



Fundacja na rzecz
Efektywnego
Wykorzystania
Energii

od 1990

Energy consumption of buildings - current state and prospects

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What do we know about our buildings?



Number of buildings, their age, energy demand, level of thermal comfort, technical condition, level of thermal modernization, used energy carriers and their consumption ...

The knowledge on this subject is / was very incomplete.

Development of the document Long-term Renovation Strategy (February 2021) as an opportunity to organize knowledge about the national building stock

The structure of buildings in Poland



The national building stock consists of 14.2 million buildings, of which almost 40% are single-family residential buildings.

The structure of buildings in Poland (as of January 1, 2020)

Source: Long-term Renovation Strategy (February 2021).

The structure of buildings in Poland

Age structure and energy demand of the housing stock in Poland

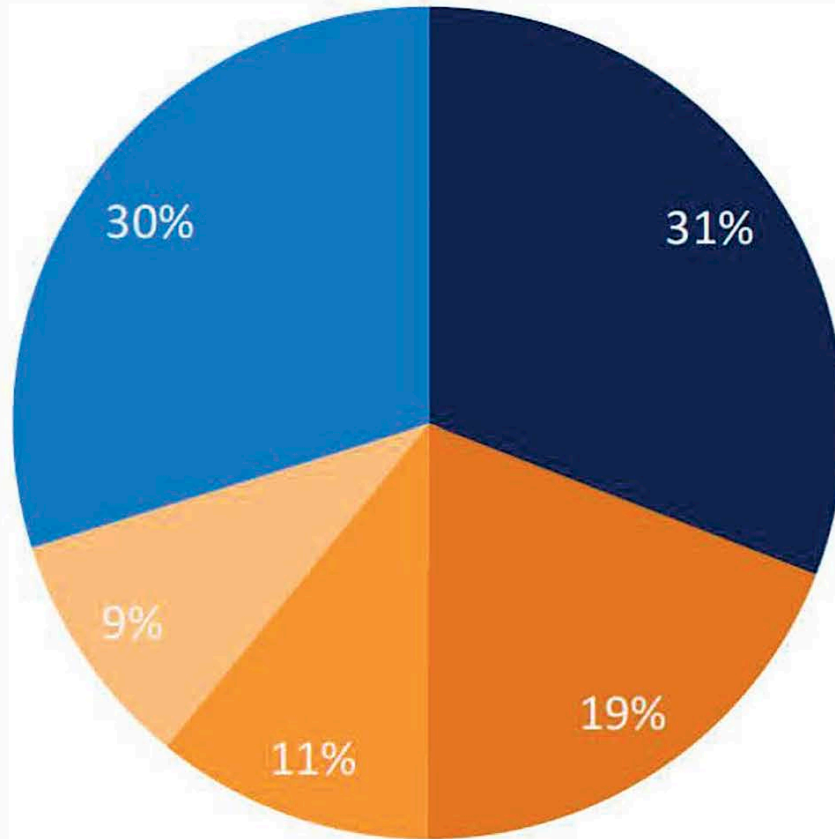
Construction period	Buildings	Flats	PE	FE
lata	tys.	mln	kWh/(m ² ·rok)	kWh/(m ² ·rok)
przed 1918	404,7	1,18	> 350	> 300
1918 – 1944	803,9	1,45	300-350	260-300
1945 – 1970	1363,9	3,11	250-300	220-260
1971 – 1978	659,8	2,07	210-250	190-220
1979 – 1988	754,0	2,15	160-210	140-190
1989 – 2002	670,9	1,52	140-180	125-160

The structure of buildings in Poland

Primary energy demand of residential buildings according the year of commissioning based on EPC of Buildings [kWh/(m² year)]

	<1994	1994-1998	1999-2008	2009-2013	2014-2016	2017-2018	2019-2020
single-family	263,7	147,9	143,5	126,3	109,1	94,0	89,3
multi-family	258,9	139,0	110,0	142,7	97,5	87,0	84,9

