The European Commission's science and knowledge service

Joint Research Centre

European Commission

The JRC-IDEES
RESIDENTIAL AND SERVICES

Brussels, 12 Oct 2017

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JRC-IDEES

Integrated
Database of the
European
Energy
System

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RESIDENTIAL

Thermal uses

Space heating
Space cooling
Water heating
Cooking

Main household types
- central heating with solids
- central heating with diesel oil
- central heating with natural gas
- central heating with LPG
- central heating with biomass and waste
- advance electric heating households
- conventional electric heating households
- district heating households
- geothermal heating households

Specific electricity uses

Lighting
White appliances
- refrigerators and freezers
- washing machines
- tumble dryers
- dishwashers

TV and multimedia
ICT equipment
Other electric appliances

43 installation types for thermal uses in households considered

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SERVICES

Thermal uses	Specific electricity uses
Space heating	Street lighting
Space cooling	Building lighting
Hot water services	Ventilation
Catering	Miscellaneous building technologies
	Commercial refrigeration
	ICT and multimedia

Each energy use in the services sector is treated separately

DATA SOURCES

A variety of data sources were considered in order to perform the decomposition:

- EUROSTAT – household consumption expenditure, population, heating degree days
- EC supported projects and studies
  - 'Survey on Energy Consumption in Households' (SECH 2010)
  - various 'Preparatory Studies on the Eco-design of Energy Using Products'
  - EU Building Observatory, BPIE, TABULA, ENTRANZE, EPISCOPE on buildings characteristics
  - JRC studies and reports
- Official national surveys and statistics

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Domestic Sector Decomposition

Identification of the number of **consumption units**

Households by cluster type for the residential sector

- Characterized by the combined space and water heating equipment
- Number of households equipped with solar thermal water heaters

Representative building cells for services

- The typical size of such a building cell is assumed constant to 450 m^2 across EU Member States over time

Characterisation of the installed energy equipment in a **vintage – specific** manner

Explicit quantifications of

- Existing energy installations (stock) and the retired ones
- New installations in existing constructions

  Cluster related constraints apply for the residential

- Completely new or fully renovated constructions

While taking into account different building characteristics

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Diesel oil Household Structure

Residential: Diesel oil heating household	Space heating, water heating (oil household)	Oil boiler / SHD wh	Space heating (oil household) Water heating (oil household)	Oil boiler Space heating device (oil)
		Oil boiler / SHD+solar wh	Space heating (oil household) Water heating (oil household)	Oil boiler Space heating device (oil) + Solar
		Oil boiler / electric wh	Space heating (oil household) Water heating (oil household)	Oil boiler Electric water heater
		Oil boiler / solar-electric wh	Space heating (oil household) Water heating (oil household)	Oil boiler Solar-Electric water heater
	Space cooling (oil household)	Space cooling (oil household)		Air conditioning
	Cooking (oil household)	Cooking (oil household)		Cooking LPG Cooking Electric

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SPECIFIC ELECTRICITY USES

Characterised at the level of consumption unit

- Appliance
- Representative electric device (e.g. ICT equipment)
- Square meters (e.g. Ventilation)

Decomposition to reflect the different drivers of energy consumption

- Operating hours
- Technical characteristics (Wattage)
- Penetration factor

Explicit consideration of new equipment characteristics

Preparatory studies under 'Eco-design of energy using products regulation' taken into consideration and matched at the EU level

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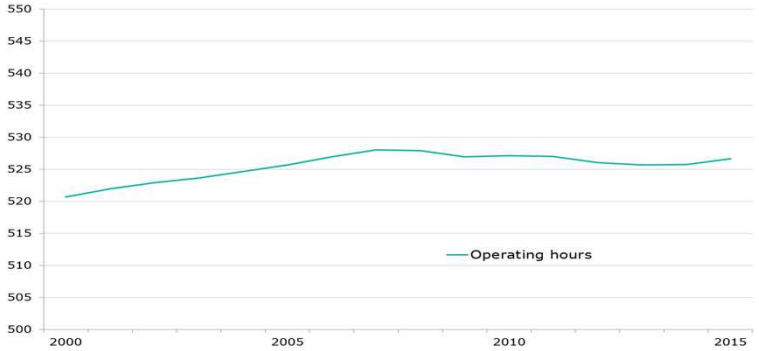
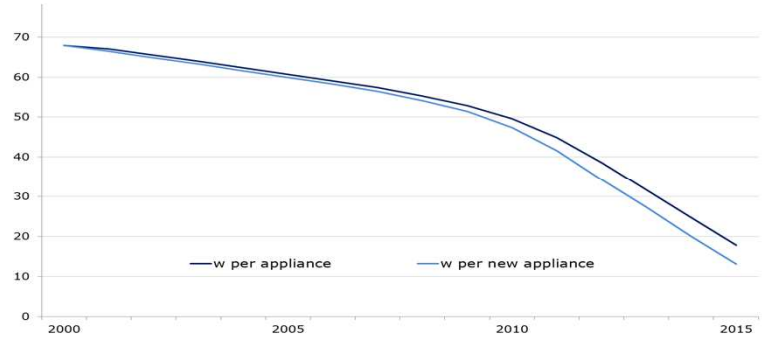
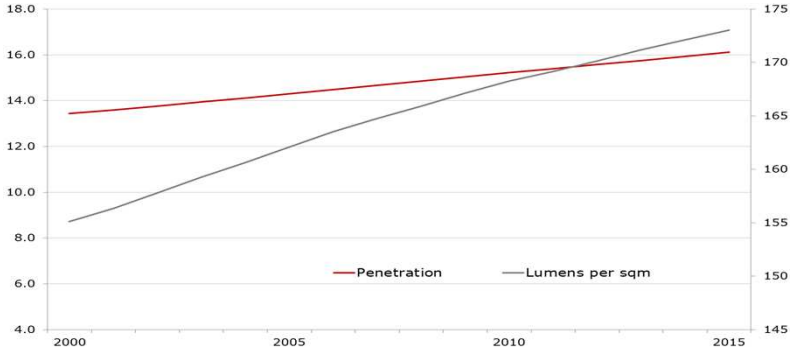
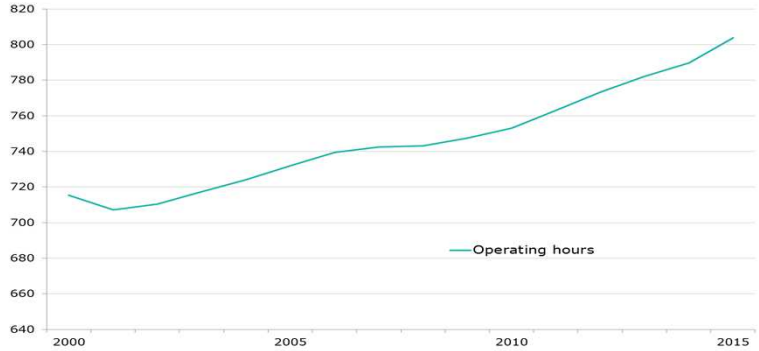
LIGHTING

