

Energy poverty as a socio-economic phenomenon of the 21st century in Slovakia



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ABSTRACT

Energy poverty is a significant and increasingly widespread issue globally, impacting millions of households. This article aims to identify the key factors related to energy poverty, examine its basis in Slovak legislation, and explore its causes and effects. It also seeks to outline the measures taken by the Slovak Republic to reduce the prevalence and impact of energy poverty on its population. Additionally, the article offers practical recommendations, highlighting successful examples from real-world applications.

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1. Introduction

The issue of energy poverty, where energy is becoming increasingly unaffordable, is no longer forced to be addressed only by developing countries. This phenomenon also affects developed countries of the world due to many negative events in society (Kumar et al., 2024). Recently, the number of households has been increasing, especially with financial problems with meeting their energy needs. Energy poverty and the factors associated with it are a socio-economic problem that reflects the current state of society (Gawusu et al., 2024).

This type of poverty is perceived as a condition where individuals or households are unable to provide heating for financial reasons, as well as other energies that are necessary to ensure the proper functioning of the household. It is necessary to mediate help to households that find themselves in energy poverty, but also to those who are at risk of this poverty. Lack of energy has an impact on health and quality of life (Lu and Ren, 2023).

The purpose of this article is to examine the key aspects of energy poverty, including its legal framework in Slovakia, its causes, and its consequences. It also explores the measures implemented by the Slovak Republic to reduce the extent and effects of energy poverty on its

population. Furthermore, the article offers essential recommendations for addressing this issue, highlighting successful practices from countries that have effectively managed the impact of energy poverty.

Energy poverty as a concept has been present and used in society for a long time, but it should be emphasized that there is no established and legislatively enshrined definition of energy poverty in the conditions of the Slovak Republic (Strakova, 2014). The only legislative regulation of energy poverty is contained in Act No. 250/2012 Coll. on Regulation in Network Industries (ÚRSO, 2012). According to this law, energy poverty is a situation where the average monthly expenditure of households on the consumption of electricity, gas, heat for heating, and the preparation of domestic hot water creates a significant share of the average monthly income of households. The problem related to this legislative amendment is that the law does not regulate in detail the term "significant share." The need for a uniform definition of energy poverty is also pointed out by experts from practice, namely scientists from the Slovak Academy of Sciences (SAS), but also experts from the Regulatory Office for Network Industries (ÚRSO, 2014). Another legislative regulation related to energy poverty is Act No. 321/2014 Coll. on Energy Efficiency and Amendments to Certain Acts. It lays down measures to promote and improve energy efficiency, obligations in the development of energy efficiency policies, and the rights and obligations of people in the field of energy efficiency.

The absence of a uniform definition not only complicates the identification of the number of households that are at risk of energy poverty but

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also negatively affects the determination of adequate measures that would provide these households with assistance. Given the global nature of this issue, one would expect the European Union to provide Member States with a uniform definition of energy poverty. Vice-President of the European Commission, Maroš Šefčovič, explains that energy poverty must be defined by each member state itself. This is due to the different contexts in which energy poverty plays a role in individual Member States, and therefore there are no efforts to create a universal definition of energy poverty within the EU.

Despite the stated facts about the uniform definition of the EU, Directive 2023/1791 of the European Parliament and of the Council of 13 September 2023 on energy efficiency and amending Regulation (EU) 2023/955 provides a definition of

energy poverty. According to the Directive, energy poverty is a household's lack of access to basic energy services, which provide basic and decent standards of living and health (Eu, 2023a; 2023b).

Discussions related to the issue of a uniform definition of energy poverty within the European Union have given rise to the different views of experts, politicians, and other stakeholders, according to which it is appropriate or inappropriate to establish the same definition for all Member States. Table 1 summarizes the most common arguments for and against the emergence of a uniform definition within the European Union and the outcome of the works by Bouzarovski (2014), Deller (2018), Fellegi and Fulop (2012), and Thomson et al. (2016).

