



Building sector indicators, definition, calculation, representation

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Executive Summary

The present report constitutes an extension of preceding project activities, wherein identifying and preparing indicators alongside potential datasets were undertaken. In this report, we delve comprehensively into the procedures and specifications underlying the calculations. During the course of this work, it became clear that there was a need to harmonize the nomenclature used for the indicators. As a result, each indicator is accompanied by its designated appellation and numerical assignment, as well as its newly proposed nomenclature and corresponding numerical designation.

This report provides a collection of indicators, along with their respective definitions and calculation methods for integration into the BuiltHub Platform. The primary focus centers on investigating available datasets and devising calculation protocols for all the outlined indicators. According to the Building Stock Observatory, in the domain of "Energy," there exists a precise three-fold categorization: "Energy Consumption," "Energy Markets," and "Energy Poverty." Likewise, in the context of "Building Stock," a division is observed into "Building Stock Characteristics" and "Building Renovation." The former, denoted as "Building Characteristics," exhibits a three-part breakdown: "Building Shell Performance," "Technical Building Systems," and "Nearly-Zero-Energy Buildings."

Conversely, the thematic areas of "Certification" and "Finance" lack sub-categorization. A hierarchical approach has been employed to enhance the structural coherence and organization of these diverse indicators. Indicators are grouped based on their inherent similarities, using a unique identifier encapsulating their defining attributes. This approach facilitates a comprehensive understanding of the essential nature of each indicator.

1. Energy	2. Building Stock	3. Building Characteristics	4. Certification	5. Finance	6. District Heating Potential
1.1 Energy Consumption	2.1 Building Stock Characteristics	3.1 Building Shell Performance			
1.2 Energy Poverty	2.2 Building Renovation	3.2 Technical Building Systems			
1.3 Energy Market		3.3 Nearly-Zero- Energy Buildings			

This report is structured into several sections to ensure clarity and coherence. In Section 1, we provide a glossary that lists units and abbreviations used throughout the document. This will aid in understanding the technical terms employed. Moving on to Section 2, we offer a comprehensive overview of BuiltHub's thematic areas. This section serves as a broad introduction to the different subjects covered within the BuiltHub framework. Section 3 is dedicated to explicating the terminology associated with the indicators, including references. This elucidation aims to establish a shared understanding and a standardized vocabulary within the BuiltHub context. Section 4 outlines unit conversions, offering insight into the process of transforming measurements from one unit to another, ensuring consistency in data



interpretation. In Section 5, a general compilation of information pertaining to all indicators within each thematic area is provided. This section offers a broad perspective on the indicators under consideration. Moving further to Section 6, we delve into the calculation procedures for each indicator. This includes an exploration of various methods by which an indicator can be computed, where applicable. The Annex contains a comprehensive compilation of available datasets as of the current project timeline. These datasets serve as the primary sources of information for the various indicators discussed in this report. By organizing the report in this manner, we aim to present the information in a logical sequence, facilitating comprehension for all readers, regardless of their level of familiarity with the subject matter.

1. Glossary

Units

ktoe	kilotons
TJ	terajoules
GWh	gigawatt-hour
MTOE	million tonnes of oil equivalent
kWh	kilowatt-hour
m²	square meters
m³	cubic meter

Abbreviations

BSO	Building Stock Observatory
SFH	Single-Family Houses
MFH	Multi-Family Houses
DH	District heating

Definitions

Dwellings: Self-contained unit of accommodation [10]

Building stock: Building stock is a term used to describe the total of buildings in a country, region, municipal area, or estate [12]

Building stock characteristics: The characteristics and quality of the buildings described through building envelope indicators and the technical building systems [12]

Building shell: Building shells form the division between the ambient environment and indoor zones of a building and, therefore, function as the interface where several physical interactions take place [13]

District heating supply area: A geographical region equipped with the infrastructure for district heating, although its adoption is not compulsory

District heating supply zone: An area where political regulations mandate the utilization of district heating

High-heat density area: A specific region or zone characterized by a significant energy demand for heating

2. Overview of BuiltHub thematic areas

The **Building Stock Observatory** (BSO)¹ currently serves as the primary online tool established by the European Commission to oversee and assess the energy efficiency of buildings. It comprises a comprehensive database, a data mapping tool, and informative factsheets, all aimed at monitoring the energy performance of buildings across Europe. The thematic scope embraced by the BuiltHub Project is depicted in Figure 1 below. Positioned on the left are the prevailing thematic areas of the BSO, inclusive of their respective sub-domains. Concurrently, the BuiltHub Project proposes novel thematic areas, which encompass indoor environmental quality, climate considerations, e-mobility integration, readiness for smart grid utilization, and the assessment of whole-life carbon impacts. This strategic expansion is motivated by the project's aspiration to provide stakeholders with indicators that furnish insights aligned with the priorities of the European Commission. As such, the indicators offer pertinent information concerning decarbonization, attainment of climate targets, curtailment of CO₂ emissions, and pertinent aspects of sector coupling, notably the synergistic interplay of smart grid technologies and e-mobility solutions.

The crux of the present report is the domains of **Building Stock**, **Building Characteristics**, **Certification**, and **Finance**. Furthermore, an in-depth examination of sub-domains is undertaken, encompassing **Building Stock Characteristics**, **Building Renovation**, **Building Shell Performance**, **Technical Building Systems**, and the concept of **Nearly-Zero Energy Buildings**.



Figure 1: BuiltHub thematic areas

¹ Can be accessed under: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/eubuilding-stock-observatory_en



3. Definitions

The initial phase encompassed the establishment of a shared comprehension concerning the terminologies employed, coupled with their precise definitions. To this end, Table 1 has been meticulously compiled to illustrate several terms of relevance within this report. Notably, this table serves as a supplementary resource in conjunction with the dedicated sections on Glossary and Conversions.

In the BuiltHub project, this effort is directly related to the main Data Model. The Data Model is like the foundation stone, helping to make sure data is shown in the same way across different datasets. This process of bringing things into line doesn't just make sure the data fits well together; it also lets the BuiltHub Platform easily access and share data from many different places while maintaining the original meaning and harmony of the information.

Table 1 is a comprehensive compilation encompassing terms pertinent to the thematic domain of **"Energy"**. Each term is accompanied within this table by its corresponding definition, the associated entity (of notable significance in programming contexts), and the designated units specific to the thematic realm of "Energy," as delineated in Figure 1. It is important to emphasize that this undertaking was underpinned by the utilization of established norms and standards, a factor duly acknowledged by the inclusion of corresponding references within the table.

Term	Entity	Explanation	Values/Unit	Reference number
Energy consumption	Float	Energy consumption is the amount of energy used	May differ according to the energy carrier: - oil & petroleum products: ktoe - natural gas: TJ - electricity: GWh - solid fuels: ktoe	[1]
Energy form	List	Energy, in physics, is the capacity to do work.	Potential, kinetic, thermal, electrical, chemical, nuclear, or other various forms	[2]
Energy use	List	Energy input to satisfy a specific need	Space heating, space cooling, domestic water heating, cooking, and lighting.	[3]
Building	List	Construction as a whole, including its envelope and all technical building systems, for which energy is	Residential or non- residential	[4]

Table 1: Definitions of terms, entities, and units



Term	Entity	Explanation	Values/Unit	Reference number
		used to condition the indoor climate		
Dwelling	List	A dwelling is a room or suite of rooms - including lobbies and corridors - in a permanent building, or a structurally separated part of a building is designed for habitation by one private household all year round.	One-family dwelling (in a standalone building) or an apartment (in a block of flats)	[5]
Energy poverty	String	As most European countries have no official definition for the term "energy poverty", this state is often described as the "inability to keep homes adequately warm".		[6]
Energy price	Float	Price of the energy commodity. The end-use price is the one paid by the final energy consumer (for example, households).	Euro / GJ or Euro/kWh	[7] [8] [9]

4. Conversions

Incorporated datasets within the BuiltHub Platform often exhibit varying units of measurement. Table 2 has been assembled to address this potential disparity to outline pertinent unit conversions that may be applied [10].

- From:	Το: TJ	Mtoe	GWh
TJ		/41868	/3.6
Mtoe	x41868		x11630
GWh	x3.6	/11630	

Table 2: Unit conversion

5. Indicators

The compilation of indicators has been meticulously curated to offer an all-encompassing insight into various facets of the European building stock. This comprehensive array takes into consideration a multifaceted spectrum of information, encompassing:

- characteristics of the building stock (e.g., floor area, number of buildings per type, use, age, etc.)
- characterization of buildings' energy performance (e.g., end-use energy, technical building systems, etc.)
- energy (e.g., energy consumption, energy market, etc.)
- certification (e.g., number of energy-certified buildings, etc.)
- financing (e.g., level of investment associated with deep retrofits and with a significant renovation, financial schemes targeting deep renovation, etc.)
- social aspects (e.g., energy poverty indicators)
- district heating potential

The indicators, curated according to thematic domains, are as follows: **"Energy"** encompasses three sub-categories, namely **"Energy consumption"**, **"Energy poverty"**, and **"Energy market"**. Notably, **"Energy consumption"** stands as the most prolific sub-category further bifurcated into "Residential" and "Non-residential" sectors. Remarkably, the "Residential" sector boasts 84 distinct indicators, while the "Non-residential" sector boasts 86. The exhaustive list of these indicators is conveniently available in Annex 1.2.

Within the **"Energy market"** sub-category, 5 indicators are outlined, while **"Energy poverty"** encompasses 10 distinct indicators. Shifting our focus to the domain of **"Building Stock"**, we



encounter the sub-categories of "Building Stock Characteristics" and "Building Renovation". The former embraces 59 indicators, whereas the latter is currently without specific indicators. Additionally, within the "Building Characteristics" domain, we find sub-categories including "Building Shell Performance" with 32 indicators, "Technical Building Systems" with 53, and "Nearly-Zero-Energy Buildings" which, at present, does not encompass specific indicators. Finally, in the "District Heating Potential" thematic area which is proposed by BuiltHub, there are 12 indicators.

The chapter 6 "Calculation procedures" expounds upon the methodologies and equations required for the computation of each indicator within its corresponding sub-category, ensuring a comprehensive understanding of the calculation processes.



6. Calculation procedures

Within this section, we outline the proposed calculation methodologies for each indicator. For certain indicators, we provide multiple methods, offering viable alternatives for consideration. The selection of the most suitable method hinges upon data availability, allowing for optimal adaptation based on the specific circumstances at hand.

6.1. Energy thematic area

In this part, we provide the variables used in the equations to calculate each indicator and the various values these elements can have. This information is essential to grasp the calculations that follow.

- *b_{resi}*: Building types of the residential sector
- *b_{nonresi}*: Building types of non-residential sector
- *t*: Construction period
- e: End-use
- c: Energy carrier

$$b_{resi} = \begin{cases} 1.1 & \text{if the building type is single} - family houses} \\ 1.2 & \text{if the building type is multi} - family houses} \\ 1.3 & \text{if the building type is multi} - family houses} \\ 1.3 & \text{if the building type is apartment blocks houses} \end{cases}$$

$$b_{nonresi} = \begin{cases} 2.1 & \text{if the building type is offices} \\ 2.2 & \text{if the building type is rade buildings} \\ 2.3 & \text{if the building type is educational buildings} \\ 2.4 & \text{if the building type is health care buildings} \\ 2.5 & \text{if the building type is hotels and restaurants} \\ 2.6 & \text{if the building type is other non - residential buildings} \\ 2.6 & \text{if the construction period is before 1945} \\ 3 & \text{if the construction period is between 1945 - 1969} \\ 3 & \text{if the construction period is between 1970 - 1979} \\ 4 & \text{if the construction period is between 1980 - 1989} \\ 5 & \text{if the construction period is between 1990 - 1999} \\ 6 & \text{if the construction period is between 2000 - 2010} \\ 7 & \text{if the construction period is between 2000 - 2010} \\ 1 & \text{if end - use is Space Heating} \\ 3 & \text{if end - use is Cooking} \\ 4 & \text{if end - use is Lighting and Appliances} \\ 5 & \text{if end - use is Space Cooling} \\ 6 & \text{if end - use is Ventilation} \end{cases}$$

$$c = \begin{cases} 1 & \text{if energy carrier is Gas} \\ 2 & \text{if energy carrier is Oil} \\ 3 & \text{if energy carrier is Coal} \\ 4 & \text{if energy carrier is Electricity} \\ 5 & \text{if energy carrier is Heat} \\ 6 & \text{if energy carrier is Renewables} \end{cases}$$

6.1.1. Energy consumption

6.1.1.1. Final Energy|Residential/Non-Residential Sectors

Based on the data at hand, two distinct methodologies have been established for the calculation of this indicator. The initial approach involves determining the indicator value through the cumulative sum of final energy categorized by energy carriers. Conversely, the second approach derives the indicator value by assessing the final energy consumption pattern corresponding to different building types.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
1	Final Energy Residential Sector	Mtoe
2	Final Energy Non-Residential Sector	Mtoe

Method 1:

Final Energy (Residential) = $\sum_{b_{resi=1,1}}^{1.3} \sum_{c=1}^{6} (Energy \ Consumption_c)_{b_{resi}}$

Final Energy (Non-Residential) = $\sum_{bnonresi=2.1}^{2.6} \sum_{c=1}^{6} (Energy \ Consumption_c)_{bnonresi}$.

Method 2:

Final Energy (Residential) =
$$\sum_{b=1.1}^{1.3} (Energy Consumption)_{b_{resi}}$$

Final Energy (Non – Residential) = $\sum_{b=2.1}^{2.6} (Energy \ Consumption \)_{b_{nonresi}}$.

6.1.1.2. Final Energy|Residential/Non-Residential Sector|Building Type

There is one method to calculate this indicator according to the available data: the sum of energy consumption by each building type.

Indicator Number	Indicator Name	Unit
3.1	Final Energy Residential Sector Single Family Houses	Mtoe
3.2	Final Energy Residential Sector Multi Family Houses	Mtoe
3.3	Final Energy Residential Sector Apartment Blocks	Mtoe
4.1	Final Energy Non-Residential Sector Offices	Mtoe
4.2	Final Energy Non-Residential Sector Trade Buildings	Mtoe
4.3	Final Energy Non-Residential Sector Educational Buildings	Mtoe
4.4	Final Energy Non-Residential Sector Health Care Buildings	Mtoe
4.5	Final Energy Non-Residential Sector Hotels and Restaurants	Mtoe
4.6	Final Energy Non-Residential Sector Other Non- Residential Buildings	Mtoe

Final Energy by Building Type (Residential) = (*Energy Consumption*)_{b_{resi}} for $\forall b$,

Final Energy by Building Type (Non – Residential) = (*Energy Consumption*)_{*b*_{nonresi} for $\forall b$.}

6.1.1.3. Final Energy|Residential/Non-Residential Sector|Energy Carrier

Considering the data accessible to us, a single method has been identified for the computation of this indicator. It involves aggregating the energy consumption attributed to each individual energy carrier.