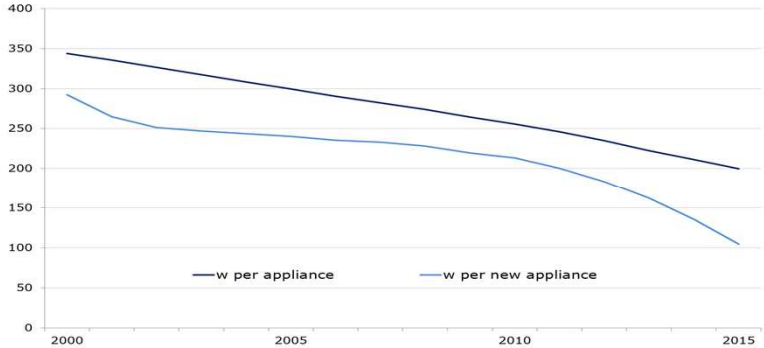


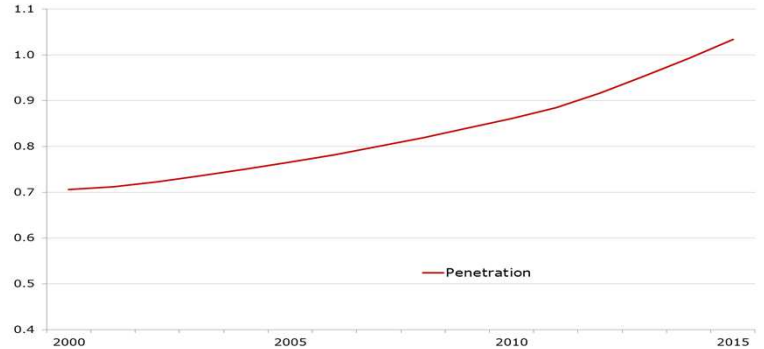




WASHING MACHINE







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WHAT CAN BE FOUND IN JRC-IDEES

Macro – economic, climate, demographic data

Household related information

- Number of households
- Total households useful surface area
- Number of new and renovated households
  and the corresponding useful surface area
- Household size
- Retired equipment
- New equipment installation
- Equipment installations in 2015 – the vintage structure

Electric appliances

- Stock – total, new installations, replacement
- Wattage and operating characteristics

Final and useful energy consumption by fuel at the level of end uses, per surface area

Energy related equipment stock characteristics

CO_2 emissions by fuel at the level of end uses per household, per surface area

Intensity indicators

File Structure – Aggregated information

RES_summary - **Residential sector summary**

Thermal uses		Thermal uses in new and renovated households		Specific electric uses	
RES_hh_num	Number of households	*RES_hh_num_in*	Number of new and renovated households	*RES_se-appl*	Residential / specific electric uses
RES_hh_fec	Final energy consumption	*RES_hh_fec_in*	Final energy consumption	*RES_RF*	Refrigerators and freezers
RES_hh_tes	Thermal energy service	*RES_hh_tes_in*	Thermal energy service	*RES_WM*	Washing machines
RES_hh_eff	System efficiency indicator of total stock	*RES_hh_eff_in*	System efficiency indicator of total stock	*RES_DR*	Clothes dryers
				RES_DW	Dishwashers
RES_hh_emi	CO2 emissions	*RES_hh_emi_in*	CO2 emissions	*RES_TV*	TV and multimedia
				RES_IT	ICT equipment
RES_hh_fech	Final energy consumption per household	*RES_hh_fech_in*	Final energy consumption per household	*RES_LI*	Lighting
				RES_OA	Other appliances (vacuum cleaners, irons etc.)
RES_hh_tesh	Thermal energy service per household	*RES_hh_tesh_in*	Thermal energy service per household		
RES_hh_emih	CO2 emissions per household	*RES_hh_emih_in*	CO2 emissions per household		
RES_hh_fecs	Final energy consumption per surface area	*RES_hh_fecs_in*	Final energy consumption per surface area		
RES_hh_tess	Thermal energy service per surface area	*RES_hh_tess_in*	Thermal energy service per surface area		
RES_hh_emis	CO2 emissions per surface area	*RES_hh_emis_in*	CO2 emissions per surface area		

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File Structure – Detailed information

Number of households		Thermal uses		Thermal uses in new and renovated households	
RES_hhdet_num	Number of households	*RES_hhdet_fec*	Final energy consumption	*RES_hhdet_in_fec*	Final energy consumption
RES_hhdet_out	Retired equipment	*RES_hhdet_tes*	Thermal energy service	*RES_hhdet_in_tes*	Thermal energy service
RES_hhdet_in	New equipment installations	*RES_hhdet_eff*	System efficiency indicator	*RES_hhdet_in_eff*	System efficiency indicator
		RES_hhdet_emi	CO2 emissions	*RES_hhdet_in_emi*	CO2 emissions
RES_hhdet_in_new	New equipment installations in new and renovated households	*RES_hhdet_fech*	Final energy consumption per household	*RES_hhdet_in_fech*	Final energy consumption per household
		RES_hhdet_tesh	Thermal energy service per household	*RES_hhdet_in_tesh*	Thermal energy service per household
RES_hhdet_in_repl	New equipment installations via replacement	*RES_hhdet_emih*	CO2 emissions per household	*RES_hhdet_in_emih*	CO2 emissions per household
RES_hhdet_numvin	Equipment installations in 2015 - vintage structure	*RES_hhdet_fecs*	Final energy consumption per surface area	*RES_hhdet_in_fecs*	Final energy consumption per surface area
		RES_hhdet_tess	Thermal energy service per surface area	*RES_hhdet_in_tess*	Thermal energy service per surface area
		RES_hhdet_emis	CO2 emissions per surface area	*RES_hhdet_in_emis*	CO2 emissions per surface area

File Structure

Detailed information by household type	
RES_hh_SLD	Solid households
RES_hh_LPG	LPG households
RES_hh_GDO	Diesel oil households
RES_hh_NGS	Gas households
RES_hh_BMS	Biomass households
RES_hh_GEO	Geothermal households
RES_hh_DHT	Derived heat households
RES_hh_AEL	Advanced electric heating households
RES_hh_CEL	Conventional electric heating households

File Structure – Aggregated information

SER_summary - **Services sector summary**

Thermal uses

SER_hh_num	Number of buildings
SER_hh_fec	Final energy consumption
SER_hh_tes	Thermal energy service
SER_hh_eff	System efficiency indicator of total stock
SER_hh_emi	CO2 emissions
SER_hh_fech	Final energy consumption per building
SER_hh_tesh	Thermal energy service per building
SER_hh_emih	CO2 emissions per building
SER_hh_fecs	Final energy consumption per useful surface area
SER_hh_tess	Thermal energy service per useful surface area
SER_hh_emis	CO2 emissions per useful surface area

Thermal uses in new and renovated buildings

SER_hh_num_in	Number of new and renovated buildings
SER_hh_fec_in	Final energy consumption
SER_hh_tes_in	Thermal energy service
SER_hh_eff_in	System efficiency indicator of total stock
SER_hh_emi_in	CO2 emissions
SER_hh_fech_in	Final energy consumption per building
SER_hh_tesh_in	Thermal energy service per building
SER_hh_emih_in	CO2 emissions per building
SER_hh_fecs_in	Final energy consumption per useful surface area
SER_hh_tess_in	Thermal energy service per useful surface area
SER_hh_emis_in	CO2 emissions per useful surface area

Specific electric uses

SER_se-appl	Services / specific electric uses
SER_VE	Ventilation and others
SER_SL	Street lighting
SER_BL	Building lighting
SER_CR	Commercial Refrigeration
SER_BT	Miscellaneous building technologies
SER_IT	ICT and multimedia

Agriculture

AGR	Agriculture sector summary
AGR_fec	detailed split of final energy consumption
AGR_ued	detailed split of useful energy demand
AGR_emi	detailed split of CO2 emissions

