ENERGY POVERTY IN THE NORDIC COUNTRIES

Nordic Energy Research

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This publication is also available online in a web-accessible version at:
https://pub.norden.org/nordicenergyresearch2024-02

FOREWORD

The Nordic region has a vision to become the most sustainable and integrated region in the world. Secure, affordable and clean energy is fundamental to realising this. Yet, in view of recent unprecedented energy prices and geopolitical risk, the concept of energy poverty and just transition has gained a great deal of attention.

Previous studies from Nordic Energy Research (Trilemma study 2023) have pointed at how the rising energy prices have affected households in the Nordic countries and how the Nordic countries have approached consumer protection versus our Baltic and EU counterparts. Although the Nordic countries have shown resilience in the face of the energy crisis there are still many who have reduced their home's temperature in order to save energy and money or who had a hard time paying electricity bills given that other expenses increased as well.

The Nordic countries have offered varying levels of support to households most affected by the high electricity prices. These actions demonstrate that energy poverty must be viewed in an economic, social, and sustainability context.

This report critically examines energy poverty in the Nordics, offering insights into challenges related to energy access and recommending strategies for improvement. Energy poverty is a global challenge that takes different shapes in different regions. In the Nordics it is important to address and reduce energy poverty to make the green transition more inclusive and socially sustainable. This increases public acceptance and support for the necessary policy changes to manage the green transition.

I'm grateful to the European Joint Research Center for permitting the use of their statistics on the issue used in the report, as well as they did previously in the 2023 report on "Inflation and its social consequences".

I commend the researchers and contributors of this report for their efforts in providing insights into energy poverty that align with the vision of a sustainable, competitive, and socially inclusive future for the Nordic Region. I trust readers will find this report as informative as I do.

Klaus Skytte
CEO, Nordic Energy Research

PHOTOS: UNSPLASH AND ISTOCK

1. EXECUTIVE SUMMARY

The concept of energy poverty, though a relatively new topic in a Nordic context, has gained a great deal of attention in the wake of the recent energy crisis and due to its prominence in the EU's work on this topic. Particularly, the revised Energy Efficiency Directive (EED) (Directive (EU) 2023/1791) and – at the time of the writing – the ongoing work on the electricity markets directive (EMD), are relevant in this context. The EED requires member states to focus on alleviating energy poverty. The introduced changes require Member States to prioritize vulnerable customers, individuals affected by energy poverty, and those living in social housing when introducing energy efficiency improvements. In addition, each Member State is responsible for achieving a share of energy savings among vulnerable customers and those affected by energy poverty.

In the Nordics, there has been limited examination of energy poverty. This can be attributed to the presence of robust social welfare systems in the region, which effectively mitigate economic crises, thereby integrating the consideration of energy poverty into broader social policies. With no distinct definition, economic scarcity due to rising energy prices is often conflated with general poverty. As a result, it is rather difficult to define the concept of energy poverty and identify indicators to estimate the prevalence of energy poverty in the Nordic context as the ideal policy tools diverge from those applied in the rest of the EU.

To support the implementation of the directive, the EU Energy Poverty Observatory (EPOV) suggests four indicators to measure the extent of energy poverty. If the Member States do not specify other indicators to estimate energy poverty, they are obliged to estimate the prevalence of energy poverty using the suggested indicators. However, the proposed indicators, both consensual- and expenditure-based, present challenges in capturing the nuanced context of energy poverty in the Nordics.

This study provides an analysis of the prevalence of energy poverty in the Nordics using several indicators including those suggested by EPOV. However, the examination reveals context-specific challenges in the Nordics. The structure of energy bills complicates expenditure-based indicators, and relative measures may not accurately reflect the absolute prevalence of energy poverty across countries. The issues also include under-reporting vulnerability and survey biases, necessitating further efforts to refine indicators for the national context. The ongoing work with energy poverty has shown the multifaceted nature of energy poverty in the Nordic context and the imperative for tailored strategies and indicators to address this critical issue. A virtual workshop, which engaged diverse stakeholders, has produced guiding recommendations for future work on energy poverty. These recommendations emerged from discussions on the initial findings of the current study, a general exploration of the EED, and consideration of climate targets outlined in both the directive and the National Energy and Climate Plans (NCEP), with a focus on not compromising energy efficiency improvements.

1.1 Recommendations

The study on energy poverty in the Nordics in continuation of the implementation of the revised Energy Efficiency Directive has pointed towards a set of recommendations that could support the countries' work with addressing energy poverty. These recommendations are summarised below and thoroughly elaborated in chapter 8.

Develop a clear and shared definition of energy poverty:

- Clarify how to understand and work with energy poverty in continuation of the implementation of the EU directives.
- Initiate national work to interpret and translate recent provided EU guidance in the Nordic context.

Develop a set of indicators, which reflect the multidimensional concept of energy poverty – at national and Nordic level:

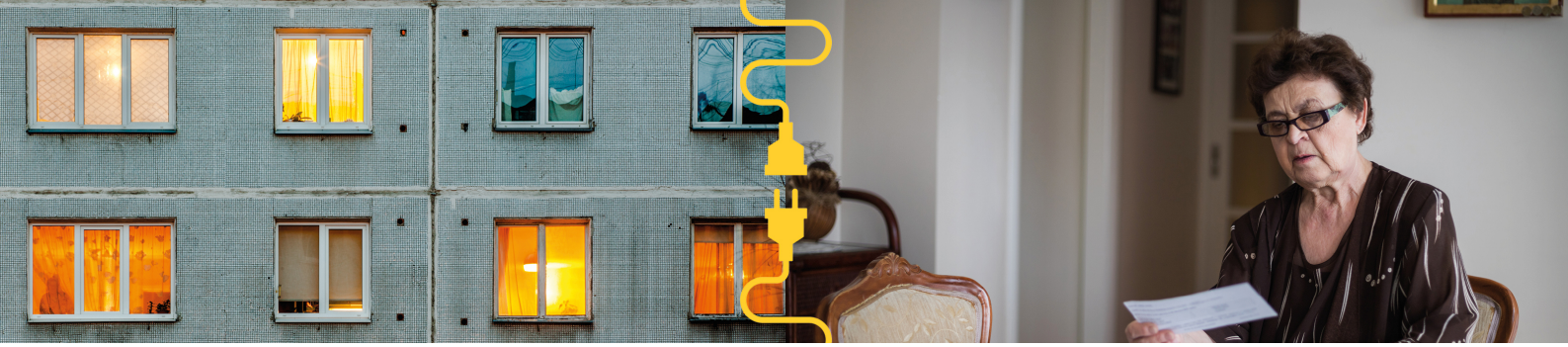
- Select a set of indicators, which mirror the local context and its complexity.
- Indicators need to be supplemented by more in-depth data.
- Consider using and establishing national data to supplement or replace EU indicators.

Establish a clear governance structure:

- Responsibility for the implementation of energy poverty related regulation should be clearly anchored in one governmental department.
- Due to the multidimensional nature of energy poverty, there is a need to establish a collaboration across different departments.
- Nordic collaboration can help further work on energy poverty in each of the Nordic countries.

Strengthened knowledge about what works:

- Establish more knowledge on how different measures work and what impact they have on different target groups.
- Establish an understanding of whether the 'full package' of applied measures adequately reflects and addresses challenges and needs.
- Share lessons learned across the Nordics to build more knowledge.



PHOTOS: ISTOCK

2. INTRODUCTION

The recent energy crisis in 2021-2023 and subsequent rapid energy price increases have challenged societies and put pressure on consumer budgets all over Europe. At the same time, repercussions of the global COVID-19 pandemic, geopolitical developments and energy supply challenges have exposed risks in the energy sector and demonstrated that shocks to energy markets are not necessarily distributed evenly across society.

Consequently, energy poverty – once considered a marginal concern in the Nordic region – has emerged as a focal point on the political agenda, and countries have responded by implementing emergency measures to mitigate the negative consequences on populations. Energy policy and social politics have converged, necessitating a comprehensive understanding and proactive measures to navigate the complex challenges of ensuring a sustainable and just transition of the Nordic energy sector moving forward.

In short, energy poverty refers to a situation where households or individuals are unable to secure, either financially or through physical utilities, an adequate level of energy services for their home[1]. Such services include adequate heating, hot water, cooling, lighting, and energy to power appliances[2]. Lack of access to such essential services can have a negative impact on health and wellbeing due to prolonged exposure to cold air, moisture or condensation and financial stress[3].

While energy poverty has been debated in a European context for several years, the energy crisis has reconfirmed energy poverty as a serious political issue in the European Union (EU). In recent years, the EU has intensified its ongoing initiatives to identify and mitigate energy poverty within Member States[4]. The revised Energy

1. EPAH handbook_introduction.pdf (europa.eu)
2. Measuring and monitoring energy poverty in the EU - examples of good practices (odyssee-mure.eu)
3. What are the effects of energy poverty and interventions to ameliorate it on people's health and well-being?: A scoping review with an equity lens, Ballesteros-Arjona et al., 2022 and Measuring and monitoring energy poverty in the EU, Robina et al., 2022
4. https://energy.ec.europa.eu/topics/markets-and-consumers/energy-consumer-rights/energy-poverty_en

Efficiency Directive (Directive (EU) 2023/1791)[5] provides a broad overarching definition of energy poverty. Based on this definition, Member States are required to define energy poverty in their specific national context. The nationally specified definitions and criteria are to be included in the National Energy and Climate Plans where Member States are also required to specify policies and measures addressing energy poverty, including social policy measures and other relevant national programmes.

In response to the above-mentioned situation, Nordic Energy Research (NER) – acting on behalf of the Electricity Market Group (EMG) under the Nordic Council of Ministers (NCM) – has called for an examination of energy poverty within the Nordic context. The motivation behind this inquiry is twofold: firstly, to expand the knowledge base that is essential for informed policymaking; and secondly, to provide substantive support to the Nordic countries in their efforts to alleviate energy poverty.

This report delves into the paradigms, definitions, indicators, and current state of energy poverty in both the Nordic countries and within a broader European Union context, shedding light on the intricacies of the issue itself and proposing avenues for effective policy interventions. Through a comprehensive exploration of the current landscape, this report aims to contribute to the ongoing dialogue on energy security, social equity, and sustainable development in the Nordic region.

2.1 Context

National as well as global climate goals combined with challenges of energy security have intensified the need to decarbonise energy systems around the world[6]. With little time at hand, the pressure on a transition of energy systems to green sources of energy generation is increasing[7]. This creates challenges for the deployment of new policies and solutions that try to balance the energy trilemma[8] (see Figure 1). The crux of the trilemma is that the three core dimensions, *security, affordability, and sustainability*, do not necessarily align naturally but require a holistic approach[9]. Balancing the energy trilemma is therefore also a central concern for policy makers when it comes to energy poverty. A case in point is the recent energy crisis, showing how the vulnerable in society can become exposed when one of the challenges (e.g. energy security) is not adequately balanced in line with the other concerns.

5. Directive (EU) 2023/1791
6. https://unfccc.int/sites/default/files/resource/UNClimateChange_AnnualReport_2022.pdf
7. https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2665~622858d454.en.pdf
8. https://www.worldenergy.org/transition-toolkit/world-energy-trilemma-index
9. https://www.norden.org/en/publication/nordic-energy-trilemma

Hence, the concept of energy poverty is closely linked to the energy trilemma because it is not only a matter of affordability and broader social resources but also concerns topics such as energy sources, energy security, and energy efficiency.

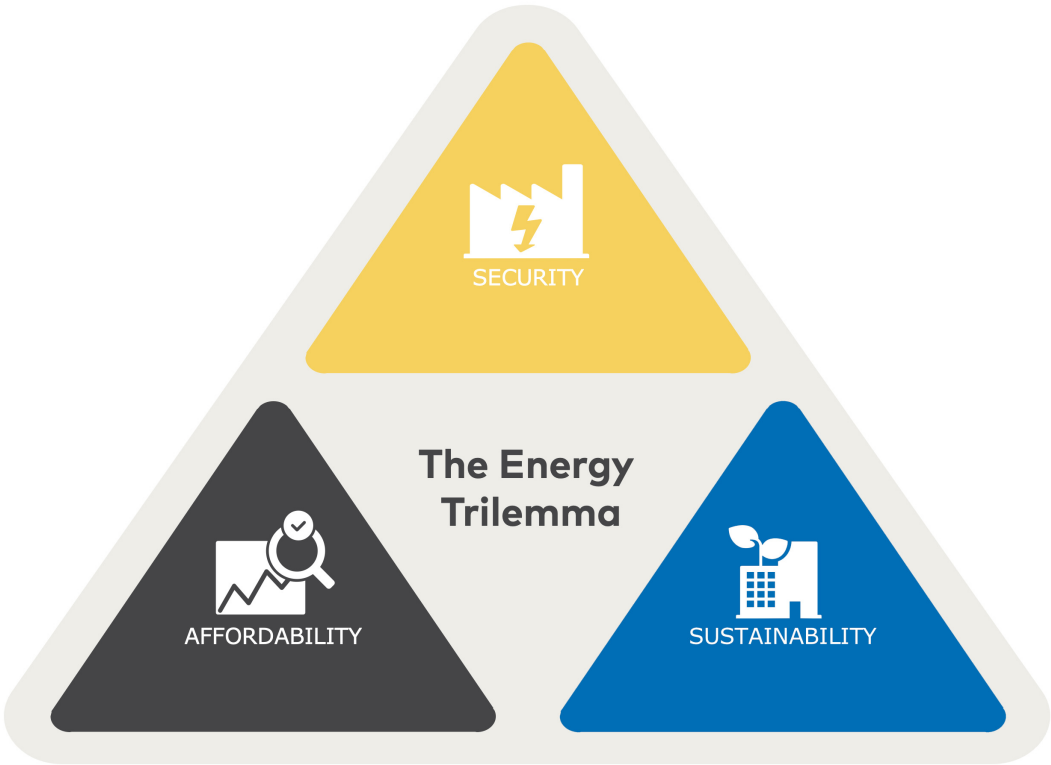


Figure 1. Illustration of the Energy Trilemma

Source: Figure taken directly from The Nordic Energy Trilemma (norden.org)

The recent energy trilemma report by NER (2023) evaluates the drivers and amplifiers of the energy crisis, along with Nordic countries' level of exposure, preparedness, and responses[10]. The table below provides an overview of the core findings from this report in terms of risks and preparedness of the Nordic countries relative to specific energy market dynamics. An important takeaway from this overview is that all countries are exposed to multiple risks, and that risk drivers such as energy import dependency, grid infrastructure, and exposure to gas supply fluctuations, all cut across multiple countries – which points to wider regional risks and the benefits of Nordic cooperation in addressing them.

10. "The Nordic Energy Trilemma" (norden.org)

DRIVER	Denmark	Finland	Iceland	Norway	Sweden
Electricity market structure	🔴	🔴	⚪	🔴	🔴
Decommis-sioned controllable electric capacity	🔴	🟢	⚪	🟢	🔴
Electricity supply and demand balancing	🔴	🟡	🟢	🟢	🔴
Lack of electric grid infrastructure	🟡	🟢	🟡	🟡	🔴
Inflexible electricity demand	🔴	🟢	🟡	🟢	🟡
Weather-dependent energy supply	🔴	🟢	🟢	🟢	🔴
Increasing energy import dependency	🟢	🟡	⚪	🟡	🟡
Natural gas supply reductions	🟢	🟡	⚪	🟡	🟢

Table 1. Risks/exposure of the Nordic countries

Source: "The Nordic Energy Trilemma. Security of Supply, Prices and the Just Transition" Nordic Energy Research, 2023, .

Note: Red = High risk, Yellow = medium risk, Green = low risk, Grey=no effect.

Considering the multiple risks associated with a disruption of the energy system, the risks posed specifically to consumers are varied and come from multiple directions. It is therefore crucial for policy makers not only to be aware of these risks based on the best available data, but also to be ready to react in a timely manner and to mitigate their impact. Further, the risks posed to consumers are not evenly distributed: Vulnerable groups (e.g. poor health, limited social and personal resources), and groups with less economic resources, are often more exposed to risks and have less resources to mitigate crises resulting from supply reductions or price peaks. Agreeing on definitions of energy poverty before a future crisis and methods for measurement, can contribute to ensuring a sufficient response to impacts specifically on vulnerable groups. This is also important when addressing the affordability perspective in the energy trilemma.

The consideration of vulnerable groups is not just a result of the current supply crisis. As mentioned, countries also have high ambitions to decarbonise due to the unfolding climate crisis. This means a transformation of the way in which the world's energy systems work, whilst balancing the trilemma: new greener energy sources and systems must be reliable and secure to prevent disruptions in energy supply[11]. The energy sources must also be socio-economically viable in a manner that unstable or high energy prices or lack of access to energy systems do not expose vulnerable groups and increase energy poverty. If the transition is not socio-economically viable, politicians risk losing the social acceptance and legitimacy necessary for the transformation of the energy system. A balance in the energy trilemma is therefore a must to ensure a smooth and successful transition that integrates environmental goals with economic and security considerations where energy poverty is not a side-effect.

11. https://www.sciencedirect.com/science/article/abs/pii/S0301479722002869

PHOTOS: ISTOCK

3. METHODOLOGY

3.1 Scope of the study

This report investigates the ongoing work on energy poverty in each of the Nordic countries in terms of defining and measuring the concept. The report also covers the implementation of policy measures to tackle energy poverty and preliminary learnings and discussions regarding the consequences of different policy initiatives. The report builds on the ongoing work on energy poverty in the EU but does not contain a broad summary or review of all relevant literature covering energy poverty.

3.2 Data

The report relies on qualitative as well as quantitative data. Furthermore, the report includes a thorough desk research on energy poverty in the Nordics and in the EU. Quantitative data have been obtained through desk research or through a special delivery from the Joint Research Centre (JRC) at the European Commission.[12]

Qualitative data have been obtained through interviews with relevant stakeholders, and from a virtual workshop regarding ongoing work and future developments. A full list of organisations that have contributed to the report can be found in appendix 9.1.

The content and results of the report were developed by Ramboll. The study does not necessarily reflect the opinions of the contributing organisations and should not be interpreted as a formal contribution to the political discussion from the organisations listed in the report.

12. The views expressed in the report are purely those of the authors and are not in any circumstance to be regarded as stating an official position of the European Commission. See details and disclaimer on data from JRC in chapter 5.

3.3 Report structure

The report consists of four main sections resulting into a set of recommendations for the Nordic countries' future work on energy poverty (chapter 8). The first section considers the work on defining and measuring energy poverty and the work up until now in each of the Nordic countries and in the EU (chapter 4). The second section provides a descriptive overview or assessment of energy poverty in the Nordic countries, using some of the most common indicators (chapter 5). The third section investigates policy measures in the Nordic countries and selected EU Member States as a response to recent years' energy crisis (chapter 6). Finally, the fourth section (chapter 7) looks ahead and considers future perspectives for the Nordic countries' work on energy poverty and in particular the implementation of the revised Energy Efficiency Directive.

PHOTOS: ISTOCK

4. DEFINING AND MEASURING ENERGY POVERTY

Section 4.1 gives a brief historical introduction to the concept of energy poverty followed by an overview of pivotal and current EU legislation and documents in sections 4.2 and 4.3, motivating the work on energy poverty in the Nordics as well as providing an EU wide definition. The EU definition sets the framework from which EU Member States are to define their own criteria and policy measures to address energy poverty. A description of the progress on defining energy poverty in each of the five Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) is examined in detail in section 4.4. Finally, a thorough discussion of the most prevalent and pertinent ways to measure the extent of energy poverty is provided in section 4.5, establishing a knowledge foundation for the further analysis.

4.1 Framework for understanding energy poverty

The original wording, fuel poverty, developed throughout the early 90's and 00's towards what is now called energy poverty in the EU. This change in terminology can be put down to a desire to avoid confusion, for whilst fuel poverty does include all energy services, the term can be interpreted as only relating to fuel input, for example, firewood or natural gas[13]. That said, energy poverty and fuel poverty is often, also in academia, used interchangeably. In this report, we consequently use the term 'energy poverty' outside of section 4.1.

Although it is hazardous to attribute a single author to the generation of a broad, overarching concept, the concept of fuel poverty was largely clarified and harmonised by the academic, Brenda Boardman, in the early 90's, through her book, *Fuel Poverty:*

13. Energy poor or fuel poor: What are the differences?, Li et al., 2014

From Cold Homes to Affordable Warmth[14], and associated academic research. She defined it as '*the inability to afford adequate warmth because of the energy inefficiency of the home'*. In contrast to general poverty, fuel poverty is a concept that occurs at the intersection of social policy and energy policy. To complicate matters further, addressing fuel poverty directly requires capital investments as opposed to 'simpler' income support policies in the case of general poverty[15].

Identifying the group of households in energy poverty seems to be quite a difficult task. Having established the concept, Brenda argued for an indicator of fuel poverty defined as expenditure on fuel that is double the median expenditure on energy services, which at the time of her writing was 10 percent or more of income[16]. This early work culminated in the UK in 2001 with the recognition of fuel poverty as an issue of national concern and the subsequent implementation of the *Warm Homes and Conservation Act 2000*[17]. Although this was the first attempt to address fuel poverty through legislation, the Electricité de France (EDF – France's main electricity provider), had already in 1993 begun to implement strategies to assist customers through a 'solidarity taskforce' to help vulnerable consumers pay their bills and thereby reduce high levels of arrears on utility bills[18].

It was not until another two years later, in 2003, following the wide-sweeping energy market liberalization that had occurred some six years earlier that the EU initiated their work on consumer protection. The concept of energy poverty appeared in EU legislation for the first time in the Third Energy Package in 2009[19]. Since then, work on energy poverty in the EU has undergone a series of refinements (see section 4.2 below) to reach a point where energy poverty is now defined as a household's lack of access to essential energy services, such as heating, hot water, cooling, lighting and energy to power appliances[20].

With the emerging recognition of energy poverty, it seems almost needless to say that the concept developed into a broad definition aiming to encompass the complex and multidimensional nature of the issue. Hence, the current understanding is that drivers for energy poverty vary, but often include low-income, high-energy prices, and low levels of energy efficiency as is depicted in Figure 2[21]. In this vein, it should be stressed that vulnerable citizens/customers as a concept differentiates itself from energy poverty in that it entails a wider range of issues, which are not necessarily concerned with energy affordability. Further, vulnerability is linked to the risk of becoming energy poor, while energy poverty is a descriptive condition of the status quo[22].

14. Fuel Poverty: From Cold Homes to Affordable Warmth, Brenda Boradman, 1991
15. Fuel poverty is different, Brenda Boardman, 2007
16. Appendix B: The Concept of Energy Poverty and Its Consequences, Green et al., 2016
17. Warm Homes and Energy Conservation Act 2000
18. The Origins of Energy Poverty in Europe, Rachel Guyet, 2022
19. Third energy package, the European Commission
20. Regulation (EU) 2023/955
21. Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures, Directorate-General for Energy, 2015
22. SWD(2023) 647

To conclude, a range of indicators has been developed to capture the essence of energy poverty, but many lie at the intersection of two of the primary drivers rather than in the centre, capturing all three primary drivers. A discussion of these indicators follows in section 4.5.

