



THERMOS

Accelerating the development of
low-carbon heating & cooling networks

Capacity Building and Train-the-trainer programme
Module 1: Thermal energy supply and demand in Europe





Module 1 of the THERMOS Capacity and Training programme

- 1.1** Status of heating and cooling in Europe
 - 1.1.1 HC supply (sectors, resources, technologies)
 - 1.1.2 HC demand (sectors, resources, technologies)
- 1.2** Key EU objectives, plans and policies on thermal energy
 - 1.2.1 European policies and legislation
 - 1.2.2 Energy efficiency objectives and potential
 - 1.2.3 Renewable objectives and potential
- 1.3** Translating EU objectives into national plans and policies
 - 1.3.1 National Energy Efficiency & Renewable Action Plans
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- 1.4** Local and regional objectives, plans and policy on thermal energy
 - 1.4.1 Heating and cooling within urban development
 - 1.4.2 Good policy and legislative initiatives
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- 1.5** Policy barriers and opportunities: Optimising the heating and cooling sector
 - 1.5.1 European level
 - 1.5.2 National level
 - 1.5.3 Regional level
 - 1.5.4 Local level



1.1 Status of heating and cooling in Europe

1.1.1 HC supply (sectors, resources, technologies)

1.1.2 HC demand (sectors, resources, technologies)



- The purpose of the H&C supply slides is to give an overview of the whole H&C sector.
- Each HC supply slide shows the final energy demand in TWh/year
- The demands are divided into three sectors:
 - industry, residential and service
- For each sector the energy supply is divided into various fuel types



