



# THERMOS

**1<sup>st</sup> THERMOS European Inspire Event**

**Affordable Smart City Heating – Dream or Reality?**

**Carsten Rothballer, Coordinator Climate and Energy, ICLEI Europe**





# THERMOS

**WELCOME**

**1<sup>st</sup> THERMOS European Inspire Event**

**Affordable Smart City Heating – Dream or Reality?**



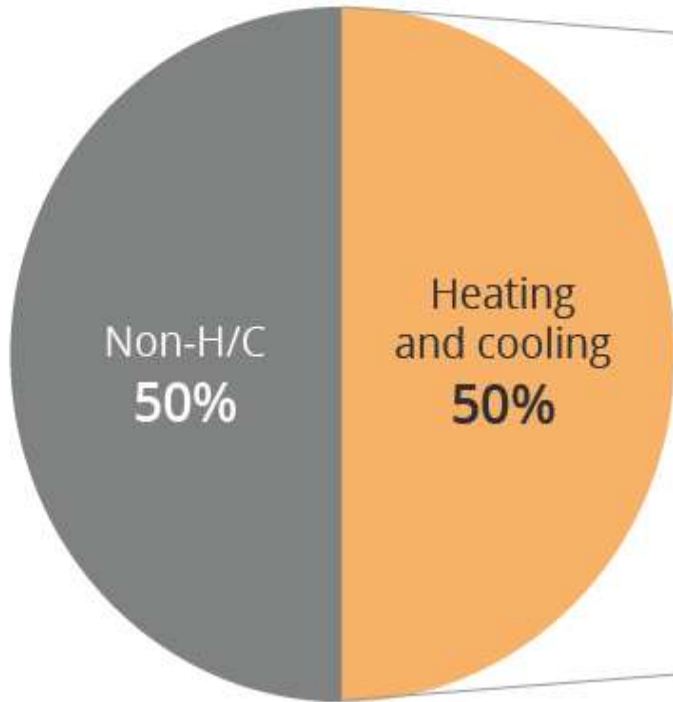


Europe consumes half of its energy for H/C purposes. Most in buildings and industry

[thermos-project.eu](http://thermos-project.eu)

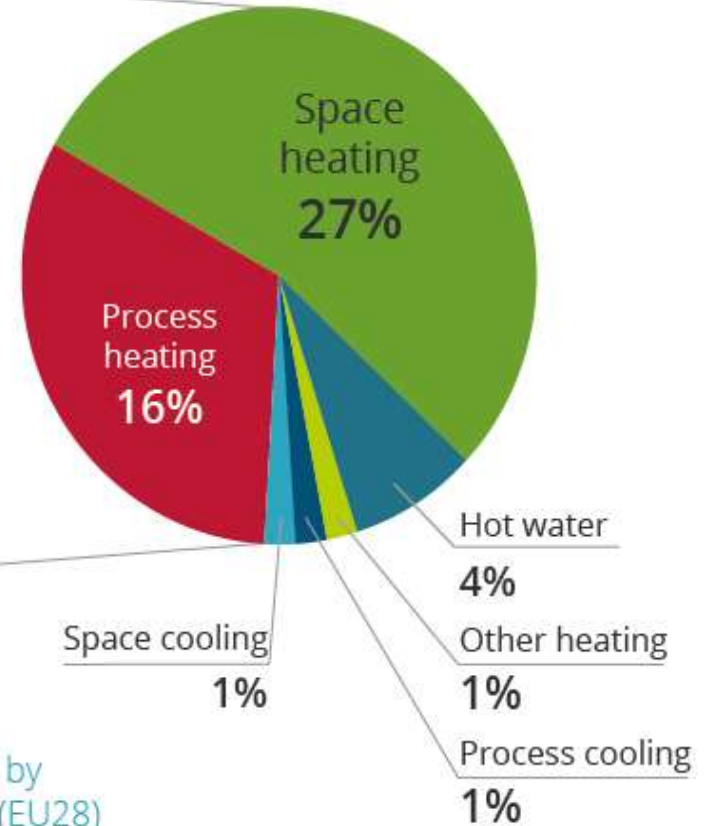


[www.heatroadmap.eu](http://www.heatroadmap.eu)  
[@HeatRoadmapEU](https://twitter.com/HeatRoadmapEU)

