

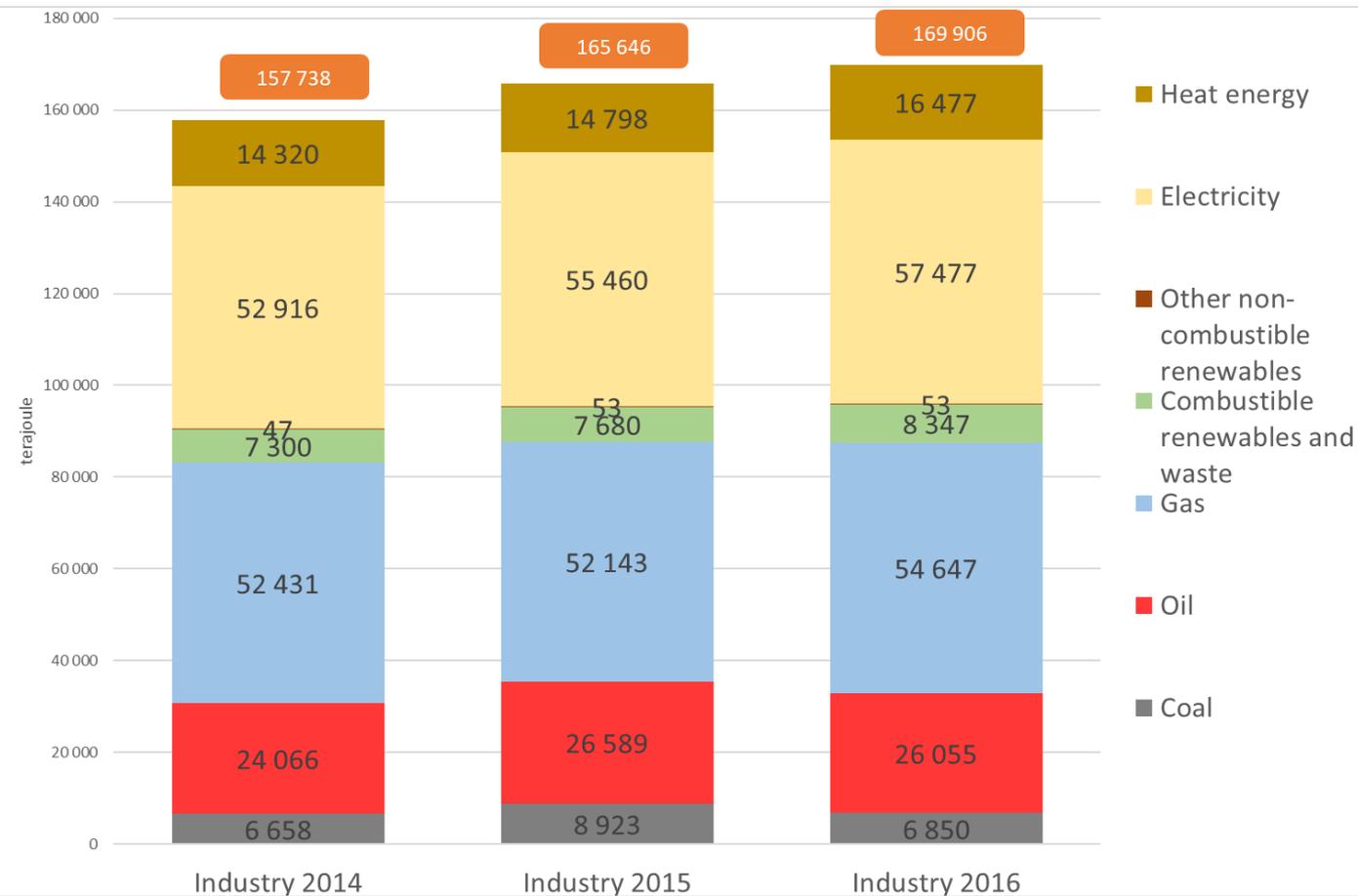
DECARBONISATION OF THE MATERIAL INDUSTRIES

HUNGARIAN OVERVIEW

EUKI „CLIMATE FRIENDLY MATERIALS” PROJECT
European Roundtable

4 March 2019
Berlin

