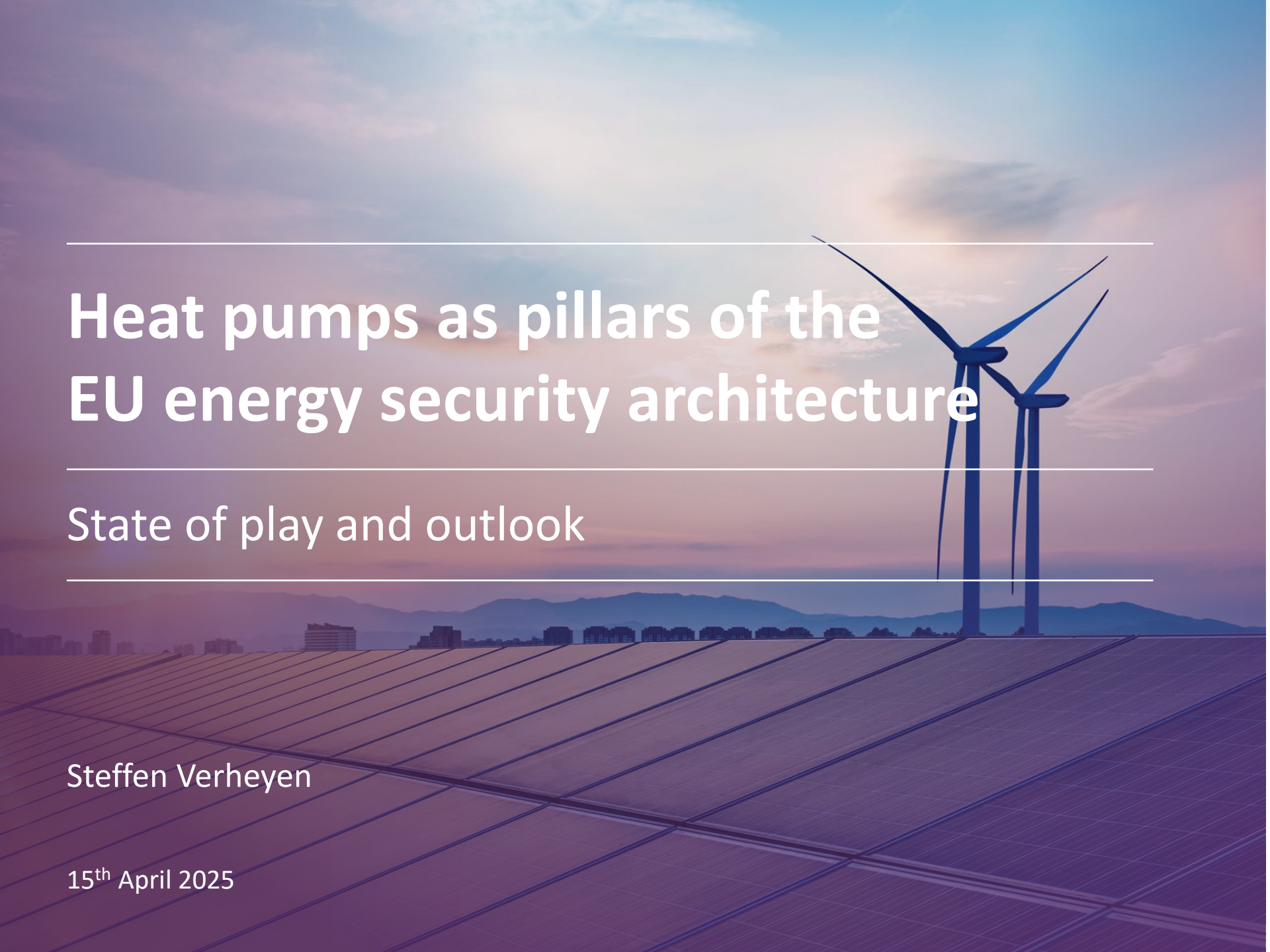


Heat pumps as pillars of the EU energy security architecture

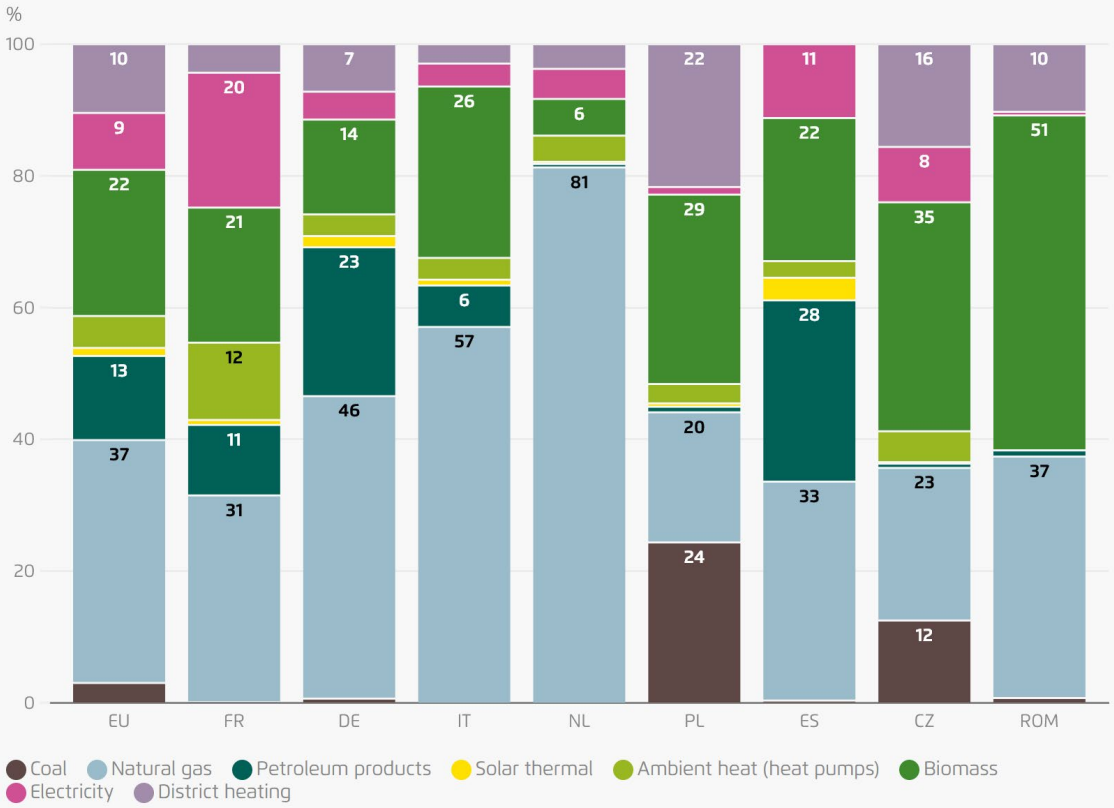
State of play and outlook

Steffen Verheyen

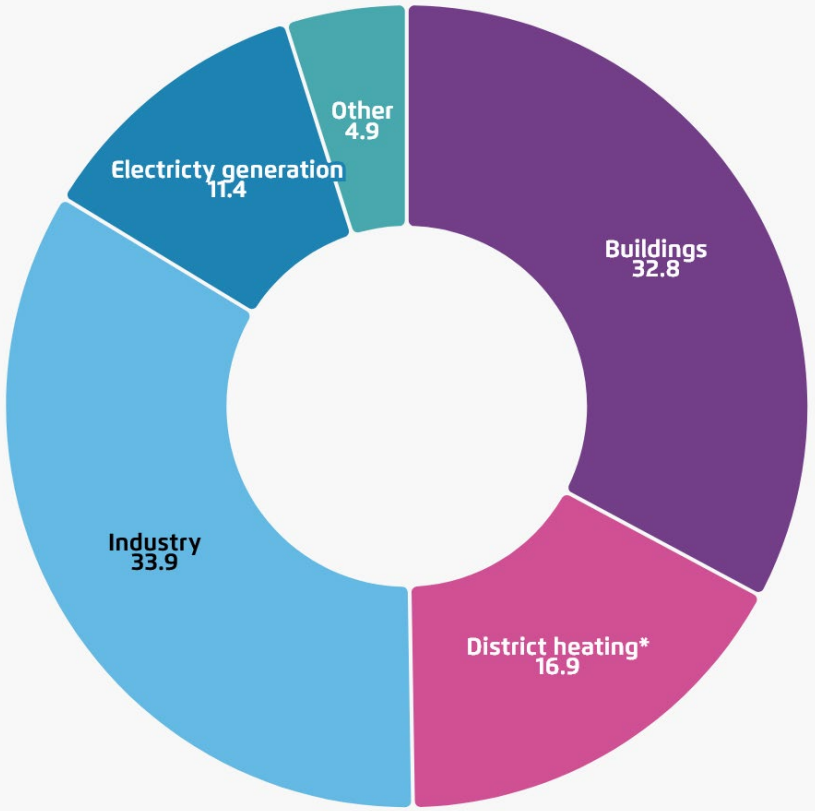
15th April 2025

Fossil fuels still dominate the EU‘s heating mix with buildings and district heating plants representing nearly half of the EU‘s gas demand

Energy mix for space and water heating (2022)