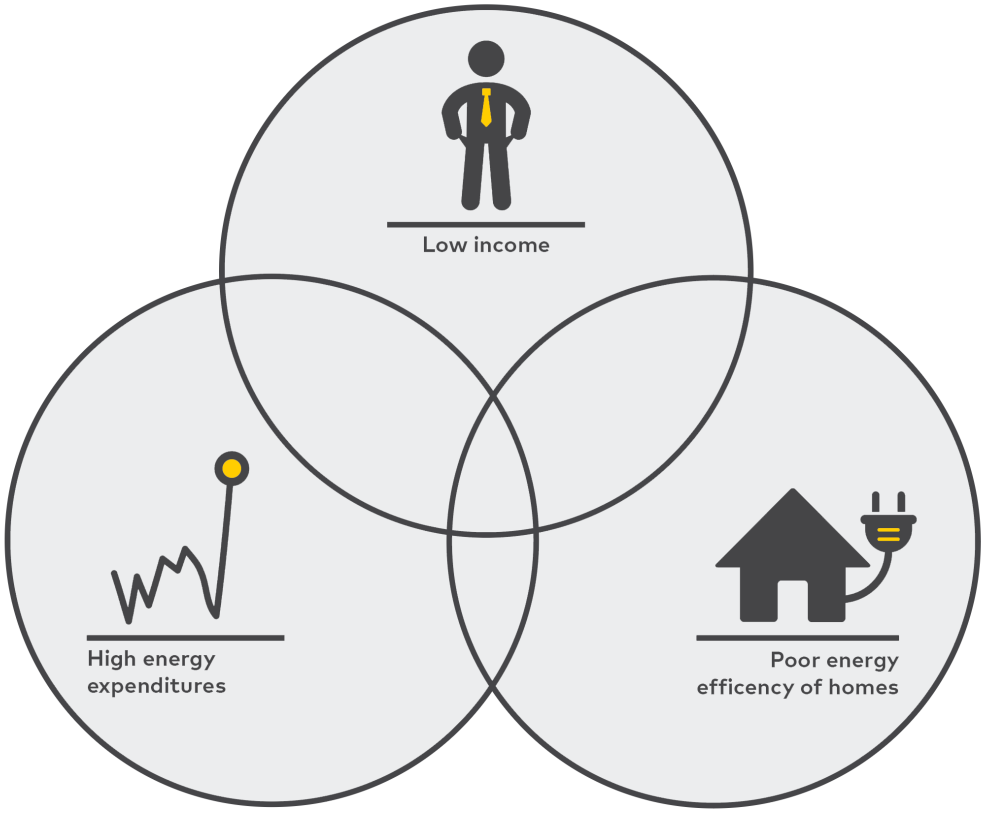


Figure 2. Drivers of energy poverty

4.2 Energy poverty in the EU

The concept of energy poverty is a relatively 'young' concept in EU legislation. The first time the EU legislation explicitly mentioned it, was in the third energy package in 2009. Since then, energy poverty has been addressed in a range of EU legislations and working documents advising and requiring Member States to address the issue. This section summarizes some of the most pivotal work and more recent developments in the EU, serving as a backdrop for the analyses on perspectives for future work with energy poverty as described in chapter 7. The section touches upon the following EU documents:

- Electricity Directive (Directive 2009/72/EC)
- Gas Directive (Directive 2009/73/EC)
- European Pillar of Social Rights (2017)
- Governance of the Energy Union and Climate Action (Regulation (EU) 2018/1999)
- Renewable Energy Directive (Directive (EU) 2018/2001)
- Energy Efficiency Directive (Directive (EU) 2018/2002)
- Clean Energy for all Europeans package (2019)
  - Governance of the Energy Union and Climate Action (Regulation (EU) 2018/1999)
  - Renewable Energy Directive (Directive (EU) 2018/2001)
  - Energy Efficiency Directive (Directive (EU) 2018/2002)
  - Non-legislative measures for defining and monitoring energy poverty
- Electricity Directive (Directive (EU) 2019/944) – *currently under revision*
- Energy Poverty Observatory (EPOV)
- Commission Recommendation (EU) 2020/1563
  - Staff Working Document (SWD(2020) 960)
- Communication on Tackling rising energy prices: a toolbox for action and support (COM/2021/660)
- Commission Notice on the Guidance (2022/C 495/02) to Member States for the update of the National Energy and Climate Plans (NECPs) due in 2023

Although the Second Energy Package, adopted in 2003, did introduce some consumer protection measures, the concept of energy poverty was not explicitly mentioned in EU legislation until the 2009 Third Energy Package. Specifically, the Electricity Directive (Directive 2009/72/EC)[23] and the Gas Directive (Directive 2009/73/EC)[24] called on Member States to *'develop national action plans or other appropriate frameworks to tackle energy poverty'*, define *'vulnerable customers'*, and protect them. This could for instance be through social security systems, prohibition of disconnection of gas and electricity at critical times, and provision of energy efficiency improvements[25].

In 2015, the multidisciplinary energy think-tank INSIGHT_E conducted a study on behalf of the Commission. The study investigated the ongoing work of Member States with defining and alleviating energy poverty[26]. They concluded that at the time less than a third of the Member States had explicitly recognised the concept of energy poverty. Seven recommendations were given to the Commission encouraging continued efforts to provide guidance and requirements for the Member States to alleviate energy poverty.

Continuing the work on energy poverty through the official EU institutions, the European Pillar of Social Rights (2017) stands as a pivotal document that recognises the importance of ensuring access to essential energy services, ranking it among the 20 key principles, which it delineates. Principle 20 states that "*Everyone has the right to access essential services of good quality, including water, sanitation, **energy**, transport, financial services, and digital communications. Support for access to such services shall be available for those in need*". The pillar's insistence on the provision of support for those lacking essential services for energy is of direct relevance to the EU and Member States' work on alleviating energy poverty. The inclusion of energy identifies its critical value for the welfare and social rights of citizens – with the cost of living and the impact that energy has across the EU currently being the number one concern for EU policy makers[27].

4.2.1 Energy as an essential service in EU policy

Following the publication of the European Pillar of Social Rights and on the back of the EU Paris Agreement, the EU implemented the Fourth Energy Package, a wide array of new laws with respect to energy policy collectively known as the 2019 *Clean Energy for all Europeans package*[28]. This package included several core legislative documents touching on the issue of energy poverty and also, for the first time, requiring member states to identify, monitor and address energy poverty. The central documents in this package that were relevant for energy poverty included:

23. Directive 2009/72/EC
24. Directive 2009/73/EC
25. Energy poverty in the EU, European Parliamentary Research Service, 2023
26. Energy poverty and vulnerable consumers in the energy sector across the EU: analysis of policies and measures, Directorate-General for Energy, 2015
27. European Pillar of Social Rights - Building a fairer and more inclusive European Union
28. Clean energy for all Europeans package, the European Commission

- Governance of the Energy Union and Climate Action (Regulation (EU) 2018/1999)[29]
- The Renewable Energy Directive (Directive (EU) 2018/2001)[30]
- The Energy Efficiency Directive (Directive (EU) 2018/2002)[31]
- Non-legislative measures to improve the work on defining and monitoring energy poverty

The Governance of the Energy Union and Climate Action (Regulation (EU) 2018/1999), which is denoted the Governance Regulation, introduces a mechanism whereby Member States are obligated to assess the prevalence of energy poverty within their borders through National Energy and Climate Plans (NECPs)[32]. If a Member State identifies a 'significant' number of households in energy poverty, it is mandated to incorporate a national objective, along with corresponding policies and measures, to mitigate this challenge.

The Renewable Energy Directive (Directive (EU) 2018/2001) contributes by directing Member States to address the accessibility of self-consumption of renewable energy sources. This directive specifically highlights the importance of enabling participation in energy communities for customers residing in low-income or vulnerable households. It recognises that such households may lack the necessary up-front capital to invest in renewable energy technologies but could substantially alleviate their energy poverty through reduced energy bills.

The Energy Efficiency Directive (Directive (EU) 2018/2002) takes the general provision for inclusion of vulnerable costumers in the Renewable Energy Directive one step further by providing a framework in Article 23-24 for the inclusion of energy poor citizens in specific efficiency improvement programmes or grants. Paragraph 24 specifically recognises that energy efficiency measures are central and complementary to social security policies at Member State level, to alleviate energy poverty, alongside the need to improve energy efficiency in buildings within the objectives set out by the Paris Agreement. Furthermore, Article 7 (11) mandates that policies directed purely towards energy efficiency savings should take into account the need to alleviate energy poverty. It is noteworthy that the integration of measures relating to capital investments in the energy efficiency regulation largely validates the earlier findings of Brenda Boardman, where measures to combat energy poverty were argued to be more effectively linked to capital investments than pure income measures. The Energy Efficiency Directive was revised in 2023, and the revisions regarding energy poverty are presented in section 4.3.

In addition to the legislative measures introduced through the Clean Energy for all Europeans package, the package also introduced non-legislative initiatives to support

29. Regulation (EU) 2018/1999
30. Directive (EU) 2018/2001
31. Directive (EU) 2018/2002
32. Regulation (EU) 2018/1999

measures to define and monitor energy poverty. Specifically, the European Commission launched the Energy Poverty Observatory (EPOV) with the purpose of improving the measuring and monitoring of energy poverty as well as sharing knowledge and best practices. EPOV has played an important role in collecting information on and discussing various indicators that measure the extent of energy poverty on a national level as well as on a local level.[33]

4.2.2 The entry of vulnerable costumers in EU policy

In tandem with the Clean Energy for all Europeans package, the Electricity Directive (Directive (EU) 2019/944)[34] requires Member States to establish robust safeguards designed explicitly to protect vulnerable customers. The Gas Directive required the Member States to define the concept of vulnerable costumers in their national context. The Electricity Directive provided a concept clarification acknowledging that '*the concept of vulnerable customers may include income levels, the share of energy expenditure of disposable income, the energy efficiency of homes, critical dependence on electrical equipment for health reasons, age or other criteria*'. The need to ensure that the benefits of the ongoing energy transition extend equitably across society is a central theme. Structural measures are identified as essential components, aiming to secure widespread societal advantages from the dynamic changes underway in the energy landscape.

The European Commission assumes a pivotal role in the evolution of the energy poverty agenda. Following the Electricity Directive (Directive (EU) 2019/944), the Commission was tasked with providing indicative guidance on appropriate indicators for measuring energy poverty and defining what constitutes a 'significant number of households in energy poverty'.[35]

In response to this mandate, the Commission delivered a landmark recommendation in 2020 (Commission Recommendation (EU) 2020/1563)[36], offering a common definition of energy poverty, along with nine recommendations designed to assist Member States in implementing new provisions on energy poverty. The accompanying Staff Working Document (SWD(2020) 960)[37] included a list of 13 indicators for measuring energy poverty from which the Member States were advised to choose those relevant for their specific national context.

Furthermore, in 2021, the Commission published the Communication on Tackling rising energy prices: a toolbox for action and support (COM/2021/660)[38]. This communication provided a rich array of suggestions for actions to tackle energy poverty, spanning compensation measures and direct support to energy-poor

33. The Energy Poverty Observatory (EPOV) project was followed by the Energy Poverty Advisory Hub (EPAH). (Observing energy poverty).
34. Directive (EU) 2019/944
35. Regulation (EU) 2018/1999
36. Commission Recommendation (EU) 2020/1563
37. SWD(2020) 960
38. COM/2021/660

end-users, safeguards to prevent disconnections from the energy grid or temporary deferment of payments, and the promotion of best practices through coordination groups.

Building on this, the Commission continued in 2022 by issuing a Commission Notice on the Guidance (2022/C 495/02) to Member States for the update of the National Energy and Climate Plans (NECPs) due in 2023[39]. An excerpt from the document is presented in box 1. This guidance serves as a measure, encouraging all Member States to establish objectives for reducing energy poverty within their jurisdictions. Against the backdrop of rising energy costs since 2021, the Commission decided to extend the recommendation to all Member States and not only those who found a significant number of people in energy poverty. The emphasis on a proactive and preventative approach underscores the Commission's mandate to foster a future in which energy poverty is not only addressed but is systematically minimised.

4.3 Current developments

The latest work on energy poverty in the EU includes the introduction of a Social Climate Fund, the revised Energy Efficiency Directive, the revised Electricity Markets Directive and an updated Commission Recommendation and accompanying Staff Working Document.

Co-legislators adopted the Social Climate Fund Regulation (Regulation (EU) 2023/955) in May 2023[40]. The fund seeks to prevent distributional impacts on the most vulnerable citizens and companies affected by the introduction of buildings and transport into the EU emissions trading system. It is explicitly mentioned that the measures and investments from the fund should be "*particularly targeted towards households in energy poverty or vulnerable households, vulnerable micro-enterprises and vulnerable transport users"* and that this targeting *"is key for a just transition towards climate neutrality*". The funds may be used both for temporary income support and for permanent measures to promote energy efficiency, energy saving and the development of new and renewable forms of energy as structural solutions to eradicate the 'root causes' of energy poverty and address any pre-existing vulnerabilities and inequalities. However, the financial support that Member States may receive from the fund is conditional on the achievements of targets related to reducing the number of vulnerable households and households in energy poverty submitted by the Member States in their national Social Climate Plans[41].

39. 2022/C 495/02
40. Regulation (EU) 2023/955
41. Guidance to MS for updated NECPs 2021-2030 - European Commission (europa.eu)

Box 1. Excerpt from Commission Notice on the Guidance to Member States for the update of the National Energy and Climate Plans (NECPs) due in 2023

ADDRESSING THE PRESSING CHALLENGES OF ENERGY POVERTY

Affordability is a priority of the Energy Union, and it should be reflected in the updated NECPs. All Member States are encouraged to set a clear, specific, attainable, measurable and time-bound objective for reducing energy poverty. Member States shall assess the number of households in energy poverty (Regulation (EU) 2018/1999). The Commission's recommendation on energy poverty (Commission Recommendation (EU) 2020/1563) provides guidance on suitable indicators for its measurement. Explanation on how this definition and indicators are used and on how the data on energy poverty are collected, including at national and local level, is encouraged.

The updated NECPs should take account of the latest legislative developments, especially the proposed definition of energy poverty in the Energy Efficiency Directive and the proposed Social Climate Fund, and the above-mentioned Council Recommendation on ensuring a fair transition towards climate neutrality.

Based on such an assessment, if a Member State finds that a significant number of households are in energy poverty, it must include in its updated national plan a national indicative objective for reducing energy poverty, including a timeframe by when the objectives are to be met (Regulation (EU) 2018/1999). However, considering the current spike in energy prices, all Member States are encouraged to set an objective for reducing energy poverty. If an objective is not considered necessary, Member States should justify this decision and determine the minimum number of households that would qualify as 'significant' in this context. Additionally, the national plans should outline the policies and measures addressing energy poverty, including social policy measures and other relevant national programmes. Member States should outline how the objective was determined, and, to account for the current energy price spike, they should use the latest available data.

Source: 2022/C 495/02

In July 2023, the revised Energy Efficiency Directive (Directive (EU) 2023/1791) was adopted and now stands as a key document in tackling energy poverty[42]. It provided the first, commonly agreed upon, EU wide definition on energy poverty serving to harmonize approaches to discussing national energy poverty definitions and indicators. The definition of energy poverty is provided in box 2. The revised Electricity Markets Directive refers to the same definition of energy poverty as defined in Article 2, point (52) of Directive (EU) 2023/1791[43].

Box 2. Definition of Energy Poverty in the recast Energy Efficiency Directive

Energy poverty' means a household's lack of access to essential energy services, where such services provide basic levels and decent standards of living and health, including adequate heating, hot water, cooling, lighting, and energy to power appliances, in the relevant national context, existing national social policy and other relevant national policies, caused by a combination of factors, including at least non-affordability, insufficient disposable income, high energy expenditure and poor energy efficiency of homes'.

Source: Directive (EU) 2023/1791

In addition to providing a formal definition of energy poverty, the directive requires a stronger focus on alleviating energy poverty. The introduced changes require Member States to prioritize vulnerable customers, individuals affected by energy poverty, and citizens living in social housing when introducing energy efficiency improvements. Specifically, each Member State is responsible for achieving a share of energy savings among vulnerable customers and citizens affected by energy poverty. The directive points to four indicators measuring the extent of energy poverty (which are discussed in sections 4.5 and 5.2) that Member States should consider if they have not assessed the share of energy poor households in their NECPs. On the other hand, the Member States retain flexibility in choosing the criteria for determining energy poverty and energy savings, thus ensuring flexibility for tailored solutions based on specific needs and circumstances within each country.

42. Directive (EU) 2023/1791
43. pdf (europa.eu)

In October 2023, the Commission issued an updated Commission Recommendation on energy poverty (Commission Recommendation (EU) 2023/2407)[44]. The document included recommendations to take swift steps to transpose and implement the definition of energy poverty into national law while ensuring that the national definition is distinguished from the concept of vulnerable costumers. It also stressed the importance of considering indicators at national and EU levels in order to determine the number of households affected by energy poverty while paying attention to data quality and comparability as well as ensuring transparency with respect to chosen indicators when assessing the number of households in energy poverty. The recommendation further included sections on policy measures, governance, trust, engagement and communication with energy poor households, energy efficiency, access to renewables, skills, and financing.

The 2023 Commission Recommendation was accompanied by a Staff Working Document (SWD/2023/647)[45]. It provided guidance on distinguishing between energy poverty and vulnerable customers as well as an analysis of the main EU level indicators with a list of pros and cons for each indicator in order to help Member States choose indicators that are available and relevant in their national context. The following section discusses these indicators in depth.

To sum up, this complex web of directives, regulations, recommendations, etc. emanating from the EU reflects a determined effort to grapple with the challenge of energy poverty. Recent developments in the EU context include (1) the establishment of a Social Climate Fund. It provides financial support to Member States fulfilling their energy poverty reduction targets, (2) the first EU wide definition of energy poverty and focus on energy poor households in measures to improve energy efficiency, and (3) a Commission recommendation on implementing a national definition of energy poverty as well as guidance on the use of energy poverty indicators.

Two issues are important to note. Firstly, the EU approach to energy poverty hinges on the fundamental principle of subsidiarity[46], which specifies that Member States should retain control over policy issues where EU intervention does not necessarily provide a better solution. This is reflected in the fact that member states are asked to define energy poverty and select indicators that fit into their specific national context. The motivation for such subsidiarity comes from the great diversity among EU countries with regard to everything from energy systems, income distributions, and energy performance of buildings to consumption behaviour, demographics, and climate conditions.

Given this diversity, the existence of a suitable EU wide approach to energy poverty is very unlikely. Rather, each Member State is tasked with defining the issue and coming up with suitable policies to address it. Secondly, the European Commission focus on energy poverty lies especially in the context of energy efficiency, decarbonisation and

44. Commission Recommendation (EU) 2023/2407
45. SWD/2003/647
46. Addressing Energy Poverty and Vulnerable Consumers in the Energy Sector Across the EU, Pye et al., 2015

clean energy transition policies adopted in recent years. This contrasts with the Nordic approach, which until now primarily has focused on energy poverty from a social perspective, as will be discussed in later sections. The following section describes the status of the implementation of the directive.

4.4 Energy poverty in the Nordics

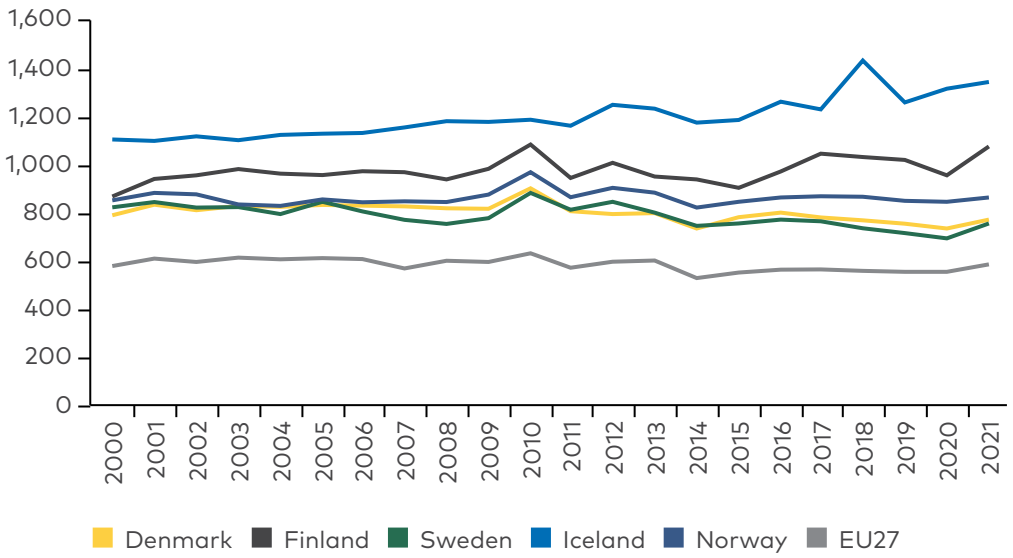
The Nordic countries are often perceived as frontrunners in terms of social welfare and relatively high levels of equality. Despite having relatively high income-levels and low levels of inequality, the recent global energy supply crisis has introduced a new scenario. This includes challenges related to affordability, housing quality, and energy sources, as well as the capacity to renovate these aspects. Consequently, end-consumers are experiencing notable price increases, placing additional strain on household budgets.

National work on energy poverty is found to be limited, which is primarily linked to the fact that all the Nordic countries have very strong social welfare systems that intend to mitigate crises economically and socially in times of crises and economic scarcity in private households. As a result, the Nordic countries have not yet developed a definition on energy poverty, and situations of economic scarcity due to rising energy prices are not distinguished from general poverty. Hence, energy poverty has been considered as a social problem addressed indirectly via social policies[47]. However, challenges of energy security have put pressure on affordability for end-consumers. The transition to renewable energy sources and an increased focus on energy efficiency can be central to mitigate energy security challenges, but effects on energy poverty and vulnerable groups need to be considered carefully.

47. https://kefm.dk/media/7095/denmarks-national-energy-and-climate-plan.pdf, sweden_draftnecp_0.pdf (europa.eu), Microsoft Word - KOMMENTEILLA 20.12.2018_Finlands Draft Integrated National Energy and Climate Plan.docx (europa.eu)

Figure 3 shows the final energy consumption per capita in each of the Nordic countries in the period from 2000 to 2021, where energy consumption is observed to be relatively high compared to the EU27 average. Iceland has the largest final energy consumption in households per capita followed by Finland and Norway. The relatively high energy consumption reflects different factors, including geographical location (high heating costs), relatively high income-levels, and large transportation distances. [48] A generally high energy consumption may indicate the countries' potential exposure to energy poverty. However, it is necessary to understand energy consumption and the countries' exposure to energy poverty in the specific context of price levels (and developments), purchasing power, energy systems, building stocks, socio-economic patterns, etc.

Figure 3. Final energy consumption in households per capita, Eurostat, 2000-2021 (Kg oil equivalent)

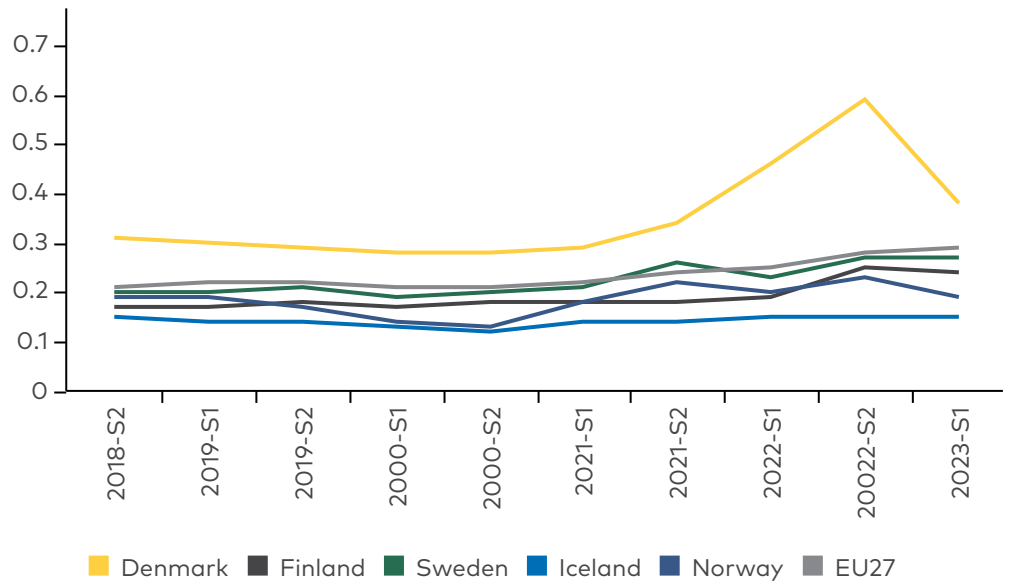


Note: The indicator measures how much electricity and heat every citizen consumes at home excluding energy used for transportation. Since the indicator refers to final energy consumption, only energy used by end consumers is considered. The related consumption of the energy sector itself is excluded.
Source: Eurostat, SDG_07_20.

48. See for example: Nordics top world energy consumption. Nordregio. 2010.

Figure 4 illustrates the development in electricity prices over time for each of the Nordic countries measured in euros, where prices increased somewhat in 2021-2022 with some seasonal variations. Prices in Denmark increased significantly more than in the rest of the Nordic countries and decreased again in the first half of 2023. Some of the general difference can be attributed to the relatively high Danish electricity tax.[49] The observed price decrease in 2022 is likely related to the temporary tax relief that was implemented on January 1, 2023 and reduced the electricity tax to the EU minimum rate.[50] Furthermore, the energy crisis especially affected Denmark and the southern parts of Norway and Sweden, while the electricity price levels in Finland, Iceland, and Northern Norway and Sweden were not affected to the same extent due to their domestic energy production and isolation from central European energy production[51].

Figure 4. Electricity prices for household consumers, bi-annual data, Eurostat, 2018-2023 (Euro per Kwh)



Note: All taxes and levies included. Consumption from 2500-4999 kWh – band DC.
Source: Eurostat, nrg_pc_204.

