

Competitiveness of the Renewable Energy Sector

Heating and Cooling

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Introduction

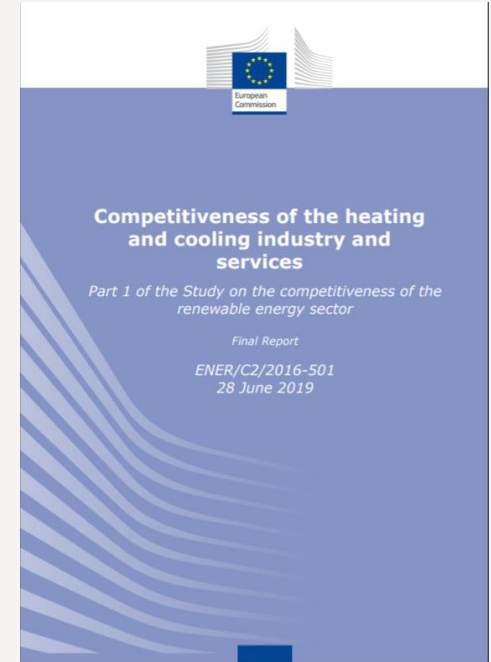
The main objective of the study is to answer:

- 1) How do renewable technologies compete in the H&C sector?
- 2) What is the impact of the H&C sector to the EU economy?

The analysis covers four key technology segments:

- > Biomass
- > Heat pumps
- > Biogas
- > Solar-thermal

It assesses the current state of play by applying Porter Five Competitive Forces Framework for each of the segments, presents the sector impacts on the EU economy in terms of employment and turnover, and provides policy recommendations.



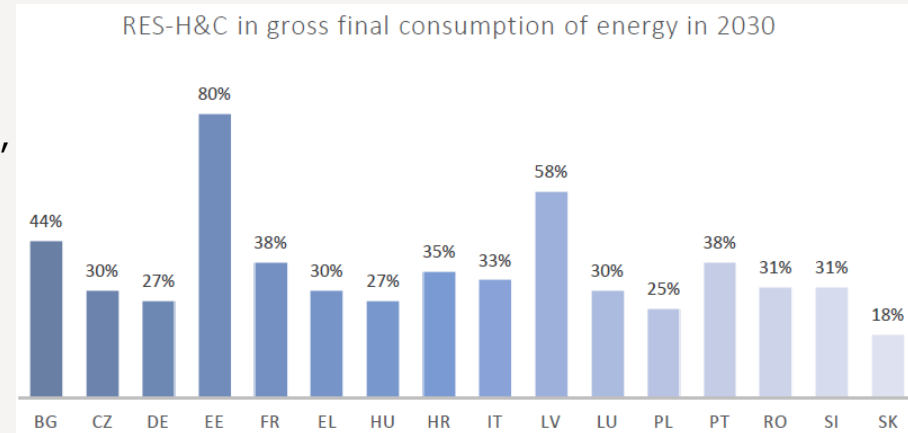
Key findings

- > The renewable energy sector has a **significant contribution** to the EU economy and nearly half of the jobs and turnover are coming from the heating and cooling industry.
- > However, the industrial competitiveness of renewables in the heating and cooling industry **needs to be improved**, as 3 out of 4 technologies are not competitive on current market terms without public support.
- > Heat from solid biomass is a cost-competitive RES H&C technology. But the reference average **energy carrier price** in the EU is lower than the **LCOE** of biogas and heat pumps and solar-thermal systems.

