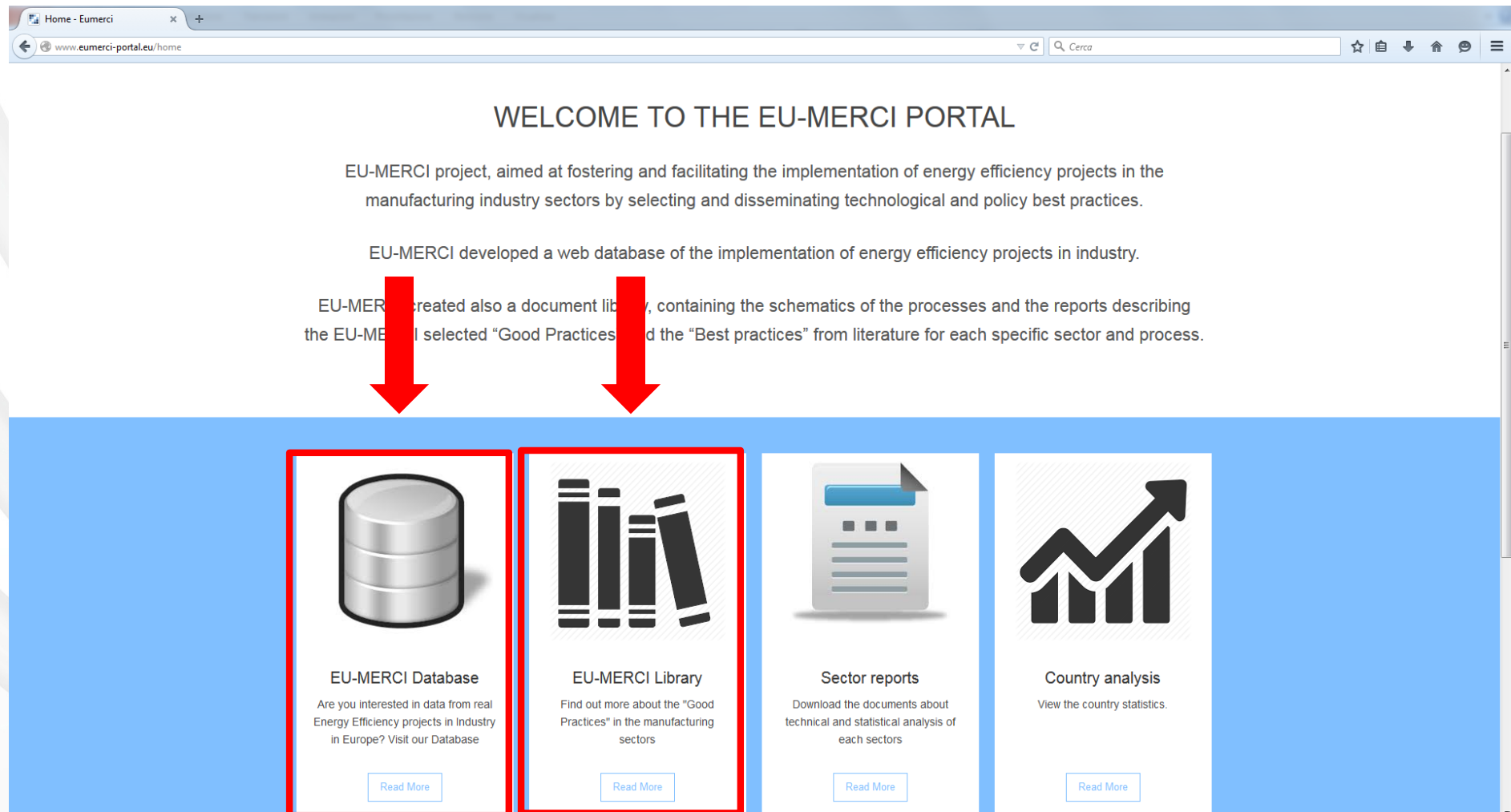


Database analysis - costs



The EIEEP Platform

EIEEP: European Industry Energy Efficiency good Practices Platform,
available at: <http://www.eumerci-portal.eu>



Conclusions

- “Good practices” can be selected in different ways: using only KPIs as the way to choose good practices might lead to choose “trivial” practices, so they shall be complemented by other criteria (statistical analysis, expert evaluation).
- KPIs are important in order to take into account different performances of the measure (energy, economy, environment)
- There are significant differences among the quality of databases across EU, depending on the information requested by policies.
- There is the need to harmonize as much as possible policies across EU and to build common “Taxonomies”, savings verification methods and information requests forms, in order to align the ways to evaluate EE goals reaching.
- There are still sectors in which investing in EE is more convenient than others, and also measures that are more convenient than others. Policy makers shall take into account these differences.
- EIEEP constitutes a very useful tool for several types of stakeholders to have a picture of EE in EU industry.

Thank You!



anna.realini@rse-web.it



simone.maggiore@rse-web.it



+39 02 3992 5385



+39 02 3992 5238

<http://www.eumerci.eu>