49. https://greenpowerdenmark.dk/energipriser/hvad-bestaar-elprisen
50. https://fm.dk/media/26367/faktaark_lempelse-af-elafgift-til-minimumssats-i-seks-maaneder.pdf
51. "The Nordic Energy Trilemma" (norden.org)

The next sections summarise the work and the context on energy poverty for each of the Nordic countries and the country-specific context in terms of National Energy and Climate Plans (NECP), the general energy market situation and energy consumption by fuel types for households. It is essential to comprehend the context of each Nordic country, as it influences the characterization, identification, and treatment of energy poverty within each individual nation.

4.4.1 Denmark

Denmark has initiated the task of implementing energy poverty in a Danish context (draft NECP 2023)[52]. However, the task remains to deliver concrete details regarding the implementation. The work of implementing energy poverty is rooted in the government, and the responsible ministry has not yet taken a stance on whether and how such a definition should be defined as it is awaiting the political position and direction.

In terms of ongoing work on energy poverty, The Danish Utility Regulator (Forsynings-tilsynet) monitors electricity supply interruptions that are reported by trading companies (per Article 59(1) (k), (l)) of the Danish Electricity Supply Act). Based on these data, The Danish Utility Supply Authority compiles annual statistics on supply interruptions[53]. The Danish Utility Regulator evaluates whether interruptions are linked to economic constraints, aligning with the concept of 'vulnerable consumers' as per ECHR 2019/944 (i.a. preamble 23): "*This would have a disproportionate impact on households and especially vulnerable consumers, who typically spend a larger portion of their disposable income on energy bills compared to high-income consumers*".[54]

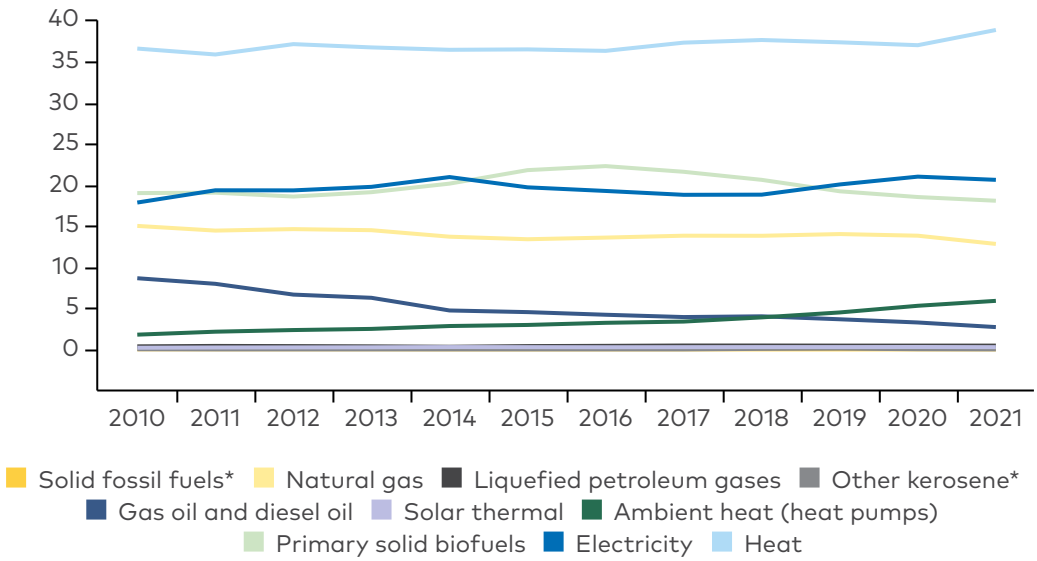
Consumers in Denmark pay relatively high electricity taxes, and the Danish consumers are therefore subject to some of the highest electricity prices in the EU.[55] However, the Danish energy system is generally considered to have a high level of security of supply and low electricity prices in the energy system[56]. Also, Denmark is considered a frontrunner on integrating variable renewable energy and does well in using energy efficient technologies[57]. Therefore, the transition towards more renewable energy is inherent when treating the directive.

Figure 5 shows the distribution of Danish households' final energy consumption across types of fuel from 2010 to 2021. It is seen that heat energy accounts for more than 35% of the final energy consumption, which is in line with a large share of Danish households that depend on district heating (approximately 64%[58]). Looking at the development from 2020 to 2021, it appears that the share of heat increased somewhat, while natural gas, gas oil and diesel oil, decreased somewhat during the

52. https://commission.europa.eu/system/files/2023-07/EN_DENMARK%20DRAFT%20UPDATED%20NECP.pdf
53. The Danish Electricity and Natural Gas Markets 2022 (forsyningstilsynet.dk)
54. EUR-Lex - 32019L0944 - EN - EUR-Lex (europa.eu)
55. https://greenpowerdenmark.dk/energipriser/hvad-bestaar-elprisen
56. https://commission.europa.eu/system/files/2023-07/EN_DENMARK%20DRAFT%20UPDATED%20NECP.pdf
57. https://www.iea.org/reports/energy-policies-of-iea-countries-denmark-2017-review
58. https://drive.google.com/file/d/14iL0x3xqUiCqHdox5mP23t5esSK4J213/view

energy crisis. Heating oil and biomass are more commonly used in older dwellings (most Danish houses were built before 1980[59]). They are less energy efficient and prove hard to upgrade, which can result in high energy expenditures. Changes in final consumption for different energy types can reflect substitution of heating sources that may have accelerated during the energy crisis. For example, the share of ambient heat (heat pumps) has been steadily increasing over the past years. Since a time-lag in the response to price increases is expected, part of these effects might not appear until 2022-2023 or later. Plans to roll-out district heating are typically planned over a longer time horizon, but in 2022, the Danish government came up with a plan to accelerate the roll-out of district heating and phase out natural gas.[60]

Figure 5. Final energy consumption in Danish households by type of fuel, Eurostat, 2010-2021 (%)



Note: Final energy consumption in households covers the energy consumption of households (individual dwellings, apartments, etc.) for space heating, water heating, cooling, cooking as well as electricity consumption by various electrical appliances. Self-produced electricity is included and counts as consumption of electricity. Self-produced heat is counted only for active systems; systems for passive heating are excluded from the scope of energy statistics. Gas oil and diesel oil are excluding biofuel portion. *No data available for 'solid fossil fuels' in 2014-2015 and 2017-2021. No data available for 'other kerosene' in 2011-2014 and 2017.
Source: Eurostat, ten00125.

59. https://www.rural-energy.eu/country-data/denmark/
60. https://www.regeringen.dk/nyheder/2022/danmark-skal-vaere-groennere-og-uafhaengig-af-gas-fra-rusland/

4.4.2 Finland

In Finland, the prevalence of energy poverty has been estimated as relatively low. Therefore, and according to Finland's NECP, Finland does not have any national objectives related to energy poverty and will continue treating energy poverty as a social policy to ensure all citizens' basic necessities will be secured[61]. Although there is currently no official definition of energy poverty, some common definitions have been applied by organisations and researchers[62]. The most common understandings include: "Situation, where households in poor financial state have difficulties in coping with the energy costs caused by living"[63], "Situation, where households cannot afford needed energy services due to low household income, high energy costs or poor energy efficiency of housing", and "Refer to issues such as deficits in meeting basic needs due to high energy costs ". In some contexts, energy poverty is defined as a relative share of energy expenditure of the disposable income[64].

Still, three studies concerning energy poverty have been conducted in Finland in 2013, 2015 and 2018. The study from 2015 examines the importance of energy poverty in Finland and estimates it to be relatively low. Moreover, the report defines the concept of energy poverty and identifies to what extent and what kind of households can be affected by energy poverty. The most affected citizens are low-income households living in large non-energy-efficient dwellings outside of urban areas. The second report combines energy poverty with the issue of improving energy efficiency in dwellings by exploring the correlation between housing improvements and the modification of heating systems in relation to the risk of energy poverty. The third report concludes that there is already a very comprehensive social support system in Finland, which has been developed to guarantee a minimum income for all – also the energy poor.

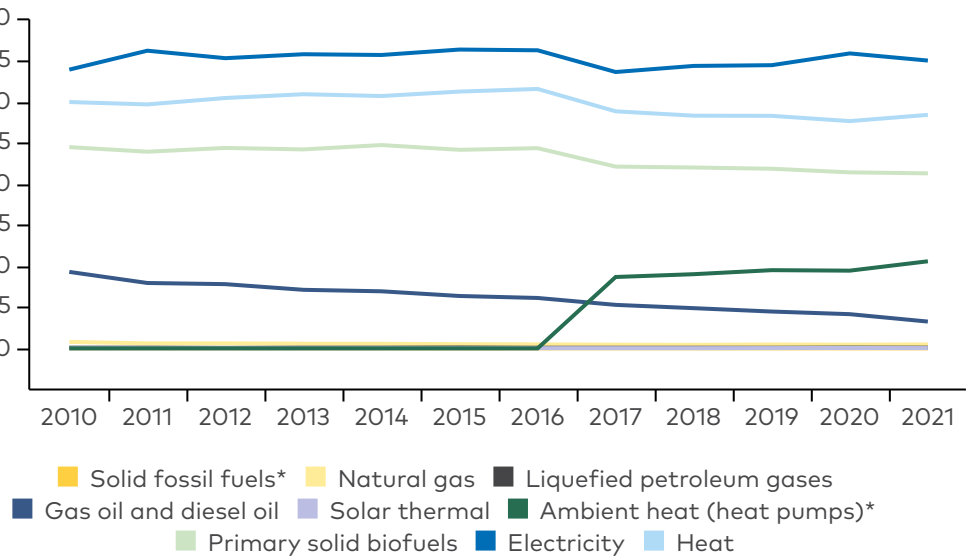
Like in Denmark, district heating is the most common form of heating in Finland, and 51% of all household buildings use district heating. Heating mode choices differ by building types; the majority of blocks of flats (89%) use district heating, while the percentage for single-dwelling houses that use district heating is only 7%. For single-dwelling houses, direct electric heating is the most common heating mode at 36%, but alternative forms such as geothermal heat and air source heat pumps have become more common during the past few years.[65] For blocks of flats, the heating costs are often included in the maintenance charge, which is a monthly payment to the housing company including housing company management, maintenance, utilities, waste management, cleaning, real estate tax and insurance. These payments are usually updated annually, which caused the pressure of increased energy prices in 2022 to show up in condominium payments with a delay.

61. KOMMENTEILLA 20.12.2018_Finlands Draft Integrated National Energy and Climate Plan.docx (europa.eu)
62. Carbon neutral Finland 2035 – national climate and energy strategy - Valto (valtioneuvosto.fi)
63. energiaköyhyys | Rakennetun ympäristön pääsanasto | Yhteentoimivuusalusta (suomi.fi)
64. Carbon neutral Finland 2035 – national climate and energy strategy - Valto (valtioneuvosto.fi)
65. Households' consumption by Type of building, Heating mode, Year and Information. PxWeb (stat.fi)

The purchase prices of residential heating energy for electricity and light fuel oil (heating oil) peaked in March 2022 and December 2022, which resulted in people who owned detached houses with electric or oil heating being affected by the increased energy prices.[66]

Figure 6 summarises the final energy consumption for Finnish households in 2010-2021 by fuel type. It shows that the consumption of electricity accounts for the majority of the energy consumption. Moreover, the share of energy from heat pumps has been increasing from 2017 to 2021 while other energy sources have been slightly decreasing in the same period, which can be ascribed to the introduction of the new energy source. The share of heat also increased somewhat from 2020 to 2021, while gas oil and diesel oil have declined steadily since 2010.

Figure 6. Final energy consumption in Finnish households by type of fuel, Eurostat, 2010-2021 (%)



Note: Final energy consumption in households covers the energy consumption of households (individual dwellings, apartments, etc.) for space heating, water heating, cooling, cooking as well as electricity consumption by various electrical appliances. Self-produced electricity is included and counts as consumption of electricity. Self-produced heat is counted only for active systems; systems for passive heating are excluded from the scope of energy statistics. Gas oil and diesel oil are excluding biofuel portion. *No available data for 'solid fossil fuels' from 2015-2021. No available data for 'ambient heat' in 2010-2016.
Source: Eurostat, ten00125.

66. Purchase price of residential heating energy by Month, Building type, Energy source and Information. PxWeb (stat.fi)

4.4.3 Iceland

Iceland differs from the other Nordic countries in terms of composition of energy system and structure of the energy market. As an energy island, the country is not connected to the European grid, but has its own independent transmission network[67] and is almost self-sufficient in energy, which has kept the energy prices relatively stable[68]. Traditionally, Iceland has experienced an abundance of renewable energy and correspondingly relatively low and affordable energy prices compared with other Nordic countries (see e.g. Figure 4 for illustration). The country has therefore been somewhat shielded from the consequences of recent years' energy crisis.

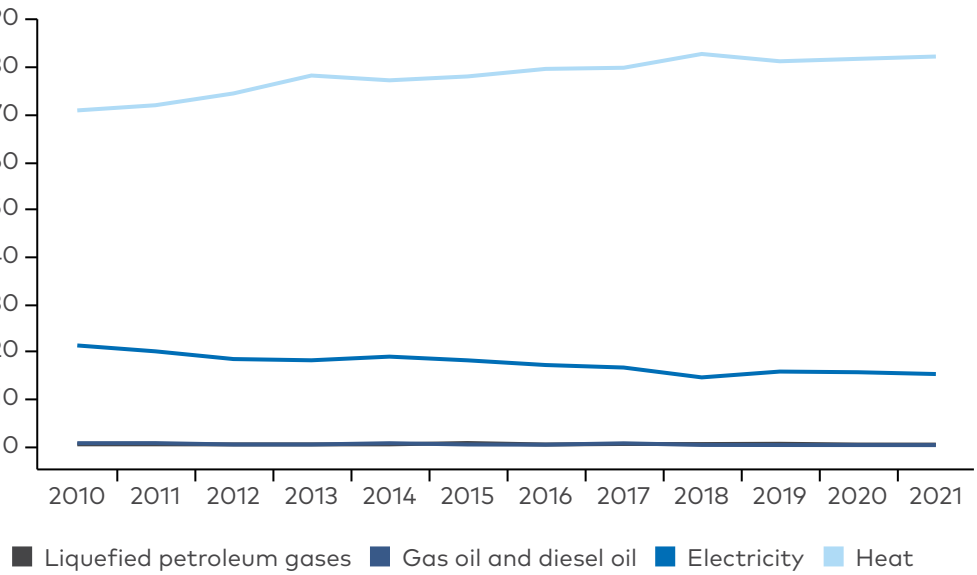
Due to the reasons described above, the work on energy poverty in Iceland has so far been very limited, and the country has not yet initiated work to establish an official definition of energy poverty. The updated "Report on Policies, Measures, and Projections - Projections of Greenhouse Gas Emissions in Iceland until 2050" mentions neither 'energy poverty' nor poverty in general.[69] According to the Ministry of the Environment, Energy and Climate, the discussions up until now have mostly been leaning towards energy security, looking at a rural versus urban perspective.

Approximately 90 percent of households rely on district heating for heating their homes, which is powered by thermal energy. Also, most of Iceland's energy comes from domestic energy production, and electricity is based almost exclusively on renewable energy (hydropower and geothermal energy).[70] Although most of the Icelandic population have access to district heating, a smaller group of households is located in fringe areas relying on fuel-based heating (oil and diesel) thus facing disproportionally higher energy costs. This is handled through an established fund targeting households without access to district heating and subsidies for heating pumps (see section 6.3 on policy measures).

67. "The Nordic Energy Trilemma" (norden.org)
68. "The Nordic Energy Trilemma" (norden.org)
69. https://ust.is/library/Skrar/loft/NIR/0_PaMsProjections_Report_2023_WITH%20BOOKMARKS.pdf
70. Geothermal Iceland: this land of fire and ice is pushing the limits of its natural energy.

Figure 7 illustrates the composition of final energy consumption for households in Iceland in 2010-2021 in terms of fuel type, where it is seen that heat and electricity accounts for almost all energy consumption. Gas oil and diesel oil account for a very small percentage of final energy consumption.

Figure 7. Final energy consumption in Icelandic households by type of fuel, Eurostat, 2010-2021 (%)



Note: Final energy consumption in households covers the energy consumption of households (individual dwellings, apartments, etc.) for space heating, water heating, cooling, cooking as well as electricity consumption by various electrical appliances. Self-produced electricity is included and counts as consumption of electricity. Self-produced heat is counted only for active systems; systems for passive heating are excluded from the scope of energy statistics. Gas oil and diesel oil are excluding biofuel portion.
Source: Eurostat, ten00125.

4.4.4 Norway

The recent rise in electricity prices in Norway has prompted discussions on the reach and severity of energy poverty, which until recently has not received a lot of attention. However, due to the price increases in the wake of the energy crisis, the extent of energy poverty is suspected to have increased. Like Iceland, Norway is not obliged to implement the Energy Efficiency Directive, nor to develop NECPs like the member states. Nonetheless, poverty is highly connected to climate changes and outlined in Norway's Climate Plan for 2021-2030[71]. The linkage is that the pressure on the natural resources due to growing populations leads to an increase in prices. In this context, the solution is to identify renewable and more sustainable sources for production.

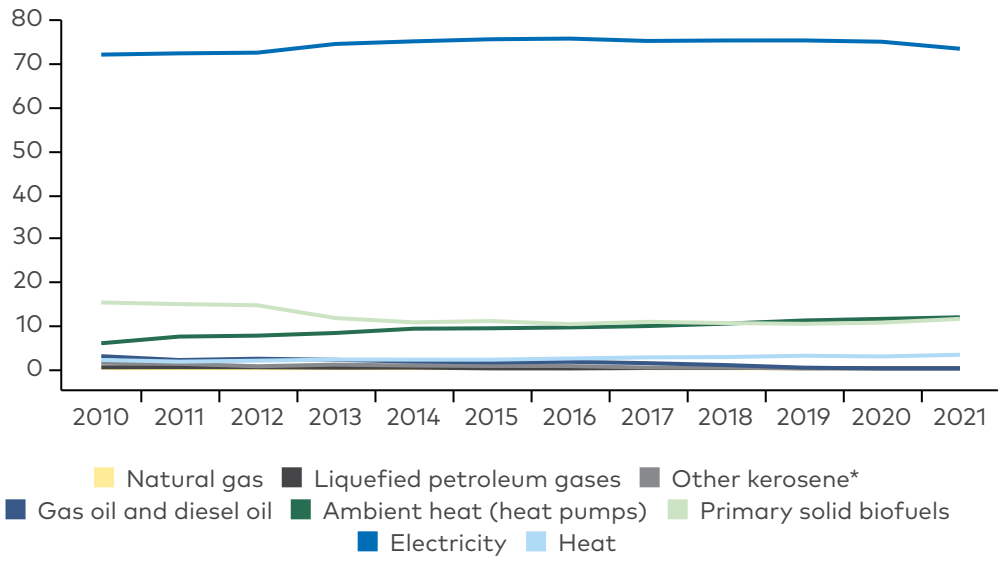
Although there is currently no official definition or established measurement criteria for energy poverty in Norway, a research project called "Power Poor", has been initiated by the Fritjof Nansens Institute (FNI) in collaboration with SBB, CICERO and the Centre for Development and the Environment at the University of Oslo[72]. The aim of the Power Poor project is to define and develop metrics of energy poverty adapted to the Norwegian context. Prior to this project, the Norwegian statistical bureau, Statistisk sentralbyrå (SSB), carried out a study on the economic consequences of high electricity prices and electricity subsidies in 2022. The study was carried out on behalf of the Norwegian Ministry of Petroleum and Energy. They found that low-income households were affected the most by the higher prices and consequently experienced the largest welfare reductions.[73]

As a way of tackling vulnerable consumers, Norway has implemented a system, where the utility companies are responsible for the delivery obligation of electricity to households. The delivery obligation ensures that customers, who cannot pay their electricity bill, do not lose power in their homes[74]. Utility companies are then responsible to follow-up with end-customers.

Looking at the Norwegian energy consumption in Figure 8, electricity accounts for more than 70% of the final energy consumption in Norwegian households. Hydrogen power plants account for almost all of the Norwegian electricity production[75], and the country – like Iceland – generally has an abundance of renewable energy. However, during the recent energy crisis electricity prices also increased somewhat in Norway due to the connections and spillover effects from central European energy markets. In extension, the perception of the challenge is more about a lack of energy than it is about actual energy poverty. The problem is considered to be related to the higher demand for energy compared to the supply, which leads to increased prices that mostly affect the poorest in society. Therefore, there is a political focus on finding solutions to strengthen the energy security.

71. Meld. St. 13 (2020–2021) - regjeringen.no
72. Understanding Energy Poverty in Norway (PowerPoor) - FNI and Hva er energifattigdom? (cicero.oslo.no)
73. Økonomiske konsekvenser av høye kraftpriser og strømstønad (ssb.no)
74. https://www.nve.no/reguleringsmyndigheten/kunde/stroem/leveringsplikt/
75. https://www.iea.org/countries/Norway

Figure 8. Final energy consumption in Norwegian households by type of fuel, Eurostat, 2010-2021 (%)



Note: Final energy consumption in households covers the energy consumption of households (individual dwellings, apartments, etc.) for space heating, water heating, cooling, cooking as well as electricity consumption by various electrical appliances. Self-produced electricity is included and counts as consumption of electricity. Self-produced heat is counted only for active systems; systems for passive heating are excluded from the scope of energy statistics. Gas oil and diesel oil are excluding biofuel portion. *No data available for 'other kerosene' in 2020-2021.
Source: Eurostat, ten00125.

4.4.5 Sweden

Like the other Nordic countries, Sweden does not have an official definition of energy poverty. The main reason is that the concept of energy poverty is not distinguished from poverty in general[76]. Instead, the welfare state is considered to be responsible for helping citizens who cannot afford essential services through different welfare schemes.

During the energy crisis, especially the southern part of Sweden experienced a significant increase in the energy prices. Although Sweden does not have a definition of energy poverty, the Swedish authorities have defined vulnerable customers as people who are permanently unable to pay for the electricity or natural gas that is transferred or delivered to them for purposes that fall outside of business operations [77]. In case of non-payment, the energy supplier must take account of the position of vulnerable customers in the electricity market and contact the social authority in the municipality in which the customer receives the transferred electricity[78]. If someone cannot afford to maintain a decent standard of living, regardless of whether it pertains to energy or other basic necessities, the Social Services Act applies[79]. The Social Services Act covers reasonable costs like accommodation, household electricity, home insurance and membership in a trade union and unemployment fund[80]. This approach underlines that energy poverty is considered to be social politics.

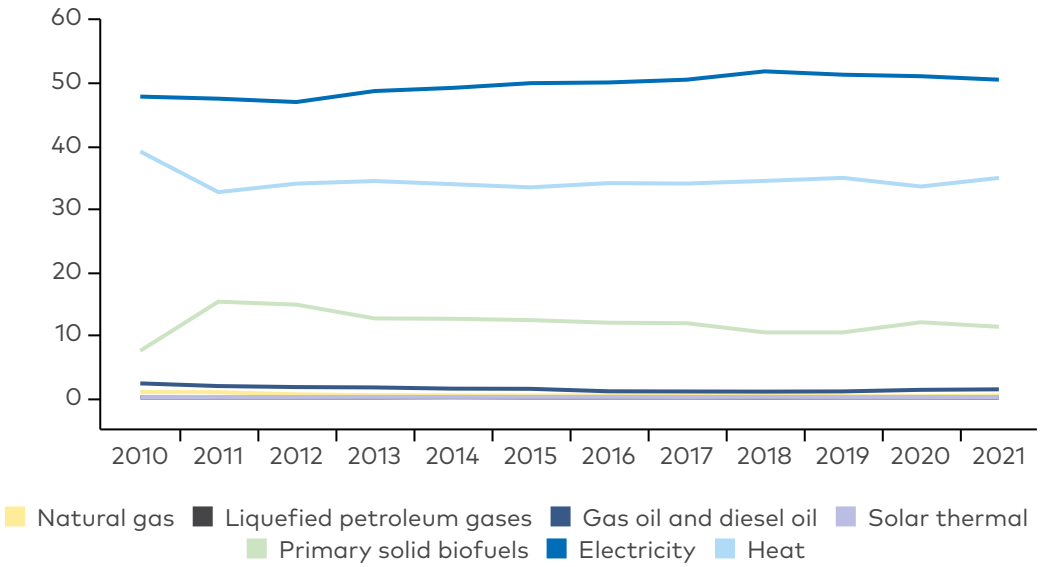
Within the EU, a measure to identify households in risk of energy poverty is households who pay twice the cost of heating their home as part of their disposable income compared to what the median household pays for heating their homes. In 2021, this value was 7.5 percent for the Swedish households. This measure must be interpreted with caution in the Swedish context due to the widespread occurrence of multi-family buildings where heating costs are usually included in the rent. This constellation limits the access to data about the heating costs (access to data about 43 percent of households)[81]. Instead, a report from the Swedish Energy Authority highlights three factors that can be considered to be energy poverty indicators: low income, low energy efficiency in the home and high energy prices[82]. This indicates that Sweden is approaching an understanding of energy poverty that suits the Swedish context.