16 Member States have included RES H&C targets in their draft NECPs for 2030

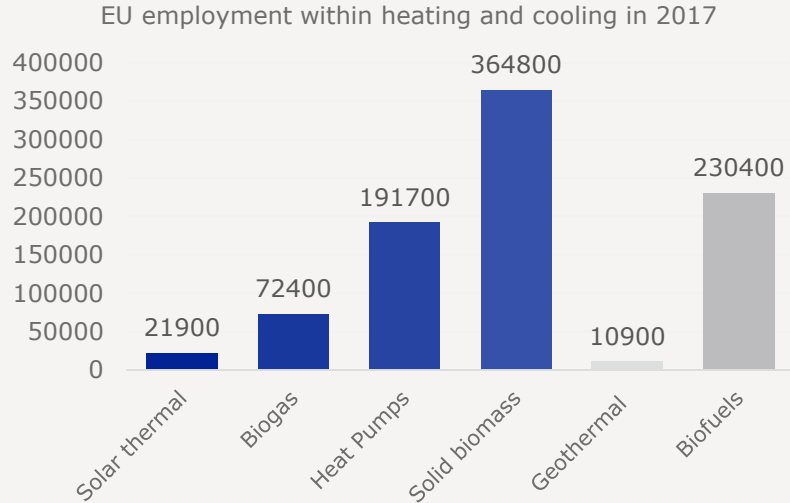
The NECPs include national policies and measures to support H&C on MS level such as:

- > Support for modernization of CHP plants, renovation of heat networks and DH infrastructure
- > Awareness campaigns to promote the use of biomass, solar heating, heat pumps and biogas
- > Support schemes to promote the use of renewable heating for households including from state and EU funds for e.g. boiler replacements, heat pumps and solar heating



Source: Draft NECPs

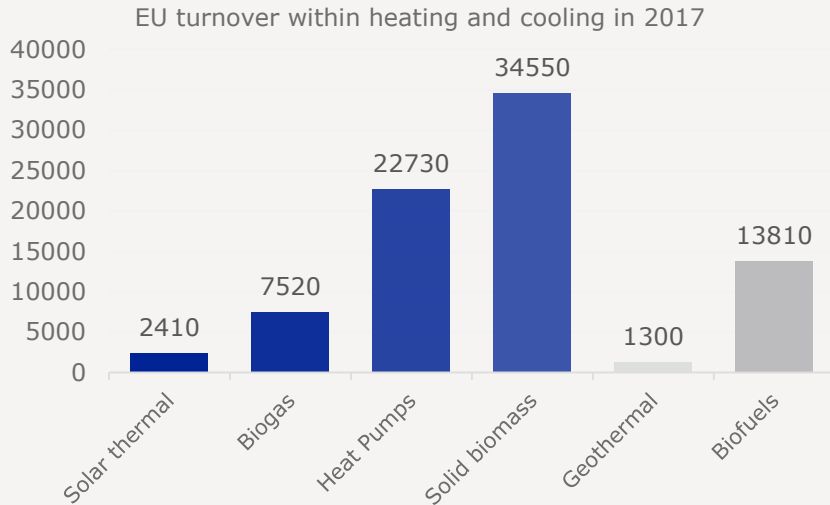
Jobs in the EU



Source: EuroObserv'ER online database

- > 1.4 million full time equivalents (FTEs) employed in the RES sector in 2017 (direct and indirect employment)
- > **650 800** FTEs are in the heating and cooling industry (biomass, biogas, heat pumps and solar-thermal) and **892 100** FTEs when adding geothermal and biofuels