Indicator Number	Indicator Name	Unit
5.1	Final Energy Residential Sector Gas	Mtoe
5.2	Final Energy Residential Sector Oil	Mtoe
5.3	Final Energy Residential Sector Coal	Mtoe
5.4	Final Energy Residential Sector Electricity	Mtoe

5.5	Final Energy Residential Sector Heat	Mtoe
5.6	Final Energy Residential Sector Renewables	Mtoe
6.1	Final Energy Non-Residential Sector Gas	Mtoe
6.2	Final Energy Non-Residential Sector Oil	Mtoe
6.3	Final Energy Non-Residential Sector Coal	Mtoe
6.4	Final Energy Non-Residential Sector Electricity	Mtoe
6.5	Final Energy Non-Residential Sector Heat	Mtoe
6.6	Final Energy Non-Residential Sector Renewables	Mtoe

Final Energy by Energy Carrier (Residential) = $(Energy \ Consumption_c)_{b_{resi}}$ for $\forall c, b_{resi}$,

Final Energy by Energy Carrier (Non – Residential) = $(Energy Consumption_c)_{b_{nonresi}}$ for $\forall c, b_{nonresi}$.

6.1.1.4. Final Energy|Residential/Non-Residential Sector|Space Heating

Based on the data at our disposal, two distinct approaches have been identified for computing this particular indicator. The initial approach involves summating the final energy across various energy carriers, while the subsequent approach derives the indicator through final energy consumption associated with different building types.

Indicator Number	Indicator Name	Unit
7	Final Energy Residential Sector Space Heating	Mtoe
8	Final Energy Non-Residential Sector Space Heating	Mtoe

The following indicators can be calculated.

Method 1:

Final Energy for Space Heating (Residential) =
$$\sum_{b_{resi=1.1}}^{1.3} (Energy \ Consumption_{b_{resi}})_e \ for ; e = 1,$$



Final Energy for Space Heating (Non – Residential) = $\sum_{b_{nonresi=2.1}}^{2.6} (Energy \ Consumption_{b_{nonresi}})_e \ for$ = 1.

Method 2:

Final Energy for Space Heating (Residential) = $\sum_{c=1}^{6} \sum_{b_{resi}=1.1}^{1.3} (Energy Consumption_{b_{resi},c})_e$ for e = 1,

Final Energy for Space Heating (Non – Residential) = $\sum_{c=1}^{6} \sum_{b_{nonresi}=2.1}^{2.6} (Energy \ Consumption_{b_{resi},c})_e \ for \ e$ = 1.

6.1.1.5. Final Energy|Residential/Non-Residential Sector|Space Heating|Building Type

According to the available data, there is one method to calculate this indicator: the sum of energy consumption by each building type.

Indicator Number	Indicator Name	Unit
7.1	Final Energy Residential Sector Single Family Houses Space Heating	Mtoe
7.2	Final Energy Residential Sector Multi Family Houses Space Heating	Mtoe
7.3	Final Energy Residential Sector Apartment Blocks Space Heating	Mtoe
8.1	Final Energy Non-Residential Sector Offices Space Heating	Mtoe
8.2	Final Energy Non-Residential Sector Trade Buildings Space Heating	Mtoe
8.3	Final Energy Non-Residential Sector Educational Buildings Space Heating	Mtoe
8.4	Final Energy Non-Residential Sector Health Care Buildings Space Heating	Mtoe
8.5	Final Energy Non-Residential Sector Hotels and Restaurants Space Heating	Mtoe
8.6	Final Energy Non-Residential Sector Other Non-Residential Buildings Space Heating	Mtoe



Final Energy for Space Heating (Residential) =
$$\sum_{b_{resi=1.1}}^{1.3} (Energy Consumption)_{b_{resi},e}$$
 for $e = 1$,
Final Energy for Space Heating (Non – Residential) = $\sum_{b_{nonresi=2.1}}^{2.6} (Energy Consumption)_{b_{nonresi},e}$ for e

= 1.

6.1.1.6. Final Energy|Residential/Non-Residential Sector Space Heating|Energy Carrier

According to the available data, one method to calculate this indicator is the sum of energy consumption by each energy carrier.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
9.1	Final Energy Residential Sector Space Heating Gas	Mtoe
9.2	Final Energy Residential Sector Space Heating Oil	Mtoe
9.3	Final Energy Residential Sector Space Heating Coal	Mtoe
9.4	Final Energy Residential Sector Space Heating Electricity	Mtoe
9.5	Final Energy Residential Sector Space Heating Heat	Mtoe
9.6	Final Energy Residential Sector Space Heating Renewables	Mtoe
10.1	Final Energy Non-Residential Sector Space Heating Gas	Mtoe
10.2	Final Energy Non-Residential Sector Space Heating Oil	Mtoe
10.3	Final Energy Non-Residential Sector Space Heating Coal	Mtoe
10.4	Final Energy Non-Residential Sector Space Heating Electricity	Mtoe
10.5	Final Energy Non-Residential Sector Space Heating Heat	Mtoe
10.6	Final Energy Non-Residential Sector Space Heating Renewables	Mtoe

Final Energy for Space Heating (Residential) = $\sum_{b_{resi}=1.1}^{1.3} \sum_{c=1}^{6} (Energy \ Consumption)_{b_{resi},c,e}$ for e = 1,

Final Energy for Space Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} \sum_{c=1}^{6} (Energy \ Consumption)_{b_{nonresi},c,e} \ for \ e = 1,$$

6.1.1.7. Final Energy|Residential/Non-Residential Sector|Water Heating

According to the available data, three different methods exist to calculate this indicator. The first method calculates it by the sum of final energy by end-use, the second method is to sum up the final energy consumption in water heating by each building type, while the third and last method calculates it by final energy consumption for energy carrier.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
11	Final Energy Residential Sector Water Heating	Mtoe
12	Final Energy Non-Residential Sector Water Heating	Mtoe

Method 1:

Final Energy for Water Heating (Residential)

= (Energy Consumption for Residential Sector)_e for e = 2,

Final Energy for Water Heating (Non – Residential) = (Energy Consumption for Non – Residential Sector)_e for e = 2.

Method 2:

Final Energy for Water Heating (Residential)

$$= \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption) \qquad for \ \forall \ b; \ e = 2,$$

Final Energy for Water Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} (Energy Consumption) \qquad for \forall b; e = 2.1$$

Method 3:

Final Energy for Water Heating (Residential) =
$$\sum_{b_{resi}=1.1}^{1.3} \sum_{c=1}^{6} (Energy \ Consumption)_{b_{resi},c,e} \ for \ e = 2,$$

Final Energy for Water Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} \sum_{c=1}^{6} (Energy \ Consumption)_{b_{nonresi},c,e} \ for \ e = 2,$$



6.1.1.8. Final Energy|Residential/Non-Residential Sector|Water Heating|Energy Carrier

According to the available data, one method to calculate this indicator is the sum of energy consumption by each energy carrier.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
11.1	Final Energy Residential Sector Water Heating Gas	Mtoe
11.2	Final Energy Residential Sector Water Heating Oil	Mtoe
11.3	Final Energy Residential Sector Water Heating Coal	Mtoe
11.4	Final Energy Residential Sector Water Heating Electricity	Mtoe
11.5	Final Energy Residential Sector Water Heating Heat	Mtoe
12.1	Final Energy Non-Residential Sector Water Heating Gas	Mtoe
12.2	Final Energy Non-Residential Sector Water Heating Oil	Mtoe
12.3	Final Energy Non-Residential Sector Water Heating Coal	Mtoe
12.4	Final Energy Non-Residential Sector Water Heating Electricity	Mtoe
12.5	Final Energy Non-Residential Sector Water Heating Heat	Mtoe

Final Energy for Water Heating (Residential) =
$$\sum_{b_{resi}=1.1}^{1.3} \sum_{c=1}^{c=6} (Energy \ Consumption)_{b_{resi},c,e} for \ e$$

= 2,

Final Energy for Water Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} \sum_{c=1}^{c=6} (Energy \ Consumption)_{b_{nonresi},c,e} for \ e=2.$$

6.1.1.9. Final Energy|Residential/Non-Residential Sector|Water Heating|Building Type

According to the available data, there is one method to calculate this indicator: the sum of energy consumption by each building type.

Indicator Number	Indicator Name	Unit
13.1	Final Energy Non-Residential Sector Offices Water Heating	Mtoe

13.2	Final Energy Non-Residential Sector Trade Buildings Water Heating	Mtoe
13.3	Final Energy Non-Residential Sector Educational Buildings Water Heating	Mtoe
13.4	Final Energy Non-Residential Sector Health Care Buildings Water Heating	Mtoe
13.5	Final Energy Non-Residential Sector Hotels and Restaurants Water Heating	Mtoe
13.6	Final Energy Non-Residential Sector Other Non-Residential Buildings Water Heating	Mtoe

Final Energy for Water Heating (Residential) = $\sum_{b_{resi}=1.1}^{1.3} (Energy Consumption)_{b_{resi},e}$ for e

= 2,

Final Energy for Water Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} (Energy Consumption)_{b_{nonresi},e} \quad for \ e = 2.$$

6.1.1.10. Final Energy|Residential/Non-Residential Sector|Cooking

According to the available data, one method to calculate this indicator is the sum of energy consumption by each energy carrier.

Indicator Number	Indicator Name	Unit
14	Final Energy Residential Sector Cooking	Mtoe
15	Final Energy Non-Residential Sector Cooking	Mtoe

Final Energy for Water Heating (Residential) =
$$\sum_{b_{resi}=1.1}^{1.3} \sum_{c=1}^{c=6} (Energy \ Consumption)_{b_{resi},c,e} for \ e$$

= 3,



Final Energy for Water Heating (Non – Residential)

$$=\sum_{b_{nonresi}=2.1}^{2.6}\sum_{c=1}^{c=6}(Energy\ Consumption)_{b_{nonresi},c,e}\ for\ e=3.$$

6.1.1.11. Final Energy|Residential Sector|Cooking|Energy Carrier

According to the available data, one method to calculate this indicator is the sum of energy consumption by each energy carrier.

Indicator Number	Indicator Name	Unit
14.1	Final Energy Residential Sector Cooking Gas	Mtoe
14.2	Final Energy Residential Sector Cooking Oil	Mtoe
14.3	Final Energy Residential Sector Cooking Coal	Mtoe
14.4	Final Energy Residential Sector Cooking Electricity	Mtoe
14.5	Final Energy Residential Sector Cooking Renewables	Mtoe

The following indicators can be calculated.

Final Energy for Water Heating (Residential) =
$$\sum_{b_{resi}=1.1}^{1.3} \sum_{c=1}^{c=6} (Energy \ Consumption)_{b_{resi},c,e} for \ e$$

= 3,

Final Energy for Water Heating (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} \sum_{c=1}^{c=6} (Energy \ Consumption) for \ e = 3$$

6.1.1.12. Final Energy|Residential/Non-Residential Sector|Lighting

According to the available data, there is one method to calculate this indicator: the sum of energy consumption by each building type.

Indicator NumberIndicator NameUnit16Final Energy | Residential Sector | LightingMtoe17Final Energy | Non-Residential Sector | LightingMtoe



Final Energy for Lighting (Residential)

$$= \sum_{b_{resi}=1.1}^{1.3} (Energy Consumption for Residential Sector)_{b_{resi},e} for e = 4,$$

Final Energy for Lighting (Non - Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.0} (Energy Consumption for Non - Residential Sector)_{b_{nonresi},e} for e = 4.$$

6.1.1.13. Final Energy|Non-Residential Sector|Lighting|Building Type

According to the available data, there is one method to calculate this indicator: the sum of energy consumption by each building type.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
17.1	Final Energy Non-Residential Sector Offices Lighting	Mtoe
17.2	Final Energy Non-Residential Sector Trade Buildings Lighting	Mtoe
17.3	Final Energy Non-Residential Sector Educational Buildings Lighting	Mtoe
17.4	Final Energy Non-Residential Sector Health Care Buildings Lighting	Mtoe
17.5	Final Energy Non-Residential Sector Hotels and Restaurants Lighting	Mtoe
17.6	Final Energy Non-Residential Sector Other Non- Residential Buildings Lighting	Mtoe

$$= \sum_{b_{nonresi}=2.1}^{2.6} (Energy Consumption) for e = 4.$$

6.1.1.14. Final Energy|Residential/Non-Residential Sector|Space Cooling

Final Energy for Lighting (Residential) =
$$\sum_{b_{resi}=1.1}^{1.3} (Energy Consumption) for e = 5$$



Final Energy for Lighting (Non – Residential)

$$= \sum_{b_{nonresi}=2.1}^{2.6} (Energy \ Consumption) \qquad for \ e = 5.$$

The following indicator can be calculated.

Indicator Number	Indicator Name	Unit
18	Final Energy Residential Sector Space Cooling	Mtoe

6.1.1.15. Specific Energy|Residential/Non-Residential Sector|per Building

Specific Energy per building (Residential) = $\frac{\sum_{b_{resi=1.1}}^{1.3} \sum_{t=1}^{7} (Energy \ Consumption \ b_{resi})_{t}}{\sum_{b_{resi}=1.1}^{1.3} \sum_{t=1}^{7} Number \ of \ Buildings_{b_{resi},t}},$

Specific Energy per building (Non – Residential)

$$= \frac{\sum_{b_{nonresi=2.1}}^{2.6} \sum_{t=1}^{7} (Energy \ Consumption \ b_{nonresi})_{t}}{\sum_{b_{nonresi}=2.1}^{2.6} \sum_{t=1}^{7} Number \ of \ Buildings_{b_{nonresi},t}}}$$

The following indicator can be calculated.

Indicator Number	Indicator Name	Unit
19	Specific Energy Residential Sector per Building	kWh/building

6.1.1.16. Specific Energy|Residential Sector|End-Use|per Dwelling

Indicator Number	Indicator Name	Unit
20.1	Specific Energy Residential Sector Space Heating per Dwelling	kWh/dwelling
20.2	Specific Energy Residential Sector Water Heating per Dwelling	kWh/dwelling
20.3	Specific Energy Residential Sector Cooking per Dwelling	kWh/dwelling
20.4	Specific Energy Residential Sector Lighting per Dwelling	kWh/dwelling



Specific Energy per dwelling (Residential) = $\frac{\sum_{b_{resi=1.1}}^{1.3} \sum_{e=1}^{6} (Energy \ Consumption \ b_{resi})_{e}}{\sum_{b_{resi}=1.1}^{1.3} \sum_{t=1}^{7} Number \ of \ Dwellings_{b_{resi},t}}.$

6.1.1.17. Specific Energy|Residential/Non-Residential Sector|per Floor area

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
21	Specific Energy Residential Sector per Floor area	kWh/m²
22	Specific Energy Non-Residential Sector per Floor area	kWh/m²

$$Specific Energy per Floor area (Residential) = \frac{\sum (Energy \ Consumption)_{b_{resi}}}{Total \ Floor \ Area_{b_{resi}}} \ for \ \forall \ b,$$

$$Specific Energy per Floor area (Non - Residential) = \frac{\sum (Energy \ Consumption)_{b_{nonresi}}}{Total \ Floor \ Area_{b_{nonresi}}} \ for \ \forall \ b.$$

6.1.1.18. Specific Energy|Residential/Non-Residential Sector|Building Type|per Floor area

Indicator Number	Indicator Name	Unit
21.1	Specific Energy Residential Sector Single Family Houses per Floor area	kWh/m²
21.2	Specific Energy Residential Sector Multi Family Houses per Floor area	kWh/m²
21.3	Specific Energy Residential Sector Apartment Blocks per Floor area	kWh/m²
22.1	Specific Energy Non-Residential Sector Offices per Floor area	kWh/m²
22.2	Specific Energy Non-Residential Sector Trade Buildings per Floor area	kWh/m²
22.3	Specific Energy Non-Residential Sector Educational Buildings per Floor area	kWh/m²

22.4	Specific Energy Non-Residential Sector Health Care Buildings per Floor area	kWh/m²
22.5	Specific Energy Non-Residential Sector Hotels and Restaurants per Floor area	kWh/m²
22.6	Specific Energy Non-Residential Sector Other Non- Residential Buildings per Floor area	kWh/m²

 $Specific \ Energy \ per \ Floor \ area \ (Residential) = \frac{(Energy \ Consumption)_{b_{resi}}}{Total \ Floor \ Area_{b_{resi}}} \ for \ \forall \ b,$

 $Specific \ Energy \ per \ Floor \ area \ (Non - Residential) = \frac{(Energy \ Consumption)_{b_{nonresi}}}{Total \ Floor \ Area_{b_{nonresi}}} \ for \ \forall \ b.$

6.1.1.19. Specific Energy|Residential/Non-Residential Sector|Space Heating/Cooling|per Floor Area

According to the available data, two different methods exist to calculate this indicator. The first method calculates it by the total final energy consumption for each building type divided by the total floor area for each building type. Moreover, the second method is, to sum up the final energy consumption of each building type and each construction period and divide it by the total floor area of each building type and each construction period.