1.1.1 HC supply

EU Country specific

Germany

Poland

United Kingdom

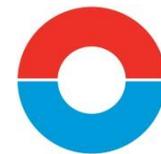
Spain

Romania

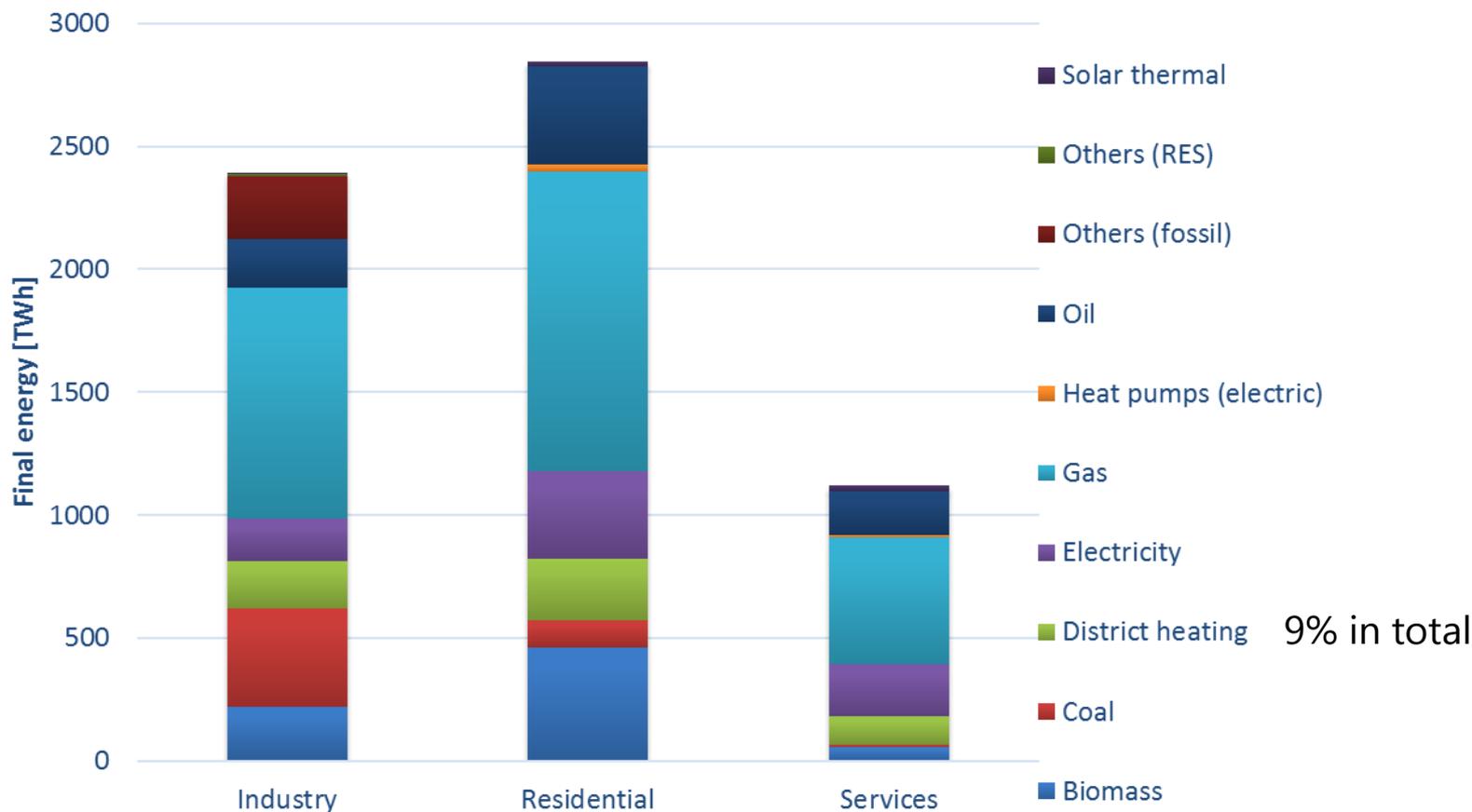
Latvia

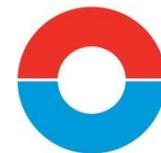
Portugal

Denmark

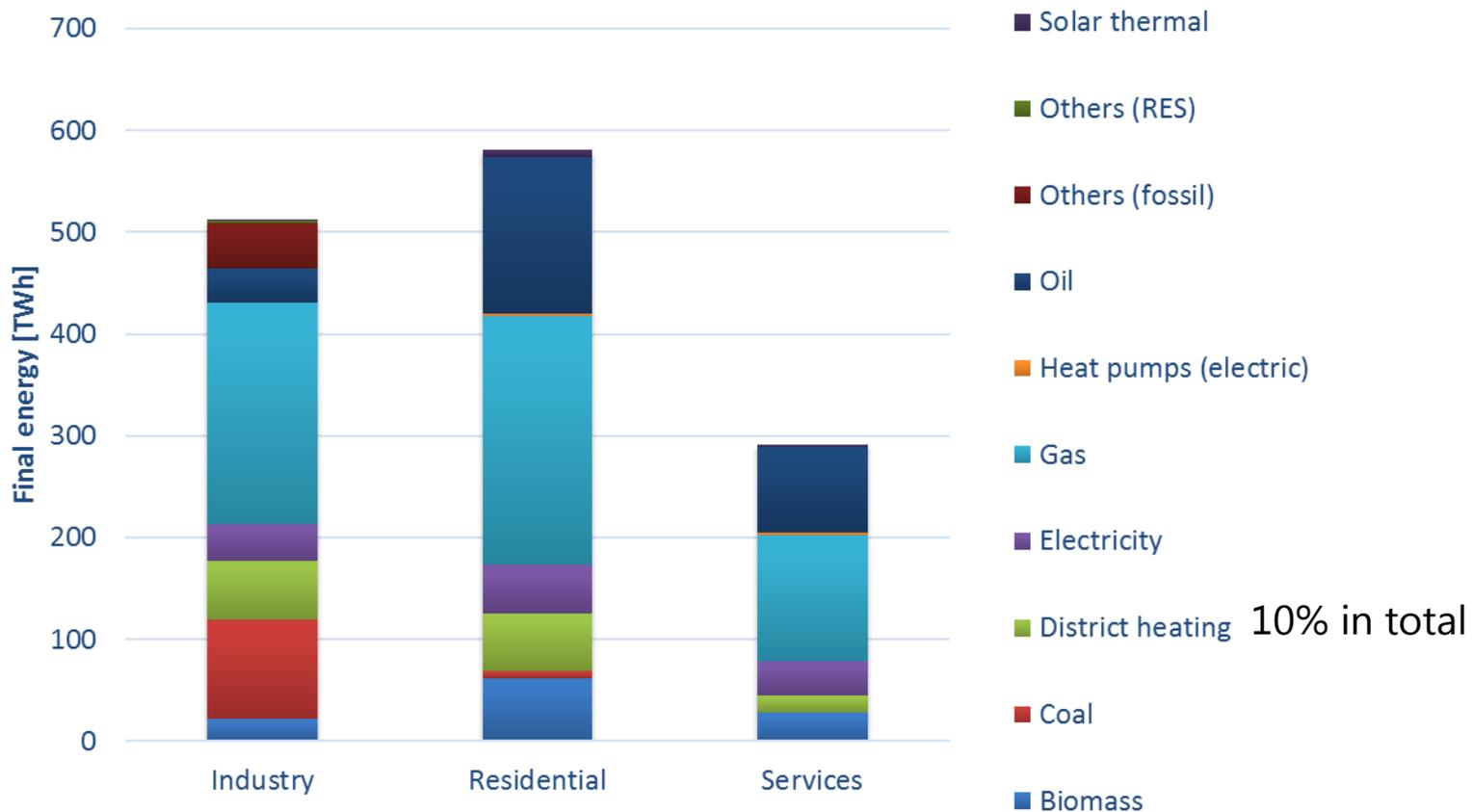


HC supply in the EU



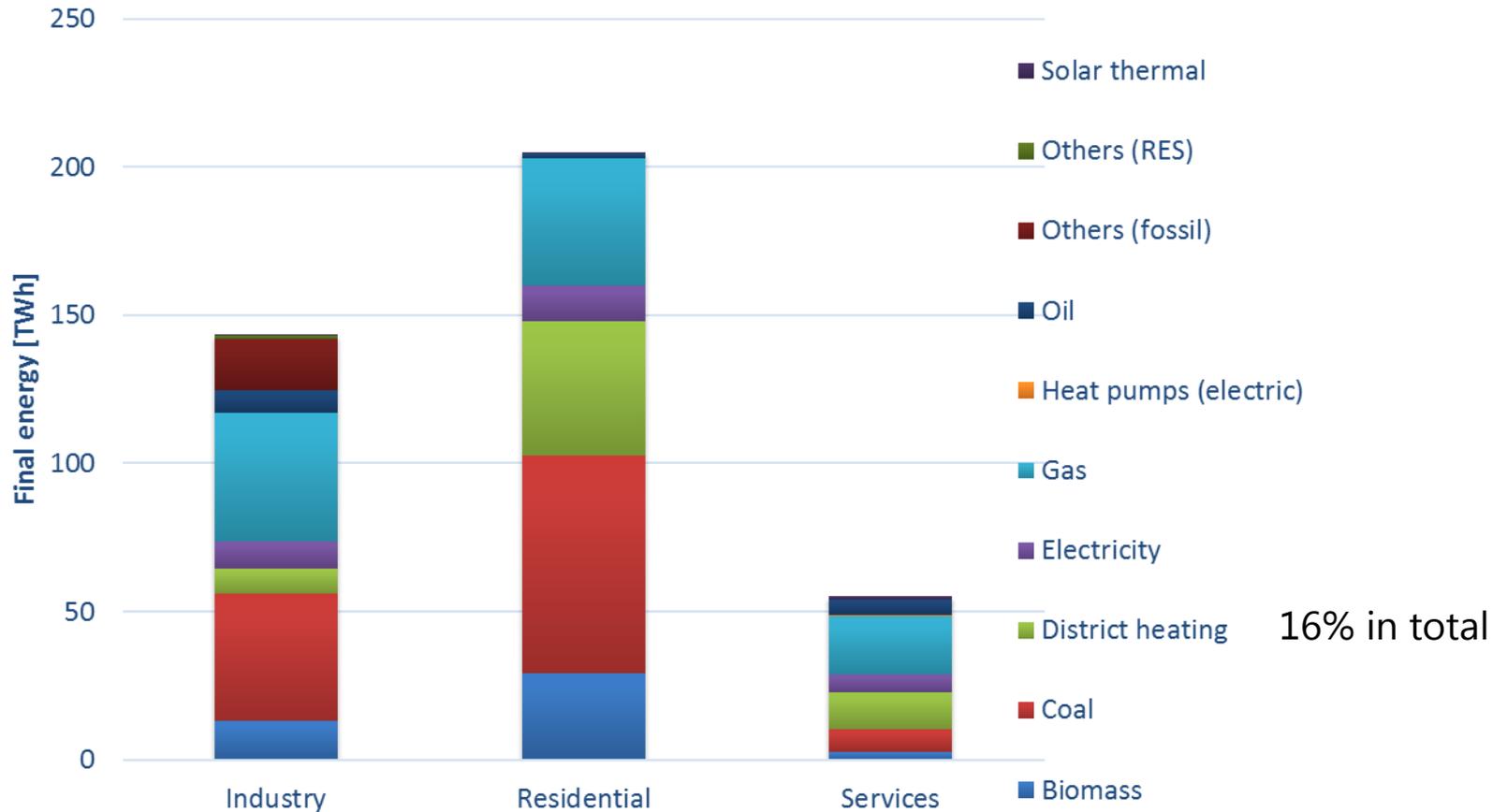


HC supply in Germany





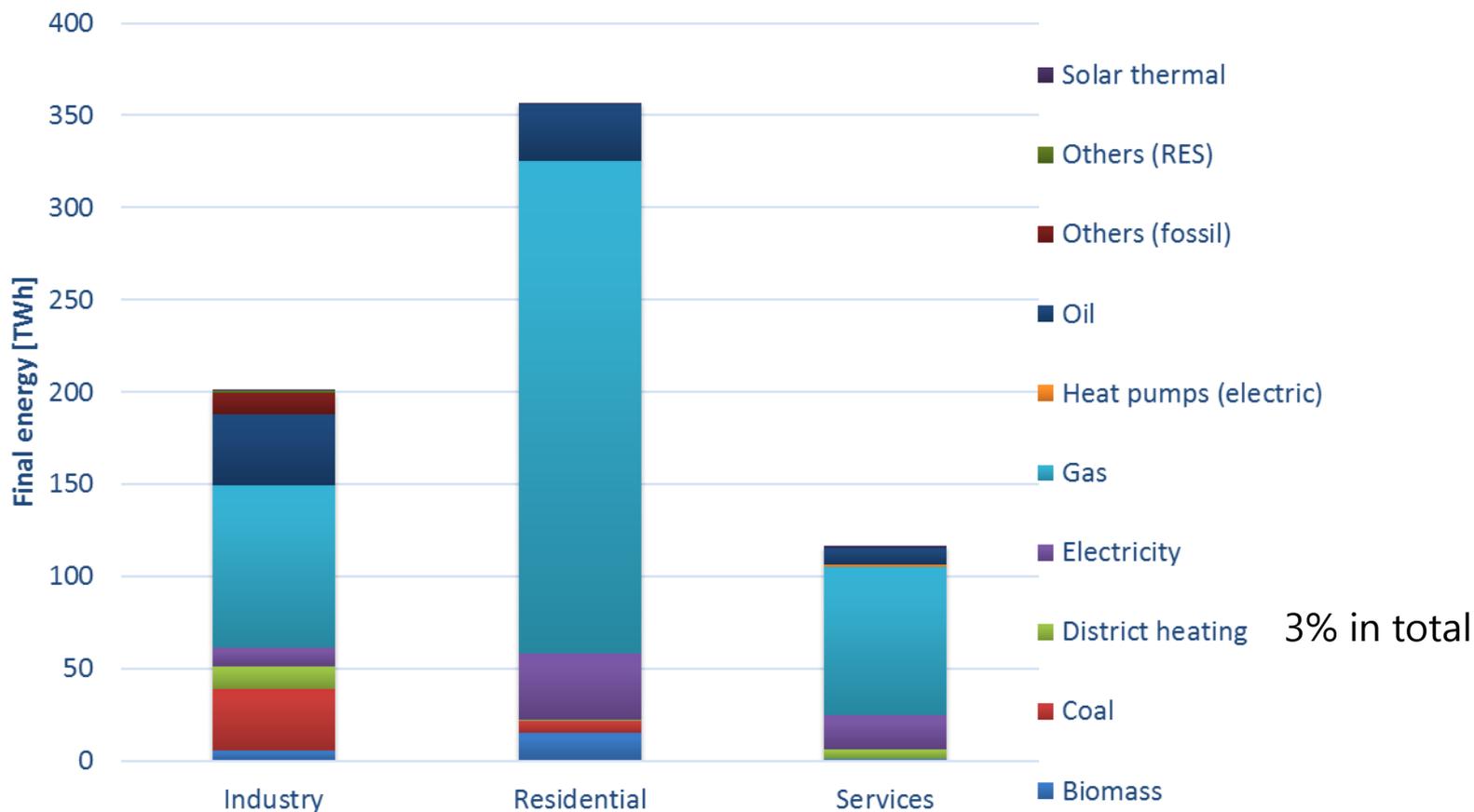
HC supply in Poland



