



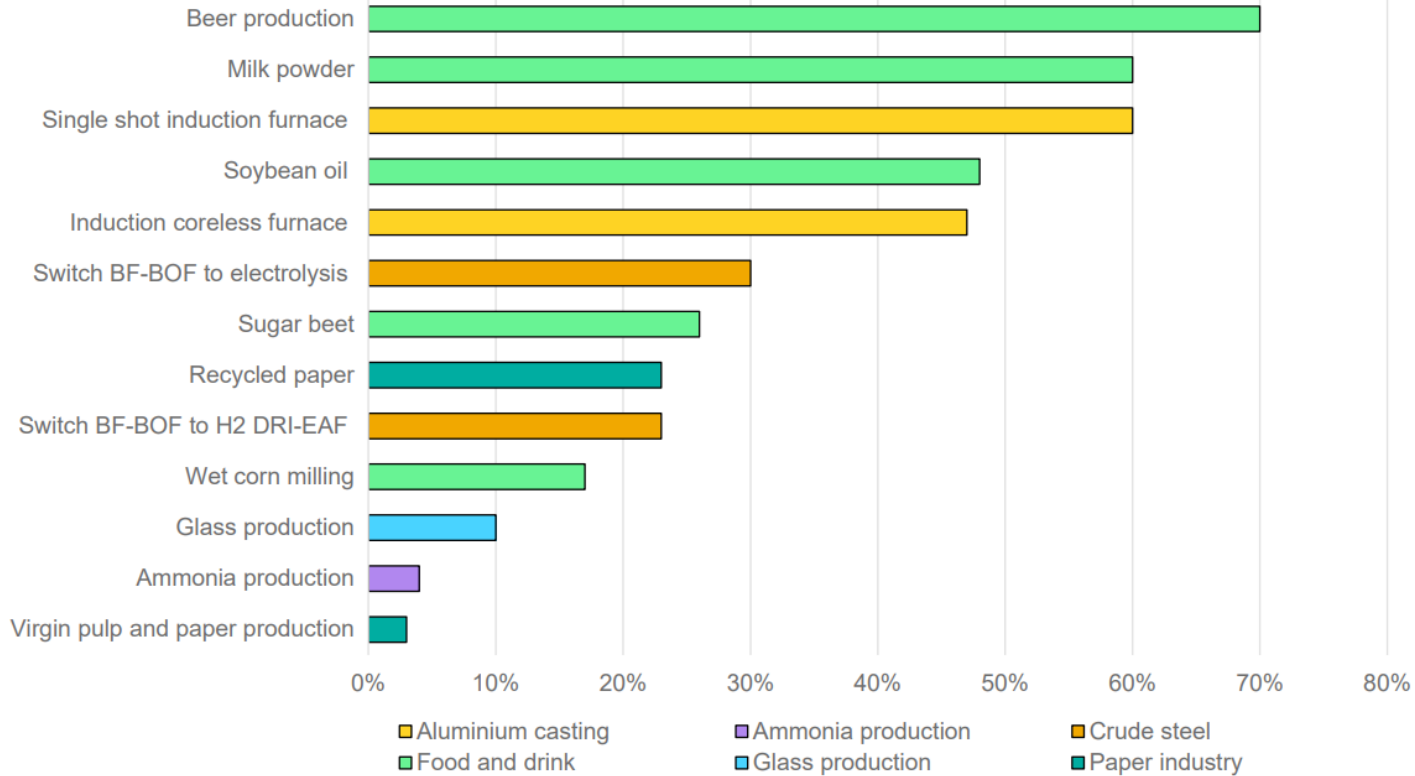
Industry in the Age of Electricity: Maximising the benefits of heat electrification

