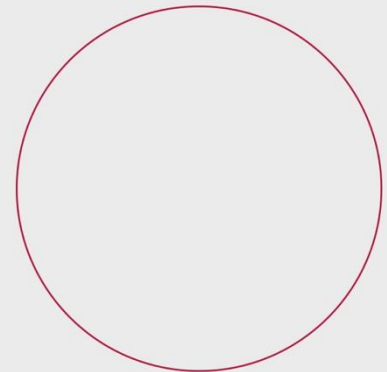


HOW TO IMPROVE THE QUALITY OF LIFE OF THE ENERGY POOR?



Jakub Sokołowski, Jan Frankowski

Main message

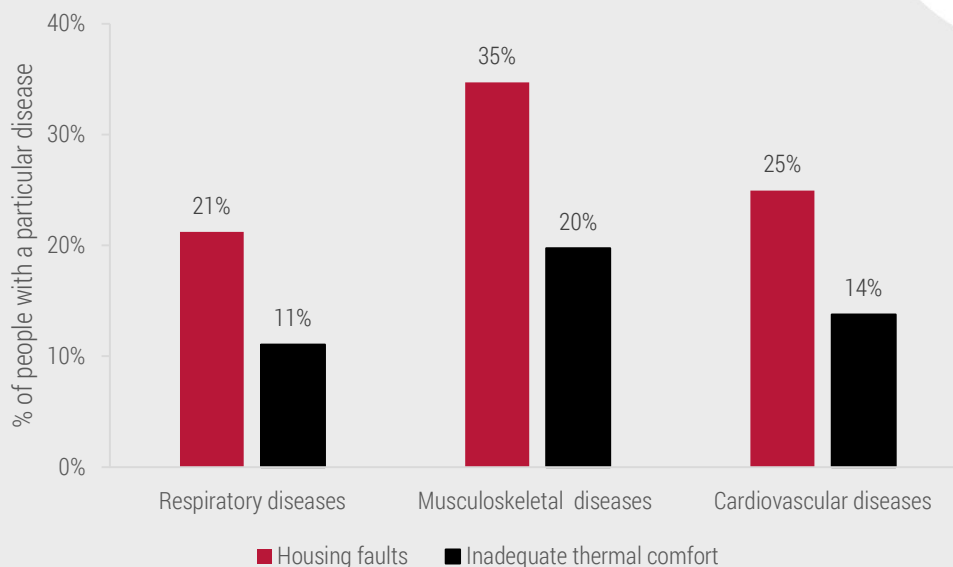
The living conditions of the energy poor in Poland are unacceptable. One of the core factors for this is living in old and uninsulated buildings. This deteriorates health and poses a higher likelihood of musculoskeletal and cardiovascular diseases development. Additionally, heating with inefficient coal or wood-fired stoves is associated with a higher risk of developing respiratory diseases.

We propose two instruments that may improve quality of life among the energy-poor population. Firstly, the introduction of a targeted fuel allowance for clean heating. Secondly, a full subsidy for thermal retrofit and heat source replacement as well as connecting multi-family dwellings to gas and heating networks. As a result, this will translate into a comprehensive reduction of energy poverty.

Key facts

- **1.3 million (10%)** households in Poland are energy poor.
- **380,000** energy-poor households use coal or wood stoves.
- Energy-poor individuals who heat their dwellings with coal or wood stoves are **by 27 p.p.** more likely to develop respiratory diseases than energy-poor individuals who are connected to district heating.
- **900,000** households live in houses with leaking roofs or dampness.
- Individuals who live in poor living conditions are more likely by **10 p.p.** to develop a musculoskeletal disease than those who live in acceptable housing conditions.

People with cardiovascular and musculoskeletal diseases often live in poor conditions



Introduction

Around 10% (1.3 million) of households in Poland are energy poor¹, i.e. they are unable to adequately warm and light their homes and use domestic appliances. Energy poverty most frequently results from the low energy efficiency of dwelling and heat sources alongside high energy costs and a low household income.

Energy poverty is often associated with poor housing conditions and health problems. It is more difficult to heat older buildings well as they often have low energy efficiency and are usually heated with coal or wood stoves. The quality of the housing conditions people live in affects their health. Long-term residence in a damp and cold house is associated with a high risk of heart disease and musculoskeletal disorders. Additionally, heating an apartment with old and energy-inefficient coal or wood stoves translates into significantly higher levels of air pollution, and, in turn, an increased probability of respiratory disorder development.

