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REGULATORY
ASSISTANCE PROJECT

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Making thermodynamics great again: industry electrification in Europe

CI Industry Electrification Workshop

Dr Jan Rosenow
Director of European Programmes
Regulatory Assistance Project



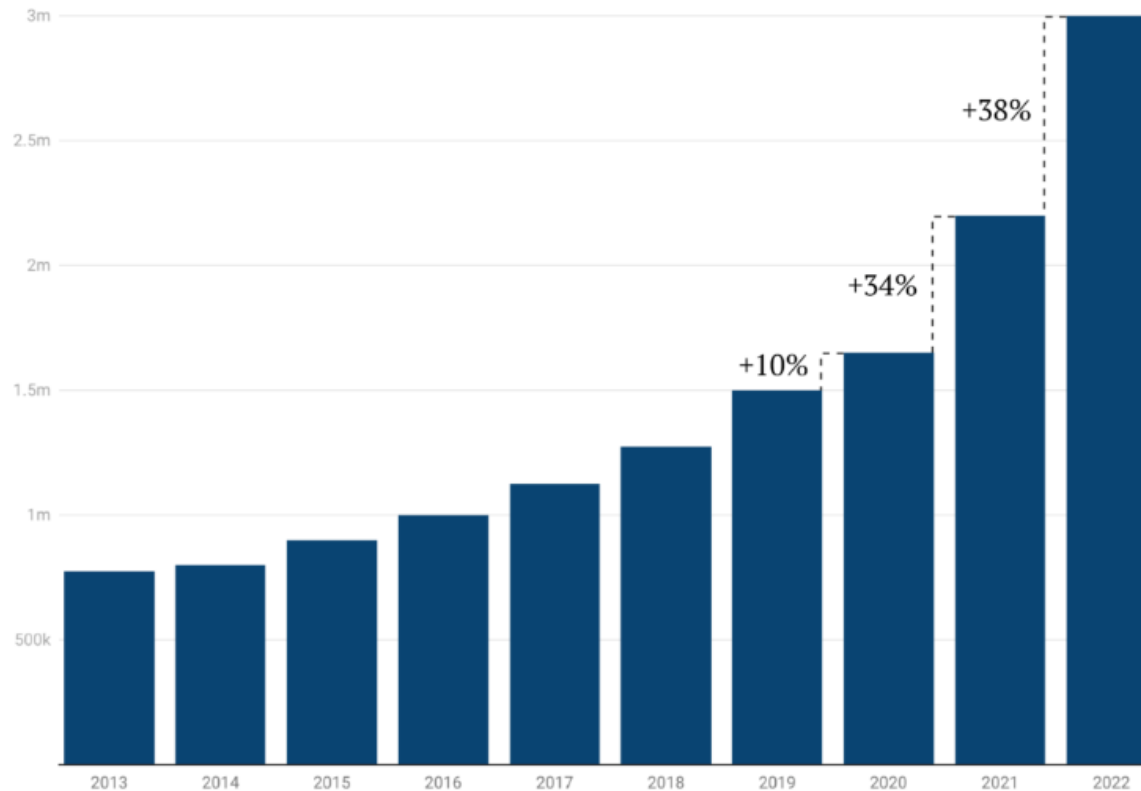
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Recap energy crisis



Huge boost for heat pumps in buildings

A record 3 million heat pumps were sold across Europe in 2022



Created with Datawrapper
Source: EHPA. Chart: Carbon Brief.

