



2050  
**Heat Roadmap Europe**

A low-carbon heating and cooling strategy

# 2015 Final Heating & Cooling Demand in Spain



Country presentation  
October 2017

Context of Spain



## General context

- **Population** <sup>[1]</sup>:  
46.5 million
  - 9.2% of EU28
- **GDP** <sup>[1]</sup>:  
1.041 billion EUR
  - 8% of EU28
- **Heating degree days** <sup>[2]</sup>:  
1.612 HDDs/year
  - 5<sup>th</sup> warmest of EU28
  - The warmest among the 14 HRE countries



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

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

## General context – Energy intensity

- **Total final energy demand (FED)** <sup>[3]</sup>:  
936 TWh
  - 7.4% of EU28
  - 5<sup>th</sup> highest of EU28 and HRE14
- **FED per capita** :  
21.1 MWh/Capita
  - 20<sup>th</sup> highest of EU28
  - 12<sup>th</sup> highest of HRE14
- **Final energy from renewable sources** <sup>[4]</sup>:  
151.2 TWh
  - 16.2% of total FED
  - 14<sup>th</sup> highest share of EU28
  - 6<sup>th</sup> highest share of HRE14
- **Final energy from renewable sources for H&C** <sup>[4]</sup>:  
64.3 TWh
  - 16.8% of the total H&C
  - 19<sup>th</sup> highest share of EU28
  - 9<sup>th</sup> highest share of HRE14



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

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



## Climate and emissions

- Spain has committed to reduce its GHG emissions by 10%<sup>[5]</sup> by 2020, compared with 2005 levels

Carbon per capita [kg CO <sub>2</sub> /person]	Carbon per GDP [ton CO <sub>2</sub> /billion EUR]	Carbon Emission per tone of energy carrier (carbon intensity) [kg CO <sub>2</sub> /toe]
5,743	257	2,289
5 <sup>th</sup> lowest among the 14 HRE	6 <sup>th</sup> lowest among the 14 HRE	7 <sup>th</sup> highest among the 14 HRE
2014 data <sup>[2]</sup>		

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

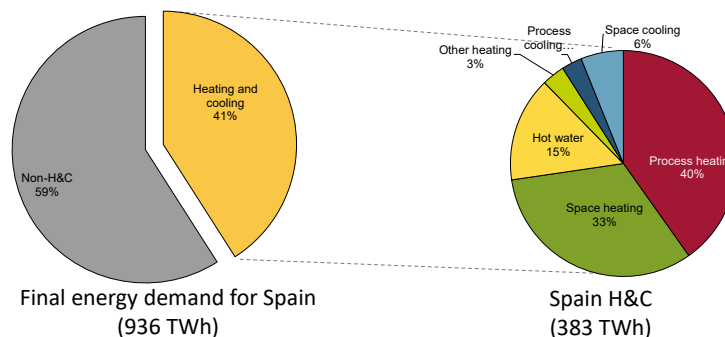
5. Official Journal of the European Union, [Decision No. 406](#) (2009)

## Current national energy situation



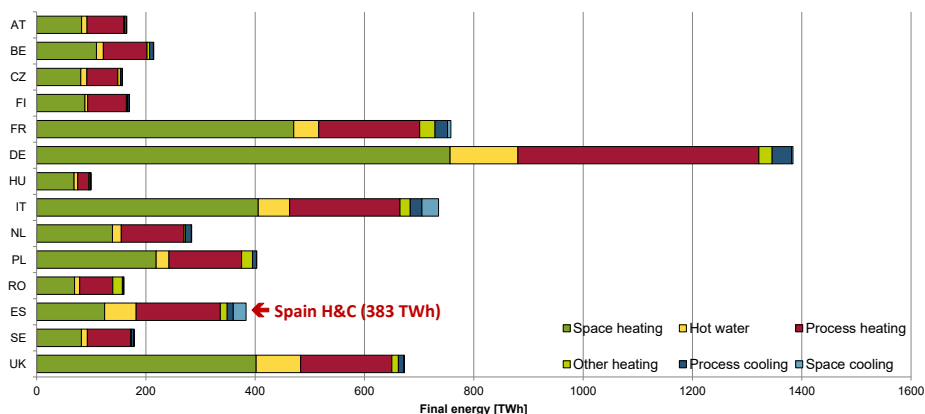
## Spain: H&C energy by purposes

- H&C comprises 41% of Spain'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