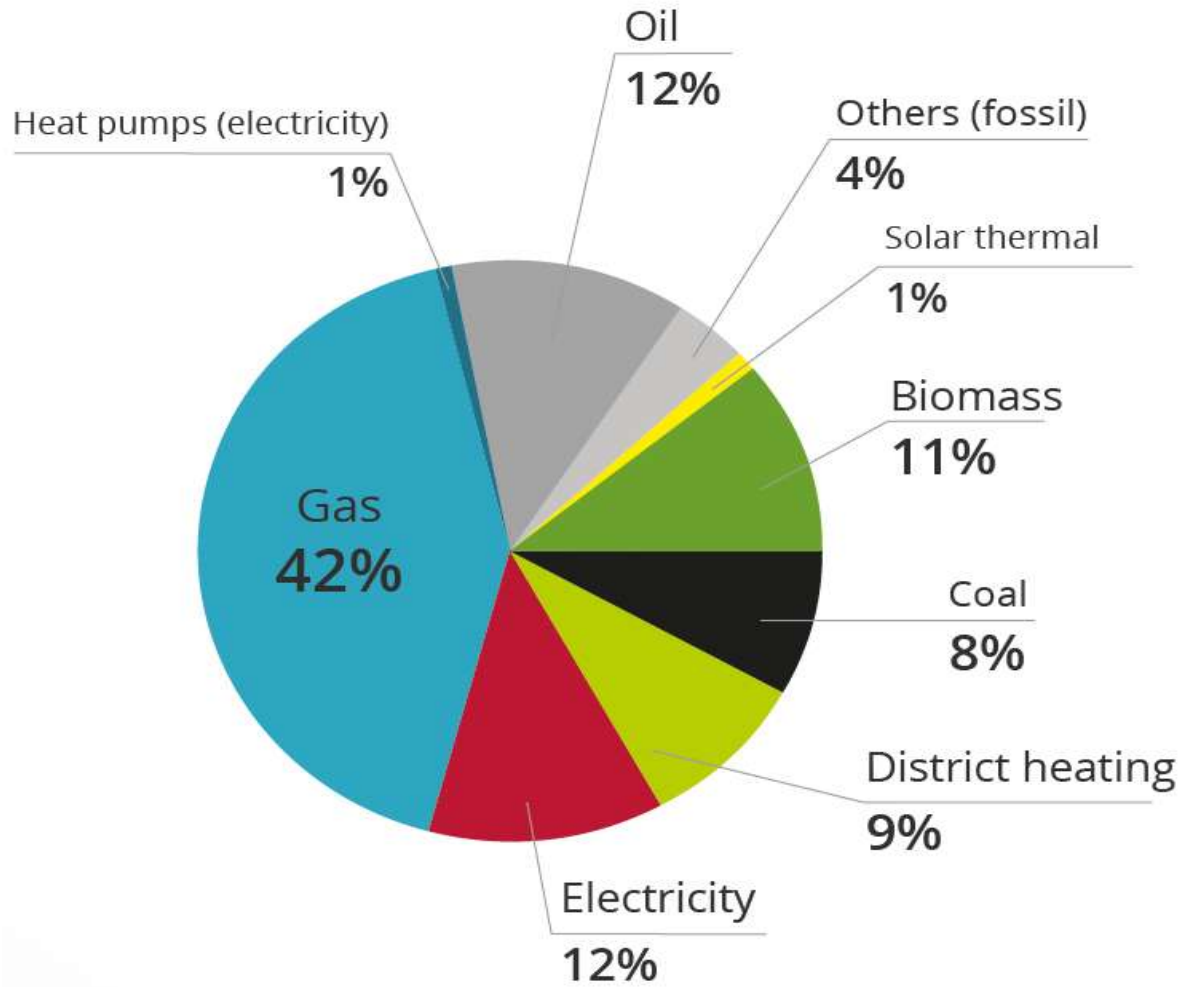


**Figure 1:**  
Total final energy in 2015 (EU28)

**Figure 2:**  
H&C final energy by end-use in 2015 (EU28)



Most thermal energy is produced from fossil fuels (66%) and only 13% comes from renewable energies





# European enabling framework conditions

Progress to targets	GHG emissions Emissions compared to 1990 levels
2020 targets	- 20%
2013 levels	- 19.8%
2014 levels (approximate)	- 23%
Member States' 2020 projections	- 24% to - 25%
Number of Member States 'on track'	24
Member States' 2030 projections	- 27% to - 30%

**17 January 2018: MEPs vote for binding targets of 35% energy efficiency and renewables by 2030.**

## EU achieved its 2020 emission target in 2014!

20 October 2015

"Trends and projections in Europe 2015"  
European Environment Agency (EEA)



# EU climate cost-benefit-analysis of 40% GHG by 2030

## What is the basis of cost-efficient climate action?



# **EU climate cost-benefit-analysis of 40% GHG by 2030**

## **What is the basis of cost-efficient climate action?**

**EU emission related health costs:  
€ 40 billion per year**

**EU climate adaptation costs:  
€ 6 - 58 billion per year**





There is more heat wasted during electricity production in Europe than is required to heat all buildings in the continent