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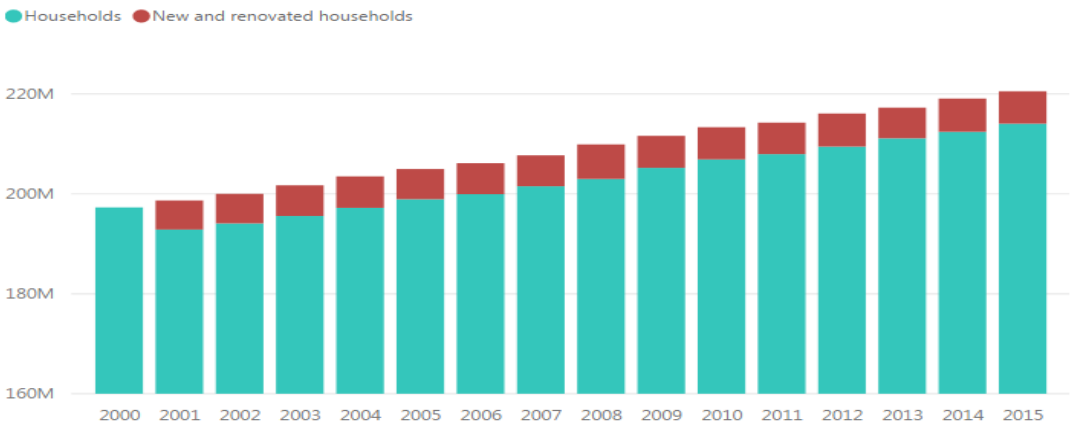
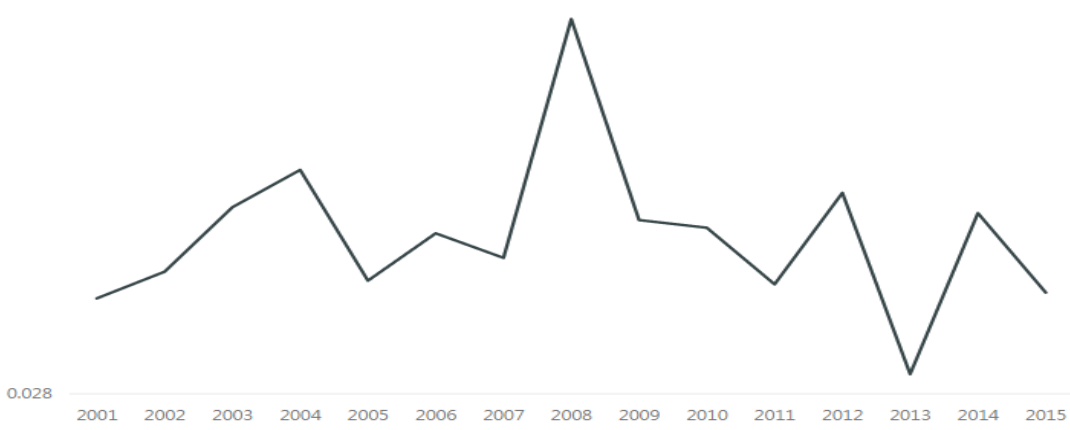
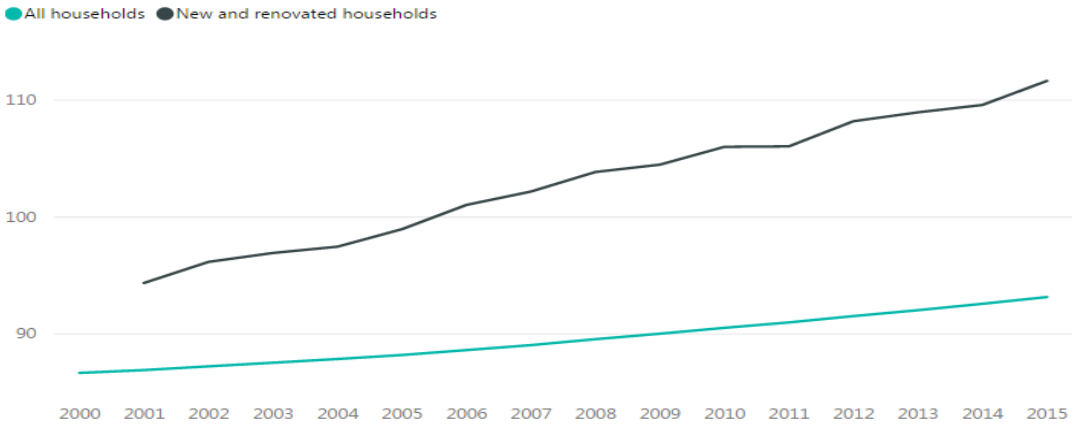
Number of households



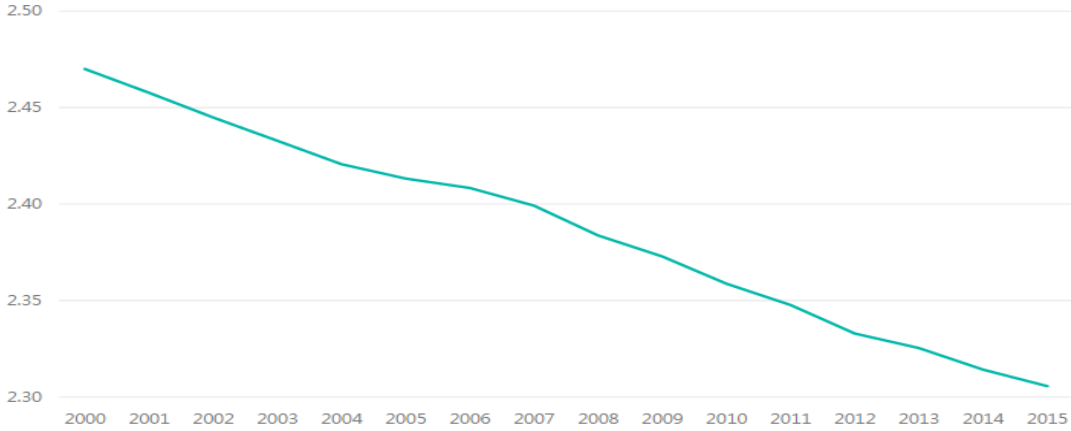
Percentage of new and renovated housholds over total stock



Useful surface area of households (sqm/household)



Size of households (inhabitants/household)