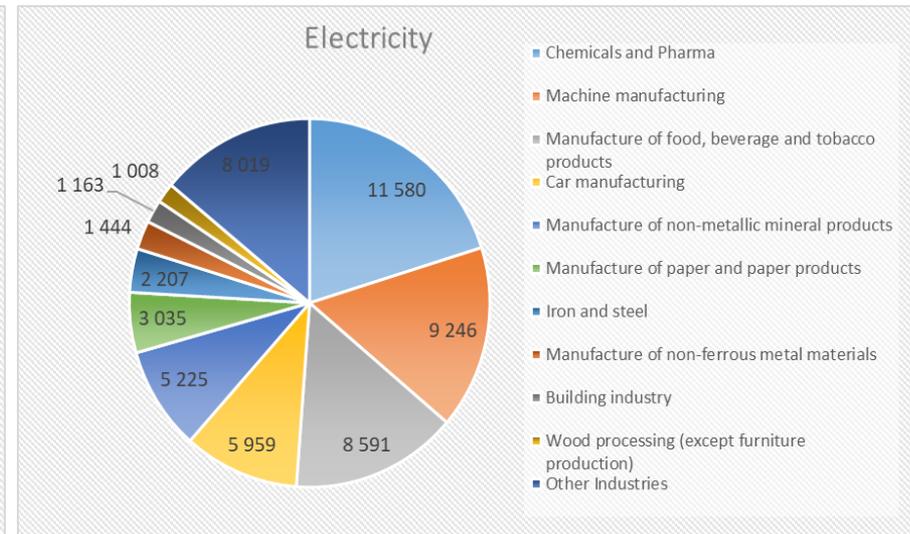
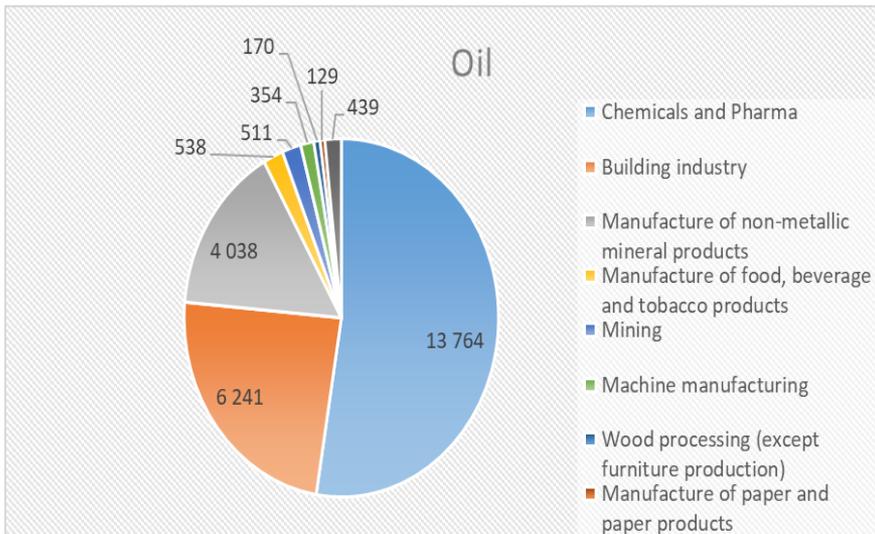
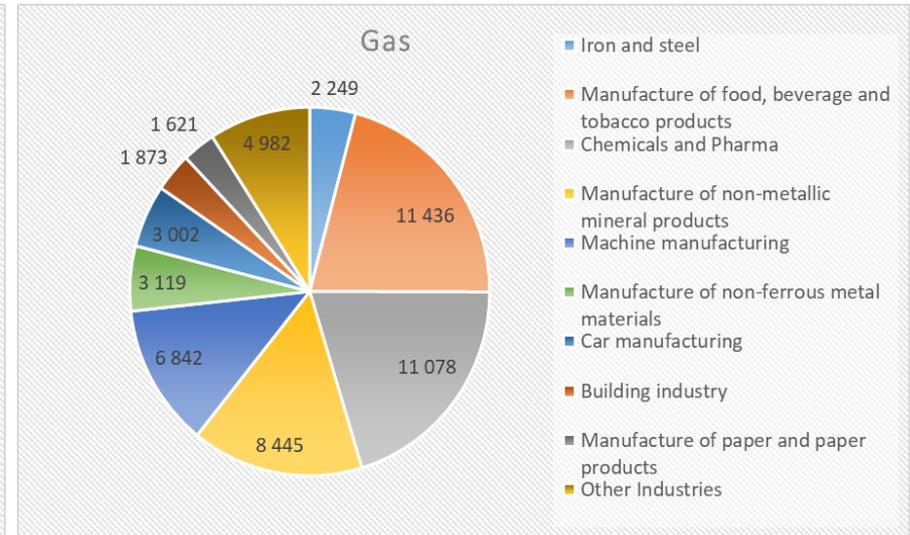
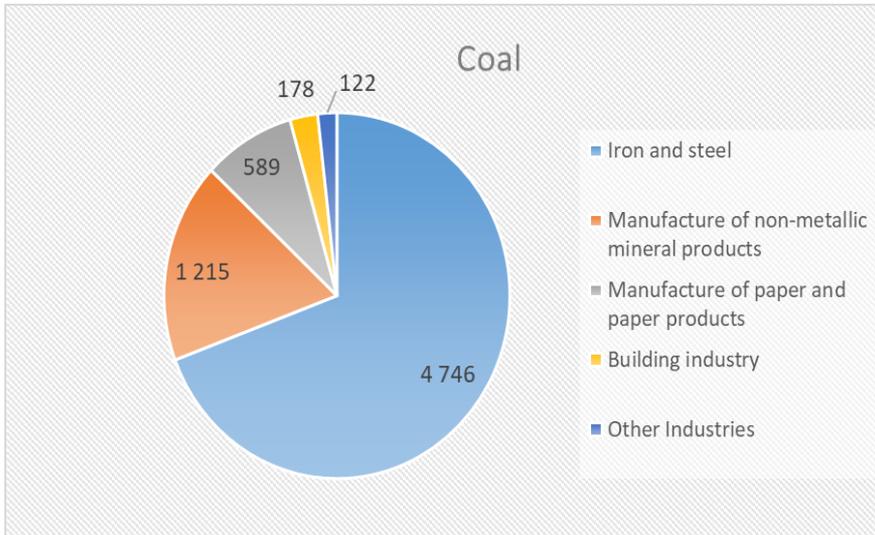
Final energy consumption of HU industrial sector (2014-2016)



