EU MERCI

EU coordinated **ME**thods and procedures based on **R**eal **C**ases for the effective implementation of policies and measures supporting energy efficiency in the **I**ndustry

Fostering the growth of energy efficiency in the EU industry

www.eumerci.eu

"Good Practices" of Energy Efficiency in the European Industry

The selection of industrial energy efficiency "Good Practices"

DDI Marcus Hofmann, Austrian Energy Agency (AEA)

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

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"Good Practice" in context of EU-MERCI

"A Good Practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result in a sustainable way"

"**Good Practice**":

- Examples of technically, economically and ecologically proven projects in practice.
- Innovative and transferable across the member states.
- Available on the EIEEP Platform (www.eumerci-portal.eu/)

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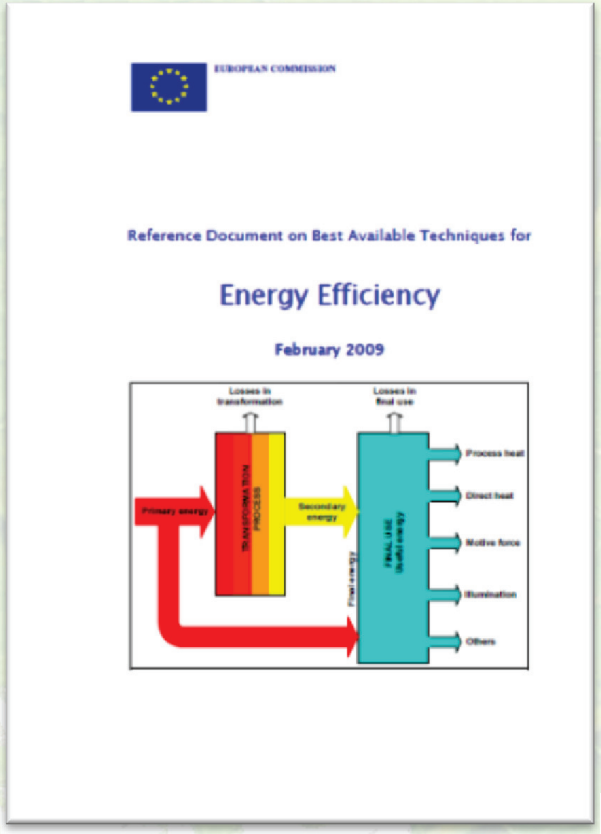
"Best Practice" in context of EU-MERCI

"A best practice is a technique or methodology that, through experience and research, has proven to reliably lead to a desired result in the most efficient and effective way."

"Best Practice":

- European Commission's Best Available Technique Reference Documents (BREF), which describe the best available techniques (BAT) of an industry.
- Ecological and economical state of the art technologies.
- Available on the EIEEP Platform (http://eippcb.jrc.ec.europa.eu/reference/)



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Available Information

- "Enabler"
  - Carbon Trust for UK, RSE for Italy, KAPE for Poland, AEA for Austria
  - White certificate schemes, energy audits, national subsidy schemes, etc.
- "Follower"
  - Greece (CRES), Bulgaria (BSERC), Slovenia (APE), Romania (ENERO), Sweden, Portugal
  - Questioneers
- Energy Efficiency Financial Institutions Group (EEFIG)
  - European Commission Directorate-General for Energy (DG Energy)
  - De-risking Energy Efficiency Platform (DEEP)