CarbonBrief
CLEAR ON CLIMATE

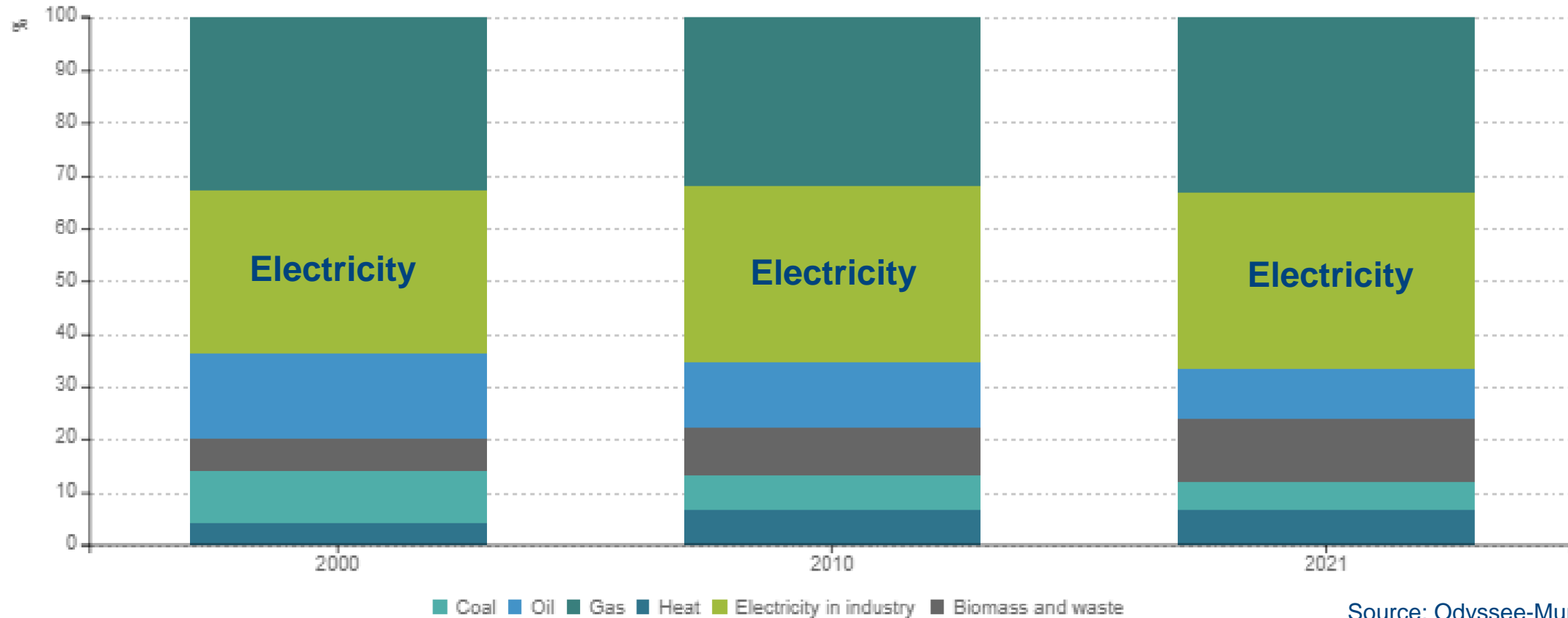
Source: Rosenow and Gibb 2023



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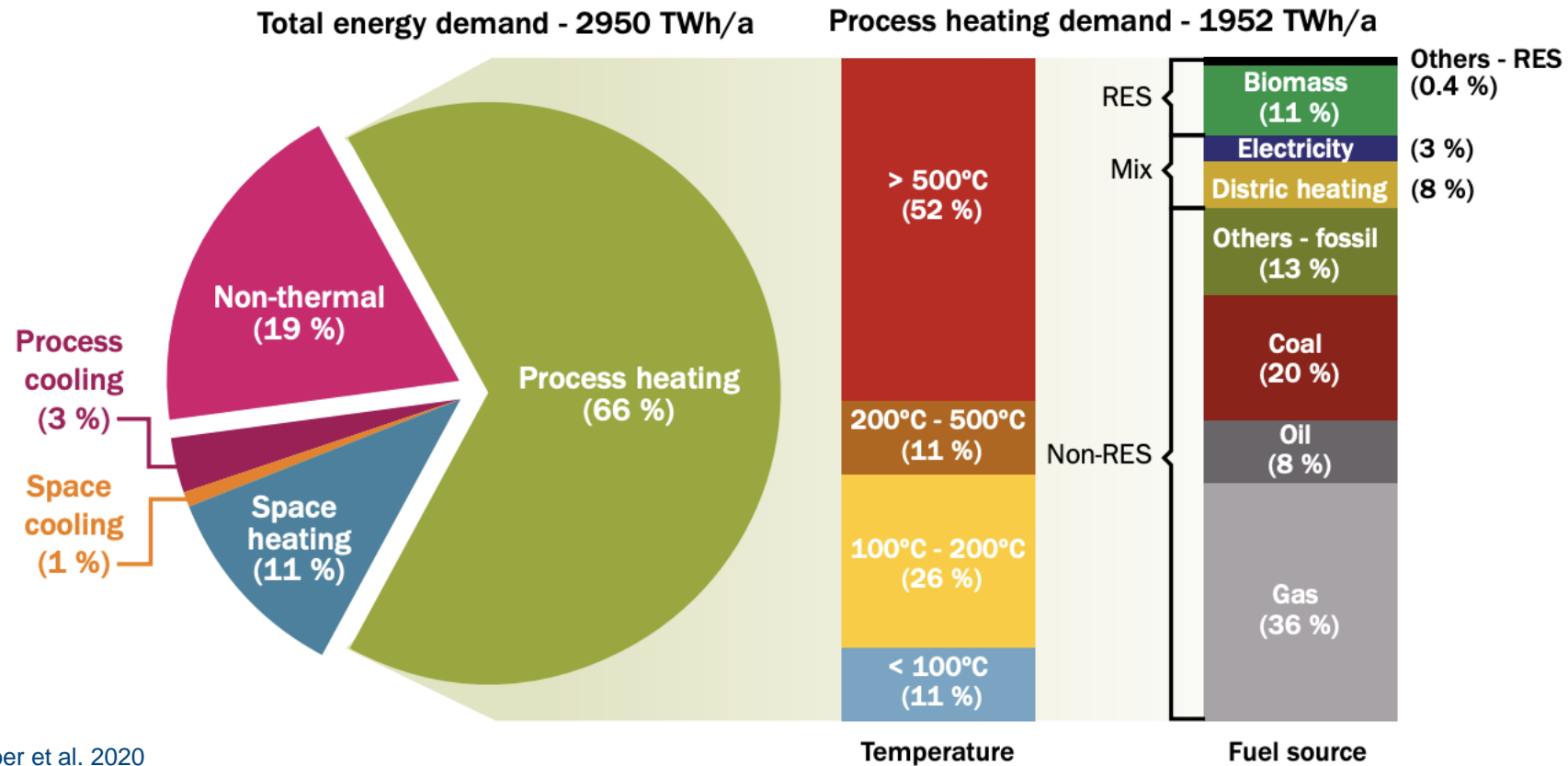
Industry electrification status quo