EU gas consumption by end-use (2023)



 Source left figure: Eurostat (2025) | Source right figure: Eurostat (2025) *Including Combined Heat and Power Plants

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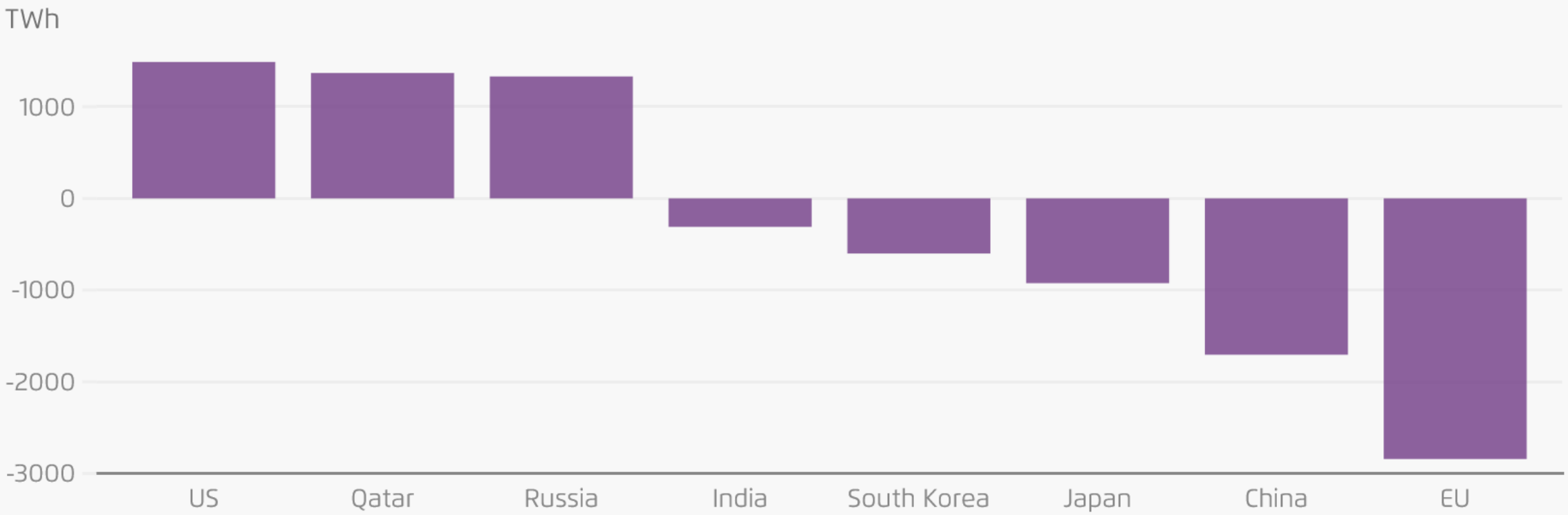
This makes heating decarbonization essential for the EU to strengthen its energy security given that it is the world largest net-importer of fossil gas