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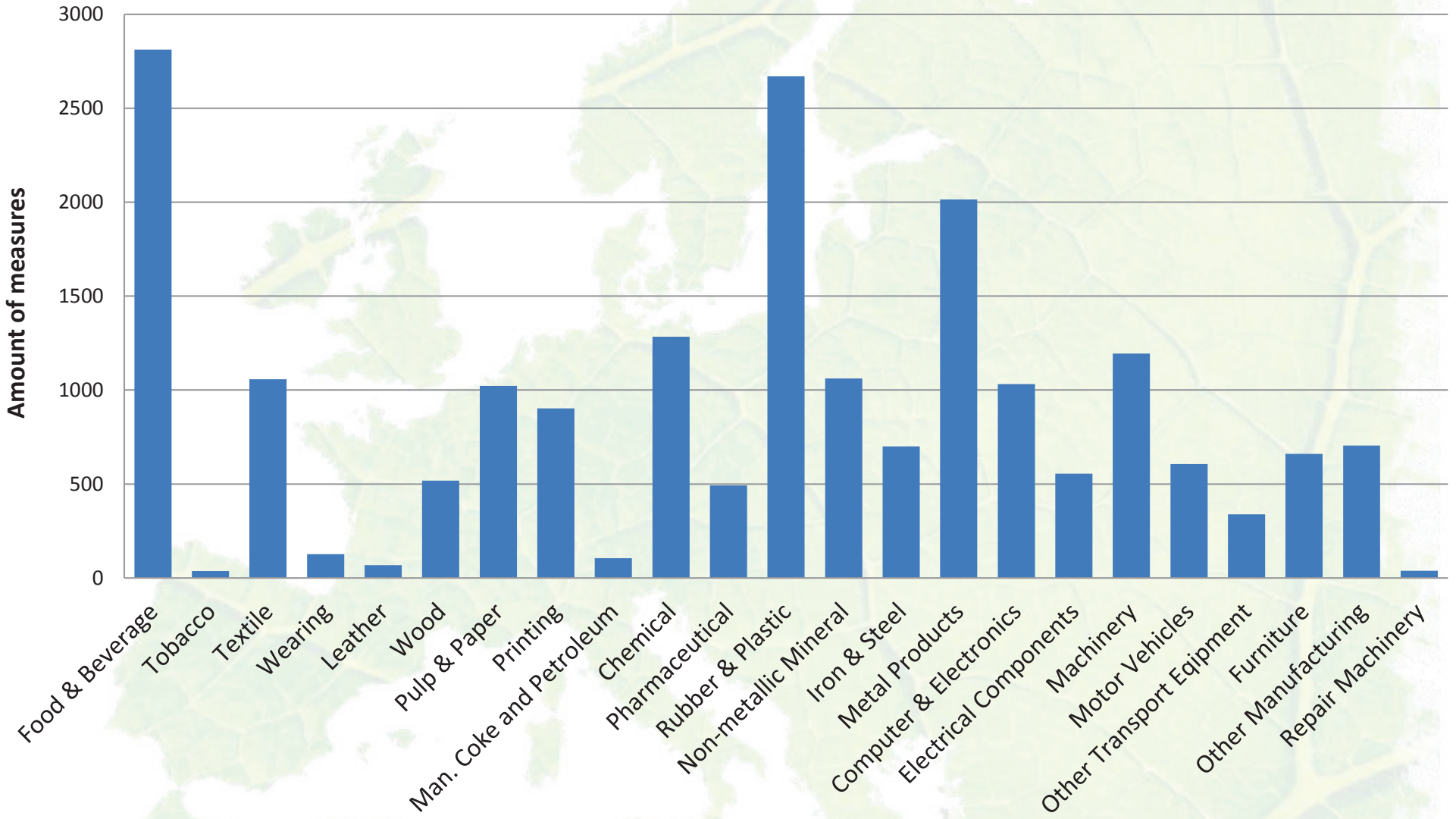
EU-MERCI Database



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Specifications

- Consideration of measures involving the use of renewable energy sources

→ Efficiency and ecological criteria taken into account when identifying GPs

- Only process-oriented measures
  - No measures with a pure building reference
    e.g. Optimization heating system or lighting