Reducing energy poverty will:

- improve the quality of life, including overall health conditions, of the energy poor;
- reduce air pollution, which will have a positive impact on the health of the general public;
- reduce the additional burden on the healthcare system.

To reduce energy poverty, two public policy interventions are needed, as suggested by IBS since 2018 (Rutkowski et al., 2018):

- Thermal retrofittings, i.e. the insulation and modernisation of heating installations;
- Connection to district heating networks.

The latter intervention is justified in places where district heating networks are well developed. Policies that improve housing and air quality should also include energy poverty support measures, such as clean heating allowances provided to the public as part of social assistance benefits. These would help households adapt to the new conditions.

The following report consists of three parts. The first one depicts the living conditions of the energy poor. In the second part, we explain how energy poverty, housing conditions and inefficient heating all correlate with health issues. In the third section, we propose public policy to counteract energy poverty and improve the living conditions of people suffering from a difficult material and housing situation in Poland.

1. Inadequate housing conditions of the energy-poor²

Housing conditions for the energy poor are far worse than for those who can afford to fulfil their energy needs. Nearly 2.5 million people (900,000 households) in Poland live in a dwelling with a leaking roof, rotting window

¹ We used a multidimensional energy poverty index to determine the number of energy poor-households in Poland: Sokołowski J., Lewandowski P., Kielczewska A., Bouzarovski S. (2020). A multidimensional index to measure energy poverty: the Polish case, Energy Sources, Part B: Economics, Planning, and Policy, DOI: 10.1080/15567249.2020.1742817

² Conclusions and data based on the report: IBS/Danae, 2020. Ubóstwo energetyczne w województwie łódzkim. Regionalne Centrum Pomocy Społecznej, Łódź.

frames or doors or with visible dampness. Some dwellings require immediate intervention which is often neglected due to a lack of financial means. More than three million people (one million households) live in inadequately heated buildings. Almost half of all households in Poland use coal or wood stoves as their primary source of heating. Using outdated stoves increases air pollution and threatens the safety of inhabitants due to the potential cause of fire or carbon monoxide poisoning.

Box 1. Who is considered 'energy poor' in Poland?

In 2015, the Institute for Structural Research (IBS), started to conduct research on energy poverty in Poland. In 2020, we carried out two research projects with a focus on the living conditions of people affected by energy poverty as well as its influence on their health. We used a set of five energy poverty indicators determined by the answers from questionnaires created to identify the energy-poor population group. People who are identified as struggling with energy poverty:

1. live in buildings with roof leakages or dampness on the walls. Indicator: **Housing faults**
2. live in buildings with insufficient heating in winter. Indicator: **Inadequate thermal comfort**
3. are unable to pay their energy bills on time. Indicator: **Difficulties paying bills**
4. incur high costs required to properly heat the building and are among the 30% of people in Poland with the lowest income. Indicator: **Low income high cost**
5. incur overly high actual energy expenditure relative to their income. Indicator: **High actual costs of energy**

The energy poor often live in poor housing conditions. The houses of energy-poor people typically have a leaking roof, plus rotting doors and windows which in turn cause dampness and mould. In general, older buildings have technical deficiencies. Nearly 70% of people who live below the minimum standard in Poland live in pre-1960 buildings (GUS, 2018). Dampness and mould in dwellings are often caused by construction defects. Poorly designed ventilation causes dampness, while ventilating uninsulated buildings quickly lowers the temperature inside. Buildings owned by the municipalities, which are intended for the least affluent people, are often uninsulated and not connected to gas and heating networks. Some lack basic amenities such as a bathroom. In 2018, 4% of flats in Polish cities and up to 17% in rural areas did not have a bathroom (GUS, 2018).

The houses of the energy poor rarely protect their inhabitants from cold or hot weather. Over three million people in Poland are unable to heat their homes accordingly (GUS, 2018). The older the building, the higher the risk that its inhabitants will not be able to heat it properly. During the summer, the temperatures inside often exceed the outside temperature, particularly in apartments located in the attic. There is therefore a need to cool the flats using fans or air conditioning, resulting in electricity bills during the summer that substitute expenses for coal or wood during the winter heating season.

Connecting to the district heating network reduces the scale of energy poverty, however, it is only economically viable in places where the grid is well developed. In a study carried out in two Silesian cities: Tychy and Ruda Śląska, 7% of those connected to the district heating network were energy poor, compared to 26% of those who heat their houses themselves.