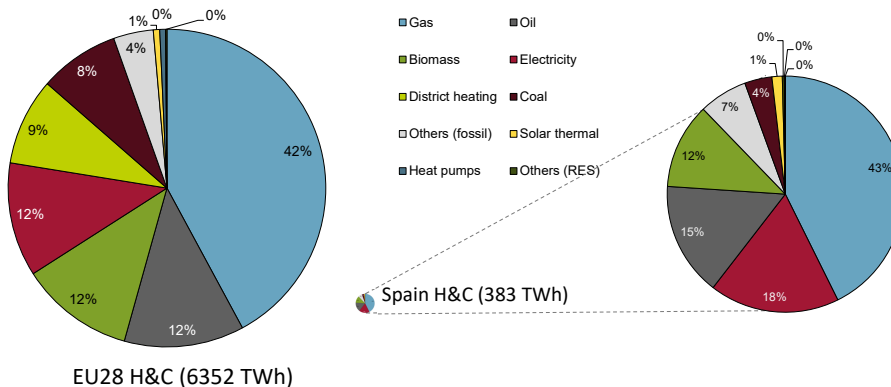
- Spain has the 6<sup>th</sup> highest final energy demand for H&C among the 14 HRE countries.





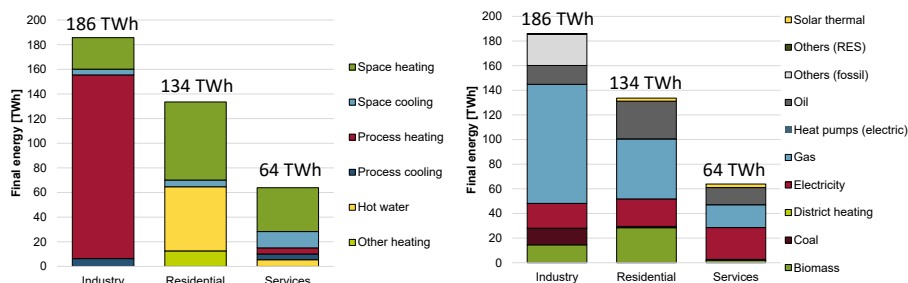
## H&C energy by energy carriers

- Spain accounts for 6% of the EU28's total delivered H&C demand.
- Compared to the EU28, it uses more electricity and it does not use district heating for H&C.



## Sectors by purposes and energy carriers

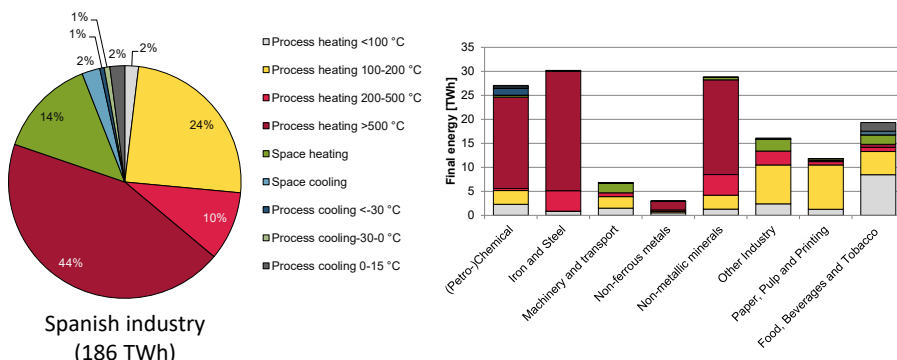
- Spanish industries are overwhelmingly dominated by process heating, other sectors by space heating and hot water.
- All sectors rely highly on fossil fuels, especially gas.
- Industry and Residential also rely on biomass.
- Solar thermal is very little used, and only in the Residential and Services sectors.