The following indicators can be calculated.

Indicator Number	Indicator Name	Unit
23	Specific Energy Residential Sector Space Heating per Floor area	kWh/m²
24	Specific Energy Non-Residential Sector Space Heating per Floor area	kWh/m²
25	Specific Energy Residential Sector Space Cooling per Floor area	kWh/m²
26	Specific Energy Non-Residential Sector Space Cooling per Floor area	kWh/m²

Method 1:

Specific Energy per Floor area (Residential) =
$$\frac{\sum_{b_{resi}=1.1}^{1.3} (Energy Consumption)_{b_{resi},e}}{Total Floor Area_{b_{resi}}} \text{ for } e$$
$$= 1 \text{ and } 5,$$



$$=\frac{\sum_{b_{nonresi}=2.1}^{2.6}(Energy\ Consumption)_{b_{nonresi},e}}{Total\ Floor\ Area_{b_{nonresi}}}\ for\ e=1\ and\ 5.$$

Method 2:

 $Specific Energy \ per \ Floor \ area \ (Residential) = \frac{\sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}{Total \ Floor \ Area_{b_{resi},t,e}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}$

 $= 1 \ or \ 5$,

$$Specific Energy per Floor area (Non - Residential) \\ = \frac{\sum_{t=1}^{7} \sum_{b_{nonresi}=2.1}^{2.6} (Energy Consumption)_{b_{nonresi},t,e}}{Total Floor Area_{b_{nonresi},t}} for e = 1 or 5,$$

6.1.1.20. Specific Energy|Residential/Non-Residential Sector|Space Heating/Cooling|Building Type|per Floor area

According to the available dataset, this indicator can be calculated by the sum of space heating energy consumption for each building type divided by the total floor area for each building type.

Indicator Number	Indicator Name	Unit
23.1	Specific Energy Residential Sector Single Family Houses Space Heating per Floor area	kWh/m²
23.2	Specific Energy Residential Sector Multi Family Houses Space Heating per Floor area	kWh/m²
23.3	Specific Energy Residential Sector Apartment Blocks Space Heating per Floor area	kWh/m²
24.1	Specific Energy Non-Residential Sector Offices Space Heating per Floor area	kWh/m²
24.2	Specific Energy Non-Residential Sector Trade Buildings Space Heating per Floor area	kWh/m²
24.3	Specific Energy Non-Residential Sector Educational Buildings Space Heating per Floor area	kWh/m²
24.4	Specific Energy Non-Residential Sector Health Care Buildings Space Heating per Floor area	kWh/m²
24.5	Specific Energy Non-Residential Sector Hotels and Restaurants Space Heating per Floor area	kWh/m²

24.6	Specific Energy Non-Residential Sector Other Non- Residential Buildings Space Heating per Floor area	kWh/m²
25.1	Specific Energy Residential Sector Single Family Houses Space Cooling per Floor area	kWh/m²
25.2	Specific Energy Residential Sector Multi Family Houses Space Cooling per Floor area	kWh/m²
26.1	Specific Energy Non-Residential Sector Offices Space Cooling per Floor area	kWh/m²
26.2	Specific Energy Non-Residential Sector Trade Buildings Space Cooling per Floor area	kWh/m²
26.3	Specific Energy Non-Residential Sector Educational Buildings Space Cooling per Floor area	kWh/m²
26.4	Specific Energy Non-Residential Sector Health Care Buildings Space Cooling per Floor area	kWh/m²
26.5	Specific Energy Non-Residential Sector Hotels and Restaurants Space Cooling per Floor area	kWh/m²
26.6	Specific Energy Non-Residential Sector Other Non- Residential Buildings Space Cooling per Floor area	kWh/m²

 $Specific Energy \ per \ Floor \ area \ (Residential) = \frac{\sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}{Total \ Floor \ Area_{b_{resi},t,e}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}{Total \ Floor \ Area_{b_{resi},t,e}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}}$

= 1 or 5,

Specific Energy per Floor area (Non – Residential)

 $= \frac{\sum_{t=1}^{7} \sum_{b_{nonresi}=2.1}^{2.6} (Energy \ Consumption)_{b_{nonresi},t,e}}{Total \ Floor \ Area_{b_{nonresi},t}} \ for \ e = 1 \ or \ 5,$

6.1.1.21. Specific Energy|Residential/Non-Residential Sector|Space Heating/Cooling|Construction Period|per Floor area

According to the available dataset, this indicator can be calculated by the sum of space heating energy consumption for each building type and each construction period divided by the total floor area for each building type and each construction period.

Indicator Number	Indicator Name	Unit
27.1	Specific Energy Residential Sector Buildings Built before 1945 Space Heating per Floor area	kWh/m²

27.2	Specific Energy Residential Sector Buildings Built between 1945-1969 Space Heating per Floor area	kWh/m²
27.3	Specific Energy Residential Sector Buildings Built between 1970-1979 Space Heating per Floor area	kWh/m²
27.4	Specific Energy Residential Sector Buildings Built between 1980-1989 Space Heating per Floor area	kWh/m²
27.5	Specific Energy Residential Sector Buildings Built between 1990-1999 Space Heating per Floor area	kWh/m²
27.6	Specific Energy Residential Sector Buildings Built between 2000-2010 Space Heating per Floor area	kWh/m²
27.8	Specific Energy Residential Sector Buildings Built after 2010 Space Heating per Floor area	kWh/m²
28.1	Specific Energy Non-Residential Sector Buildings Built before 1945 Space Heating per Floor area	kWh/m²
28.2	Specific Energy Non-Residential Sector Buildings Built between 1945-1969 Space Heating per Floor area	kWh/m²
28.3	Specific Energy Non-Residential Sector Buildings Built between 1970-1979 Space Heating per Floor area	kWh/m²
28.4	Specific Energy Non-Residential Sector Buildings Built between 1980-1989 Space Heating per Floor area	kWh/m²
28.5	Specific Energy Non-Residential Sector Buildings Built between 1990-1999 Space Heating per Floor area	kWh/m²
28.6	Specific Energy Non-Residential Sector Buildings Built between 2000-2010 Space Heating per Floor area	kWh/m²
28.7	Specific Energy Non-Residential Sector Buildings Built after 2010 Space Heating per Floor area	kWh/m²
29.1	Specific Energy Residential Sector Buildings Built before 1945 Space Cooling per Floor area	kWh/m²
29.2	Specific Energy Residential Sector Buildings Built between 1945-1969 Space Cooling per Floor area	kWh/m²
29.3	Specific Energy Residential Sector Buildings Built between 1970-1979 Space Cooling per Floor area	kWh/m²
29.4	Specific Energy Residential Sector Buildings Built between 1980-1989 Space Cooling per Floor area	kWh/m²
29.5	Specific Energy Residential Sector Buildings Built between 1990-1999 Space Cooling per Floor area	kWh/m²

29.6	Specific Energy Residential Sector Buildings Built between 2000-2010 Space Cooling per Floor area	kWh/m²
29.7	Specific Energy Residential Sector Buildings Built after 2010 Space Cooling per Floor area	kWh/m²
30.1	Specific Energy Non-Residential Sector Buildings Built before 1945 Space Cooling per Floor area	kWh/m²
30.2	Specific Energy Non-Residential Sector Buildings Built between 1945-1969 Space Cooling per Floor area	kWh/m²
30.3	Specific Energy Non-Residential Sector Buildings Built between 1970-1979 Space Cooling per Floor area	kWh/m²
30.4	Specific Energy Non-Residential Sector Buildings Built between 1980-1989 Space Cooling per Floor area	kWh/m²
30.5	Specific Energy Non-Residential Sector Buildings Built between 1990-1999 Space Cooling per Floor area	kWh/m²
30.6	Specific Energy Non-Residential Sector Buildings Built between 2000-2010 Space Cooling per Floor area	kWh/m²
30.7	Specific Energy Non-Residential Sector Buildings Built after 2010 Space Cooling per Floor area	kWh/m²

 $Specific Energy \ per \ Floor \ area \ (Residential) = \frac{\sum_{t=1}^{7} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{1.3} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{1.3} \sum_{t=1}^{1.3} \sum_{b_{resi}=1.1}^{1.3} (Energy \ Consumption)_{b_{resi},t,e}}}{Total \ Floor \ Area_{b_{resi},t}} \ for \ e^{-\frac{1}{2} \sum_{t=1}^{1.3} \sum_{t=1}^{1.3$

= 1,

Specific Energy per Floor area (Non – Residential)

 $= \frac{\sum_{t=1}^{7} \sum_{b_{nonresi}=2.1}^{2.6} (Energy \ Consumption)}{Total \ Floor \ Area_{b_{nonresi},t}} for \ e = 1.$



6.1.3. Energy market

6.1.3.1. Average Energy Price|Residential/Non-Residential Sector|by Energy Carrier

According to the available datasets in BuiltHub, these indicators can be directly collected from the related dataset (see Annex) for both residential and non-residential sectors for the year 2019.²

Indicator Number	New Indicator Name (suggested by TU Wien)	Unit
31.1	Average Energy Price Residential Sector Natural Gas	EUR/kWh
31.2	Average Energy Price Residential Sector Fuel Oil	EUR/kWh
31.3	Average Energy Price Residential Sector Coal	EUR/kWh
31.4	Average Energy Price Residential Sector Electricity	EUR/kWh
31.5	Average Energy Price Residential Sector Biomass	EUR/kWh
32.1	Average Energy Price Non-Residential Sector Natural Gas	EUR/kWh
32.2	Average Energy Price Non-Residential Sector Fuel Oil	EUR/kWh
32.3	Average Energy Price Non-Residential Sector Coal	EUR/kWh
32.4	Average Energy Price Non-Residential Sector Electricity	EUR/kWh
32.5	Average Energy Price Non-Residential SectorlBiomass	EUR/kWh

6.1.4. Energy poverty

The Energy Poverty Advisory Hub (EPAH) ³is a prominent initiative by the European Union that aims to help reduce energy poverty and speed up the fair shift to sustainable energy practices in local governments throughout Europe.

Concerning this matter, the Energy Poverty Advisory Hub (EPAH) has formulated indicators for the purpose of illustrating energy poverty. Consequently, we propose the inclusion of these indicators among the existing BuiltHub indicators. These numerical values are readily accessible within the Building Sustainability Ordinance (BSO). It is essential to bear in mind

² https://ec.europa.eu/eurostat/documents/2995521/10826603/8-07052020-AP-EN.pdf/2c418ef5-7307-5217-43a6-4bd063bf7f44

³ https://energy-poverty.ec.europa.eu/system/files/2023-

^{01/}EPAH_Energy%20Poverty%20National%20Indicators%20Report_0.pdf



that while a range of indicators is articulated for both residential and non-residential domains, the indicators specific to this subcategory are exclusively delineated for the residential sector.

Indicator Number	Indicator Name	Unit
33	Risk of Poverty Share of Population	Share (%)
34	Leaking Roof or Damp Walls Share of Population	Share (%)
35	Inhabitants living in inadequate warm houses Share of Inhabitants	Share (%)
36.1	Multi-Family Residential Buildings Number of Rooms	Number
36.2	Single-Family Residential Buildings Number of Rooms	Number
37	Winter Mortality Number of Deaths per year	Number
38	Final Consumption Expenditure per Capita	(€/capita)
39	Expenditures for Housing Share	Share (%)
40	Expenditures for Fuels Share	% household s
41	Debts on Utility Bills Share of Population	% household s

6.2. Building stock thematic area

Within this section, we outline the proposed calculation methodologies for each indicator. A systematic framework has been established, wherein a specific set of variables has been defined for calculating indicators within each thematic area. Subsequently, the calculation procedure for each indicator group is expounded alongside a comprehensive list of indicators amenable to such computations. It is imperative that this information be seamlessly incorporated into the BuiltHub platform, serving as vital metadata to enhance its operational efficacy.

6.2.1. Building stock characteristics

This section provides the variables essential for the equations established to compute each indicator, along with the potential range of values these variables can assume. This insight aids in comprehending the subsequent calculations.

- *b_{resi}*: Building types of the residential sector
- *b_{nonresi}*: Building types of non-residential sector
- *t*: Construction period

b _{resi} =	=	 1.1 if the building type is single – family houses 1.2 if the building type is multi – family houses 1.3 if the building type is apartment blocks houses
b _{nonresi} =	$ \begin{pmatrix} 2.1 \\ 2.2 \\ 2.3 \\ 2.4 \\ 2.5 \\ 2.6 \end{pmatrix} $	if the building type is offices if the building type is trade buildings if the building type is educational buildings if the building type is health care buildings if the building type is hotels and restaurants if the building type is other non – residential buildings
<i>t</i> =	1 2 3 4 5 6 7	if the construction period is before 1945 if the construction period is between 1945 – 1969 if the construction period is between 1970 – 1979 if the construction period is between 1980 – 1989 if the construction period is between 1990 – 1999 if the construction period is between 2000 – 2010 if the construction period is after 2010

6.2.1.1. Number of Dwellings/Buildings|Residential/Non-Residential Sector|Building Type

The indicator number of dwellings refers to the number of dwellings or buildings. It can be classified by building type (e.g., residential or non-residential) and sub-category (e.g., residential: single-family houses (SFH), etc.) – as defined in b_{resi} above. The equivalent holds for non-residential buildings; $b_{nonresi}$ above. Classifying the buildings by construction period is also possible through parameter t above.

Total number of dwellings:
$$\sum_{t=1,i=1.1}^{t=7,i=2.6} (Number \ of \ dwellings \ (or \ buildings))_{t,b_{resi,nonresi}}$$

The following indicators can be calculated with this method.

