



2050
Heat Roadmap Europe

A low-carbon heating and cooling strategy

2015 Final Heating & Cooling Demand in the United Kingdom



Country presentation
October 2017

Context of the UK

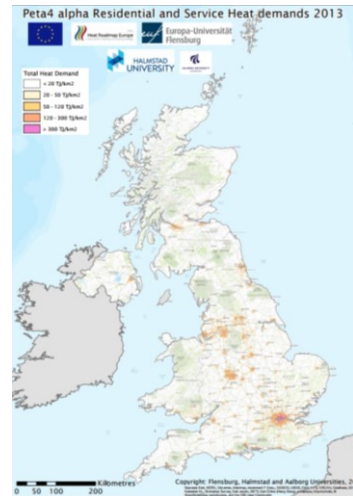




General context

- **Population** ^[1]:
 - 64.4 million
 - 12.7% of EU28
- **GDP** ^[1]:
 - 2 254 billion EUR
 - 17.3% of EU28
- **Heating degree days** ^[2] :
 - 3 010 HDDs/year
 - 11th coldest of EU28
 - 6nd coldest among the 14 HRE countries

1. DG Energy's 2014 data from the [UK datasheet](#) (2016)
2. Eurostat's 2015 data on [HDDs](#) in in the UK (2016)

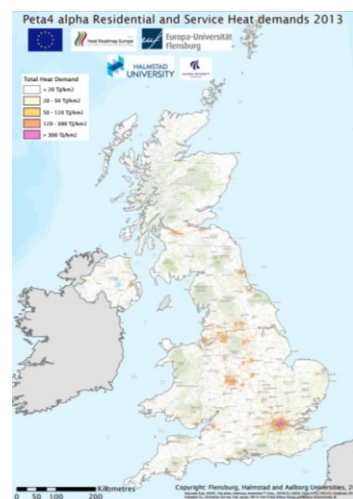


Heat Demand Atlas (major population centres are visible [\[HRE4, 2013\]](#))

General context – Energy intensity

- **Total final energy demand (FED)** ^[3]:
 - 1 528 TWh
 - 12.1% of EU28
 - 3rd highest of EU28 and HRE14
- **FED per capita** :
 - 23.7 MWh/Capita
 - 14th highest of EU28
 - 9th highest of HRE14
- **Final energy from renewable sources** ^[4]:
 - 125.7 TWh
 - 8.2% of total FED
 - 24th highest share of EU28
 - 12th highest share of HRE14
- **Final energy from renewable sources for H&C** ^[4]:
 - 37.3 TWh
 - 5.5% of the total H&C
 - 2nd lowest share of EU28 and HRE14

3. Eurostat's 2015 data on [annual energy quantities](#) in the UK
4. Eurostat's RES [Shares 2015 results](#)



Heat Demand Atlas (major population centres are visible [\[HRE4, 2013\]](#))





Climate and emissions

- The UK has committed to a GHG emission decrease of 16% ^[5] by 2020, within the EU Climate and Energy Package

Carbon per capita [kg CO ₂ /person]	Carbon per GDP [ton CO ₂ /billion EUR]	Carbon Emission per tone of energy carrier (carbon intensity) [kg CO ₂ /toe]
5,795	229	2,332
6 th lowest among the 14 HRE	4 th lowest among the 14 HRE	5 th highest among the 14 HRE
2014 data ^[1]		

1. DG Energy's 2014 data from the [UK datasheet](#) (2016)

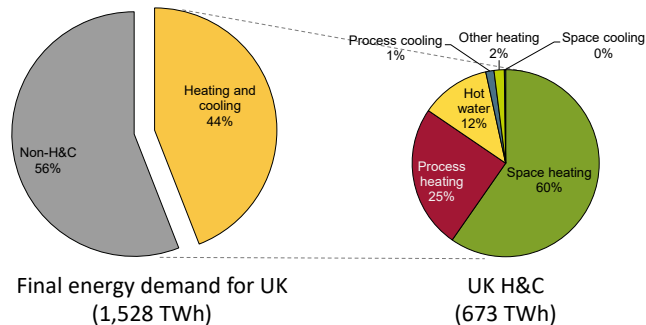
5. Official Journal of the European Union, [Decision No. 406](#) (2009)