16% in total

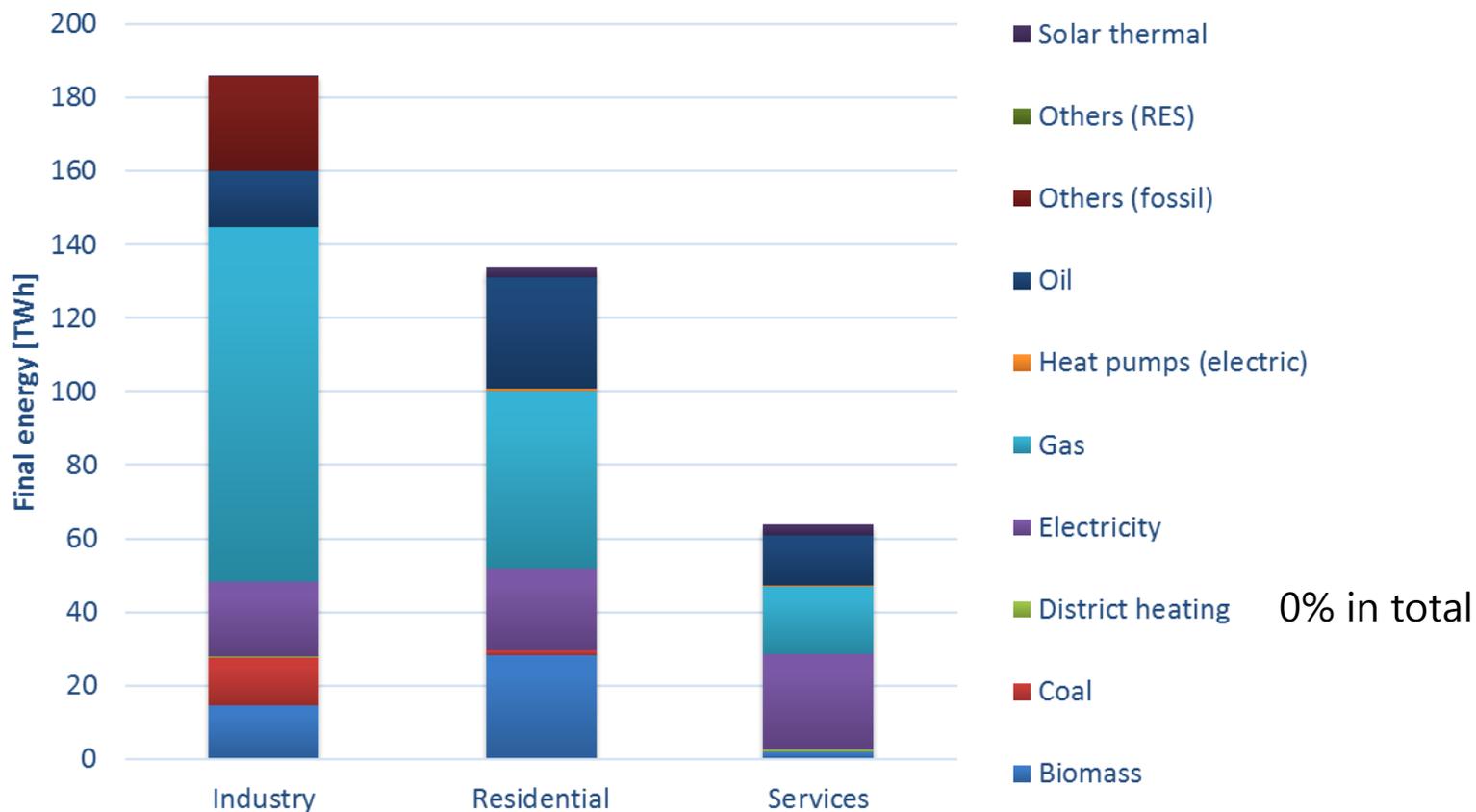


HC supply in United Kingdom



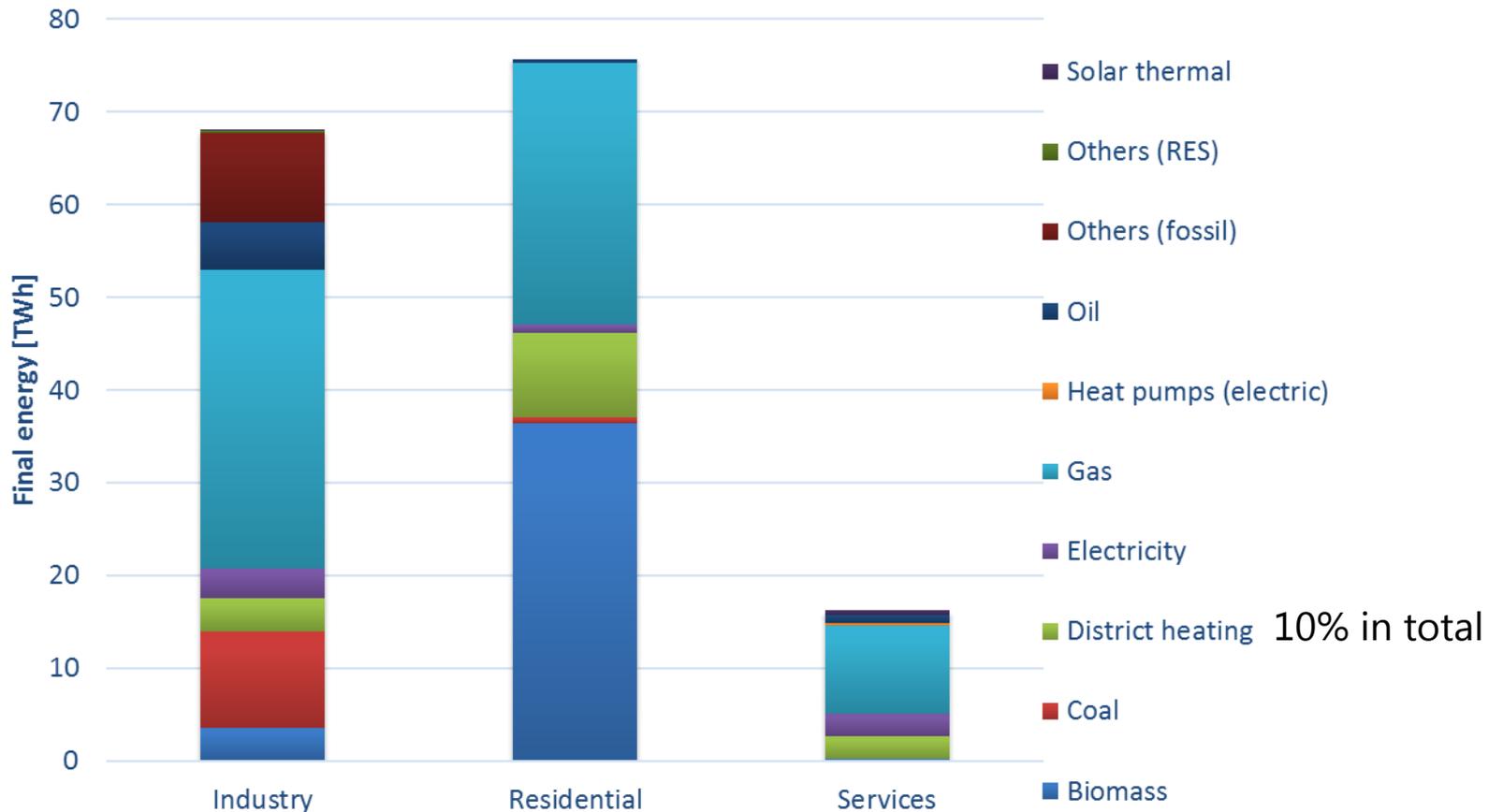


HC supply in Spain



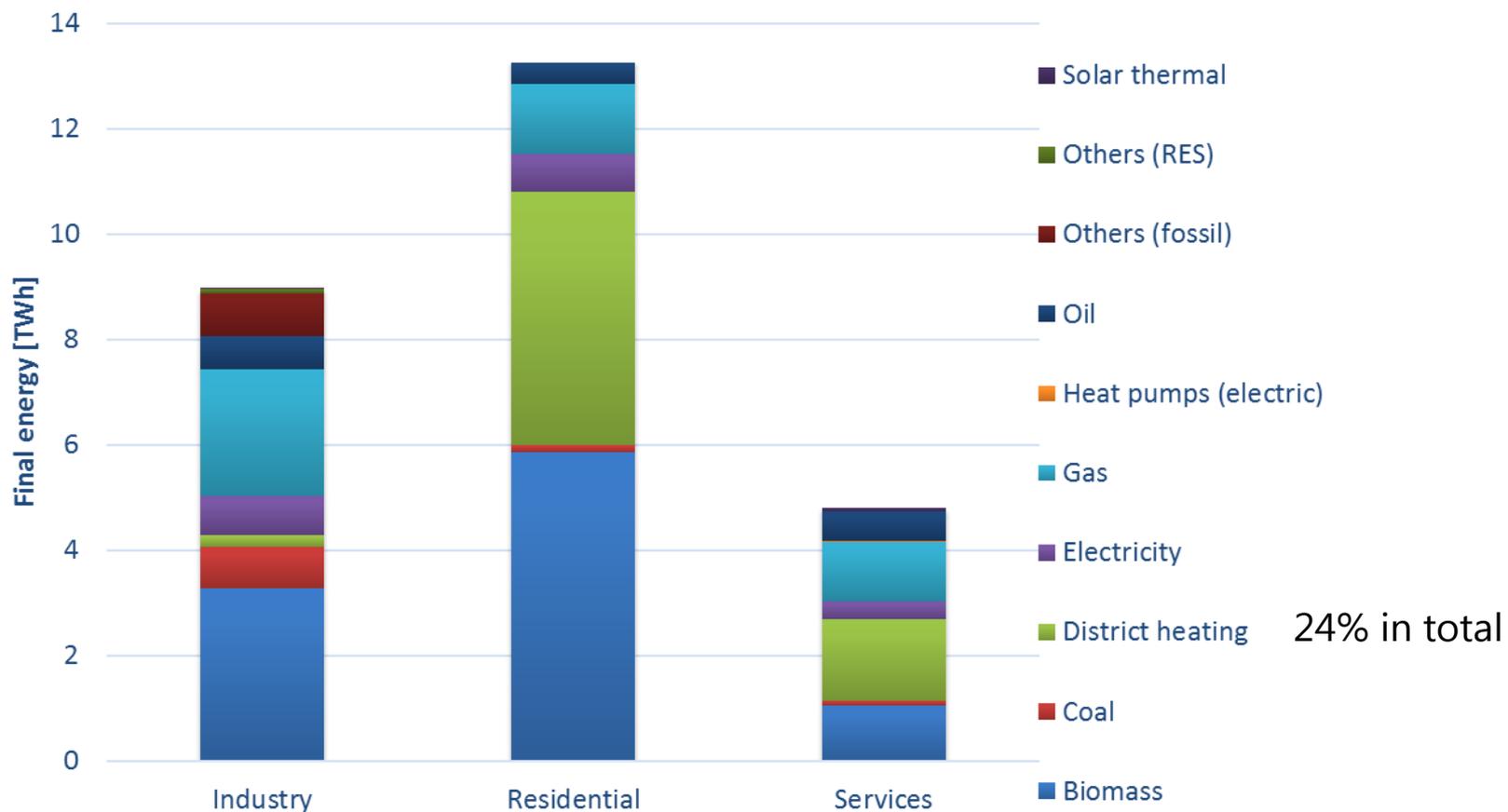


HC supply in Romania



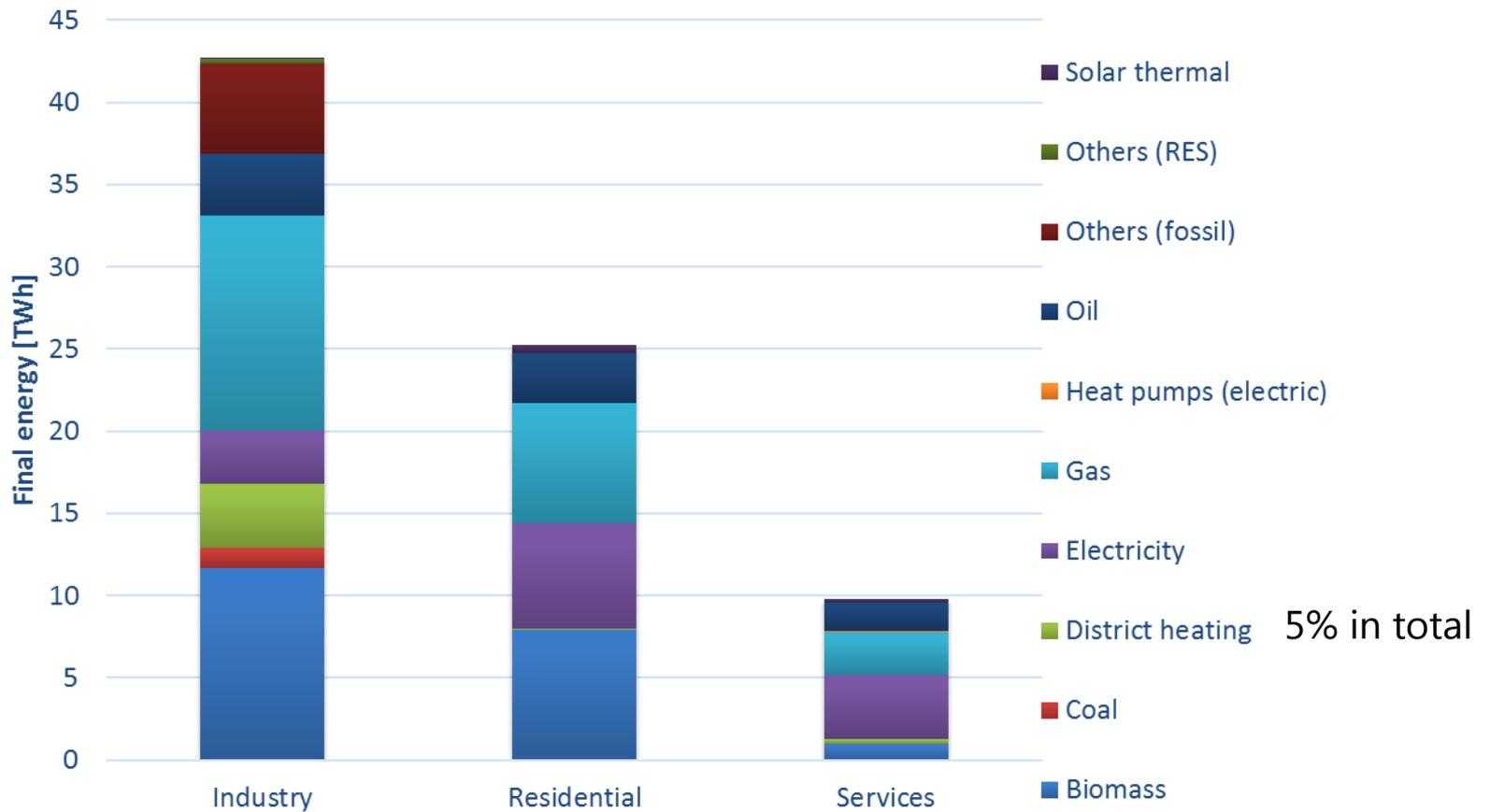


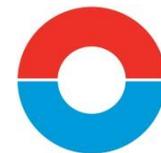
HC supply in Latvia



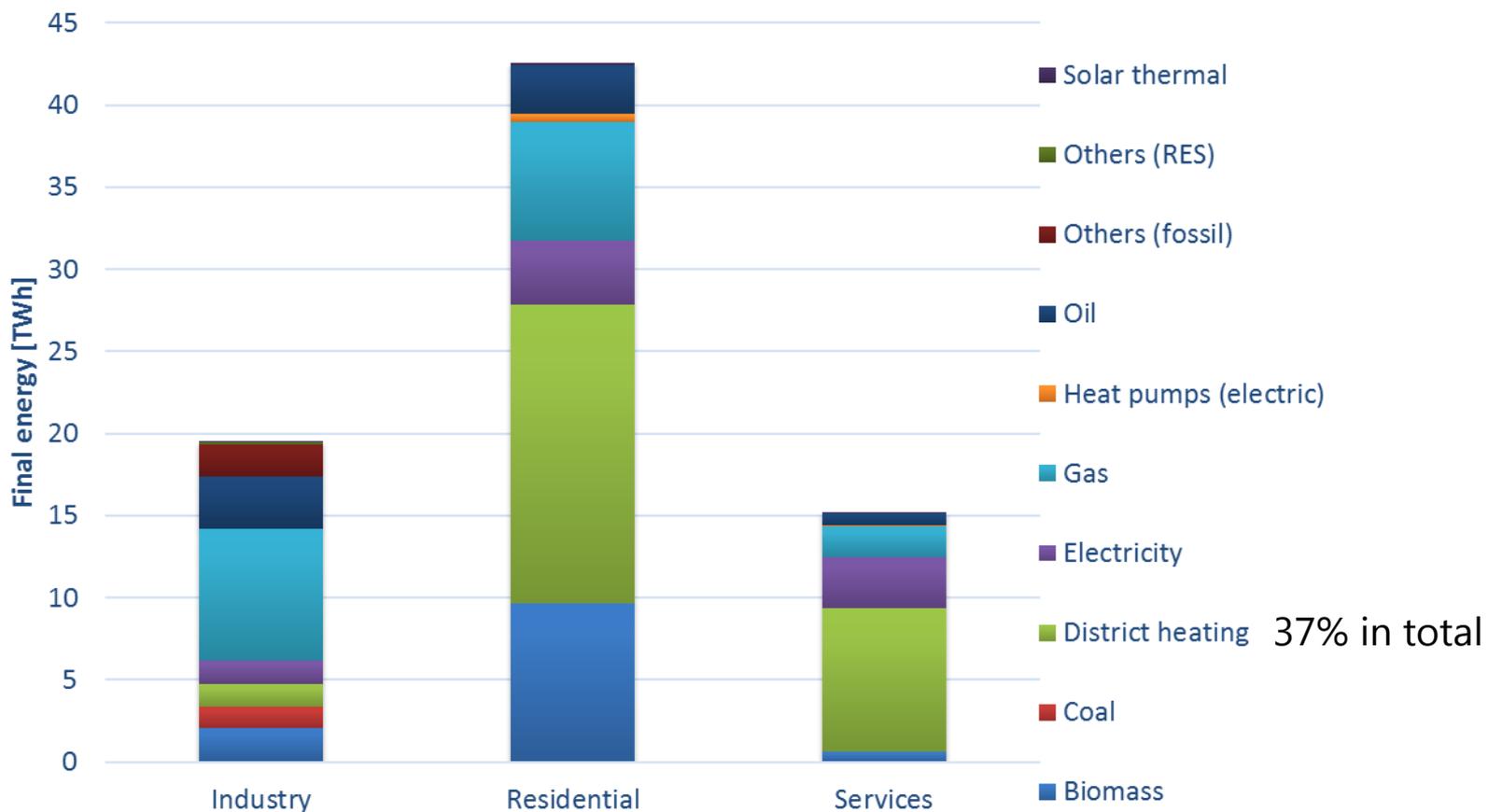


HC supply in Portugal





HC supply in Denmark





1.1.2 HC Demand