Indicator Number	Indicator Name	Unit
42	Number of dwellings Residential Sector	Thousands
42.1	Number of dwellings Residential Sector SFH	Thousands
10.0	Number of dwellings Residential Sector MFH	Thousands
42.2		

42.3	Number of dwellings Residential Sector Apartment blocks	Thousands
43	Number of dwellings Residential Sector Permanently occupied	Thousands
43.1	Number of dwellings Residential Sector SFH Permanently occupied	Thousands
43.2	Number of dwellings Residential Sector MFH Permanently occupied	Thousands
43.3	Number of dwellings Residential Sector Apartment blocks Permanently occupied	Thousands
45	Number of buildings Residential Sector	Thousands
45.1	Number of buildings Residential Sector SFH	Thousands
45.2	Number of buildings Residential Sector MFH	Thousands
45.3	Number of buildings Residential Sector Apartment blocks	Thousands
46	Number of buildings Non-Residential Sector	Thousands
46.1	Number of buildings Non-Residential Sector Offices	Thousands
46.2	Number of buildings Non-Residential Sector Trade buildings	Thousands

46.3	Number of buildings Non-Residential Sector Educational buildings	Thousands
46.4	Number of buildings Non-Residential Sector Health care buildings	Thousands
46.5	Number of buildings Non-Residential Sector Hotels and restaurants	Thousands
46.6	Number of buildings Non-Residential Sector Other non-residential buildings	Thousands

6.2.1.2. Share of Dwellings/Buildings|Residential/Non-Residential Sector| Construction Period

Share of residential buildings = $\frac{\sum_{t=1,i=1}^{t=7,i=1.3} (Number of \ buildings)_{b_{resi},t}}{\sum_{t=1,i=1}^{t=7,i=2.6} (Number \ of \ buildings)_{b_{resi+nonresi},t}},$

Share of non - residential buildings

$$= \frac{\sum_{t=1,i=2}^{t=7,i=2.6} (Number of buildings)_{b_{nonresi},t}}{\sum_{t=1,i=1}^{t=7,i=2.6} (Number of buildings)_{b_{resi+nonresi},t}}$$

The following indicators can be calculated with this method.

Indicator Number	Indicator Name	Unit
47.1	Share of dwellings Residential Sector Built before 1945	Share (%)
47.2	Share of dwellings Residential Sector Built between 1945 and 1969	Share (%)
47.3	Share of dwellings Residential Sector Built between 1970 and 1979	Share (%)

47.4	Share of dwellings Residential Sector Built between 1980 and 1989	Share (%)
47.5	Share of dwellings Residential Sector Built between 1990 and 1999	Share (%)
47.6	Share of dwellings Residential Sector Built between 2000 and 2010	Share (%)
48.1	Share of buildings Residential Sector Built before 1945	Share (%)
48.2	Share of buildings Residential Sector Built between 1945 and 1969	Share (%)
48.3	Share of buildings Residential Sector Built between 1970 and 1979	Share (%)
48.4	Share of buildings Residential Sector Built between 1980 and 1989	Share (%)
48.5	Share of buildings Residential Sector Built between 1990 and 1999	Share (%)
48.6	Share of buildings Residential Sector Built between 2000 and 2010	Share (%)
48.7	Share of buildings Residential Sector Built after 2010	Share (%)
49.1	Share of buildings Non-Residential Sector Built before 1945	Share (%)
49.2	Share of buildings Non-Residential Sector Built between 1945 and 1969	Share (%)
------	---	-----------
49.3	Share of buildings Non-Residential Sector Built between 1970 and 1979	Share (%)
49.4	Share of buildings Non-Residential Sector Built between 1980 and 1989	Share (%)
49.5	Share of buildings Non-Residential Sector Built between 1990 and 1999	Share (%)
49.6	Share of buildings Non-Residential Sector Built between 2000 and 2010	Share (%)
49.7	Share of buildings Non-Residential Sector Built after 2010	Share (%)

6.2.1.3. Floor Area of Dwellings/Buildings|Residential/Non-Residential Sector|Building Type

Total floor area =
$$\sum_{t=1,i=1 \text{ or } 2}^{t=7,i=1.3 \text{ or } 2.6} (Floor Area)_{b_{resi \text{ or nonresi}},t_i}$$

Indicator Number	Indicator Name	Unit
50	Floor area of dwellings Residential Sector	Mm2
50.1	Floor area of dwellings Residential Sector SFH	Mm2

50.2	Floor area of dwellings Residential Sector MFH	Mm2
50.3	Floor area of dwellings Residential Sector Apartment blocks	Mm2
51	Floor area of buildings Non-Residential Sector	Mm2
51.1	Floor area of buildings Non-Residential Sector Offices	Mm2
51.2	Floor area of buildings Non-Residential Sector Trade buildings	Mm2
51.3	Floor area of buildings Non-Residential Sector Educational buildings	Mm2
51.4	Floor area of buildings Non-Residential Sector Health care buildings	Mm2
51.5	Floor area of buildings Non-Residential Sector Hotels and restaurants	Mm2

6.2.1.4. Share of Floor Area| Residential Sector|Construction Period

$$Share floor area residential buildings = \frac{\sum_{t=1,i=1}^{t=7,i=1.3} (Floor Area)_{b_{resi},t_i}}{\sum_{t=1,i=1}^{t=7,i=1.3} (Floor Area)_{b_{resi},t_i}}$$

Indicator
NumberIndicator NameUnit52.1Share of total Mm2|Residential Sector|Built before
1945Share (%)52.2Share of total Mm2|Residential Sector|Built between
1945 and 1969Share (%)

52.3	Share of total Mm2 Residential Sector Built between 1970 and 1979	Mm2 Share (%)
52.4	Share of total Mm2 Residential Sector Built between 1980 and 1989	Share (%)
52.5	Share of total Mm2 Residential Sector Built between 1990 and 1999	Share (%)
52.6	Share of total Mm2 Residential Sector Built between 2000 and 2010	Share (%)
52.7	Share of total Mm2 Residential Sector Built after 2010	Share (%)

6.2.1.5. Cooled/Heated Floor Area|Residential/Non-Residential Sector|Building Type/Construction Period

Total heated floor area =
$$\sum_{t=1,i=1}^{t=7,i=2.6} (Heated Floor Area)_{t,b_{resi,nonresi'}}$$

Total cooled floor area =
$$\sum_{t=1,i=1}^{t=7,i=2.6} (Cooled Floor Area)_{t,b_{resi,nonresi'}}$$

Indicator Number	Indicator Name	Unit
53	Cooled Floor Area Residential Sector	Mm2
53.1	Cooled Floor Area Residential Sector SFH	Mm2
53.2	Cooled Floor Area Residential Sector MFH	Mm2
53.3	Cooled Floor Area Residential Sector Apartment blocks	Mm2

53.4	Cooled Floor Area Residential Sector Built before 1945	Mm2
53.5	Cooled Floor Area Residential Sector Built between 1945 and 1969	Mm2
53.6	Cooled Floor Area Residential Sector Built between 1970 and 1979	Mm2
53.7	Cooled Floor Area Residential Sector Built between 1980 and 1989	Mm2
53.8	Cooled Floor Area Residential Sector Built between 1990 and 1999	Mm2
53.9	Cooled Floor Area Residential Sector Built between 2000 and 2010	Mm2
53.10	Cooled Floor Area Residential Sector Built after 2010	Mm2
54	Heated Floor Area Residential Sector	Mm2
54.1	Heated Floor Area Residential Sector SFH	Mm2
54.2	Heated Floor Area Residential Sector MFH	Mm2
54.3	Heated Floor Area Residential Sector Apartment blocks	Mm2
54.4	Heated Floor Area Residential Sector Built before 1945	Mm2
54.5	Heated Floor Area Residential Sector Built between 1945 and 1969	Mm2
54.6	Heated Floor Area Residential Sector Built between 1970 and 1979	Mm2

54.7	Heated Floor Area Residential Sector Built between 1980 and 1989	Mm2
54.8	Heated Floor Area Residential Sector Built between 1990 and 1999	Mm2
54.9	Heated Floor Area Residential Sector Built between 2000 and 2010	Mm2
54.10	Heated Floor Area Residential Sector Built after 2010	Mm2
55	Cooled Floor Area Non-Residential Sector	Mm2
55.1	Cooled Floor Area Non-Residential Sector Offices	Mm2
55.2	Cooled Floor Area Non-Residential Sector Trade buildings	Mm2
55.3	Cooled Floor Area Non-Residential Sector Educational buildings	Mm2
55.4	Cooled Floor Area Non-Residential Sector Health care buildings	Mm2
55.5	Cooled Floor Area Non-Residential Sector Hotels and restaurants	Mm2
55.6	Cooled Floor Area Non-Residential Sector Other non- residential buildings	Mm2
55.7	Cooled Floor Area Non-Residential Sector Built before 1945	Mm2
55.8	Cooled Floor Area Non-Residential Sector Built between 1945 and 1969	Mm2

55.9	Cooled Floor Area Non-Residential Sector Built between 1970 and 1979	Mm2
55.10	Cooled Floor Area Non-Residential Sector Built between 1980 and 1989	Mm2
55.11	Cooled Floor Area Non-Residential Sector Built between 1990 and 1999	Mm2
55.12	Cooled Floor Area Non-Residential Sector Built between 2000 and 2010	Mm2
55.13	Cooled Floor Area Non-Residential Sector Built after 2010	Mm2
56	Heated Floor Area Non-Residential Sector	Mm2
56.1	Heated Floor Area Non-Residential Sector Offices	Mm2
56.2	Heated Floor Area Non-Residential Sector Trade buildings	Mm2
56.3	Heated Floor Area Non-Residential Sector Educational buildings	Mm2
56.4	Heated Floor Area Non-Residential Sector Health care buildings	Mm2
56.5	Heated Floor Area Non-Residential Sector Hotels and restaurants	Mm2
56.6	Heated Floor Area Non-Residential Sector Other non- residential buildings	Mm2
56.7	Heated Floor Area Non-Residential Sector Built before 1945	Mm2

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56.8	Heated Floor Area Non-Residential Sector Built between 1945 and 1969	Mm2
56.9	Heated Floor Area Non-Residential Sector Built between 1970 and 1979	Mm2
56.10	Heated Floor Area Non-Residential Sector Built between 1980 and 1989	Mm2
56.11	Heated Floor Area Non-Residential Sector Built between 1990 and 1999	Mm2
56.12	Heated Floor Area Non-Residential Sector Built between 2000 and 2010	Mm2
56.13	Heated Floor Area Non-Residential Sector Built after 2010	Mm2

6.2.2. Building renovation

Currently, there are not any indicators for this subcategory.

6.2.3. Nearly-zero energy buildings

Currently, there are not any indicators for this subcategory.

6.3. Building characteristics thematic area

6.3.1. Building shell performance

This section gives the variables for the equations determined to calculate each indicator and their possible values.

- 1. b_{resi} : Building types of the residential sector
- 2. *b_{nonresi}*: Building types of non-residential sector
- 3. *t*: Construction period
- 4. e: Energy carrier
- 5. *f*: Building part
- 6. *h*: Heating system/source

b _{resi}	 1.1 if the building type is single – family houses 1.2 if the building type is multi – family houses 1.3 if the building type is apartment blocks houses 	
b _{nonresi} =	 2.1 if the building type is offices 2.2 if the building type is trade buildings 2.3 if the building type is educational buildings 2.4 if the building type is health care buildings 2.5 if the building type is hotels and restaurants 52.6 if the building type is other non - residential buildings 	
<i>t</i> =	 if the construction period is before 1945 if the construction period is between 1945 – 1969 if the construction period is between 1970 – 1979 if the construction period is between 1980 – 1989 if the construction period is between 1990 – 1999 if the construction period is between 2000 – 2010 if the construction period is after 2010 	
	$e = \begin{cases} 1 & \text{if the energy carrier is electricity} \\ 2 & \text{if the energy carrier is oil} \\ 3 & \text{if the energy carrier is natural gas} \\ 4 & \text{if the energy carrier is coal} \\ 5 & \text{if the energy carrier is solar} \end{cases}$	
	$f = \begin{cases} 1 & \text{if the building part is floors} \\ 2 & \text{if the building part is roofs} \\ 3 & \text{if the building part is windows} \end{cases}$	
h =	 if the heating system/source is solar thermal panel if the heating system/source is solar biomass heaters if the heating system/source is district heating system if the heating system/source is reversible heat pumps if the heating system/source is conventional boilers if the heating system/source is heat pumps if the heating system/source is fireplace 	L

6.3.1.1. U-Value|Residential/Non-Residential Sector|Building Part|Construction Period

 $(U - value)_{t, b_{resi, nonresi, f, h} t:1, \dots, 7; b_{resi}=1.1, 1.2, 1.3; b_{nonresi}=2.1, 2.2, 2.3, 2.4, 2.5, 2.6; h:1, \dots, 7; f:1, 2, 3.}$

The subsequent indicators can be computed using this approach.

Indicator Number		Indicator Name	Unit
	57		W/m² °C
		U-Value Residential Sector External walls	
	57.1	U-Value Residential Sector External walls Built before 1945	W/m² °C
	57.2	U-Value Residential Sector External walls Built between 1945 and 1969	W/m² °C
	57.3	U-Value Residential Sector External walls Built between 1970 and 1979	W/m² °C
	57.4	U-Value Residential Sector External walls Built between 1980 and 1989	W/m² °C
	57.5	U-Value Residential Sector External walls Built between 1990 and 1999	W/m² °C
	57.6	U-Value Residential Sector External walls Built between 2000 and 2010	W/m² °C
	57.7	U-Value Residential Sector External walls Built between after 2010	W/m² °C
	58	Energy Efficiency Residential Sector Floors	W/m² °C
	58.1	U-Value Residential Sector Floors Built before 1945	W/m² °C
	58.2	U-Value Residential Sector Floors Built between 1945 and 1969	W/m² °C
	58.3	U-Value Residential Sector Floors Built between 1970 and 1979	W/m² °C
	58.4	U-Value Residential Sector Floors Built between 1980 and 1989	W/m² °C
	58.5	U-Value Residential Sector Floors Built between 1990 and 1999	W/m² °C
	58.6	U-Value Residential Sector Floors Built between 2000 and 2010	W/m² °C
	58.7	U-Value Residential Sector Floors Built between after 2010	W/m² °C
	59	Energy Efficiency Residential Sector Roofs	W/m² °C
	59.1	U-Value Residential Sector Roofs Built before 1945	W/m² °C
	59.2	U-Value Residential Sector Roofs Built between 1945 and 1969	W/m² °C
	59.3	U-Value Residential Sector Roofs Built between 1970 and 1979	W/m² °C

59.4	U-Value Residential Sector Roofs Built between 1980 and 1989	W/m² °C
59.5	U-Value Residential Sector Roofs Built between 1990 and 1999	W/m² ℃
59.6	U-Value Residential Sector Roofs Built between 2000 and 2010	W/m² °C
59.7	U-Value Residential Sector Roofs Built between after 2010	W/m² °C
60	Energy Efficiency Residential Sector Windows	W/m² °C
60.1	U-Value Residential Sector Windows Built before 1945	W/m² °C
60.2	U-Value Residential Sector Windows Built between 1945 and 1969	W/m² °C
60.3	U-Value Residential Sector Windows Built between 1970 and 1979	W/m² °C
60.4	U-Value Residential Sector Windows Built between 1980 and 1989	W/m² °C
60.5	U-Value Residential Sector Windows Built between 1990 and 1999	W/m² °C
60.6	U-Value Residential Sector Windows Built between 2000 and 2010	W/m² °C
60.7	U-Value Residential Sector Windows Built between after 2010	W/m² °C
61	Energy Efficiency Non-Residential Sector External walls	W/m² °C
61.1	U-Value Non-Residential Sector External walls Built before 1945	W/m² °C
61.2	U-Value Non-Residential Sector External walls Built between 1945 and 1969	W/m² °C
61.3	U-Value Non-Residential Sector External walls Built between 1970 and 1979	W/m² °C
61.4	U-Value Non-Residential Sector External walls Built between 1980 and 1989	W/m² °C
61.5	U-Value Non-Residential Sector External walls Built between 1990 and 1999	W/m² °C
61.6	U-Value Non-Residential Sector External walls Built between 2000 and 2010	W/m² °C
61.7	U-Value Non-Residential Sector External walls Built between after 2010	W/m² °C
62	Energy Efficiency Non-Residential Sector Floors	W/m² °C