Dr. Emma Mooney

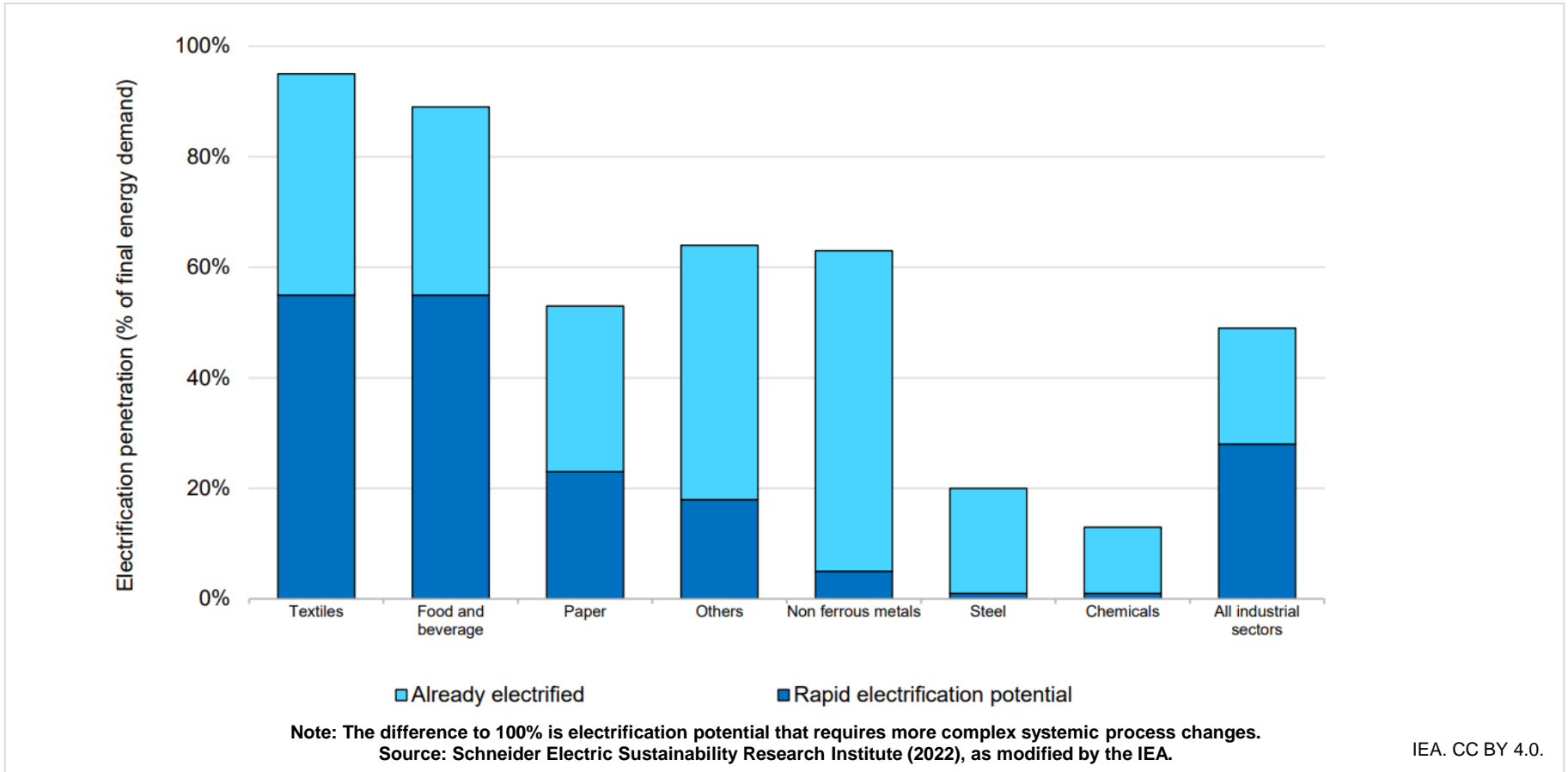
Electrification: The Key to a Competitive, Net-Zero Future, 25th November 2025