EU Country specific

Germany

Poland

United Kingdom

Spain

Romania

Latvia

Portugal

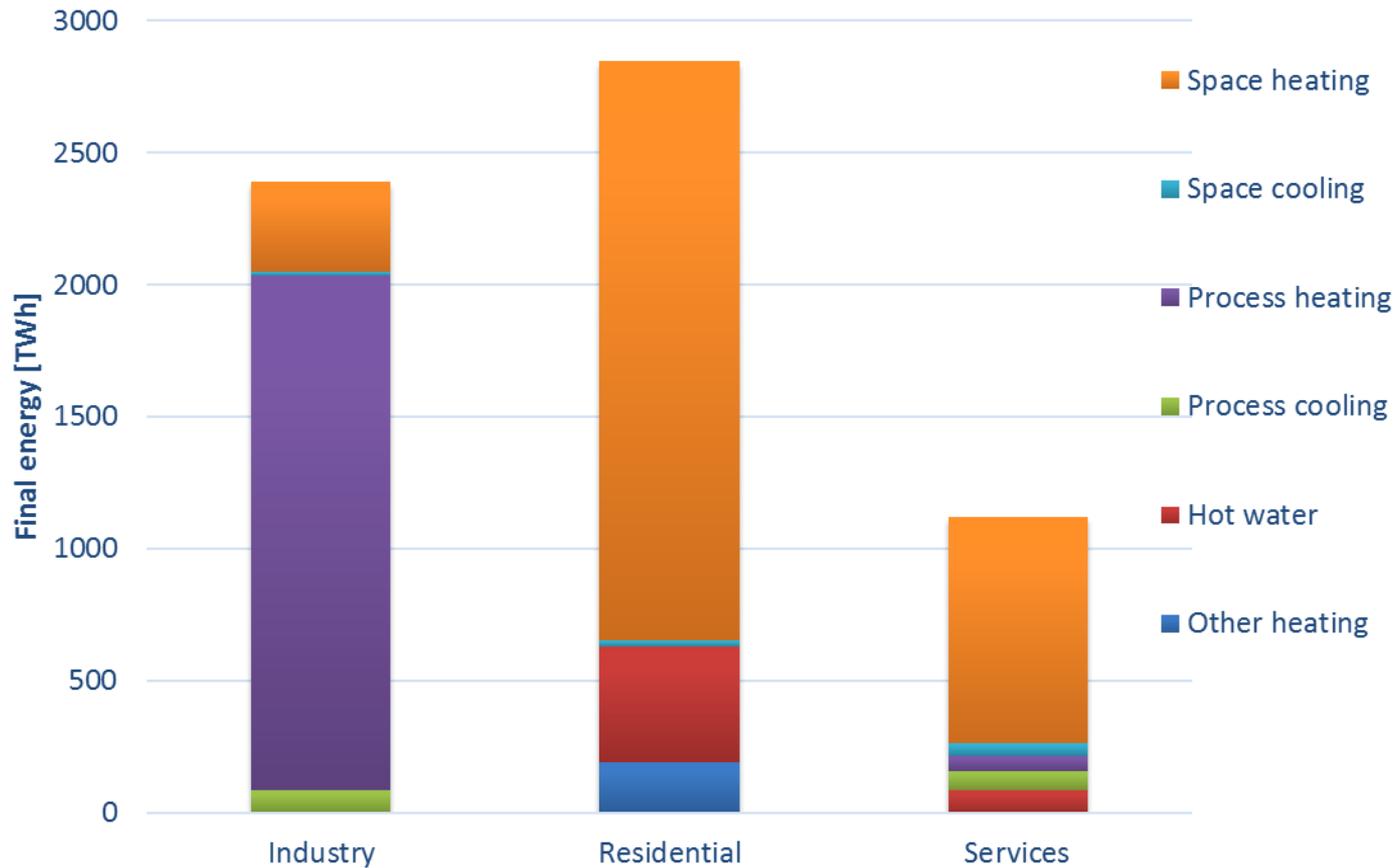
Denmark



- Each HC demand slide shows the final energy demand in TWh/year
- The demands are divided into three sectors:
 - industry, residential and service
- For each sector the energy supply is divided into:
 - Space heating
 - Space cooling
 - Process heating
 - Process cooling
 - Hot water
 - Other heating