Current national energy situation



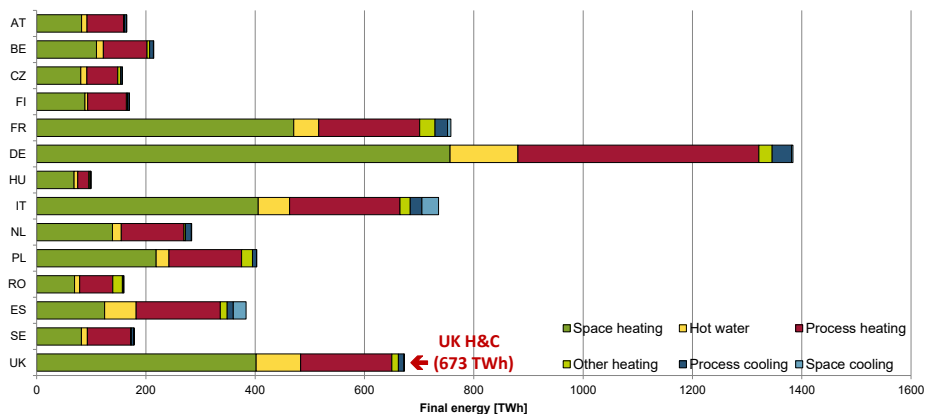
United Kingdom: H&C energy by purposes

- H&C comprises 44% of the UK's final energy demand.
- Very little cooling process needs, but very high need for space and process heating



14 HRE: H&C energy by purposes

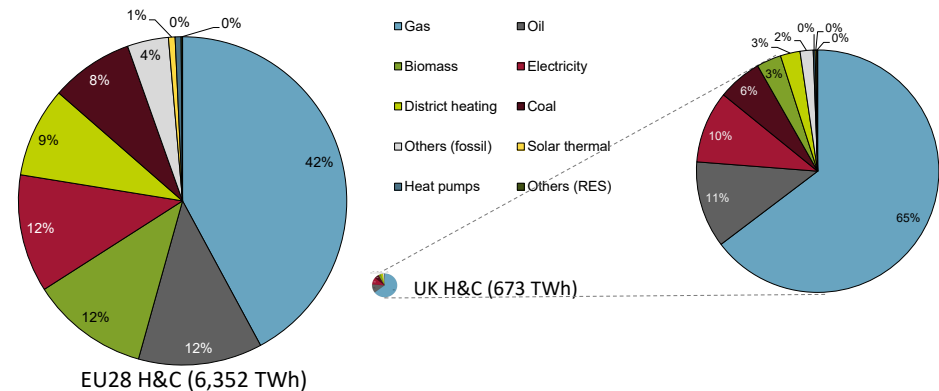
- The UK has the 4th highest final energy demand for H&C among the 14 HRE countries.





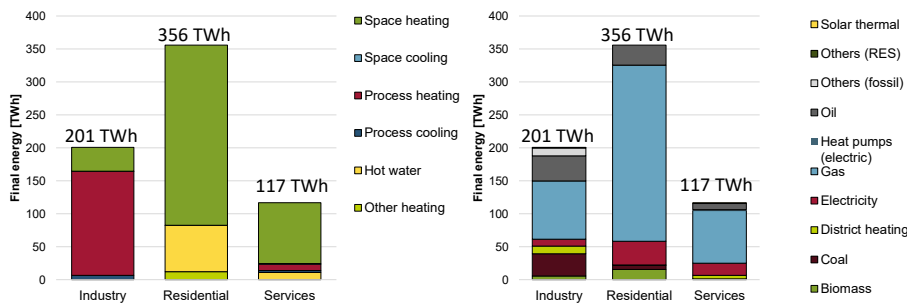
H&C energy by energy carriers

- UK accounts for 11% of the EU28's final delivered H&C demand.
- Compared to the EU28, UK uses way more gas and less of all the remaining sources.



Sectors by purposes and energy carriers

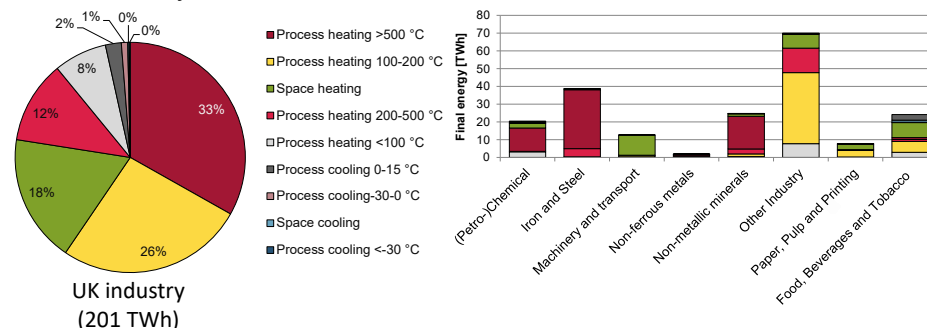
- UK industries are overwhelmingly dominated by process heating, other sectors by space heating.
- UK industry, residential and service sectors use mostly gas and oil.
- UK households use some biomass