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Variable

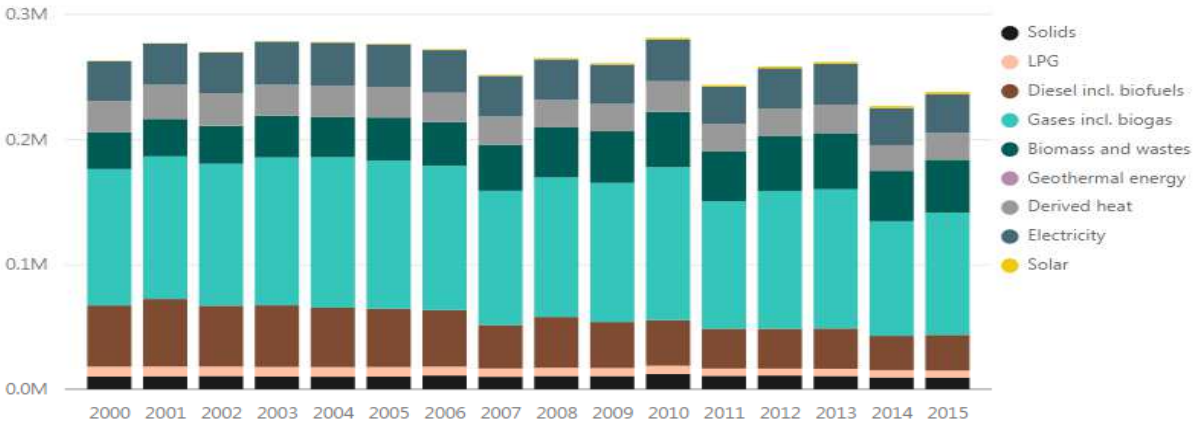
Final energy consumption

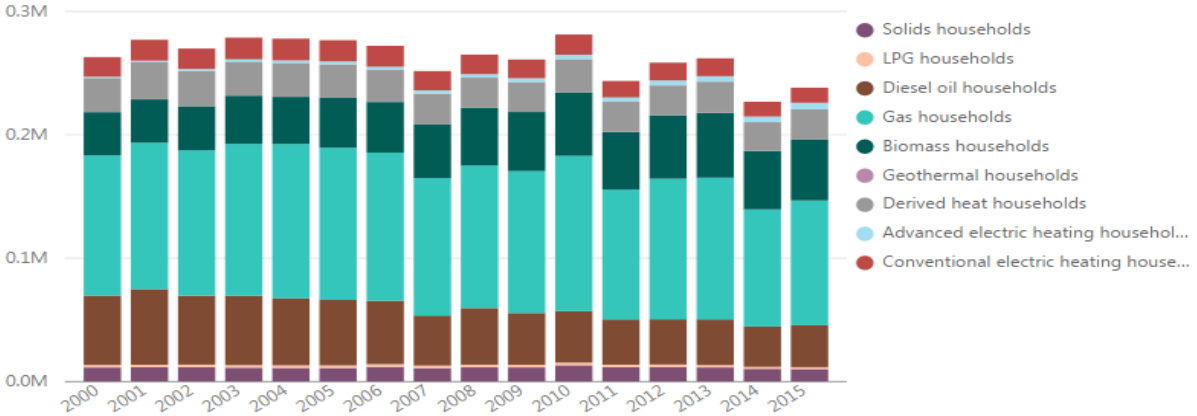
Household type

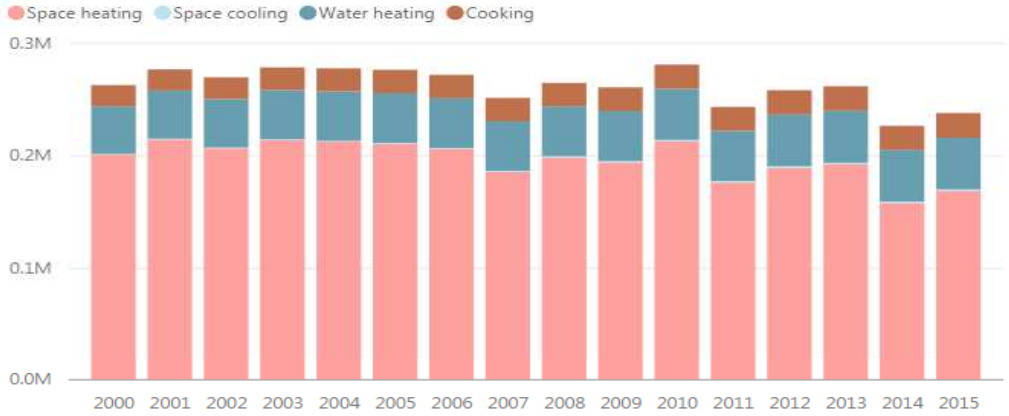
All

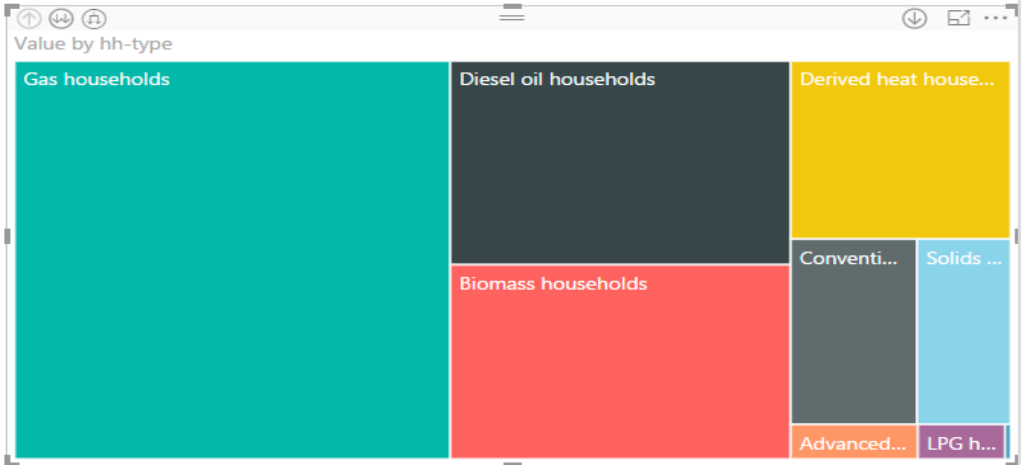
End-use

All









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Variable

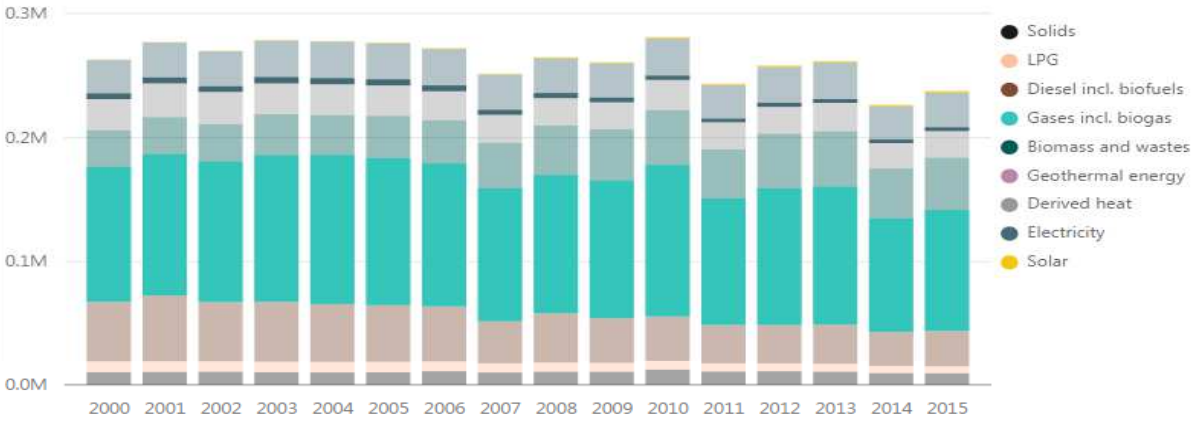