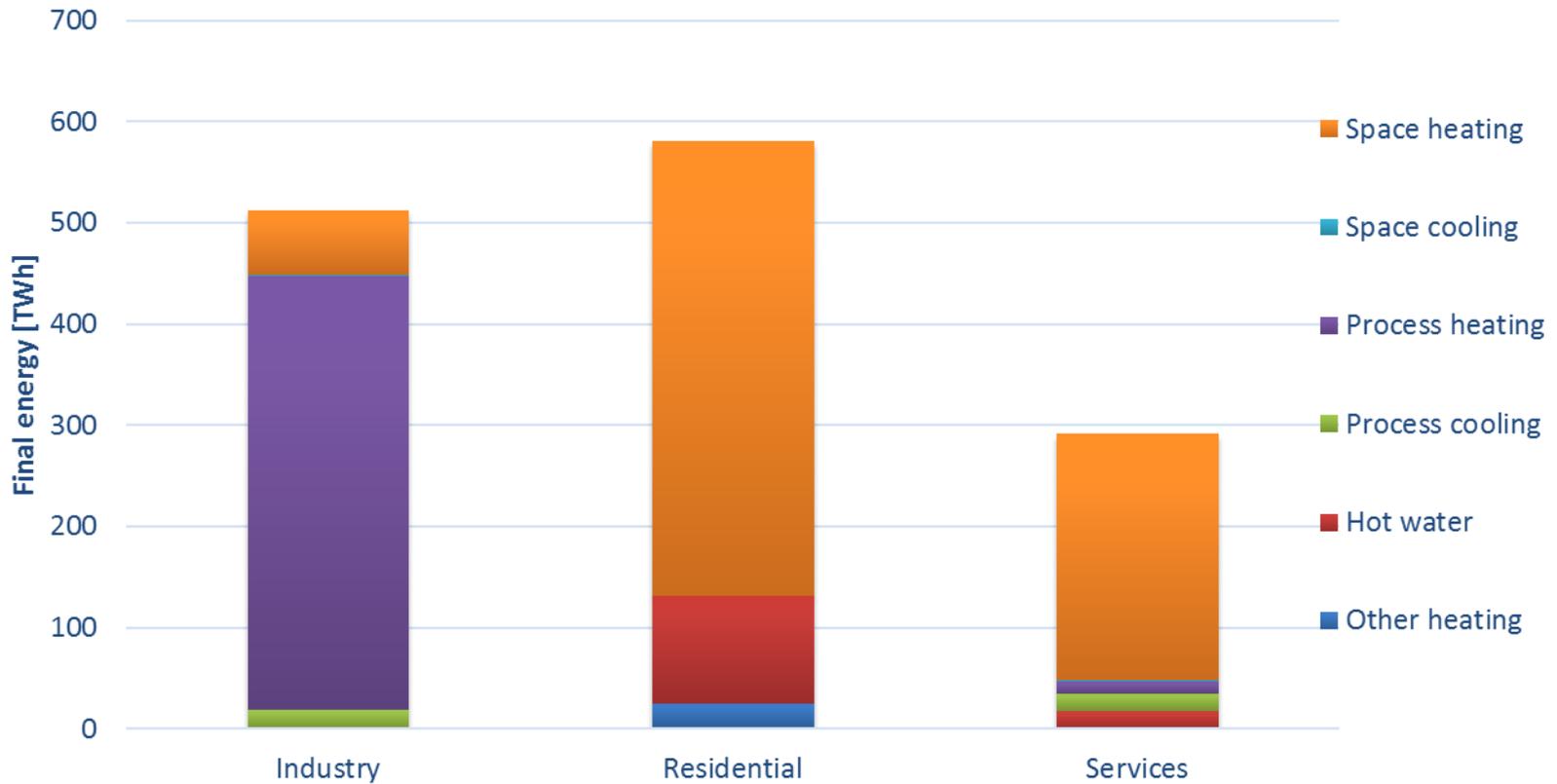


HC Demand in the EU



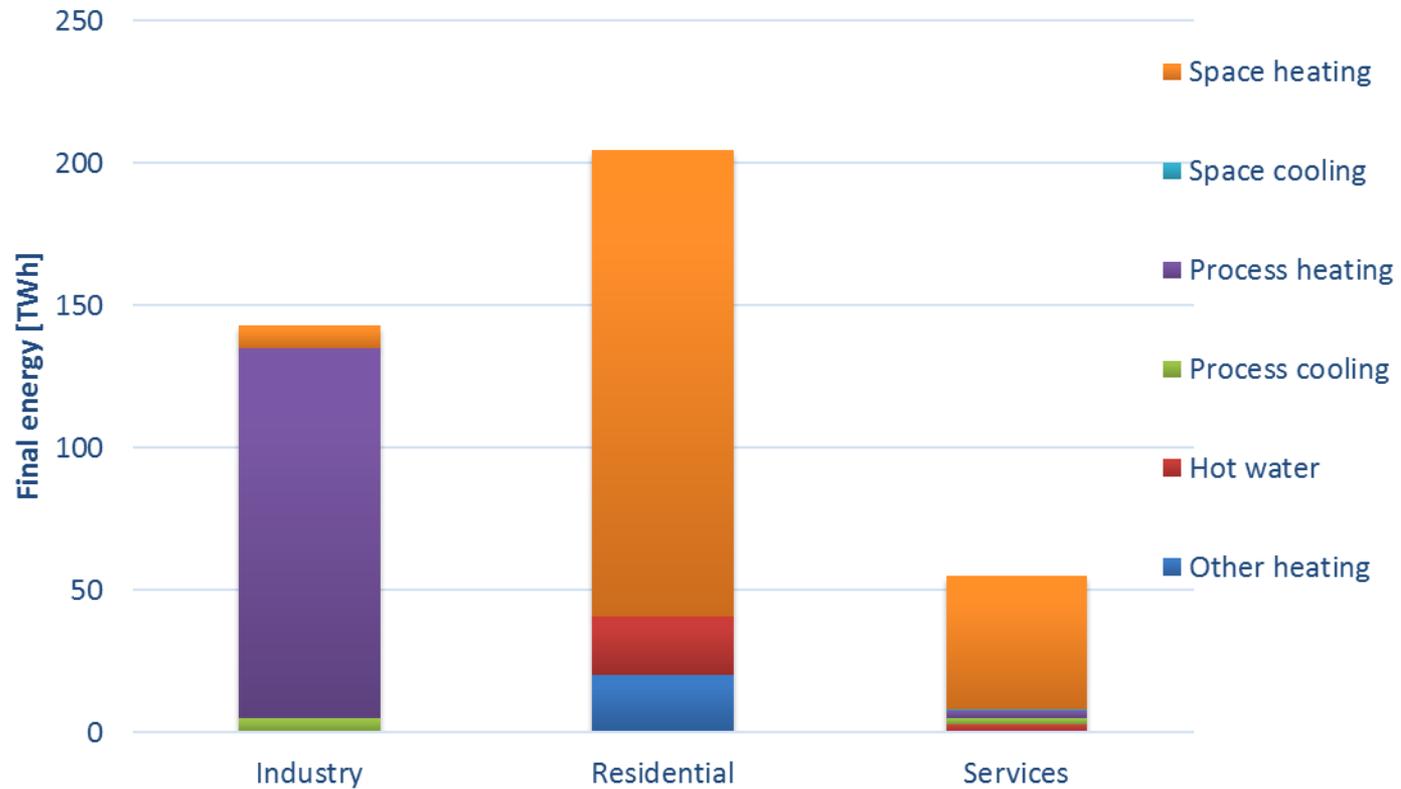


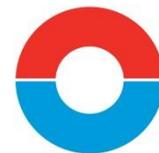
HC Demand in Germany



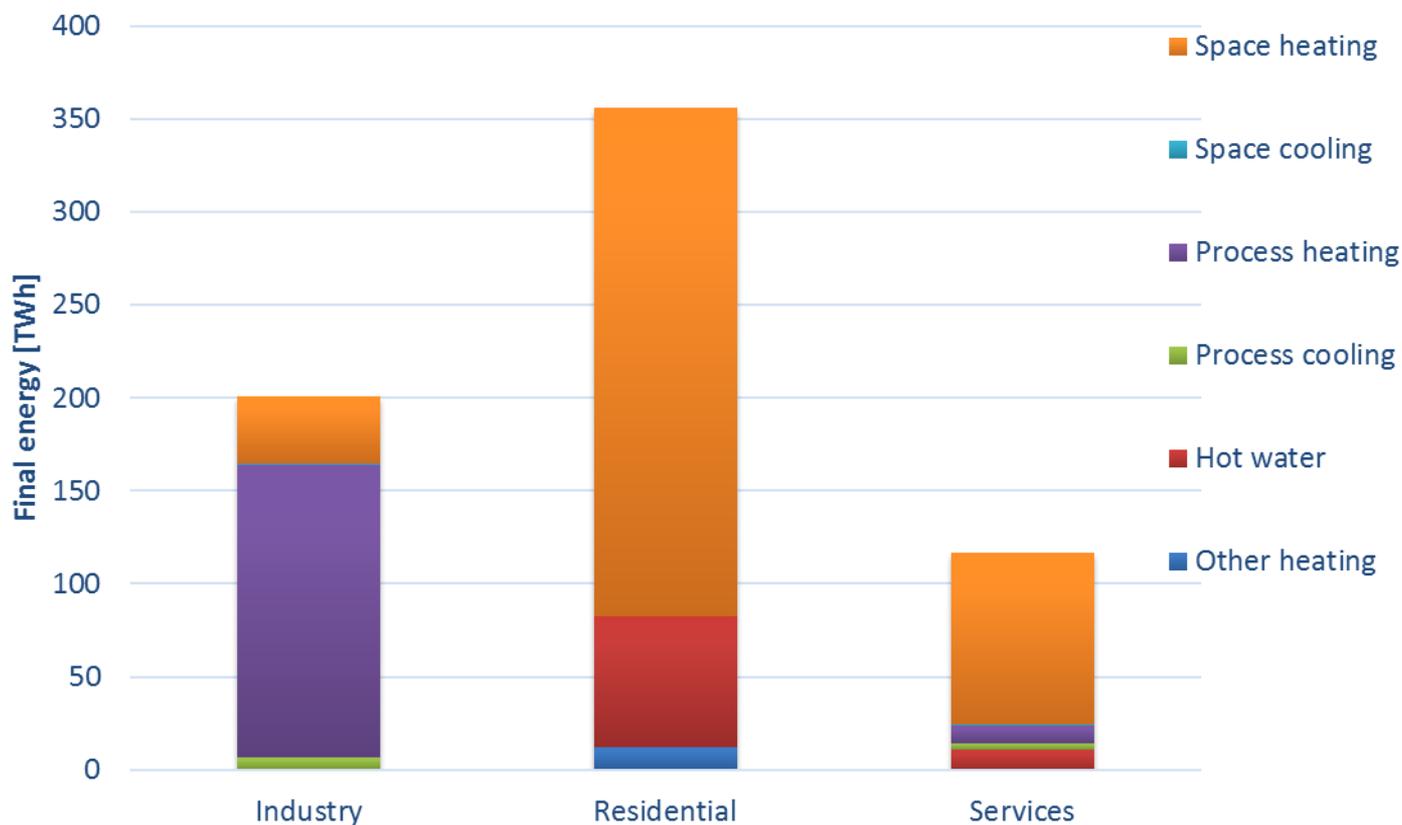


HC Demand in Poland



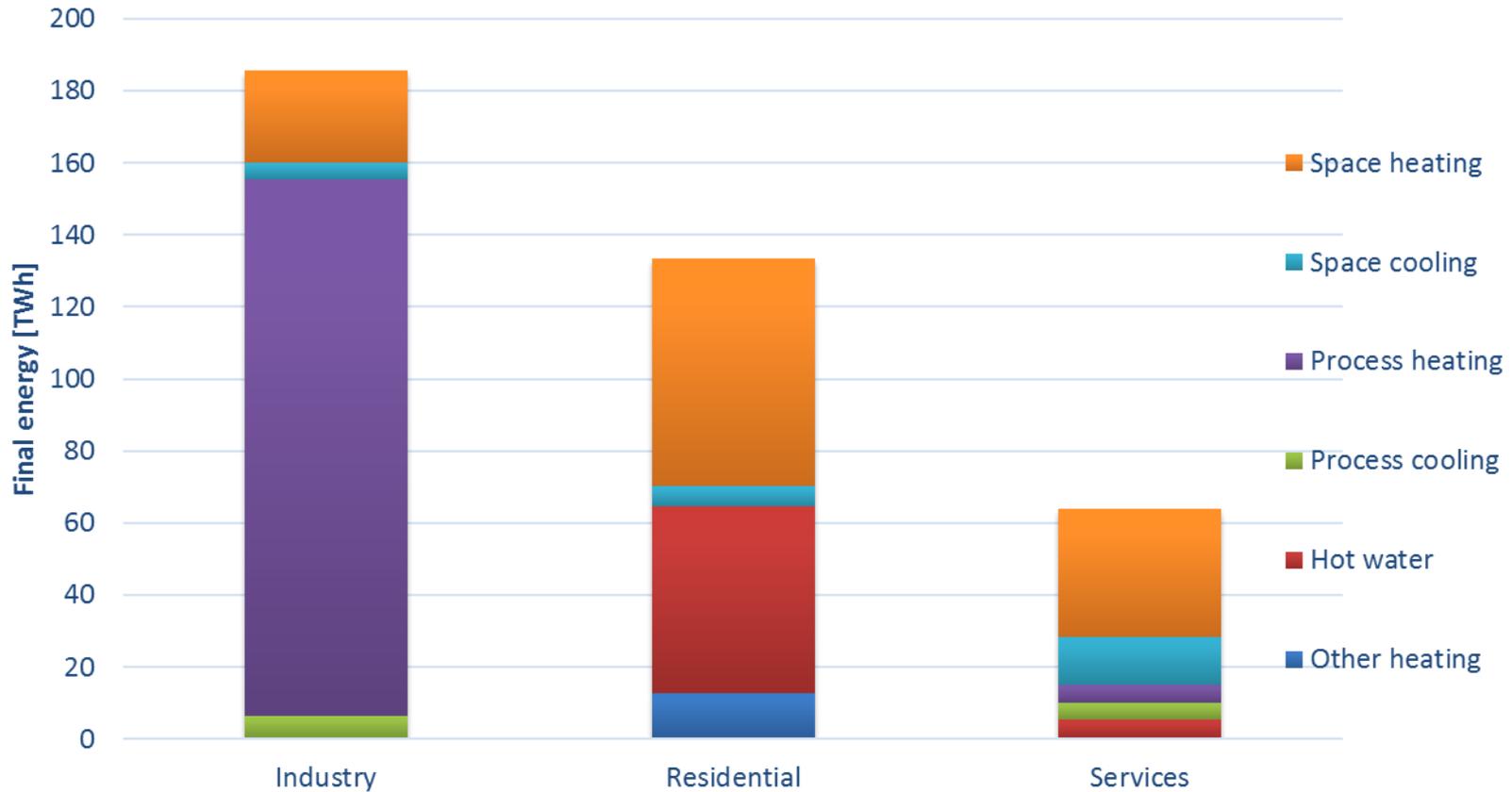


HC Demand in United Kingdom



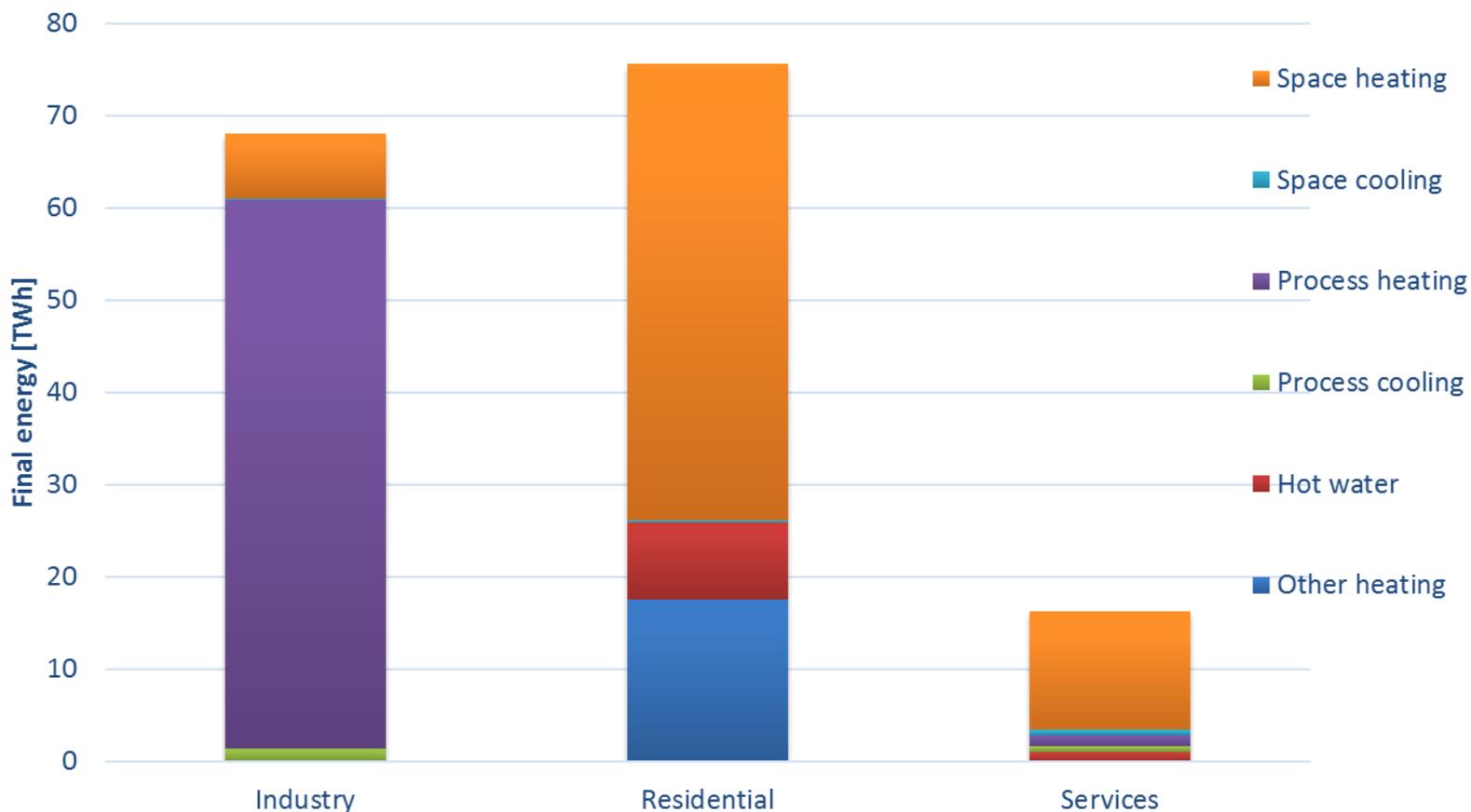


HC Demand in Spain



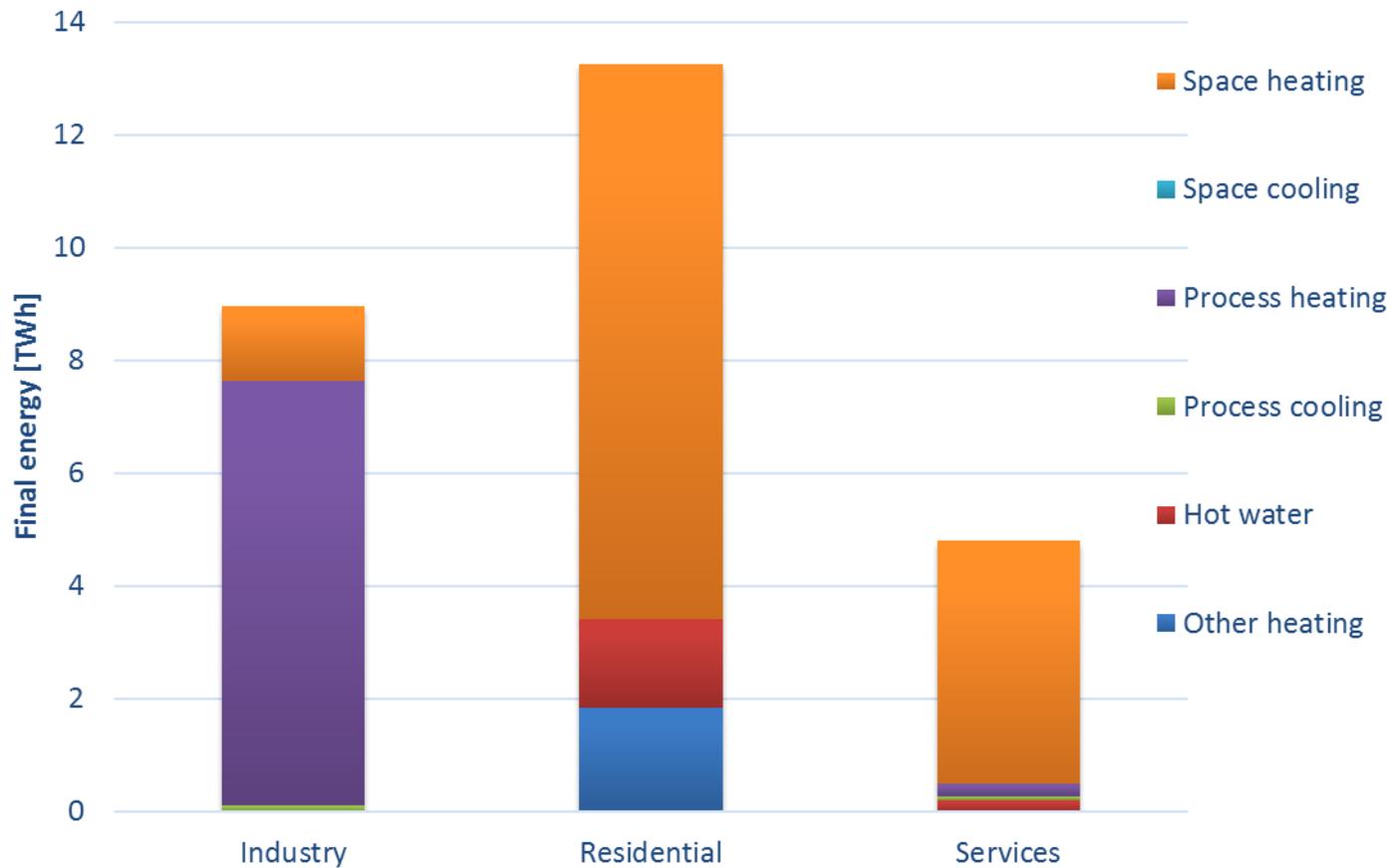


HC Demand in Romania



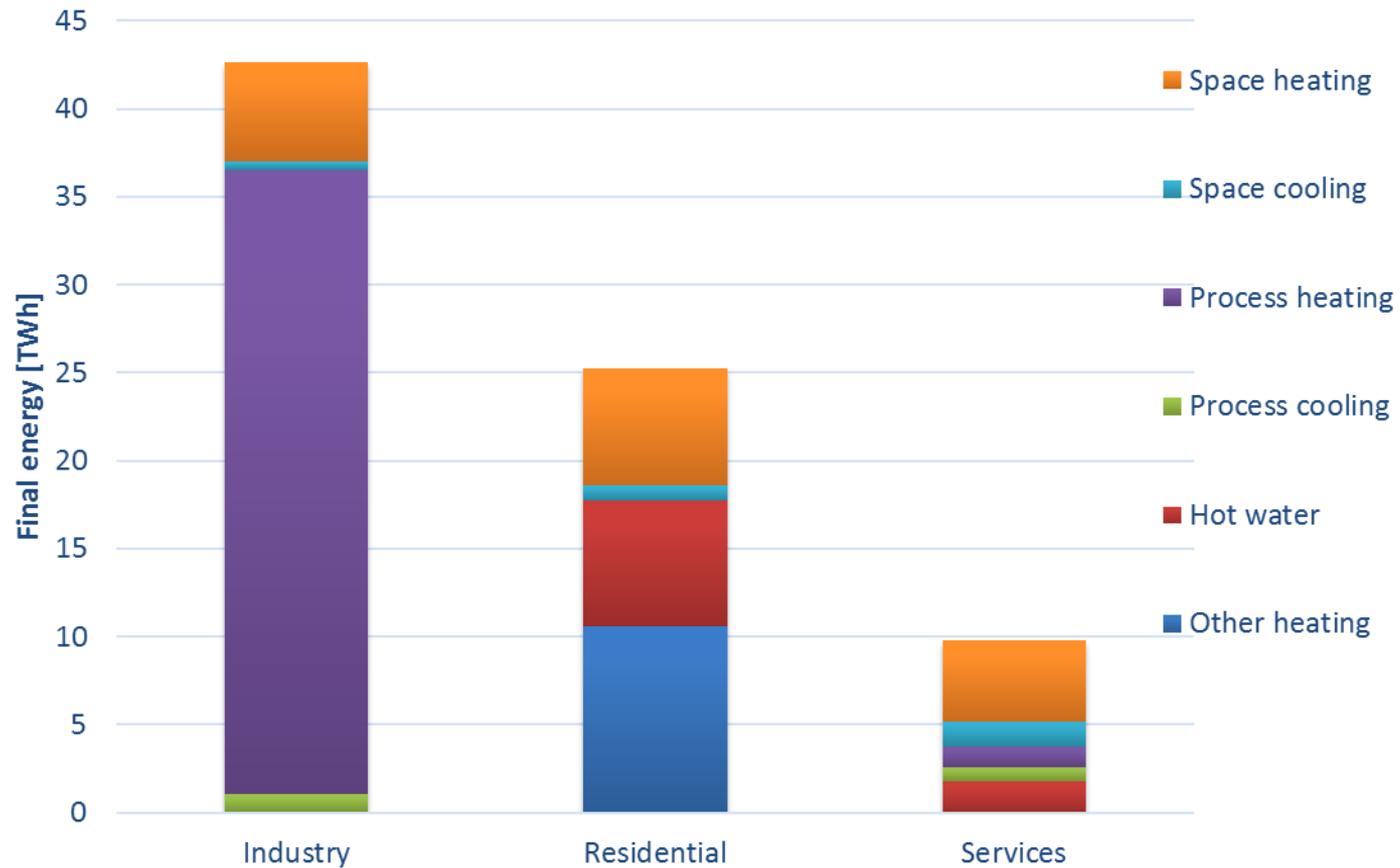


HC Demand in Latvia



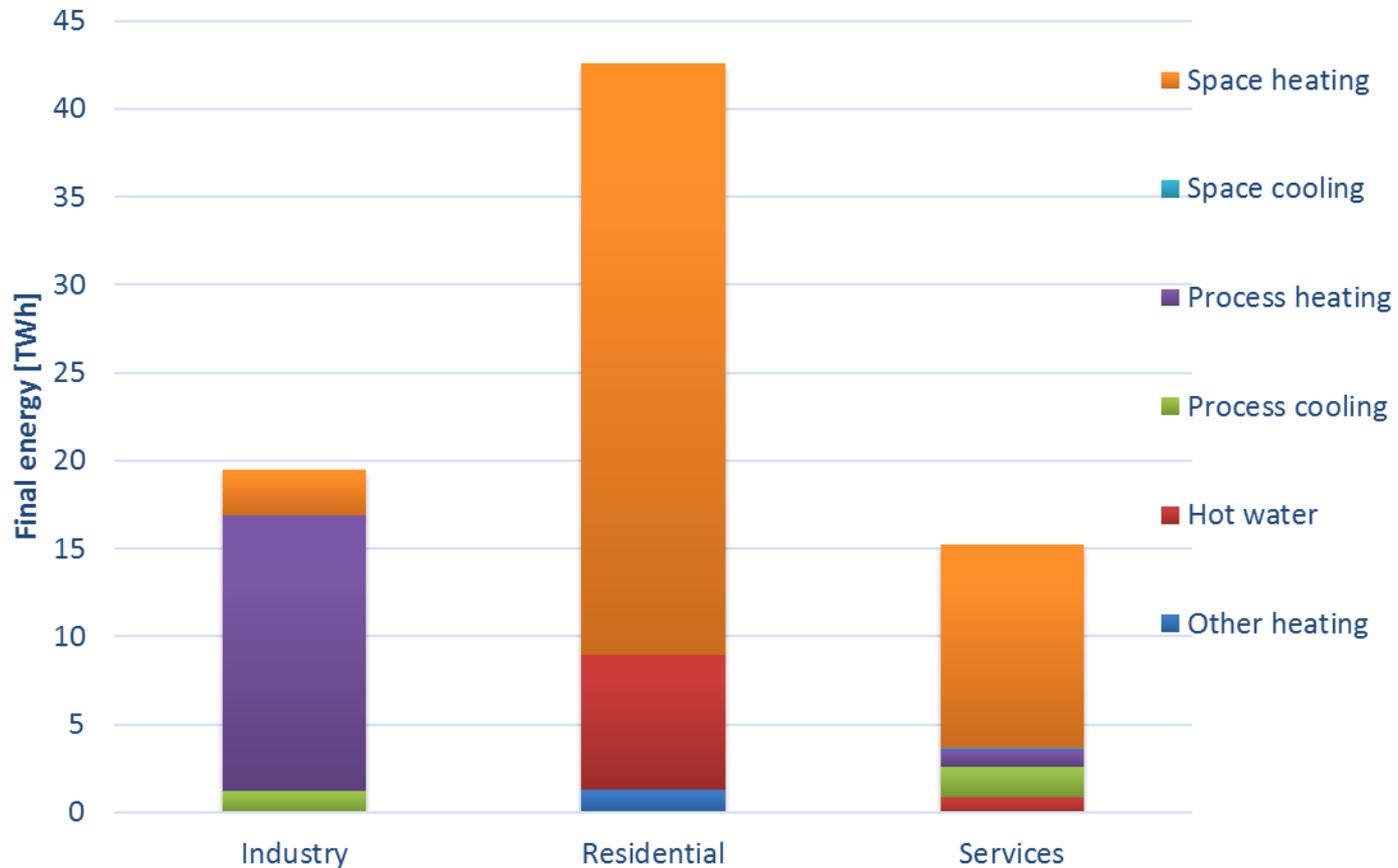


HC Demand in Portugal





HC Demand in Denmark





1.2 Key EU objectives, plans and policies on thermal energy

1.2.1 European policies and legislation

1.2.2 Energy efficiency objectives and potential