The energy consumption in Sweden consists primarily of electricity, heat, and primary from solid biofuels (see Figure 9). The structure of the electricity market zones in Sweden is divided into four different energy zones with interconnectors to different countries (Denmark, Norway, Finland, Germany, and Lithuania)[83]. The different interconnectors also implies that the energy prices vary across Sweden. During the energy crisis in 2022, some concern about increasing energy prices were prevalent in the south of Sweden due to higher energy prices, especially in the south of Sweden

76. utkast-till-sveriges-uppdaterade-nationella-energi--och-klimatplan-2023.pdf (regeringen.se)
77. Förordning (2016:742) med instruktion för Energimarknadsinspektionen | Sveriges riksdag (riksdagen.se)
78. Ellag (1997:857) | Sveriges riksdag (riksdagen.se)
79. access-essential-services_en.pdf (europa.eu)
80. Anvisade elavtal (ei.se)
81. Energimyndighetens webbshop (a-w2m.se)
82. Energimyndighetens webbshop (a-w2m.se)
83. "The Nordic Energy Trilemma" (norden.org)

compared to the north. However, energy poverty was predicted to increase to ≈4% in Sweden, which was significantly less than in other European economies[84]. Interviews with stakeholders in the Swedish energy sector indicate that energy poverty is not of a great concern in Sweden today.

Figure 9. Final energy consumption in Swedish households by type of fuel, Eurostat, 2010-2021 (%)



Note: Final energy consumption in households covers the energy consumption of households (individual dwellings, apartments, etc.) for space heating, water heating, cooling, cooking as well as electricity consumption by various electrical appliances. Self-produced electricity is included and counts as consumption of electricity. Self-produced heat is counted only for active systems; systems for passive heating are excluded from the scope of energy statistics. Gas oil and diesel oil are excluding biofuel portion.
Source: Eurostat, ten00125.

84. "The Nordic Energy Trilemma" (norden.org)

4.5 Measuring energy poverty

As mentioned, measuring energy poverty is a component of the directive, and it has proven to be quite a tricky task. Challenges related to measuring the extent of energy poverty include diverse national and local contexts, multidimensionality of the concept, as well as data availability. Furthermore, energy poverty is a 'private' problem '*largely confined to the walls of the home and is not easy to observe or follow from a public policy standpoint.*'[85] There are nonetheless attempts to convert the broad definition of energy poverty provided at EU level into indicators that can be used to measure and monitor the state of energy poverty in countries or regions.

A lot of the recent work on developing indicators in the EU context can be attributed to the Energy Poverty Advisory Hub (EPAH) and its predecessor project, the EU Energy Poverty Observatory (EPOV), both of which are initiatives run by the European Commission. Besides providing publications with guidance on how to use the developed indicators, EPAH engages with experts, local authorities and civil society organisations and provides technical assistance, underlining the importance of the national and local context. The following section largely draws on knowledge produced by these two initiatives as they are the front-runners when it comes to investigating energy poverty in a European context.

Due to the inherent complexity of energy poverty, there does not exist a single agreed upon way to measure it. Indicators can be distinguished according to type of measurement. The most common categorization referenced in several EPOV and EPAH reports and building on Thomson et al. (2017)[86] categorises indicators in three approaches, which are summarised in Box 3. Providing an adequate overview of the state of energy poverty may therefore require examination, using several different approaches (and indicators) in tandem, whilst considering national and regional dynamics and constraints.

85. Measuring and monitoring energy poverty in the EU - examples of good practices, Robina et al., 2022
86. Rethinking the measurement of energy poverty in Europe: A critical analysis of indicators and data, Thomson et al., 2017

Box 3. Types of measurements

1. **Expenditure-based approach** – where examinations of the energy costs faced by households against absolute or relative thresholds provide a proxy for estimating the extent of domestic energy deprivation.
2. **Consensual approach** – based on self-reported assessments of indoor housing conditions, and the ability to attain certain basic necessities relative to the society in which a household resides.
3. **Direct measurement** – where the level of energy services (such as heating) achieved in the home is compared to a set standard.

Source: Thomson et al. (2017)

4.5.1 Primary indicators

The EU Energy Poverty Observatory (EPOV) recommends using four primary indicators to capture a country's level of energy poverty – two consensual-based and two expenditure-based measures - and stress that they should be viewed and used in combination[87]. The selection of these indicators has been guided both by theoretical and by data availability considerations. A thorough discussion of the indicators is provided in the accompanied methodology guidebook[88]. The four primary indicators include:

Consensual-based approach:

- Inability to keep home adequately warm: self-reported thermal discomfort.
- Arrears on utility bills: households' self-reported inability to pay utility bills on time in the past 12 months.

Expenditure-based approach:

- High share of energy expenditure in income (2M): part of population with share of energy expenditure in income more than twice the national median
- Low absolute energy expenditure/Hidden energy poverty (M/2): part of population whose absolute energy expenditure is below half the national median.

87. Towards an inclusive energy transition in the European Union, EPOV, 2020
88. EPOV Indicator Dashboard: Methodology Guidebook, Thema and Vondung, 2020

The two consensual-based indicators originate from the EU Statistics of Income and Living Conditions (SILC) survey, collected by Eurostat on a yearly basis from Member States. The two expenditure-based indicators originate from the Household Budget Survey (HBS), also collected by Eurostat but every five years rather than annually. These surveys currently provide the best option for harmonized data across EU Member States. This is the case even though Member States are not obliged to use the specific wording proposed for the questions in the surveys, which may cause some inconsistency. Nonetheless, they provide a common foundation, which makes comparison between countries possible. As such, several Member States make use of these indicators as measures of energy poverty in their NECPs[89]. The measures are discussed below, and the discussion is further elaborated in chapter 5.

The indicator 'inability to keep home adequately warm' captures the feeling of material deprivation. This indicator is criticised for being susceptible to personal preferences and perceptions. What is adequate may vary with age groups or social and cultural expectations[90]. The indicator 'arrears on utility bills' indicates financial struggles to pay utility bills on time. However, it can be argued that the critical number is not necessarily whether a household pays their bills on time, but rather the number of disconnections they experience (as a result thereof).

The 2M indicator seeks to capture households where energy expenses take up a disproportionate share of the household budget. The M/2 indicator, on the other hand, aims to identify households in 'hidden energy poverty' that may underconsume energy due to financial inability. A crucial difference between the indicators is that the 2M indicator is based on the share of energy expenditure out of income whereas the M/2 indicator is based on absolute energy expenditures in euros. Both indicators are based on equivalized income and expenditures to account for the relative burden of varying household sizes[91]. Both expenditure-based indicators also use the national median as point of reference and hence depend on the underlying national income distributions and should be interpreted with these in mind. As such, caution should be exercised, when using the expenditure-based indicators for cross-country comparisons. Further, expenditure-based measures are also more sensitive towards changes in energy prices such as the ones following the energy crisis.

Using multiple indicators is essential because different measures will not necessarily identify the same group of individuals as energy poor. While the expenditure-based measures may seem intuitively more accurate, because they are not subject to individual assessments, they may struggle to identify the 'feeling' of material deprivation as perceived by individuals who feel that they cannot keep their home adequately warm. As an example, Price et al. (2012) shows that while there is a positive correlation between the 'objective', expenditure-based measure, and 'subjective' measure that they investigate, in many cases, they do not overlap[92]. Thus, individuals who agree that they struggle to keep their home adequately warm are not

89. Towards an inclusive energy transition in the European Union, EPOV, 2020
90. Measuring and monitoring energy poverty in the EU - examples of good practices, Robina et al., 2022
91. EPOV Indicator Dashboard: Methodology Guidebook, Thema and Vondung, 2020
92. Objective and subjective measures of fuel poverty, Price et al., 2012

necessarily the same as the ones who e.g. spend more than twice the national median share of their income on energy expenditures. Conversely, expenditure-based measures may also include individuals who do not perceive themselves to be deprived of energy as their purchasing power, which is influenced by factors such as overall expenditure and wealth, remains largely unaffected despite their comparatively higher spending on energy. Hence, it is vital that, where possible, multiple indicators for energy poverty are used or combined. Both consensual and expenditure-based indicators are examined and discussed in chapter 5.

4.5.2 Secondary indicators and latest developments

Besides the primary indicators, several secondary indicators have been developed. Secondary indicators do not measure energy poverty directly but are related to the issue by characterizing the circumstances leading to a situation of vulnerability. EPOV presented 19 secondary indicators in their 2020 methodology guidebook, drawing mainly on data from Eurostat, SILC, HBS and the Building Stock Observatory (BSO) [93]. These indicators included energy prices, thermal discomfort both during winter and summer, presence of leak, damp, or rot in the dwelling, share of energy expenditure in income split into income quintiles, a range of building stock features such as population density, energy labels, heating equipment and air conditioning, and poverty and health risks.

The primary and secondary indicators have undergone revision and quality assessment conducted by EPAH and described in their 2022 and 2023 reports[94]. The latest update entails a reorganization of indicators into topics and subtopics, providing policymakers among others with an enhanced overview of how the various dimensions of energy poverty come into play in different policy topics. The four primary topics include *climate, facilities and housing, mobility, and socioeconomic aspects*. Facilities and housing are further divided into subtopics of building stock on the one hand and energy consumption and equipment on the other. Socioeconomic aspects are further divided into socioeconomic and living conditions, energy expenditure and energy markets, and health. The reorganization of indicators builds on the work of EPAH, the Joint Research Center (JRC) and the Covenant of Mayors for Climate and Energy in Europe (CoM) who initially proposed the reorganization of indicators available at the local level[95]. Besides the four topics mentioned above, the local topics also include policy and regulatory framework as well as participation and awareness raising. Local indicators enable municipalities to diagnose and develop policies to alleviate energy poverty at a local level, thus holding a key role in complementing the broader strategies formulated at the national level.

93. EPOV Indicator Dashboard: Methodology Guidebook, Thema and Vondung, 2020
94. Energy Poverty National Indicators: Insights for a more effective measuring, EPAH 2022 and National Indicators: Uncovering New Possibilities for Expanded Knowledge, EPAH 2023
95. Reporting Guidelines on Energy Poverty, Covenant of Mayors for Climate & Energy, 2022

Since the obligations stated in the Governance Regulation for the Commission to provide guidance on what constitutes a significant number of households in energy poverty, the Commission has published two recommendations, each accompanied by a staff working document (SWD), as described in sections 4.2 and 4.3. The 2020 SWD [96] included 13 suggested indicators, four of which correspond to the ones suggested by EPOV. The remaining indicators covered issues such as share of energy expenditure in household income by income quintile, energy prices, presence of leak, damp or rot in the dwelling and energy consumption. The 2023 SWD[97] provided a discussion of these indicators highlighting their strengths and weaknesses to help Member States choose indicators based on data availability and suitability given the national context. The document recognises the difficulty of choosing adequate indicators while pointing to several gaps in Member States' reports on energy poverty. Most notably, the present reporting is mostly limited to using the two consensual based indicators and Member States may thus fail to identify e.g. households in hidden energy poverty. The Commission recommends a comprehensive assessment including both SILC and HBS indicators as well as breaking these indicators down into the population at risk of poverty and the population not at risk of poverty. The population at risk of poverty is defined as households with income levels below 60% of the median equivalised income after social transfers.[98]

As discussed above in section 4.3, the Energy Efficiency Directive (Directive (EU) 2023/1791) suggests four indicators of energy poverty. The indicators are:

- The inability to keep the home adequately warm
- The arrears on utility bills
- The total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor
- At-risk-of-poverty rate (AROP)

These four indicators are to be used, if Member States do not publish a set of criteria for how to determine the share of energy poor households in their national context. This requirement is likely to encourage Member States, who do not agree with these indicators being sufficient or accurate, to develop their own indicators. The 2023 SWD encourages such work and the use of national and local data sources. However, in chapter 5, some of these indicators are applied to estimate the prevalence of energy poverty in the Nordics.

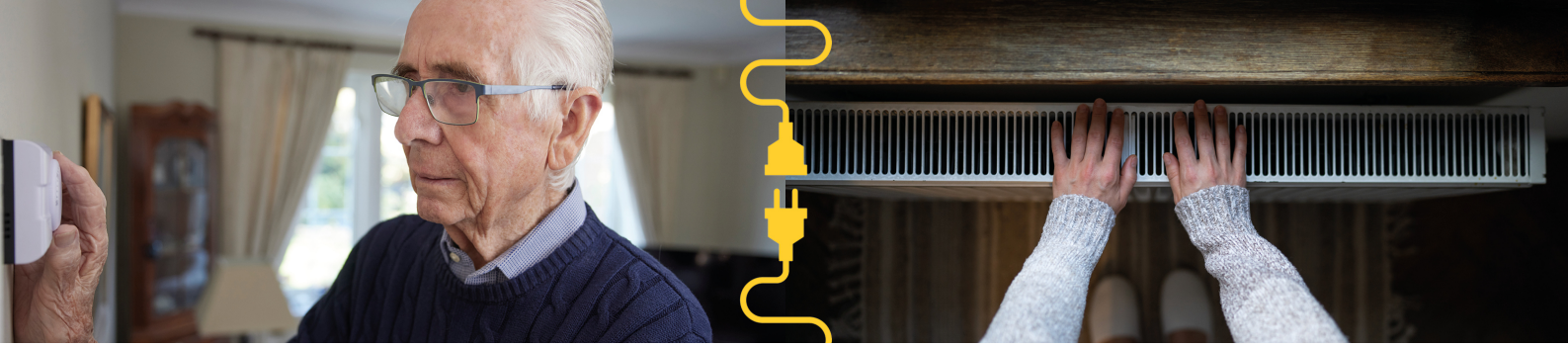
In sum, challenges persist in measuring energy poverty due to diverse contexts and the multidimensional nature of the concept. The EU Energy Poverty Observatory has

96. SWD(2020) 960
97. SWD(2023) 647
98. Glossary: At-risk-of-poverty rate - Statistics Explained, Eurostat

previously recommended four primary indicators, including both consensual and expenditure-based measures. The importance of using multiple indicators is emphasized, acknowledging that different measures may identify distinct groups experiencing energy poverty. In their 2023 recommendation, the European Commission encourages Member States to develop their own indicators if the suggested ones are deemed insufficient.

A policy brief from 2022 provides an overview of best practice examples of EU Member States' work with defining and measuring energy poverty[99], while the report by EPOV from 2020 provides a summative assessment of the considerations on energy poverty presented in the NECPs of each EU Members State at that time.[100]

99. https://www.odyssee-mure.eu/publications/policy-brief/measuring-energy-poverty.pdf
100. https://data.europa.eu/doi/10.2833/103649



PHOTOS: ISTOCK

5. ASSESSMENT OF ENERGY POVERTY IN THE NORDICS

This chapter provides an assessment of energy poverty in the Nordics. The analysis is based on existing survey-based data obtained through the EU Joint Research Center (JRC)[101]. Specifically, the statistics presented are based on data from the EU statistics on income and living conditions (EU-SILC) survey[102] and the EU Household Budget Survey (HBS)[103]. Given that these surveys are collected on an EU level from each Member State (and some countries outside of EU), they allow for a harmonized assessment across the Nordic countries[104]. The assessment is based on some of the most frequently applied indicators on energy poverty (see section 4.5 for a more elaborate discussion on indicators).

The chapter is structured in three major sections. Section 5.1 conducts an overall assessment of energy poverty in the Nordics through time, based on selected indicators of energy poverty. Sections 5.3 and 5.4 take stock of how the prevalence of energy poverty varies on a range of background variables. Specifically, section 5.3 is concerned with demographics whereas section 5.4 is concerned with living conditions such as dwelling and tenure types.

101. The assessments are based on JRC data analysis over the EU SILC and HBS data (output JRC135908, part of the data catalogue "Just Energy and Transport Data Inventory"). The views expressed in the report are purely those of the authors and may not in any circumstance be regarded as stating an official position of the European Commission.
102. https://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions
103. https://ec.europa.eu/eurostat/web/microdata/household-budget-survey
104. It should be noted that the surveys are susceptible to uncertainty in sampling. It has not been possible for us to test the statistical significance of the findings.

5.1 High-level indicators of energy poverty in the Nordic countries

This section assesses the level of energy poverty in the Nordics through time[105]. The assessment is based on five indicators in a combination of consensual and expenditure-based approaches (see section 4.5). The selection of indicators has been guided by data availability and the wish to triangulate the assessment of energy poverty. While no indicator is perfect on its own, as discussed in section 4.5, the assessment of energy poverty using multiple indicators and adopting different approaches may help identify important dimensions of energy poverty. The five indicators are:

- **Inability to keep home adequately warm:** Percentage of population reporting that they are unable to keep their home adequately warm (SILC)
- **Arrears on utility bills:** Percentage of population reporting that they have been unable to pay the utility bills in time at least once in the past twelve months (SILC)
- **High energy expenditures (2M):** Percentage of households whose share of (equivalised) energy expenditure in (equivalised) disposable income is above twice the national median share (HBS)
- **10%:** Percentage of households whose share of (equivalized) energy expenditure in (equivalized) disposable income is above 10% (HBS)[106]
- **Low absolute energy expenditures (M/2):** Percentage of households whose absolute (equivalised) energy expenditure in euros is below half the national median (HBS)

105. Due to data availability and comprehensive computational time, it has not been possible to provide complete time series. The selection of years to be presented from the SILC survey is based on critical socio-economic importance as well as the wish to be able to compare with HBS data. Thus, EU-SILC survey data are presented for the years 2015, 2016, 2018, 2020, 2021, and 2022. HBS data are available in 5-year intervals and thus presented for the years 2010, 2015 and 2020. The Nordic (and EU27) average reported in a given year is based on countries with available data in the given year.
106. This is the absolute equivalent to the 2M indicator meaning that while the 2M threshold is defined by the underlying distribution of energy expenditures and income, the 10% threshold is constant.

Table 2 provides an overview of the identified and discussed pros and cons in chapter 5:

Table 2. Overview of the pros and cons of the five indicators

Indicator	Pros	Cons
Inability to keep home adequately warm (warm)	Provides important insights into the mechanics at play, especially 'hidden' energy poverty.	Subject to individual preferences varying with age, gender, and other socioeconomic factors.
Arrears on utility bills (arrears)	Provides a measure for a very targeted monetary indicator for energy poverty.	Expression of prioritization of paying energy bills over keeping the accommodation warm.
Twice the national median share (2M indicator)	The relative nature of the indicator creates a dynamic target.	The indicator may misidentify high-income households with relatively high energy expenses and overlook low-income households that under consume due to financial constraints.
10% indicator	The indicator is expected to reflect the general energy price level of the countries compared to other goods and services.	In some countries, the energy bills are included in the rent and therefore hard to differentiate from other housing costs.
Half or less than the national median level (M/2 indicator)	Aims to measure the number of households with abnormally low energy expenditures, who potentially are failing to meet their basic needs.	The indicator may also capture households living in highly energy efficient homes, which explains the low level of consumption.

As will be seen, the five indicators provide a different picture of energy poverty in the Nordics, both across the Nordic countries and in comparison with the EU27. These results underscore the importance of triangulation and a thorough discussion of the contribution of each indicator. Also evident is the fact that data are missing on some indicators for some of the Nordic countries, reflecting the importance of investigating the potential for using alternative data sources or establishing new data sources to measure energy poverty in the Nordic countries.

5.1.1 Consensual based indicators

One of the most referenced indicators of energy poverty is the self-reported **inability to keep home adequately warm (warm)** indicator stemming from the SILC survey. While this indicator can be criticized for being subject to individual preferences varying with age, gender, and other socioeconomic factors, it does provide important insights into the mechanics at play, like hidden energy poverty and deprivation, especially when comparing across time.

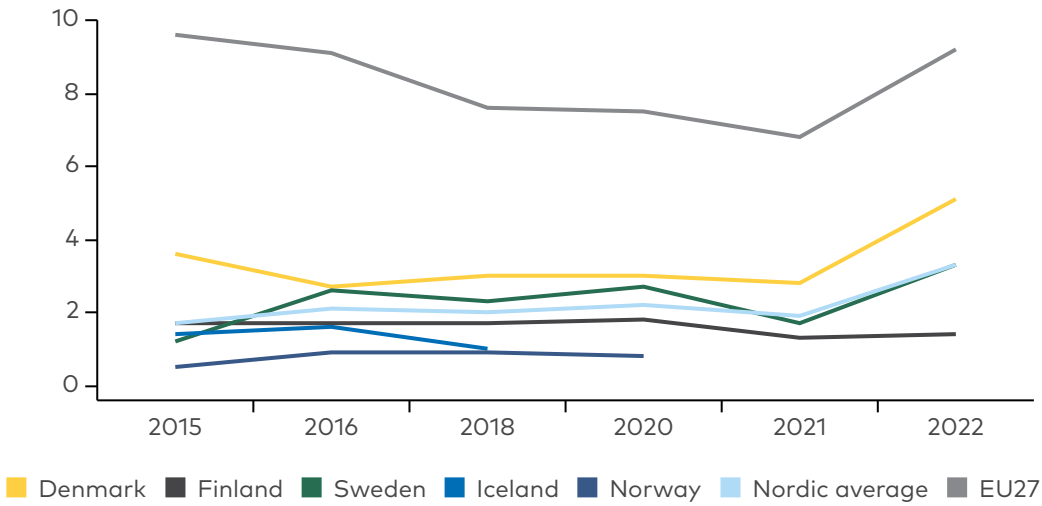
Figure 10 shows the proportion of individuals who report being unable to keep their houses adequately warm. The figure presents the share for each of the Nordic countries, the average across the Nordic countries, and the EU27 average. The figure suggests that all Nordic countries report fewer issues with keeping their housing adequately warm than the average across the EU27. While the Nordic average does not exceed 3.3% of individuals being unable to keep their home adequately warm, the EU27 average varies between 6.8% and 9.6%. This tendency of variation was a subject of criticism during the workshop because, to some extent, it constitutes uncertainties about the variable's credibility.

The figure also suggests that the proportion of individuals reporting issues with keeping their housing adequately warm increased from 2021 to 2022 for both Denmark and Sweden, the Nordic average[107], and the EU27. This increase in thermal discomfort is probably due to the energy crisis that hit towards the end of 2021, causing a surge in energy prices. The reality and consequences of rising energy prices is seemingly reflected in the ability of individuals' to afford essential energy services (such as being able to keep their home adequately warm) in line with the extra financial burden of increased energy prices. Somewhat surprisingly, the share of individuals being unable to keep their home adequately warm did not increase in Finland from 2021 to 2022 as opposed to in Denmark and Sweden[108]. This may be explained by the disconnection protection policy that Finland has in place to protect households in debt from being disconnected from the supply. Furthermore, Denmark has a higher share than both Sweden and Finland in the 2022 survey. This may also be explained by the fact that energy costs are included in the rent in Finland and, usually but not always, in Sweden too[109], which shifts the decision of cutting down on energy services in response to

107. Note that Norway and Iceland data were unavailable for 2021 and 2022. The Nordic average in these years comprises Denmark, Finland, and Sweden.
108. Energy efficiency at what cost? Unjust burden-sharing of rent increases in extensive energy retrofitting projects in Sweden, von Platten et al., 2022 and Member state reports on energy poverty 2019, EPOV, 2020
109. Member state reports on energy poverty 2019, EPOV, 2020

price increases away from the individual household. Consequently, Swedish and Finnish households may have less control over and incentive to reduce energy costs.