Difference between gas production and consumption (2023)



 Source: Our world in data (2025)

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Consequently, the European heat pump market experienced a strong increase during the 2022 energy crisis

Heat pump sales in Europe by technology (2014-2022)

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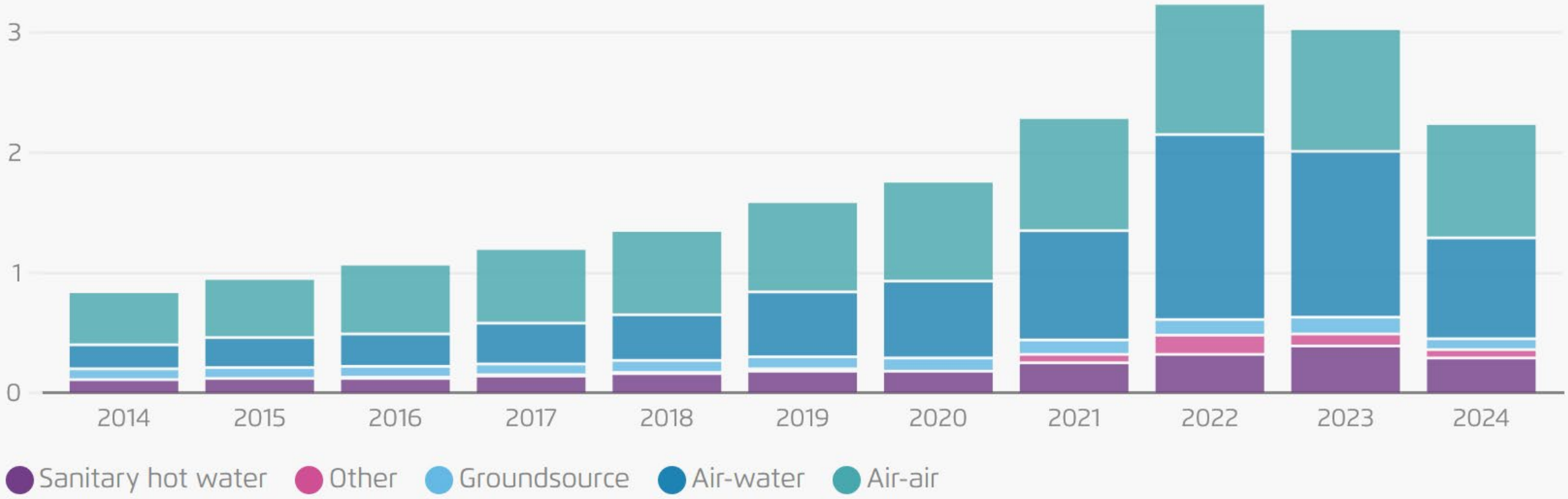
Recently, however, sales numbers have returned to pre-crisis figures

Heat pump sales in Europe by technology (2014-2024)



 Source: EHPA (2025)

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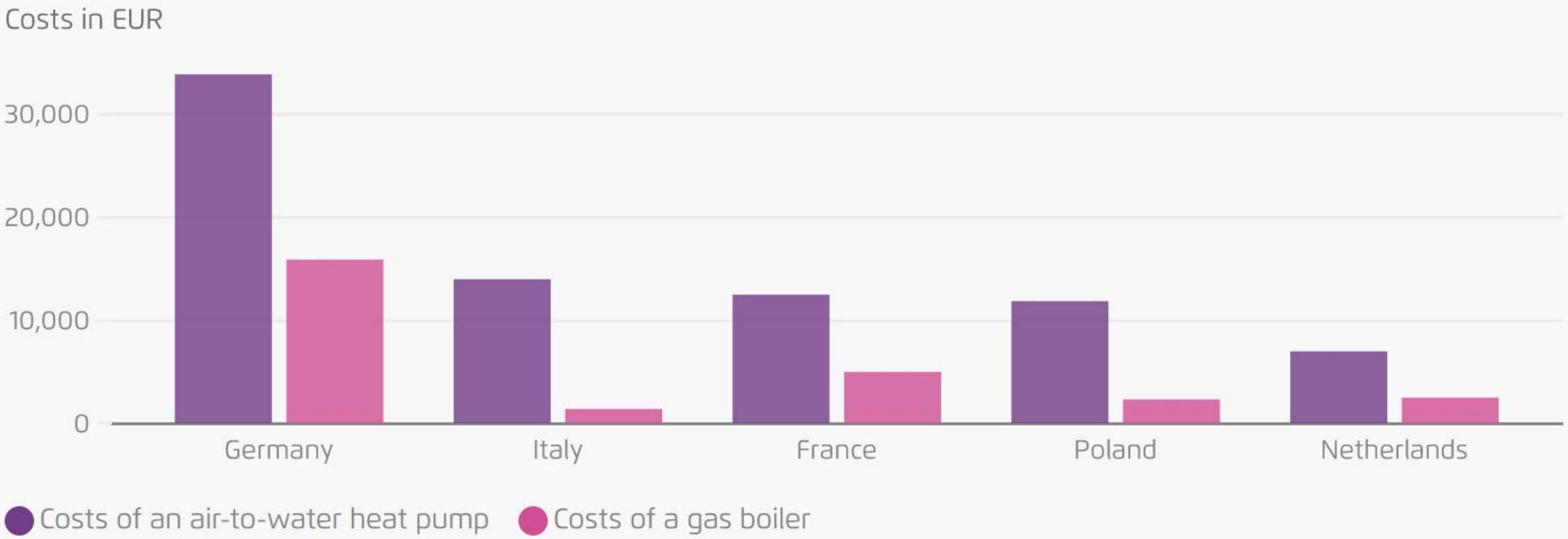
High upfront costs are constraining the access to heat pumps

