



2050  
**Heat Roadmap Europe**

A low-carbon heating and cooling strategy

# 2015 Final Heating & Cooling Demand in Sweden



Country presentation  
October 2017

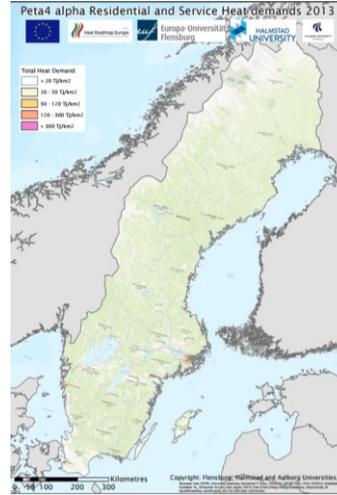
Context of Sweden





## General context

- **Population** <sup>[1]</sup>:  
9.65 million
  - 1.9% of EU28
- **GDP** <sup>[1]</sup>:  
431 billion EUR
  - 3.3% of EU28
- **Heating degree days** <sup>[2]</sup> :  
4 910 HDDs/year
  - 2<sup>nd</sup> coldest of EU28
  - 2<sup>nd</sup> among the 14 HRE countries



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

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

## General context – Energy intensity

- **Total final energy demand (FED)** <sup>[3]</sup>:  
369 TWh
  - 2.9% of EU28
  - 9<sup>th</sup> highest of EU28 and HRE14
- **FED per capita** :  
38.3 MWh/Capita
  - 3<sup>rd</sup> highest of EU28
  - 2<sup>nd</sup> highest of HRE14
- **Final energy from renewable sources** <sup>[4]</sup> :  
199.2 TWh
  - 53.9% of total FED
  - Highest share of EU28 and HRE14
- **Final energy from renewable sources for H&C** <sup>[4]</sup>:  
122.4 TWh
  - 28.6% of the total H&C
  - Highest share of EU28 and HRE14



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

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





## Climate and emissions

- Sweden has committed to reduce GHG emissions by 17% <sup>[5]</sup> by 2020, within the EU Climate and Energy Package

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]
4,735	117	948
<i>3<sup>rd</sup> lowest among the 14 HRE</i>	<i>The lowest among the 14 HRE</i>	<i>The lowest among the 14 HRE</i>
2014 data <sup>[2]</sup>		

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

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

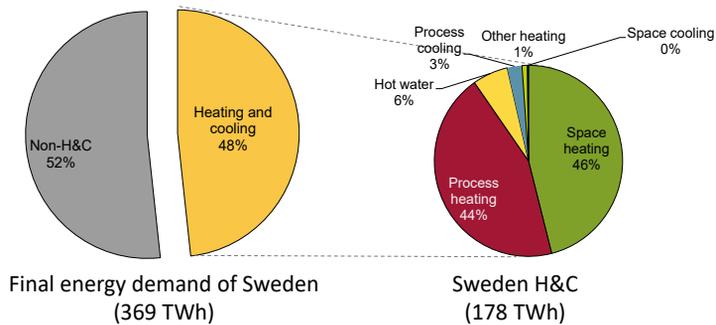
## Current national energy situation





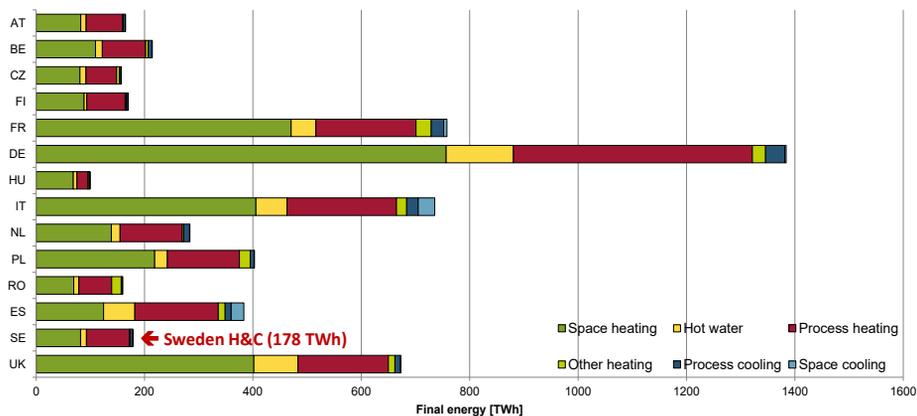
## Sweden: H&C energy by purposes

- H&C comprises 48% of Sweden'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