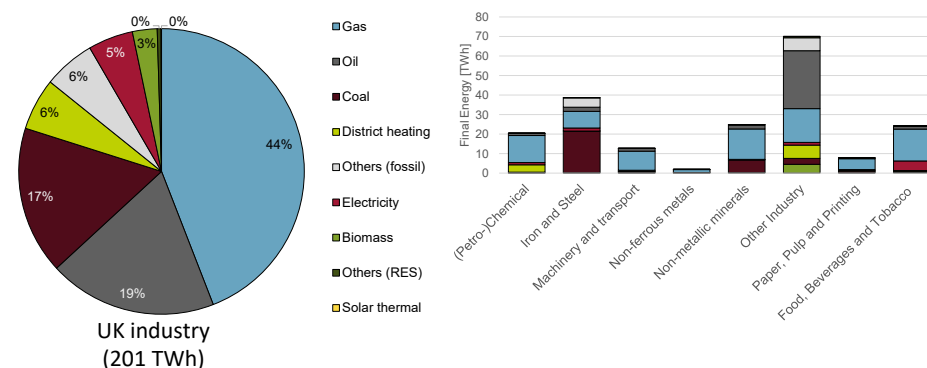
Industry sub-sectors by H&C purposes

- UK industry is dominated by process heating at very high and medium temperatures.
- Most of the high temperature heating is used for the metals industry, (petro-)chemicals and non-metallic minerals.
- The medium temperature process heating is used mainly in 'Other industry'



Industry sub-sectors by energy carriers

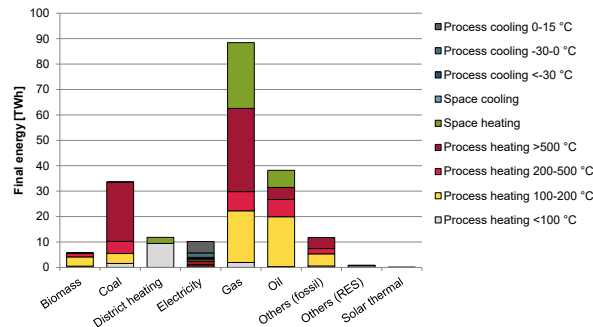
- To attain the high temperatures, the UK industry to a large extent relies on fossil fuels, mainly gas, but also oil and coal.





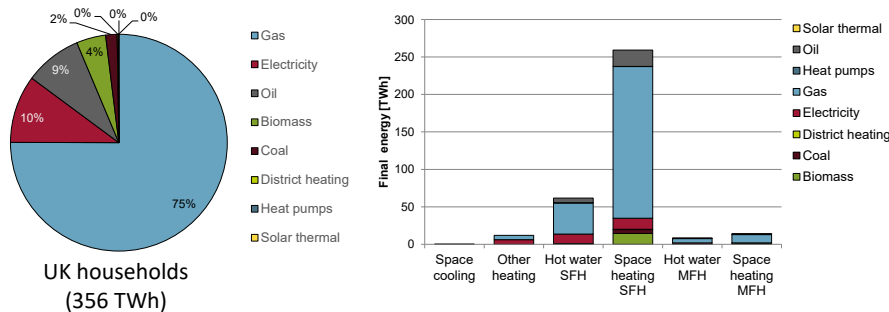
Industry Space Heating

- UK Industry uses mostly gas and oil for space heating, although there is some district heating too



Residential sub-sectors by energy carriers

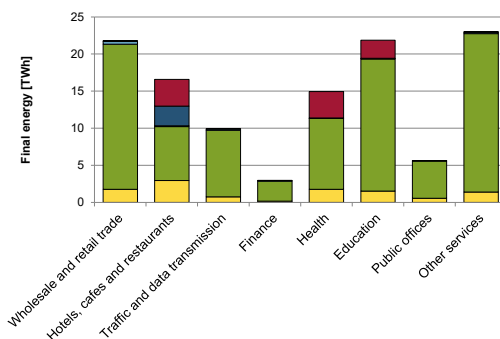
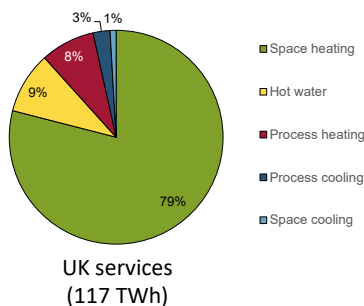
- UK households primarily use gas for heating.
- Single-family homes are the only market for biomass heating.