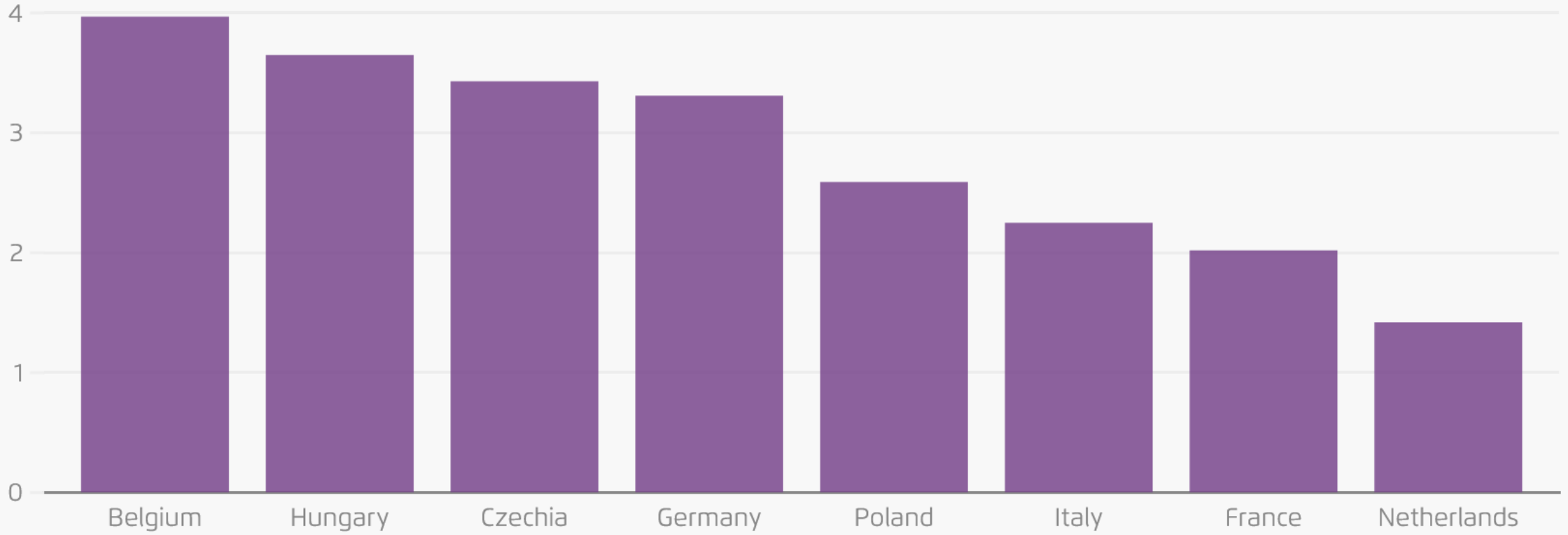
Upfront costs for installing an air-to-water heat pump and a gas boiler (without subsidies)



 Source: Verbraucherzentrale (2025), IZI by EDF (2024), Aira (2023), Enerad (2025), Homedeal.nl (2025), Serwis Ogrezewania (2022), Consomentenbond (2025)

Electricity is still far more expensive than gas in many member states making heat pump investments unattractive for households

Electricity-to-gas price ratios in selected EU member states (March 2025)



 Source: HEPI (2025)

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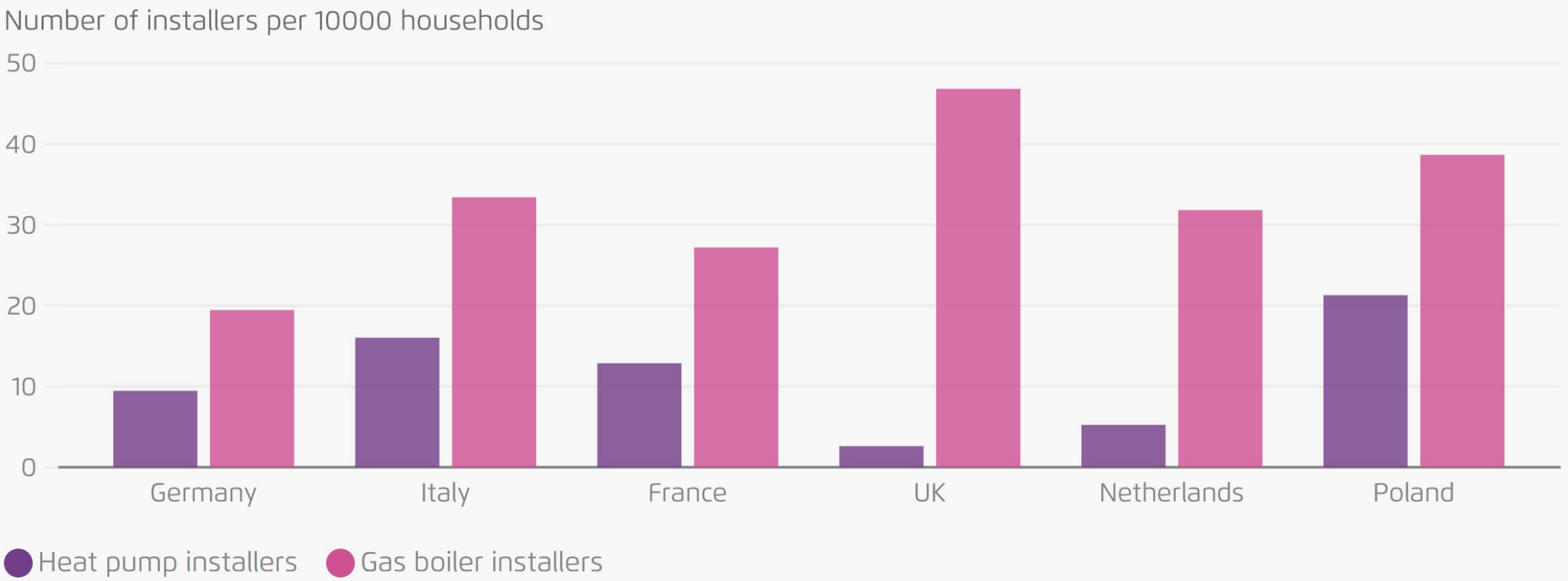
The shortage of skilled installers represents a key bottleneck for the heat pump uptake throughout Europe