The final energy consumption of domestic industry grew by 12 PJ in two years. The largest increases are at heating, electricity, renewables and natural gas. The industry's share of the final energy consumption was 21% in 2016. 55% of coal products, 10% of crude oil, 21% of natural gas, 43% of electricity and 37% thermal energy

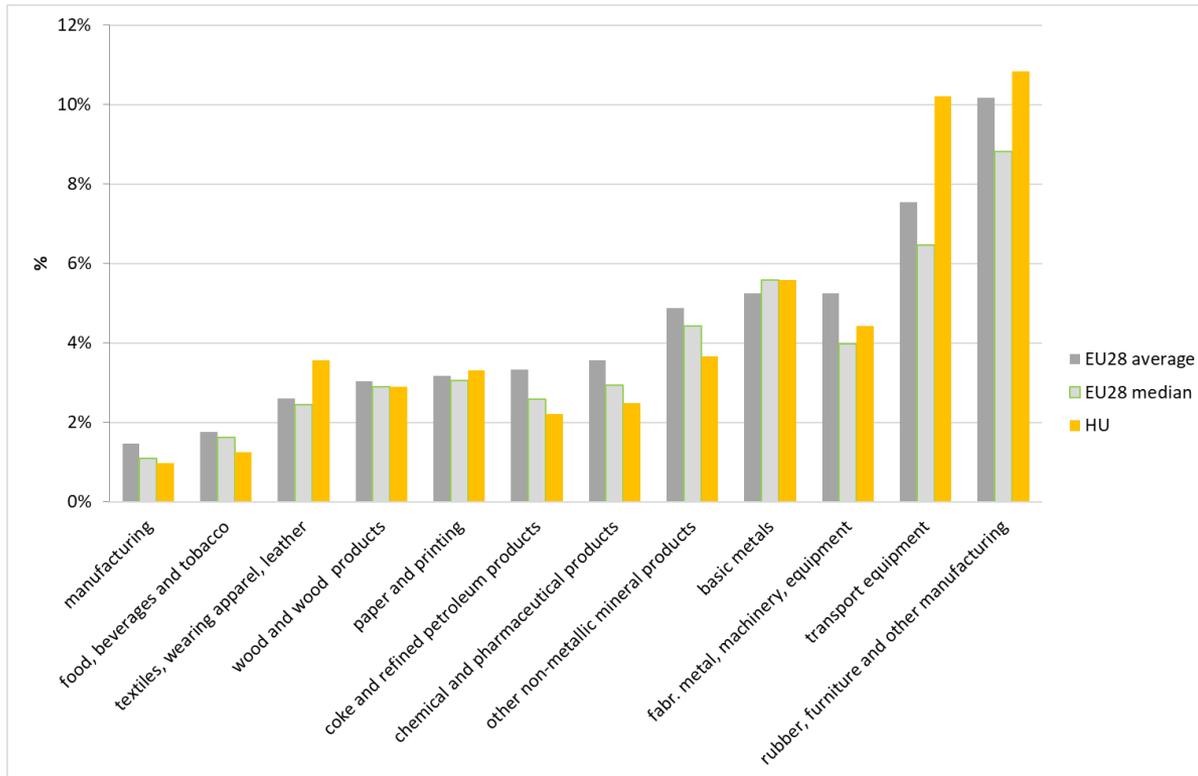
Source: MEKH, National Annual Energy Statistics