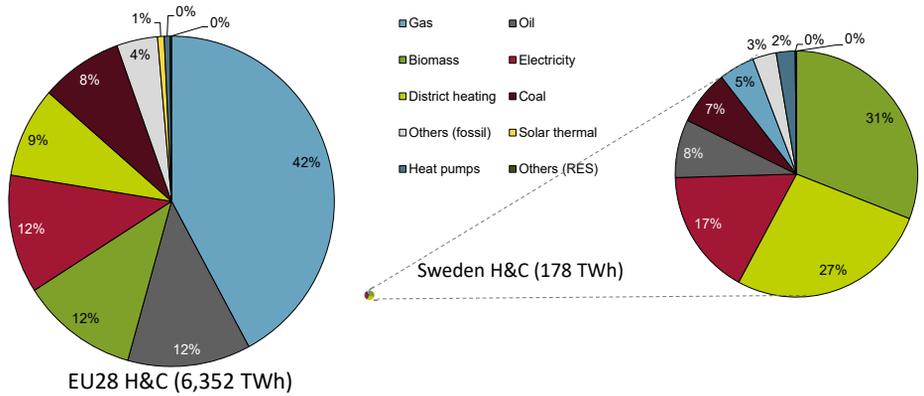
- Sweden has the 6<sup>th</sup> lowest final energy demand for H&C among the 14 HRE countries.





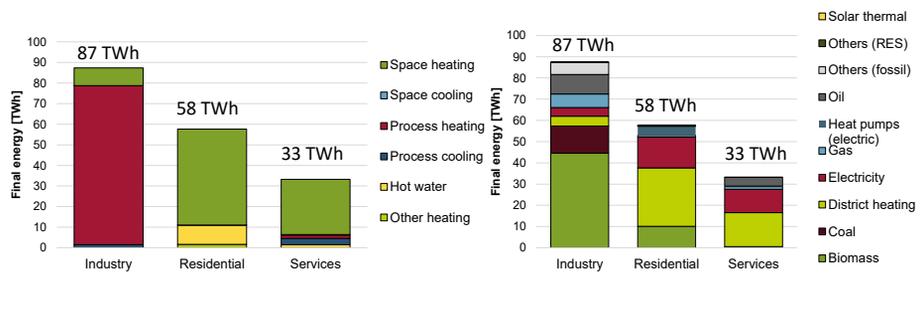
## H&C energy by energy carriers

- Sweden accounts for 3% of the EU28's total delivered H&C demand.
- Compared to the EU28, it uses way less Gas and oil and way more biomass and district heating.



## Sectors by purposes and energy carriers

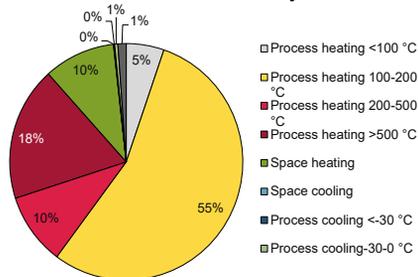
- Swedish industries are overwhelmingly dominated by process heating, other sectors by space heating.
- Its industry relies mostly on biomass and coal
- The residential sector relies on biomass, district heating and electricity.
- The service sector relies on district heating and electricity



