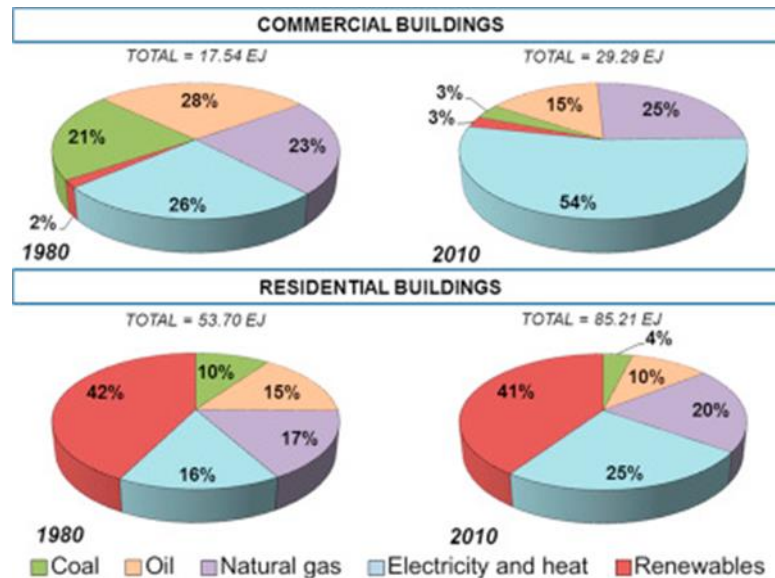




# Key questions

- What are the main **trends** regarding the heating systems?
- Are regulatory frameworks **effective** regarding energy efficient systems?

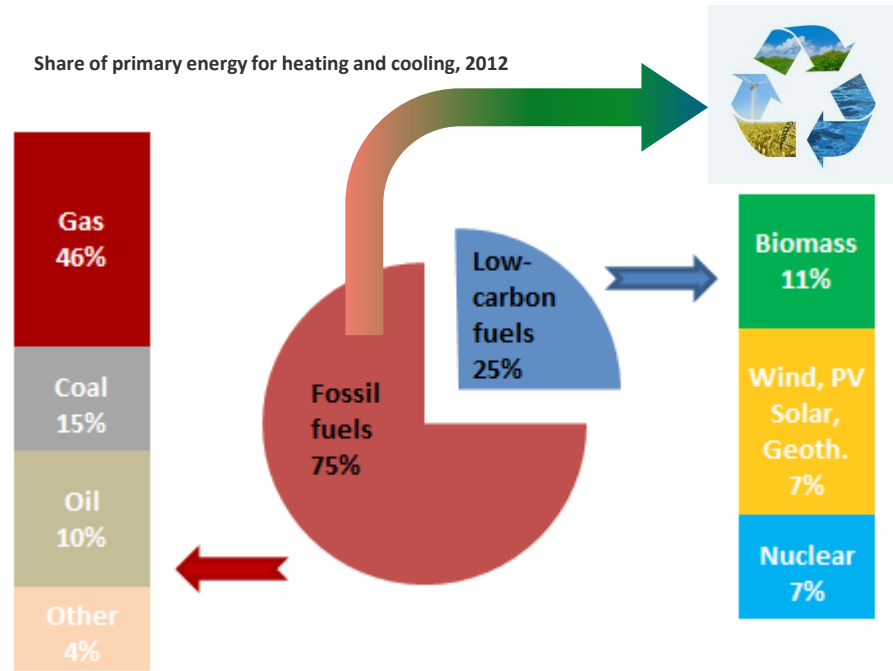
World total final buildings energy consumption by final energy carrier