The potential of electrification

Potential energy savings from electrification of industry in the United States



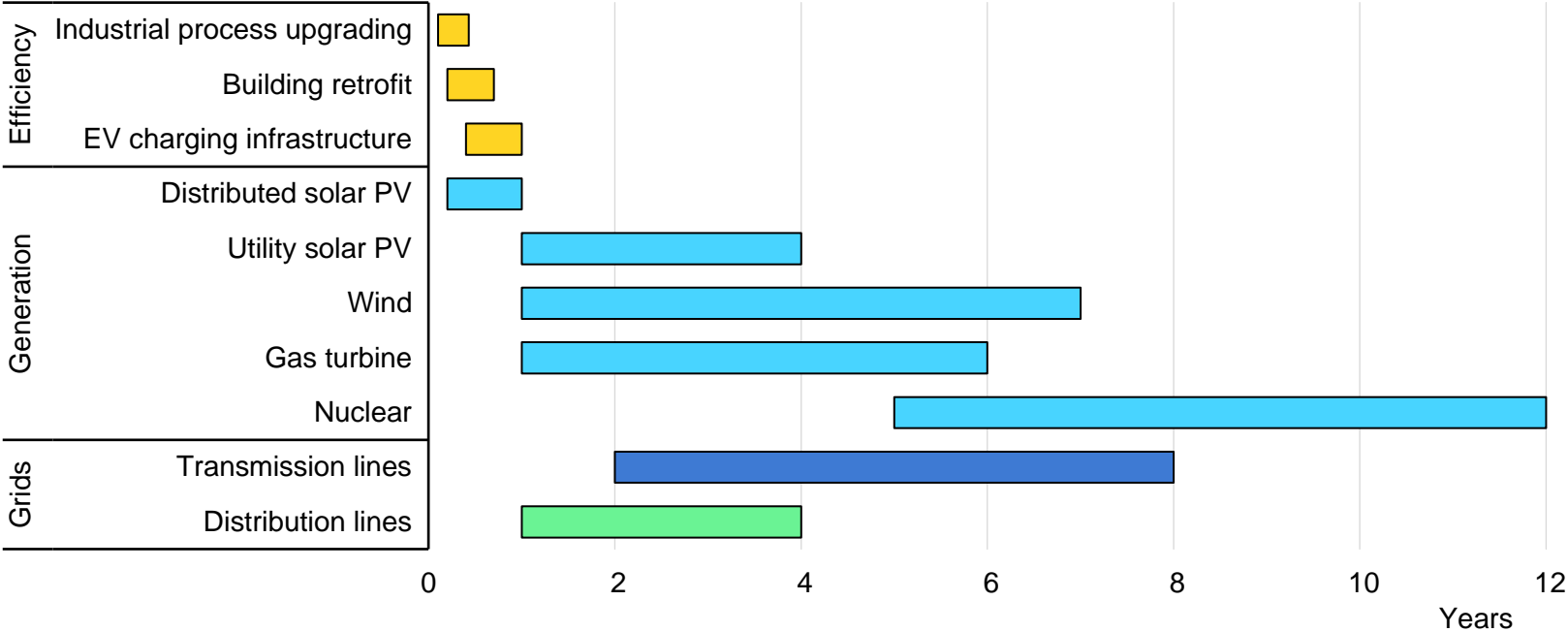
Potential for rapid electrification of industry in Europe



Demand side measures vs grid investments



Typical development time for selected efficiency measures, electricity generation and grids