1.2.3 Renewable objectives and potential



1.2.1 European policies and legislation

The main focus is on the following policies:

EU strategy for Heating
and Cooling

The Energy Efficiency
Directive

The Directive on Energy
Performance of
Buildings



EU Policy on heating and cooling

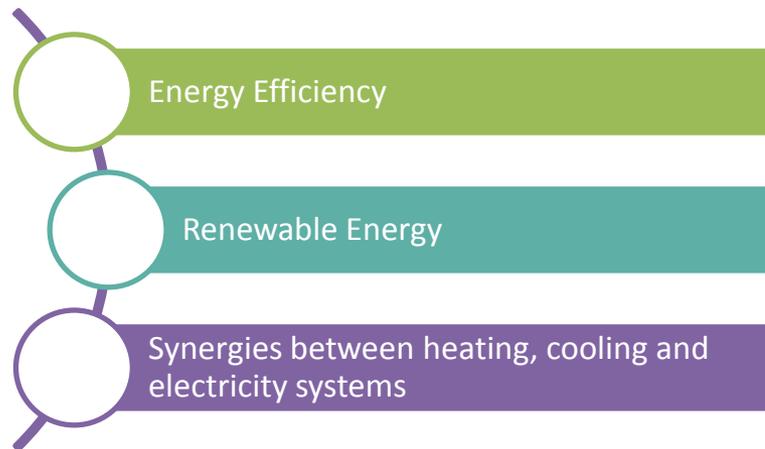
COM(2016) 51 final: An EU Strategy on Heating and Cooling

- Heating and cooling is 50% of EU's energy demand
 - Largely based on fossil fuels
 - Inefficient both in terms of supply and end-use
 - Sets the goal to decarbonize buildings in EU by 2050
 - Proposed tools and solutions:
 - district heating,
 - smart energy systems,
 - linking sectors,
 - refurbishment of existing buildings
 - etc.