Final energy consumption

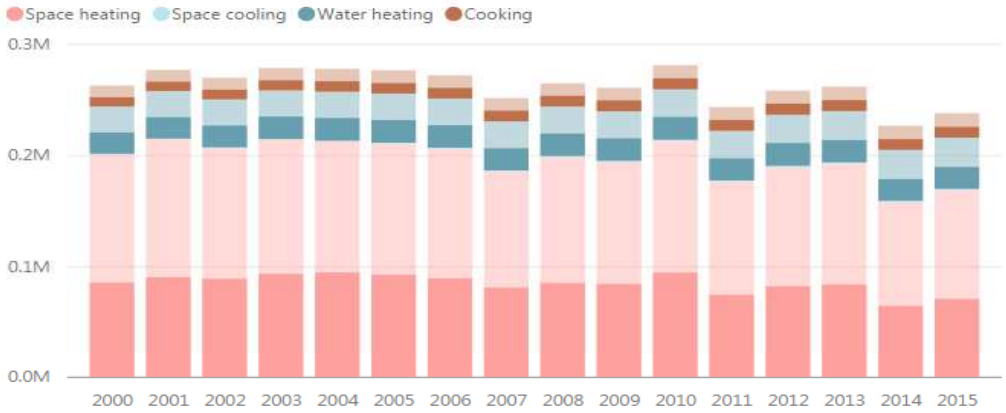
Household type

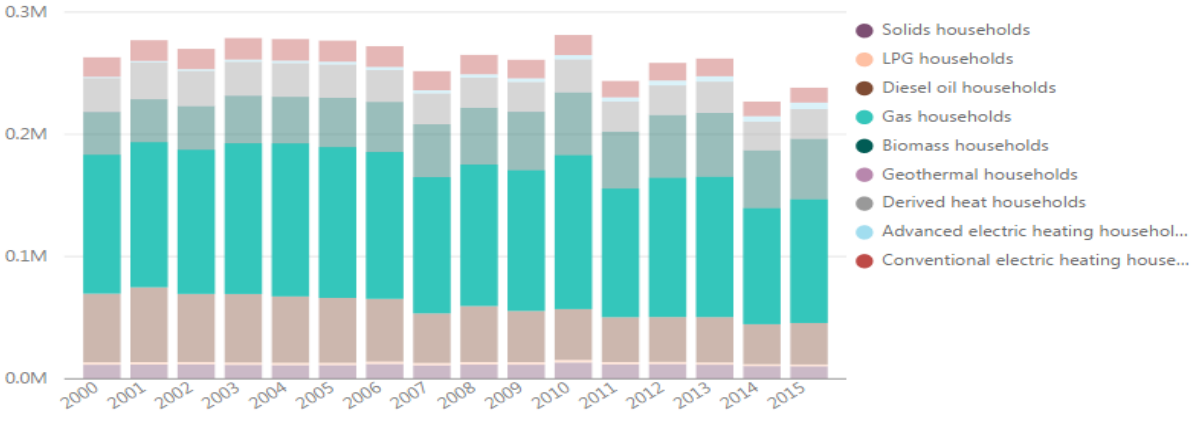
All

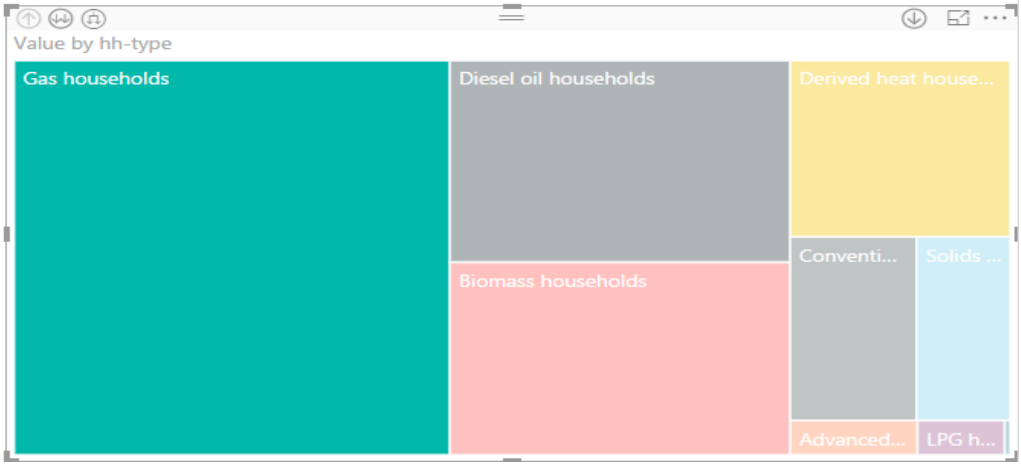
End-use

All









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Variable

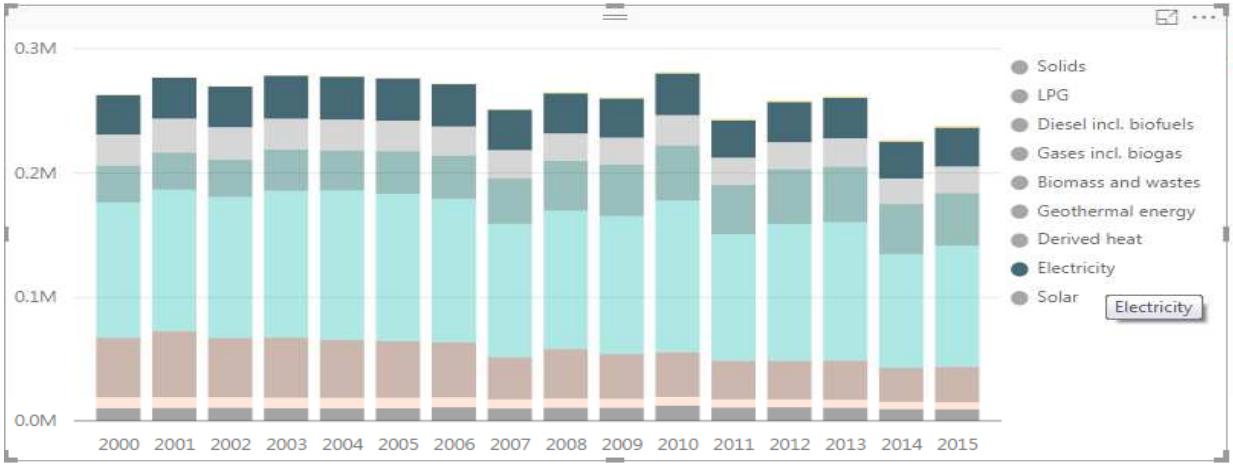
Final energy consumption

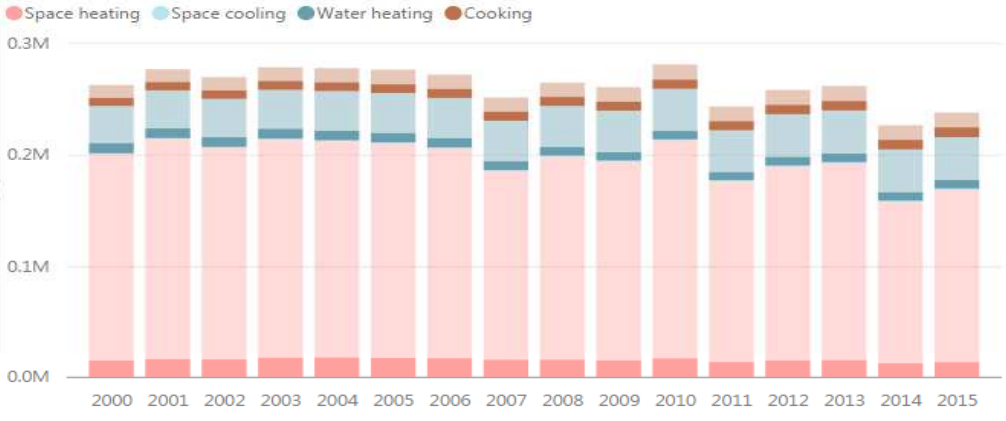
Household type