thermos-project.eu



www.heatroadmap.eu  
@HeatRoadmapEU



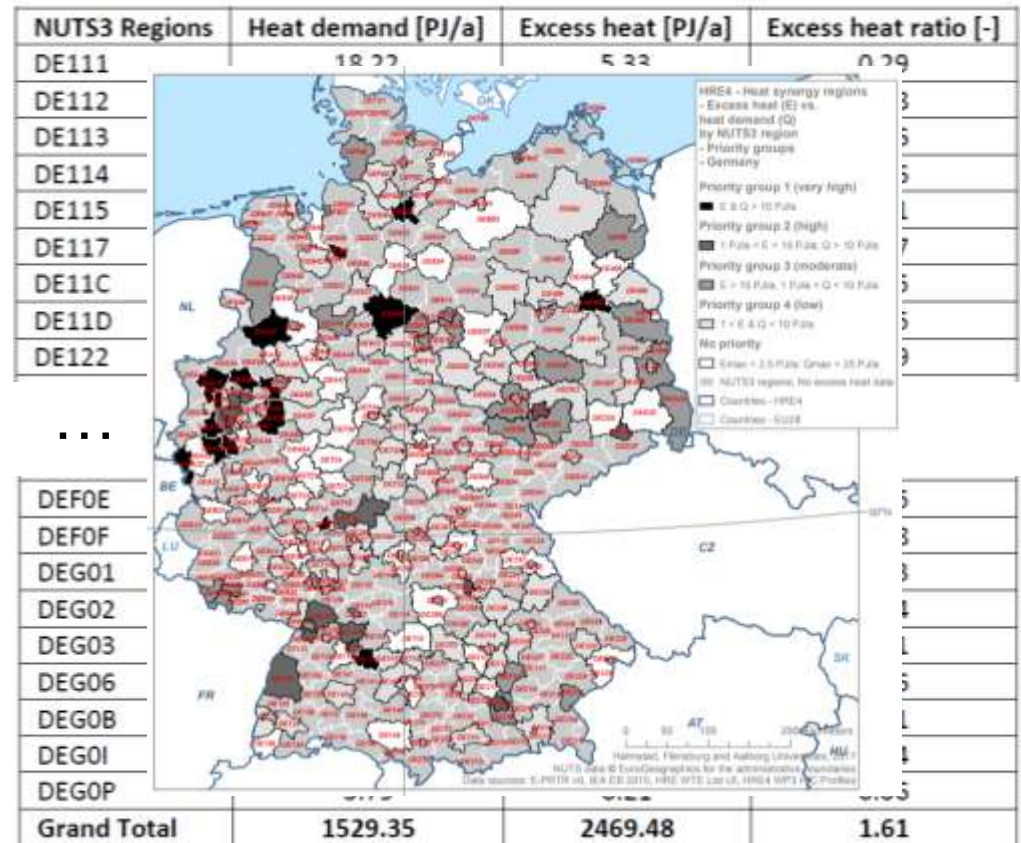
Heat demands: 1,529 PJ/y

Excess heat: 2,470 PJ/y

District heating share: 12%

Renewable energy in heating: 12%

**Not a technical barrier to improve energy efficiency**