- Focus on eight selected industrial sectors

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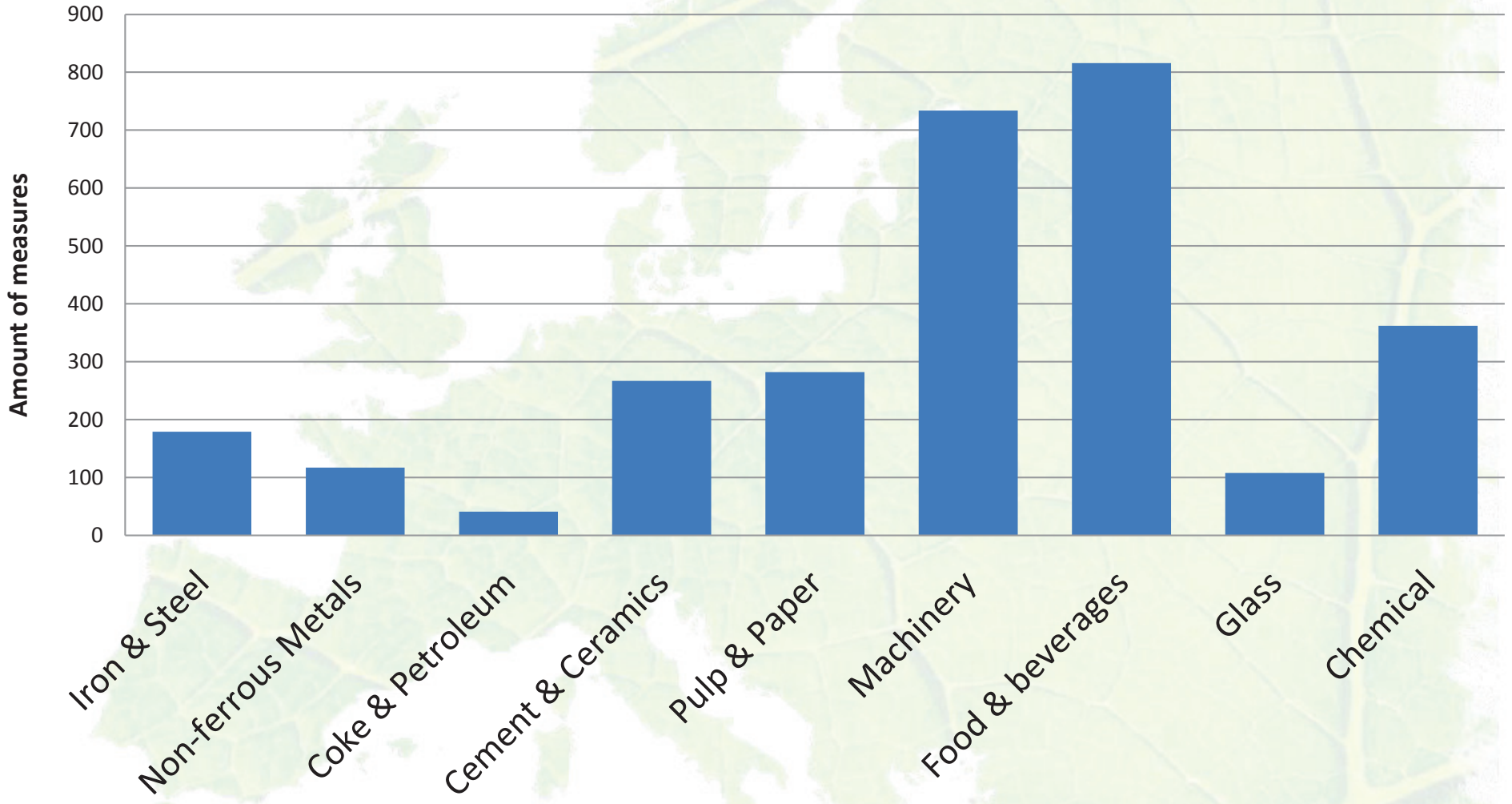
Selected Industry Sectors