Share of electricity in EU industry increased from 31% in 2000 to 34% in 2021



Source: Odyssee-Mure 2023

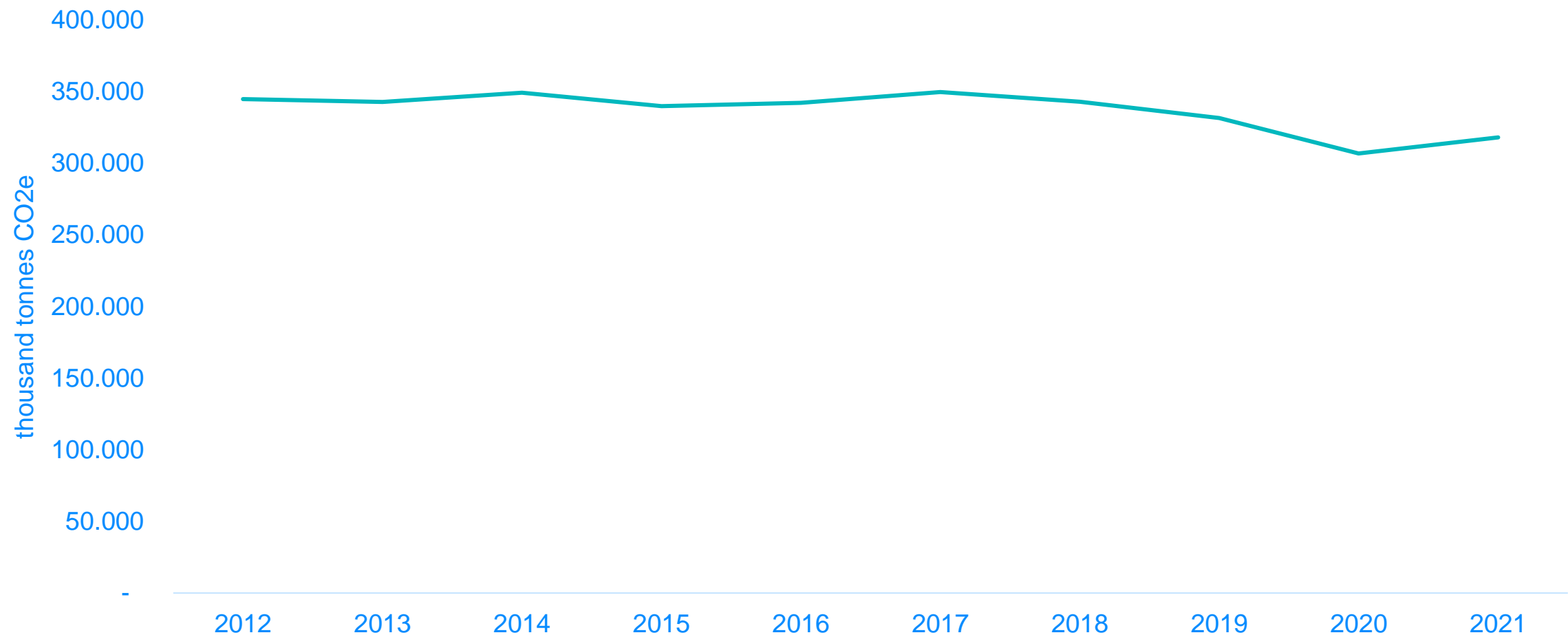
83% of Europe's industrial process heat is from burning fossil fuels with only 3% from electricity