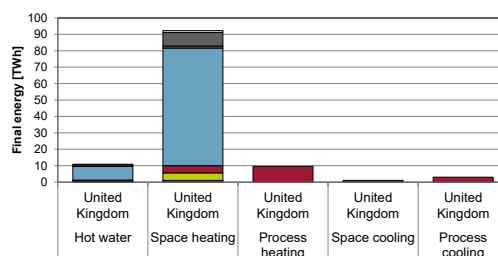
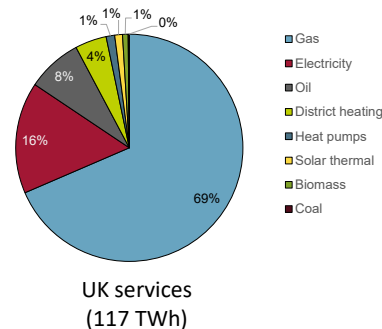
Service sub-sectors by H&C purposes

- Space heating is definitely the main concern for the UK's service sector.
- UK's service sector has very little demand for cooling. The only sub-sector using cooling is the hospitality one.



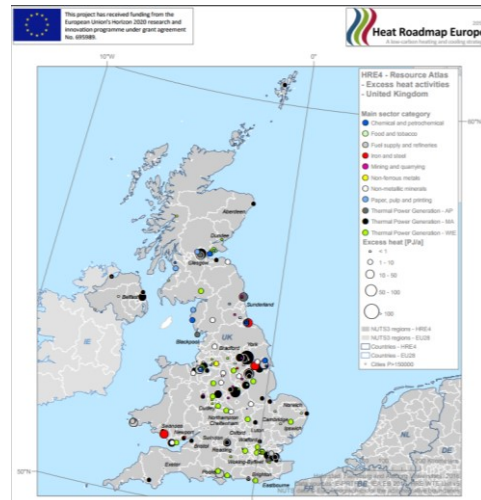
Service sectors by energy carriers

- The UK's service sector relies greatly on gas, most of which goes to space heating.
- All cooling, and process heating, are powered by electricity only.



Excess heat sources

- **Excess Heat:**
 - At least 1,130 Twh*
 - Would cover 65% of the final energy demand for Space heating and Hot water
- The biggest excess heat sources are located in central region of UK and around the metropolitan area of London.

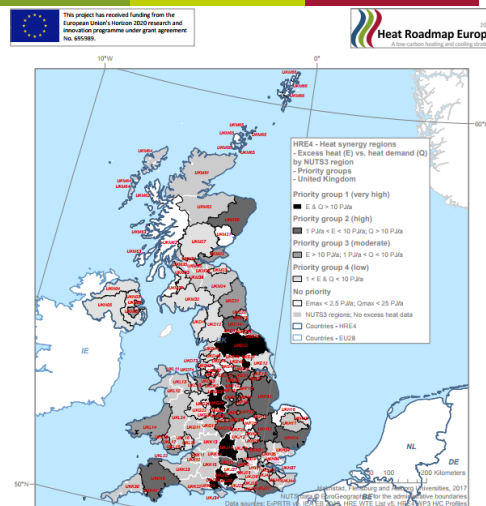


Excess Heat Atlas [HRE4, 2013]

* Calculated from the 192 biggest facilities in UK using [Peta 4.2](#)

Heat Synergy Regions

- 4 regions present a very high potential for district heating
- At least 15 regions present a high potential for district heating



Excess Heat Atlas [HRE4, 2013]



Main references cited

1. DG Energy's 2014 data from the [UK datasheet](#) (2016)
2. Eurostat's 2015 data on [HDDs](#) (2016)
3. Eurostat's 2015 data on [annual energy quantities](#)
4. Eurostat's RES [Shares 2015 results](#)
5. Official Journal of the European Union, [Decision No. 406](#) (2009)