Table 1: Positions on a common EU definition of energy poverty

A common EU definition	Against a common EU definition
Higher political involvement and public awareness	Energy poverty is made up of many components, the existence of a uniform definition can distort its complicated character
Development of a common vocabulary related to the problem	Some of the vulnerable groups may be prioritized in addressing energy poverty, causing inappropriate targeting of measures
Ability to design uniform measures and present statistics	Inability to integrate the specific needs of individual regions and states into the solution of the problem
An opportunity for integration in different policy areas	

It is precisely the absence of a uniform definition of energy poverty according to the European Union that causes the fact that there is currently no official data on the extent of energy poverty in Europe. Approximate estimates ranging (depending on the metrics used) between 50 and 160 million people at risk of energy poverty can be considered relevant. The only pan-European statistics and data available in this area are published by Eurostat, but the total data for individual countries are different depending on the ways in which energy poverty is defined and measured in these countries (Bouzarovski, 2014; Maxim et al., 2016).

In response to the inevitable need to define energy poverty in the conditions of the Slovak Republic, the ÚRSO (2023a) developed and presented to the government a specific proposal for this definition in 2023. The draft definition also considers the definitions of other European Union states that have been dealing with the issue of energy poverty for a long time but also considers the specific specificities of the Slovak Republic. The draft definition is currently not approved by the Government of the Slovak Republic and there are no facts that would indicate that there will be any changes in this issue soon. The proposed applicable definition of energy poverty according to ÚRSO (2023a):

1. A household is at risk of energy poverty if, after payment of expenses for the basic level of energy and water consumption, which ensures a decent standard for the life and health of household members, less than 1.5 times the subsistence minimum remains, and at the same time its total net annual equivalent disposable income for the

previous year, calculated per number of household members, less than the national median.

2. A household is at risk of energy poverty if its annual energy costs for the previous calendar year are below half of the national median and at the same time, its total net annual equivalent disposable income for the previous calendar year is lower than 60% of the national median.
3. The household is without physical access to the supply of electricity for reasons that are exhaustively determined.

The household is at risk of energy poverty in cases where at least one of criteria A or B applies, or criterion C is met. The definition mentioned is based on the existing elements of social policy, on the subsistence minimum, which considers the number of members in the household. It is also based on a comparison of household income and expenditure, which also reflects the fact that the Slovak Republic is among the countries in Europe with the highest ratio between energy expenditure and household disposable income. Applying this definition, there would be approximately 150,000 energy-poor households in Slovakia, which represents approximately 8.2% of all households according to the latest population, house, and apartment census of the SR 2021 (ÚRSO, 2023a).

In a simpler context, energy poverty can be characterized as a state where a household cannot afford to support a suitable temperature in its home. It is most often associated with insufficient funds to cover energy expenses or if the household's income does not sufficiently cover its energy expenses. This means that after paying household energy costs, household members do not have enough financial

resources to cover basic life needs (Dokupilová, 2024).

Energy-poor households are often forced to significantly reassess their expenses. For most households, the most important thing is to secure housing, and they consider the energy and other expenses associated with it appropriately according to the balance of their finances.

One of the indicators that speak of energy poverty is the ability/inability to keep adequate heat in the home. This indicator reflects the number of households that cannot afford to maintain an adequate temperature in the home, to heat sufficiently due to insufficient financial resources. When considering this factor, it is important to realize its subjectivity and the numerous factors that

influence it, for example when comparing it with other households, according to age, health status, and other factors. According to the data in Fig. 1, it is possible to state an unfavorable development over time. While in neighboring countries the share of households unable to maintain adequate heat in the apartment in the part of the population below the poverty line has been decreasing over the last 20 years, in Slovakia there is an increasing tendency, from 19% in 2005 to 25% in 2022 to 30 % in 2023. In Poland, this share fell from 51% in 2005 to 10% in 2022, in Hungary from 34% to 10% in the same years, and in the Czech Republic from 19.5% in 2005 to 7% in 2022 and 16 % in 2023.