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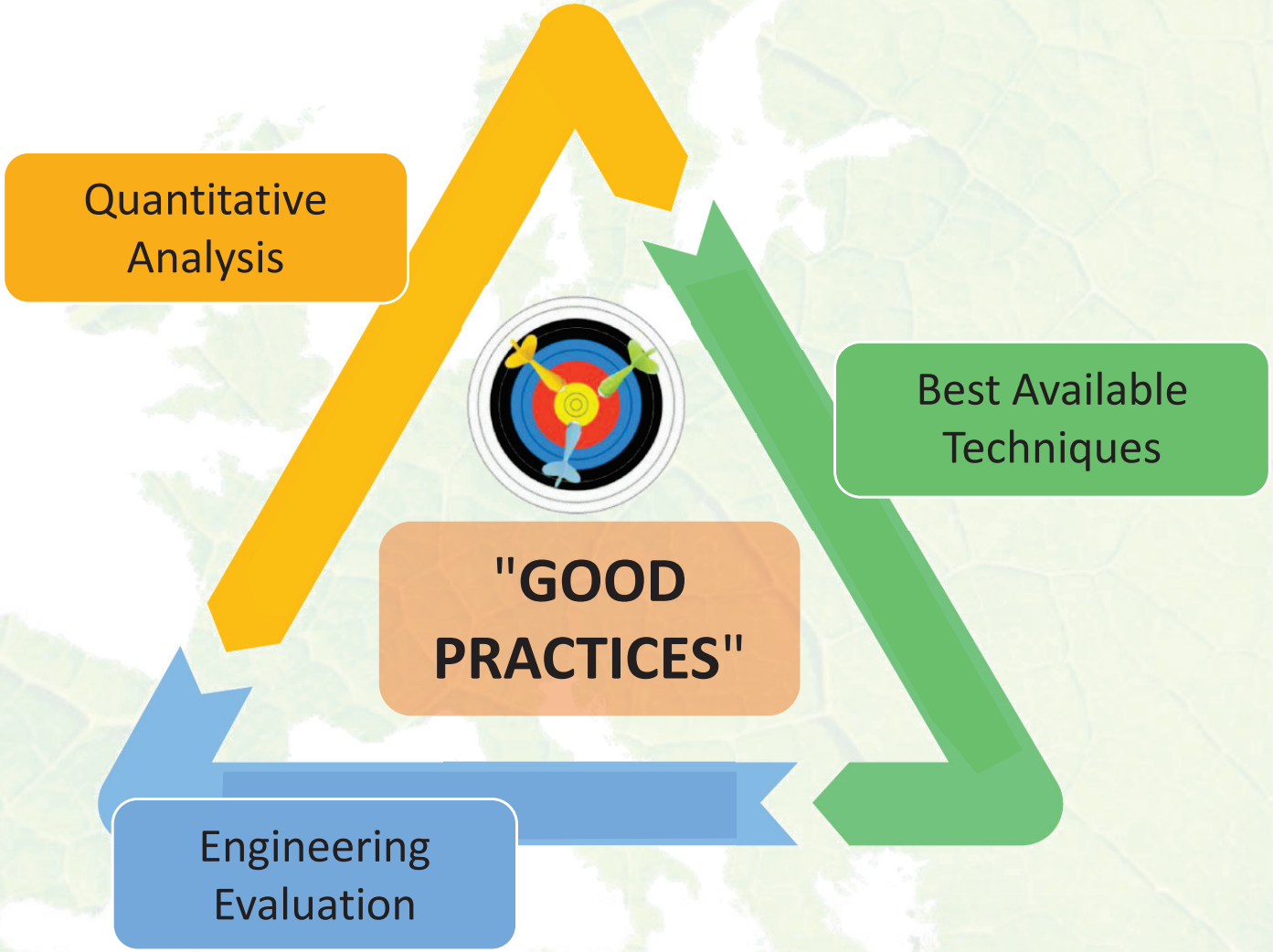
Methodology for "Good Practices" selection



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Quantitative Analysis

Goal of quantitative analysis:

- Assessment based on **technical, economic** and **ecological** criteria
- Sector specific
- Compare diverse measures in the database

9 Key Perfomance Indicators (KPIs) for different areas:

- **3 technical** indicators
- **3 economic** indicators
- **3 advanced** indicators

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Quantitative Analysis: Technical Indicators

Primary Energy Savings [toe]

- Calculated directly from the final energy savings. In order to compare different energy sources, final energy was converted into primary energy.

Energy Consumption Improvement [%]

- Energy consumption reduction compared to baseline energy consumption. Indicates efficiency of measure.