Source: de Boer et al. 2020

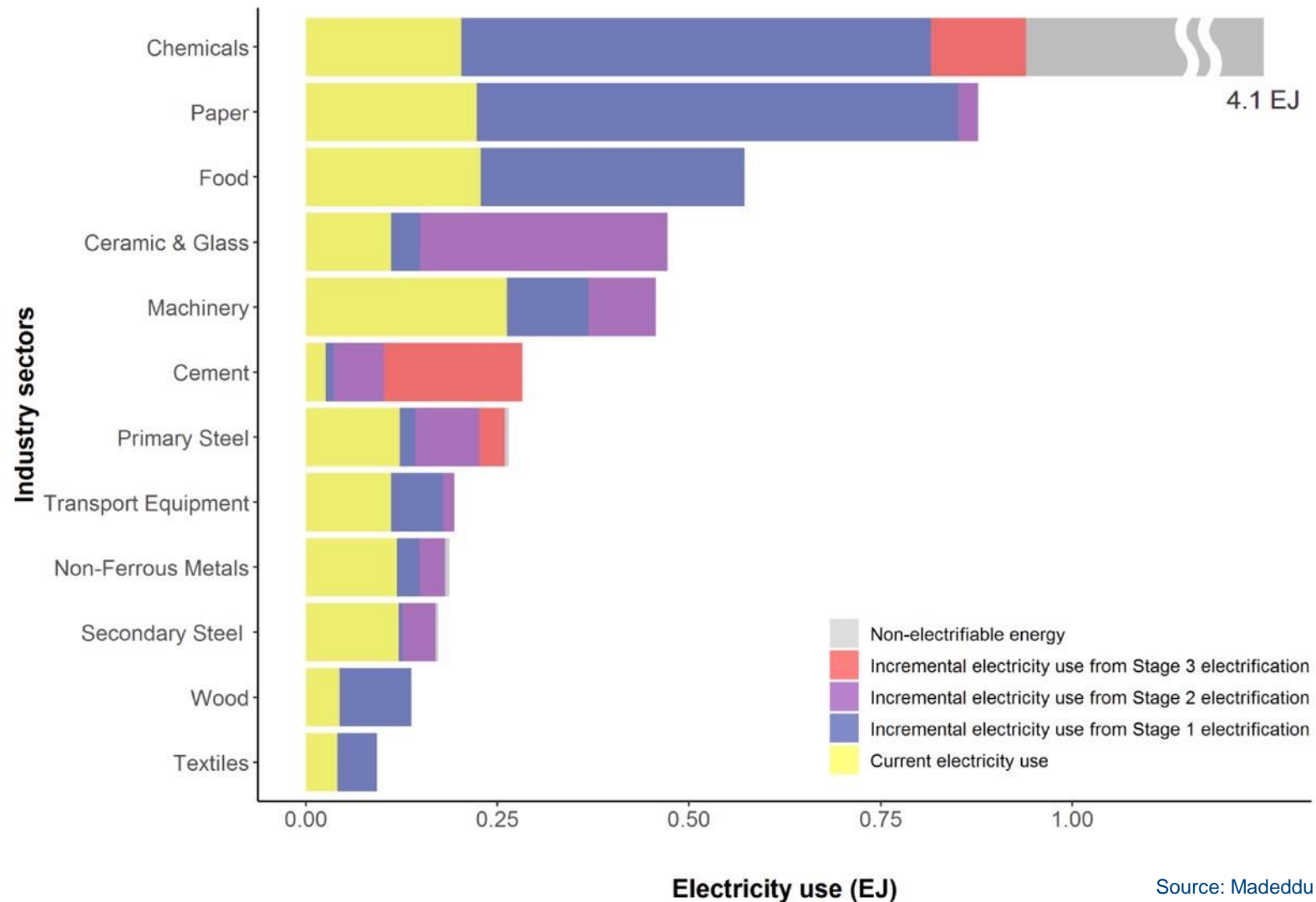
Notes: 61% of EU27 district heating fuel mix is from fossil fuels