Figure 10. Proportion of individuals unable to keep home adequately warm, SILC, 2015-2022* (%)



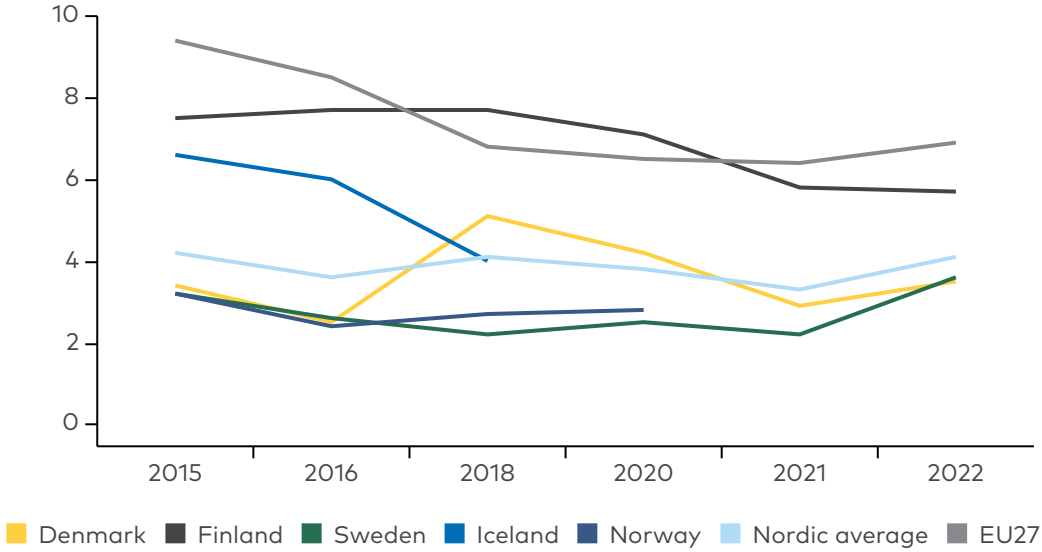
Note: No available data for IS after 2018, and for NO after 2020. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. *Years: 2017 and 2019 are missing in the presented time series.
Source: JRC analysis based on Eurostat data, EU-SILC (2015-2022)

The second self-reported indicator included in this assessment (and suggested by EPOV, see section 4.5.1) is the **arrears on utility bills (arrears)** indicator. The measure offers a focused and specific approach to addressing energy poverty, which can be advantageous when estimating its prevalence. However, the indicator may also reflect a prioritisation of paying energy bills over maintaining a warm living environment. In addition, the indicator has not been adjusted for general buying-power and levels of inflation underlining the indicator's nature of self-regulation.

Figure 11 summarises the development in this indicator over time for the Nordic countries and the EU27 average. Struggles to pay the utility bills in time is generally more prevalent in the EU27 average than in the Nordic countries. During the entire time series, however, Finland has the highest share of individuals with arears on utility bills among the Nordic countries, which is on par with the EU27 average. This is in stark contrast to the warm indicator, for which Finland was found to be among the lowest shares. The discrepancy may be due to the Finnish disconnection protection policy ensuring that missed payments do not automatically lead to disconnections from supply. Norway and Sweden have the lowest average levels across the observed years, which may be due to the universal energy service obligation and relatively low energy prices in Norway.

The figure also suggests that all countries with available data in 2021-2022 (except Finland) experience an increase in poverty from 2021 to 2022, pointing once again to the energy crisis. Interestingly, the energy crisis does not seem to have had as big of an impact on the arrears indicator as it does on the warm indicator. There are several potential explanations for this. Firstly, the Nordic countries have strong social security mechanisms in place where households can apply for support when paying their energy bills. Secondly, the relationship between the two indicators could indicate a trade-off effect, where consumers are prioritising paying their bills over keeping their accommodation warm. Thirdly, with energy being a basic good, households might cut down consumption elsewhere in order to meet their basic needs for energy services. Lastly, the modest increase in poverty may also reflect that although increasing energy prices put a strain on household budgets, the price increases might have been manageable. This is considering the various policies, which have been implemented in the Nordics to support households against the financial stress during the energy crisis.

Figure 11. Proportion of individuals with reported arrears on utility bills, SILC, 2015-2022* (%)



Note: The figure shows the proportion of individuals having arrears on utility bills during the past year. No available data for IS after 2018, and for NO after 2020. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. *Years: 2017 and 2019 are missing in the presented time series.
Source: JRC analysis based on Eurostat data, EU-SILC (2015-2022)

5.1.2 Expenditure-based indicators

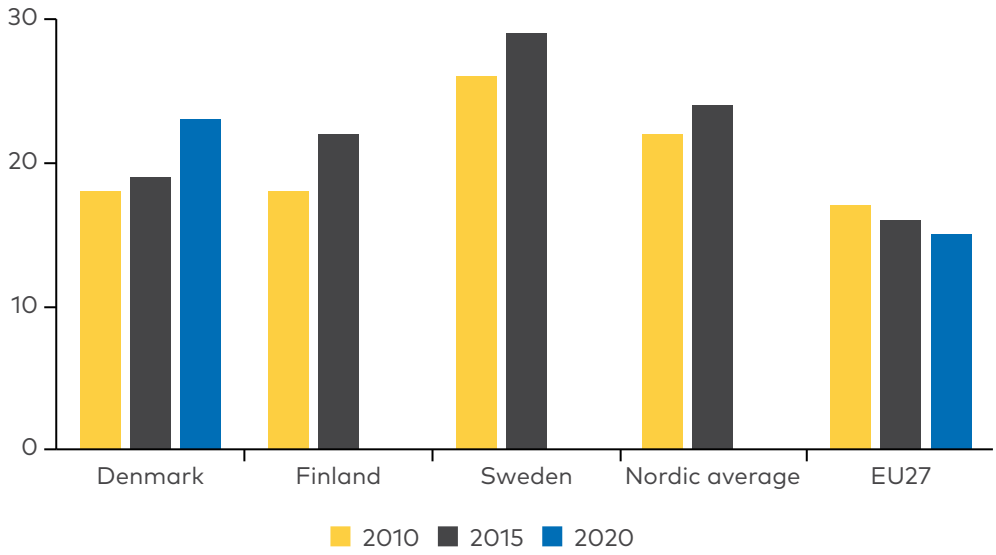
The expenditure-based indicators are usually applied in tandem because they each capture distinct issues related to energy poverty and affordability. The expenditure-based indicators originate from HBS and are presented for the years 2010, 2015, and 2020[110]. Unfortunately, the data do not cover the energy crisis as the most recent available data are from 2020[111].

The **twice the national median share (2M indicator)** provides an insight into the budgetary burden of energy bills relative to households' disposable income, using the national median as point of reference[112]. This relative nature of the indicator causes the shares to be affected by the underlying distribution of income and energy expenditures within each country (see section 4.5 for a discussion on indicators), creating a moving target. On the other hand, the indicator may depict the relative hardship of households within a country. With regard to archetypes, the indicator may misidentify high-income households with proportionally high energy expenses while not identifying low-income households who underconsume energy due to general financial constraints.

Figure 12 shows the proportion of households that have a share of energy expenses relative to income, which is equal to or higher than the 2M indicator. The data indicate that all the Nordic countries (with available data) have a higher prevalence of energy poverty according to the 2M indicator than the EU average. The estimated Nordic average is above 20 percent in both 2010 and 2015, indicating that more than a fifth of the Nordic households included in the analysis are energy poor according to this indicator. The result is especially driven by Sweden, for whom 29% of the households had more than twice the national median share of energy expenditures to income in 2015. Evidently, this high prevalence of energy poverty according to the 2M indicator stands in stark contrast to the warm and arrears indicators from above. The shares in the Nordic countries have increased over time, while the EU average has decreased slightly over time (note, however, that Denmark is the only Nordic country with data for 2020). Such increases may be driven either by increased energy expenses moving households above the 2M threshold or by a decrease in the 2M threshold and as such prove very hard to interpret.

110. HBS data are not available for NO and IS. HBS 2020 data are only available for DK. The Nordic average is based on countries with available data, which in 2010 and 2015 were DK, FI and SE. The Nordic average is not reported for 2020, because DK is the only Nordic country with available data in this year.
111. Some countries do collect these data on a more frequent basis, e.g. Denmark collects the HBS annually. However, the EU wide collection of HBS data via Eurostat, on which we base this assessment, follows 5-year intervals.
112. EPOV Indicator Dashboard: Methodology Guidebook, Thema and Vondung, 2020

Figure 12. Proportion of households with a share of energy expenditure relative to net household income twice as high or more than the national median (2M indicator), HBS, 2010-2020 (%)



Note: Income and energy expenditures are equivalized according to household size. No available data for IS and NO in all years, and for FI and SE in 2020. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. EU figures as the average of countries with available data are inconsistent for 2010 and 2015 because of the inconsistencies in the sampling weights of some countries.
Source: JRC analysis based on Eurostat data, HBS (2010, 2015, 2020)

In order to avoid some of the issues related to the 2M indicator, we provide numbers for the **10% indicator**[113], which identifies the proportion of households with energy expenses of 10% or more of net household income. Unlike the previous indicator, the 10% cut-off is not dependent on the population distribution. Instead, the indicator is expected to reflect the general energy price level of the countries compared to other goods and services. Unfortunately, data from Iceland and Norway are not available for this indicator. In addition, it is common for certain property types in Finland and Sweden to have the energy expenditures included in the rental[114]. For this reason, when respondents are asked to indicate how much they spend on energy costs, it may not be possible to differentiate this number from the housing costs. This was evident in the Swedish data, where a lump of households specified that they had zero energy expenditures[115]. This highlights the importance of examining energy poverty within national constraints. It also underlines the problems associated with the 2M indicator,

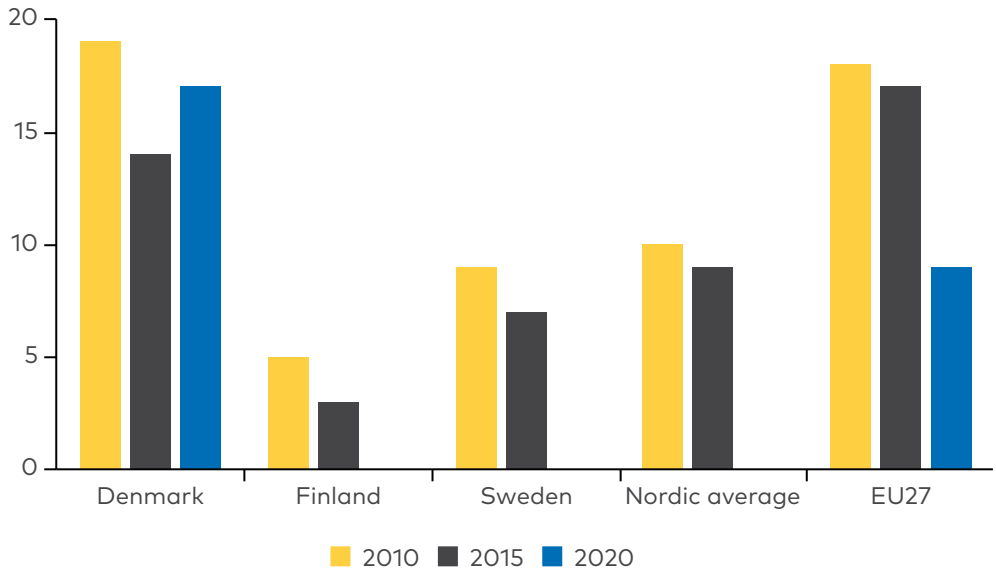
113. The 10% indicator is the absolute equivalent of the 2M indicator, Energy poverty indicators: Conceptual issues, Part I: The ten-percent-rule and double median/mean indicators, Schuessler, 2014
114. Member state reports on energy poverty 2019, EPOV, 2020
115. This is also evident in the EPOV methodology report published in 2020: EPOV Indicator Dashboard: Methodology Guidebook, Thema and Vondung, 2020

as the very low number of households in Finland and Sweden that identified with the 10% indicator does not nearly meet the high number of households identified with the 2M indicator. This is likely due to a downward bias in the median threshold applied by the 2M indicator.

Figure 13 shows that the proportion of households identified by this measure varies considerably across the three included countries. While Finland and Sweden have less than 10% of households spending more than 10% of their budget on energy, Denmark has 14-19% of households spending more than 10%. While the difference between the countries in part may be explained by higher energy prices in Denmark as described in section 4.4, some of the discrepancy may – as argued – be attributed to the fact that energy bills are included in the rent in Finland and, usually but not always, in Sweden as well.

Contrary to the 2M indicator, the results show a decrease in the percentages of the population that may be considered at risk of energy poverty. While some households have decreased their energy expenditure to below 10%, a number of households also moved above the 2M threshold. Due to the decrease in the absolute 10% indicator, it is likely that the increase in the relative 2M indicator above can be explained by a lower 2M threshold rather than increased energy expenditures. Nonetheless, the figure shows that of the three Nordic countries measured, Denmark is the only country where the identified share of households exceeds the EU27 average by a considerable margin (in 2010 and 2020), indicating a level of economic strain similar to the 2M measure above. Lastly, the EU27 share decreases considerably from 2015 to 2020. This reflects a decrease in the economic strain across the EU27 countries with available data in 2020.

Figure 13. Proportion of households with a share of energy expenditure relative to net household income of 10% or more (10% indicator), HBS, 2010-2020 (%)

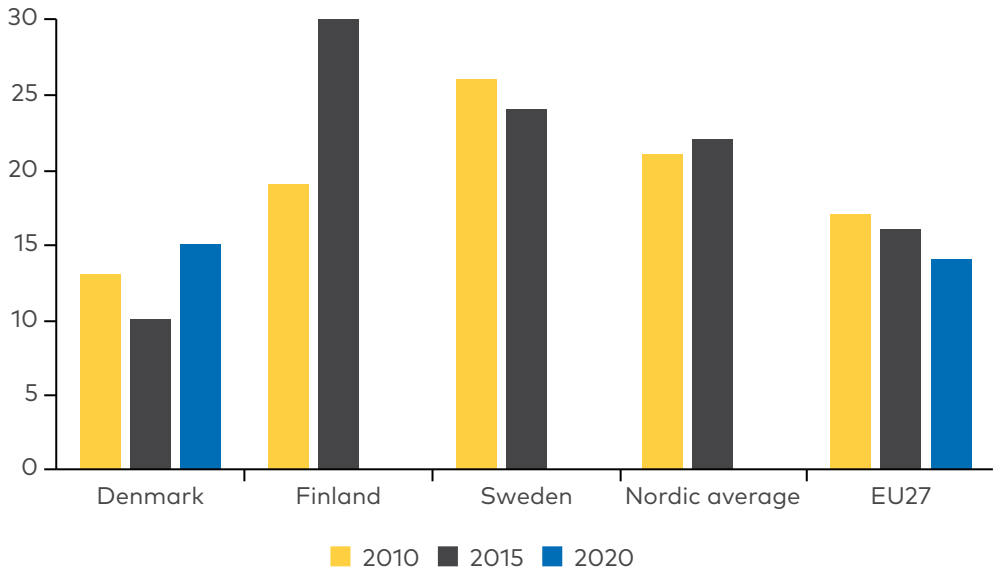


Note: Income and energy expenditures are equivalized according to household size. No available data for IS and NO in all years, and for FI and SE in 2020. The figures in "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. EU figures as the average of countries with available data are inconsistent for 2010 and 2015 because of the inconsistencies in the sampling weights of some countries.
Source: JRC analysis based on Eurostat data, HBS (2010, 2015, 2020)

In contrast to the two previous indicators, Figure 14 illustrates the proportion of households with energy expenses in euros that is **half or less than the national median level (M/2 indicator)**. This measure is referred to as *hidden energy poverty*, because it aims to measure the number of households with abnormally low energy expenditures, who potentially are failing to meet their basic needs. The pitfalls of this indicator are that it may also capture households living in highly energy efficient homes as well as also being referenced to as a changing target, where changes in the energy expenditure distribution translates into a new M/2 threshold.

Considering the shares of households based on this indicator, Finland and Sweden are observed to have an overall higher level of potentially hidden energy poverty than Denmark and the EU27 average. Interestingly, the distribution and development of this indicator resembles quite closely the M2 indicator.

Figure 14. Proportion of households with absolute energy expenditures equal to half or less than the national median (M/2 indicator), HBS, 2010-2020 (%)

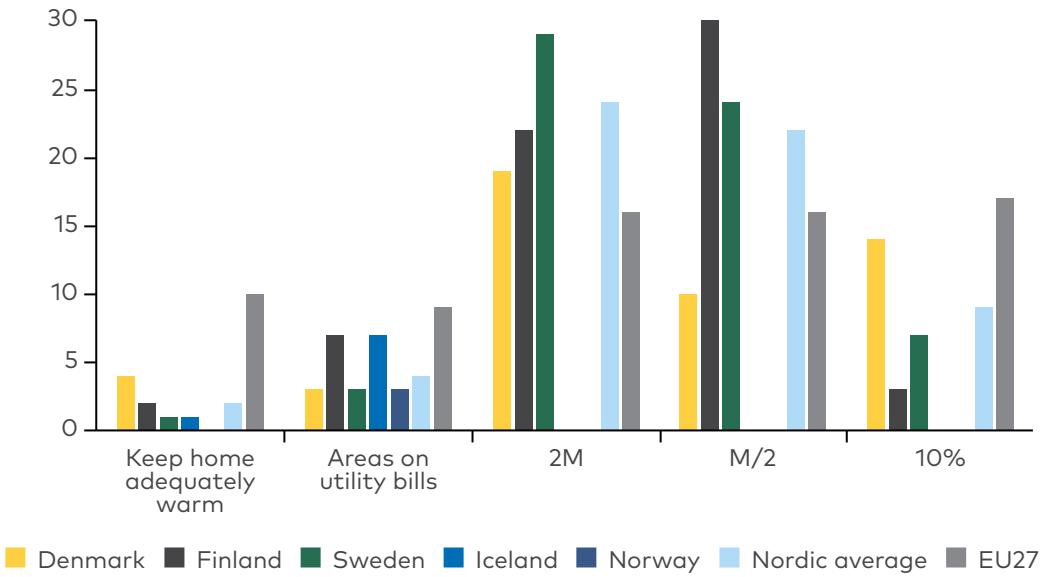


Note: Income and energy expenditures are equivalized according to household size. No available data for IS and NO in all years, and for FI and SE in 2020. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. EU figures as the average of countries with available data are inconsistent for 2010 and 2015 because of the inconsistencies in the sampling weights of some countries.
Source: JRC analysis based on Eurostat data, HBS (2010, 2015, 2020)

5.1.3 Comparison across consensual- and expenditure-based indicators

The five indicators presented in the previous sections are summarised in Figure 15 in 2015 levels as 2015 is the most recent year where all Nordic EU Member States have available data in HBS. The figure shows a stark contrast between the consensual-based and expenditure-based indicators. In general, the expenditure-based measures indicate substantially higher levels of energy poverty in the Nordics. The same conclusion applies to the EU average. However, the difference is not nearly as large.

Figure 15. Comparison of energy poverty indicators across SILC and HBS, 2015 (%)



Note: The HBS indicators are based on income and energy expenditures equivalized according to household size. No available data for IS and NO in HBS. The figures in "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. EU figures as the average of countries with available data are inconsistent for 2010 and 2015 because of the inconsistencies in the sampling weights of some countries.
Source: JRC analysis based on Eurostat data, SILC (2015) and HBS (2015)

While providing an assessment of energy poverty on the aggregate level in the Nordics, this section also underlines some of the inherent challenges associated with using these indicators to assess energy poverty in the Nordics as the indicators do not identify a specific group of energy poor citizens.

Most notably, the structure of energy bills poses severe limitations on interpretations from the expenditure-based indicators. Furthermore, the 2M and M/2 indicators are subject to changing targets and do not lend themselves very easily to comparisons across countries. While it may seem that there is a high prevalence of energy poverty in relative terms, it might not be the case when comparing across countries in absolute terms. The expenditure-based indicators are also sensitive towards purchasing power. Other issues may include under-reporting of vulnerability (on consensual-based

indicators), survey bias caused by sample sizes as well as the citizens' space for action, e.g. consume energy when it is cheap, heat up specific areas of the residence while leaving others cold and similar. Irrespective of the root cause, these differences highlight the need for further efforts to triangulate the measurement of energy poverty and perhaps investigate alternative indicators suited for the specific national context.

5.2 Energy poverty and the revised EED

This section takes stock of energy poverty using the indicators suggested in the Energy Efficiency Directive (EED). Given that the EED suggests using a general poverty indicator to indicate energy poverty, the section further investigates the intersection between energy poverty and general poverty. The aim of that discussion is also to provide some insights into the question of whether energy poverty is, in fact, an issue serving its own merit in the Nordic countries.

As discussed above in section 4.3, the Energy Efficiency Directive (Directive (EU) 2023/1791) requires the Member States to use the arithmetic average share of the following four indicators to measure the extent of energy poverty in their National Energy and Climate Plans, if they have not already committed themselves to other indicators:

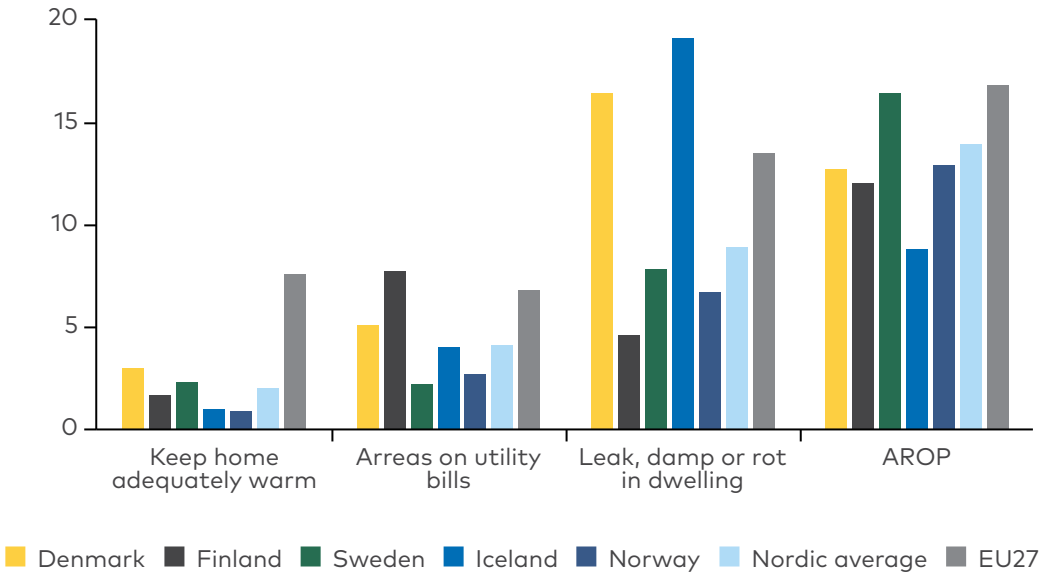
- Inability to keep the home adequately warm
- Arrears on utility bills
- Population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor
- At-risk-of-poverty rate (AROP)

All four indicators are collected in the SILC survey. Figure 16 shows the four indicators for each country in 2018[116]. The warm and arrears indicators follow the same tendencies as described above, that the Nordic countries generally have lower shares than the EU27 average on both measures. The share of the population living with **leak, damp or rot** varies significantly across the Nordic countries with Iceland and Denmark having higher shares than the EU27 and Finland having the lowest share. The leak, damp or rot indicator can be interpreted as a proxy for building quality or poor conditions in dwellings. However, the measure is best used to support other measures for energy poverty. In Iceland, for example, it can be argued that the comparatively low energy prices (as shown in section 4.4) might somewhat offset energy poverty associated with poor housing quality. Although not disclosed here, the leak, damp or rot indicator remains relatively stable over time, which is to be expected given that changes to the building stock is often slow to implement.

116. 2018 is the latest year where data on all Nordic countries are available in the SILC survey.

The **at risk of poverty** (AROP) indicator identifies the share of the population with an equivalized disposable income (after social transfers) below 60% of the national equivalized median income[117]. Figure 16 shows that, for all countries, a larger share of the population is at risk of poverty than having trouble keeping their homes adequately warm or experiencing arrears on utility bills. As such, it seems that energy poverty is less prevalent than general poverty in all the Nordic countries. Recall, however, that the AROP measure is relative to the national median whereas the warm and arrears indicators are 'absolute' measures without reference to a changing target.