Energy Intensity Reduction [toe/k€]

- Energy savings in relation to the company's output (turnover).

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Quantitative Analysis: Economic Indicators

Simple Payback Time [years]

- Profitability of an investment. Non-Energy Benefits are not considered.

Cumulative Cashflow [€]

- Sum of costs and energy savings over the technical life time of the measure.

Share of Project Cost Subsidized [%]

- Share of subsidized investment costs.

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Quantitative Analysis: Advanced Indicators

Cost of Energy Savings [€/toe]

- Investment costs in relation to the annual energy savings.

Cost of Carbon Savings [€/tCO_2]

- Investment costs in relation to the annual CO_2 savings.

Renewable Energy Use [%]

- Share of renewable energy sources in the measure.

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Quantitative Analysis: "Clustering" Effect (I)

- Number of **occurrences** of measures is taken into account
  - If a measure is often implemented in practice, there is a valid reason for it (high efficiency, easy to implement, well integrated into the process ...)
  - Measures were rated 0-10 points according to their occurrences

- **Generic taxonomy**
  - It allows comparison of measures also across different process and / or sectors
  - The most common types of measures for the machinery sector:
    - 80 Heat Recovery, 71 Biomass Boiler, 61 Process Design and Optimisation, 56 Variable Speed Drive

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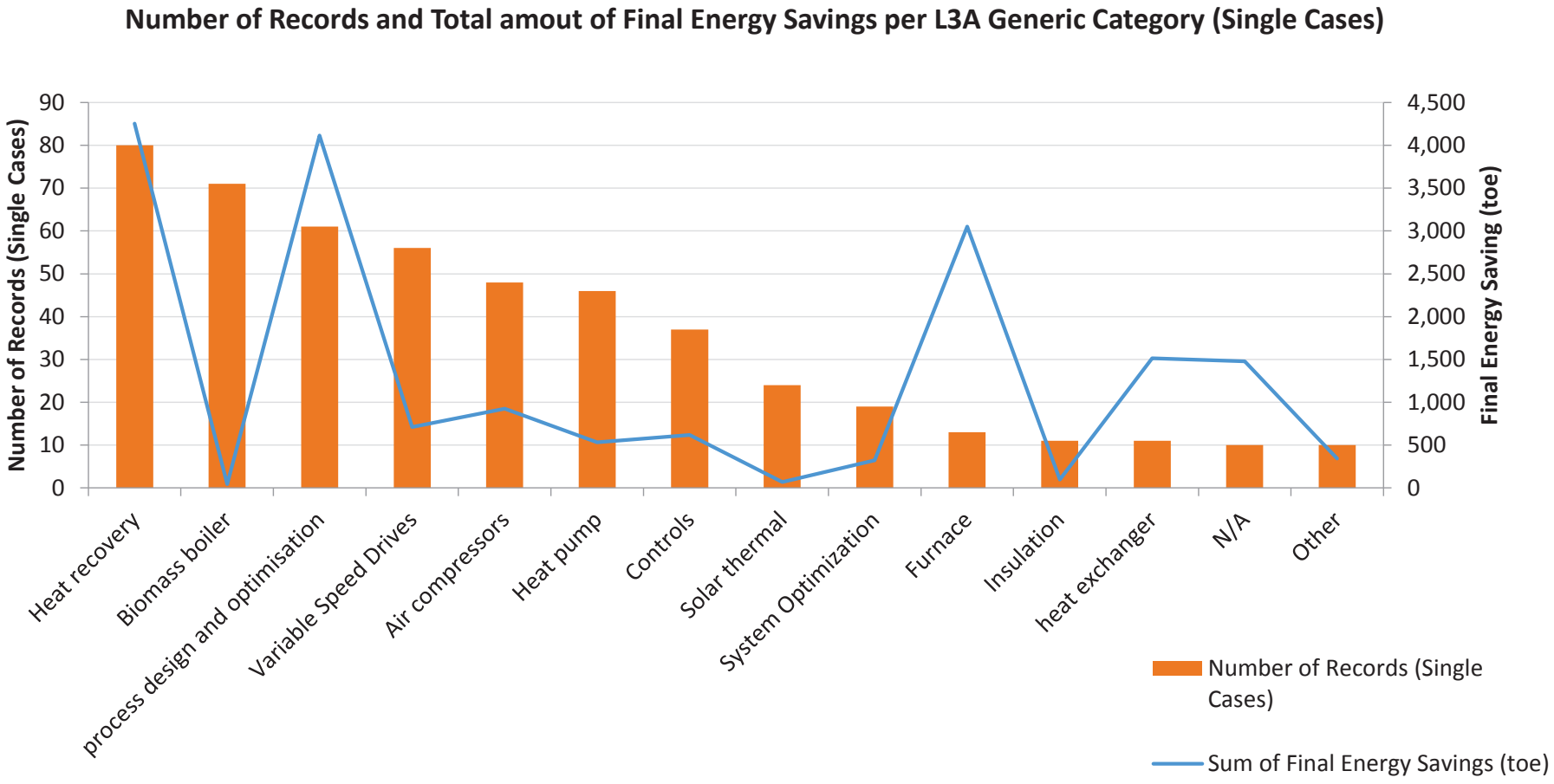
Quantitative Analysis: "Clustering" Effect (II)