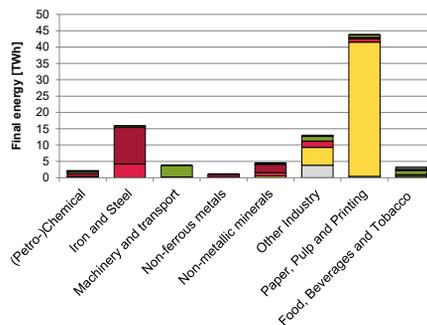


## Industry sub-sectors by H&C purposes

- Swedish industry is dominated by process heating at 100-200 degrees Celsius.
- Most of this is used for the paper, pulp and printing industry and other industry.
- There are some higher temperature processes, which are mostly for the iron and steel industry

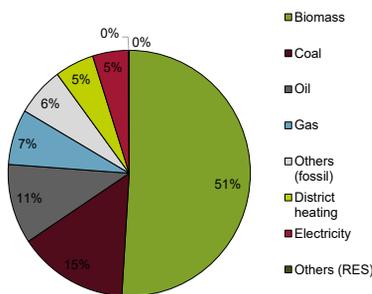


Swedish industry (87 TWh)

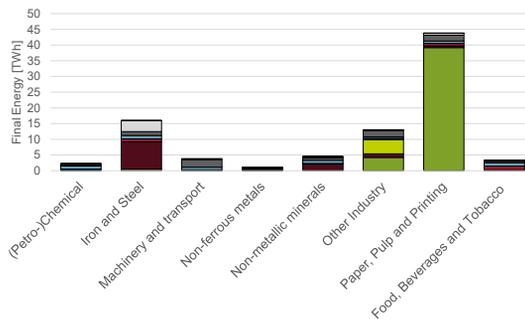


## Industry sub-sectors by energy carriers

- The lower temperature processes in the paper, pulp and printing industry is mostly produced from biomass.
- The higher temperature processes in the iron and steel industry are mostly produced from coal



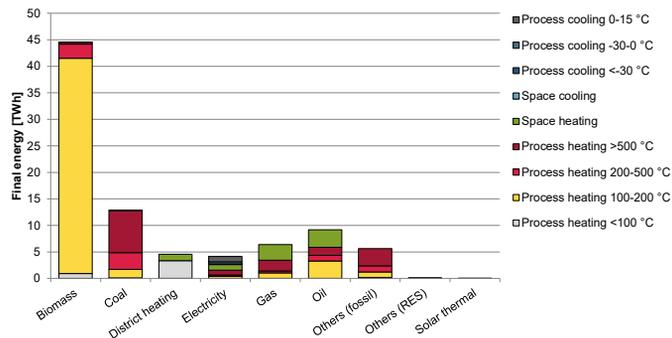
Swedish industry (87 TWh)





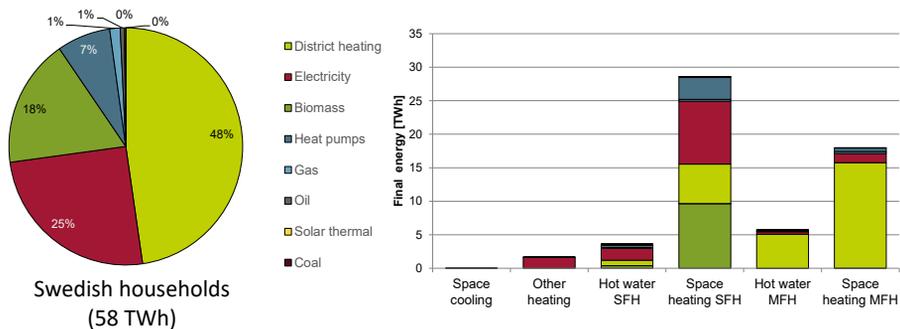
## Industry Space Heating

- Swedish Industry uses mainly gas and oil for space heating, although there is some district heating and electricity too.



## Residential sub-sectors by energy carriers

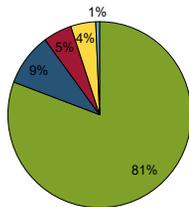
- Swedish households use a mix of district heating, electricity, biomass and heat pumps for heating.
- Swedish households use practically no fossil fuels for heating.
- Multi-family homes are the primary market for district heating.