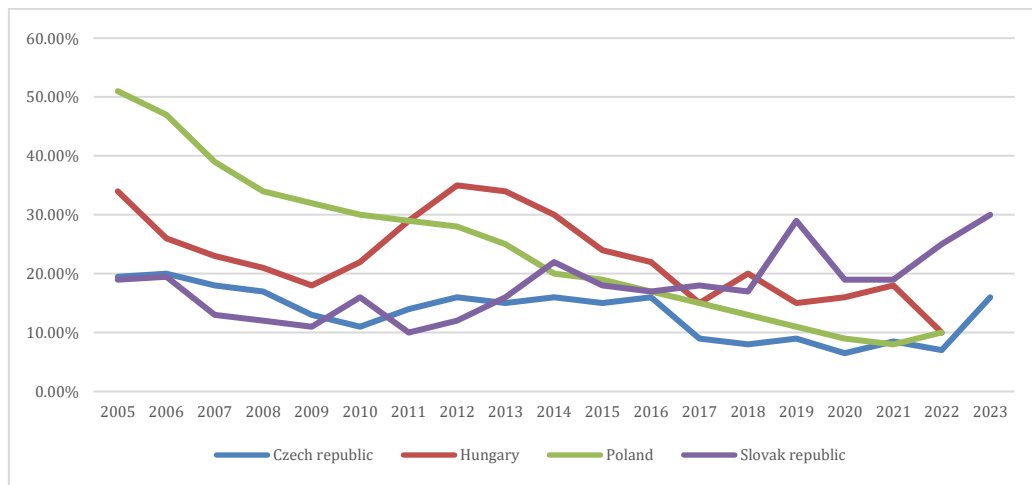


Fig. 1: Inability of residents below the poverty line to maintain adequate heat in their homes in V4 countries

2. Causes of energy poverty

The availability of energy is among the basic life needs of people, and it has a significant impact on social and economic development. Most of the currently used resources are non-renewable and the supply of these resources is decreasing. Considering the ever-increasing demands of the population for energy, related to the growth of the standard of living, but also the growth of the population, the price of energy also increases in response to these factors. This is reflected in the increasing pressure on the budgets of individual households.

Energy poverty cannot be measured based on one indicator. It is necessary to consider several causative factors, such as personal and regional economic and social specifics, climatic conditions, type of dwelling, available heating/cooling equipment, but also gender, age, and health status of persons living in the same household (Teixeira et al., 2024).

Among the key causes of the emergence, persistence, and deepening of energy poverty, we can primarily include:

1. Insufficient income (income poverty), decrease in income – the impact of insufficient income on energy poverty is indisputable and manifests itself as one of the main reasons for its emergence. Low-

or non-income results from job insecurity, unemployment, and low social protection (EPAH, 2022).

2. Inefficient way of functioning in the home (poor thermal insulation of roofs, walls, and windows, old household appliances with higher energy consumption, inefficient heating systems).
3. Insufficient thermal insulation of buildings leads to the discomfort of individuals in households, drafts in houses and apartments, and the appearance of moisture and mold.
4. Price unavailability of energy or increase in energy prices (Boardman, 2010; Liddell et al., 2012). It is energy prices that significantly influence whether households will be able to secure sufficient access to energy that would ensure their well-being. Energy prices are primarily influenced by geopolitical and economic factors, but also by climate change and state interventions (EPAH, 2022).

All the above causes have an impact on the deteriorating physical and mental health of individuals living in energy-poor households. Low temperature in the interior, insufficient lighting, drafts, or mold can lead to diseases of the respiratory tract, skin, or cardiovascular and developmental disorders. Elevated temperatures in the interior can in extreme cases cause heatstroke or death, with old

furnaces there is a risk of burns, fire, or suffocation. The longer the state of energy poverty in households persists, the more serious the impacts arising from this situation. As a social problem, energy poverty also leads to the social exclusion of individuals. It is also linked to climate change - the energy poor cannot afford clean, low-emission heating and often waste energy (Nsenkyire et al., 2023).

It can be concluded that there is a link between the causes of energy poverty. As a result of the synergistic connection of these factors, energy poverty arises. Fig. 2 illustrates this causal relationship.

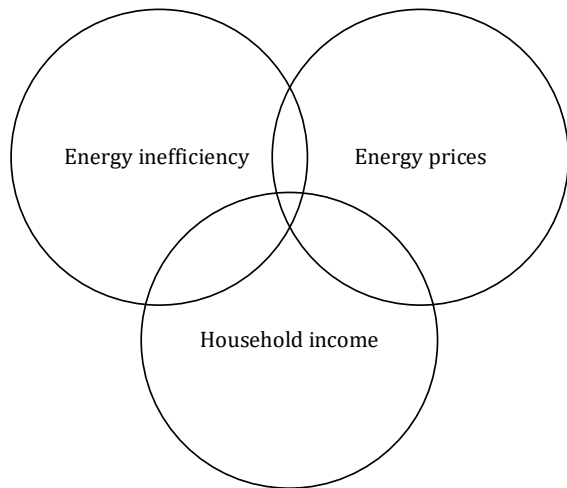


Fig. 2: Connection of factors causing energy poverty

Energy poverty often causes foreclosures and indebtedness, which is the result of arrears for energy. This is a one-time expense that low-income households are unable to cover, and the benefit system cannot respond to these expenses. Low-income households are in a hopeless situation when trying to change this situation, because they do not have the financial means to insulate or replace the heating source, or they live in a sublet in which they do not have the right to implement such interventions (Großmann et al., 2024).