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Quantitative Analysis: KPIs Weighting

- Different KPIs → different meanings
  - For common evaluation, the KPIs must be made comparable
  - Normalized point-system
- Each KPI receives 0-10 points, depending on how well the measure performs compared to the other measures in the sector
  - Best measure: 10 points
  - Worst measure: 0 points
  - Data gaps are interpreted neutrally (5 points)
- Sum of points gives the final KPIs score
- The projects with the best KPIs score are pre-selected

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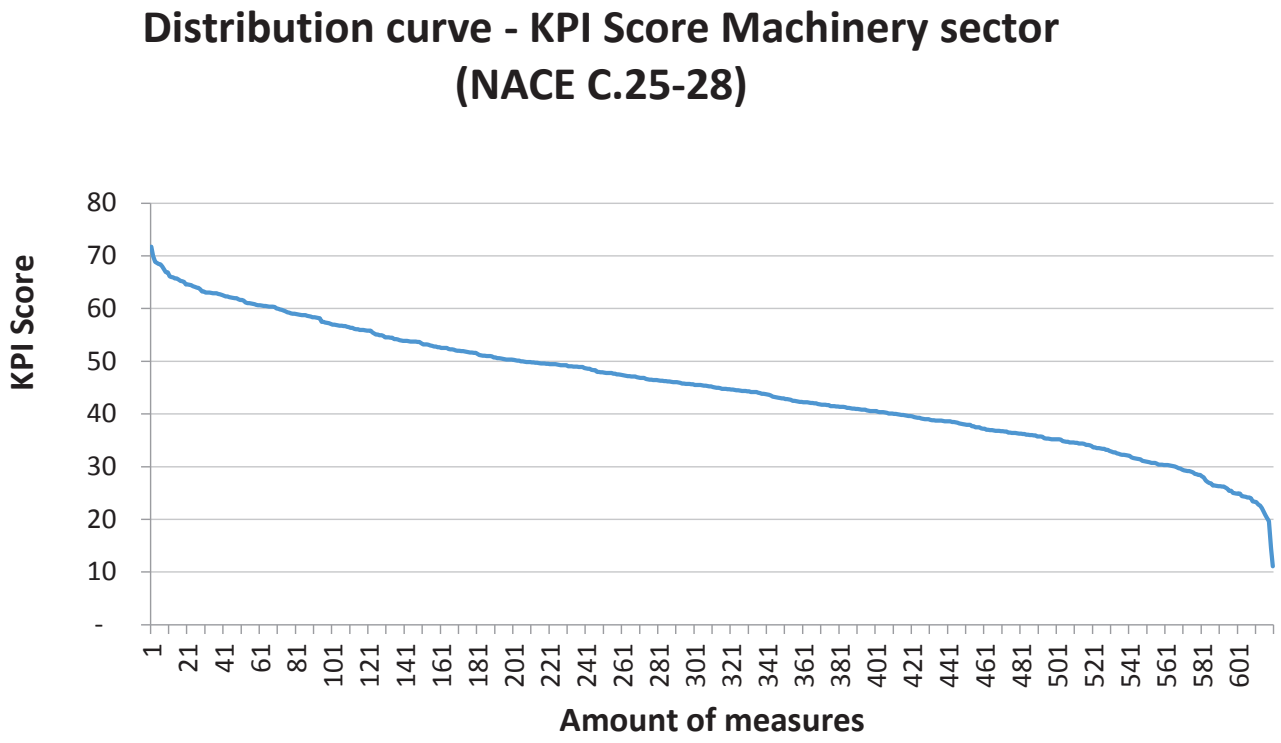
Quantitative Analysis: Exemplary Results