62.1	U-Value Non-Residential Sector Floors Built before 1945	W/m² ℃
62.2	U-Value Non-Residential Sector Floors Built between 1945 and 1969	W/m² ℃
62.3	U-Value Non-Residential Sector Floors Built between 1970 and 1979	W/m² °C
62.4	U-Value Non-Residential Sector Floors Built between 1980 and 1989	W/m² °C
62.5	U-Value Non-Residential Sector Floors Built between 1990 and 1999	W/m² °C
62.6	U-Value Non-Residential Sector Floors Built between 2000 and 2010	W/m² °C
62.7	U-Value Non-Residential Sector Floors Built between after 2010	W/m² ℃
63	Energy Efficiency Non-Residential Sector Roofs	W/m² °C
63.1	U-Value Non-Residential Sector Roofs Built before 1945	W/m² °C
63.2	U-Value Non-Residential Sector Roofs Built between 1945 and 1969	W/m² ℃
63.3	U-Value Non-Residential Sector Roofs Built between 1970 and 1979	W/m² ℃
63.4	U-Value Non-Residential Sector Roofs Built between 1980 and 1989	W/m² °C
63.5	U-Value Non-Residential Sector Roofs Built between 1990 and 1999	W/m² °C
63.6	U-Value Non-Residential Sector Roofs Built between 2000 and 2010	W/m² °C
63.7	U-Value Non-Residential Sector Roofs Built between after 2010	W/m² °C
64	Energy Efficiency Non-Residential Sector Windows	W/m² °C
64.1	U-Value Non-Residential Sector Windows Built before 1945	W/m² °C
64.2	U-Value Non-Residential Sector Windows Built between 1945 and 1969	W/m² °C
64.3	U-Value Non-Residential Sector Windows Built between 1970 and 1979	W/m² ℃
64.4	U-Value Non-Residential Sector Windows Built between 1980 and 1989	W/m² °C

64.5	U-Value Non-Residential Sector Windows Built between 1990 and 1999	W/m² °C
64.6	U-Value Non-Residential Sector Windows Built between 2000 and 2010	W/m² ℃
64.7	U-Value Non-Residential Sector Windows Built between after 2010	W/m² ℃

6.3.2. Technical building systems

6.3.2.1. Share of heating system per dwellings/Buildings|Residential/Non-Residential Sector|Heating System

Share buildings with heating system

$$=\frac{\sum_{t=1,i=1,h=1}^{t=7,i=2.6,h=7} \left(Number \ of \ heating \ sytem_h\right)_{t,b_{resi \ or \ nonresi}}}{\sum_{t=1,i=1,h=1}^{t=7,i=2.6,h=7} \left(Number \ of \ buildings/dwellings}\right)_{t,b_{resi \ or \ nonresi}}}.$$

Indicator Number	Indicator Name	Unit
65	Share of dwellings Residential sector Condensing boilers	Share (%)
66	Share of dwellings Residential sector Conventional boilers	Share (%)
67	Share of dwellings Residential sector Heat pumps	Share (%)
68	Share of dwellings Residential sector Reversible heat pumps	Share (%)
69	Share of dwellings Residential sector Solar heating systems	Share (%)
70	Share of dwellings Residential sector Stove	Share (%)
71	Share of dwellings Residential sector Fireplace	Share (%)
72	Share of dwellings Residential sector District heating systems	Share (%)

73	Share of dwellings Residential sector Local space heating	Share (%)
74	Share of buildings Non-residential sector Heat pumps	Share (%)
75	Share of buildings Non-residential sector Reversible heat pumps	Share (%)
76	Share of buildings Non-residential sector Solar heating systems	Share (%)
77	Share of buildings Non-residential sector Stove	Share (%)
78	Share of buildings Non-residential sector Fireplace	Share (%)

6.3.2.2. Number of heating systems per building stock|Residential/Non-Residential Sector|Heating System

Number of heating system per dwelling by h

$$= \sum_{t=1,i=1,h=5}^{t=7,i=2.6,h=5} \left(Number of heating sytem_h \right)_{t,b_{resi or nonresi}}.$$

Indicator Number	Indicator Name	Unit
81	Number of dwellings Residential sector Conventional boilers	Thousands
82	Number of dwellings Residential sector Combi boilers	Thousands
83	Number of dwellings Residential sector Heat pumps	Thousands
84	Number of dwellings Residential sector Water heating on electric heaters (not heat-pump)	Thousands
85	Number of dwellings Residential sector Water heating with other heaters	Thousands
86	Number of dwellings Residential sector Water heater/boiler	Thousands

87	Number of buildings Non-residential sector Condensing boilers	Thousands
88	Number of buildings Non-residential sector Conventional boilers	Thousands
89	Number of buildings Non-residential sector Combi boilers	Thousands
90	Number of buildings Non-residential sector Heat pumps	Thousands

6.3.2.3. Number of Dwellings/Buildings|Residential/Non-Residential Sector|Energy Carrier for Heating

Total number of dwellings (buildings) by energy carrier e

$$=\sum_{t=1,i=1,h=5}^{t=7,i=2.6,h=5} \left(Number of buildings_e \right)_{t,b_{resi or nonresi}}$$

Indicator Number	Indicator Name	Unit
91.1	Number of dwellings Residential sector Heating with electricity	Thousands
91.2	Number of dwellings Residential sector Heating on fuel oil	Thousands
91.3	Number of dwellings Residential sector Heating on kerosene	Thousands
91.4	Number of dwellings Residential sector Heating on LPG	Thousands
91.5	Number of dwellings Residential sector Heating on natural gas	Thousands
91.6	Number of dwellings Residential sector Heating on solar thermal panel	Thousands
91.7	Number of dwellings Residential sector Heating on coal	Thousands
91.8	Number of dwellings Residential sector Heating on biomass	Thousands

92.1	Number of buildings Non-residential sector Heating on electricity	Thousands
92.2	Number of buildings Non-residential sector Heating on fuel oil	Thousands
92.3	Number of buildings Non-residential sector Heating on kerosene	Thousands
92.4	Number of buildings Non-residential sector Heating on LPG	Thousands
92.5	Number of buildings Non-residential sector Heating on natural gas	Thousands
92.6	Number of buildings Non-residential sector Heating on solar thermal energy	Thousands
92.7	Number of buildings Non-residential sector Heating on coal	Thousands
92.8	Number of buildings Non-residential sector Heating on biomass	Thousands
92.9	Number of buildings Non-residential sector Water heating on electric heaters (not heat-pump)	Thousands

6.3.2.4. Surface Area|Residential/Non-Residential Sector|Roof/External Walls/South Facade| per Building Type

The indicators within this cluster are absent from the BSO's coverage. BuiltHub suggests these indicators as innovative indicators. Indicators numbered 83-88 revolve around evaluating the PV potential inherent in the building stock, thus holding significance within the energy community framework.

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Indicator Number	Indicator Name	Unit
93	Surface area Residential Sector Roof per Building Type	m²
94	Surface area Non-Residential Sector Roof per Building Type	m²
95	Surface area Residential Sector External Walls per Building Type	m²
96	Surface area Non-Residential Sector External Walls per Building Type	m²
97	Surface area Residential Sector South Facade per Building Type	m²
98	Surface area Non-Residential Sector South	m²

6.4. Certification thematic area

This section gives the variables for the equations determined to calculate each indicator and their possible values.

- *b_{resi}*: Building types of the residential sector
- *b_{nonresi}*: Building types of non-residential sector
- *t*: Construction period
- f: EPC class

	(1.1	if the building type is single – family houses
$b_{resi} =$	1.2	if the building type is multi – family houses
	(1.3	if the building type is apartment blocks houses

	(2,1)	if the building type is offices
	2.2	if the building type is trade buildings
L	2.3	if the building type is educational buildings
D _{nonresi} =	2.4	if the building type is health care buildings
	2.5	if the building type is hotels and restaurants
	2.6	if the building type is other non – residential buildings

$$t = \begin{cases} 1 & \text{if the construction period is before 1945} \\ 1 & \text{if the construction period is between 1945} - 1969 \\ 3 & \text{if the construction period is between 1970} - 1979 \\ 4 & \text{if the construction period is between 1980} - 1989 \\ 5 & \text{if the construction period is between 1990} - 1999 \\ 6 & \text{if the construction period is between 2000} - 2010 \\ & \text{if the construction period is after 2010} \end{cases}$$

$$f = \begin{cases} 1 & \text{if the EPC class is A} \\ 2 & \text{if the EPC class is B} \\ 3 & \text{if the EPC class is C} \\ 4 & \text{if the EPC class is D} \\ 5 & \text{if the EPC class is > D} \end{cases}$$

6.4.1.1. Number of EPC|Residential/Non-Residential Sector

Total number of EPC =
$$\sum_{t=1,i=1}^{t=7,i=2.6} (Number of EPC)_{t,b_{resi or nonresi}}$$

The following indicators can be calculated with this method.

Indicator Number	Indicator Name	Unit
99	Number of EPC Residential Sector	Thousands
100	Number of EPC Non-Residential Sector	Thousands

6.4.1.2. Share of EPC|Residential/Non-Residential Sector|EPC Class

This indicator can be calculated via two methods: one is by the number of buildings, and the other is by total floor area. Related equations are provided below:

Share of EPC by Floor Area =
$$\frac{\sum_{e=1,t=1,i=1}^{e=5,t=7,i=2.6} (Number of EPC)_{e,b_{resi or nonresi,t}}}{\sum_{t=1,i=1}^{t=7,i=2.6} (Floor Area)_{b_{resi or nonresi,t}}}.$$

Share of EPC by Number of Buildings

$$= \frac{\sum_{e=1,t=1,i=1}^{e=5,t=7,i=2.6} (Number of EPC)_{e,b_{resi or nonresi},t}}{\sum_{t=1,i=1}^{t=7,i=2.6} (Number of Buildings)_{b_{resi or nonresi},t}}}$$

Indicator Number	Indicator Name	Unit
99.1	Share of EPC Residential Sector Class A	Share (%)
99.2	Share of EPC Residential Sector Class B	Share (%)
99.3	Share of EPC Residential Sector Class C	Share (%)
99.4	Share of EPC Residential Sector Class D	Share (%)
99.5	Share of EPC Residential Sector Class >D	Share (%)
100.1	Share of EPC Residential Sector Class A related to m2 covered	Share (%)
100.2	Share of EPC Residential Sector Class B related to m2 covered	Share (%)
100.3	Share of EPC Residential Sector Class C related to m2 covered	Share (%)
100.4	Share of EPC Residential Sector Class D related to m2 covered	Share (%)
100.5	Share of EPC Residential Sector Class >D related to m2 covered	Share (%)
101.1	Share of EPC Non-Residential Sector Class A	Share (%)
101.2	Share of EPC Non-Residential Sector Class B	Share (%)
101.3	Share of EPC Non-Residential Sector Class C	Share (%)

101.4	Share of EPC Non-Residential Sector Class D	Share (%)
101.5	Share of EPC Non-Residential Sector Class >D	Share (%)
102.1	Share of EPC Non-Residential Sector Class A related to m2 covered	Share (%)
102.2	Share of EPC Non-Residential Sector Class B related to m2 covered	Share (%)
102.3	Share of EPC Non-Residential Sector Class C related to m2 covered	Share (%)
102.4	Share of EPC Non-Residential Sector Class D related to m2 covered	Share (%)
102.5	Share of EPC Non-Residential Sector Class >D related to m2 covered	Share (%)

6.5. Finance thematic area

Currently, there are not any available datasets to calculate these indicators, but they have been grouped to ease the future calculation procedure.

The variables for the equations determined to calculate each indicator and their possible values are given below.

- *b_{resi}*: Building types of the residential sector
- *b_{nonresi}*: Building types of non-residential sector
- t: Construction period

 $b_{resi} = \begin{cases} 1.1 & \text{if the building type is single} - \text{family houses} \\ 1.2 & \text{if the building type is multi} - \text{family houses} \\ 1.3 & \text{if the building type is apartment blocks houses} \end{cases}$

$$b_{nonresi} = \begin{cases} 2.1 & \text{if the building type is offices} \\ 2.2 & \text{if the building type is trade buildings} \\ 2.3 & \text{if the building type is educational buildings} \\ 2.4 & \text{if the building type is health care buildings} \\ 2.5 & \text{if the building type is hotels and restaurants} \\ 2.6 & \text{if the building type is other non - residential buildings} \\ if the building type is other non - residential buildings \\ if the construction period is before 1945 \\ if the construction period is between 1945 - 1969 \\ if the construction period is between 1970 - 1979 \\ if the construction period is between 1980 - 1989 \\ 5 & \text{if the construction period is between 1990 - 1999} \\ 6 & \text{if the construction period is between 2000 - 2010} \\ if the construction period is after 2010 \\ \end{cases}$$

6.5.1.1. Investments|Residential/Non-Residential Sector|Building Type|in Renovation/Energy Related

Calculation procedures will be defined according to the available datasets.

Indicator Number	Indicator Name	Unit
103	Investments Residential Sector in renovation	Mio/EURyear
103.1	Investments Residential Sector SFH in renovation	Mio/EURyear
103.2	Investments Residential Sector MFH in renovation	Mio/EURyear
103.3	Investments Residential Sector Apartment blocks in renovation	Mio/EURyear
104	Investments Residential Sector Energy related	Mio/EURyear
104.1	Investments Residential Sector SFH Energy related investments	Mio/EURyear
104.2	Investments Residential Sector MFH Energy related investments	Mio/EURyear

104.3	Investments Residential Sector Apartment blocks Energy related investments	Mio/EURyear
105	Investments Non-Residential Sector in renovation	Mio/EURyear
105.1	Investments Non-Residential Sector Offices in renovation	Mio/EURyear
105.2	Investments Non-Residential Sector Trade buildings in renovation	Mio/EURyear
105.3	Investments Non-Residential Sector Educational buildings in renovation	Mio/EURyear
105.4	Investments Non-Residential Sector Health care buildings in renovation	Mio/EURyear
105.5	Investments Non-Residential Sector Hotels and restaurants in renovation	Mio/EURyear
105.6	Investments Non-Residential Sector Other non-Non- Residential buildings in renovation	Mio/EURyear
106	Investments Non-Residential Sector Energy related investments	Mio/EURyear
106.1	Investments Non-Residential Sector Offices Energy related investments	Mio/EURyear
106.2	Investments Non-Residential Sector Trade buildings Energy related investments	Mio/EURyear
106.3	Investments Non-Residential Sector Educational buildings Energy related investments	Mio/EURyear
106.4	Investments Non-Residential Sector Health care buildings Energy related investments	Mio/EURyear

106.5	Investments Non-Residential Sector Hotels and restaurants Energy related investments	Mio/EURyear
106.6	Investments Non-Residential Sector Other non-Non- Residential buildings Energy related investments	Mio/EURyear

6.5.1.2. Average Investments|Residential/Non-Residential Sector|Building Type|in Energy Renovation

Calculation procedures will be defined according to the available datasets.