Clusters of energy-poor households occur mainly in areas dominated by older buildings outside the district heating network. We observed a similar pattern in Ruda Śląska, for example, in residential workers' settlements where the energy poverty ratio is higher than in the rest of the city. In Tychy, another city where we looked into

energy poverty in detail, fewer areas are affected as the majority of the population lives within the heating network.

Adequate heating is the most intractable problem for the energy poor. Roughly 400,000 of the energy-poor households in Poland heat their homes with coal or wood stoves. Lack of access to affordable heating means that the energy poor rely on outdated coal stoves and portable electric heaters. The buildings they live in are often uninsulated. Due to financial constraints, their inhabitants are forced to buy inefficient, low-quality fuel. Financial instability results in fewer servicing of the stoves and ventilation systems due to the high costs of repair.

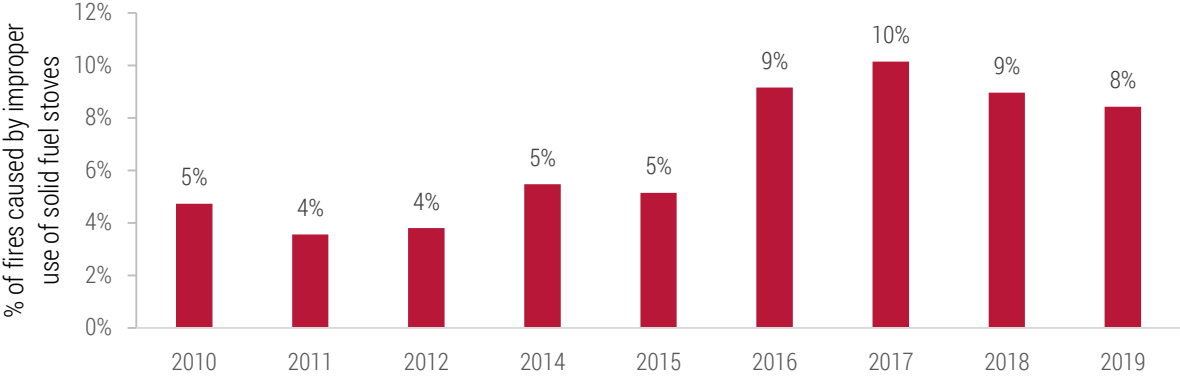
Photo 1. Boiler room after an oil furnace fire. After the incident, residents bought a second-hand, low-grade coal stove.



Source: Photographs taken by the authors of the report during field research in the Łódź Voivodeship.

Incorrect heating methods can threaten the safety of household inhabitants. The share of fires in Poland caused by improper stove usage has been increasing since 2010. Outdated heating sources threaten the safety of household members and their neighbours. The number of fires caused by inadequate stove use has doubled over the last decade, leading up to almost 13,000 fires in 2019 alone (dane.gov.pl, 2020). Due to a lack of financial resources, vulnerable people often repair their stoves on their own using ad hoc solutions such as gas cylinders or portable electric heaters. In the case of electric heating, the system is often unable to cope with the intensive use of the heating and cooling equipment, which in turn overloads the network. As a result, the houses occupied by the vulnerable population is more prone to fires. Carbon dioxide poisoning and gas explosions are also more frequent.

Figure 1. Outdated and badly operated stoves as a cause of fires in Poland



Note: The chart shows the percentage of fires in Poland caused by improper use of solid fuel heating equipment.

Source: Own elaboration based on dane.gov.pl [access 02.11.2020].

Maintaining a comfortable temperature at home is particularly difficult for older and sick people. Individual heating and sustaining a stable temperature requires the purchase, storage and regular replenishment of fuel. In buildings occupied by the elderly who are more likely to develop illnesses, inadequate heating can lead to further health deterioration. Heating also requires a consistent effort such as getting up at night, carrying the fuel, cleaning the stove and using additional support equipment such as air heaters, moisture absorbers or air purifiers. Additional energy consumption is therefore necessary, causing higher costs and excessive burden on retirees' and pensioners' household budgets. As a result, a significant proportion of people who replace their heat source in urban areas are the elderly who try to reduce the burdensome task of individual heating.

Photo 2: Left: Temporary covering of defects in the door to the boiler room using plywood. Right: A working coal tiled stove next to a children's bunk bed.



Source: Photographs taken by the article authors during field research in the Łódź Voivodeship.