Availability of heat pump and gas boiler installers in different European countries



 Source: LCP Delta (2023)

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Member states have mobilized considerable resources to reduce upfront costs – ETS 2 will increase prices for fossil fuels from 2027

Upfront cost

→ Grants (most of the memer states)

→ Differentiated VAT (e.g. France, Belgium)

→ Zero/Low-interest loans

Running costs

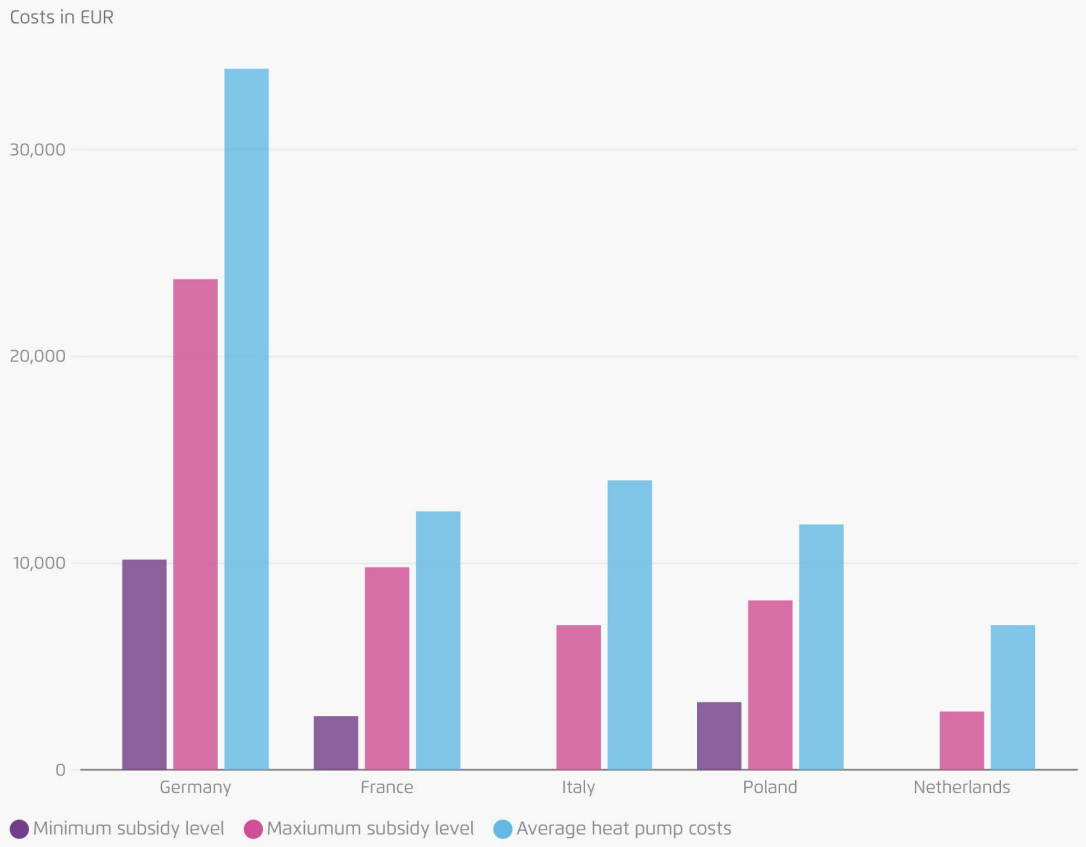
→ Carbon price for heating fuels

- ETS 2 (from 2027): European carbon price

→ Rebalancing of energy prices

→ Incentives for rooftop PV/self-consumption

Subsidy level for installing an air-to-water heat pump



Subsidy level assumed on average prices. Subsidy levels vary according to income level in Germany, France, and Poland and according to replaced heating system and refrigerant in Germany. Subsidy levels in the Netherlands depend on heat pump size and energy efficiency.