EU Strategy on heating and cooling

- From February 2016 as part of the Energy Security package from the European Commission
- Overall aim is decarbonizing the EU buildings based on:



- District heating is recognized as an efficient technology based on waste heat recovery, cogeneration and renewables
- In September 2016 the strategy was adopted by the European Parliament



1.2.2 Energy efficiency objectives and potential

- The current Energy Efficiency Directive is from October 2012
- Legally binding measures to encourage energy efficiency in all parts of the energy supply chain
- Common framework for promoting energy efficiency within the EU, with a target of a reduction of 20% in 2020
- Establishment of national energy efficiency targets for 2020 (indicative) through National Energy Efficiency Action Plans (NEEAPs)
- The requirements are minimum and countries are allowed to increase them in their national plans



The Energy Performance of Buildings Directive (EPBD) (1/2)

- The present Directive on the Energy Performance of Buildings is from 2010
 - Aims at improving the energy performance of buildings in EU setting minimum requirements (covers heating, hot water, cooling, ventilation and lighting)
 - National authorities must set cost-effective minimum energy performance requirements
 - The Commission is responsible for establishing the methodology to calculate the optimal cost levels for the energy performance requirements
 - New buildings must meet the minimum standards and contain high-efficiency alternative energy systems.
 - Existing buildings, when undergoing major renovation, must upgrade their energy performance to meet the EU requirements.
 - National authorities operate an energy performance certification system.



The Energy Performance of Buildings Directive (EPBD) (2/2)

- On December 2017 it was agreed by the EU Council, Commission and Parliament to adopt new measures regarding:
 - Energy performance certificates are to be included in all advertisements for the sale or rental of buildings
 - EU countries must establish inspection schemes for heating and air conditioning systems or put in place measures with equivalent effect
 - all new buildings must be nearly zero energy buildings by 31 December 2020 (public buildings by 31 December 2018)
 - EU countries must set minimum energy performance requirements for new buildings, for the major renovation of buildings, and for the replacement or retrofit of building elements (heating and cooling systems, roofs, walls and so on)
 - EU countries have to draw up lists of national financial measures to improve the energy efficiency of buildings.



1.2.3 Renewable objectives and potential

- The present Directive on promotion of the use of energy from renewable sources is from 2009
 - Sets a common set of rules for the use of renewable energy in the EU so as to limit greenhouse gas (GHG) emissions and promote cleaner transport
 - Sets national binding targets for all EU countries with the overall aim of making renewable energy sources account by 2020 for 20% of EU energy and for 10% of energy specifically in the transport sector (gross final energy consumption)
- In November 2016 a revised version was proposed by the EU Commission adding a 2030 target of 27% Renewable Energy



1.3 Translating EU objectives into national plans and policies

1.3.1 National Energy Efficiency & Renewable Action Plans

1.3.2 EU Directives with a main impact on heating and cooling

1.3.3 National initiatives on heating and cooling



1.3.1 National Energy Efficiency & Renewable Action Plans

The following slides are country specific:

For each
country:

National Energy
Efficiency
Action Plans
(NEEAPs)

National
Renewable
Action Plans
(NREAPs)

For each
action
plan:

National 2020
targets

Measures to
reach the
targets



Germany

NEEAP (2017)

- Goal of reducing the primary energy consumption to 276.6 Mtoe in 2020 (from 314.3 Mtoe in 2008)
- The expectations is to reach 273.8 Mtoe in 2020

The measures to reach this is:

- The National Energy Efficiency Plan from 2014 (NAPE)
- KfW energy efficiency programs
- Competitive tendering model for energy efficiency
- Energy Audits for non-SMEs
- National energy efficiency labelling
- Smart Metering

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

NREAP (2010)

- Goal of 19.8% Renewable Energy in 2020

The measures to reach this is:

- Renewable Energy Act (EEG)
- Renewable Energies Heat Act (EEWärmeG)
- Market Incentive Programme
- KfW-funding programs
- Combined Heat and Power Act
- Energy Saving Ordinance
- Biofuel Quota Act

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



Poland

NEEAP (2017)

- Goal of reducing primary energy consumption by 13.6 Mtoe from 2010 to 2020
- The forecast is that in 2020 a reduction of the primary energy consumption of 11.97 Mtoe will be reached

The measures to reach this is:

- Energy certificates (white certificates)
- Energy audits
- Smart meters
- Consumer information programmes
- Building renovation strategy

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

NREAP (2010)

- Goal of 15% Renewable Energy by 2020

The measures to reach this is:

- Obligation to purchase energy from RES
- Obligation for grid operators to secure priority for RES
- Reduction of grid connection fees
- Support for small RES (less than 5 MW)
- Various financial support to investments in RES

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



United Kingdom

NEEAP (2017)

- Goal of reducing final energy consumption by 18% in 2020 compared to 2007
- In 2016 a savings of 11% was reached and it is expected to reach 15% in 2020 (218 TWh)

The measures to reach this is:

- Around 6800 energy audits has been completed (Energy Savings Opportunity Scheme)
- The Green Deal which enables consumers to take loans to pay for energy efficiency improvements
- Public sector energy efficiency loans
- Smart metering

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

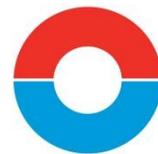
NREAP (2010)

- Goal of 15% Renewable Energy in 2020

The measures to reach this is:

- Renewables Obligation
- Feed in Tariffs
- Renewable Heat Incentive
- European Investment Bank
- Green Investment Bank
- Various bioenergy schemes
- Low carbon building programme
- Building Regulations

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



Spain

NEEAP (2017)

- Goal of reducing primary energy consumption by 25.3% in 2020 (41.2 Mtoe)
- The current target is to reach a reduction of 24.7% in 2020 compared to a baseline scenario (40.2% reduction)

The measures to reach this is:

- Law 15/2012 on fiscal measures for energy sustainability
- PAREER-CRECE Programmes, which aids improvements of building efficiency and improvements of heating and lighting systems
- JESSICA-FIDAE fund. Supports energy efficiency and solar thermal

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency->

NREAP (2010)

- Goal of 20% Renewable Energy in 2020

The measures to reach this is:

- General
 - Support for R&D and upcoming technologies
 - Streamlined regulation for RE
- Electricity generation
 - Support Smart Grid technologies
 - Planning of new transmissions lines
 - Demand management in real time
- Thermal Renewable Energy
 - Involve financial system in funding of thermal RE
 - Inclusion of heating networks in building certifications
 - Introduction of RE in heating through municipal involvement
- Hydro, geothermal, solar, wind, biomass and biofuels

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



Romania

NEEAP (2017)

- Indicative target of reducing primary energy consumption by 10% in 2020 achieving a saving of 10 Mtoe, so that the primary energy consumption will be 42.99 Mtoe in 2020.

The measures to reach this is:

- Energy Efficiency Obligation Schemes
- Energy Audits
- Metering and billing
- Consumer information programmes
- Energy Efficiency measures in buildings both residential and public
- Energy Efficiency measures in industries

NREAP (2010)

- Goal of 24% Renewable Energy in 2020

The measures to reach this is:

- RES Valuation Strategy
- Energy strategy for Romania 2007-2020
- Carrying out Joint Implementation type projects
- Use of biofuels in combination with conventional fuels
- Co-financing schemes
- Programme on increasing energy efficiency in the public sector
- Programme on the production from RES



Latvia

NEEAP (2017)

- Indicative target of reducing primary energy consumption by 0.67 Mtoe in 2020 so that the consumption will be 4.47 Mtoe
- It is estimated that a reduction of 0.69 Mtoe will be reached in 2020

The measures to reach this is:

- Energy Efficiency Obligation Scheme
- Energy efficiency obligations of public authorities
- Energy audits
- A national energy efficiency fund

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

NREAP (2010)

- Goal of 40% Renewable Energy in 2020

The measures to reach this is:

- Oblige public utilities to purchase electricity from RES, biomass and Cogeneration plants
- Reduction of excise duty
- Develop public awareness of climate change
- Increase energy performance of government buildings, tertiary education building and manufacturing building
- Development of GHG reducing technologies
- RES utilization in the transport and household sector
- Measures to increase efficiency in district heating systems

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



Portugal

NEEAP (2017)

- Indicative target of reducing primary energy consumption by 25% to 22.5 Mtoe in 2020 from a 30 Mtoe projection
- In 2015 the primary energy consumption was below this, and it is expected that it will be below the 25% reduction in 2020

The measures to reach this is:

- Energy Efficiency Obligation Schemes
- Energy Audits
- Consumer information programmes
- Energy Efficiency funds

NREAP (2010)

- Goal of 31% Renewable Energy in 2020

The measures to reach this is:

- Improve planning and licensing of electricity
- Support mini-production of electricity
- Various programmes for “hydro, wind, solar, wave, biomass, geothermal and biogas” in electricity, heating, cooling and transport sectors

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>



Denmark

NEEAP (2017)

- Goal of reducing gross energy consumption by 14.5 % in 2020 compared with 2006 (719.6 PJ)
- The baseline projection indicates that Denmark will reach 730 PJ in 2020

The measures to reach this is:

- The national energy efficiency obligation scheme, which includes a target of 10.1 PJ of annual savings (this was formerly 12.2 PJ)
- Energy audits of large enterprises (500-700 in Denmark)
- Individual meters for heat and electricity costumers (around half have implemented this already)
- Building code has implemented low-energy building requirements with building classes 2015 and 2020

Source: <https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficiency-directive/national-energy-efficiency-action-plans>

NREAP (2010)

- Goal of 30% RE in 2020

The measures to reach this is:

- Governmental investment in research, development and demonstration projects
- Efforts for increase of energy efficiency in buildings
- Energy savings efforts on national and local levels
- Price subsidies for energy generation from RES
- Financial support for mini and micro installations
- Biofuel blending obligations
- Tax reliefs

Source: <https://ec.europa.eu/energy/en/topics/renewable-energy/national-action-plans>

1.3.2 EU Directives with a main impact on heating & cooling



Directive 2010/31/EU
of the European
Parliament and of the
Council of 19 May
2010 on the energy
performance of
buildings



Directive 2012/27/EU
of the European
Parliament and of the
Council of 25 October
2012 on energy
efficiency



The Clean Energy
Package (November
2016)



The Clean Energy Package (November 2016)

- Renewable Energy Directive (revised for 2030 targets):
 - Framework for renewable heating and cooling
 - Market framework for district heating and cooling
 - District heating/cooling potential to provide balancing, demand response and storage services
 - Waste heat and cold as supply source
 - Bio-sustainability criteria for biomass and biomass fuels used in heating and cooling
 - Renewable self-consumption and renewable energy communities
- Energy Performance of Buildings Directive:
 - Long-term renovation strategies for highly efficient and decarbonized buildings to guide investment decisions
 - Energy performance to take into account renewable energy on buildings and supplied through energy carriers (e.g. district heating and electricity networks)
- Energy Efficiency Directive:
 - Renewable energy on buildings and primary energy savings through district heating/cooling can count towards the national end-use energy saving requirements



1.4 Local and regional objectives, plans and policy on thermal energy

1.4.1 Heating and cooling within urban development

1.4.2 Good policy and legislative initiatives

1.4.3 Local energy system planning



DHC AS A STRATEGIC COMPONENT AND PRIORITY TO DEVELOP A LONG TERM DECARBONISATION ROADMAP TO 2030 AND 2050 (1/2)

- EU long-term objective of reducing greenhouse gas emissions by 80-95% when compared to 1990 levels by 2050
- The transition of the energy system compatible with this greenhouse gas reductions target needs multiple actions: DHC plays leading role.
- Significant investments need to be made in renewable energy, energy efficiency and grid infrastructure.
- Policy-makers have to adjust priorities and instruments as renewables' deployment grows
- A stable business climate that promotes investments in the decarbonisation of the H&C sector through energy efficiency and fuel switch to renewables must begin supported by Policies and LG planning capacities: THERMOS enables both