Demand for thermomodernization in multi-family buildings

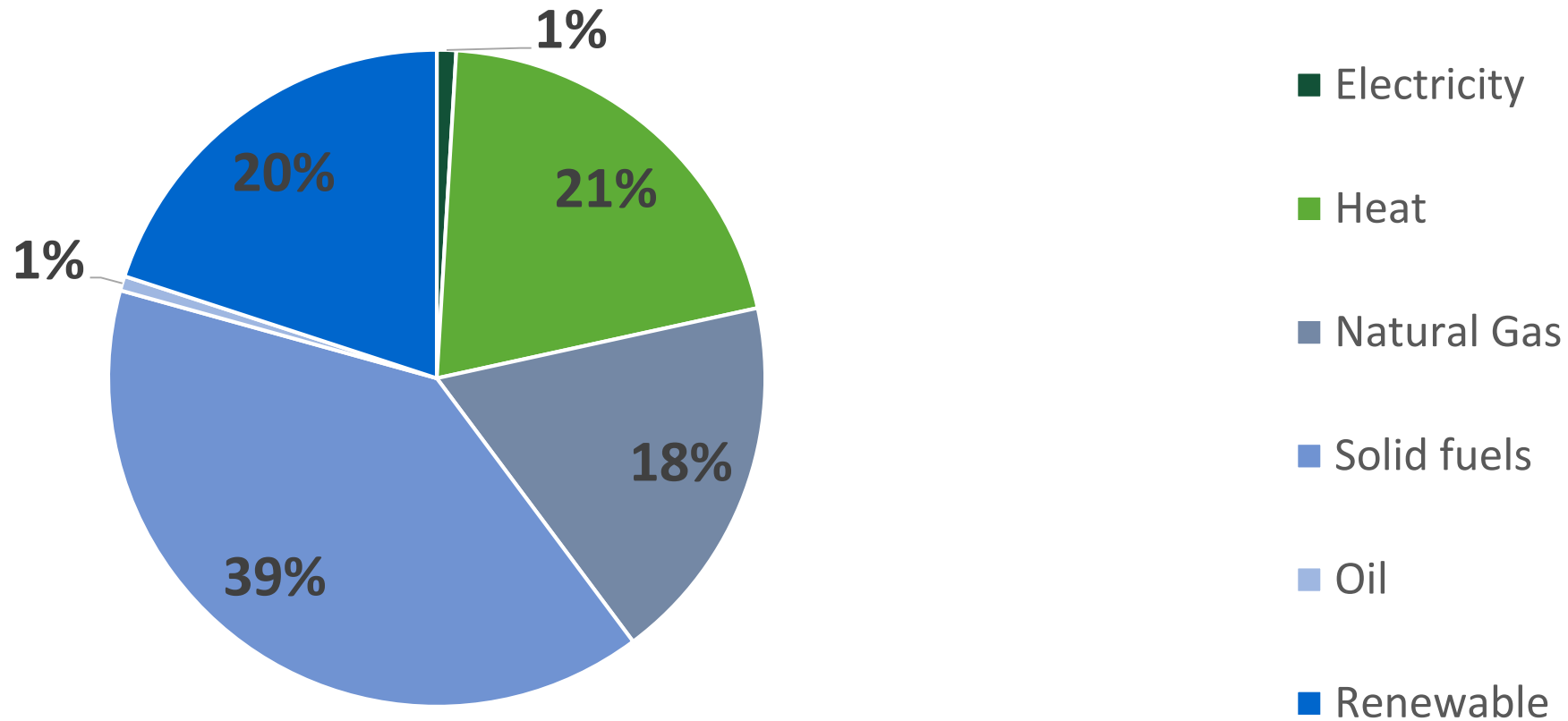


- Buildings that do not require thermal modernization
- Buildings that underwent thermal modernization before 2010
- Buildings subject to thermal modernization in 2010-2016
- Buildings for which thermal modernization is required and planned / started in 2017-2020
- Buildings for which thermal modernization is required but not planned in 2017-2020