Figure 16. Comparison of energy poverty and poverty indicators, SILC, 2018 (%)

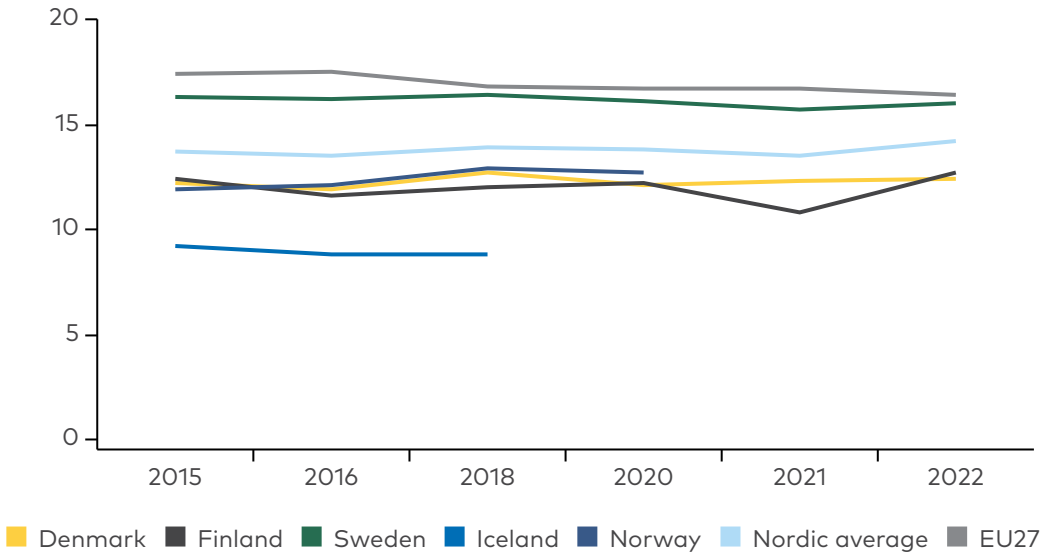


Note: The leak, damp or rot in the dwelling indicator shows the proportion of individuals living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames or floor. The at risk of poverty (AROP) indicator identifies the share of the population with an equivalized disposable income (after social transfers) below 60% of the national equivalized median income. The figures in "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, SILC (2018)

117. Glossary: At-risk-of-poverty rate - Statistics Explained, Eurostat

Figure 17 shows the development in the AROP indicator over time. Evidently, the share of individuals at risk of poverty is relatively stable in all Nordic countries and the EU27. This contrasts with the development in the energy poverty (warm and arrears) indicators shown above, which tend to fluctuate more and increased significantly in 2022. Although high correlation between poverty and energy poverty is to be expected, the development of the two are not perfectly correlated. Some of this discrepancy may be ascribed to the relative nature of the AROP indicator (where the share is dependent on the national median) versus the 'absolute' nature of the warm and arrears indicators.

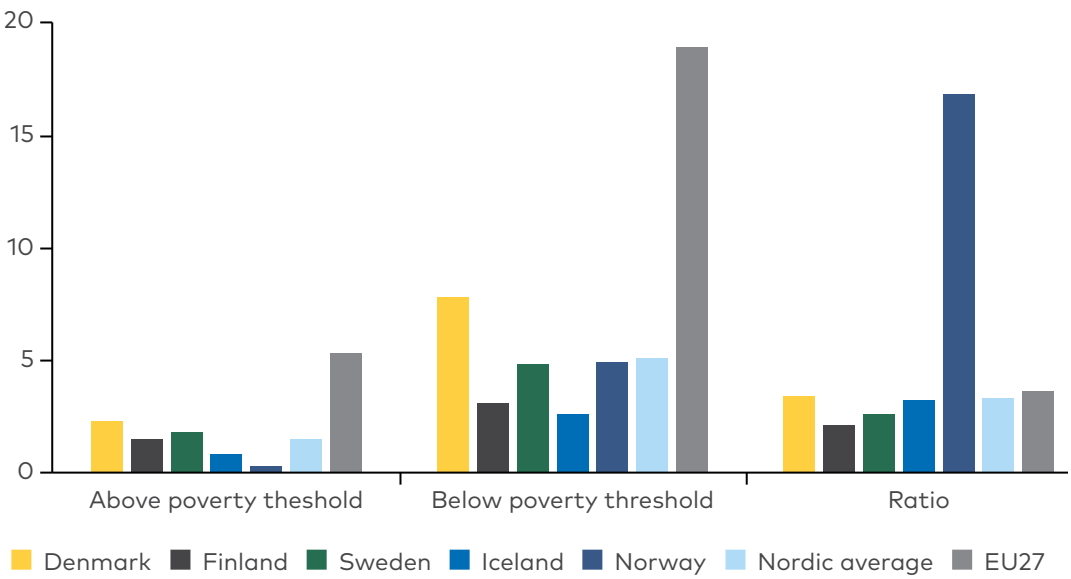
Figure 17. Proportion of individuals below at risk of poverty threshold (AROP indicator), SILC, 2015-2022* (%)



Note: The at risk of poverty (AROP) indicator identifies the share of the population with an equivalized disposable income (after social transfers) below 60% of the national equivalized median income. No available data for IS after 2018, and for NO after 2020. The figures in "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. *Years: 2017 and 2019 are missing in the presented time series.
Source: JRC analysis based on Eurostat data, SILC (2015-2022)

Although the warm and AROP indicators do not perfectly align, there are correlations. Using 2018 data, these correlations are illustrated in Figure 18, where the share of individuals unable to keep their home adequately warm is calculated for individuals above and below the AROP threshold. Recall that the AROP threshold is 60% of the national equivalized median income. The third panel illustrates the ratio between the two groups. The panel shows that individuals at risk of poverty have 3.3 times the likelihood of being unable to warm their houses compared to individuals not at risk of poverty. Given that access to essential energy services is largely dependent on financial capabilities, this relationship is to be expected. Norway is an outlier in this respect with a ratio as high as 16.8, indicating that people at risk of poverty have almost a seventeen times higher risk of not being able to keep their home adequately warm. This result is mainly driven by the very low share of individuals above the AROP threshold being unable to keep their home adequately warm. Ultimately, the AROP indicator is not necessarily an appropriate indicator for identifying energy poor individuals if being used isolated. Rather, it may be useful for identifying a group of individuals at *risk* of energy poverty.

Figure 18. Proportion of individuals 'unable to keep home adequately warm' by 'at risk of poverty' indicator, SILC, 2018 (%)



Note: The at risk of poverty (AROP) indicator identifies the share of the population with an equivalized disposable income (after social transfers) below 60% of the national equivalized median income. The figures in "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, SILC (2018)

5.3 Energy poverty and vulnerable groups

This section aims to investigate the prevalence of energy poverty across demographic groups in order to qualify a discussion of whether there are groups that are especially vulnerable towards energy poverty. The parameters considered include income levels, economic activity, health, household types, children in the household, age, and gender.

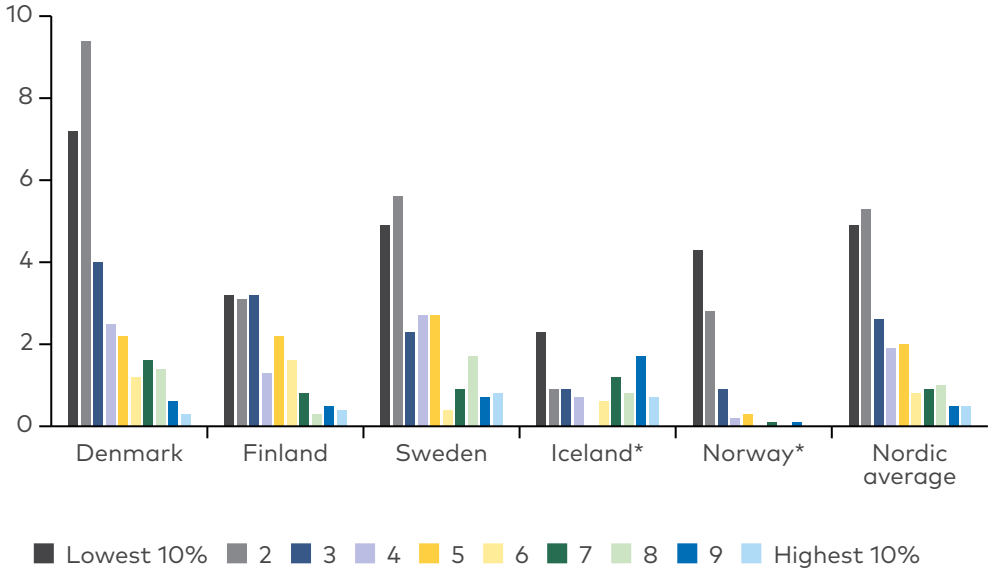
In October 2023, EPAH published a report on updated indicators divided into four primary topics: *Climate, Facilities/Housing, Mobility,* and *Socioeconomic aspects*[118]*.* The topics are supplemented by subtopics, indicators and a comprehensive set of suggested variables applied for disaggregation of each indicator in the EPAH dashboard solution[119]. The inherent complexity of the concept of energy poverty merits an investigation of several indicators coupled with disaggregation of these indicators on secondary variables to get a comprehensive understanding of the issue. The following section is based primarily on the inability to keep home adequately warm indicator disaggregated on various secondary variables[120].

In general, income is one of the main explanatory components of energy poverty as described in section 4.1. This merits a thorough look into the dynamics of how energy poverty affects different groups in the income distribution. In this context, it is worth noting that energy poverty may be a subset of vulnerable groups, and if so, it is essential to describe the connections between these groups. In the Nordics, there is some overlap between vulnerable groups in general and those experiencing energy poverty. However, it should be emphasized that energy poverty does not automatically imply vulnerability. This underscores the necessity of clearly distinguishing between the two groups and elucidating how they are interconnected (see chapter 8 for policy recommendation).

Figure 19 shows the proportion of individuals in each income decile who are unable to keep their home adequately warm in 2018[121]. Interestingly, the distribution of energy poverty according to the warm indicator varies quite a lot across the Nordic countries. There seems to be a strong correlation between income and energy poverty in Denmark and Norway and to some extent in Sweden, where the first- and second-income deciles have the highest shares of energy poverty on this measure. The distribution of energy poverty across income seems more equal in Finland and especially in Iceland.

118. Energy Poverty National Indicators Uncovering New Possibilities for Expanded Knowledge. Energy Poverty Advisory Hub. October 2023.
119. Energy Poverty Advisory Hub. National Indicators.
120. While we have argued for a triangulation of indicators in general, this section focuses primarily on the warm indicator. This is due to the low reliability of expenditure-based indicators in the Nordic countries. The warm indicator is prioritised over the arrears indicator in order to limit the scope of the analysis. The warm indicator was chosen because some countries in the Nordics, e.g. Finland, have policies that guard against disconnections due to arrears. In such settings, the arrears would overestimate the level of energy poverty.
121. 2018 is the latest year where data on all Nordic countries are available in the SILC survey.

Figure 19. Proportion of individuals with reported inability to keep home adequately warm by income deciles, SILC, 2018 (%)

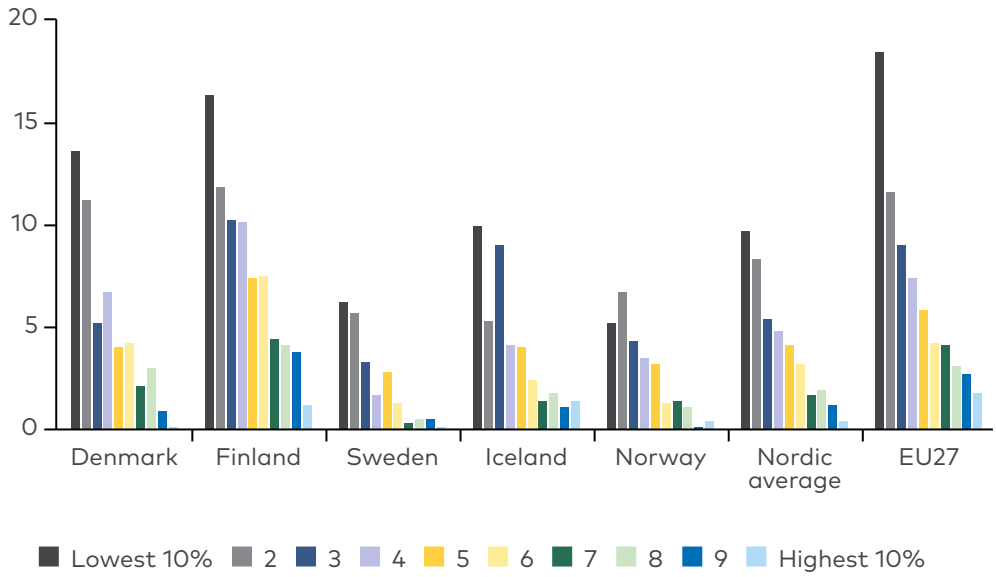


Note: Income deciles are based on equivalized disposable household income. "Nordic average" refers to the average of the Nordic countries with available data in the given year. The EU27 panel is left out to be able to see the nuances in the Nordic countries. *Data are missing for the 5th income decile in IS and the 6th, 8th, and 10th income deciles in NO. 2018 is the latest year where data were available for all Nordic countries.

Source: JRC analysis based on Eurostat data, SILC (2018)

Figure 20 illustrates the proportion of individuals in each income decile who have experienced arrears on utility bills in 2018. Unsurprisingly, the overall pattern is that lower income deciles have a higher risk of experiencing arrears for all Nordic countries and the EU27. The larger the difference in proportions for high and low deciles, the more explanatory power income presumably has in terms of explaining the 'arrears on utility bills' indicator. The data indicate that individuals in the lowest income decile in the Nordic countries on average are 2.4 times more likely to have arrears on utility bills compared to the average individual.

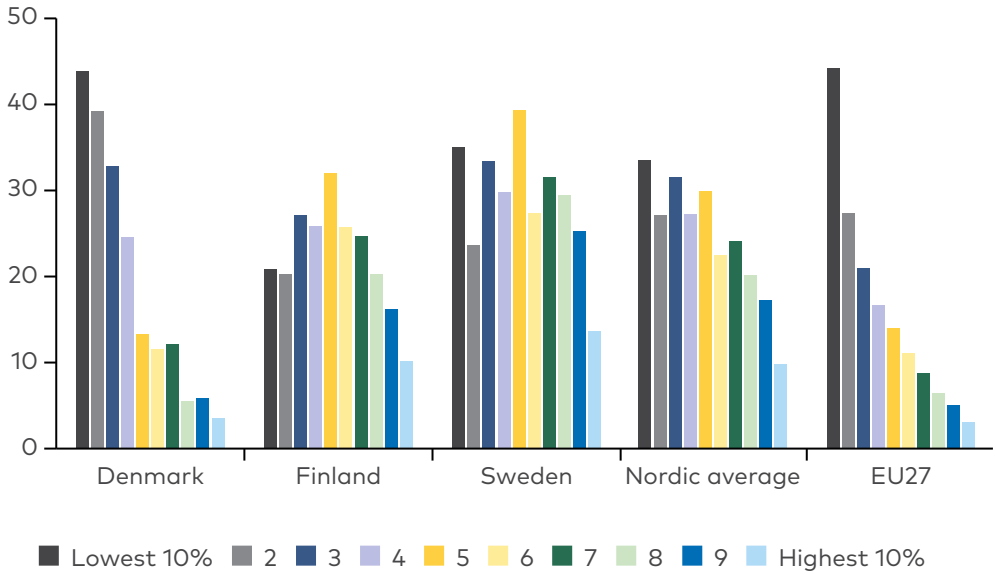
Figure 20. Proportion of individuals with reported arrears on utility bills by income deciles, SILC, 2018 (%)



Note: Income deciles are based on equivalized disposable household income. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, SILC (2018)

Figure 21 indicates the share of households in each income decile with a ratio of energy expenditure relative to net household income twice as high or more than the national median in 2015. The distribution of energy poverty according to the 2M indicator varies a great deal across countries. Income seems to correlate strongly with energy poverty according to this measure in Denmark and the EU27 average, with lower income deciles having a higher share of individuals with energy expenditures above the 2M threshold. In Finland and Sweden, on the other hand, the share of energy poor households is the highest in the 5th income decile. This result underlines the structural difference in energy bills mentioned in section 5.1.1. Because energy bills are included in the rent in these countries, some households may wrongly indicate that they have (close to) zero energy expenditures, which translates into a downwards bias in the median. This caveat underlines the severe problems with using these expenditure-based indicators in Sweden and Finland as they do not appropriately reflect energy poverty.

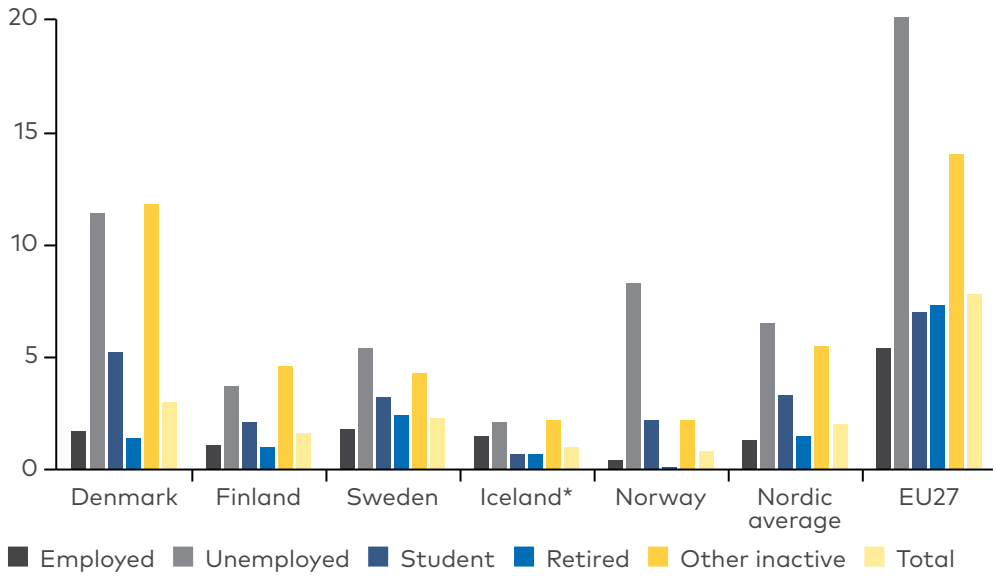
Figure 21. Proportion of households with share of energy expenditure relative to net household income twice as high or more than the national median (2M indicator) by income deciles, HBS, 2015 (%)



Note: Income and energy expenditures are equivalized according to household size. No available data for IS and NO. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. EU figures as the average of countries with available data are inconsistent for 2010 and 2015 owing to the inconsistencies in the sampling weights of some countries.
Source: JRC analysis based on Eurostat data, HBS (2015)

Although income is an important factor, other variables may provide alternative insights into what constitutes and drives energy poverty. Figure 22 illustrates the proportion of individuals with different economic status, who are unable to keep houses adequately warm. The figure shows that unemployed individuals are more exposed to not being able to warm their houses. However, the category 'other', which comprises individuals outside of the four other categories, also experiences a consistently higher risk of not being able to warm their houses. A key insight from this is that there is also a significant group of 'other inactive' who may not be active on the job market, who are shown to be exposed to potential energy poverty. Hence, any measure of energy poverty must also account for proportions of the population that slip through standard measures of the labour market.

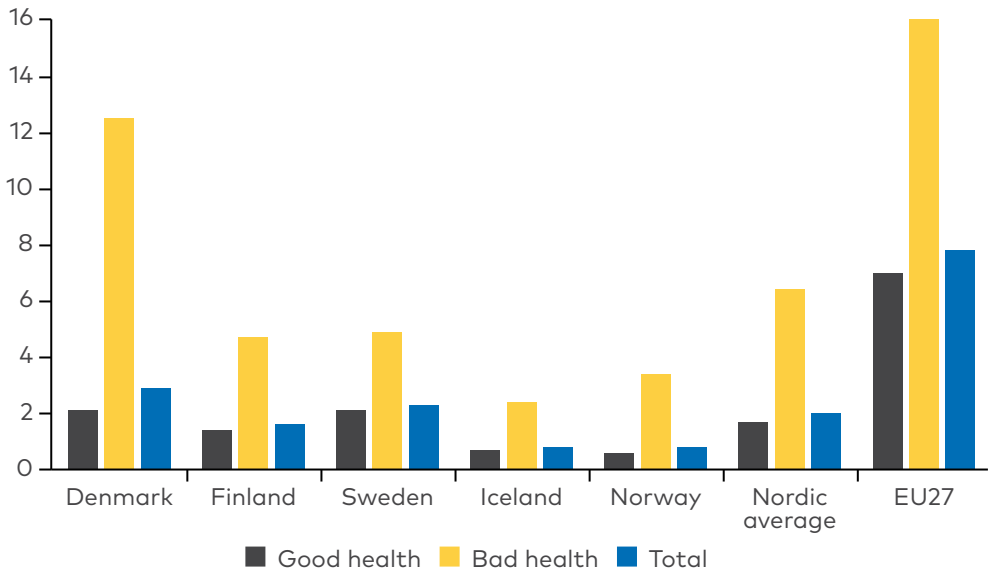
Figure 22. Proportion of individuals unable to keep home adequately warm by economic activity status, SILC, 2018* (%)



Note: Data are based on the population aged 18 and above. Other inactive includes individuals unable to work due to long-standing health problems, individuals fulfilling domestic tasks (housewife/husband), individuals in compulsory military or civilian service and other. *IS data are from 2016 due to missing data on unemployed in 2018. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, SILC (2018)

One of the consequences of energy poverty is poor health. There already exists comprehensive academic literature investigating the effects of energy poverty on health. Some studies even document how energy poverty increases morbidity and mortality[122]. Figure 23 illustrates the proportion of individuals unable to keep home adequately warm disaggregated based on self-perceived health status. It is apparent that having self-perceived poor health is highly correlated with not being able to keep your home adequately warm. Denmark and Norway have the highest correlations where the risk of not being able to heat your home is respectively 6 and 5.7 times higher for people with self-perceived poor health. Such connections may also reinforce the previous figure, where poor perceived mental or physical health has the risk of resulting in long-time unemployment.

Figure 23. Proportion of individuals unable to keep home adequately warm by general health status, SILC, 2018 (%)

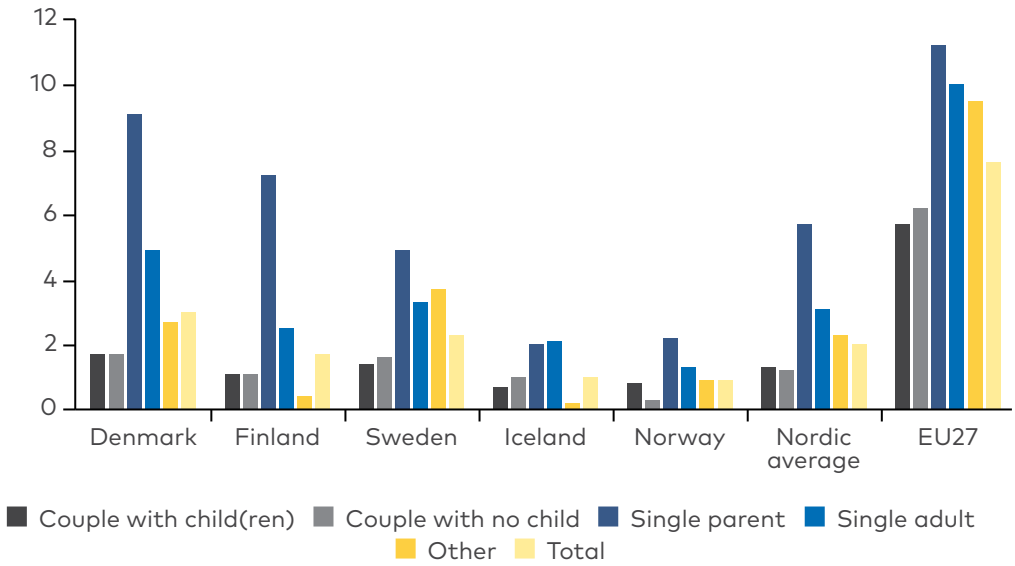


Note: Data are based on the population aged 18 and above. General health status is defined by self-perceived general health status. 'Good health includes 'Good' and 'Fairly good'. 'Bad' includes 'bad' and 'very bad'. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, SILC (2018)

122. What are the effects of energy poverty and interventions to ameliorate it on people's health and well-being?: A scoping review with an equity lens, Ballesteros-Arjona et al., 2022

Another key variable to investigate is household type. Figure 24 provides a break-down of the inability to keep home adequately warm indicator for different household compositions. The figure shows that single parent households struggle to keep their houses adequately warm to a higher degree than the other household compositions across all countries. Single adult households come in second in all countries except for Sweden. These shares stand in stark contrast to couples with and without children, who have very low shares of individuals unable to keep their home adequately warm. Seemingly the number of adults in a household correlate very strongly with the access to adequate heating.