Source: <https://www.sciencedirect.com/science/article/pii/S1364032114007151>

# Heating and cooling in conditioned buildings of Europe

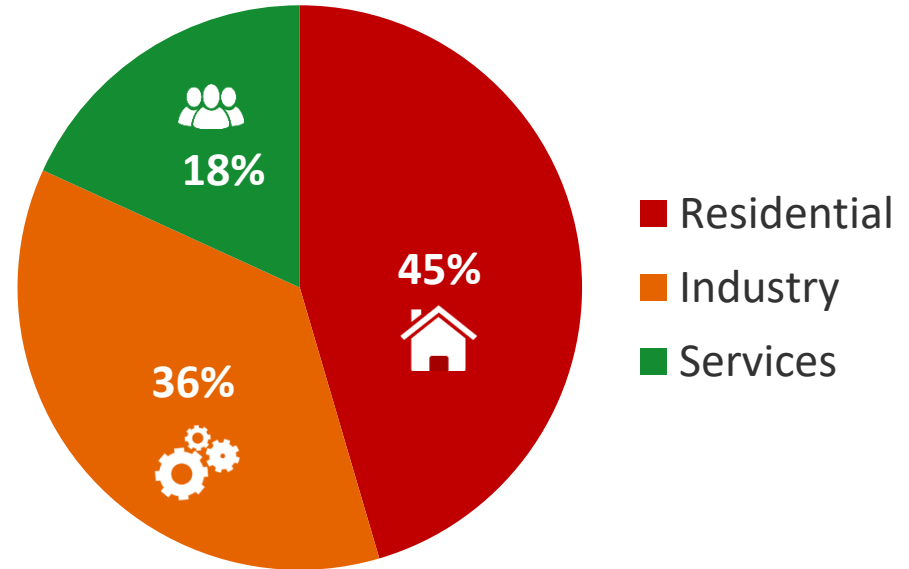
- Heating and cooling of buildings consume **half** of the EU's energy
- 75% of the fuel for conditioning buildings come from **fossil fuels**
- EUR 166 million of EU funding for **research, demonstration and market uptake** of energy efficient, low carbon and renewables heating and cooling solutions



[ec.europa.eu/energy/sites/ener/files/documents/overview\\_of\\_eu\\_support\\_activities\\_to\\_h-c\\_-\\_final.pdf](http://ec.europa.eu/energy/sites/ener/files/documents/overview_of_eu_support_activities_to_h-c_-_final.pdf)

# Heating & cooling

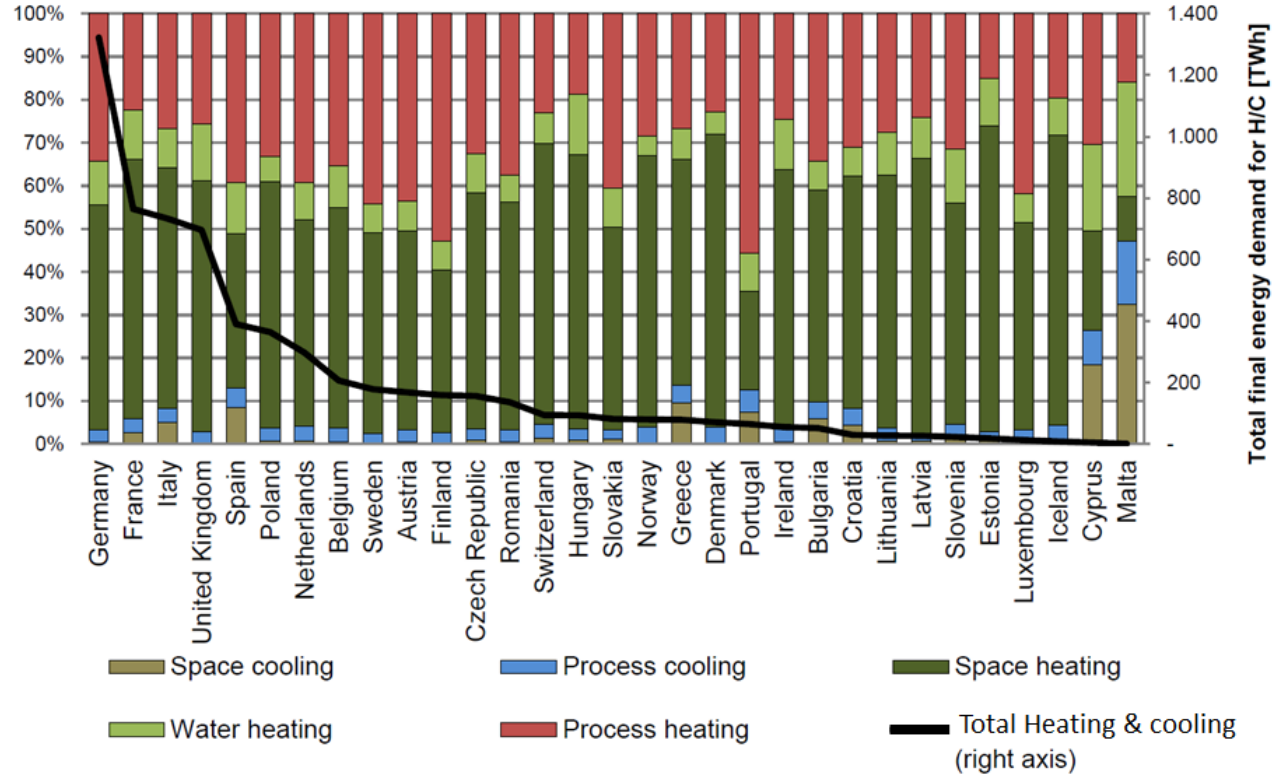
- 45% of energy in heating and cooling in the EU is used in the residential sector, 36% in industry and 18% in services