Turnover in the EU



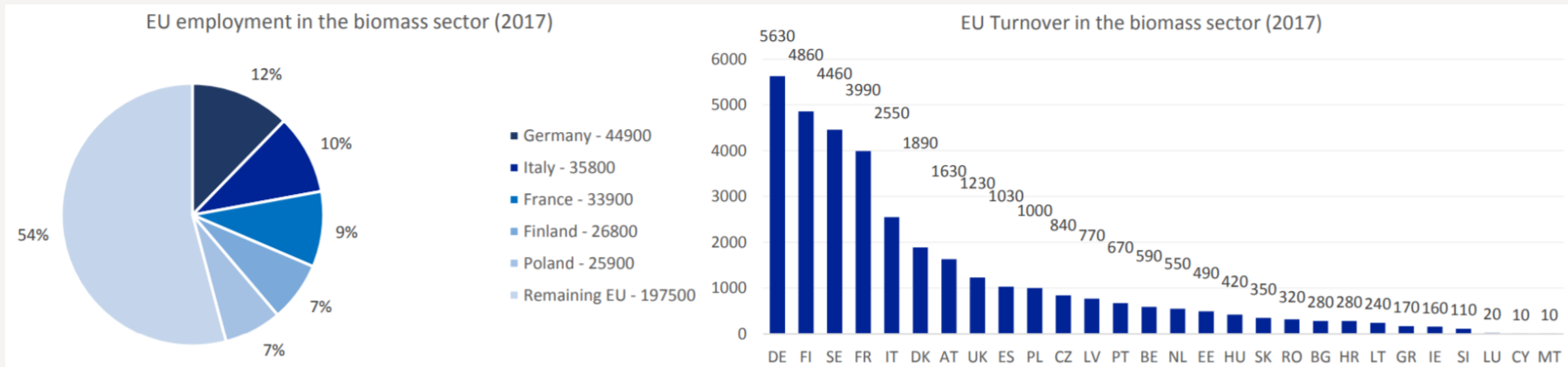
Source: EuroObserv'ER online database

- > The **RES sector** turnover in 2017 was approximately EUR 154.7 billion
- > The combined turnover of the four technologies is EUR 67.2 billion, accounting for 43% of the total turnover of all RE technologies
- > **Biomass** accounts for **51%** of the turnover of all four technologies (i.e. EUR 67.2 billion)

Segment assessments and case studies

Biomass

Dominant in most Member States. The labor market accounts for more than 364 800 jobs, with Germany, Italy, France, Finland and Poland as the largest employers in the EU. As the biomass sector is expanding, the turnover has reached €34.5 b in 2017.



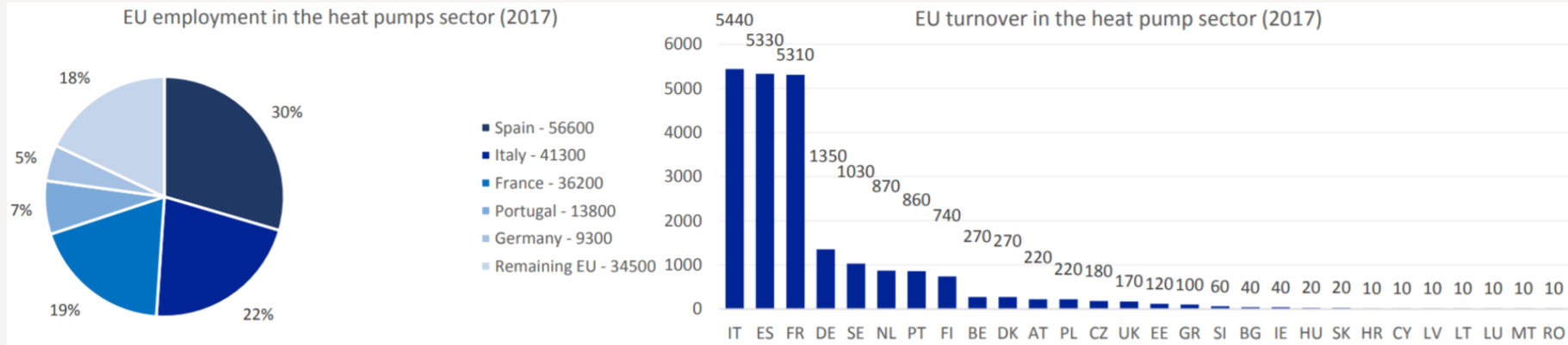
Biomass case study, Naantali (FI)

- > Government prohibits the **use of coal** in energy production by 2029
- > **Subsidies** are flexible and set in relation to CO₂ prices thus maintaining the competitiveness of biomass compared to coal: high CO₂ prices leads to low biomass subsidy and vice versa
- > The **energy tax system** provides an incentive for using forest chips and by-products in CHP production and ensures that today peat is competitive to coal
- > The district heating **market is liberalised** with price levels set to be competitive with best alternatives for end-users - thus providing a strong incentive for products to be cost-effective



Heat Pumps

In 2017 heat pumps employment was 191 700 FTEs, with a turnover of € 22.73 billion. With 56 600 FTEs, Spain outranked Italy, the frontrunner of this sector. Together with France, Portugal and Germany, these 5 countries have the highest employment figures, accounting for 82% of the total EU FTEs in the heat pumps sector.