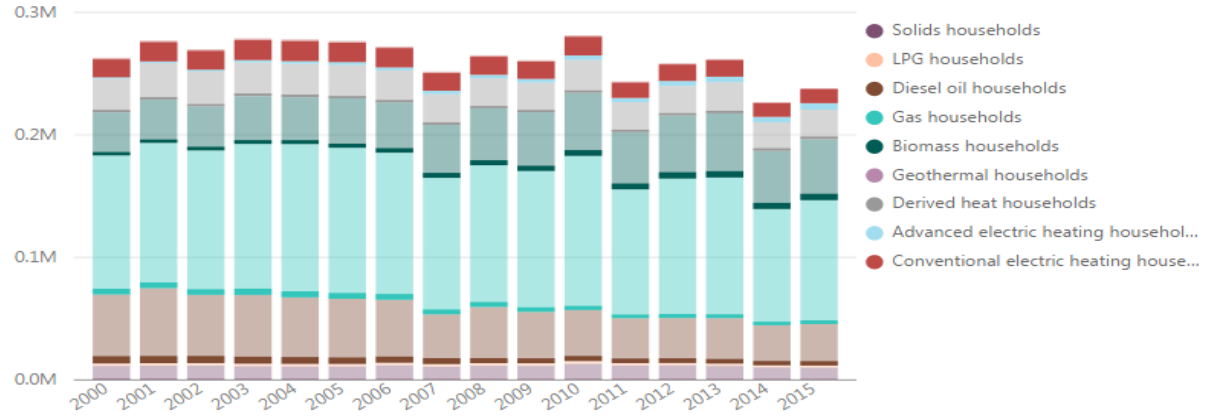
All

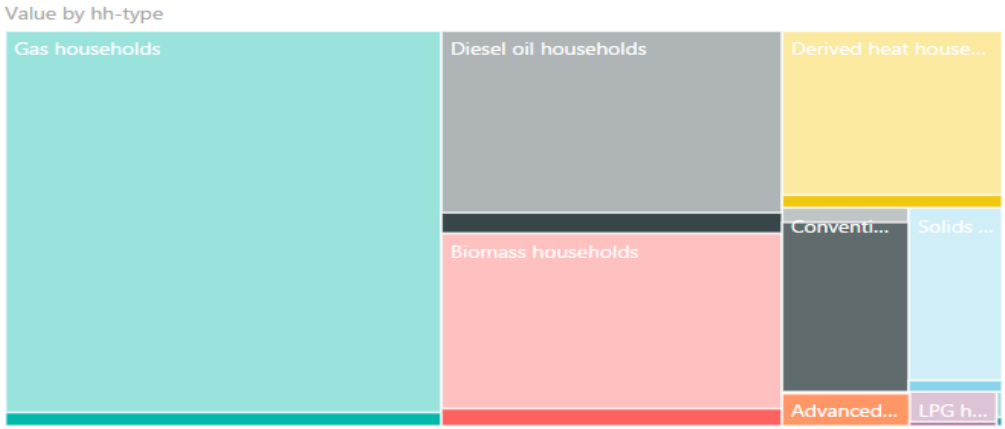
End-use

All









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Variable

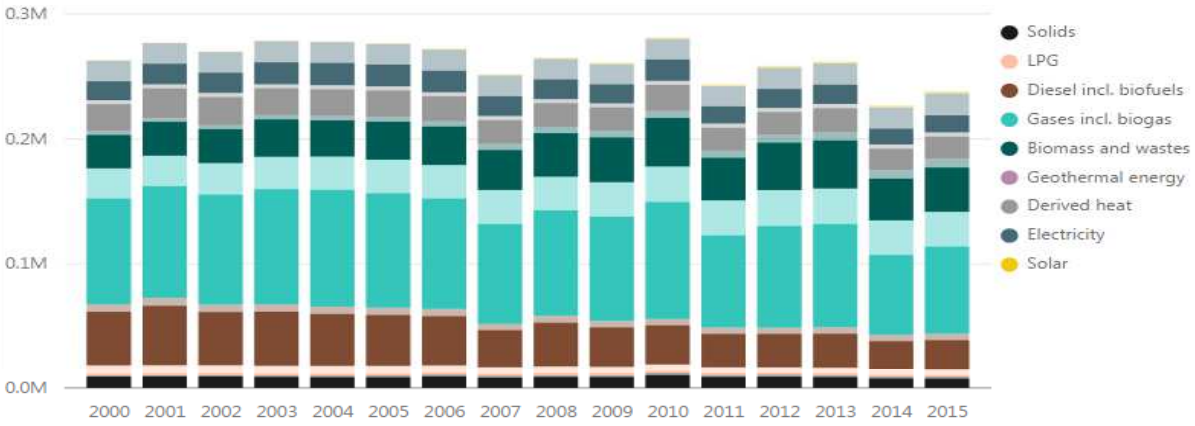
Final energy consumption

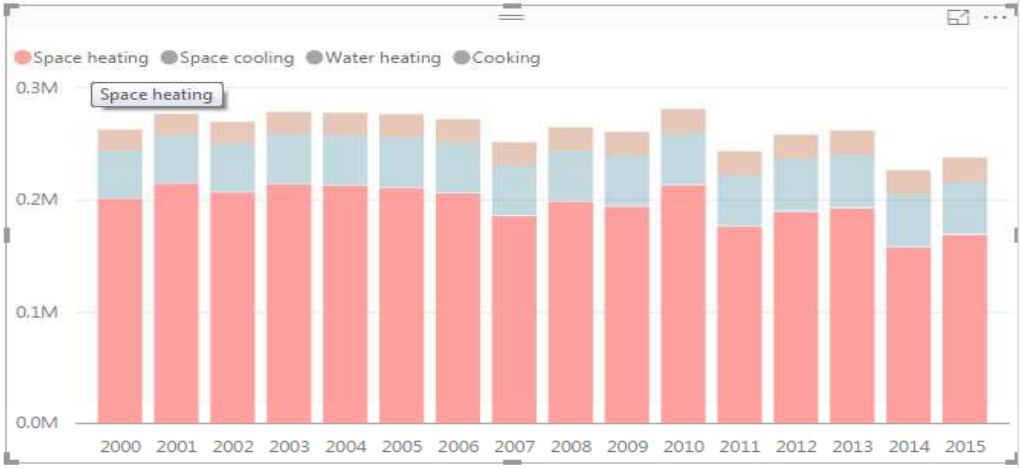
Household type

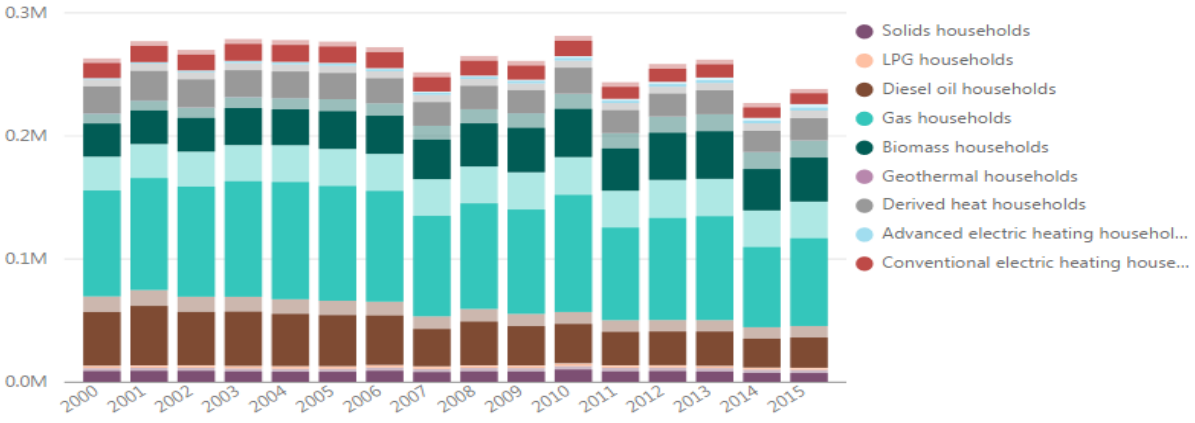
All

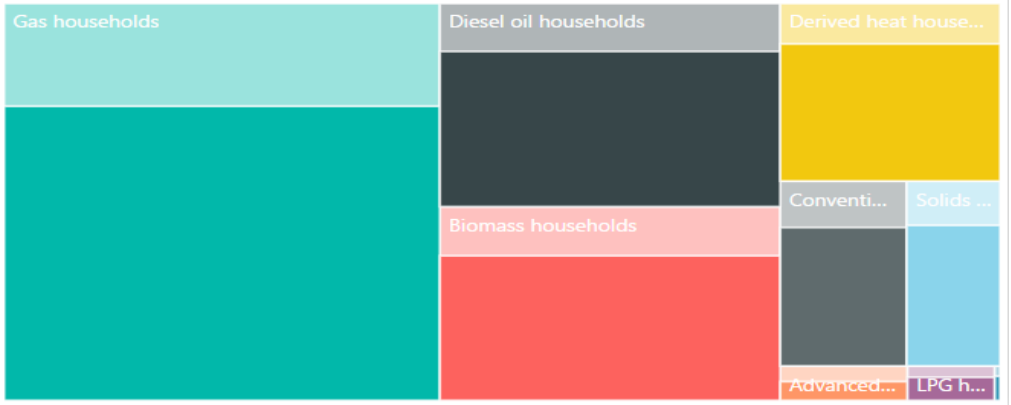
End-use

All