There is undoubtedly a close causal connection between energy poverty and income poverty. Energy poverty can be considered a subset of income poverty. The reason for this is the fact that in the conditions of the Slovak Republic, the question of the availability of the necessary amount of energy and

water is tied primarily to the financial condition of the household and not to the physical absence of energy and water. Therefore, household income is a key factor in eliminating energy poverty, as energy poverty also decreases after reaching a certain level of income.

According to Dokupilová et al. (2020), there are many ways to think about energy poverty but approaches with the ambition to really influence public policies are limited by the availability and quality of data. The Slovak Republic has two basic sources of data whose quality and regularity of collection enable their use in the conceptualization and measurement of energy poverty. These are:

1. The so-called "Family accounts," which are a sample statistical survey, cover the structure of household expenses and income and their development. They also provide information on housing expenditure, including detailed information on energy and related expenditure types.
2. The survey on income and living conditions (EU SILC) focuses on a wide range of manifestations of poverty, social exclusion, and deprivation. It contains detailed information about household incomes and their structure.

From the point of view of energy poverty, there is a significant difference between these detection methods. While "Family Accounts" make it possible to identify energy poverty based on data on household expenditure on energy, or based on their comparison with household incomes, EU SILC offers indicators based on subjective perception in relation to energy poverty. In this way, energy poverty can be captured through the occurrence of arrears for energy, difficulties in maintaining a suitable temperature in the dwelling, or the occurrence of material deprivation related to housing. Although the EU SILC does not investigate the structure of expenditure, the survey contains information on the total amount of expenditure spent on housing. This can help in the identification of risky households (Dokupilová et al. 2020). Table 2 provides an overview of the different indicators of energy poverty based on the data and their combination from these surveys (Dokupilová et al., 2020).

Table 2: Indicators of energy poverty

Objective indicators based on household expenses (data from "Family accounts")	Indicators based on subjective perception (EU-SILC survey)
The share of energy costs in relation to the total disposable income of households	Problems maintaining a suitable temperature in the home
Low incomes, high energy costs	Arrears for utility bills
Low income after deducting energy costs	Unsuitable living conditions – leaking roof, leaky windows, damp walls
	Excessive burden of housing expenses

2.1. Factors of vulnerability to energy poverty and endangered population groups in Slovakia

The vulnerability of the household as a whole or of individuals manifests itself in several ways.

Vulnerability to energy poverty is influenced by several factors. It is important to emphasize that vulnerability to energy poverty has a situational nature and can be found through many internal and external factors that are subsumed into a single

whole. For a better understanding of such a complex issue, which energy poverty undoubtedly is, these factors can be divided into 5 groups. These factors can help not only to understand what causes greater vulnerability to energy poverty but can also be helpful in finding ways to solve this problem with an emphasis on the targeting of interventions and the recognition of citizens dependent on help. The top 5 drivers of greater vulnerability to energy poverty include:

1. Socio-demographic factors: vulnerability mainly concerns households and individuals who are among the beneficiaries of social assistance (e.g. those in material need), tenants of social housing, people with low education, but also ethnic minorities (EPAH, 2022).
2. Type of household: households of single parents, pensioners, families with disabled household members, and students in rented apartments may be more at risk.
3. Health: individuals with diseases that require special conditions regarding heat and air quality, for example, individuals with cardiovascular diseases, respiratory diseases, or other diseases that weaken the immune system.
4. Energy literacy: it mainly concerns individuals and households that are not capable of applying technological innovations in the field of energy, or the transition to innovative energy-based ways of functioning in the home, this may include individuals who do not have adequate awareness or education about the issue, do not have enough financial resources for such changes, use inappropriate energy management in the home.

5. Cultural factors: they primarily concern people whose culture prevents them from perceiving the seriousness of the energy issue, which also affects their behavior and the solution to this problem (EPAH, 2022).