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Attempts to restrict installations in existing buildings experienced a strong pushback while installations in new buildings are already strongly restricted

	Requirements on new buildings	Requirements on existing buildings	Requirements on infrastructure
	Obligations for *Zero-emission buildings* from 2030	Obligation for member states to reduce primary energy demand: 16% by 2030	Obligatory local heating and cooling plans, assessment of future gas grid
	Minimum renewables requirement of 65% for all installations from 2024/2026-2028	*65% requirement for existing buildings from 2026/2028 (unclear future under incoming government)*	Mandatory municipal heat planning
	Ban on the installation of gas boilers in new buildings from 2022	✗	✗
	✗	✗	No gas connection for new buildings since 2018
	Ban on installations of gas boilers in new buildings since 2013	✗	Phase-out of gas supply to buildings in 2035

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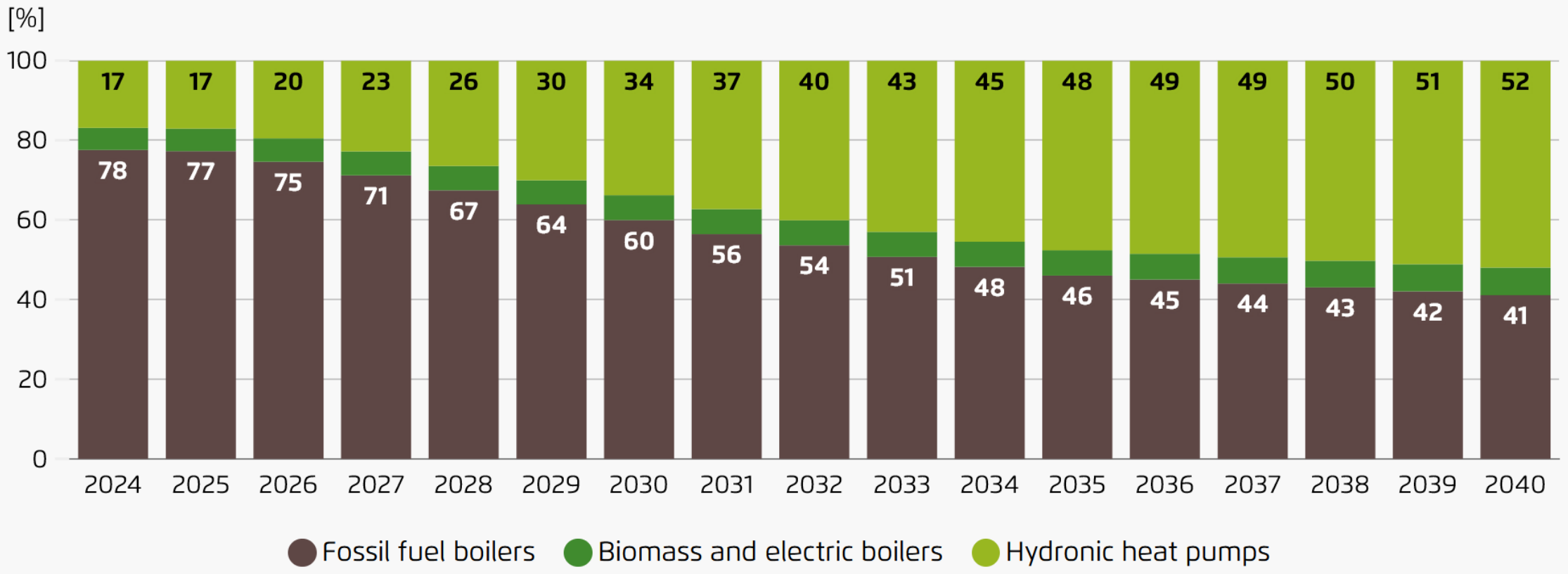
Without a strong policy signal, fossil gas boilers are set to dominate the European heating market well into the 2030s

Projections of heating appliance sales (by technology) in the EU until 2040



 Source: Agora Energiewende (2024) based on LCP Delta (2025)

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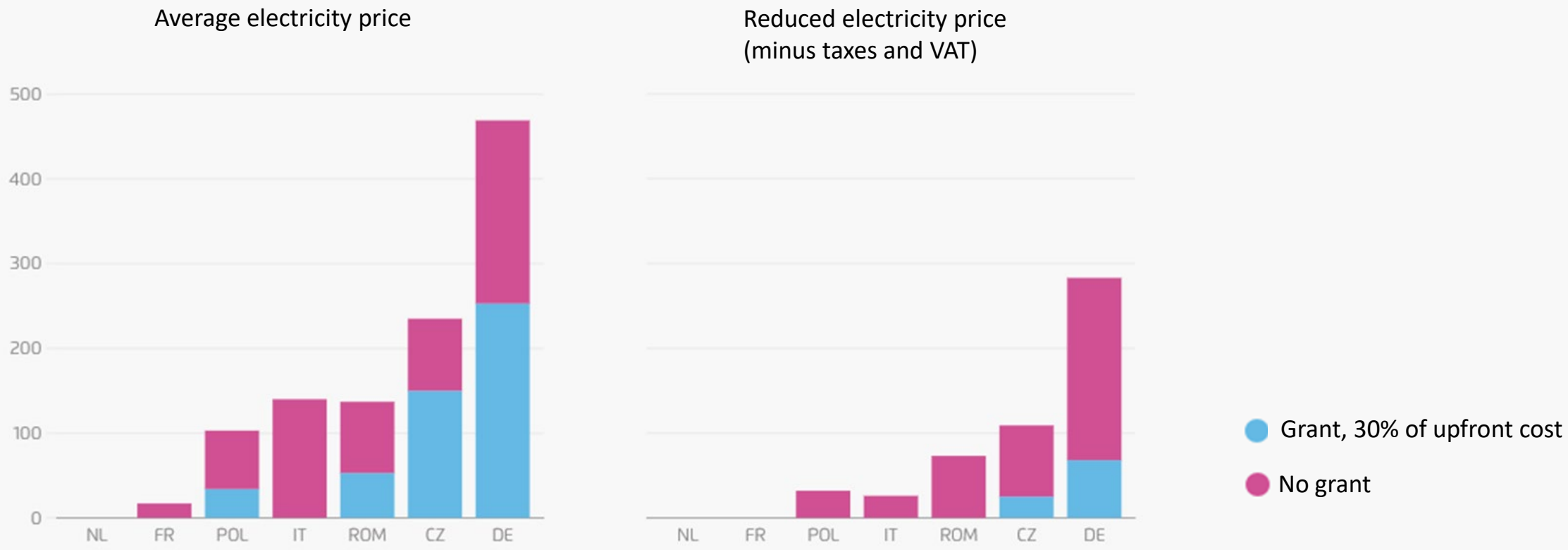
Different levers are needed to make heat pumps cost-competitive – with strong variations between member states