The share of industrial consumption in the use of certain energy sources(2016)



Source: MEKH, National Annual Energy Statistics

Share of energy costs in the value of total purchases of goods and services in Hungary and the EU, 2015, %



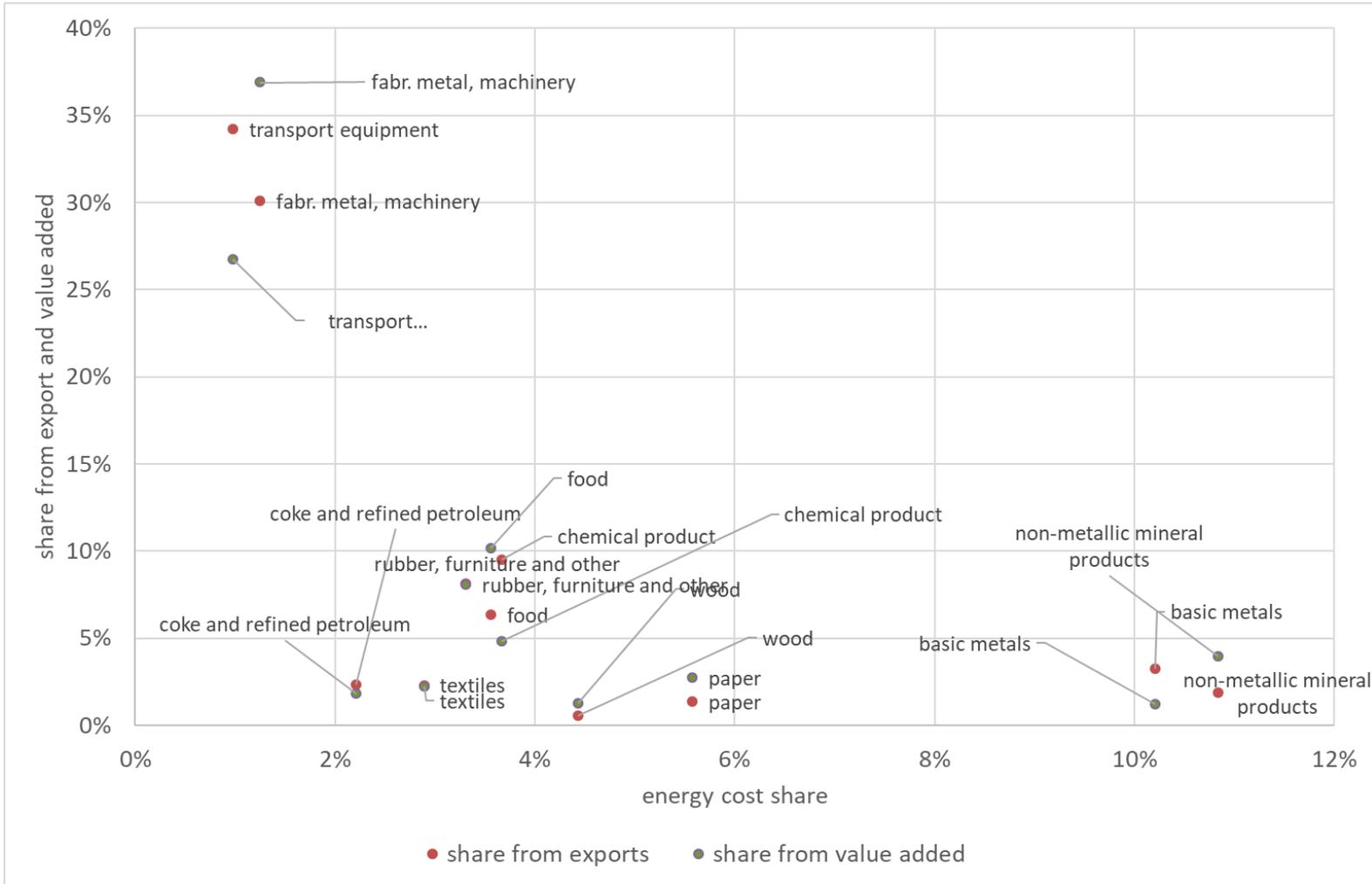
Industries with the highest energy cost share are the following:

- chemical and pharmaceutical products
- paper and printing
- wood and wood products
- basic metals
- non-metallic mineral products

In case of the sectors having the highest energy cost share, the ratio exceeds the EU mean and median values.

Source: REKK calculation based on Eurostat data. Note: Eurostat data on energy costs do not include the cost of non-energy use, i.e. energy products used as raw materials in the production process.

Share of domestic manufacturing sectors in export revenues and value added, according to their energy cost shares, 2015



Energy costs have a lower share in total costs in case of industries contributing most to export revenues and value added.

Source: REKK calculation based on Eurostat data

Real unit energy cost (RUEC) shows the ratio of energy costs to the value added in a given sector (both values expressed in current prices). The indicator can be used as a measure of *energy cost competitiveness*.

- Energy cost competitiveness is basically influenced by two factors:
 - cost of energy
 - efficiency of energy use (energy intensity)

RUEC can be decomposed in two sub-indicators related to these factors:

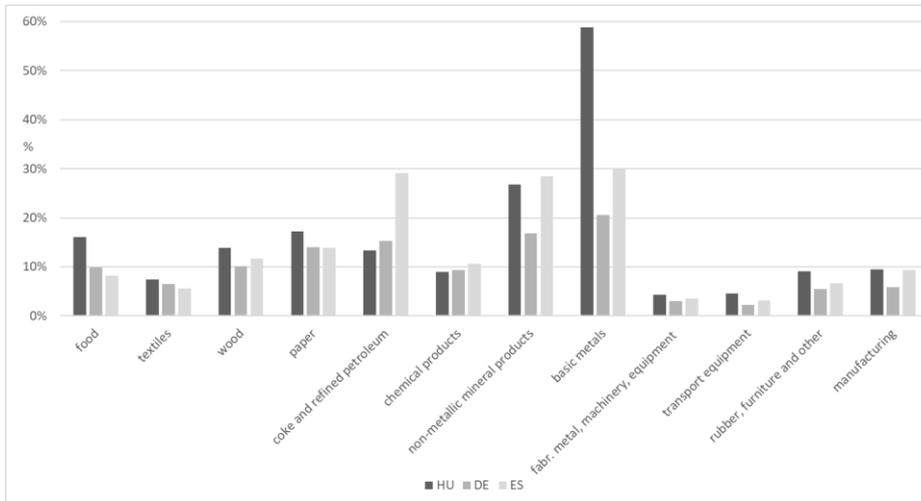
- ‚real energy price‘ and
- ‚energy intensity‘, making it possible to compare the determinants of energy cost competitiveness across countries/regions and over time.

$$RUEC = \frac{EC}{VA_{cur}} = \frac{EC}{VA_{const} * P_{VA}} = \underbrace{\frac{EC}{Q_E * P_{VA}}}_{\text{real energy price}} * \underbrace{\frac{Q_E}{VA_{const}}}_{\text{energy intensity}}$$