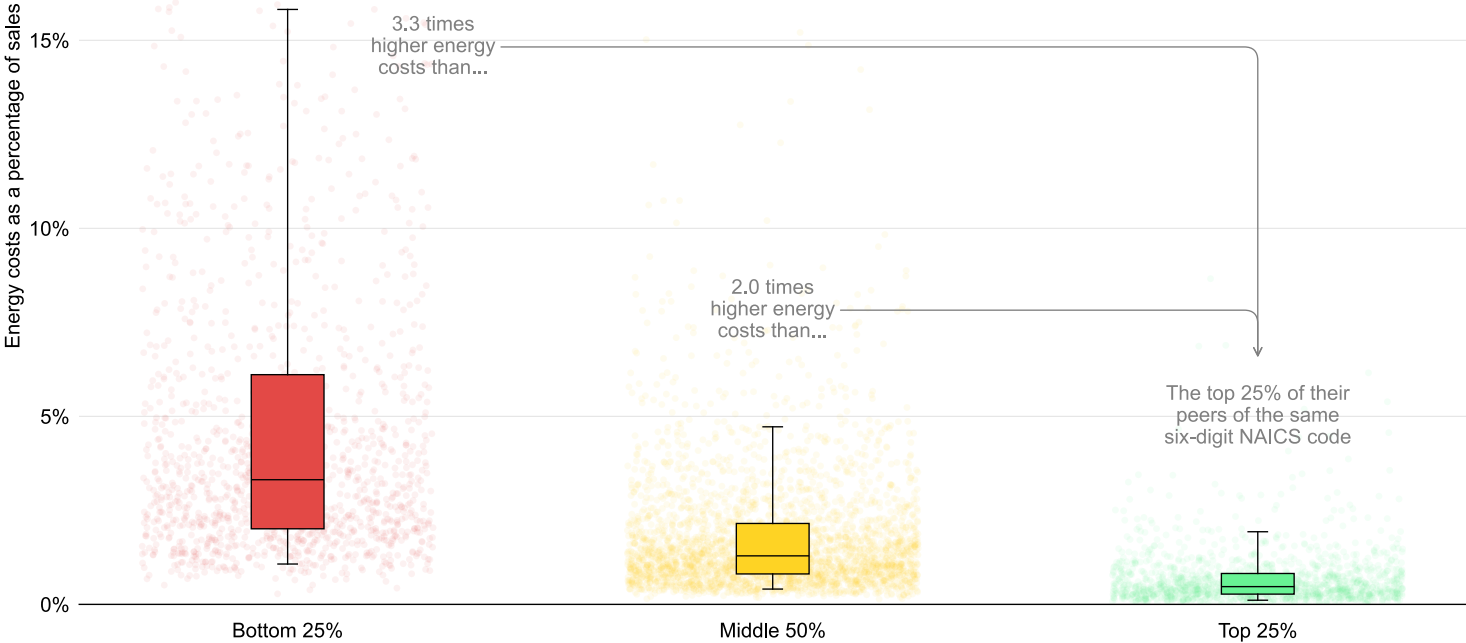


Source

IEA Analysis based on IEA (2025) [The Path to a New Era for Nuclear Energy](#); Solar Reviews (2024), [Solar Panels and Installation Time](#).

Energy use in the industrial sector – is there any efficiency left?

Comparing energy costs for 10 000 facilities against peers with the same six-digit NAICS category, United States, 2002-2024



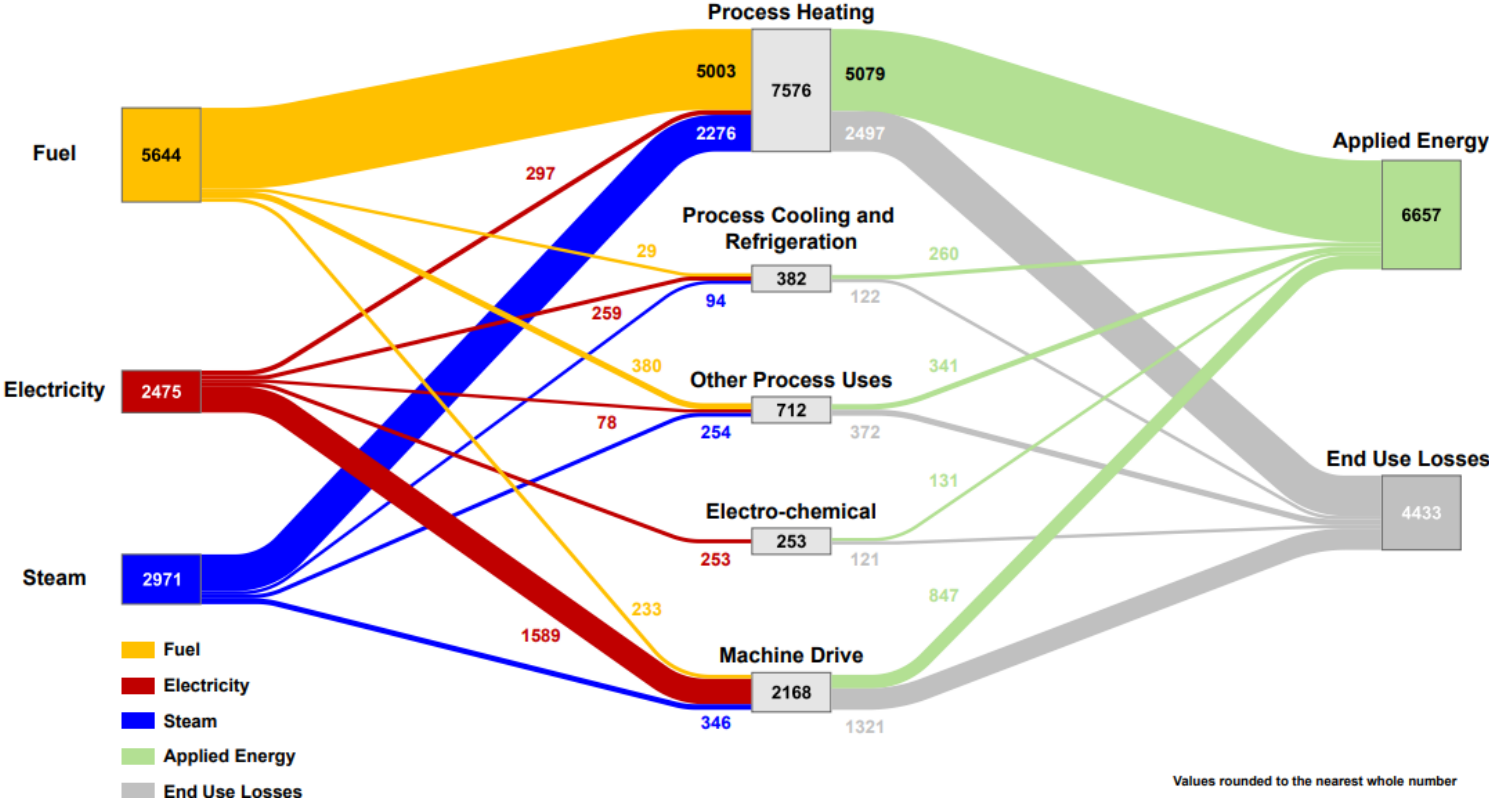
Notes: Facility outliers by are excluded based on employee count, facility area and energy intensity. Lines denote the 5th to 95th percentile, while bars show the 25th to 75th percentile. Bars present the average energy cost proportions for 100 different NAICS industrial classifications, grouped by their energy intensity percentile relative to the same six-digit industrial classifications. Source: IEA analysis based on Industrial Assessment Centers [IAC Database](#) (2002-2024).