EU industry carbon emissions are barely down



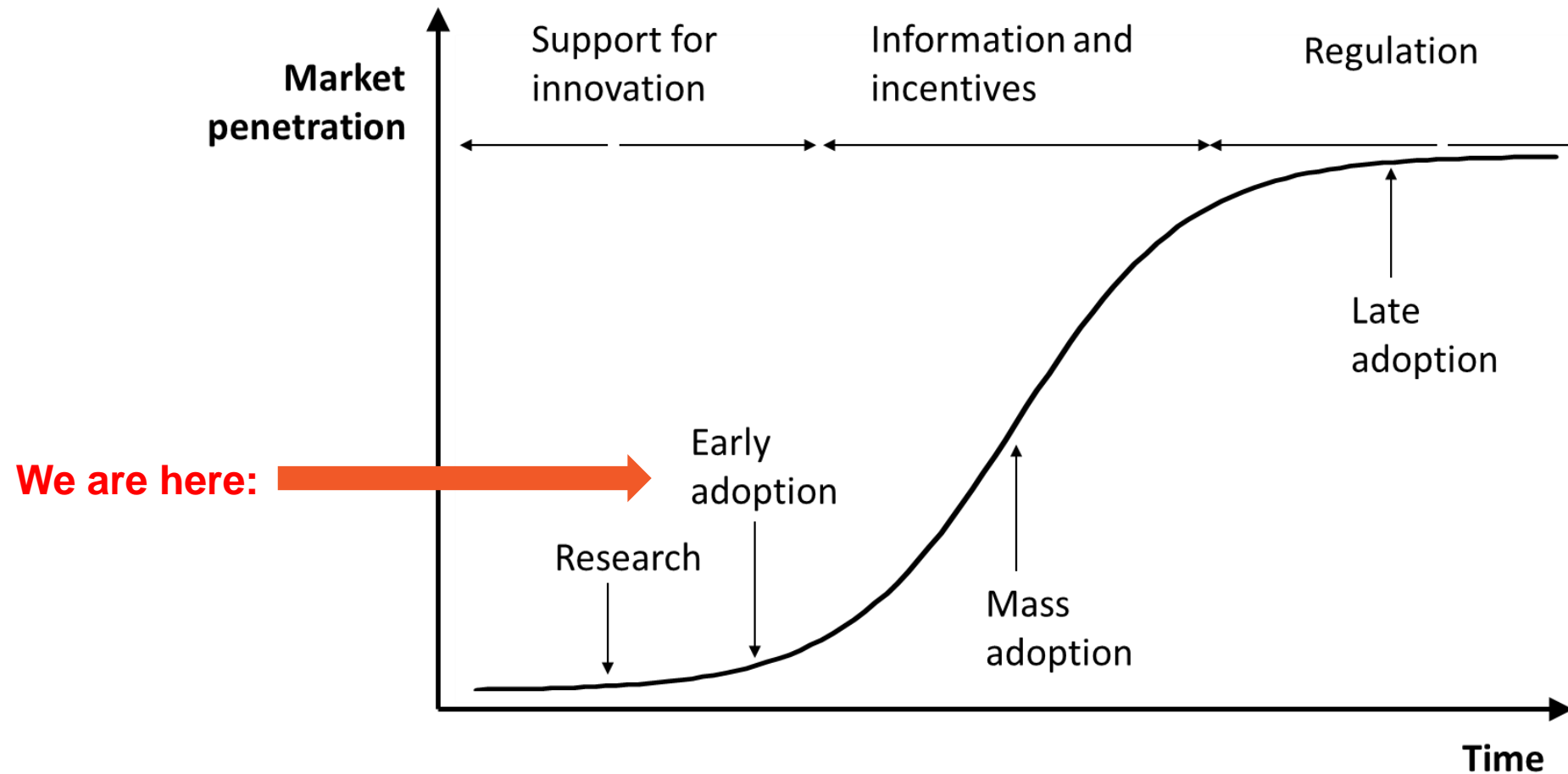
Source: Eurostat 2023

Industry: 78% electrifiable with existing technologies



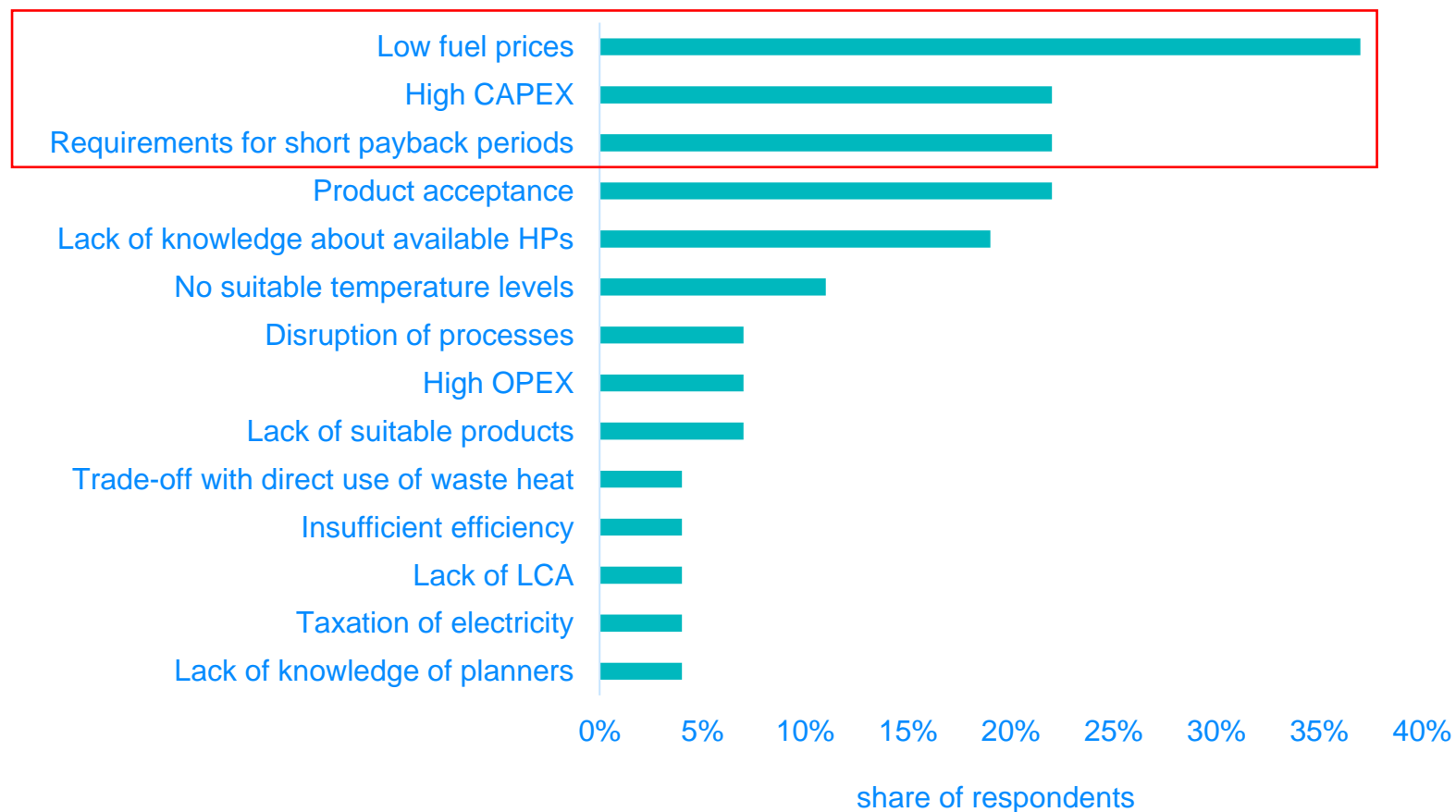