# Bonn-Cologne in HRE4's Pan-European Thermal Atlas

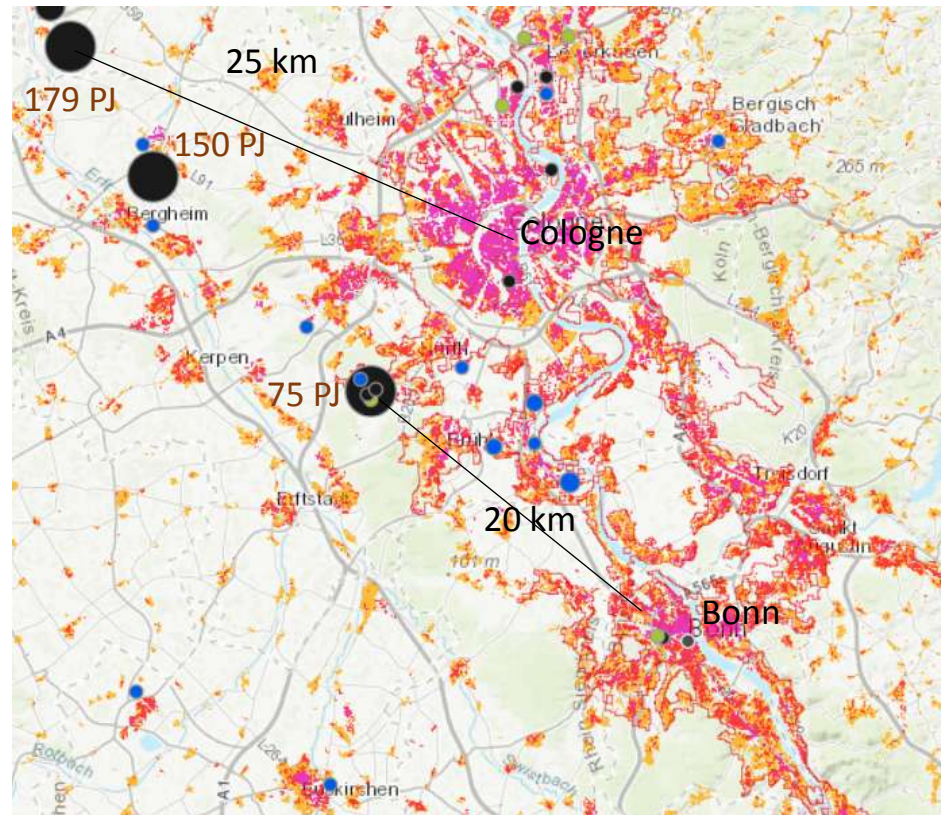
thermos-project.eu



www.heatroadmap.eu  
@HeatRoadmapEU



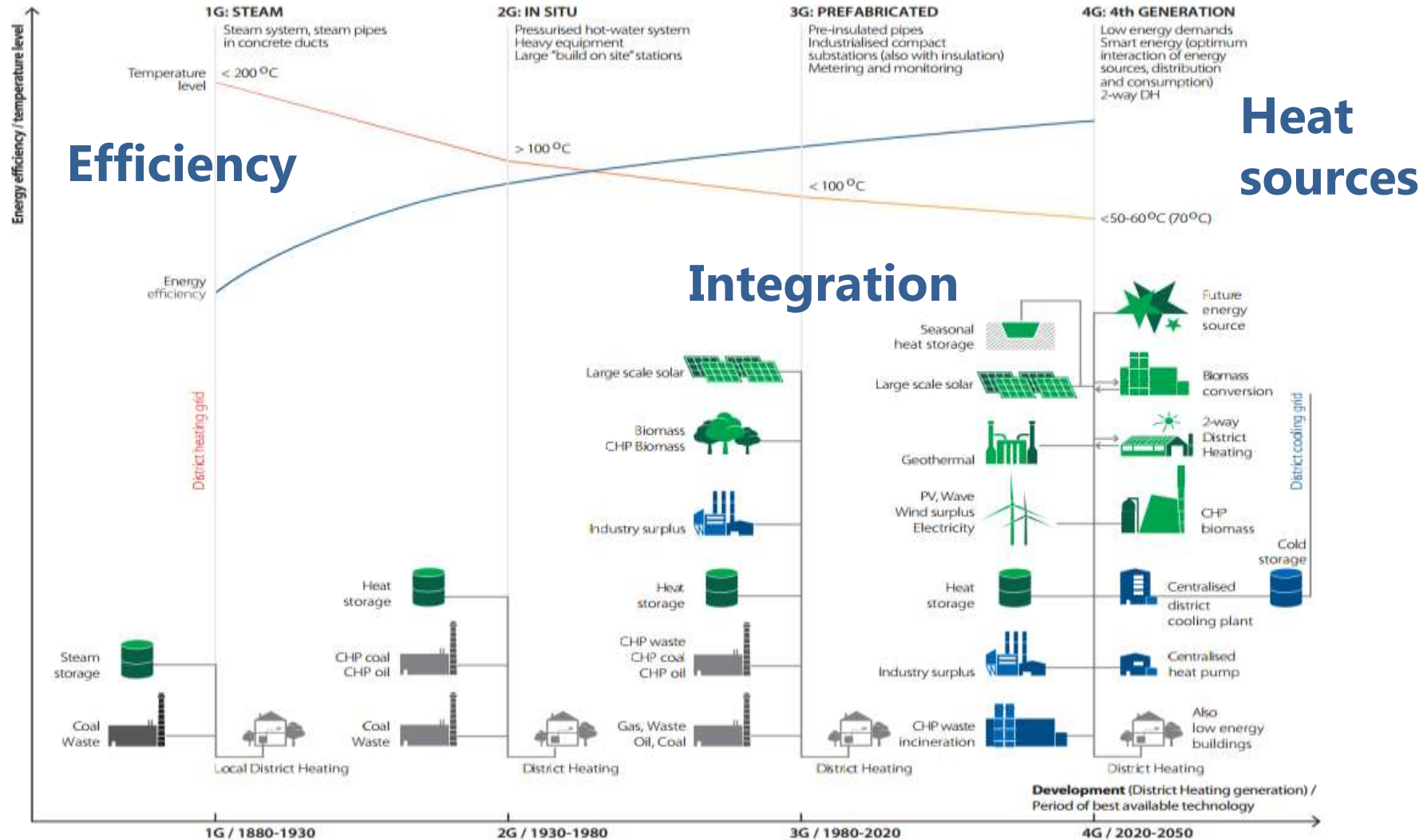
- **Population:**
  - 1.76 million
- **Area:**
  - 511 km<sup>2</sup>
- **Total Heat Demand (HD):**
  - 64 PJ
    - HD in density > 300 TJ/km<sup>2</sup>: 26 PJ
    - HD in density 120-300 TJ/km<sup>2</sup>: 24 PJ
- **Biomass resources in the region:**
  - Forest residues: 1 PJ
  - Biowaste: 3 PJ
  - Straw: 2 PJ
- **Estimated excess heat:**
  - > 450 PJ