# Final energy demand for heating and cooling by end-use

Substantial differences across the European countries

➤ Due to the structural and climatic differences



# Policies and objectives of energy efficiency

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## Efficiency measures:

- Improvements to the building envelope insulation
- Air tightness and ventilation in both new buildings and renovation

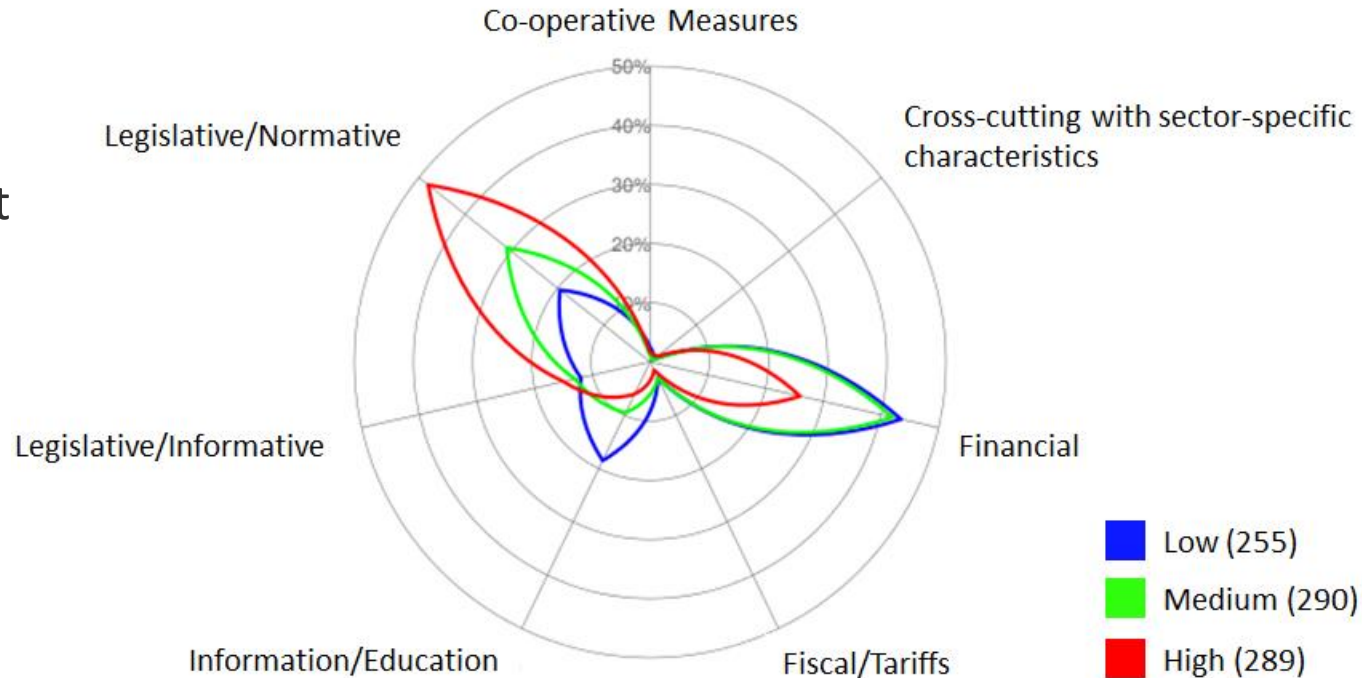
## Decarbonisation measures:

- Use of renewable energy
  - Electricity
  - District heating

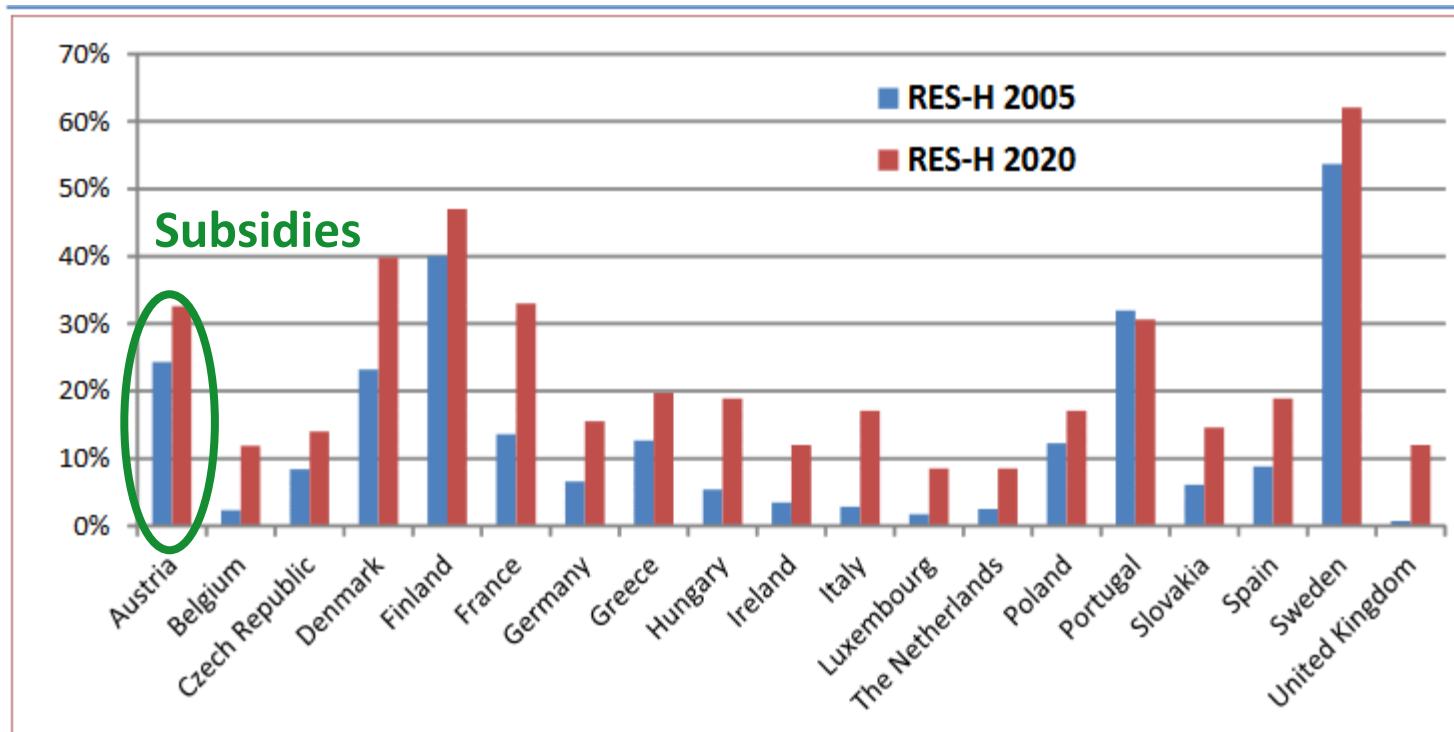


# The most effective measures

1. Legislative or normative measures
2. Financial support
3. Information activities



# Use of renewable energy in the heating/cooling systems

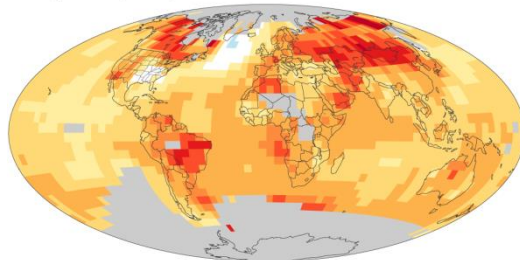


Source: IEA analysis of EU Member States RE Action Plans 2010.



# Fundamental challenges

- Fragmented market and investors
- Market infrastructure
- Strong climate influence



Renewable energy is produced locally!

# Different strategies

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- Research and Development & Demonstration policies
- Fiscal policies such as tax exemptions and reductions and carbon tax
- Pricing policies such as Feed-in tariffs
- CHP Feed-in premiums and quantitative policies such as obligations
- Certification schemes with minimum quotas and building procurements

# Trends

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Strong regulatory obligations for implementing low carbon systems

Solar thermal technologies combining water and space heating – called Solar Combi-Systems

On-site bioenergy technologies including efficient wood burning stoves, municipal solid waste incineration and pellet boilers

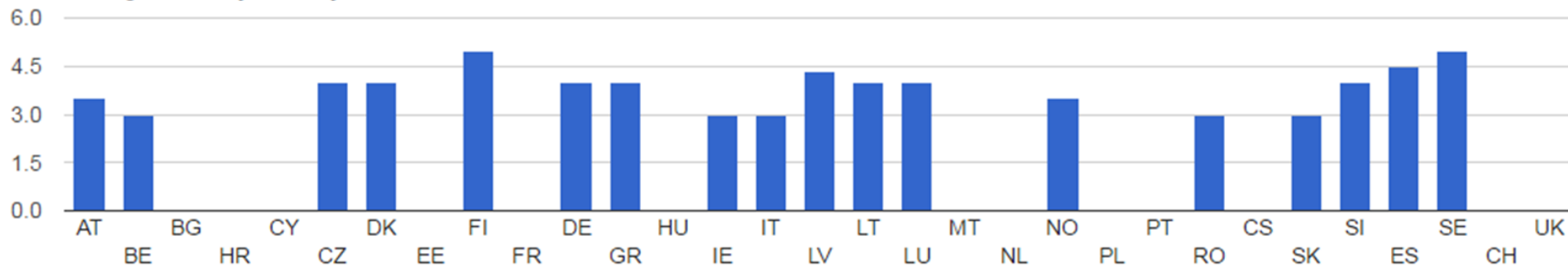
Heat pumps

Renewable energy carriers used in district heating and cooling and tapping a wider range of locally available low carbon energy sources, e.g. solar thermal, geothermal and biomass

Recovery of heat from waste and sewage water

# Countries with successful measures for energy efficiency policy regarding space heating

Average Score by Country



## An outlook towards 2050?

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- The energy systems and their application regarding energy saving towards 2050 should be **planned carefully** and tailored for each country concerning its **geographical situation**.
- Each urban area needs a **strategic master plan** on how to organise this transition towards a more sustainable heating and cooling system

In project IEE-Stratego it was shown among others, that the heat sector is one of the **cheapest options for integrating renewables**; and that 50% of the heat demand in Europe can be supplied with district heating.

# Contact

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Providing answers through expert know-how to questions of the **energy future** – this goal is supported by the Austrian Energy Agency with its **strategic personnel development**.

The Austrian Energy Agency is ÖNORM ISO 50001:2011 and ISO 29990:2010 certified.