PES (toe)	Energy consumption improvement (0....1)	CRU (toe_p/kE)	CAPEX/PES (E/toe)	CAPEX/CO2 (E/tonCO2)	RES %	PBT (years)	CCF (E)	SPCS %	Occurences - Generic L3 - A (n)	Occurences Specific L3 - A (n)	PES (0-10pt)	Energy consumption improvement (0-10pt)	CRU (0-10pt)	CAPEX/PES (0-10pt)	CAPEX/CO2 (0-10pt)	RES (0-10pt)	PBT (0-10pt)	CCF (0-10pt)	SPCS (0-10pt)	Occurences - Generic L3 - A (0-5pt)	Occurences Specific L3 - A (0-5pt)	SUM
23,49	N/A	0,88	37,56	7,61	0,32	0,04	358.143,93	N/A	2,00	N/A	6,3	5,0	6,0	9,2	9,9	8,7	9,9	9,1	5,0	0,2	2,5	72
54,34	N/A	10,96	13,53	5,76	-	0,03	228.065,66	N/A	37,00	N/A	8,1	5,0	9,4	9,2	9,9	-	9,9	8,8	5,0	2,1	2,5	70
115,42	N/A	3,39	216,59	84,35	-																	
2.749,07	N/A	128,75	3.371,93	682,82	0,32																	
7.936,45	N/A	371,69	3.503,96	709,55	0,32																	
203,78	N/A	8,45	108,25	46,06	-																	
106,41	N/A	3,84	138,21	53,82	-																	
35,83	N/A	7,23	164,19	63,94	-																	
38,26	N/A	2,47	65,34	26,04	-																	
46,58	N/A	9,39	21,47	8,36	-																	
63,77	N/A	2,99	342,07	133,21	-																	
104,69	N/A	3,52	351,17	136,75	-																	
42,99	N/A	1,45	17,10	7,28	-																	
26,91	N/A	5,43	81,96	34,88	-																	
26,91	N/A	5,43	81,96	34,88	-																	
45,83	N/A	1,76	320,88	136,54	-																	
94,76	N/A	0,90	310,37	120,87	-																	
178,63	N/A	63,21	63,82	24,85	-																	
49,08	N/A	2,89	239,69	93,34	-																	
326,20	N/A	2,19	450,82	175,56	-																	
176,01	N/A	6,22	743,61	289,58	-																	
75,85	N/A	0,72	290,84	113,26	-																	
106,28	N/A	3,34	359,77	153,09	-																	
44,96	N/A	2,65	392,48	152,84	-																	
36,59	N/A	12,95	341,62	133,04	-																	
140,00	0,30	0,81	339,29	144,38	-																	



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Engineering Evaluation – "Bringing it all together"

- Considers quantitative analysis, BAT and engeneering evaluation
  - e.g. "**innovative aspect**"
- Selected list of GPs qualitatively assessed by experts
  - sector descriptions, BREF documents, expert knowledge
- Sectors were split among project partners
- For specific questions external experts were consulted
- "Good Practice" proposals discussed in the project team
- Examples published on the EU-MERCI **EIEEP Platform**

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Contact

Thank you for your attention!

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