Heat Demand Densities 2015 [[PETA 4.2](#)]

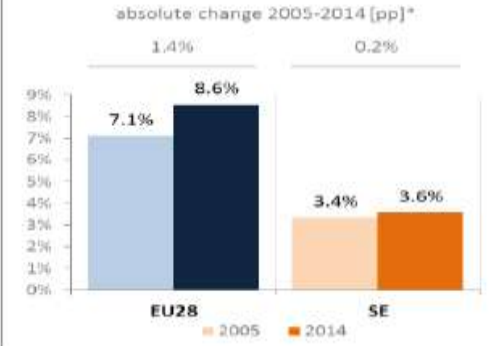


# Pathway to Smart Heating and Cooling





**Energy affordability - energy expenditure share in final consumption expenditure for the lowest quintile**

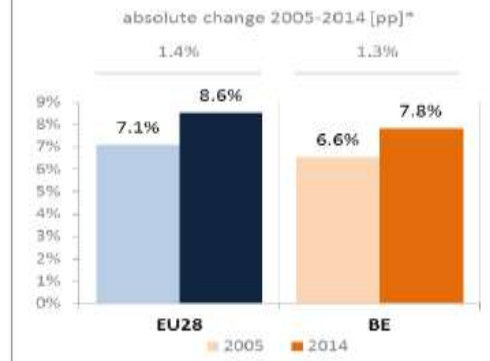


**Inability to keep home adequately warm (share in total population at-risk-of-poverty)**



Sweden

**Energy affordability - energy expenditure share in final consumption expenditure for the lowest quintile**

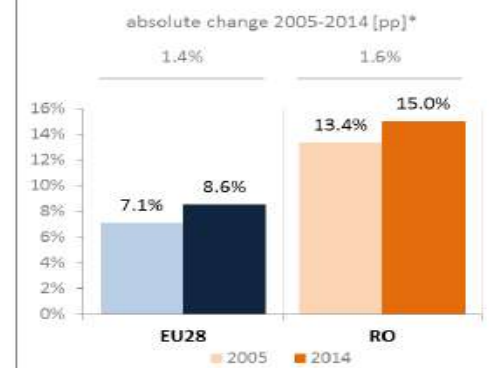


**Inability to keep home adequately warm (share in total population at-risk-of-poverty)**

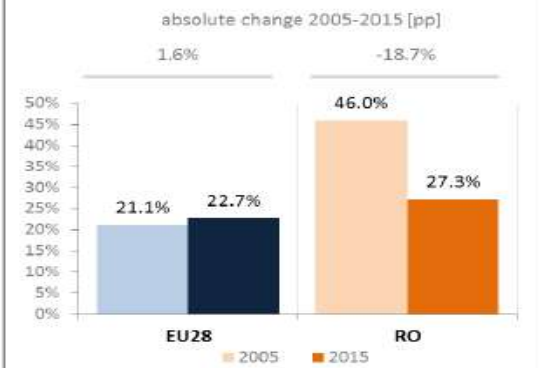


Belgium

**Energy affordability - energy expenditure share in final consumption expenditure for the lowest quintile**



**Inability to keep home adequately warm (share in total population at-risk-of-poverty)**



Romania

# Energy Affordability Diverse in EU



# Cities Transforming the European Heating System

- *Do the obvious with ambition*
- *Add innovation and integration*
- *Advance urban thermal planning of infrastructure*
- *Build in-house capacity*





# THERMOS

**1<sup>st</sup> THERMOS European Inspire Event**

**Affordable Smart City Heating – Dream or Reality?**