Source: Madeddu et al. 2020

Moving up the s-curve



Source: Rosenow et al. 2015

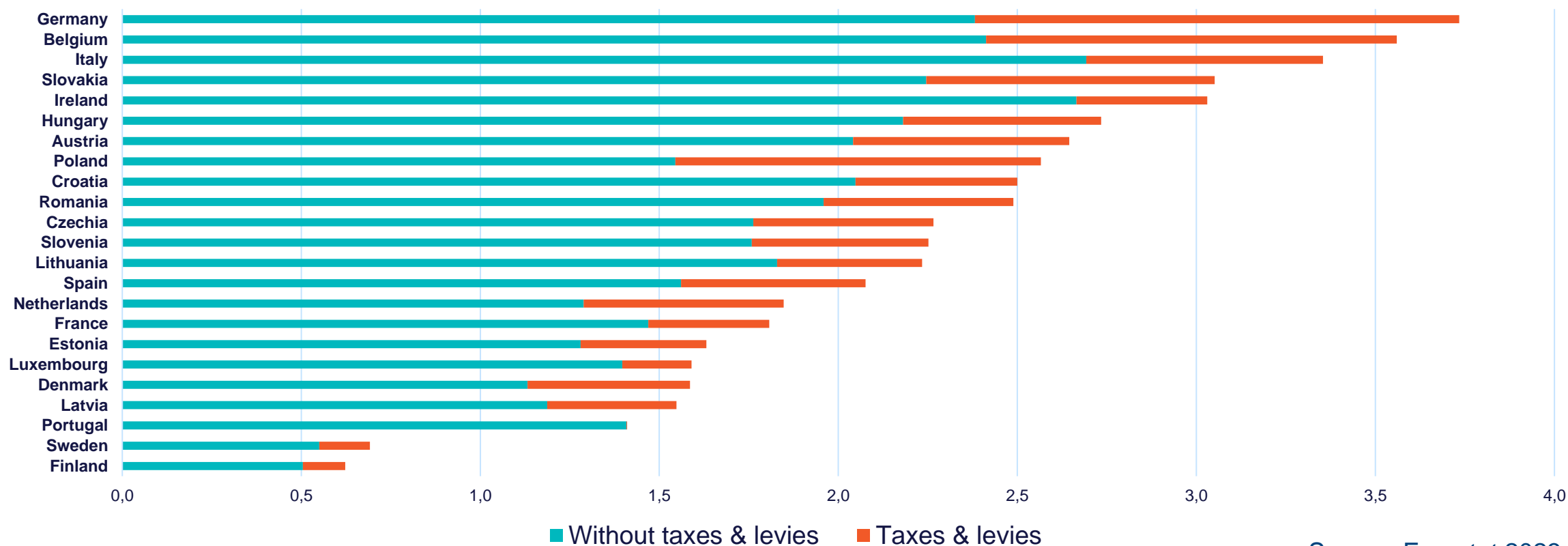
Challenging economics identified as key barrier to deployment