Source: GUS 2019

Energy consumption - households

Heating



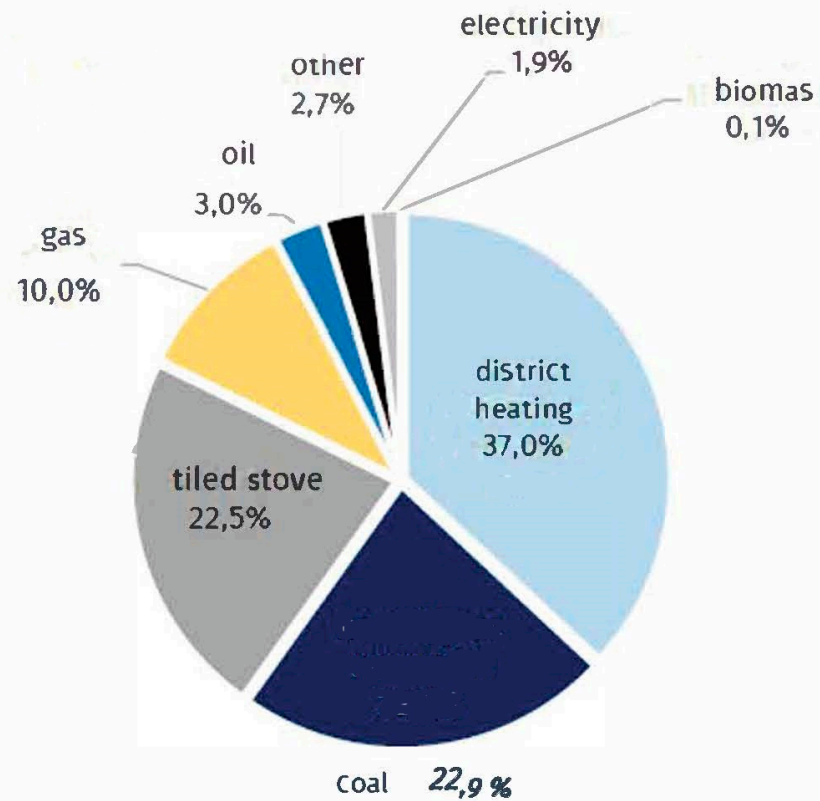
Source: Estimated energy consumption in households 2019 (GUS 2021)

Thermomodernization of buildings (multi-family)