Within the same specific subsector energy costs can vary by three times across facilities

Energy use in the industrial sector – is there any efficiency left?



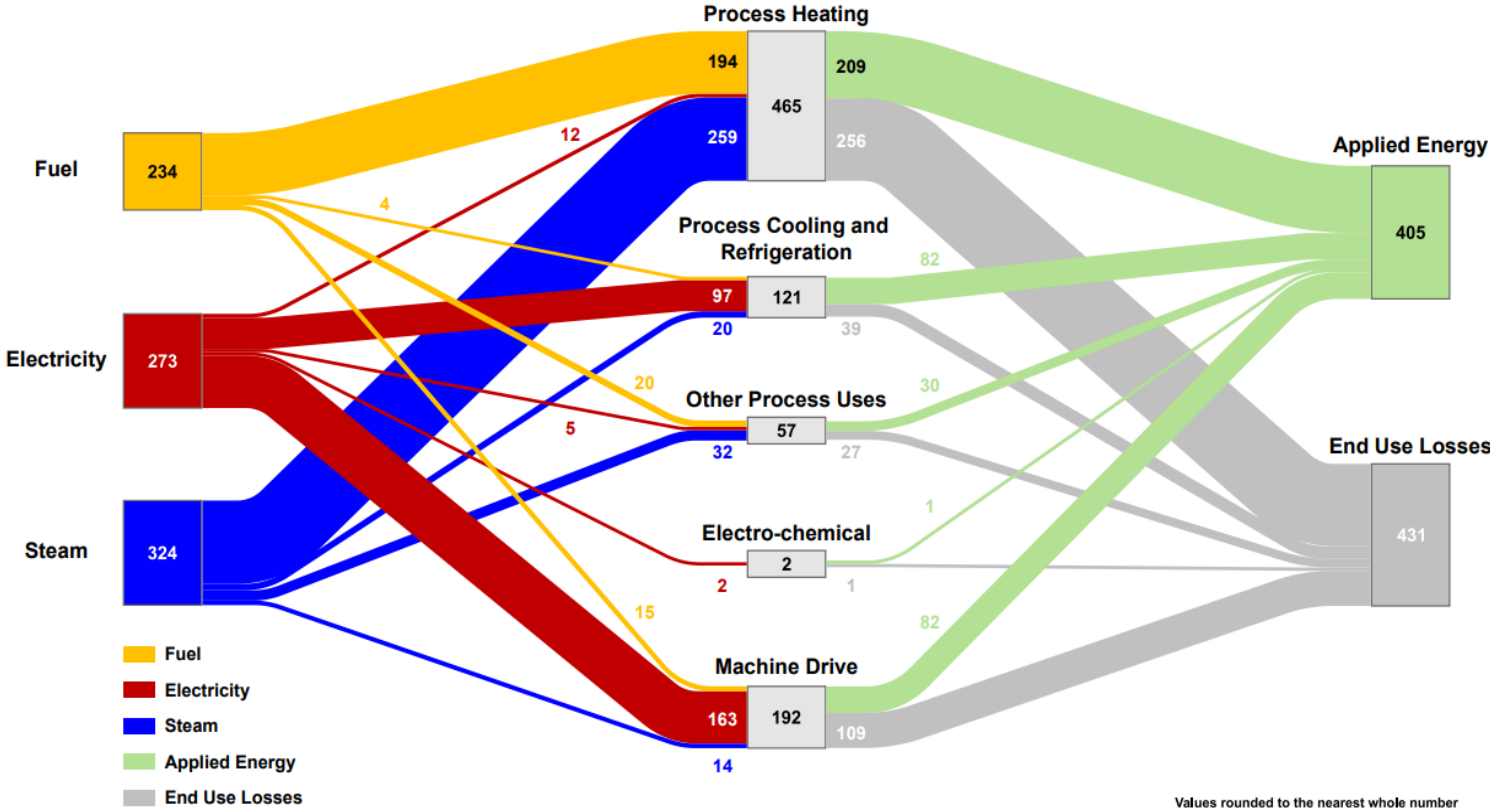
All Manufacturing (NAICS 31-33) Process Energy (tBtu) 2018



Energy use in the industrial sector – is there any efficiency left?