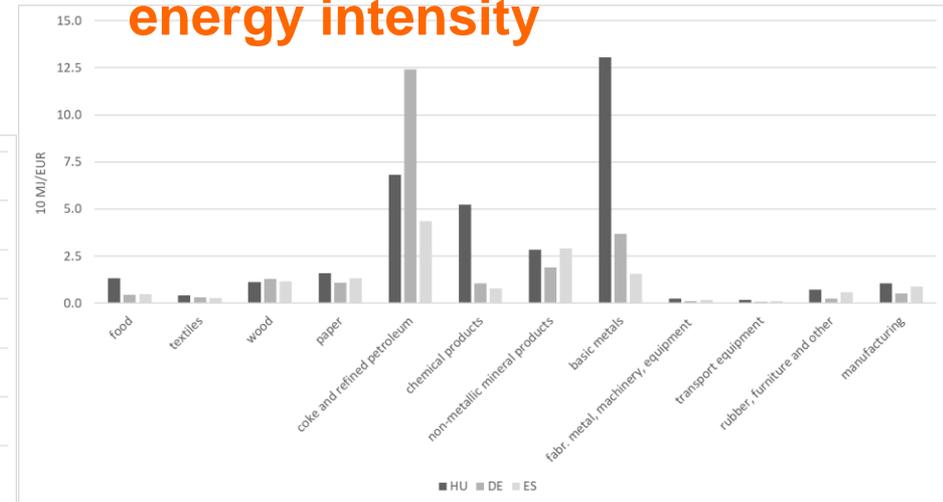
- RUEC - Real unit energy cost (%)
- EC - total cost of energy used (EUR)
- VA_{cur} - value added in current price (EUR)
- VA_{const} - value added in constant price (EUR)
- P_{VA} - value added deflator (price index)
- Q_E - amount of energy used (TJ, ktoe, kWh)

RUEC and its sub-indicators calculated for the German, Spanish and Hungarian manufacturing sectors, 2015

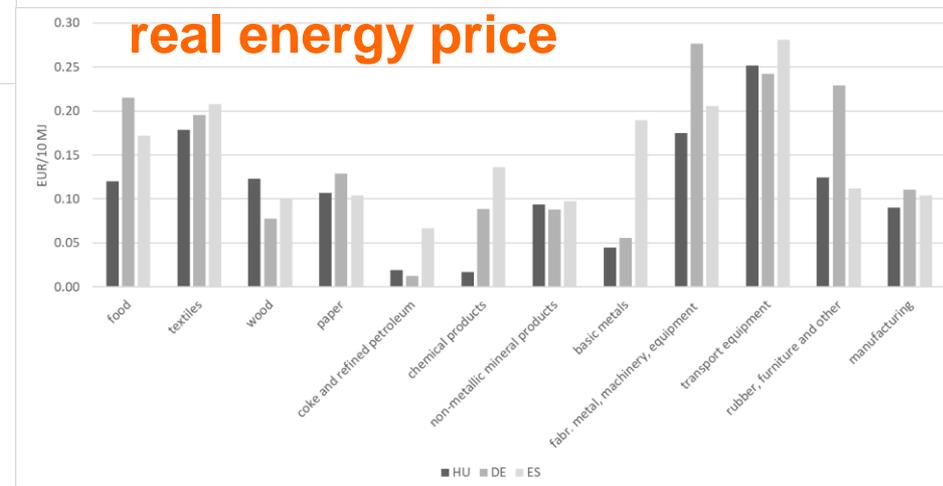
RUEC



energy intensity



real energy price



- Hungarian RUEC **exceed the values received for German and Spanish industries**
- The difference can be explained by **higher energy intensities** (except for the textile and wood industries)