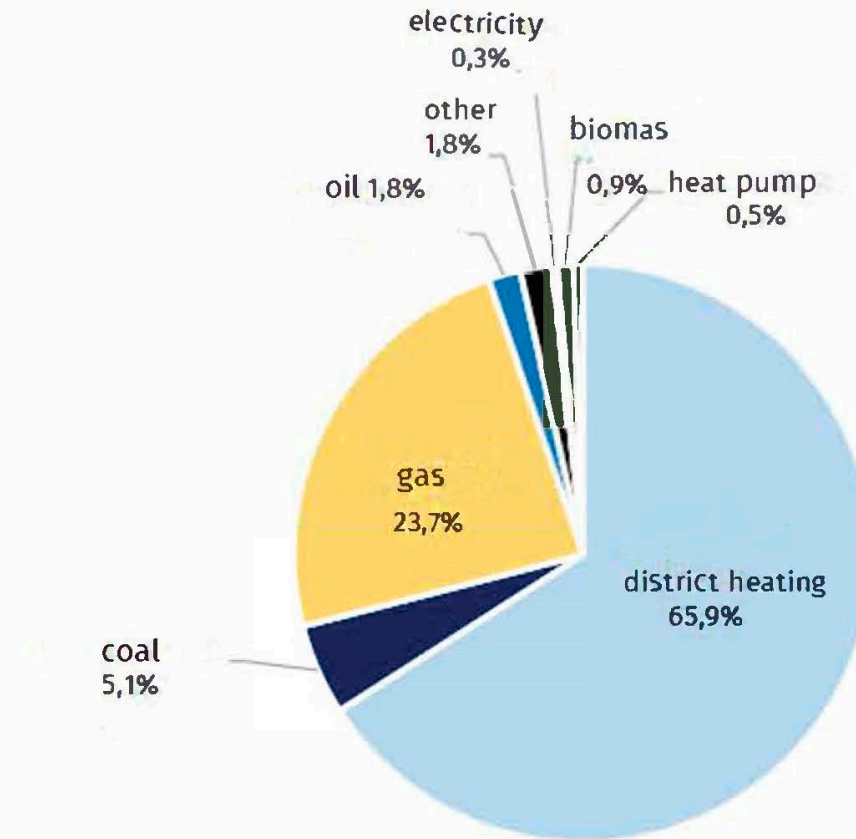


est. 1990

Types of heat sources before thermo-modernization



Types of heat sources after thermo-modernization



Towards low energy buildings

Key documents at the national level

1. Energy Policy 2040 r.
2. National Energy and Climate Plan 2021-2030
3. The National Recovery and Resilience Plan
4. Long-term Building Renovation Strategy

Towards low energy buildings

What results from national documents (1,2,3)

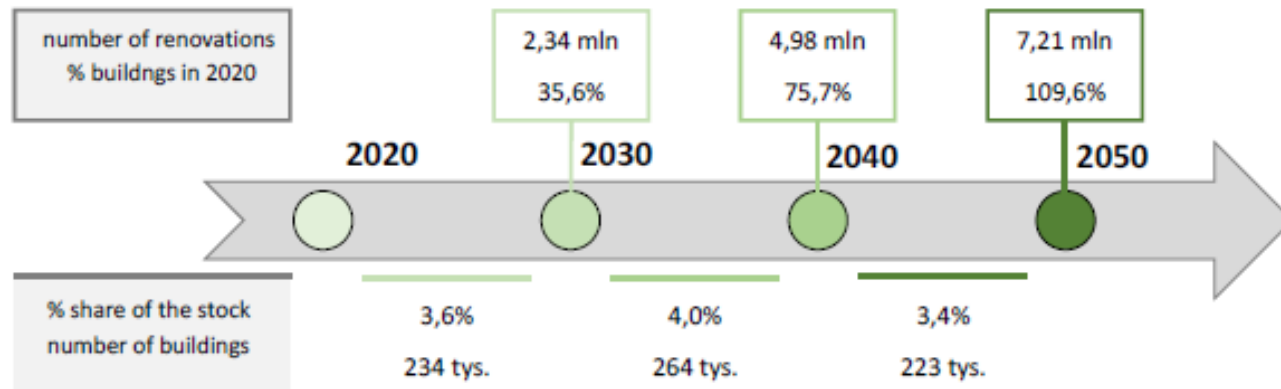
- End of coal combustion in households in cities by 2030, in rural areas by 2040.
- Improving energy efficiency - no specific target for buildings (efficiency increase by 23% in all sectors of the economy)
- Increase in the share of renewable energy sources in heating and cooling by 1.1% annually
- Support for the thermo-modernisation of buildings
- Support for the development of renewable energy in buildings

Towards low energy buildings

What results from national documents (4)