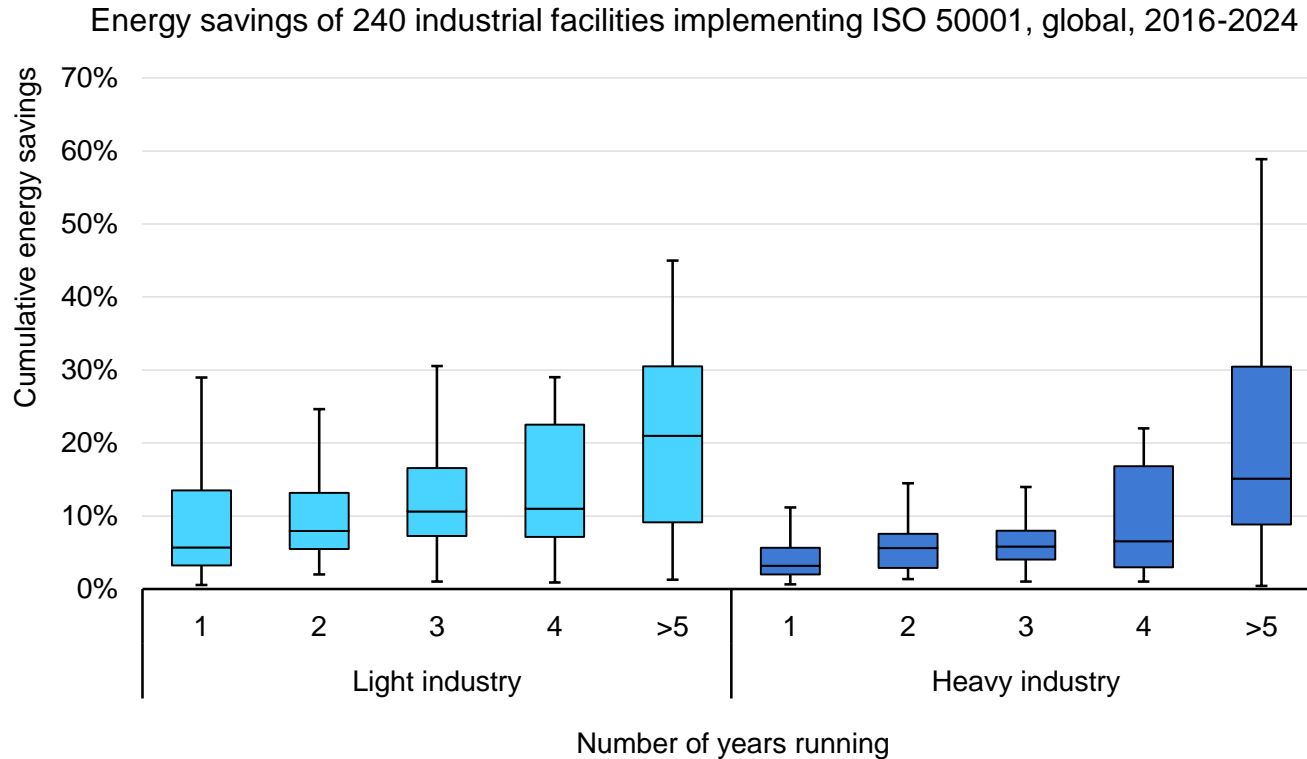


Food and Beverage (NAICS 311-312) Process Energy (tBtu) 2018



Values rounded to the nearest whole number

Levels of saving achievable

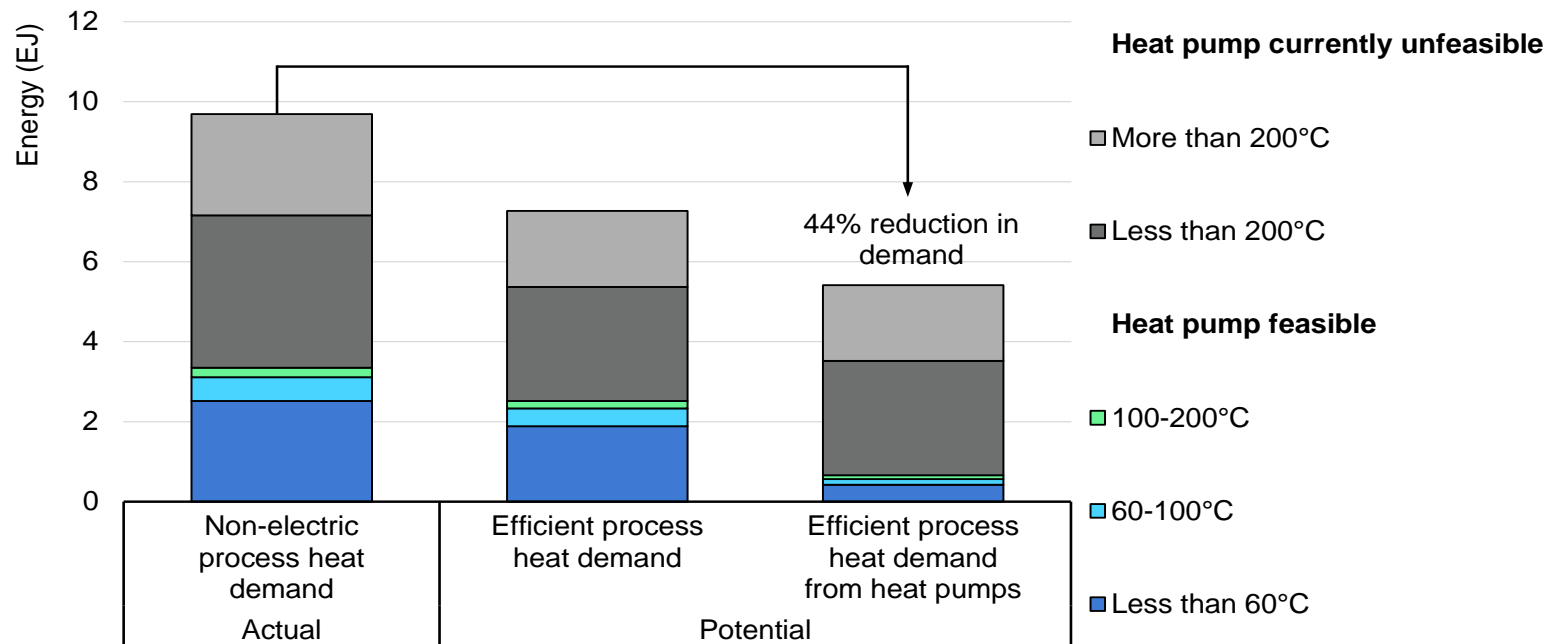


Systematic and persistent efficiency & benefits at low cost
Energy management can enable energy cost savings of more than 10% in the first years of implementation