Source: REKK calculation based on Eurostat data

Feedback on efficiency-related activities of participant companies 1

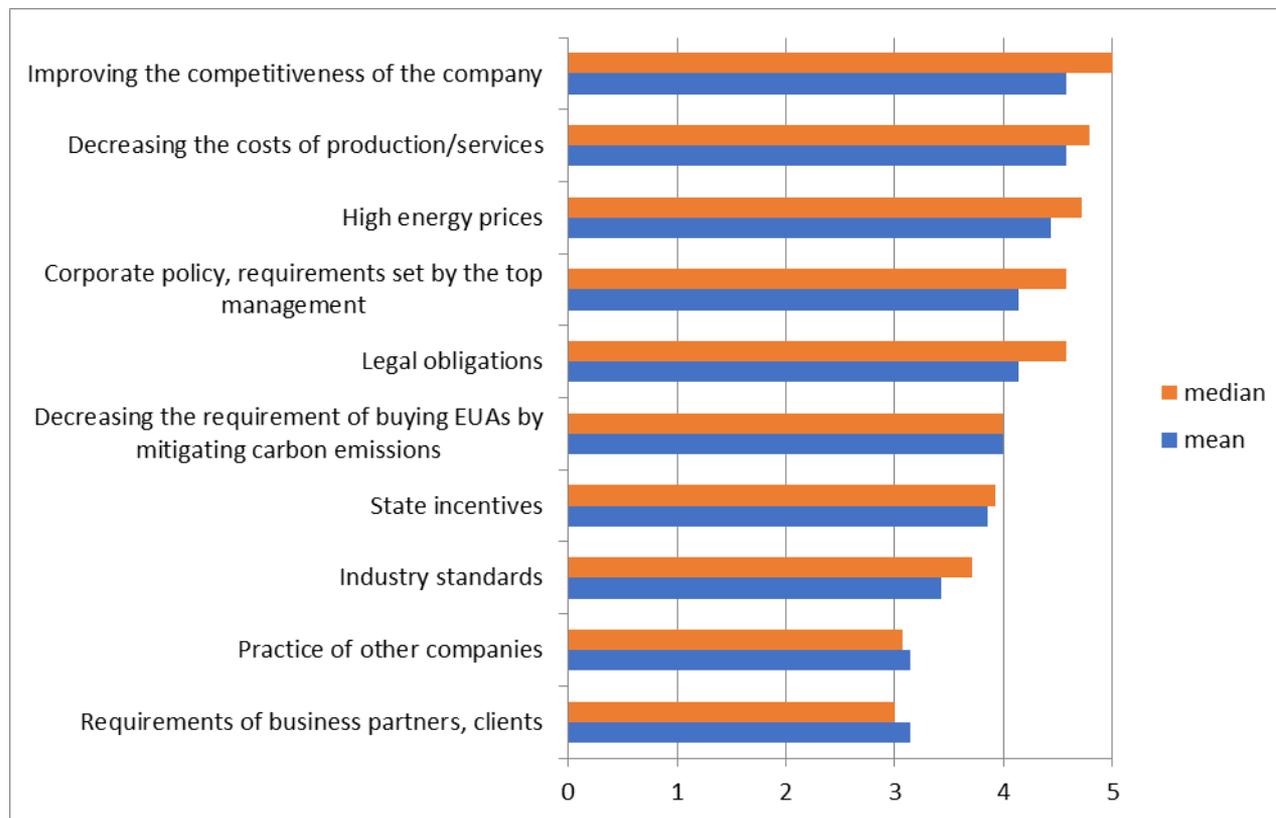
- A small questionnaire including 18 questions related to energy efficiency measures and renewable energy use were sent to the contributing companies. Answers were received from 7 large industrial energy consumers belonging to the cement, chemical, iron and steel and refinery sectors.

The main results are the following:

- All companies but one carried out **measures improving energy efficiency** in the last 5 years, all of which were related to production processes and production site infrastructure. Two companies also invested in HVAC, more efficient lighting and business processes.
- The main **motivating factors for engaging in energy efficiency** improvements was mainly decreasing the energy costs, but decreasing carbon emissions, increasing the good reputation of the company and the change of outdated machinery were also mentioned as reasons.

Feedback on efficiency-related activities of participant companies 2

- From among the possible **factors influencing energy-efficiency decisions**, *decreasing production costs and improving the competitiveness* of the company were scored the highest on average in a likert scale ranging from 1 to 5, followed by *increased energy prices*. *Expectations of buyers and the practice of other companies* were scored the lowest, although were also valued above 3 on average.