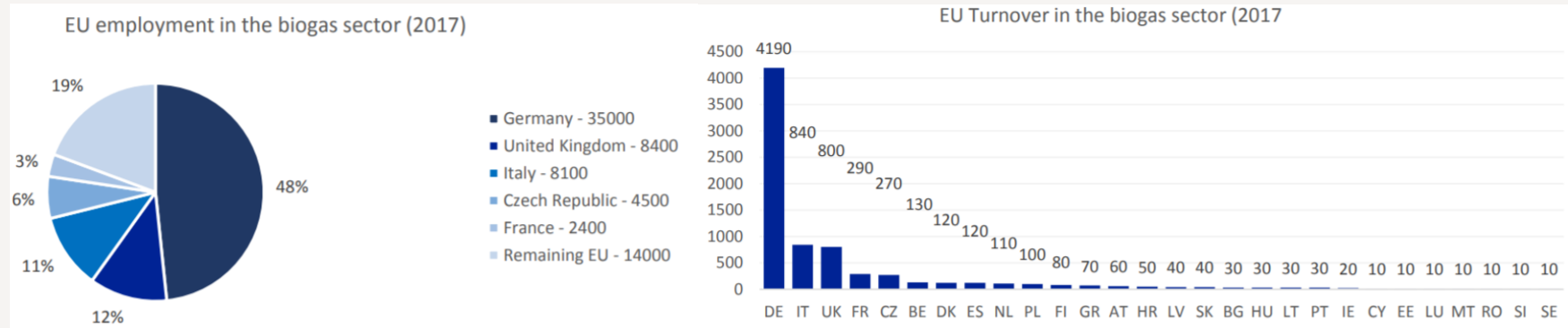
Heat pumps case (Arnhem, NL)

- > **Government target** to disconnect all houses from national gas network by 2050
- > National **subsidy scheme** providing grants to support households' and businesses' investments in clean technologies
- > National law allows social housing companies to increase the rent by an '**Energy Performance Fee**' when houses are transformed into zero-energy buildings
- > **Installers** that replace natural gas boilers may prefer gas heating technologies that they know of already, and installers knowledgeable of heat pumps are in scarce supply



Biogas

The biogas segment employment accounts for 72 400 FTEs. Germany, as the biggest EU employer in the biogas sector, accounts for 48% of the total employment. Together with the United Kingdom, Italy, the Czech Republic and France, these Member States account for 80% of the total employment in the EU biogas sector.



Biogas case, Trebon (CZ)

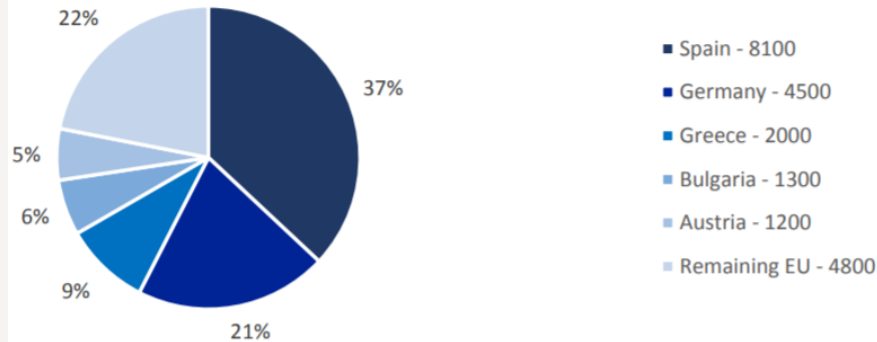
- > **Investment support** (25% of the total investment costs from the Operational Programme Enterprise and Innovation, EKO-ENERGIE under ERDF)
- > **Local acceptance** and involvement – land owners, feedstock suppliers and consumers
- > **Guaranteed income flow** through pre-project purchase agreement with heat consumers
- > **Feed-in tariffs** for electricity, but not for heat production