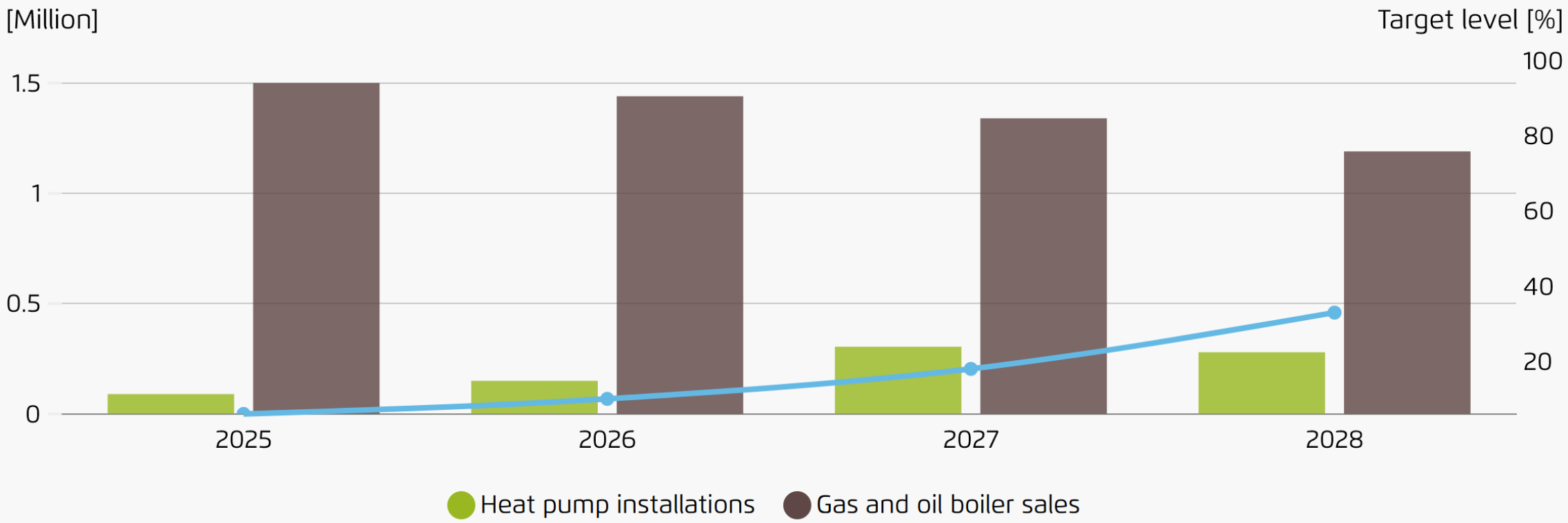
Additional carbon price needed for a heat pump investment to break-even in ten years at December 2024 energy prices



 Source: Agora Energiewende (2025) based on LCP Delta (2025) and HEPI (2025). Note: The reduced electricity price is calculated as the average electricity price minus VAT and taxes.

The UK Clean Heat Market Mechanism provides a clear pathway for the transition of the British heating market

Target level and corresponding appliance sales for UK Clean Heat Market Mechanism



 Source: Agora Energiewende (2025) based on UK government (2023)

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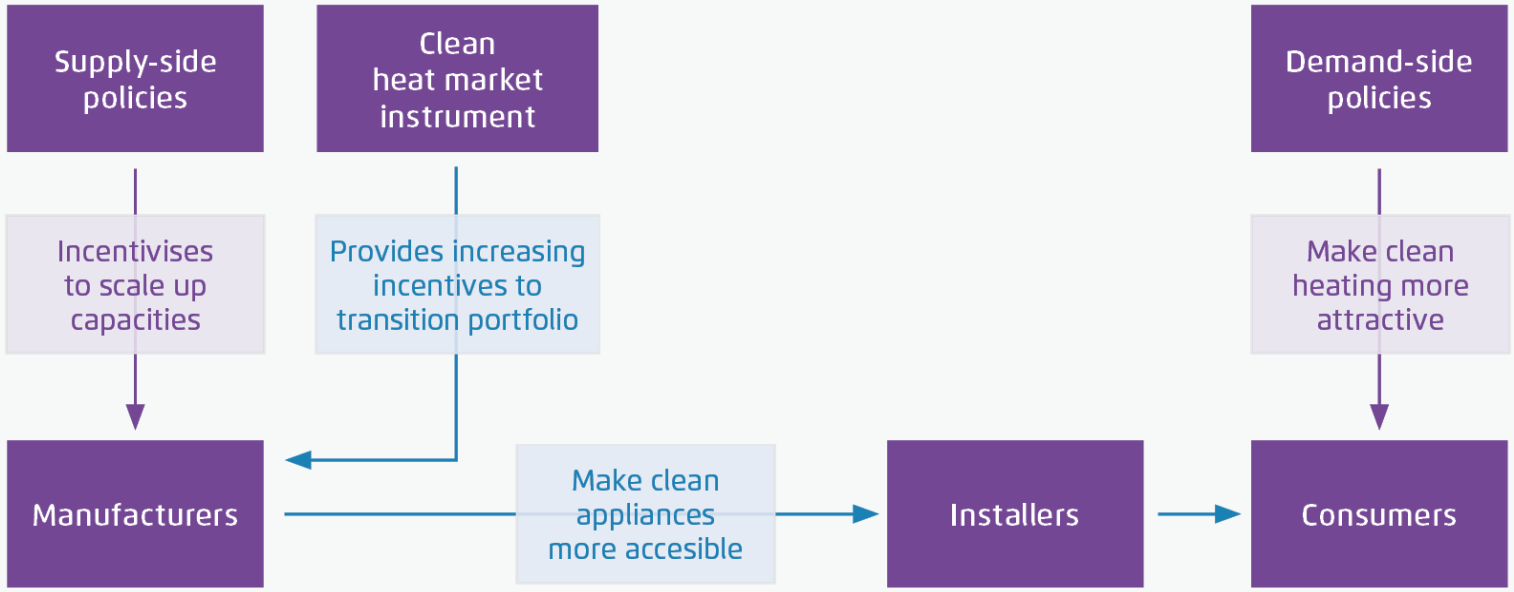
A Clean Heat Market Instrument would represent an innovative new approach to EU heating policy