However, it is necessary to perceive these factors as changing over time, with an emphasis on their local character. Some of the factors may be more pronounced in one state, while another factor will have the most fundamental influence in another state. The social situation of households and individuals is constantly changing, whether due to individual decisions or external influences, and therefore in this context the vulnerability of people to energy poverty can also change.

Even though the issue of energy poverty affects essentially all residents, there are significantly more vulnerable population groups within society. These are already in energy poverty or are at imminent risk of falling into poverty if their living situation does not improve (Dokupilová, 2024).

According to Table 3, the biggest risk that encourages the emergence of energy poverty is the economic inactivity not only of pensioners but also of other individuals. This category of economically inactive residents is represented by the greatest threat of energy poverty when up to 40% of households are exposed to this poverty. An important group of households at risk are families with children, complete and incomplete. In the case of this type, every eighth household in Slovakia is characterized by energy poverty (Dokupilová, 2024).

Table 3: Households most at risk of energy poverty according to population group in Slovakia

Population group	Percentage representation of households
Economically inactive non-pensioners living independently	42.5% households
A pensioner living independently, economically inactive	40.3% households
Single-parent families with at least one child under the age of 25	14.6% households
Other groups	14.2% households
Pensioners living in couples (husbands, spouses, partners)	14.9% households
Complete families with at least one child under 25 years of age	13.8% households
Non-pensioners living independently - economically active	6.1% households
Pensioners living independently - economically active	0.0% households

Energy poverty disproportionately affects women due to various socio-economic and physiological factors. Research indicates that women, particularly those who are single parents or elderly and living alone, face higher risks of energy poverty. This increased vulnerability is often attributed to lower income levels and longer life expectancy compared to men (Shrestha et al., 2021).

Physiologically, women tend to be more sensitive to colder temperatures. Studies suggest that hormonal differences, such as higher estrogen levels, cause blood vessels to be more constricted in colder conditions, leading to colder extremities and a heightened perception of cold.

Consequently, women may require higher indoor temperatures to maintain comfort, potentially leading to increased energy consumption for heating. This combination of socio-economic and

physiological factors underscores the importance of considering gender-specific strategies when addressing energy poverty.

3. Examples of good practice: A selection of European countries

Many states have identified the issue of energy poverty as a challenge for the creation and implementation of public policies and are approaching its solutions from various aspects. The solutions themselves are influenced by the definition of energy poverty adopted in the state, the state of market liberalization, the social situation, and the political decisions of state representatives. The range of approaches to solving energy poverty is different: e.g., determining the supplier's obligation to inform social and nursing services, energy allowances,

various social tariffs, or legislative prohibitions on disconnecting certain groups of residents before disconnecting the household from energy (Dokupilová, 2020).

In some Member States, energy poverty is mainly addressed in terms of affordability, through support systems for vulnerable households. This system addresses housing and energy affordability and at the same time helps, for example through tax credits, social tariffs, energy vouchers, or heating allowances. Such systems play a significant role, especially in times of crisis, but do not provide a basis for a comprehensive improvement in the situation of vulnerable households. When solving energy poverty, member states use a combination of approaches and interventions that affect the affected entities in different ways (ÚRSO, 2023b).

A random selection of states was used to collect data on good examples of practice according to the most effective steps implemented by the state and at the same time a selection of V4 states that are neighbors with Slovakia and a certain connection and cooperation in solving the problem can be assumed.

According to Nordic Energy Research, the countries with effective energy poverty results include:

1. Sweden includes energy poverty in its social policy. This state has a very well-developed social support system as well as an energy policy that emphasizes energy efficiency and renewable energy sources. Thus, Sweden does not help in the field of energy poverty in the true sense of the word. This type of assistance is part of the standard social care system. They introduced some temporary policy measures in the most critical period of the energy crisis in 2021-2022. These were consumer-oriented, with temporary subsidy schemes and a compensation scheme differentiated according to energy zones. Subsidies were also aimed at agricultural companies with the aim of compensating them for extraordinary costs related to electricity.
2. Denmark has a strong energy policy focused on sustainability and energy efficiency. It invests in renewable energy sources and has strong regulatory frameworks to protect consumers. Danish properties have high-quality insulation, which helps reduce energy costs. During the 2022 energy crisis, it introduced several measures aimed at citizens who were at risk of being affected by rising energy prices and energy poverty. Most of the implemented measures were aimed at the most vulnerable groups that have already received some kind of social assistance. Fewer measures were aimed at the entire

population, for example through the reduction of electricity tax.