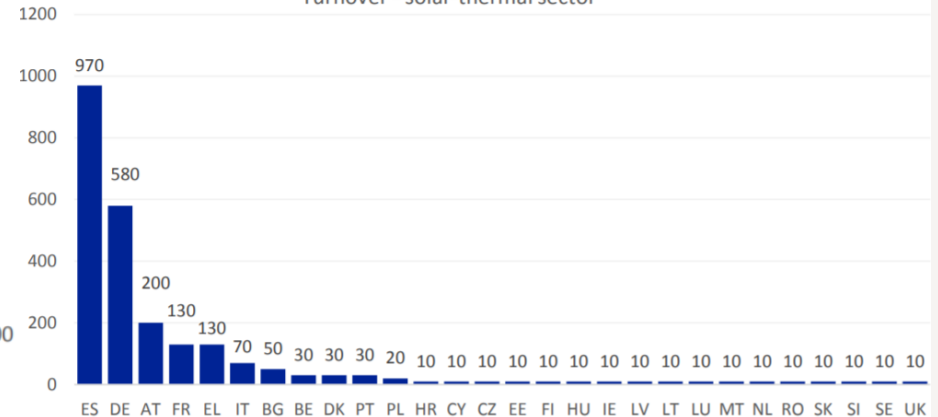
Solar-thermal

Around 21 900 people were employed in 2017. The five countries with the highest numbers of employees were Spain, Germany, Greece, Bulgaria and Austria. In contrast, in 14 Member States only around 100 people are employed in the solar-thermal sector, namely in Belgium, Cyprus, Estonia, Finland, Ireland, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Romania, Slovakia, Slovenia and Sweden. Turnover was € 2,4 billion.

EU employment in the solar-thermal sector (2017)



Turnover - solar-thermal sector



Solar-thermal case, (Silkeborg, DK)

- > **Municipal target** for carbon neutrality by 2030
- > The Energy Savings Agreement of the Parliament allow for funding because of the achieved energy savings. About 5-10% of investment costs have been covered by **government support**
- > Inclusion of solar-thermal next to natural gas allows the CHP to maintain more **predictable consumer prices** (hedging against gas price fluctuations)
- > District heating **infrastructure** in place already
- > **Land** can be a challenge to acquire for the construction of the solar plant



Conclusions

- > **Solid biomass** appears the most cost competitive renewable energy technology for heat production.
- > **Biogas** companies are competing mainly on national markets and current market conditions make them highly dependent on support schemes.
- > Even with low operating costs, **heat pumps** are not competitive in the absence of support schemes due to their high upfront investment costs.
- > The **solar-thermal** segment is competitive when support schemes are available to cover part of the upfront investment costs.

The following factors impede on the industrial competitiveness of RES in the heating and cooling sector

- > **The lack of a carbon price** renders fossil fuel-based solutions relatively cheaper than they would otherwise be.
- > **High capital expenditures** still constitute a major barrier, even though some technologies offer very low operation costs.
- > **Imperfect knowledge** on the different RHC alternatives to established fossil fuel technologies.
- > **Competitive rivalry** is limited in certain local areas and technology segments.

Possible areas of intervention

Easing administrative costs and barriers

- > Stipulations of RED II aim to address this issues by setting up national contact points that would guide applicants throughout the entire administrative permit application and permit granting process

Recognising the role of, and upgrading the skills and knowhow of installers

- > As per RED II, MS must ensure that installers undergo a training which leads to certification in the key RHC technologies

Supporting energy consumers

- > RED II provides for enhanced consumer rights regarding the information they receive on the performance of a given technology

Developing efficient support schemes

- > Including feed-in-tariffs covering renewable heating not only electricity



Thank you for your attention.

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