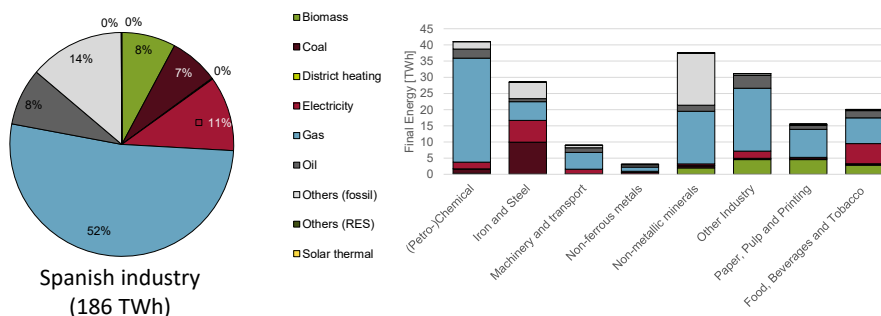
## Industry sub-sectors by H&C purposes

- Spanish industry is dominated by high temperature heating processes.
- Most of this is used for the metals industry, (petro-)chemicals and non-metallic minerals.



## Industry sub-sectors by energy carriers

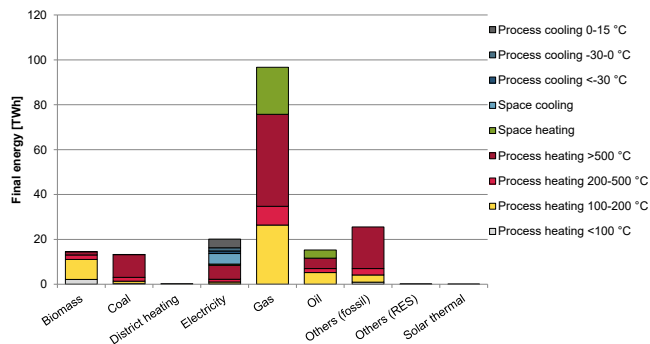
- To attain such high temperatures, Spanish industry relies almost exclusively on fossil fuels, especially on gas.
- The Iron and Steel industry is the one that relies the most on coal.





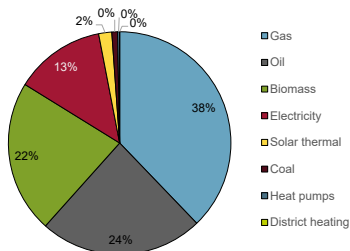
## Industry Space Heating

- Spanish Industry uses only gas and oil for space heating.

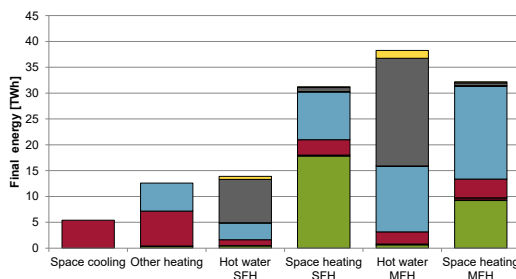


## Residential sub-sectors by energy carriers

- Spanish households use mostly fossil fuels (gas and oil) for heating, but there is also a significant use of biomass.
- Single-family homes lead the way in biomass
- Multi-family homes are the primary market for gas
- Oil is used mostly for hot water.