IEA. CC BY 4.0.

Maximising the benefits of heat electrification

Global non-electric process heat demand in less intensive manufacturing, and estimated efficiency-related savings potential, 2023

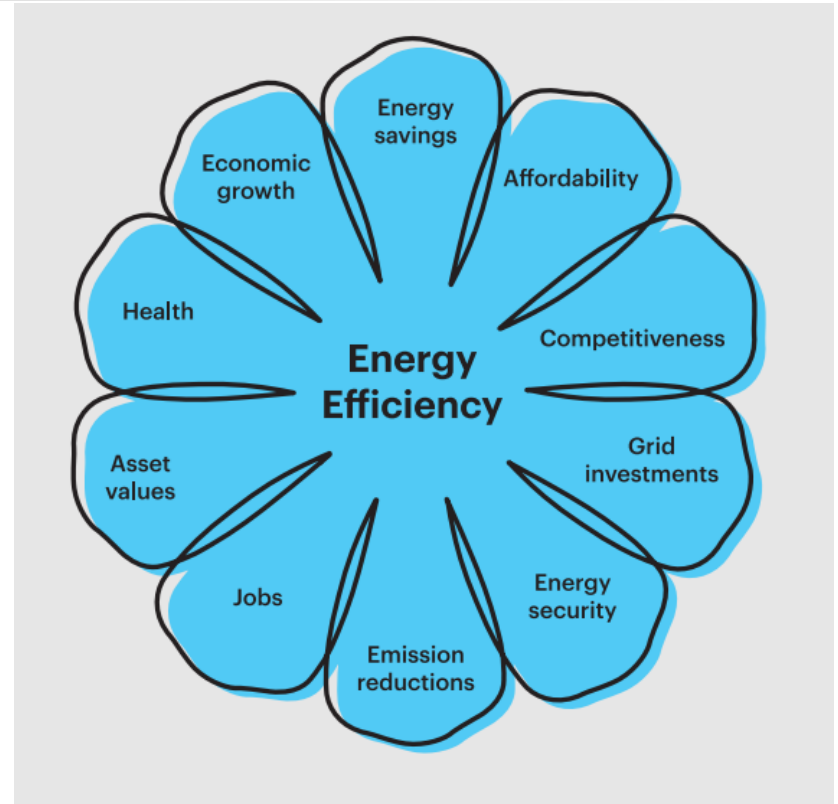


Sources: IEA analysis based on data from the IEA (2024), World Energy Balances; IEA (2022), Future of Heat Pumps; and IEA (2024), Future of Heat Pumps in China.