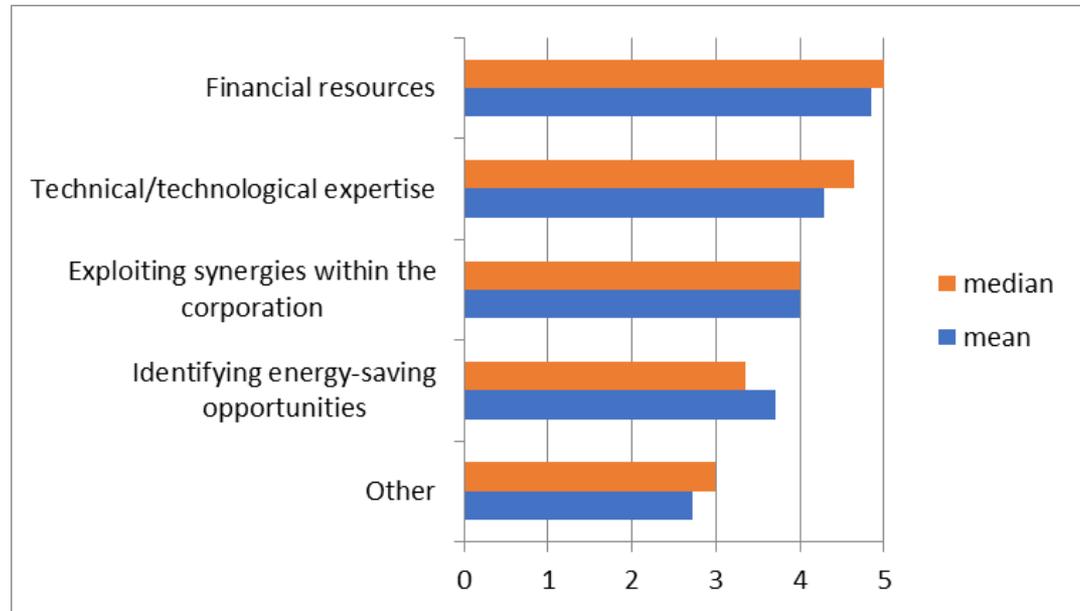
Feedback on efficiency-related activities of participant companies 3

- 4 out of the 7 companies have **implemented smart systems** already for the management and monitoring of energy consumption at their facilities.
- Only one company **uses renewable energy** to meet the requirements of their production processes or the energy consumption of their facilities, albeit 4 of the other companies are planning to use renewables in the future. Of those, who plan to do this, 2 companies would invest in on-site installation of RES-E generating systems, one is thinking to engage in a PPA, while the others would purchase renewable electricity from their energy suppliers.
- The respondents were asked whether their technologies and associated emission of pollutants meet (or will meet) the **requirements laid down in the relevant BAT** documentation in line with the requirements of Industrial Emissions Directive, two companies said they lag behind with the necessary improvements, and in one case it is even doubtful, whether the required investments can be implemented by deadline.
- **Decisions on the implementation of energy-efficiency measures** are made at the corporate management level in 5 cases, while plant management at productions sites decide in two cases. These two cases belong to the chemical industry.
- Decisions on electricity procurement are made at the corporate management level in one case, the national level.

Feedback on efficiency-related activities of participant companies 4

- Plants at lower company levels heavily **rely on corporate resources** in financing energy-efficiency measures and receive significant contribution as regards technical/technological expertise. Company-wide synergies are also exploited widely in most of the cases. Tips for energy-saving opportunities are provided by the corporate centre, but are also identified at the plant level.

How much do you rely on corporate resources in relation to energy-efficiency improvements concerning the following (1-not at all, 5 – very much):



- On a likert scale ranging from 1 to 5, companies evaluated the **current level of energy efficiency** of their business processes and production processes to be 3.7 on average, facility lighting received 3.5 points, transportation 3.4, and HVAC only 3 on average, suggesting that there is a room for improvement in these areas.

Feedback on efficiency-related activities of participant companies 5

- Respondents were asked to identify those **areas in which they see opportunities for electrification** in their companies. With the exception of two iron and steel producers, all of them mentioned production technologies. Heating and cooling was cited by 3 companies, while 4 of them consider the use of electric vehicles a feasible option.

- The figure shows the answers to the question on how much they rely on the listed **options for reducing carbon intensity**, and the potential they see in the given measures to decrease carbon intensity at their companies (1 – not at all, 5 – largely) - potentials do not deviate much from recent exploitation of opportunities