3. France is among the countries with the longest history of analyzing and solving energy poverty problems. Much attention is paid to energy poverty in France. France implements such approaches that adapt to changing conditions and information, which also ensures better and more exact targeting of measurements, as well as subsequent interventions. When assessing energy poverty, they consider the change in weather, energy prices, the amount of taxes, energy consumption, household income, and household characteristics. France has many programs aimed at promoting energy efficiency and fighting energy poverty. An example is the program "Habiter Mieux" (Live Better), which provides financing for the renovation of houses to improve their energy efficiency. It also provides subsidies to reduce energy costs for low-income households in the form of an energy check that is sent automatically. Depending on the composition and income of the household, its amount ranges from €48 to €277 per year. One of the conditions is the fulfillment of tax obligations and a household income of less than 10,700 euros/year. It is intended to cover energy costs but also to increase energy efficiency (Dokupilová et al., 2020).

Good examples of practice are considered by Dokupilová et al. (2020) as well as the Czech Republic and Hungary, which, together with Poland, are historically and structurally in many aspects like the Slovak Republic, and at the same time all these countries are approaching the solution of the issue of energy poverty.

- a. Czech Republic, in which, according to estimates, 20% of households may be affected by energy poverty (Kod'ousková and Lehotský, 2020). The most vulnerable groups are pensioners and the unemployed, who have the highest share of energy expenditure in relation to their income. Single-person households and households with children with only one parent are also at risk. The reason is their low income compared to other population groups. People living in family houses are a significantly more vulnerable group compared to apartment buildings. Although the Czech Republic has several programs that focus on increasing energy efficiency, they are not directly intended for residents affected by energy poverty. The disadvantage of some programs is that they need initial investments, for which the affected households usually do not have the financial means. Table 4 highlights the strengths and weaknesses of the Czech Republic in the area of energy poverty (Dokupilová et al., 2020).

Table 4: Strengths and weaknesses of the Czech Republic in the area of energy poverty

Strengths of the Czech Republic	Weaknesses of the Czech Republic
Social allowance for housing, which also includes an energy allowance	Absence of a definition of energy poverty
Good indicators of the level of material deprivation	Insufficient connection of measures to reduce energy consumption with targeting households that are assumed to be in energy poverty

b. Hungary - the issue of energy poverty is a long-term analyzed topic in Hungary. Although a functional definition was not approved in Hungary, which would help direct public policies more directly, the government created several programs ensuring protection against energy poverty for the most vulnerable. Some of the implemented measures:

- Protection for vulnerable customers in the form of the possibility of requesting a postponement of energy invoice installments or a prepaid subscription,
- Consumers with disabilities may not be disconnected from energy due to past due payments or non-payment of energy bills,
- Providing loans to improve the energy efficiency of the home - insulation, and replacement of heating systems,
- The social compensation system, which applies to the consumption of gas and heat in households,
- Customers are protected for 60 days when gas is taken, and 3 months when electricity is suspended - until then, the customer is offered a prepaid subscription (Dokupilová et al., 2020).

While the member states of the European Union focus on their own approaches to solving the problem, the European Union has adopted several

measures to solve energy poverty and protect vulnerable consumers. Not only in the legislative area. In recent years, the European Commission has been paying more and more attention to the issue of energy poverty and issues related to it.

3.1. Inspiring cases related to energy poverty across Europe

The subchapter is focused on case studies of selected cities that represent a good example of practice focusing on ending energy poverty and improving the living situation of citizens affected and threatened by energy poverty. In selected locations, these activities are covered by national partners or other groups of experts. The cities shown in Table 5 implement specific activities through programs or projects with the aim of eliminating the impacts and deepening energy poverty (EPAH, 2021).

3.2. Recommendations for practice in solving energy poverty in the conditions of the Slovak Republic

The issue of solving energy poverty is becoming increasingly serious and debated due to the growing number of households threatened by this phenomenon.