2. The relation between energy poverty and poor health outcomes³

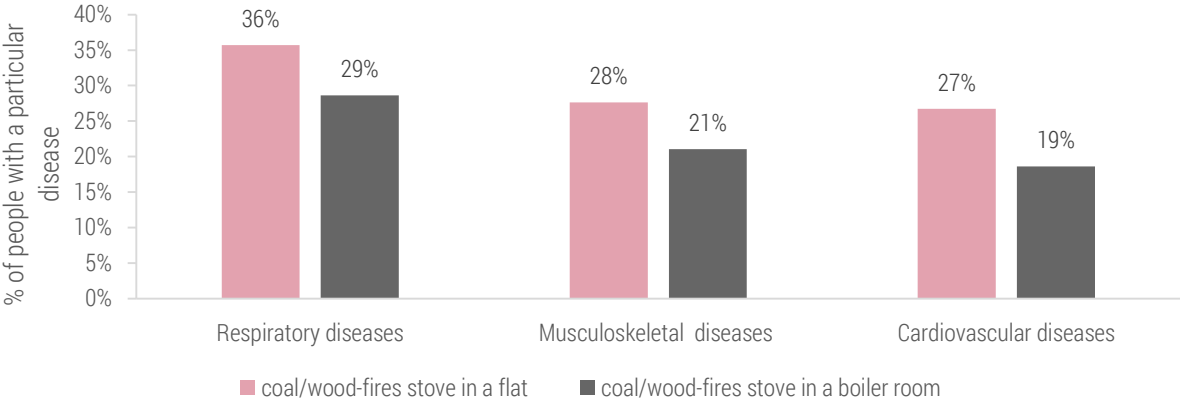
Energy poverty is associated not only with poor housing conditions but also with deteriorating health. Living in inadequate conditions increases the risk of musculoskeletal and cardiovascular diseases. Over 30% of people living in substandard conditions suffer from musculoskeletal diseases while 25% struggle with cardiovascular diseases. The likelihood of developing cardiovascular disease or mobility issues among those living in substandard housing conditions compared to those living in flats and houses in good conditions is 6 p.p. and 10 p.p. higher, respectively.

Municipal buildings are usually in poor condition. Approximately 65% of the housing owned by the municipality in Poland was constructed before 1945. The majority of the housing contains poorly equipped electrical, heating, and water-sewage installations (Muzioł-Węclawowicz and Nowak, 2018). The risk of musculoskeletal diseases is on average 11 p.p. higher among tenants in comparison to outright owners in the same building. Inhabitants of municipal buildings have limited propensity for general renovation, wall and roof insulation or are rarely offered a connection to the gas and district heating network.

³ Conclusions and data based on: Sokołowski J., Frankowski J., Lewandowski P. (2020). Energy poverty, housing conditions and self-assessed health: evidence from Poland. IBS Working Paper 10/2020.

Heating a house with coal and wood stoves implies a higher risk of developing lung disease, especially among the energy poor. Inefficient heat sources exacerbate indoor air pollution. Almost 40% of people using coal or wood-fired stoves suffer from respiratory diseases. Living in such conditions particularly affects children, who are at a higher risk of developing lung diseases such as asthma and bronchitis. Also, the energy poor who heat their dwellings using coal or wood stoves located in an apartment have a 27 p.p. higher risk of developing respiratory diseases than the energy-poor population whose dwellings are connected to a district heating network.

Chart 2. Almost 40% of people heating their flats with coal or wood-fired stoves suffer from respiratory diseases.



Source: Sokolowski J., Frankowski J., Lewandowski P. (2020). Energy poverty, housing conditions and self-assessed health: Poland case study. IBS Working Paper 10/2020.

3. Summary and conclusions for policymakers

The energy-poor population often live in poor housing conditions and are more likely to become ill, compared to those who can meet their basic energy needs. We propose two instruments aimed at reducing the energy poverty scale and the overall quality of life improvement among the energy poor:

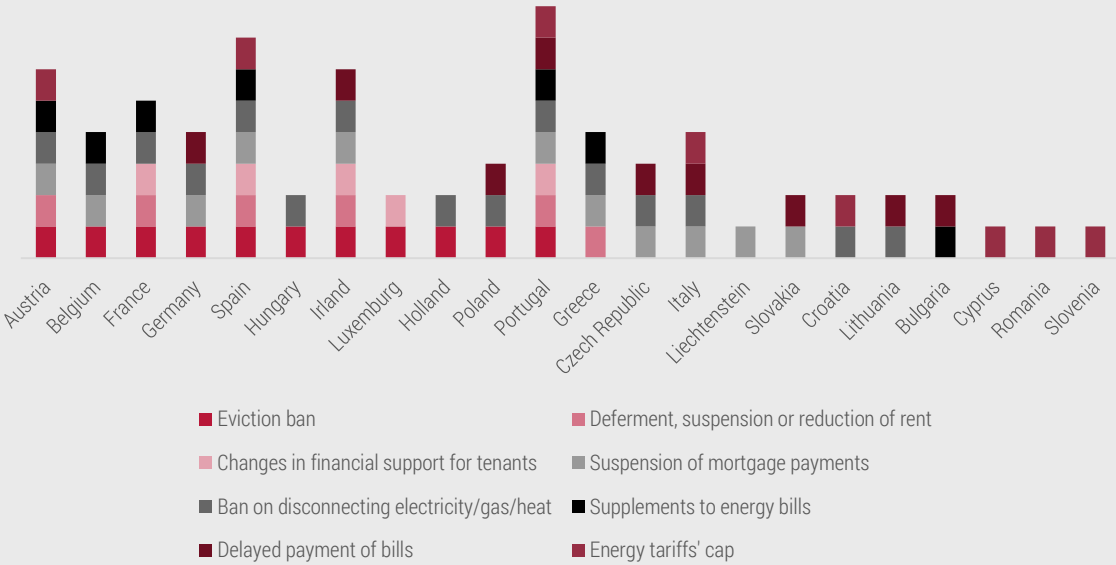
- Targeted fuel allowance for clean heating;
- Full subsidy of thermal retrofit and heat source replacement, as well as the connection of multi-family dwellings to gas and heating networks.

The ad hoc introduction of a targeted fuel allowance for clean heating will improve the quality of life of the energy poor. Subsequently, full financing of the thermal retrofit and heat source replacement and the connection of multi-family dwellings to gas and heating networks will translate into a reduction in the overall scale of energy poverty. Consequently, this will improve the air quality, general health and living conditions of the energy-poor population.

Full financing of thermal retrofitting and heat source replacement or connection to a heating network is the most effective instrument for minimising energy poverty. Poland is implementing the “Czyste Powietrze” (Clean Air) and “Stop Smog” programmes which will already partially meet the conditions necessary for supporting energy-poor households. In the case of “Czyste Powietrze”, the scale and form of support are, however, insufficient. Financially vulnerable households will herewith not be able to undertake thermal retrofitting despite the increased level of co-financing. During the preparation of the report, only seven cities participated in the Stop Smog programme, which assumes full financing of thermal retrofitting and heat sources.⁴

Box 2. COVID-19 pandemic makes the relation between housing and public health crucial

Housing conditions, limited access to health services and exposure to air pollution can all increase the risk of infection and mortality due to respiratory failure. As a result of the COVID-19 pandemic, EU countries have introduced additional measures to reduce housing hardship and energy poverty. The most common forms of support in the EU countries include eviction bans, a utility disconnection ban, a cap on rent increases and facilitating access to housing benefits. In Poland, protection against the termination of a tenancy agreement, rent increases and eviction has been introduced, alongside a ban on disconnecting gas and electricity in case of unpaid bills. The amount of overall housing benefits has also been increased.



Source: Own elaboration based on OECD (2020) and ENGAGER (2020)

A regeneration policy is a solution to the issue of energy poverty resulting from inadequate housing conditions. Its principal function should be the replacement of coal stoves and electric heating with central heating, especially in the case of multi-family buildings. This in turn will improve the technical condition of buildings, safety and the inhabitants’ quality of life. Replacing the heat source as part of the revitalisation should be a

⁴ As per November 2020.

priority, as it involves numerous inhabitants simultaneously while reducing the smog levels in densely populated urban areas. Additionally, regeneration focused on addressing energy poverty is an example of a model intervention overcoming negative social, environmental, spatial-functional, and technical consequences of energy poverty.

We suggest maintaining or increasing the level of funds allocated to both repairs of municipal housing and compensation of higher energy expenses among the most vulnerable population. This should positively affect the living conditions of the most disadvantaged since it will lead to reduced financial strain and better housing quality. Support should be prioritised for people living in uninsulated houses and should result in a rent reduction for those who decide to install a new heating source. The scope of the granted support should be calculated based on income and building characteristics (e.g. floor area or type of heating).

Improvement of living conditions is a requirement for a just transition of the Polish energy sector. Reducing energy consumption and emissions without compromising quality of life should be the paramount goal of decarbonisation of the economy. The absence of a guarantee to access basic housing standards and efficient heating and use of energy appliances undermines the idea of a just transition.

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