DHC AS A STRATEGIC COMPONENT AND PRIORITY TO DEVELOP A LONG TERM DECARBONISATION ROADMAP TO 2030 AND 2050 (2/2)

- National, regional, and local governments essential in ensuring common long-term objectives are met.
- National long-term strategies with short, medium and long-term plans should be developed
- Strong reporting and monitoring system is encouraged, with reliable data collected.
- Under the Energy Efficiency Directive Article 7, Member States have the obligation to set up an energy efficiency obligation scheme that ensure that energy distributors achieve an energy savings target (1.5% of the annual energy sales to final consumers or equivalent measures).
- In the post-2020 framework attention should be put in avoiding provisions that are locking-in technologies non-compatible with the decarbonisation objectives



1.4.1 Heating & cooling within urban development

- Several actors are responsible for DHC within the municipality (energy in public buildings, energy planning, energy aspects of urban development, etc.).
- Energy services have to be considered in the planning phase: when they prove to be a viable option (technologically and economically), they should be financed and implemented
- Thermal-quality (both heating and cooling) requirements for buildings tighten in time(including the requirement of how much cooling a building is allowed to need). New buildings and renovations are adjusted to comply to these new requirements. Subsidies can be foreseen for the compliance.
- (Industrial) excess heat from the paper industry could potentially get fed into the district heating network.
- Energy agencies have to conduct awareness raising activities
- Many of the older buildings could benefit from refurbishment measures, especially thermal renovation.
- A sound local regulatory planning framework must be present to encourage companies to invest.
- Strategic long-term planning and forward thinking helps to reach the targets.
- THERMOS tool answers to that



1.4.2 Good policy and legislative initiatives

- EU's 2030 climate and energy objectives are translated by the European institutions into standardised templates for lower tiers
- Ambitious minimum requirements in Nearly Zero Energy Buildings
- Avoid lock-in and investments in technologies non-compatible with the decarbonisation objective
- In the revised RES Directive, for instance, there is a need to develop a definition and a methodology to take into account renewable cooling.



1.4.3 Local energy system planning

Thermos planning concept - the baseline replication assessment report:

- The Baseline Replication Assessment Report aims to map-out and assess the national and local framework conditions for a successful adoption of the THERMOS model.
- The four Pilot Cities of the THERMOS project: Granollers, Islington, Jelgava and Warsaw.
- Most relevant characteristics and features that should be considered for the adoption of the THERMOS tool through energy mapping are analysed.
- The analysis for THERMOS energy system mapping covers the following elements:
 - Heating and Cooling in the local context:
 - analysis of the local energy system (energy mix, key performance indicators on thermal supply and demand),
 - key energy policy and legislation, the adoption of Renewable Energy Sources (RES) in the city
 - existing energy objectives and plans
 - Stakeholder Identification and Engagement
 - Barriers that could prevent the adoption of the THERMOS tool and the solutions to overcome them are examined



1.5 Policy barriers and opportunities: Optimising the heating and cooling sector

1.5.1 European level

1.5.2 National level

1.5.3 Regional level

1.5.4 Local level



What:

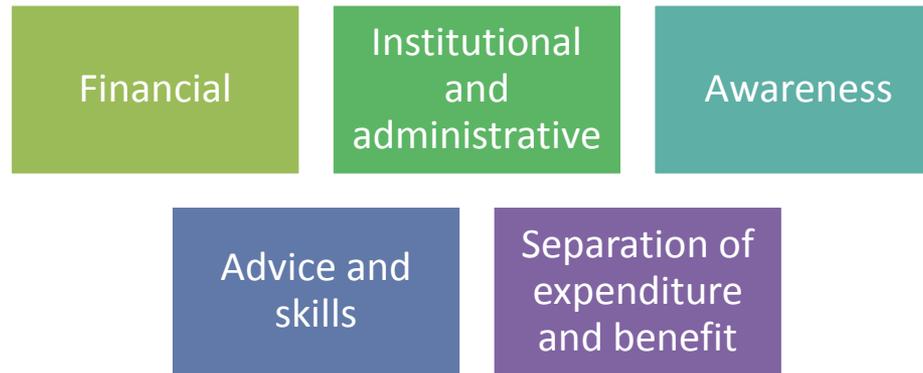
- a) Hindering/fostering factors in using and implementing DHC technologies, which can principally be overcome by suitable policies.
- b) Frame conditions that lead to use/non-use of DHC technologies

Using the adapted of Doble and Bullard (2008a, 2008b) and Reddy (2013) we can divide:

- *Supply-side barriers*: inhibitive factors for the implementation of DHC technologies.
- *Demand-side barriers*: inhibitive factors for the use of DHC technologies on supply side



The classification of barriers and opportunities as identified by the BPIE survey (Economidou et al. 2011) are:



In particular:

- Financial-economic factors can be seen as factors limiting financial feasibility or profitability:
 - such as initial investment as well as ongoing costs and benefits
- Institutional-structural and market oriented factors play an important part on feasibility of a DHC network implementation:
 - e.g. political, legal or technologies related framework conditions have to be taken into account because they may affect the economics of an investment



Barriers and opportunities

Supply side

- Infrastructures
- Regulations
- Technology suitability
- Policy framework
- Multi-stakeholder issues

Demand side

- Energy demand
- Building stock
- Policy framework
- Multi-stakeholder issues



Stakeholders as individuals have to be taken into account as well in their *behavioral* factors as knowledge and awareness.

BAU approach

Training

Uncertainties

Knowledge / awareness gaps

Trained practitioners and workmen

Risk reluctance

Loan/debt reluctance



1.5.1 European level

1. Understand the need to pursue full decarbonisation of the building sector and to decarbonise the H&C sector as a whole

EU supporting technological development to decarbonise economies and to ensure competitiveness because:

- Almost 50% of EU final energy consumption is used in the heating and cooling (H&C) sector.
- Buildings are the first consumers of H&C. In some colder climate zones, space heating can account for more than 80% of H&C consumption.
- Huge potential lies in the building sector to decarbonise the H&C sector as a whole.
- When decarbonising the building sector, it is crucial to reduce energy demand of buildings through energy efficiency measures and simultaneously increase the share of renewable energy sources in the remaining energy consumption.

Fight against energy poverty and stability to heat supply to protecting consumers:

- DHC used energy management a whole system and better works towards integration, smart thermal grids and to new industrial processes.



2. Trigger renovation in existing buildings

- Setting long term (2050) national refurbishment strategies with minimum requirements in terms of primary energy and with some form of financial support:
- Owners generally fail to undertake cost-efficient renovations because of lacking awareness of the benefits, and financial constraints.
- The tenant/landlord issues also plays an important role as large shares of houses are rental housing.
- Modernising and replacing the old stock of individual heating installations with modern and renewable installations is a must but is also very challenging due to the structure of ownership.



1.5.2 National level

1. Regulations barriers and opportunities

Regulations vary from country to country as well as at the local level

Land use regulations can hinder or foster investment in infrastructure

- LGs can foster more investment in district heating based on combined heat and power when they act as guarantors

Technical regulations

- installation of meters and comply with monitoring, verification, and reporting protocols
- Space use, occupation authorisations
- Fees to obtain permits or licenses,

Building law

- Depending on the type of action/refurbishment, projects need specific authorization procedures



2. Institutional-structural market oriented barriers and opportunities

Energy demand - affects the feasibility of renewable energies:

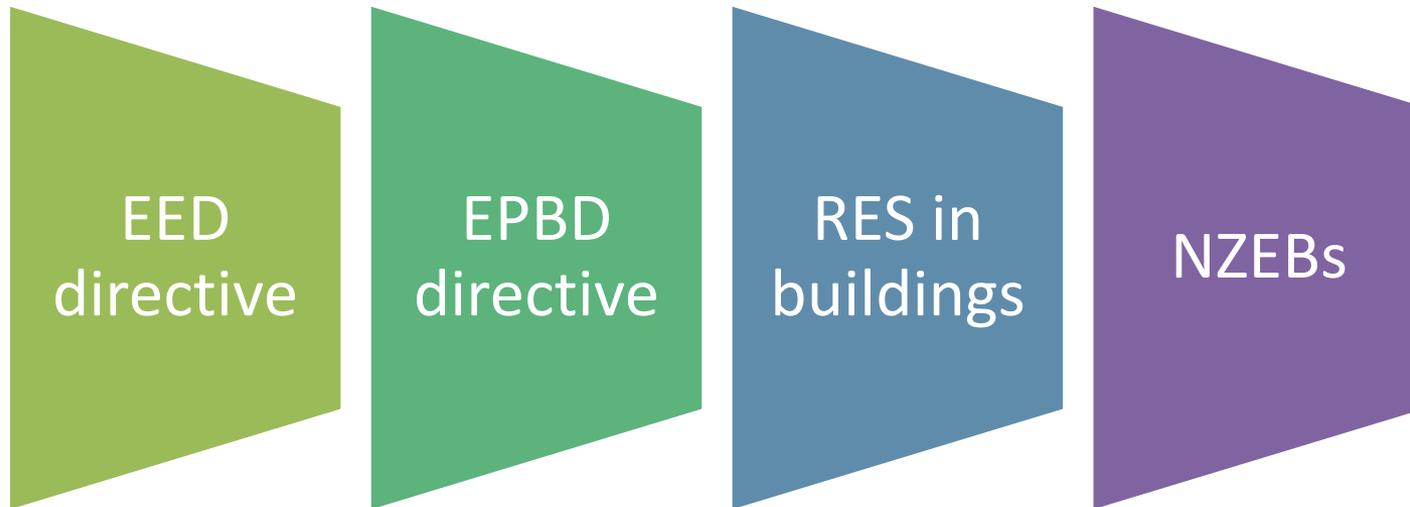
- Residential sector
- Non-residential (service) sector
- Cooling demand

Building stock

- Buildings of historic interest
- Age
- Size
- Ownership



3. Development of favorable building codes





1.5.3 Regional level

Administrative procedures that are managed at regional level

- Energy burden sharing goals
- Infrastructural authorisations
- Structural funds: indirect EU funds and regional funding



1.5.4 Local level

The Role of Local Governments:

Local governments worldwide are using a wide range of policies and activities to promote district energy, demonstrating the significant and diverse roles that cities can play in deploying such systems.

Local Government as Planner and Regulator:

- Energy policy objectives, strategy and targets
- Energy mapping
- Holistic energy plans: integrating energy in infrastructure and land-use planning
- Connection policies

Local Government as Facilitator: Enabling Actions to Leverage Finance:

- Financing and fiscal incentives
- City assets
- Demonstration projects



Local Government as Provider and Consumer

- Municipal utility targets and promotion policies
- Municipal utility interconnecting resources and networks
- Waste tariff regulation
- City as consumer

Local Government as a Coordinator and Advocate

- Market facilitation and capacity-building
- Awareness-raising and outreach
- Advocating for district energy at other levels of government



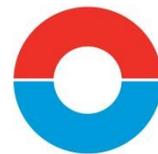
Conclusion

1.1 Status of heating and cooling in Europe

- From the overview it is clear that district heating supplies around 9% of the heat and cooling supply within the EU, while varying between 0-37% within the specific countries
- The demand is split into industry, residential and service sectors consisting mostly of space heat, process heat and hot water

1.2 Key EU objectives, plans and policies on thermal energy

- The key objectives on GHG reductions and energy efficiency are to be reached mainly through a focus on energy efficiency, renewable energy and the synergies between heating, cooling and electricity systems where district heating is an important technology



Conclusion

1.3 Translating EU objectives into national plans and policies

- All countries have made National Energy Efficiency Action Plans (NEEAPs) & National Renewable Action Plans (NREAPs)

1.4 Local and regional objectives, plans and policy on thermal energy

- All countries have regional and local Plans although local variety plays a key role

1.5 Policy barriers and opportunities optimising the heating and cooling sector

- Different tiers on regulatory aspects hinder the processes and lengthen the timings of decision making and planning

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