Indicator Number	Indicator Name	Unit
107	Average investments Residential Sector	EUR/m2
107.1	Average investments Residential Sector SFH	EUR/m2
107.2	Average investments Residential Sector MFH	EUR/m2
107.3	Average investments Residential Sector Apartment blocks	EUR/m2
108	Average investments Residential Sector in energy renovation	EUR/m2
108.1	Average investments Residential Sector SFH in energy renovation	EUR/m2
108.2	Average investments Residential Sector MFH in energy renovation	EUR/m2
108.3	Average investments Residential Sector Apartment blocks in energy renovation	EUR/m2
109	Average investments Non-Residential Sector	EUR/m2

109.1	Average investments Non-Residential Sector Offices	EUR/m2
109.2	Average investments Non-Residential Sector Trade buildings	EUR/m2
109.3	Average investments Non-Residential Sector Educational buildings	EUR/m2
109.4	Average investments Non-Residential Sector Health care buildings	EUR/m2
109.5	Average investments Non-Residential Sector Hotels and restaurants	EUR/m2
109.6	Average investments Non-Residential Sector Other non-Non-Residential buildings	EUR/m2
110	Average investments Non-Residential Sector in energy renovation	EUR/m2
110.1	Average investments Non-Residential Sector Offices in energy renovation	EUR/m2
110.2	Average investments Non-Residential Sector Trade buildings in energy renovation	EUR/m2
110.3	Average investments Non-Residential Sector Educational buildings in energy renovation	EUR/m2
110.4	Average investments Non-Residential Sector Health care buildings in energy renovation	EUR/m2
110.5	Average investments Non-Residential Sector Hotels and restaurants in energy renovation	EUR/m2
110.6	Average investments Non-Residential Sector Other non-Non-Residential buildings in energy renovation	EUR/m2



6.5.1.3. Achieved Energy Savings by Renovation|Residential/Non-Residential Sector|Building Type

Calculation procedures will be defined according to the available datasets.

Indicator Number	Indicator Name	Unit
111	Achieved energy savings by renovation Residential Sector	kWh/year
111.1	Achieved energy savings by renovation Residential Sector SFH	kWh/year
111.2	Achieved energy savings by renovation Residential Sector MFH	kWh/year
111.3	Achieved energy savings by renovation Residential Sector Apartment blocks	kWh/year
112	Achieved energy savings by renovation Non- Residential Sector	kWh/year
112.1	Achieved energy savings by renovation Non- Residential Sector Offices	kWh/year
112.2	Achieved energy savings by renovation Non- Residential Sector Trade buildings	kWh/year
112.3	Achieved energy savings by renovation Non- Residential Sector Educational buildings	kWh/year
112.4	Achieved energy savings by renovation Non- Residential Sector Health care buildings	kWh/year
112.5	Achieved energy savings by renovation Non- Residential Sector Hotels and restaurants	kWh/year
112.6	Achieved energy savings by renovation Non- Residential Sector Other non-residential buildings	kWh/year

6.5.1.4. Annual savings per EUR invested for Retrofit|Residential/Non-Residential Sector|Building Type

Calculation procedures will be defined according to the available datasets.

Indicator Number	Indicator Name	Unit
113	Average energy cost savings for retrofit Residential Sector	Mio/EURyear
113.1	Average energy cost savings for retrofit Residential Sector SFH	Mio/EURyear
113.2	Average energy cost savings for retrofit Residential Sector MFH	Mio/EURyear
113.3	Average energy cost savings for retrofit Residential Sector Apartment blocks	Mio/EURyear
114	Average energy cost savings for retrofit Non- Residential Sector	Mio/EURyear
114.1	Average energy cost savings for retrofit Non- Residential Sector Offices	Mio/EURyear
114.2	Average energy cost savings for retrofit Non- Residential Sector Trade buildings	Mio/EURyear
114.3	Average energy cost savings for retrofit Non- Residential Sector Educational buildings	Mio/EURyear
114.4	Average energy cost savings for retrofit Non- Residential Sector Health care buildings	Mio/EURyear
114.5	Average energy cost savings for retrofit Non- Residential Sector Hotels and restaurants	Mio/EURyear
114.6	Average energy cost savings for retrofit Non- Residential Sector Other non-residential buildings	Mio/EURyear

6.6. Potential for energy delivery by district heating thematic area

The indicators within this cluster are absent from the BSO's coverage. BuiltHub suggests these indicators as innovative indicators. Indicators numbered 89-96 are primarily associated with assessing district heating potentials and utilization in the existing building stock. The availability of requisite data enables us to generate insightful analyses concerning the current state of district heating utilization, thereby facilitating informed future planning.

Indicators numbered 115-126 encompass zones where district heating may emerge as an economically viable option in the proximate future. Pertinent estimations could be extrapolated from the Hotmaps dataset, which also underpins the derivation of other indicators within this deliverable.

Indicator Number	Indicator Name	Unit
115	Number of buildings Residential Sector in a DH supply area	Thousands
116	Number of buildings Non-Residential Sector in a DH supply area	Thousands
117	Share of buildings Residential Sector in a DH supply area	Share (%)
118	Share of buildings Non-Residential Sector in a DH supply area	Share (%)
119	Number of buildings Residential Sector in a DH supply zone	Thousands
120	Number of buildings Non-Residential Sector in a DH supply zone	Thousands
121	Share of buildings Residential Sector in a DH supply zone	Share (%)
122	Share of buildings Non-Residential Sector in a DH supply zone	Share (%)
123	Number of buildings Residential Sector in a high heat density area	Thousands
124	Number of buildings Non-Residential Sector in a high heat density area	Thousands

125	Share of buildings Residential Sector in a high heat density area	Share (%)
126	Share of buildings Non-Residential Sector in a high heat density area	Share (%)



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1. Annex

1.1. Available datasets for energy thematic area



Figure 2: Available datasets

1.2. List of indicators

1.2.1. Energy consumption

Indicator Number	Indicator Name	Unit
1	Final Energy Residential Sector	Mtoe
2	Final Energy Non-Residential Sector	Mtoe
3.1	Final Energy Residential Sector Single Family Houses	Mtoe
3.2	Final Energy Residential Sector Multi Family Houses	Mtoe
3.3	Final Energy Residential Sector Apartment Blocks	Mtoe

4.1	Final Energy Non-Residential Sector Offices	Mtoe
4.2	Final Energy Non-Residential Sector Trade Buildings	Mtoe
4.3	Final Energy Non-Residential Sector Educational Buildings	Mtoe
4.4	Final Energy Non-Residential Sector Health Care Buildings	Mtoe
4.5	Final Energy Non-Residential Sector Hotels and Restaurants	Mtoe
4.6	Final Energy Non-Residential Sector Other Non- Residential Buildings	Mtoe
5.1	Final Energy Residential Sector Gas	Mtoe
5.2	Final Energy Residential Sector Oil	Mtoe
5.3	Final Energy Residential Sector Coal	Mtoe
5.4	Final Energy Residential Sector Electricity	Mtoe
5.5	Final Energy Residential Sector Heat	Mtoe
5.6	Final Energy Residential Sector Renewables	Mtoe
6.1	Final Energy Non-Residential Sector Gas	Mtoe
6.2	Final Energy Non-Residential Sector Oil	Mtoe
6.3	Final Energy Non-Residential Sector Coal	Mtoe
6.4	Final Energy Non-Residential Sector Electricity	Mtoe
6.5	Final Energy Non-Residential Sector Heat	Mtoe
6.6	Final Energy Non-Residential Sector Renewables	Mtoe
7	Final Energy Residential Sector Space Heating	Mtoe
7.1	Final Energy Residential Sector Single Family Houses Space Heating	Mtoe
7.2	Final Energy Residential Sector Multi Family Houses Space Heating	Mtoe
7.3	Final Energy Residential Sector Apartment Blocks Space Heating	Mtoe
8	Final Energy Non-Residential Sector Space Heating	Mtoe
8.1	Final Energy Non-Residential Sector Offices Space Heating	Mtoe

8.2	Final Energy Non-Residential Sector Trade Buildings Space Heating	Mtoe
8.3	Final Energy Non-Residential Sector Educational Buildings Space Heating	Mtoe
8.4	Final Energy Non-Residential Sector Health Care Buildings Space Heating	Mtoe
8.5	Final Energy Non-Residential Sector Hotels and Restaurants Space Heating	Mtoe
8.6	Final Energy Non-Residential Sector Other Non- Residential Buildings Space Heating	Mtoe
9.1	Final Energy Residential Sector Space Heating Gas	Mtoe
9.2	Final Energy Residential Sector Space Heating Oil	Mtoe
9.3	Final Energy Residential Sector Space Heating Coal	Mtoe
9.4	Final Energy Residential Sector Space Heating Electricity	Mtoe
9.5	Final Energy Residential Sector Space Heating Heat	Mtoe
9.6	Final Energy Residential Sector Space Heating Renewables	Mtoe
10.1	Final Energy Non-Residential Sector Space Heating Gas	Mtoe
10.2	Final Energy Non-Residential Sector Space Heating Oil	Mtoe
10.3	Final Energy Non-Residential Sector Space Heating Coal	Mtoe
10.4	Final Energy Non-Residential Sector Space Heating Electricity	Mtoe
10.5	Final Energy Non-Residential Sector Space Heating Heat	Mtoe
10.6	Final Energy Non-Residential Sector Space Heating Renewables	Mtoe
11	Final Energy Residential Sector Water Heating	Mtoe
11.1	Final Energy Residential Sector Water Heating Gas	Mtoe
11.2	Final Energy Residential Sector Water Heating Oil	Mtoe

11.3	Final Energy Residential Sector Water Heating Coal	Mtoe
11.4	Final Energy Residential Sector Water Heating Electricity	Mtoe
11.5	Final Energy Residential Sector Water Heating Heat	Mtoe
12	Final Energy Non-Residential Sector Water Heating	Mtoe
12.1	Final Energy Non-Residential Sector Water Heating Gas	Mtoe
12.2	Final Energy Non-Residential Sector Water Heating Oil	Mtoe
12.3	Final Energy Non-Residential Sector Water Heating Coal	Mtoe
12.4	Final Energy Non-Residential Sector Water Heating Electricity	Mtoe
12.5	Final Energy Non-Residential Sector Water Heating Heat	Mtoe
13.1	Final Energy Non-Residential Sector Offices Water Heating	Mtoe
13.2	Final Energy Non-Residential Sector Trade Buildings Water Heating	Mtoe
13.3	Final Energy Non-Residential Sector Educational Buildings Water Heating	Mtoe
13.4	Final Energy Non-Residential Sector Health Care Buildings Water Heating	Mtoe
13.5	Final Energy Non-Residential Sector Hotels and Restaurants Water Heating	Mtoe
13.6	Final Energy Non-Residential Sector Other Non- Residential Buildings Water Heating	Mtoe
14	Final Energy Residential Sector Cooking	Mtoe
14.1	Final Energy Residential Sector Cooking Gas	Mtoe
14.2	Final Energy Residential Sector Cooking Oil	Mtoe
14.3	Final Energy Residential Sector Cooking Coal	Mtoe
14.4	Final Energy Residential Sector Cooking Electricity	Mtoe
14.5	Final Energy Residential Sector Cooking Renewables	Mtoe

15	Final Energy Non-Residential Sector Cooking	Mtoe
16	Final Energy Residential Sector Lighting	Mtoe
17	Final Energy Non-Residential Sector Lighting	Mtoe
17.1	Final Energy Non-Residential Sector Offices Lighting	Mtoe
17.2	Final Energy Non-Residential Sector Trade Buildings Lighting	Mtoe
17.3	Final Energy Non-Residential Sector Educational Buildings Lighting	Mtoe
17.4	Final Energy Non-Residential Sector Health Care Buildings Lighting	Mtoe
17.5	Final Energy Non-Residential Sector Hotels and Restaurants Lighting	Mtoe
17.6	Final Energy Non-Residential Sector Other Non- Residential Buildings Lighting	Mtoe
18	Final Energy Residential Sector Space Cooling	Mtoe
19	Specific Energy Residential Sector per Building	kWh/building
20.1	Specific Energy Residential Sector Space Heating per Dwelling	kWh/dwelling
20.2	Specific Energy Residential Sector Water Heating per Dwelling	kWh/dwelling
20.3	Specific Energy Residential Sector Cooking per Dwelling	kWh/dwelling
20.4	Specific Energy Residential Sector Lighting per Dwelling	kWh/dwelling
21	Specific Energy Residential Sector per m ²	kWh/m2
21.1	Specific Energy Residential Sector Single Family Houses per m ²	kWh/m2
21.2	Specific Energy Residential Sector Multi Family Houses per m ²	kWh/m2
21.3	Specific Energy Residential Sector Apartment Blocks per m ²	kWh/m2
22	Specific Energy Non-Residential Sector per m ²	kWh/m2
22.1	Specific Energy Non-Residential Sector Offices per m ²	kWh/m2
22.2	Specific Energy Non-Residential Sector Trade Buildings per m ²	kWh/m2

22.3	Specific Energy Non-Residential Sector Educational Buildings per m ²	kWh/m2
22.4	Specific Energy Non-Residential Sector Health Care Buildings per m ²	kWh/m2
22.5	Specific Energy Non-Residential Sector Hotels and Restaurants per m ²	kWh/m2
22.6	Specific Energy Non-Residential Sector Other Non-Residential Buildings per m ²	kWh/m2
23	Specific Energy Residential Sector Space Heating per m ²	kWh/m2
23.1	Specific Energy Residential Sector Single Family Houses Space Heating per m ²	kWh/m2
23.2	Specific Energy Residential Sector Multi Family Houses Space Heating per m ²	kWh/m2
23.3	Specific Energy Residential Sector Apartment Blocks Space Heating per m ²	kWh/m2
24	Specific Energy Non-Residential Sector Space Heating per m ²	kWh/m2
24.1	Specific Energy Non-Residential Sector Offices Space Heating per m ²	kWh/m2
24.2	Specific Energy Non-Residential Sector Trade Buildings Space Heating per m ²	kWh/m2
24.3	Specific Energy Non-Residential Sector Educational Buildings Space Heating per m ²	kWh/m2
24.4	Specific Energy Non-Residential Sector Health Care Buildings Space Heating per m ²	kWh/m2
24.5	Specific Energy Non-Residential Sector Hotels and Restaurants Space Heating per m ²	kWh/m2
24.6	Specific Energy Non-Residential Sector Other Non-Residential Buildings Space Heating per m ²	kWh/m2
25	Specific Energy Residential Sector Space Cooling per m ²	kWh/m2
25.1	Specific Energy Residential Sector Single Family Houses Space Cooling per m ²	kWh/m2
25.2	Specific Energy Residential Sector Multi Family Houses Space Cooling per m ²	kWh/m2
25.3	Specific Energy Residential Sector Apartment Blocks Space Cooling per m ²	kWh/m2