Source: Wolf et al. 2017

Key barrier to industry electrification remains

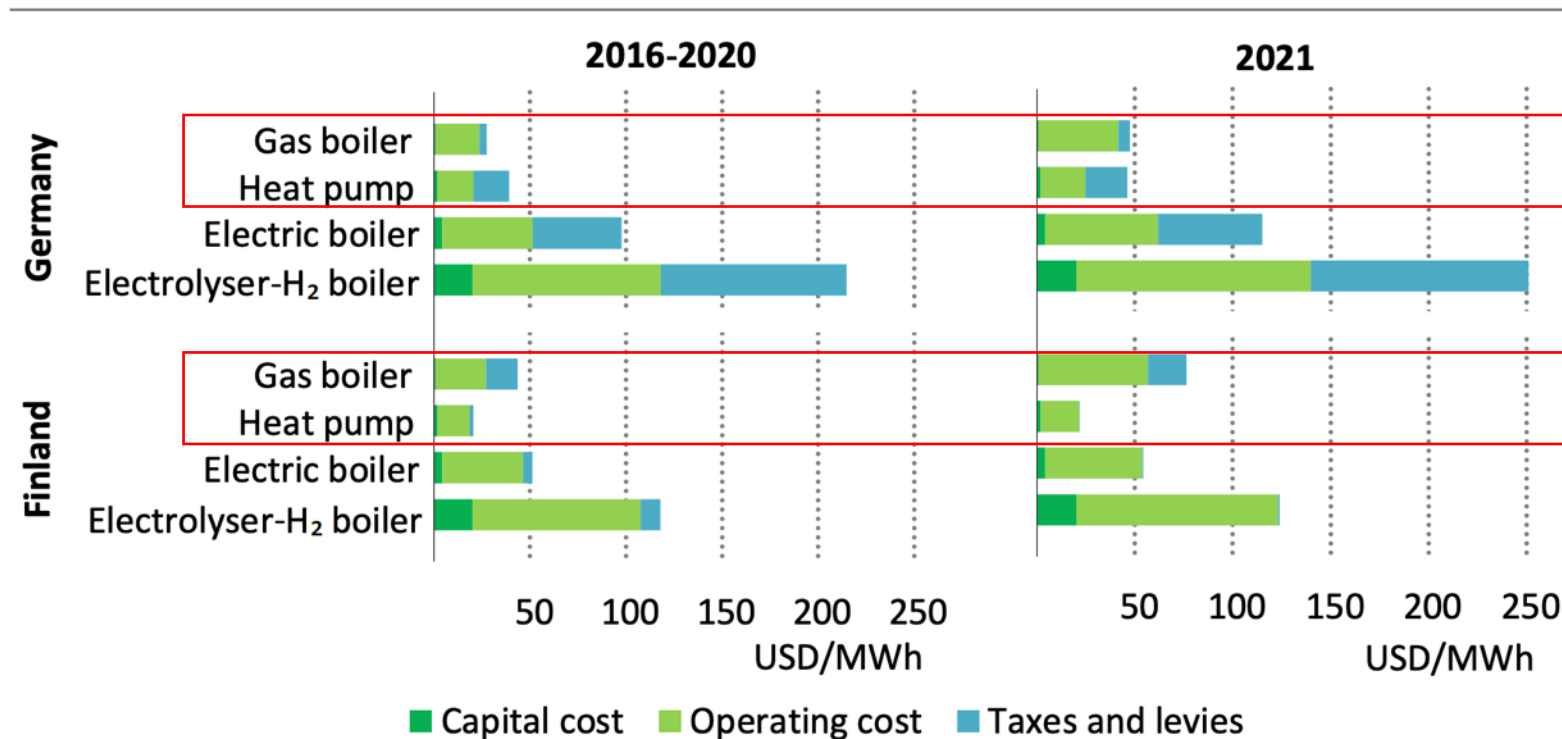
Ratio electricity to gas price for medium-sized industrial consumers in 2022 with and without taxes and levies



Source: Eurostat 2023

Higher gas prices in 2021 and 2022 helped

Figure 1.18 ▶ Average levelised cost of production of industrial heat in Germany and Finland