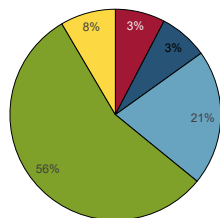
Spanish households  
(134 TWh)



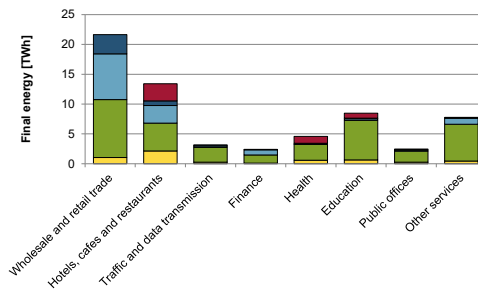


## Service sub-sectors by H&C purposes

- Space heating is the main concern for the Spanish service sector
- Space cooling also represents a significant demand, mostly in the wholesale and retail trade and in hospitality facilities.

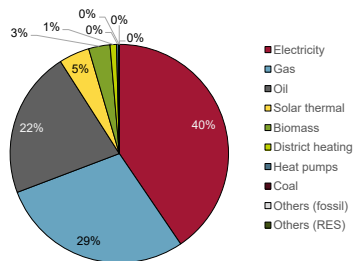


Spanish services  
(64 TWh)

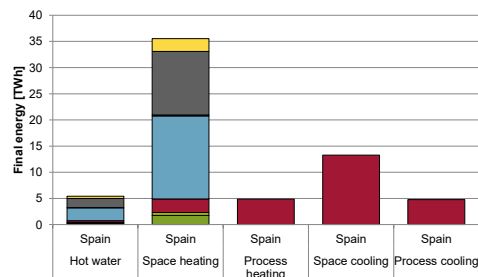


## Service sectors by energy carriers

- The Spanish service sector relies mostly on fossil fuels (gas and oil), but it also has a high use of electricity for H&C.
- Almost all heating demand is for space heating.
- All cooling, and process heating, are powered by electricity only.

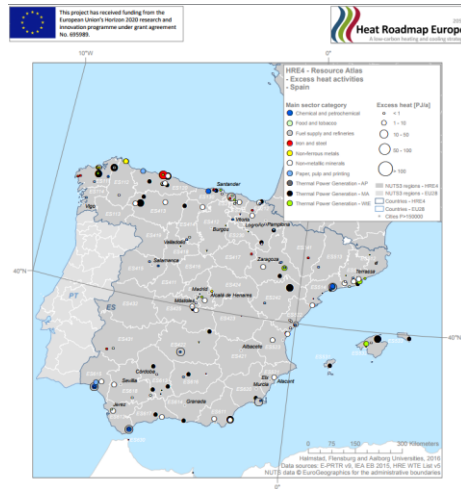


Spanish services  
(64 TWh)



## Excess heat sources

- **Excess Heat:**  
At least 174 Twh\*
  - Would cover 95% of the final energy demand for Space heating and Hot water in Spain
- The biggest excess heat sources are mostly concentrated in the North regions.

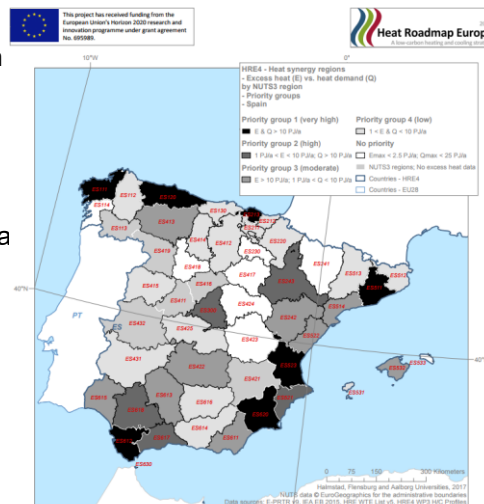


Excess Heat Atlas [HRE4, 2013]

\* Calculated from the 204 biggest facilities in Spain, using [Peta 4.2](#)

## Heat Synergy Regions

- There are 8 regions with very high potential for district heating
- 4 other regions present a high potential for district heating



Excess Heat Atlas [HRE4, 2013]



## Main references cited

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1. DG Energy's 2014 data from the [Spanish 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)