Figure 24. Proportion of individuals unable to keep home adequately warm by household type, SILC, 2018 (%)

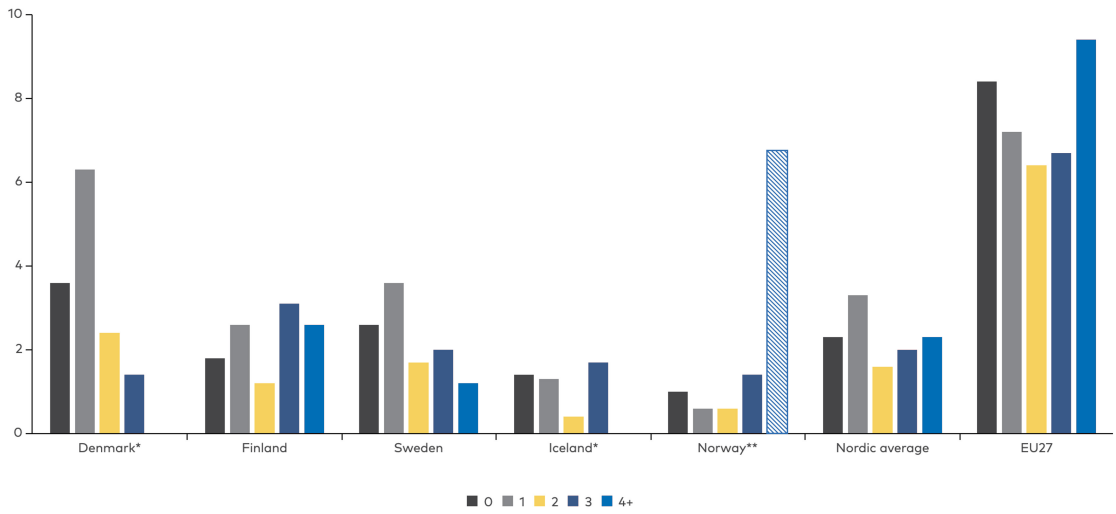


Note: "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.

Source: JRC analysis based on Eurostat data, SILC (2018)

Delving further into household types, Figure 25 shows the share of households unable to keep their home adequately warm disaggregated by the number of children in the household in 2018. In Denmark and Sweden, the highest shares of energy poor households are households with one child. In Finland and Iceland, the highest shares are among households with three children. For the EU average, the highest incidence of energy poverty is observed among families with either no children or more than four children. While the pattern across the examined countries is ambiguous, it is challenging to definitively establish the significance of children in relation to energy poverty. Nonetheless, having children living at home constitutes a factor to consider when addressing the consequences of rising energy prices through mitigation measures.

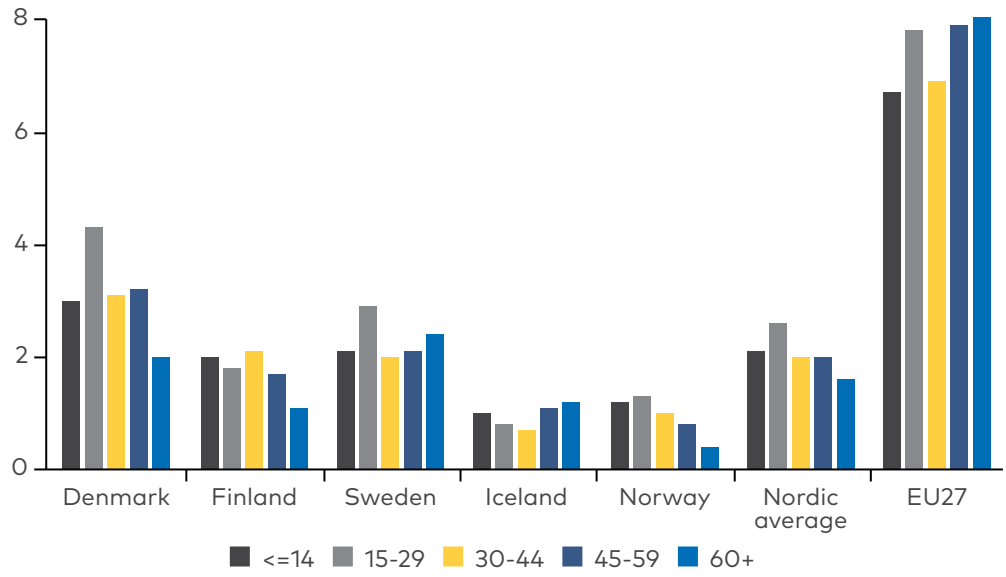
Figure 25. Proportion of households with reported inability to keep home adequately warm by number of children in the household, SILC, 2018 (%)



Note: Total number of children in the household refers to children aged 0-17. *Data for households with 4+ children are unavailable for DK and IS. **The shaded bar indicates low reliability due to small number of observations. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, EU-SILC (2018)

Interestingly, when the indicator of inability to keep home adequately warm is cross-tabulated with age groups as in Figure 26, there does not appear to be large differences. All countries show a similar distribution, where younger adults seem to struggle the most, which then tapers off with age. According to these numbers, older individuals do not seem to be especially vulnerable, which may come as a surprise since elderly people have been highlighted as a vulnerable group in literature and in the qualitative data in particular[123].

Figure 26. Proportion of individuals unable to keep home adequately warm by age groups, SILC, 2018 (%)

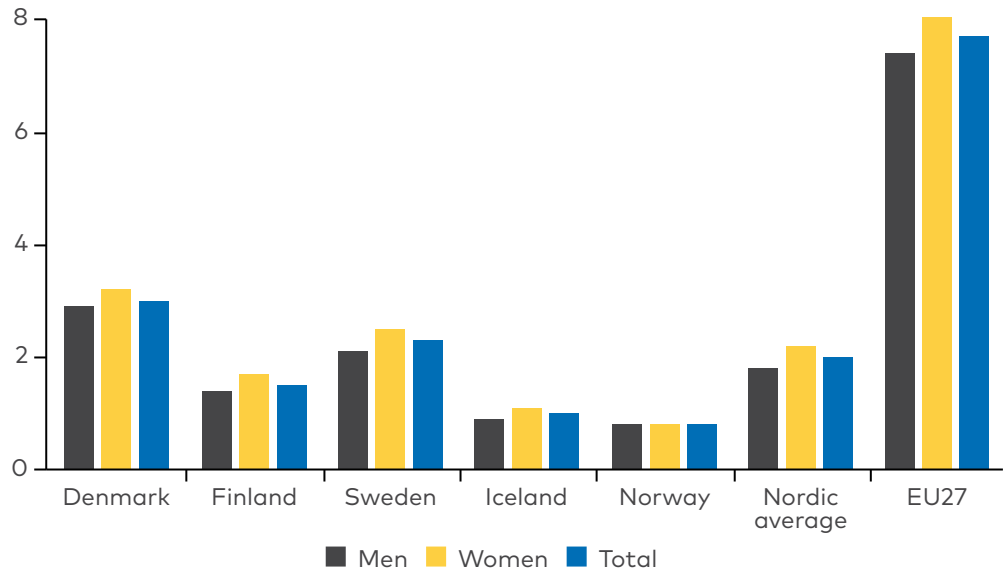


Note: "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, EU-SILC (2018)

123. Energy poverty – New insights for measurement and policy

Previous work has examined aspects of energy poverty in relation to gender, specifically in terms of the gender pay gap; the gender pension gap; and women's more limited possibilities to work compared with men due to their disproportionate burden of care for children and other close relatives[124]. Taking inspiration from this work, Figure 27 shows the proportion of men and women who are unable to keep their houses adequately warm. The share of women is slightly higher for all Nordic countries (and the EU27 average) except for Norway. Like previous figures, this seems to suggest a well-functioning social welfare system. However, it is worth noting that the relative difference between men and women are similar between the EU27 average and DK, SE and FI.

Figure 27. Proportion of individuals unable to keep home adequately warm by gender, 2018 (%)



Note: Data are based on the population aged 18 and above. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, EU-SILC (2018)

124. Zamfir I., Gender aspects of energy poverty, EPRS, February 2023 (https://www.europarl.europa.eu/thinktank/en/document/EPRS_ATA(2023)739349)

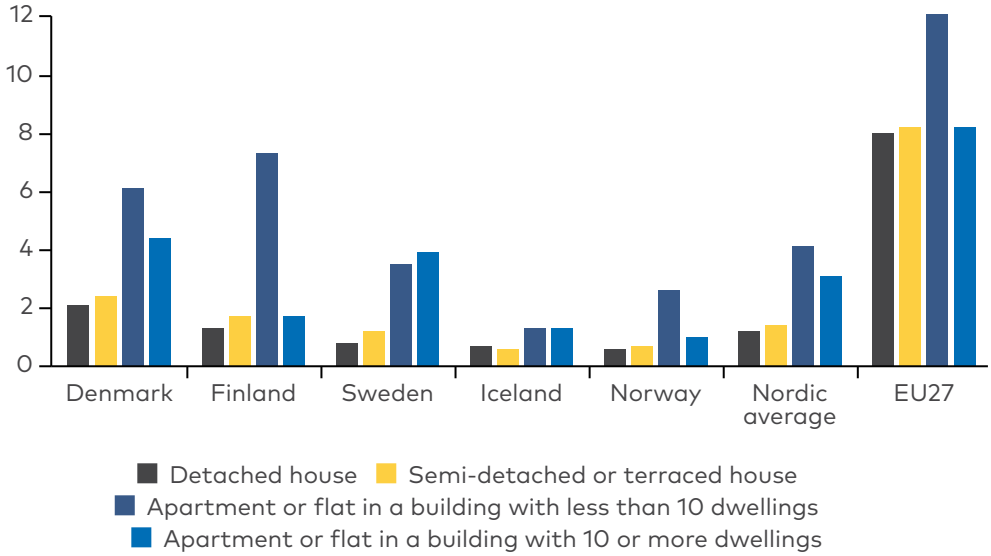
5.4 Energy poverty and living conditions

This section aims to investigate the prevalence of energy poverty associated with living conditions. The parameters considered include dwelling type, tenure status, and the presence of leak, damp or rot.

The relationship between housing stock and ability to keep dwellings warm appears to be an important dynamic. Figure 28 shows the share of individuals unable to keep their home adequately warm within each type of dwelling. The figure indicates that individuals who live in apartment buildings with less than 10 dwellings (and to some extent in apartment buildings with 10 or more dwellings) appear to be at the highest risk of being unable to keep their home warm. This result may reflect several factors. Firstly, an inability of individual owners (or renters) of apartments to renovate in order to make their dwelling more energy efficient. Secondly, there could also be a correlation with income, where lower income or single income individuals for whom it is more difficult to afford adequate heating, may be more likely to reside in apartments as opposed to houses in the Nordic countries. Thirdly, it may also reflect the rental-owner situation, where renters may be over-represented in apartments while also having smaller disposable incomes and thus less likely to be able to afford adequate heating. Fourthly, with respect to the size of the apartment blocks, small blocks with less than 10 dwellings are more at risk than larger blocks in all cases (except for in Sweden). This may reflect that larger apartment blocks are typically more recent and, as a result, better insulated than smaller apartment dwellings. Some of the oldest apartments may have such poor insulation that adequately heating them becomes challenging irrespective of the resident's income.

Irrespective of the underlying dynamic, it is an important finding that individuals living in houses have a very low risk of being unable to keep their home warm compared to individuals living in apartments. This may reflect that energy efficiency renovations are more available to individuals living in houses, and as such may stress the importance of targeting energy efficiency towards individuals living in apartments.

Figure 28. Proportion of individuals unable to keep home adequately warm by type of dwelling, SILC, 2018 (%)

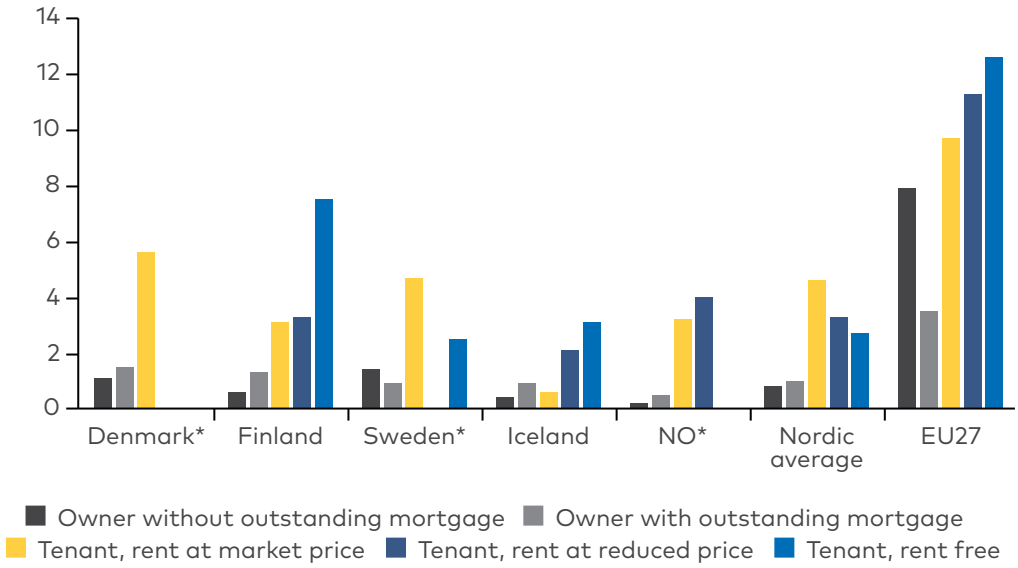


Note: "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. Germany is excluded from the EU27 average due to unavailable data on dwelling type in some years. 2018 is the latest year where data were available for all Nordic countries.

Source: JRC analysis based on Eurostat data, EU-SILC (2018)

Figure 29 below shows the indicator for ability to keep home warm in terms of individuals' tenure status. These results show a far less homogenous picture across the different Nordic countries, reflecting different (social) housing standards and regulations. For example, in Denmark, reduced rent and rent-free tenures are not reported, whilst in Sweden, reduced rate rentals are also not seen[125]. In contrast, rent-free tenures in Finland are seen to contain a very high proportion of individuals unable to keep their dwellings adequately warm. As mentioned, this seems to reflect differing housing tenure systems among the different Nordic countries. The implications are that energy poverty should be considered to a large degree in tandem with the individual countries' housing tenure systems. Across the Nordic countries, however, owners both with and without outstanding mortgage report very low shares of individuals unable to keep their home adequately warm. Again, this may correlate with latent variables such as income and competencies to implement energy efficiency improvements.

Figure 29. Proportion of individuals unable to keep home adequately warm by tenure status, SILC, 2018 (%)

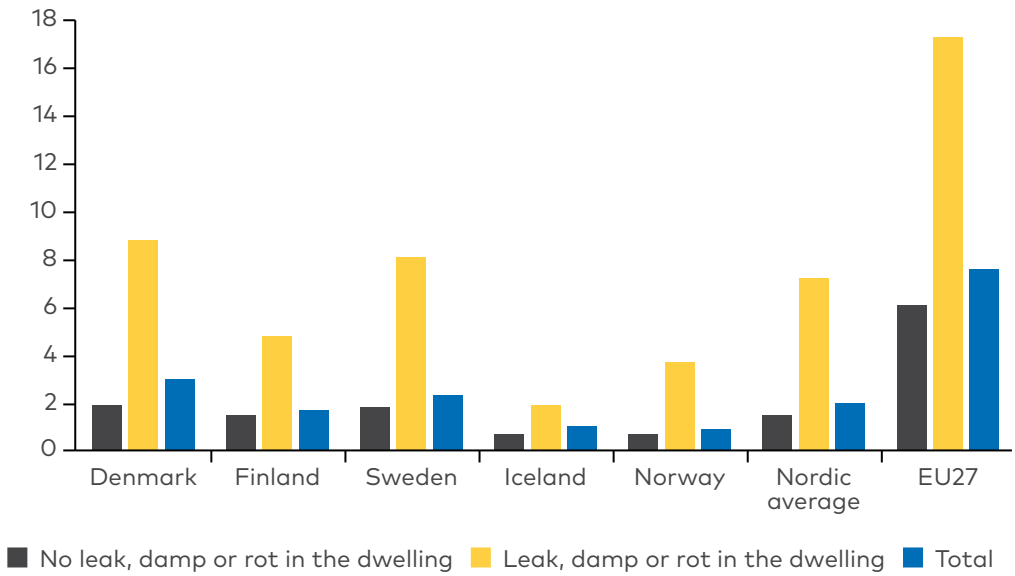


Note: *Data for tenants renting at reduced price are unavailable for DK and SE. Data for rent-free tenants are unavailable for DK and NO. "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest year where data were available for all Nordic countries.
Source: JRC analysis based on Eurostat data, EU-SILC (2018)

125. "In a situation where there is no clear distinction between a 'prevailing rent' sector and a 'reduced rent' sector, all renters would be classified as 'tenant or subtenant paying rent at prevailing or market rate'." Methodological guidelines and description of EU-SILC target variables, 2021

Finally, Figure 30 below gives an indication of how the building quality is associated with the ability to keep the dwelling adequately warm. Although it is somewhat expected that damp, leak, or rot would be correlated with the ability to keep the dwelling warm, the figure shows a very strong correlation between the two. The data indicate that the likelihood of being unable to keep the home adequately warm is 4.7 times as high when living in a dwelling with leak, damp or rot.

Figure 30. Proportion of individuals with reported inability to keep home adequately warm grouped by having leak, damp, or rot in the dwelling, SILC, 2018 (%)



Note: "Nordic average" and "EU27" refer to the average of the Nordic countries and EU Member States with available data in the given year. 2018 is the latest *year where data were available for all Nordic countries.*
Source: JRC analysis based on Eurostat data, EU-SILC (2018)

PHOTOS: ISTOCK

6. POLICY MEASURES TO REDUCE ENERGY POVERTY

This section gives a presentation of each Nordic country's approach and short-term emergency measures implemented to protect vulnerable consumers from high energy prices during the recent energy crisis. The identification of policy measures is based on previous studies, desk research, and in-depth interviews with relevant authorities and administrators.

Within this section, the short-term impacts, and in some instances the medium and long-term impacts, of the identified measures will be discussed. However, it is worth noting that few mitigation measures have been evaluated fully.

In addition to this, we will compare policy measures in the Nordic countries with measures in Germany and the Netherlands. These two countries have been chosen as they resemble the Nordic countries on some key aspects. These aspects include similar weather conditions, socioeconomic characteristics, energy sources and energy interconnectors (see section 6.6 for elaboration). The implemented measures across countries are also discussed in terms of risks and potential medium- and long-term effects.

An overview of the implemented measures is provided in table 2 below, where the key points include the following:

- All countries but Iceland implemented both measures targeted at the broader population with *price regulations* on different energy sources, *tax breaks* (lowered to the EU-minimum standard), and measures targeting the most vulnerable citizens like *social transfers* and *social energy tariffs*.
- Fewer countries implemented measures that allowed consumers to *postpone the payment* of their energy bill to a later date.
- Implementation of *subsidies for energy-efficient solutions* applies to all the countries being compared. This measure distinguishes itself from the other

measures as the aim is either 1) to lower the energy consumption in general due to e.g. better insulation or 2) to reduce the consumption of certain types of energy sources due to replacements with cheaper and more renewable sources. In most countries, the mitigation measures are/were accompanied by information campaigns, informing citizens about energy savings.

- Lastly, some countries have started developing a set of indicators to define and identify vulnerable customers.

Table 3. Implemented measures in the Nordics, Germany and the Netherlands

Country/Measures	DA	FI	IS	NO	SE	GE	NL
Price regulation (fuel, gas, electricity)	✓	✓	-	✓	✓	✓	✓
Postponement of energy bills	✓	✓	-	-	-	-	-
Tax breaks	✓	✓	-	✓	✓	✓	✓
Social energy tariffs	-	-	-	-	✓	-	-
Social transfers to vulnerable groups	✓	✓	(✓)	✓	✓	✓	✓
Subsidies for energy-efficient solutions such as heat pumps and solar panels	✓	✓	(✓)	✓	✓	✓	✓
Information campaigns and education on saving energy	✓	✓	-	✓	✓	✓	✓
Harmonised indicator set to monitor energy poverty	-	(✓)	(✓)	(✓)	(✓)	-	(✓)

Learnings and experiences from these previous policy measures will be examined in chapter 8 with respect to policy recommendations.

6.1 Denmark

During the energy crisis in 2022, Denmark implemented several measures targeting citizens who were at risk of being affected by rising energy prices, and consequently energy poverty. This contrasts with the norm, where poverty-related deprivation, including housing deprivation, is addressed through social policy (versus energy policy). Unsurprisingly, the majority of the implemented measures targeted the most vulnerable groups who had already received some type of social subsidy. In contrast, fewer measures targeted the entire population through e.g. the electricity tax reduction.

The targeted measures include *social transfers* such as a one-time payment, known as a *heating cheque*, of €807 for households with low incomes and specific types of heating. This heating-cheque was followed by several other tax-free, one-off payments to some welfare recipients with a view to providing help to these groups in the light of rising energy prices. Recipients included pensioners, students, single parents, and later, parents receiving child benefits.

Measures targeting the broader population were also implemented in Denmark. One such measure was an electricity *tax reduction*, which was lowered to the EU's minimum electricity tax threshold[126]. Furthermore, a possibility of voluntary *postponement of extra bills for energy* consumption was introduced for both households and companies. As a part of the 'heating package', the government negotiated an agreement with companies to even out heating bills (*price regulation*) as to prevent sudden shocks in payments. The package also included an agreement admitting municipalities to apply for additional compensation to cover increases in citizens' heating costs as well as strengthened information campaigns regarding energy preservation. Lastly, the Danish Energy Agency conducted a national information campaign, which in a later evaluation proved to have contributed to significant electricity and heat savings[127].

No actual evaluation of the implemented measures has been conducted to estimate the impact on the target groups' buying power. However, there was extensive public debate on the impact of some of the measures. Especially the heating cheque received some critique related to the consequences of increasing people's buying power in a time with relatively high levels of inflation. Yet, there is no evidence indicating that the one-time subsidy boosted the inflation. Also, the heating cheque received some critique as the data being used to identify the target group were not updated (BBR national data). Therefore, some non-vulnerable groups also received a cheque they technically were not eligible to receive. It is most likely that the monetary measures have an impact on buying power – especially for the most economically vulnerable citizens – in the short run, while measures related to energy efficiency will have an impact in the longer run depending on the stability and price of the new energy source.

126. National fiscal policy responses to the energy crisis (bruegel.org)
127. National energisparekampagne bidrog til markante el- og varmebesparelser | Energistyrelsen (ens.dk)

6.2 Finland

During the energy crisis in 2022-2023, several fixed term policies were introduced by the government in Finland to support households with increased energy costs in addition to existing social policies. It is estimated that the energy crisis cost Finnish households an additional five billion euros due to increased energy prices[128].

Measures targeting reductions on transport to *regulate the price* include a temporary increase in the maximum deduction for commuting expenses from €7,000 to €8,400. Later, a 7.5 percentage point reduction in the biofuel distribution obligation for 2022 and 2023 was agreed upon.

The household-focused measures encompass initiatives such as a reduction in *value-added tax on electricity* from 24% to 10% with the purpose of improving the households' purchasing power and lump-sum reimbursements for electricity expenses. Later, the government approved an amendment proposal to the Income Tax Act, temporarily incorporating tax credit provisions for household expenses associated with electricity bills. The Social Insurance Institution (Kela) also offered financial support to households that could not fully make use of the fixed-term tax credit for electricity due to their low income.[129]

Retail sellers of electricity were required to extend the payment period of consumption-related electricity bills at the customer's request from January to April 2023. The extension to the payment period for electricity bills was planned in order to help households and companies pay their electricity bills in the winter months.

Electricity cost reimbursements were paid automatically to the consumers entitled to them as a deduction to their electricity bill issued by the electricity company. The retroactive reimbursement for electricity costs was paid per metering point to those end-users whose electricity price in their electricity contract exceeded 10 cents per kilowatt-hour, and to end-consumers with spot price-based electricity contracts.[130]

The fixed term policies have been criticised for being poorly targeted, not cost-efficient, and ineffective in supporting the actual vulnerable groups at risk. For example, the measure of lowering the value-added tax was offered to everyone regardless of the risk-level of the group they belonged to. Key challenges of planning these policies were lack of time in planning, poor understanding of the groups and individuals at risk and poor availability of data due to their data being split between different systems and organisations. There are no published studies yet of the efficiency and impacts of the fixed term policies implemented in 2022-2023.

128. Finnish consumers paid €5bn extra in electricity costs last year, Yle investigation finds | Yle News | Yle
129. Energy situation and financial support for electricity (valtioneuvosto.fi)
130. Acts on retroactive reimbursement for electricity costs and extended payment periods of electricity bills enter into force next week (valtioneuvosto.fi)

6.3 Iceland

Iceland has not implemented specific policy initiatives to address energy poverty in response to the recent energy crisis, as the country has remained unaffected by the escalating energy prices stemming from the crisis (cf. chapter 5). However, residents in areas that do not have access to geothermal heating and instead heat their houses with other energy types (e.g. oil or diesel) are eligible to receive *subsidies for heating*, since it is much more expensive than heating with geothermal heat. Being disconnected from geothermal heating can thus be considered an *indicator to monitor* energy poverty. The group disconnected from district heating is estimated to constitute approx. 10% of the population in Iceland[131]. In 2002, a law was passed on subsidizing house heating costs[132]. However, subsidies for fringe areas or 'cold areas' were implemented before the energy crisis and are therefore not considered a reaction to the energy crisis in 2021-2023. Iceland also has grants that work to *promote energy efficiency* and a subsidy scheme, where VAT on heat pumps can be refunded when shifting from fossil-fuel-based heating (or electric heat)[133].