26	Specific Energy Non-Residential Sector Space Cooling per m ²	kWh/m2	
26.1	Specific Energy Non-Residential Sector Offices Space Cooling per m ²	kWh/m2	
26.2	Specific Energy Non-Residential Sector Trade Buildings Space Cooling per m ²	kWh/m2	
26.3	Specific Energy Non-Residential Sector Educational Buildings Space Cooling per m ²	kWh/m2	
26.4	Specific Energy Non-Residential Sector Health Care Buildings Space Cooling per m ²	kWh/m2	
26.5	Specific Energy Non-Residential Sector Hotels and Restaurants Space Cooling per m ²	kWh/m2	
26.6	Specific Energy Non-Residential Sector Other Non-Residential Buildings Space Cooling per m ²	kWh/m2	
27.1	Specific Energy Residential Sector Buildings Built before 1945 Space Heating per m ²	kWh/m2	
27.2	Specific Energy Residential Sector Buildings Built between 1945-1969 Space Heating per m ²	kWh/m2	
27.3	Specific Energy Residential Sector Buildings Built between 1970-1979 Space Heating per m ²	kWh/m2	
27.4	Specific Energy Residential Sector Buildings Built between 1980-1989 Space Heating per m ²	kWh/m2	
27.5	Specific Energy Residential Sector Buildings Built between 1990-1999 Space Heating per m ²	kWh/m2	
27.6	Specific Energy Residential Sector Buildings Built between 2000-2010 Space Heating per m ²	kWh/m2	
27.7	Specific Energy Residential Sector Buildings Built after 2010 Space Heating per m ²	kWh/m2	
28.1	Specific Energy Non-Residential Sector Buildings Built before 1945 Space Heating per m ²	kWh/m2	
28.2	Specific Energy Non-Residential Sector Buildings Built between 1945- 1969 Space Heating per m ²	kWh/m2	
28.3	Specific Energy Non-Residential Sector Buildings Built between 1970- 1979 Space Heating per m ²	kWh/m2	
28.4	Specific Energy Non-Residential Sector Buildings Built between 1980- 1989 Space Heating per m ²	kWh/m2	
:	28.5	Specific Energy Non-Residential Sector Buildings Built between 1990- 1999 Space Heating per m ²	kWh/m2
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:	28.6	Specific Energy Non-Residential Sector Buildings Built between 2000- 2010 Space Heating per m ²	kWh/m2
	28.7	Specific Energy Non-Residential Sector Buildings Built after 2010 Space Heating per m ²	kWh/m2
:	29.1	Specific Energy Residential Sector Buildings Built before 1945 Space Cooling per m ²	kWh/m2
2	29.2	Specific Energy Residential Sector Buildings Built between 1945-1969 Space Cooling per m ²	kWh/m2
:	29.3	Specific Energy Residential Sector Buildings Built between 1970-1979 Space Cooling per m ²	kWh/m2
2	29.4	Specific Energy Residential Sector Buildings Built between 1980-1989 Space Cooling per m ²	kWh/m2
:	29.5	Specific Energy Residential Sector Buildings Built between 1990-1999 Space Cooling per m ²	kWh/m2
:	29.6	Specific Energy Residential Sector Buildings Built between 2000-2010 Space Cooling per m ²	kWh/m2
:	29.7	Specific Energy Residential Sector Buildings Built after 2010 Space Cooling per m ²	kWh/m2
:	30.1	Specific Energy Non-Residential Sector Buildings Built before 1945 Space Cooling per m ²	kWh/m2
;	30.2	Specific Energy Non-Residential Sector Buildings Built between 1945- 1969 Space Cooling per m ²	kWh/m2
;	30.3	Specific Energy Non-Residential Sector Buildings Built between 1970- 1979 Space Cooling per m ²	kWh/m2
;	30.4	Specific Energy Non-Residential Sector Buildings Built between 1980- 1989 Space Cooling per m ²	kWh/m2
	30.5	Specific Energy Non-Residential Sector Buildings Built between 1990- 1999 Space Cooling per m ²	kWh/m2
;	30.6	Specific Energy Non-Residential Sector Buildings Built between 2000- 2010 Space Cooling per m ²	kWh/m2



30.7 Specific Energy|Non-Residential Sector|Buildings Built after 2010|Space Cooling|per m²

kWh/m2

1.2.2. Energy markets

Indicator Number	Indicator Name	Unit
31.1	Average Energy Price Residential Sector Natural Gas	EUR/kWh
31.2	Average Energy Price Residential Sector Fuel	EUR/kWh
31.3	Average Energy Price Residential Sector Coal	EUR/kWh
31.4	Average Energy Price Residential Sector Electricity	EUR/kWh
31.5	Average Energy Price Residential Sector Biomass	EUR/kWh
32.1	Average Energy Price Non-Residential Sector Natural Gas	EUR/kWh
32.2	Average Energy Price Non-Residential Sector Fuel Oil	EUR/kWh
32.3	Average Energy Price Non-Residential Sector Coal	EUR/kWh
32.4	Average Energy Price Non-Residential Sector Electricity	EUR/kWh
32.5	Average Energy Price Non-Residential Sector Biomass	EUR/kWh

1.2.3. Energy poverty

Indicator Number	Indicator Name	Unit
33	Risk of Poverty Share of Population	%
34	Leaking Roof or Damp Walls Share of Population	%

35	Inhabitants living in inadequate warm houses Share of Inhabitants	%
36.1	Multi-Family Residential Buildings Number of Rooms	Number
36.2	Single-Family Residential Buildings Number of Rooms	Number
37	Winter Mortality Number of Deaths	Number
38	Final Consumption Expenditure per Capita	(€/capita)
39	Expenditures for Housing Share	%
40	Expenditures for Fuels Share	%
41	Debts on Utility Bills Share of Population	%

1.2.4. Building stock characteristics

Indicato Numbe	r Indicator Name	Unit
4	2 Number of dwellings Residential Sector	Thousands
42	1 Number of dwellings Residential Sector SFH	Thousands
42	2 Number of dwellings Residential Sector MFH	Thousands
42	3 Number of dwellings Residential Sector Apartment blocks	Thousands
4	3 Number of dwellings Residential Sector Permanently occupied	Thousands
43	 Number of dwellings Residential Sector SFH Permanently occupied 	Thousands
43	2 Number of dwellings Residential Sector MFH Permanently occupied	Thousands
43	3 Number of dwellings Residential Sector Apartment blocks Permanently occupied	Thousands
4	4 Number of dwellings Residential Sector Secondary residences	Thousands
4	5 Number of buildings Residential Sector	Thousands
45	1 Number of buildings Residential Sector SFH	Thousands
45	2 Number of buildings Residential Sector MFH	Thousands
45	3 Number of buildings Residential Sector Apartment blocks	Thousands

46	Number of buildings Non-Residential Sector	Thousands
46.1	Number of buildings Non-Residential Sector Offices	Thousands
46.2	Number of buildings Non-Residential Sector Trade buildings	Thousands
46.3	Number of buildings Non-Residential Sector Educational buildings	Thousands
46.4	Number of buildings Non-Residential Sector Health care buildings	Thousands
46.5	Number of buildings Non-Residential Sector Hotels and restaurants	Thousands
46.6	Number of buildings Non-Residential Sector Other non-residential buildings	Thousands
47.1	Share of dwellings Residential Sector Built before 1945	Share (%)
47.2	Share of dwellings Residential Sector Built between 1945 and 1969	Share (%)
47.3	Share of dwellings Residential Sector Built between 1970 and 1979	Share (%)
47.4	Share of dwellings Residential Sector Built between 1980 and 1989	Share (%)
47.5	Share of dwellings Residential Sector Built between 1990 and 1999	Share (%)
47.6	Share of dwellings Residential Sector Built between 2000 and 2010	Share (%)
47.7	Share of dwellings Residential Sector Built after 2010	Share (%)
48.1	Share of buildings Residential Sector Built before 1945	Share (%)
48.2	Share of buildings Residential Sector Built between 1945 and 1969	Share (%)
48.3	Share of buildings Residential Sector Built between 1970 and 1979	Share (%)
48.4	Share of buildings Residential Sector Built between 1980 and 1989	Share (%)
48.5	Share of buildings Residential Sector Built between 1990 and 1999	Share (%)
48.6	Share of buildings Residential Sector Built between 2000 and 2010	Share (%)

48.7	Share of buildings Residential Sector Built after 2010	Share (%)
49.1	Share of buildings Residential Sector Built before 1945	Share (%)
49.2	Share of buildings Residential Sector Built between 1945 and 1969	Share (%)
49.3	Share of buildings Residential Sector Built between 1970 and 1979	Share (%)
49.4	Share of buildings Residential Sector Built between 1980 and 1989	Share (%)
49.5	Share of buildings Residential Sector Built between 1990 and 1999	Share (%)
49.6	Share of buildings Residential Sector Built between 2000 and 2010	Share (%)
49.7	Share of buildings Residential Sector Built after 2010	Share (%)
50	Floor area of dwellings Residential Sector	Mm2
50.1	Floor area of dwellings Residential Sector SFH	Mm2
50.2	Floor area of dwellings Residential Sector MFH	Mm2
50.3	Floor area of dwellings Residential Sector Apartment blocks	Mm2
51	Floor area of buildings Non-Residential Sector	Mm2
51.1	Floor area of buildings Non-Residential Sector Offices	Mm2
51.2	Floor area of buildings Non-Residential Sector Trade buildings	Mm2
51.3	Floor area of buildings Non-Residential Sector Educational buildings	Mm2
51.4	Floor area of buildings Non-Residential Sector Health care buildings	Mm2
51.5	Floor area of buildings Non-Residential Sector Hotels and restaurants	Mm2
51.6	Floor area of buildings Non-Residential Sector Other non-residential buildings	Mm2
52.1	Share of total Mm2 Residential Sector Built before 1945	Mm2
52.2	Share of total Mm2 Residential Sector Built between 1945 and 1969	Mm2

52.3	Share of total Mm2 Residential Sector Built between 1970 and 1979	Mm2
52.4	Share of total Mm2 Residential Sector Built between 1980 and 1989	Mm2
52.5	Share of total Mm2 Residential Sector Built between 1990 and 1999	Mm2
52.6	Share of total Mm2 Residential Sector Built between 2000 and 2010	Mm2
52.7	Share of total Mm2 Residential Sector Built after 2010	Mm2
53	Cooled Floor Area Residential Sector	Mm2
53.1	Cooled Floor Area Residential Sector SFH	Mm2
53.2	Cooled Floor Area Residential Sector MFH	Mm2
53.3	Cooled Floor Area Residential Sector Apartment blocks	Mm2
53.4	Cooled Floor Area Residential Sector Built before 1945	Mm2
53.5	Cooled Floor Area Residential Sector Built between 1945 and 1969	Mm2
53.6	Cooled Floor Area Residential Sector Built between 1970 and 1979	Mm2
53.7	Cooled Floor Area Residential Sector Built between 1980 and 1989	Mm2
53.8	Cooled Floor Area Residential Sector Built between 1990 and 1999	Mm2
53.9	Cooled Floor Area Residential Sector Built between 2000 and 2010	Mm2
54	Heated Floor Area Residential Sector	Mm2
54.1	Heated Floor Area Residential Sector SFH	Mm2
54.2	Heated Floor Area Residential Sector MFH	Mm2
54.3	Heated Floor Area Residential Sector Apartment blocks	Mm2
54.4	Heated Floor Area Residential Sector Built before 1945	Mm2
54.5	Heated Floor Area Residential Sector Built between 1945 and 1969	Mm2
54.6	Heated Floor Area Residential Sector Built between 1970 and 1979	Mm2

54.7	Heated Floor Area Residential Sector Built between 1980 and 1989	Mm2
54.8	Heated Floor Area Residential Sector Built between 1990 and 1999	Mm2
54.9	Heated Floor Area Residential Sector Built between 2000 and 2010	Mm2
55	Cooled Floor Area Non-Residential Sector	Mm2
55.1	Cooled Floor Area Non-Residential Sector Offices	Mm2
55.11	Cooled Floor Area Non-Residential Sector Built between 1980 and 1989	Mm2
55.12	Cooled Floor Area Non-Residential Sector Built between 1990 and 1999	Mm2
55.13	Cooled Floor Area Non-Residential Sector Built between 2000 and 2010	Mm2
55.2	Cooled Floor Area Non-Residential Sector Trade buildings	Mm2
55.3	Cooled Floor Area Non-Residential Sector Educational buildings	Mm2
55.4	Cooled Floor Area Non-Residential Sector Health care buildings	Mm2
55.6	Cooled Floor Area Non-Residential Sector Hotels and restaurants	Mm2
55.7	Cooled Floor Area Non-Residential Sector Other non-residential buildings	Mm2
55.8	Cooled Floor Area Non-Residential Sector Built before 1945	Mm2
55.9	Cooled Floor Area Non-Residential Sector Built between 1945 and 1969	Mm2
53.10	Cooled Floor Area Residential Sector Built after 2010	Mm2
54.10	Heated Floor Area Residential Sector Built after 2010	Mm2
55.10	Cooled Floor Area Non-Residential Sector Built between 1970 and 1979	Mm2
55.14	Cooled Floor Area Non-Residential Sector Built after 2010	Mm2
56.1	Heated Floor Area Non-Residential Sector	Mm2

56.10	Heated Floor Area Non-Residential Sector Built between 1970 and 1979	Mm2
56.11	Heated Floor Area Non-Residential Sector Built between 1980 and 1989	Mm2
56.12	Heated Floor Area Non-Residential Sector Built between 1990 and 1999	Mm2
56.13	Heated Floor Area Non-Residential Sector Built between 2000 and 2010	Mm2
56.14	Heated Floor Area Non-Residential Sector Built after 2010	Mm2
56.2	Heated Floor Area Non-Residential Sector Offices	Mm2
56.3	Heated Floor Area Non-Residential Sector Trade buildings	Mm2
56.4	Heated Floor Area Non-Residential Sector Educational buildings	Mm2
56.5	Heated Floor Area Non-Residential Sector Health care buildings	Mm2
56.6	Heated Floor Area Non-Residential Sector Hotels and restaurants	Mm2
56.7	Heated Floor Area Non-Residential Sector Other non-residential buildings	Mm2
56.8	Heated Floor Area Non-Residential Sector Built before 1945	Mm2
56.9	Heated Floor Area Non-Residential Sector Built between 1945 and 1969	Mm2

1.2.5. Building shell performance

Indicator Number	Indicator Name	Unit
57	Energy Efficiency Residential Sector External walls	W/m² °C
57.1	U-Value Residential Sector External walls Built before 1945	W/m² °C
57.2	U-Value Residential Sector External walls Built between 1945 and 1969	W/m² °C
57.3	U-Value Residential Sector External walls Built between 1970 and 1979	W/m² °C
57.4	U-Value Residential Sector External walls Built between 1980 and 1989	W/m² °C

57.5	U-Value Residential Sector External walls Built between 1990 and 1999	W/m² °C
57.6	U-Value Residential Sector External walls Built between 2000 and 2010	W/m² °C
57.7	U-Value Residential Sector External walls Built between after 2010	W/m² °C
58	Energy Efficiency Residential Sector Floors	W/m² °C
58.1	U-Value Residential Sector Floors Built before 1945	W/m² °C
58.2	U-Value Residential Sector Floors Built between 1945 and 1969	W/m² °C
58.3	U-Value Residential Sector Floors Built between 1970 and 1979	W/m² °C
58.4	U-Value Residential Sector Floors Built between 1980 and 1989	W/m² °C
58.5	U-Value Residential Sector Floors Built between 1990 and 1999	W/m² °C
58.6	U-Value Residential Sector Floors Built between 2000 and 2010	W/m² °C
58.7	U-Value Residential Sector Floors Built between after 2010	W/m² °C
59	Energy Efficiency Residential Sector Roofs	W/m² °C
59.1	U-Value Residential Sector Roofs Built before 1945	W/m² °C
59.2	U-Value Residential Sector Roofs Built between 1945 and 1969	W/m² °C
59.3	U-Value Residential Sector Roofs Built between 1970 and 1979	W/m² °C
59.4	U-Value Residential Sector Roofs Built between 1980 and 1989	W/m² °C
59.5	U-Value Residential Sector Roofs Built between 1990 and 1999	W/m² °C
59.6	U-Value Residential Sector Roofs Built between 2000 and 2010	W/m² °C
59.7	U-Value Residential Sector Roofs Built between after 2010	W/m² °C
60	Energy Efficiency Residential Sector Windows	W/m² °C
60.1	U-Value Residential Sector Windows Built before 1945	W/m² °C