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Variable

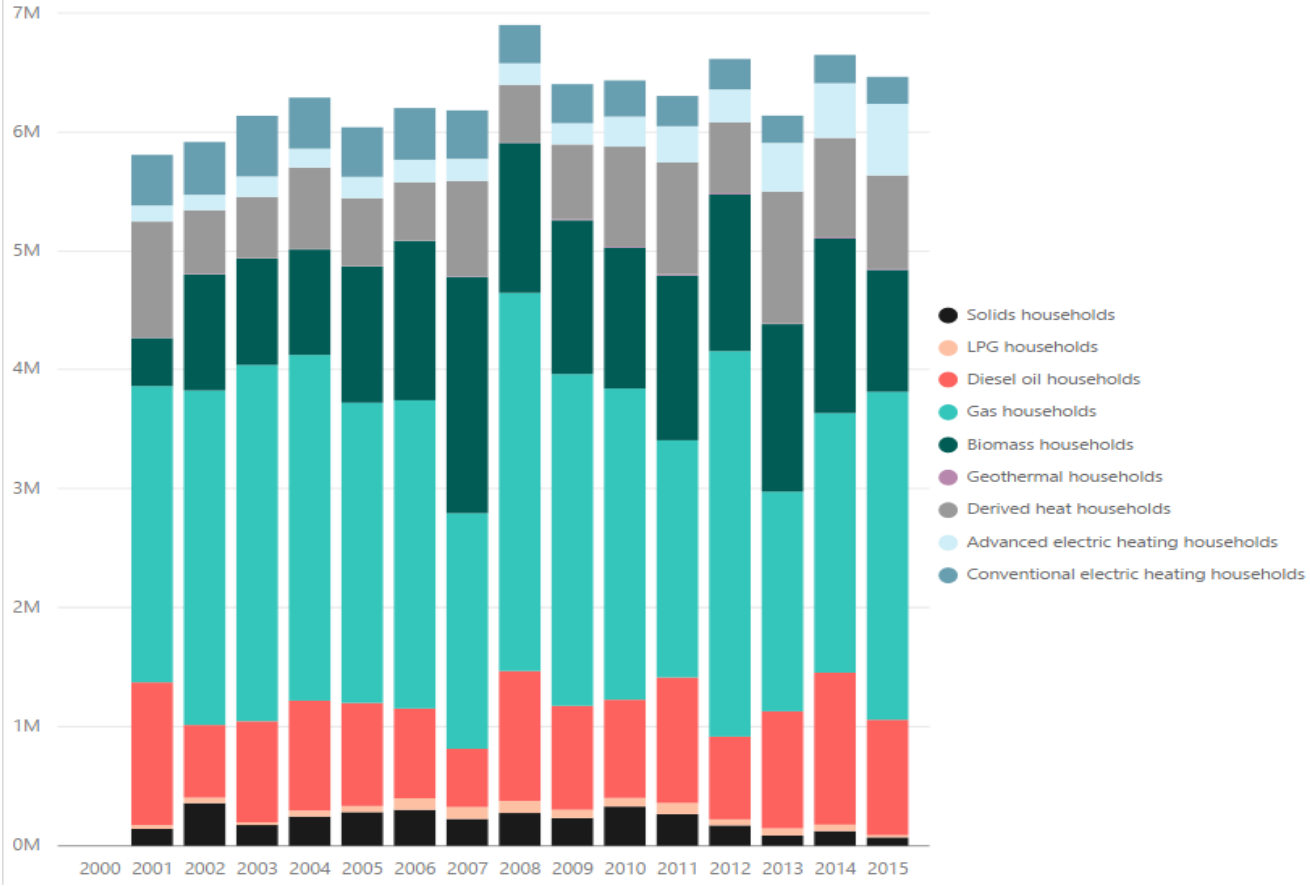
New equipment installations in new and renovated hou...

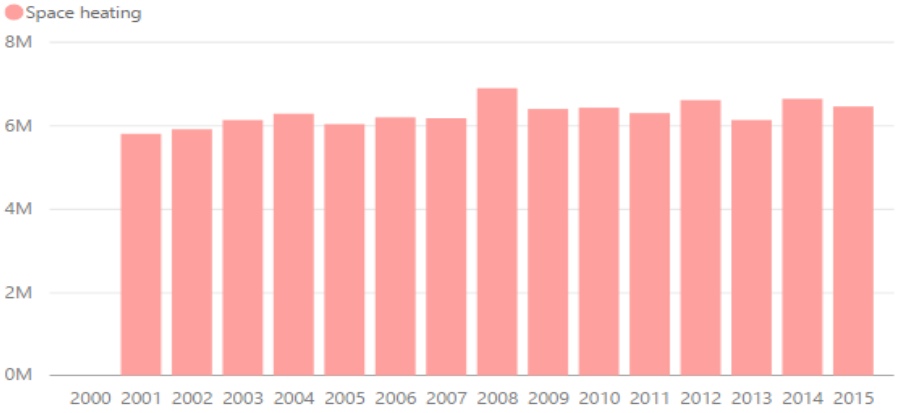
Household type

All

End-use

Space heating





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Variable

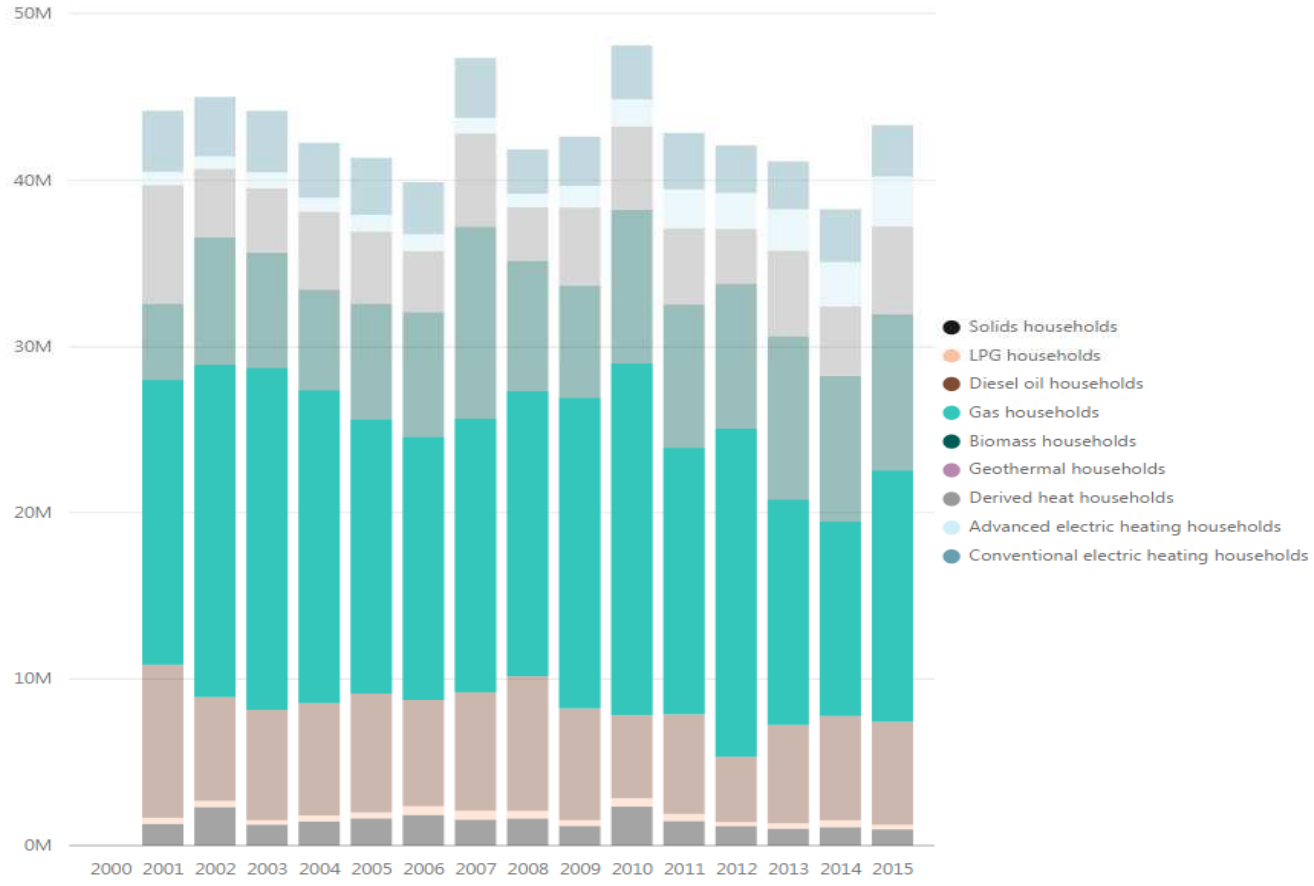
New equipment installations via replacement