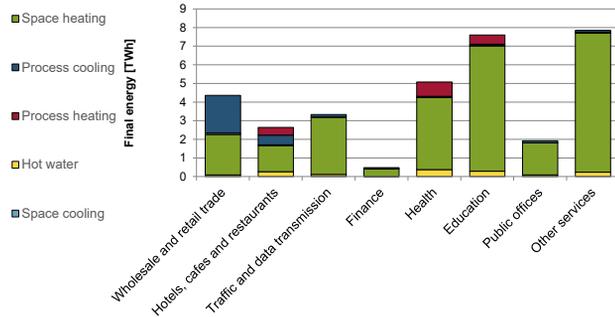


## Service sub-sectors by H&C purposes

- Space heating is definitely the main concern for Sweden's service sector.
- Their only significant cooling needs are from wholesale/retail trade, and some from hospitality facilities.

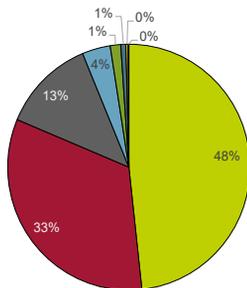


Swedish services (33 TWh)

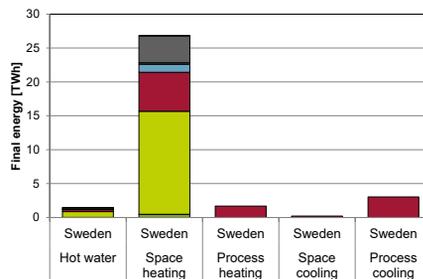


## Service sectors by energy carriers

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



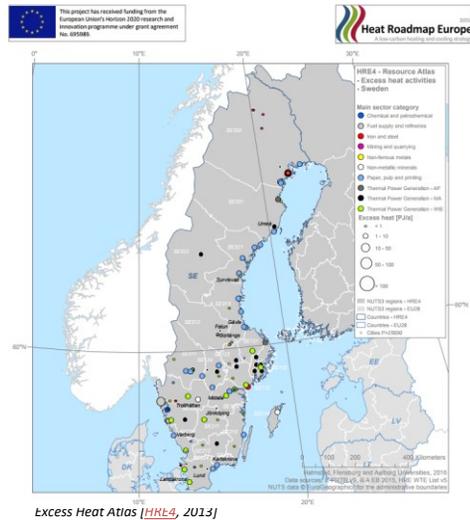
Swedish services (33 TWh)





## Excess heat sources

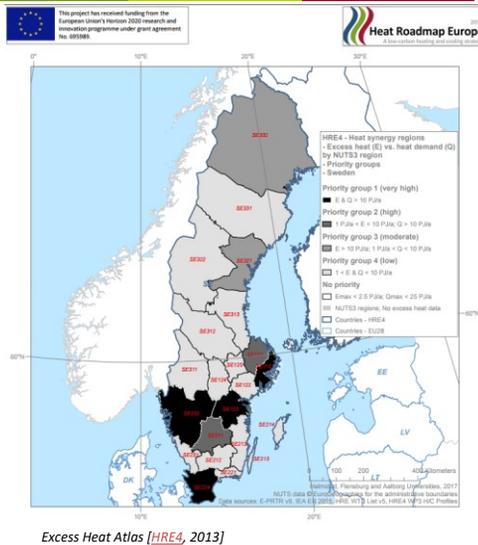
- **Excess Heat:**  
At least 52 Twh\*
  - Would cover 56% of the final energy demand for Space heating and Hot water
- The biggest excess heat sources are concentrated along the coast and in the South regions of the country.



\* Calculated from the 123 biggest facilities in Sweden, using [Peta 4.2](#)

## Heat Synergy Regions

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





## Main references cited

---

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