60.2	U-Value Residential Sector Windows Built between 1945 and 1969	W/m² °C
60.3	U-Value Residential Sector Windows Built between 1970 and 1979	W/m² °C
60.4	U-Value Residential Sector Windows Built between 1980 and 1989	W/m² °C
60.5	U-Value Residential Sector Windows Built between 1990 and 1999	W/m² °C
60.6	U-Value Residential Sector Windows Built between 2000 and 2010	W/m² °C
60.7	U-Value Residential Sector Windows Built between after 2010	W/m² °C
61	Energy Efficiency Non-Residential Sector External walls	W/m² °C
61.1	U-Value Non-Residential Sector External walls Built before 1945	W/m² °C
61.2	U-Value Non-Residential Sector External walls Built between 1945 and 1969	W/m² °C
61.3	U-Value Non-Residential Sector External walls Built between 1970 and 1979	W/m² °C
61.4	U-Value Non-Residential Sector External walls Built between 1980 and 1989	W/m² °C
61.5	U-Value Non-Residential Sector External walls Built between 1990 and 1999	W/m² °C
61.6	U-Value Non-Residential Sector External walls Built between 2000 and 2010	W/m² °C
61.7	U-Value Non-Residential Sector External walls Built between after 2010	W/m² °C
62	Energy Efficiency Non-Residential Sector Floors	W/m² °C
62.1	U-Value Non-Residential Sector Floors Built before 1945	W/m² °C
62.2	U-Value Non-Residential Sector Floors Built between 1945 and 1969	W/m² °C
62.3	U-Value Non-Residential Sector Floors Built between 1970 and 1979	W/m² °C
62.4	U-Value Non-Residential Sector Floors Built between 1980 and 1989	W/m² °C
62.5	U-Value Non-Residential Sector Floors Built between 1990 and 1999	W/m² °C

62.6	U-Value Non-Residential Sector Floors Built between 2000 and 2010	W/m² °C
62.7	U-Value Non-Residential Sector Floors Built between after 2010	W/m² °C
63	Energy Efficiency Non-Residential Sector Roofs	W/m² °C
63.1	U-Value Non-Residential Sector Roofs Built before 1945	W/m² °C
63.2	U-Value Non-Residential Sector Roofs Built between 1945 and 1969	W/m² °C
63.3	U-Value Non-Residential Sector Roofs Built between 1970 and 1979	W/m² °C
63.4	U-Value Non-Residential Sector Roofs Built between 1980 and 1989	W/m² °C
63.5	U-Value Non-Residential Sector Roofs Built between 1990 and 1999	W/m² °C
63.6	U-Value Non-Residential Sector Roofs Built between 2000 and 2010	W/m² °C
63.7	U-Value Non-Residential Sector Roofs Built between after 2010	W/m² °C
64	Energy Efficiency Non-Residential Sector Windows	W/m² °C
64.1	U-Value Non-Residential Sector Windows Built before 1945	W/m² °C
64.2	U-Value Non-Residential Sector Windows Built between 1945 and 1969	W/m² °C
64.3	U-Value Non-Residential Sector Windows Built between 1970 and 1979	W/m² °C
64.4	U-Value Non-Residential Sector Windows Built between 1980 and 1989	W/m² °C
64.5	U-Value Non-Residential Sector Windows Built between 1990 and 1999	W/m² °C
64.6	U-Value Non-Residential Sector Windows Built between 2000 and 2010	W/m² °C
64.7	U-Value Non-Residential Sector Windows Built between after 2010	W/m² °C

1.2.6. Technical building systems

Indicator Indicator Name Number Unit

65	Share of dwellings Residential sector Condensing boilers	Share (%)
66	Share of dwellings Residential sector Conventional boilers	Share (%)
67	Share of dwellings Residential sector Heat pumps	Share (%)
68	Share of dwellings Residential sector Reversible heat pumps	Share (%)
69	Share of dwellings Residential sector Solar heating systems	Share (%)
70	Share of dwellings Residential sector Stove	Share (%)
71	Share of dwellings Residential sector Fireplace	Share (%)
72	Share of dwellings Residential sector District heating systems	Share (%)
73	Share of dwellings Residential sector Local space heating	Share (%)
74	Share of buildings Non-residential sector Condensing boilers	Share (%)
75	Share of buildings Non-residential sector Conventional boilers	Share (%)
76	Share of buildings Non-residential sector Heat pumps	Share (%)
77	Share of buildings Non-residential sector Reversible heat pumps	Share (%)
78	Share of buildings Non-residential sector Solar heating systems	Share (%)
79	Share of buildings Non-residential sector Stove	Share (%)
80	Share of buildings Non-residential sector Fireplace	Share (%)
81	Number of dwellings Residential sector Condensing boilers	Thousands
82	Number of dwellings Residential sector Conventional boilers	Thousands
83	Number of dwellings Residential sector Combi boilers	Thousands
84	Number of dwellings Residential sector Heat pumps	Thousands
85	Number of dwellings Residential sector Water heating on electric heaters (not heat-pump)	Thousands

86	Number of dwellings Residential sector Water heating with other heaters	Thousands
87	 Number of buildings Non-residential sector Condensing boilers 	Thousands
88	Number of buildings Non-residential sector Conventional boilers	Thousands
89	Number of buildings Non-residential sector Combi boilers	Thousands
90	Number of buildings Non-residential sector Heat pumps	Thousands
91.1	Number of dwellings Residential sector Heating on electricity	Thousands
91.2	Number of dwellings Residential sector Heating on fuel oil	Thousands
91.3	Number of dwellings Residential sector Heating on kerosene	Thousands
91.4	Number of dwellings Residential sector Heating on LPG	Thousands
91.5	Number of dwellings Residential sector Heating on natural gas	Thousands
91.6	Number of dwellings Residential sector Heating on solar thermal energy	Thousands
91.7	Number of dwellings Residential sector Heating on coal	Thousands
91.8	Number of dwellings Residential sector Heating on biomass	Thousands
92.1	Number of buildings Non-residential sector Heating on electricity	Thousands
92.2	Number of buildings Non-residential sector Heating on fuel oil	Thousands
92.3	8 Number of buildings Non-residential sector Heating on kerosene	Thousands
92.4	Number of buildings Non-residential sector Heating on LPG	Thousands
92.5	 Number of buildings Non-residential sector Heating on natural gas 	Thousands
92.6	Number of buildings Non-residential sector Heating on solar thermal energy	Thousands
92.7	 Number of buildings Non-residential sector Heating on coal 	Thousands

92.8	Number of buildings Non-residential sector Heating on biomass	Thousands
92.9	Number of buildings Non-residential sector Water heating on electric heaters (not heat-pump)	Thousands
93	Surface area Residential Sector Roof per Building Type	m²
94	Surface area Non-Residential Sector Roof per Building Type	
95	Surface area Residential Sector External Walls per Building Type	m²
96	Surface area Non-Residential Sector External Walls per Building Type	m²
97	Surface area Residential Sector South Facade per Building Type	m²
98	Surface area Non-Residential Sector South Facade per Building Type	m²

1.2.7. Certification

Indicator Number	Indicator Name	Unit
99	Number of EPC Residential Sector	Thousands
99.1	Share of EPC Residential Sector Class A	Share (%)
99.2	Share of EPC Residential Sector Class B	Share (%)
99.3	Share of EPC Residential Sector Class C	Share (%)
99.4	Share of EPC Residential Sector Class D	Share (%)
99.5	Share of EPC Residential Sector Class >D	Share (%)
101.1	Share of EPC Residential Sector Class A related to m2 covered	Share (%)
101.2	Share of EPC Residential Sector Class B related to m2 covered	Share (%)
101.3	Share of EPC Residential Sector Class C related to m2 covered	Share (%)
101.4	Share of EPC Residential Sector Class D related to m2 covered	Share (%)
101.5	Share of EPC Residential Sector Class >D related to m2 covered	Share (%)

100	Number of EPC Non-Residential Sector	Thousands
100.1	Share of EPC Non-Residential Sector Class A	Share (%)
100.2	Share of EPC Non-Residential Sector Class B	Share (%)
100.3	Share of EPC Non-Residential Sector Class C	Share (%)
100.4	Share of EPC Non-Residential Sector Class D	Share (%)
100.5	Share of EPC Non-Residential Sector Class >D	Share (%)
102.1	Share of EPC Non-Residential Sector Class A related to m2 covered	Share (%)
102.2	Share of EPC Non-Residential Sector Class B related to m2 covered	Share (%)
102.3	Share of EPC Non-Residential Sector Class C related to m2 covered	Share (%)
102.4	Share of EPC Non-Residential Sector Class D related to m2 covered	Share (%)
102.5	Share of EPC Non-Residential Sector Class >D related to m2 covered	Share (%)

1.2.8. Finance

Indicator Number	Indicator Name	Unit
103	Investments Residential Sector in renovation	Mio/EURyear
103.1	Investments Residential Sector SFH in renovation	Mio/EURyear
103.2	Investments Residential Sector MFH in renovation	Mio/EURyear
103.3	Investments Residential Sector Apartment blocks in renovation	Mio/EURyear
104	Investments Residential Sector Energy related investments	Mio/EURyear
104.1	Investments Residential Sector SFH Energy related investments	Mio/EURyear
104.2	Investments Residential Sector MFH Energy related investments	Mio/EURyear
104.3	Investments Residential Sector Apartment blocks Energy related investments	Mio/EURyear
105	Investments Non-Residential Sector in renovation	Mio/EURyear

	Investments Non-Residential Sector Offices in renovation	Mio/EURyear
105.2	Investments Non-Residential Sector Trade buildings in renovation	Mio/EURyear
105.3	Investments Non-Residential Sector Educational buildings in renovation	Mio/EURyear
105.4	Investments Non-Residential Sector Health care buildings in renovation	Mio/EURyear
105.5	Investments Non-Residential Sector Hotels and restaurants in renovation	Mio/EURyear
105.6	Investments Non-Residential Sector Other non- Non-Residential buildings in renovation	Mio/EURyear
106	Investments Non-Residential Sector Energy related investments	Mio/EURyear
106.1	Investments Non-Residential Sector Offices Energy related investments	Mio/EURyear
106.2	Investments Non-Residential Sector Trade buildings Energy related investments	Mio/EURyear
106.3	Investments Non-Residential Sector Educational buildings Energy related investments	Mio/EURyear
106.4	Investments Non-Residential Sector Health care buildings Energy related investments	Mio/EURyear
106.5	Investments Non-Residential Sector Hotels and restaurants Energy related investments	Mio/EURyear
106.6	Investments Non-Residential Sector Other non- Non-Residential buildings Energy related investments	Mio/EURyear
107	Average investments Residential Sector	EUR/m2
107.1	Average investments Residential Sector SFH	EUR/m2
107.2	Average investments Residential Sector MFH	EUR/m2
107.3	Average investments Residential Sector Apartment blocks	EUR/m2
108	Average investments Residential Sector in energy renovation	EUR/m2
108.1	Average investments Residential Sector SFH in energy renovation	EUR/m2
108.2	Average investments Residential Sector MFH in energy renovation	EUR/m2

108.3	Average investments Residential Sector Apartment blocks in energy renovation	EUR/m2
109	Average investments Non-Residential Sector	EUR/m2
109.1	Average investments Non-Residential Sector Offices	EUR/m2
109.2	Average investments Non-Residential Sector Trade buildings	EUR/m2
109.3	Average investments Non-Residential Sector Educational buildings	EUR/m2
109.4	Average investments Non-Residential Sector Health care buildings	EUR/m2
109.5	Average investments Non-Residential Sector Hotels and restaurants	EUR/m2
109.6	Average investments Non-Residential Sector Other non-Non-Residential buildings	EUR/m2
110	Average investments Non-Residential Sector in energy renovation	EUR/m2
110.1	Average investments Non-Residential Sector Offices in energy renovation	EUR/m2
110.2	Average investments Non-Residential Sector Trade buildings in energy renovation	EUR/m2
110.3	Average investments Non-Residential Sector Educational buildings in energy renovation	EUR/m2
110.4	Average investments Non-Residential Sector Health care buildings in energy renovation	EUR/m2
110.5	Average investments Non-Residential Sector Hotels and restaurants in energy renovation	EUR/m2
110.6	Average investments Non-Residential Sector Other non-Non-Residential buildings in energy renovation	EUR/m2
111	Achieved energy savings by renovation Residential Sector	EUR/m2
111.1	Achieved energy savings by renovation Residential Sector SFH	EUR/m2
111.2	Achieved energy savings by renovation Residential Sector MFH	EUR/m2
111.3	Achieved energy savings by renovation Residential Sector Apartment blocks	EUR/m2

112	Achieved energy savings by renovation Non- Residential Sector	EUR/m2
112.1	Achieved energy savings by renovation Non- Residential Sector Offices	EUR/m2
112.2	Achieved energy savings by renovation Non- Residential Sector Trade buildings	EUR/m2
112.3	Achieved energy savings by renovation Non- Residential Sector Educational buildings	EUR/m2
112.4	Achieved energy savings by renovation Non- Residential Sector Health care buildings	EUR/m2
112.5	Achieved energy savings by renovation Non- Residential Sector Hotels and restaurants	EUR/m2
112.6	Achieved energy savings by renovation Non- Residential Sector Other non-Non-Residential buildings	EUR/m2
113	Average energy cost savings for retrofit Residential Sector	Mio/EURyear
113.1	Average energy cost savings for retrofit Residential Sector SFH	Mio/EURyear
113.2	Average energy cost savings for retrofit Residential Sector MFH	Mio/EURyear
113.3	Average energy cost savings for retrofit Residential Sector Apartment blocks	Mio/EURyear
114	Average energy cost savings for retrofit Non- Residential Sector	Mio/EURyear
114.1	Average energy cost savings for retrofit Non- Residential Sector Offices	Mio/EURyear
114.2	Average energy cost savings for retrofit Non- Residential Sector Trade buildings	Mio/EURyear
114.3	Average energy cost savings for retrofit Non- Residential Sector Educational buildings	Mio/EURyear
114.4	Average energy cost savings for retrofit Non- Residential Sector Health care buildings	Mio/EURyear
114.5	Average energy cost savings for retrofit Non- Residential Sector Hotels and restaurants	Mio/EURyear
114.6	Average energy cost savings for retrofit Non- Residential Sector Other non-Non-Residential buildings	Mio/EURyear



1.2.9. Potential for energy delivery by district heating

Indicator Number		Indicator Name	Unit
	115	Number of buildings Residential Sector in a DH supply area	Thousands
	116	Number of buildings Non-Residential Sector in a DH supply area	Thousands
	117	Share of buildings Residential Sector in a DH supply area	Share (%)
	118	Share of buildings Non-Residential Sector in a DH supply area	Share (%)
	119	Number of buildings Residential Sector in a DH supply zone	Thousands
	120	Number of buildings Non-Residential Sector in a DH supply zone	Thousands
	121	Share of buildings Residential Sector in a DH supply zone	Share (%)
	122	Share of buildings Non-Residential Sector in a DH supply zone	Share (%)
	123	Number of buildings Residential Sector in a high heat density area	Thousands
	124	Number of buildings Non-Residential Sector in a high heat density area	Thousands
	125	Share of buildings Residential Sector in a high heat density area	Share (%)
	126	Share of buildings Non-Residential Sector in a high heat density area	Share (%)









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