IEA. CC BY 4.0.

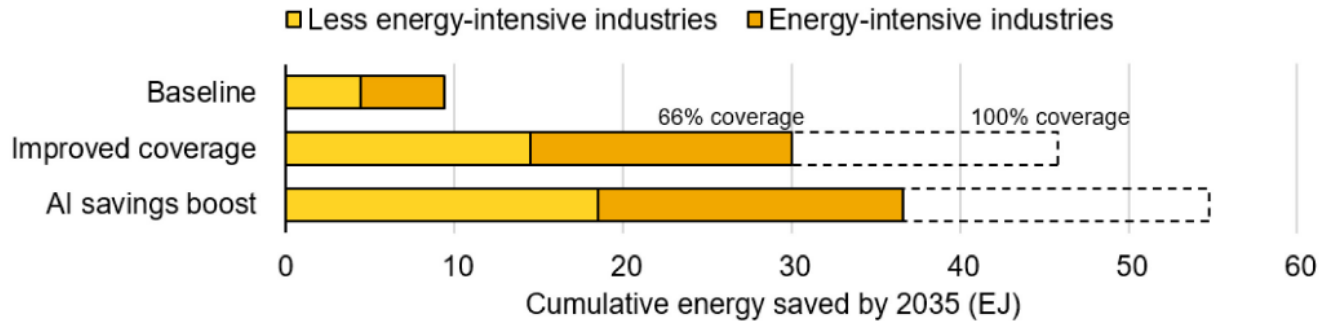
Benefits of efficiency first

- Increased visibility, control and flexibility of the new system (competitiveness and operational gain)
- Increased production and/or production capacity (competitiveness)
- Reduced operational and maintenance cost, with associated reduction in unscheduled down time (operational cost and competitiveness)
- An increase in health and safety (competitiveness)
- Increased compliance with environmental regulations (competitiveness)



Example measures

- Process heat integration techniques - 10 to 35% - integration of heat pumps approx. 50%.
- Maintaining and controlling process heat distribution reduces system losses -15% of total energy use.
- Improving the efficiency of motorised systems can reduce both electricity demand and base load.
- Energy management - an average 11% energy savings within the first years of implementation
- The scaling up of known AI applications could reduce energy demand in light industries by up to 8% by 2035.





Energy Transition Accelerator

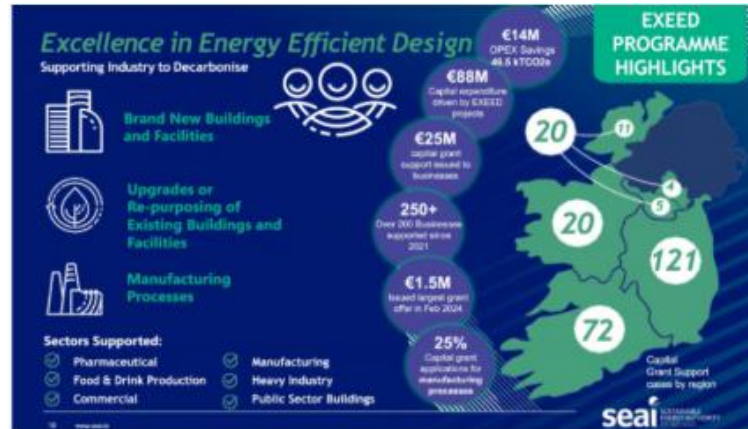


PATHWAY →

Sector Decarbonisation Programme

SUPPORT →

Regional Energy Transition Accelerator



- Report [Energy Management for Industry - Driving efficiency implementation](#)
- Report [Energy Efficiency 2025](#)
- Report [Energy and AI](#)

- Commentary [Industrial facilities could save billions by implementing energy management](#)
- Commentary [Networks of manufacturers can help governments and industry meet their energy goals – and more](#)
- Commentary [Integrated energy and water management will boost savings in industry](#)

- Policy Toolkit [Energy Efficiency Policy Toolkit 2025](#)

Thank you

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