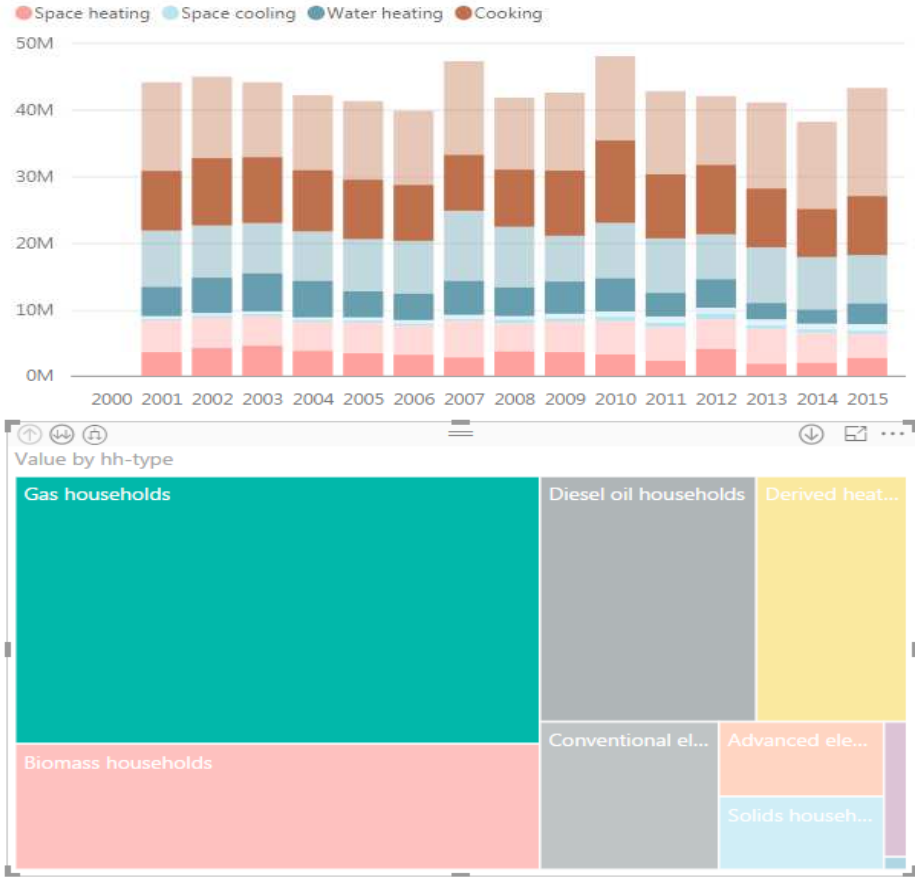
Household type

All

End-use

All





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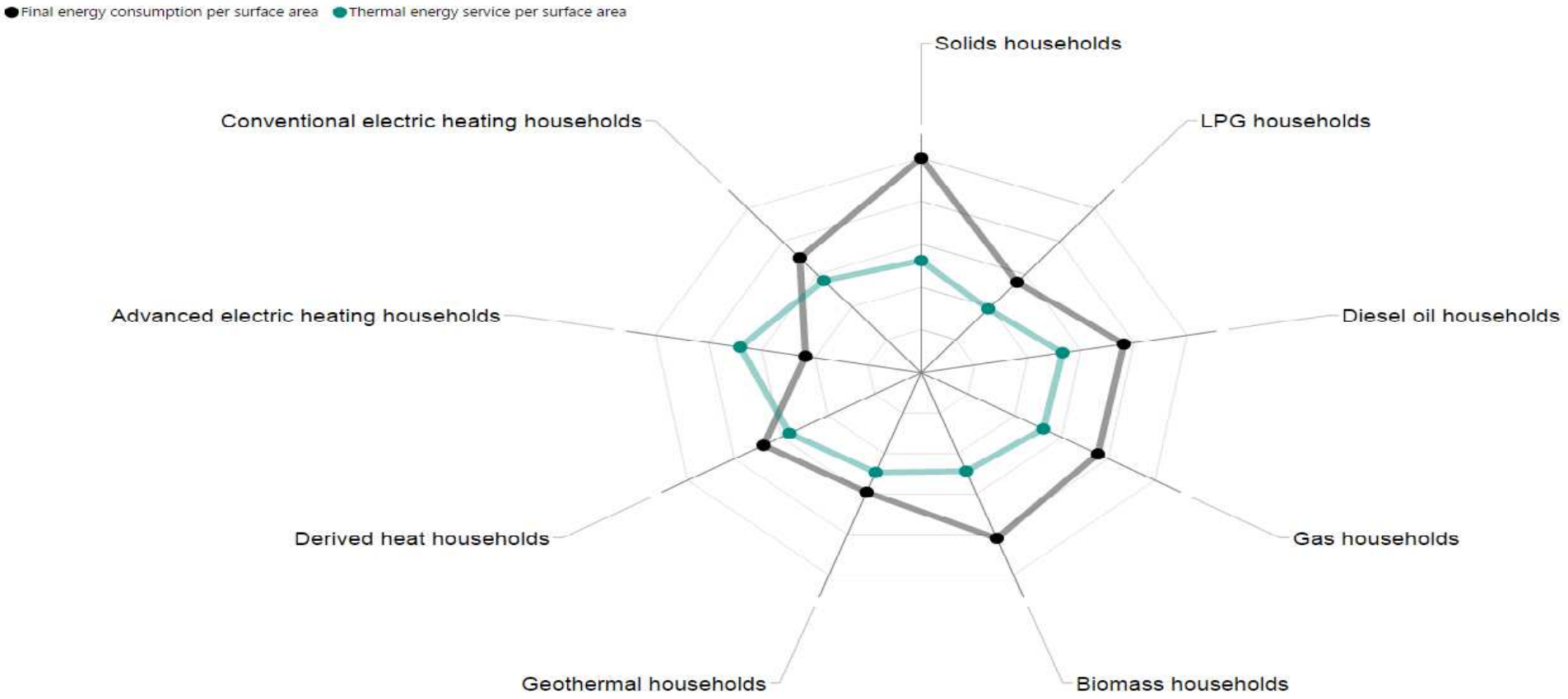
End-use

Multiple Selected

Year

2015



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Thank you for your attention

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