Recommended renovation scenario - action plan until 2050

Cumulative number of thermo-modernization



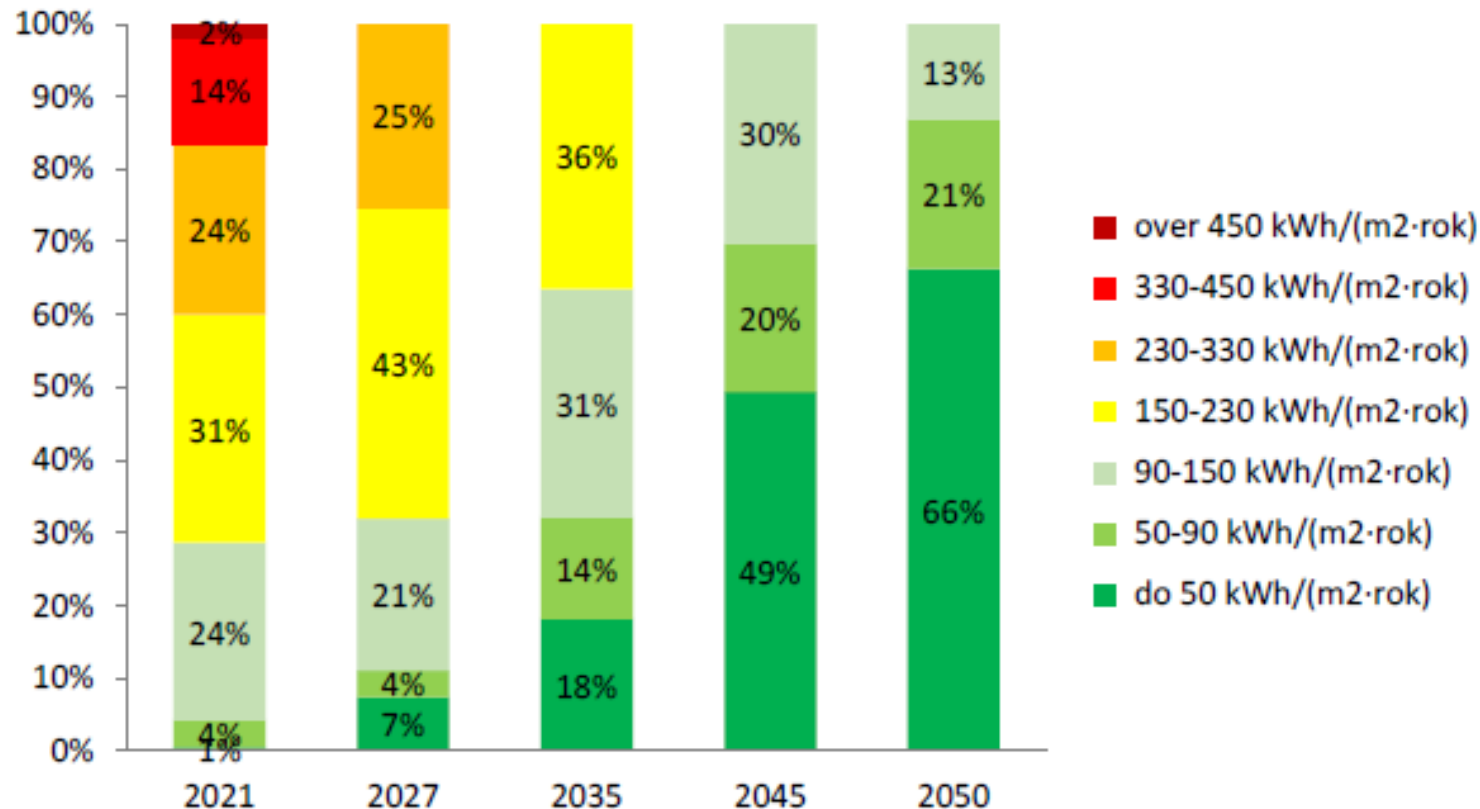
Annual rate of thermo-modernization

- Quick implementation of the first stage of thermal modernization of buildings from the worst energy efficiency ranges, combined with the popularization of deep thermal modernization in the coming years, and then dissemination of a high standard of renovation on the scale of the entire market.
- By 2027 all buildings with PE index greater than 330 kWh/(m² year) will be modernized, and by 2035 buildings with PE index greater than 230 kWh/(m² year), in 2045 all buildings will have PE index higher than not more than 150 kWh/(m² year).

Towards low energy buildings

What results from national documents (4)

Distribution of residential and public buildings in particular periods according to the PE index - recommended scenario



By 2050, 65% of buildings will achieve an PE index of no more than 50 kWh/(m² year), and 22% - from 50 to 90 kWh/(m² year), the remaining 13% of buildings which, for technical or economic reasons, cannot be modernized so deeply, they will achieve the PE index in the range of 90-150 kWh/(m² year)

Problems for discussion

- To what extent do the documents at the national level correspond to the latest objectives of the European Green Deal and the Fit for 55 package?
- Is the energy transition possible without a more ambitious and comprehensive approach to building renovation?
- What barriers stand in the way of deep renovation of buildings in Poland?
- Potential benefits of deep modernization and decarbonisation of buildings.



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Thank You

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