An EU Clean Heat Market Instrument would:

1. Obligate heating appliance manufacturers to **report their annual sales** of heating appliances;
2. Publicly **benchmark** and disclose the performance of individual manufacturers and
3. Apply **performance-based charges** to heating appliance manufacturers for each fossil boiler sold, while allowing for a partial recovery of these charges

Clean Heat Market Instrument and traditional policy measures



A CHMI can serve as an important part of a strong policy mix

How a CHMI could help to support the transition:

1. **Activates market actors to make clean heating more accessible**

→ Decreasing prices for clean appliances

→ Improve technical support

2. **Government commitment device**

→ Signals government's dedication to clean heating goals

→ Governments would be compelled to strengthen policy framework for clean heating

3. **Increases effectiveness of carbon pricing**

→ Complements carbon price with a corresponding price signal on heating appliances

→ Additional installations of clean appliances reduce demand for certificates and thus prices in ETS II

A Clean Heat Market Instrument is no silver bullet

A CHMI cannot drive the transition on its own:

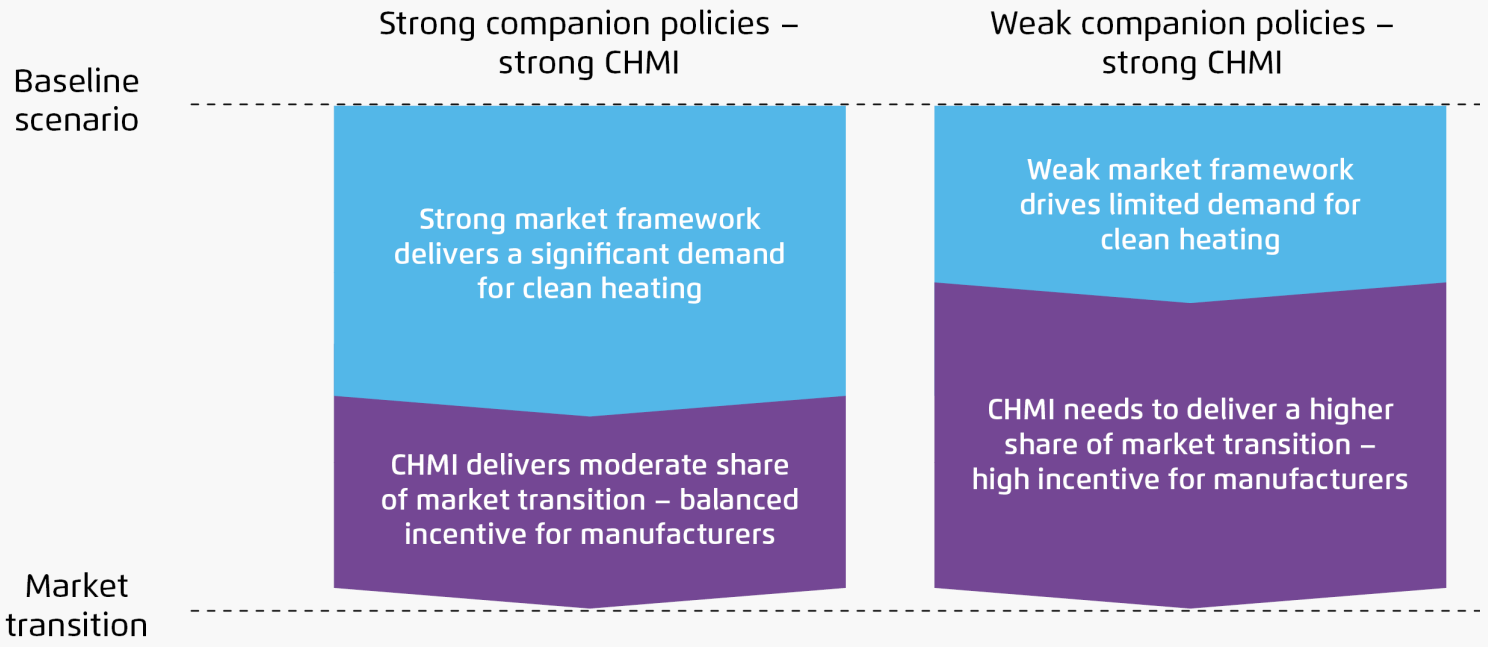
→ Does not address all market barriers

A balanced policy mix is required:

→ Rebalancing energy prices for improving the market framework

→ Providing targeted support to vulnerable households (e.g. through higher subsidy rates)

How the broader market framework influences the relative impact of a Clean Heat Market Instrument (CHMI)



Thank you for your attention!

Do you have any questions or comments?

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