Table 5: Ways to end energy poverty in selected cities

City	Implementer	Main Activities	Type of Intervention	Topics
Barcelona, Spain	Barcelona Provincial Council	Home energy audits, reducing utility costs, consumer education on efficiency and rights	Consumer advice, empowerment, stakeholder engagement, transparency	Air quality, climate change, insulation, energy audits, efficiency
Lancashire, UK	Cosy Homes in Lancashire	Grants for central heating, Green Homes Grant, supplier switching assistance	Energy access, financing schemes, household efficiency, consumer empowerment	Heating and cooling, insulation, energy efficiency
Gent, Belgium	Dampoort Renovates!	Framework development, candidate selection, renovation execution	Household energy efficiency and refurbishment	Heating and cooling, insulation, energy access, financing schemes
Milan, Italy	Energia su Misura	Identifying vulnerable families, installing energy monitoring kits, providing personalized advice	Capacity building, consumer empowerment, data collection, efficiency improvements	Indoor comfort, energy access, behavior, quality of dwellings, debts
Hauts-de-France, France	Hauts-de-France Pass Renovation	Financial support for home renovation, repaid through energy savings	Financial mechanisms, energy efficiency monitoring, impact assessment	Renewable energy, insulation, energy efficiency, rural areas

In the conditions of the Slovak Republic, several national programs and strategies were adopted, which are not primarily aimed at solving energy poverty, but their effects may have a secondary impact on solving energy poverty. Examples of such national programs and strategies are:

1. The National Reform Program (NPR) is a document representing a package of national policies and measures aimed at maintaining growth and employment. It provides a comprehensive overview of implemented and planned measures by which the Slovak Republic responds to the specific recommendations of the Council of the EU for Slovakia (MFSR, 2024).
2. Recovery and Resilience Plan of the Slovak Republic - the priorities of the recovery plan consider the key problems of the economy and the most important social challenges, which were

chosen based on a comparison of the EU average but also based on common European priorities. It is divided into 5 basic areas: better education for everyone, competitive and innovative Slovakia, green Slovakia, healthy life for everyone, efficient state, and digitization.

3. The national framework strategy for supporting social inclusion and the fight against poverty is a strategic document systematizing approaches to solving poverty and social exclusion.

Several specific measures to reduce energy poverty have been adopted in Slovakia:

- Providing loans for the insulation of apartment buildings (State housing development fund),
- Creation of employment programs,
- Provision of investment incentives leading to increased employment,

- The creation of operational programs that secondarily support the reduction of energy poverty,
- Support for creating jobs for people in an unfavorable social situation,
- Allowance for the installation of equipment for the use of renewable energy sources in households.

In 2023, the government approved the Concept for the Protection of Consumers from Energy Poverty, which was developed by the Office for the Regulation of Network Industries (ÚRSO, 2023a). The approved concept is a set of recommendations that should increase the rate of long-term sustainable availability of energy and drinking water for socially vulnerable households in the medium term. The proposed measures include:

1. Support for the use of the pre-paid (credit) electricity purchase system - households that fall under the definition of energy poverty would have the opportunity to pre-pay for electricity in advance and thus better manage their consumption in relation to disposable income. The advantage of this measure is also the prevention of unpaid bills and better management of own consumption.
2. Optimizing supply and distribution tariffs - creating an obligation for energy suppliers to analyze and find the best tariffs for households at risk of energy poverty once a year and to allow them to change supply and distribution tariffs once a year free of charge if necessary. The aim of the measure is to adjust the price parameters, which will lead to an effective reduction of the annual cost of energy security.
3. Offer of free installment plans. The aim of this measure is to help customers pay for energy supplies. If the household's current situation does not allow the repayment of the entire amount of the obligation, it would be possible to spread it over time and thus prevent the emergence of the status of a debtor against whom claims are recovered through executions.
4. Offer of free energy consultancy.
5. Protection against the interruption of the distribution of energy and drinking water in winter.
6. Prohibition of door-to-door sales of energy and drinking water - door-to-door sales are not best in terms of control and prevention of unfair business practices by supplier representatives.

According to the recommendations of the European Commission, not only Slovakia but also other member states should focus primarily on (ÚRSO, 2023b):

- The adoption of rapid steps with the aim of defining the concept of energy poverty in national law,
- A clear distinction between structural measures to solve energy poverty and measures to increase the

affordability of energy, with emphasis on prioritizing structural measures,

- The introduction of measures aimed at preventing the disconnection of consumers affected by energy poverty and vulnerable consumers through financial support systems,
- Ensuring coherence between public policies, especially between energy and social policy, and preventing contradictory measures, whereby energy poverty should be included in individual social policies to apply an inclusive and supportive policy, especially in the case of households affected and at risk of energy poverty,
- The creation of systems that will enable households affected by energy poverty to access energy-efficient household appliances to reduce energy bills.