IEA. CC BY 4.0. Source: IEA 2023



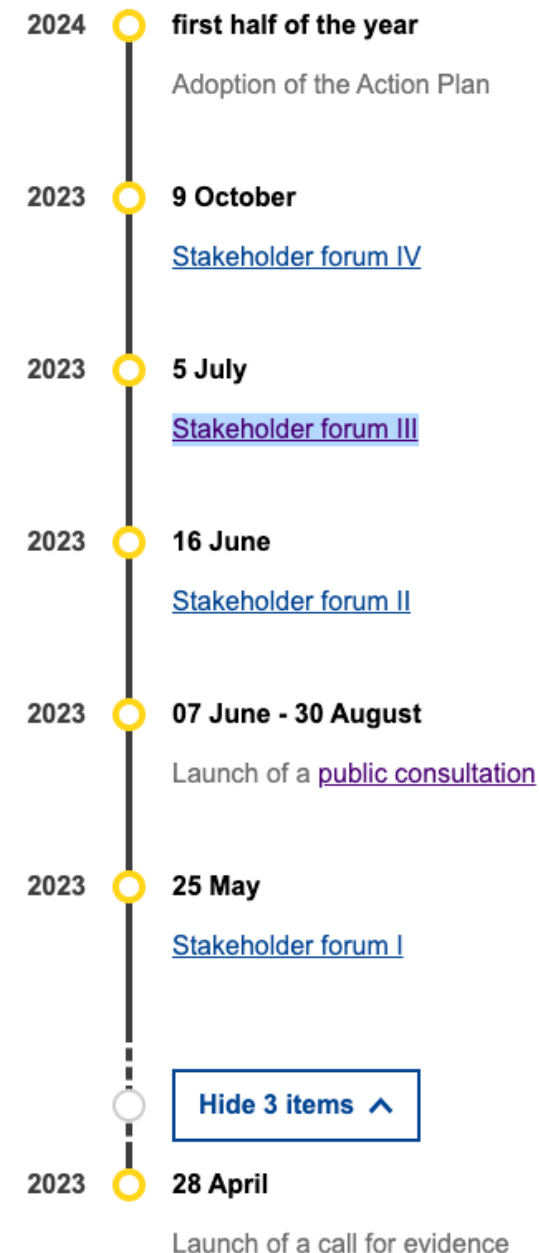
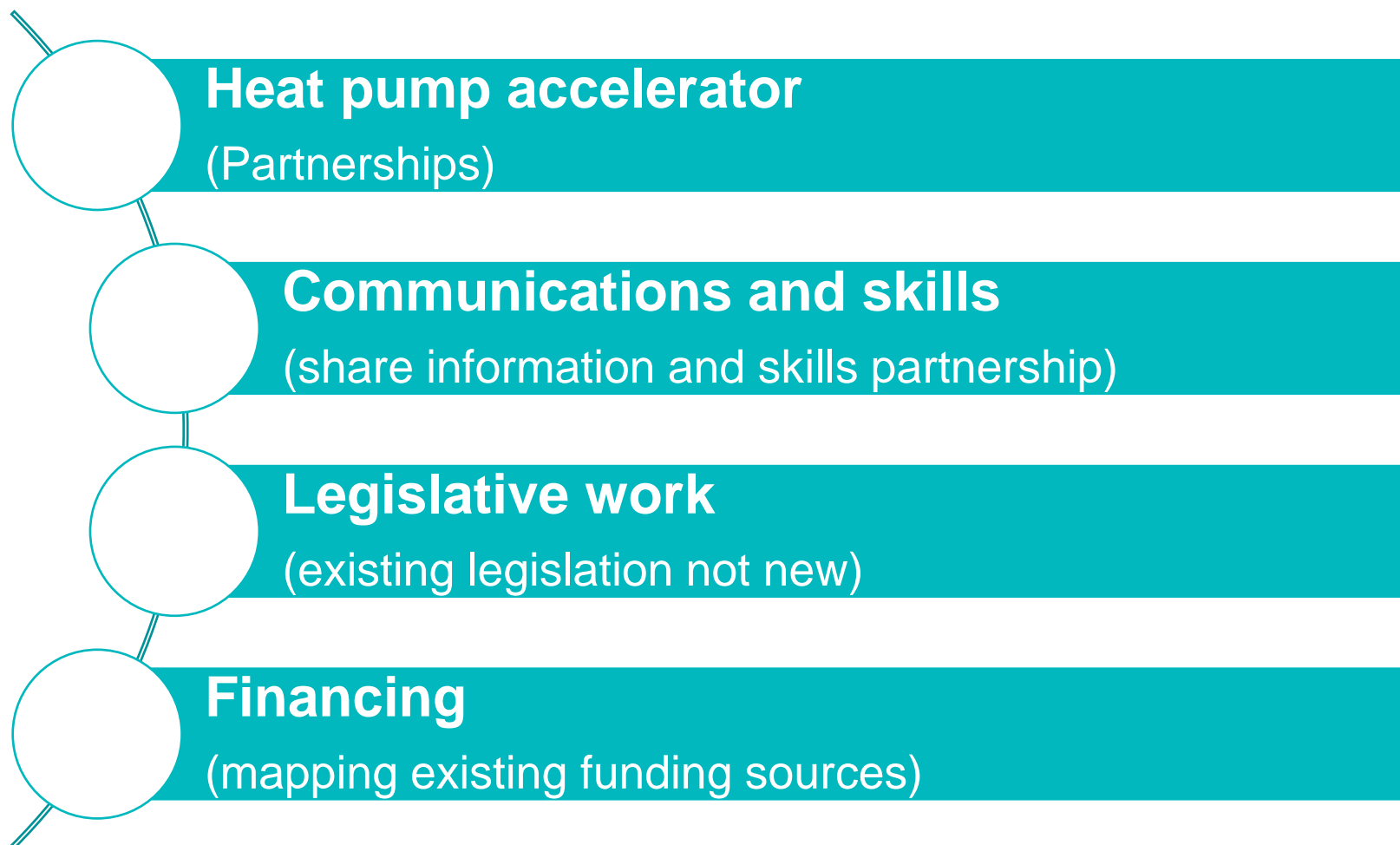
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EU policy

REPowerEU Strategy

- Sees “great potential for electrification of industry”.
- But detailed implementation plan mentions electrification 9x vs hydrogen 229x.
- Mentions Innovation Fund and guidance on PPAs as main vehicles to support industry electrification.

EU Heat Pump Action Plan



EU Heat Pump Accelerator



A joint plan for boosting heat pump deployment and meeting the REPowerEU targets



Credit: Kensa Contracting

Innovation Fund selected no projects on industry electrification

The 41 projects were selected following the [third call for large-scale projects](#), covering four topics: “general” decarbonisation; “industry electrification and hydrogen”; “clean tech manufacturing”; and “mid-sized pilots”.

Projects in brief

- In “**general**” decarbonisation topic: 8 projects worth €1.4 billion

They include 3 projects from refineries and 5 projects in the cement and lime sector, and are located in Belgium, Croatia, Germany, Greece, the Netherlands, Portugal, and Sweden.

- In “**industry electrification and hydrogen**” topic: 13 projects worth almost €1.2 billion

They include 6 projects on renewable hydrogen production as well as 7 projects on hydrogen use in different sectors: chemical industry, refineries and steel. The projects are located in Austria, Belgium, France, Germany, the Netherlands, Portugal, Spain, Sweden and Norway.