Addressing energy poverty requires systemic interventions at both national and international levels (Liu et al., 2020). However, individuals and households can also adopt practical measures to reduce energy consumption and alleviate energy poverty. There are insights into effective strategies for enhancing energy efficiency at home:

1. Turn Off Devices Completely: Electronic devices consume energy even in standby mode. Unplugging devices or using smart power strips can eliminate this "phantom" energy usage. A study in *Energies* highlights the importance of monitoring and managing household appliance consumption to optimize energy use.
2. Switch Off Lights When Not in Use: Consistently turning off lights when exiting a room or leaving the house can conserve electricity. Research in *Sustainability* emphasizes that changing energy consumption behavior is a promising strategy to enhance household energy efficiency and reduce carbon emissions.
3. Lower Water Heater Temperature: Reducing the temperature setting on your water heater can lead to significant energy savings. For instance, lowering the temperature from 75°C to 55°C can reduce electricity consumption for water heating, resulting in annual savings. An article in *Energies* discusses the impact of energy efficiency improvements in households, including adjustments to heating systems.
4. Opt for Showers Instead of Baths: Taking showers instead of baths can substantially decrease water and energy usage, as showers typically require less hot water. The *Energy Conservation* article in *Energies* highlights the significance of occupants' behavior in shaping home energy demand, including water usage habits.
5. Use a Dishwasher Instead of Hand-Washing: Modern dishwashers are designed to use water and energy more efficiently than washing dishes by hand, especially when run with full loads. Research in *Sustainability* indicates that energy-efficient appliances, such as dishwashers, can

contribute to reduced household energy consumption.

Implementing these measures can help households reduce their energy consumption, lower utility bills, and contribute to global efforts to mitigate energy poverty.

In the home, it is possible to save even if the lights are not turned on when it is still bright enough, by regularly cleaning the filters in the appliances, not turning on the washing machine and dishwasher when it is half empty, and in many other ways.

Although the above recommendations will not solve the critical situation of households at risk of energy poverty, they can save several hundred euros per year. Incorrect habits that individuals use in the home can increase energy consumption by 30-40% per year.

One of the key measures in the fight against energy poverty, but also in the broader context of climate change, is the preparation and implementation of nationwide information campaigns to educate various consumers focused on energy efficiency and saving energy and water (ÚRSO, 2022). In Slovakia, energy prices and sufficient access to them are most often addressed, there is a lack of regular information on how to save energy and what impact high energy consumption has not only on household finances but also on the quality of life and the environment.

4. Conclusion

Energy poverty is a significant problem that requires urgent solutions. In Slovakia, the unfavorable situation worsens over time (Dokupilová et al., 2024). Energy poverty and the problems associated with it cannot be effectively solved in isolation only through regulatory measures. The first necessary step is to adopt a definition that would define the range of households that would need help. A solution in the context of society is essential, considering social aspects, education, and creating job opportunities that will ensure higher incomes for individuals and households. Another necessary element is an integrated approach of all interested public administration entities. Due to the complexity of energy poverty, this issue must be approached as a multidisciplinary phenomenon requiring a multisectoral approach. Solving energy poverty is a clear task of the state as such, through individual departments and cooperation between them. The task of each department is to take part in the solution of the given question from the point of view of its scope and competencies, and to give constructive proposals for measures (ÚRSO, 2023a).

In the area of solving energy poverty, measures that strengthen the position of households in energy poverty and vulnerable to energy poverty should be a priority. The measures should primarily enable these households to implement their own steps to

improve the way they live in terms of energy efficiency and energy consumption from renewable sources.

Energy poverty is usually a consequence of poverty itself. It is therefore especially important to look for solutions to cut poverty. Cooperation at the level of the government, ministries, municipalities, but also the private sector is key.

In the fight against energy poverty, self-government can be a helpful entity. Given the knowledge of the local population and other factors related to the local territory, they can effectively represent the interests of local citizens. Their activity can be oriented towards the provision of social housing, but also financial support. It is also possible to consider providing relief from local taxes for households to meet the criteria of energy poverty, e.g., in the form of a temporary tax reduction on the property where the family lives in energy poverty.

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Compliance with ethical standards

Conflict of interest

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