6.4 Norway

In Norway, the prevailing perspective on energy poverty assigns energy poverty to an insufficient energy supply relative to the demand level. This approach is mirrored in the increased support to energy efficiency initiatives in municipally owned rental housing, resulting in lower electricity bills for the tenants[134]. In addition to fostering the search for new and more secure energy sources to prevent future instances of energy poverty, Norway has implemented measures to alleviate its current impact on the most vulnerable citizens and the population in general.

To help households deal with extraordinary electricity prices, the Norwegian government has implemented an *energy compensation scheme* for high energy prices. When the spot price on energy within a specific hour exceeds 0.73 NOK/kWh, customers will be reimbursed 90% of the difference between the spot price and the 0.73 NOK/kWh threshold. The scheme covers household consumption of up to 5,000 kWh per month. Moreover, the general *electricity tax* was reduced by 0.8 NOK/kWh for the coldest months, January to March, which was a fee reduction by 47%[135].

Additionally, the Parliament has approved increased *social transfers* such as housing support, an exceptional grant for students, heightened assistance for widows, and increased framework grants to municipalities to address the rising costs of social assistance payments. Existing subsidy schemes for these vulnerable groups were used

131. District heating main page — Orkustofnun
132. 78/2002: Act on subsidizing heating costs
133. Use of Economic Instruments in Nordic Environmental Policy 2018-2021.
134. Regjeringens strømtiltak - regjeringen.no
135. Regjeringens strømtiltak - regjeringen.no

as a means to channel the support. The measures include increased housing allowance by a total of NOK 1.9 billion (€0.19 billion) in 2022 to alleviate the situation of high electricity prices. Students who have paid electricity in addition to their rent and who receive a loan/scholarship could apply for a one-off payment of NOK 1,500 (€294.6). The electricity grant for students was in addition to the ordinary electricity subsidy that all households with electricity expenses received. For municipalities, the economic framework was increased in 2021 by NOK 100 million and again in 2022 by NOK 300 million to cover increased social assistance payments due to high electricity prices.

Moreover, the government established an *energy efficiency subsidy scheme* in certain municipal buildings. NOK 263.7 million has been allocated to the scheme. The subsidy will be applied to measures that reduce the energy demand in municipally owned rental housing, care homes and nursing homes. By reducing electricity costs in municipally owned rental housing, the scheme will be able to benefit low-income households, among other things.

As mentioned in section 4.4.4, the Fritjof Nansen Institute (FNI) initiated a research project, "Power Poor", in collaboration with SBB, CICERO and the Centre for Development and the Environment at the University of Oslo *to define, identify and estimate the prevalence of energy poverty*.

In Norway, some research has been conducted to estimate the impact of the implemented policy measures. The research documents that the electricity allowance did reduce the utility loss for households because it reduced the price increase for the consumers. In extension, the report also shows that the consumers did continue saving energy even though they received the subsidy, which is central in a situation of scarcity. However, to the extent that the electricity subsidy leads to increased energy consumption, it will also lead to a loss of efficiency. The less households adapt their consumption as a result of the electricity allowance, the smaller this loss of efficiency for society. Thus, there are potential risks for security and again affordability if the consumer does not change behaviour[136].

136. https://www.ssb.no/energi-og-industri/energi/artikler/okonomiske-konsekvenser-av-hoye-kraftpriser-og-stromstonad/_/attachment/inline/9a39ac2d-f93a-41b4-80e2-5b38ddd7ad2b:71b9050840159e1478462581eaac6c03ebb8d40f/RAPP2022-36.pdf

6.5 Sweden

As mentioned, energy poverty is considered social policy in Sweden. This means that no policy measures at this moment are implemented to target energy poverty solely. Instead, vulnerable citizens can receive economic support from their local municipality to cover essential services within the regular social welfare scheme. During the energy crisis in the autumn and winter of 2021 and in 2022, some temporary policy measures were implemented. The policy measures were targeted towards the consumers through temporary subsidy schemes and a compensation scheme differentiated by energy zones. Moreover, a subsidy was targeted towards agricultural companies to compensate their extra costs related to electricity and transport.

Considering the broader mitigation measures, a temporary progressive *compensation* measure was implemented in January 2022 to help the most affected households. The measure targeted households with a consumption above 2,000 kWh/month. They received SEK 2,000 monthly for the three months. Later, a temporary *subsidy scheme* was implemented to support households and businesses in energy price zones in the south of Sweden (technically called SE3 and SE4). In zone SE3, the support was SEK 0.50, and in zone SE4, SEK 0.79 per kWh of electricity consumed between October 2021 and September 2022[137]. To even out the price differences and lower the prices in the south, Svenska kraftnät also plans to increase transmission capacity from northern to southern Sweden. Moreover, a temporary *tax reduction* on diesel and petrol to the lowest permitted level in EU was implemented. Finally, households can access subsidies covering 50 percent of the expenses for insulation and heat pump installation in residential structures. Meanwhile, companies and tenant-owned apartments are eligible for support, covering up to 30 percent of the costs associated with diverse energy efficiency measures.

Regarding the *social transfers* targeted a more specific target group, the housing allowance for families with children was used as a channel to elevate the subsidy temporarily from July to December 2022. The additional child allowance, constituting 25 percent of the initial housing allowance, is capped at a maximum of €128 per month. The anticipated expenditure for this measure is estimated to be €48 million.

No evaluations on the previous mitigation measures have been conducted. However, some experiences and learnings have been discussed based on these temporary measures. The electricity support scheme received some critique because it compensated those with the highest consumption (gave up to a maximum of SEK 6,000 in compensation). The initial design hit a blind spot as the reimbursement was based on consumption. Customers with fixed electricity prices (tied to long contracts with low prices) and customers in price areas in the north of Sweden with low electricity prices received as much as those most affected if they consumed above a certain level. The incentive was thus partly distorting. Consequently, there is an attention towards linking the work on energy poverty with the work that social

137. The Swedish electricity market – today and in the future (riksbank.se)

authorities do because there is an overlap between poor and/or socially vulnerable citizens and the risk of energy poverty.

6.6 EU member states

To broaden the comparison of the findings on policy measures in the Nordic countries with other relevant countries, we have selected two European countries that resemble the Nordic countries on different parameters. For this purpose, we have decided to compare the Nordic countries with the Netherlands and Germany. This section provides a summary of the implemented policy measures in Germany and the Netherlands.

Comparing the Netherlands and Germany to the Nordic countries is meaningful due to shared parameters. Firstly, similar weather patterns in Northern Europe impact energy systems in both regions. Secondly, Germany and the Netherlands mirror the diversity in country sizes found in the Nordic countries. Thirdly, personal income profiles in Germany and the Netherlands resemble those in the Nordics. Lastly, the availability of specific energy sources such as hydro, wind, or nuclear, influences responses to crises. Additionally, interconnectors between the Netherlands, Germany, and the Nordic countries indicate shared dependencies on energy sources and price flows[138].

In general, both Germany and the Netherlands earmarked and allocated a higher percentage of their GDP to households and companies to shield them from the energy crisis in the period September 2021 to January 2023[139]. Germany allocated funding equal to 4.4% of their GDP while the Netherlands allocated 4.6%. In comparison, Norway allocated 2%, Sweden allocated 1.3%, while Denmark and Finland allocated around 0.5% of their GDP[140]. Although the Nordic countries allocated a relatively smaller share of their GDP to mitigate the energy crisis compared to Germany and the Netherlands, the countries still implemented the same type of measures.

The limited allocation for addressing the impacts of increasing energy prices in the Nordics can be ascribed to the prevalent belief that the existing welfare state adequately safeguards the most vulnerable citizens.

The Netherlands

In the Netherlands, the government has implemented measures that are both targeted vulnerable citizens and companies as well as the entire population. Most of the implemented measures are related to tax regulations and price caps, and fewer measures are targeted towards vulnerable customers specifically through subsidy schemes.

138. "The Nordic Energy Trilemma" (norden.org)
139. National fiscal policy responses to the energy crisis (bruegel.org)
140. Iceland did not implement any measures due to the energy crisis.

In 2022, the government reduced the *energy tax* for households and businesses, costing €2.7 billion for household compensation and €0.5 billion for company compensation. Later on, a price cap agreement on electricity at €0.40/KWh and the freezing of gas prices at €1.45 per cubic meter for specific levels of consumption were introduced. Finally, a price cap on electricity starting in January 2023, *restricting the price* to the average from January 2022 for an average level of consumption.

An allocation of €150 million to support vulnerable households with high energy bills and poorly insulated homes through insulation-improving measures were implemented (*social transfers* and *subsidy for energy efficiencies*). At the same time, the government increased the one-off energy allowance for people around the social assistance income level to €800, along with a reduction in the VAT on energy from 21% to 9%, and a 21% cut in the excise duty on petrol and diesel. Later, one-off energy consumption benefits for vulnerable households worth €1,300 were implemented as part of an energy package.

In terms of defining energy poverty, The Ministry of Economic Affairs and Climate Policy has asked the national statistics in the Netherlands (CBS) and a research centre (TNO) to provide an up-to-date assessment of energy poverty at national and local level. In this regard, the identification of a harmonised set of indicators is in progress [141].

Germany

The German government has implemented a series of measures to address the challenges posed by rising energy prices and the impact on vulnerable consumers. Initially, there was hesitation to intervene, but subsequently several measures were implemented.

Firstly, the government announced *reductions on the price* of electricity for all citizens. Later, the government announced a comprehensive €200 billion 'economic defence shield' in September 2022, including measures like the 'gas price brake' to *reduce average gas prices* and scrapping a planned gas consumption levy, which also covered all citizens. In between the universal measures, some measures targeting more vulnerable groups were also introduced (*social transfers*). These include coverage of heating bills, including a one-off grant package of €130 million allocated to low-income households. Additionally, the government passed multiple relief packages, including *tax reductions*, increased payments for poor families with children, and subsidies for low-income households.

Finally, utility companies received financial support from the government. In July 2022, a €17 billion rescue package was provided as a help-package to the utility company Uniper. The government also announced an energy tax, allowing utility companies to pass on increased costs to consumers. Eventually, the European Commission approved a plan to recapitalize the energy company.

141. CBS and TNO map household energy poverty

6.7 Cross-cutting perspectives

In this section, we critically examine the implemented measures in the Nordics, the Netherlands and Germany. The mitigation measures are compared according to the type of mitigation measure (e.g. a green, a social or a mix), including target group/reach, as well as the incentive structure on which the measures build.

For the measures targeting the most vulnerable groups, existing welfare schemes were used to identify the groups eligible for support. For example, Germany, Norway, and Denmark implemented lump-sum payments for students. Existing schemes like child support, housing allowances, and/or social assistance were also boosted in Germany, the Netherlands, Denmark, Finland, Norway, and Sweden. These measures were implemented both to reduce the specific impact of increased energy prices on the vulnerable to act as a buffer against general inflationary impacts caused by increased energy prices throughout the economy (e.g. on the cost of food). It is noteworthy that the use of the existing welfare schemes may indicate that countries consider current welfare recipients as a good proxy for sections of society that are vulnerable to energy poverty.

However, the use of existing welfare structures has faced criticism for its effectiveness in targeting those citizens most in need of support. While increased welfare schemes have positively had an impact on economic robustness, determining the adequacy of the support in relation to energy poverty remains challenging. Additionally, within the vulnerable citizen group, varying circumstances such as distance between home and work, residency in specific energy zones, and the energy sources used can act to increase as well as to decrease vulnerability[142]. These critiques underscore the necessity for more finely meshed indicators. Therefore, there is a need to conduct regular policy evaluation to assess the effectiveness of such measures if they are to be relied upon.

For measures such as price regulation and tax breaks that have been implemented without discriminating between recipients, the entire population benefits. While providing short-term economic respite, there is a risk of feeding into inflation, especially in the context of already existing high inflation levels. Additional criticism includes concerns that these measures may encourage more energy consumption at a time when energy conservation is crucial for price stability. A study from Norway, however, found little evidence that lower prices during the energy crisis led to increased consumption[143]. It remains unclear whether this result is due to effective communication campaigns around reducing energy consumption or another dynamic – as such, it is also uncertain whether the result could be replicated in other countries. And, from a socio-economic perspective, artificially low prices on certain energy types in the medium- to long-term may diminish incentives to investment in more sustainable sources[144].

142. Preventing energy poverty | TNO
143. Økonomiske konsekvenser av høye kraftpriser og strømstønad. En empirisk studie av stønadsberettigede husholdninger, (ssb.no)
144. The Swedish electricity market – today and in the future (riksbank.se)

Subsidies for the transition to more energy-efficient solutions have also been implemented in the focus countries of this study. This approach is generally endorsed to reduce the demand burden on the energy system. Imbalances between energy demand and supply constitute a critical factor for energy prices. Consequently, addressing this imbalance through demand efficiency has a positive spill-over throughout society. Nonetheless, there are very particular challenges to be found with energy efficiency renovations. During the workshop, some concern about energy-efficiency schemes was raised. A major critique was with respect to the qualification of buildings to be included in the scheme. There is a risk that some buildings will not qualify for energy-source replacements owing to poor quality of the existing building, leading to an inability to secure financing due to high existing risks. Also, there was a concern that the most vulnerable groups might not be able to take advantage of the subsidies simply due to a lack of existing capital or resources (e.g. upfront costs, lack of knowledge, health issues, etc.).

An alternative approach to the use of existing welfare channels or policy mechanisms for support is to develop targeted indicators that either reinforce existing channels or can be used independently of existing systems. However, indicators that are more detailed also come with some risks. These include the lack of updated databases, which can lead to misleading/outdated information (like the Building and Property Register, BBR, in Denmark), and databases that do not cover all households/citizens (like in Sweden where some households' energy costs are included in the rent).

PHOTOS: ISTOCK

7. PERSPECTIVES FOR FUTURE WORK WITH ENERGY POVERTY IN THE NORDICS

As described in previous chapters, the Nordic countries have initiated the work on energy poverty. Although the ministries, agencies, industry organisations, utility regulators and other stakeholders involved, are awaiting a ready political direction on the implementation of the revised energy efficiency directive, some work has already been done. The initial work has also kick-started some considerations about what future work paths for energy poverty in the Nordics could look like. Future perspectives on energy poverty have been discussed in a virtual workshop where actors from different sectors across the Nordics participated.

In the following sections, perspectives for the implementation of the revised energy efficiency directive in terms of energy poverty are outlined. Specifically, this chapter includes perspectives on:

- Implementation of the revised energy efficiency directive
- Anchorage
- Indicators and data
- Reach and moving from measurement to action

7.1 Implementation of the revised energy efficiency directive

As described in section 4.3, the revised Energy Efficiency Directive (2023) poses requirements on Member States. This includes a requirement to achieve energy savings for a defined target group including people in energy poverty (EED Art. 8.3). The achieved end-use savings from policy measures directed at these specific groups must match the percentage of households experiencing energy poverty. For example, if "*a Member State reports that 10% of its population is in energy poverty, 10% of the cumulative end-use Energy Savings Obligation should be delivered among the defined energy poor groups*"[145].

Box 4 provides three recommendations for implementing the new Energy Efficiency Directive at a national level provided by The Industry Coalition for Energy Savings.

Box 4. Excerpt from policy brief: Implementing the new Energy Efficiency Directive to alleviate energy poverty[146]

MAIN ENERGY EFFICIENCY SUPPORT TO ENERGY POOR HOUSEHOLDS

- Introduction of the first European narrative **definition of energy poverty** (Article 2)
- Introduction of a **mandatory share of energy savings** to be achieved amongst energy poor households (Article 8)
- Introduction of a new article (22) requiring that **energy poor households be prioritised** in energy efficiency, consumer protection, and information measures. It also requires that Member States establish a **cross-sectoral network of experts** to support energy poverty alleviation policy making.

145. The new 2023 Energy Efficiency Directive - Guidance and recommendations for national planning and implementation. The Coalition for Energy Savings. 2023.
146. EED Briefing_Implementing_the_new_Energy_Efficiency_Directive_to_alleviate_energy_poverty_FINAL.pdf (socialwatt.eu)

Eventually, the chosen definition of energy poverty has implications for the required delivery of end-use energy savings at the national level. Depending on the percentage of the population included in the target population, a corresponding percentage of the cumulative end-use *Energy Savings Obligation*[147] should be obtained through measures targeting that group. This means that a set of criteria needs to be established to determine a target group that policy measures can be targeted towards.

Perspectives for the future implementation of the energy efficiency directive were discussed during a workshop with various stakeholders from the Nordic countries as well as representatives from relevant European organs (e.g. DG Ener, EPAH). In this context, it was emphasised by participating actors that the Nordic countries have distinct starting points for implementing the directive as EU Member States are obligated to do so, while third countries are not bound by such commitments. In general, it was emphasised that it is unfamiliar to specify a certain kind of vulnerability in the Nordics. Workshop discussions revealed concerns about potential double subsidising due to existing social support systems. Furthermore, there were concerns raised about the achievability of the energy savings obligation based on national definitions. This is particularly relevant when the defined group of energy poor individuals already consumes a minimal amount of energy. Consequently, it is crucial to identify the purpose of a definition on energy poverty and how it should align with other vulnerabilities to guide appropriate subsidy schemes and communication strategies.

In this section, we delineate the key perspectives integral to the forthcoming implementation, which was highlighted during the workshop discussions, with a particular focus on aspects related to anchoring, data, and reach. However, it is important to emphasise that it is key to formulate a national political decision and wording of the directive's implementation due to its complexity. This complexity makes it challenging to present more specific scenarios at this point.

7.1.1 Anchorage

An initial step in implementing the Energy Efficiency Directive involves defining the directive's purpose within the context of each country. In this context, it is relevant to consider the impact of upcoming directives, including how they can be aligned, as these will also influence national policies, such as the Electricity Market Directive. During interviews and the workshop, discussions have centred on whether the directive aims to mitigate the impact of rising energy prices for the most vulnerable citizens, whether the directive focuses on enhancing energy efficiency to prevent future shortages or both. Decisions regarding the political intent behind the directive and the subsequent definition of energy poverty will determine the appropriate anchoring ministry or agency (e.g. Ministry of Social Affairs, Ministry of Energy and Supply). The different approaches to grasp energy poverty are visualised in Figure 31.

147. Energy efficiency directive - European Commission (europa.eu)

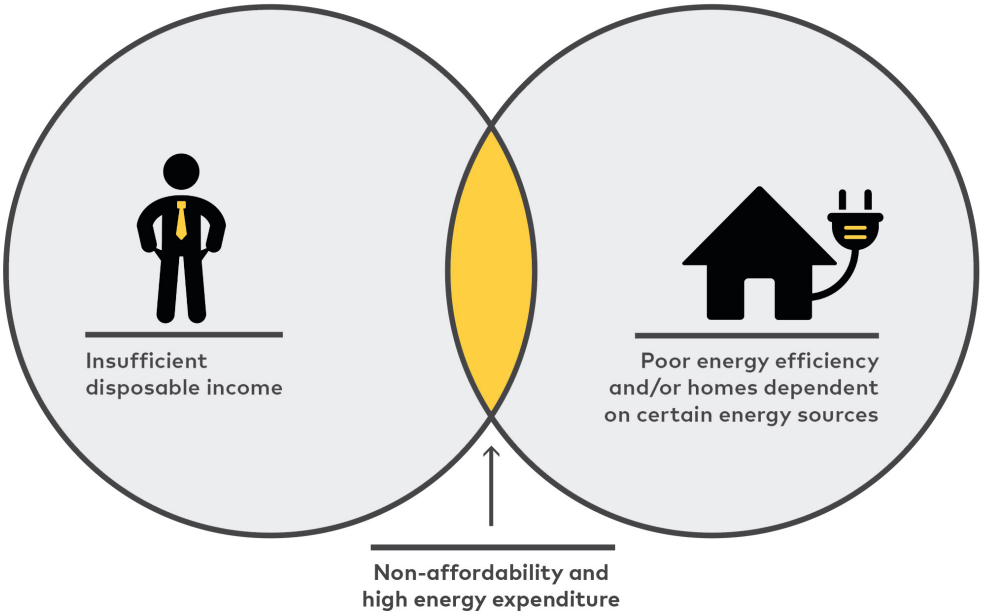


Figure 31. Illustration of different perspectives in energy poverty

Some actors assert that the root cause of higher energy prices lies in energy scarcity, emphasizing the need for a more efficient energy supply. Others argue that the energy crisis exposes gaps in their social welfare schemes, prompting the need for a more robust safety net. Additionally, some actors contend that a clear definition of energy poverty would facilitate the identification of citizens that may require greater support for their energy bills in the short-term and/or energy efficiency support in the longer term. These diverse perspectives highlight the varying considerations and political purposes when implementing the directive. This indicates that the first crucial step is to make a political determination of the directive's purpose and subsequently anchor it within the appropriate ministry and agency. Moreover, adequate cross-sectorial collaboration is key, given that certain organisations or units have the best overview of vulnerable groups.

7.1.2 Indicators and data

Upon defining the purpose of implementing the directive, the subsequent focus shifts towards identifying an appropriate threshold for energy poverty and estimating the prevalence of energy poverty – be it an affordability or energy efficiency focus – along with relevant indicators and data. When debating which indicators are most suitable to measure energy poverty, different scenarios have been discussed in interviews and in the workshop.

For some actors, it is key to have a Nordic collaboration and to share experiences on the identification of the most cost-effective indicators and variables in order to support a sustainable strategy for the implementation. This collaboration should focus on identifying appropriate indicators that support the understanding of the prevalence and the character of energy poverty, as well as sharing experiences, and on examining operational systems that align with multiple EU directives addressing energy poverty. However, it has been emphasised that quantitative variables present challenges when compared, especially across Europe. Despite the harmonized measurements of EU-SILC, it may not necessarily be the most optimal source due to data availability across countries as well as country-contextual differences like diverse energy sources, geographical and demographical structures, which influence the individual's opportunities. For this reason, some of the indicators, as suggested by the revised energy efficiency directive, receives some criticism as they might over- or underestimate the severity of energy poverty (see section 4.5 and chapter 5 for a discussion on indicators). Finally, the suggested indicators are based on sample-based survey-data and therefore do not by themselves identify a target population of reachable individuals, which will complicate the subsequent policy implementation.

Several actors advocate for registry-based indicators over subjective ones. The concern is that individual preferences influence the perception of e.g. being adequately warm. Instead, they argue that one must establish a fine-meshed set of indicators based on national data combined with survey data to achieve higher precision. Despite the critique of indicators having a subjective nature, these indicators have also been highlighted as crucial in the work of identifying energy poverty. Subjective measures are acknowledged as important, prompting countries to supplement with quantitative data from national sources. It is argued that qualitative investigations can discover energy poverty that would not have been identified solely by the use of quantitative data. In this regard, it is especially hidden poverty as expressed by the prioritisation and deprivation in households that can be identified. Also, lack of resources to serve advanced technology like a heat pump or to understand guidance and information campaigns can be identified through a qualitative approach.

Triangulation of data and consideration of various indicators and variables are crucial for a comprehensive understanding of the prevalence, the covariance between indicators and general character of energy poverty. Lack of precise data may affect the accuracy of any support programmes. When triangulating data sources, collaboration with energy suppliers can be pivotal to access the data needed. In this regard, utility companies express a concern in relation to GDPR-related matters.

7.1.3 Transition to policy implementation

As mentioned, the chosen definition of energy poverty leads to certain energy savings obligations. Consequently, the initial steps of defining the political purpose, anchoring the directive, diagnosing the national level of energy poverty and obtaining the right indicators, must be followed by a practical dimension of reaching the target groups with corresponding policy measures to meet these obligations. Due to these obligations, it has been questioned what definitions the directive incites.

Interviews with Nordic stakeholders and discussions at the virtual workshop highlight the need for frameworks to reach relevant target groups at the right stage in terms of intervention. In other words, how does the identification of energy poverty translate into specific regulation and interventions to make a real difference for the desired target population, and how can authorities communicate with this target group.

Specific examples of measures that might be difficult to communicate to the most relevant target groups are support schemes for heat pumps or energy retrofitting that generally are highly relevant for energy poor households with high energy expenditures due to expensive heating sources or low energy efficiency. However, insights from interviews indicate that it can be difficult for the most vulnerable groups to find and take advantage of these types of initiatives. In addition, economic as well as demographic structures can delimit citizens' opportunities to take advantage of these initiatives. Although the variables behind these schemes exist, they might not reach nor help the most relevant target groups.

Another example is the disconnections of electricity, where it can be difficult to know whether not paying the bill is an expression of energy poverty, relocation, or something else. This requires the grid companies to have knowledge of end-users or to collaborate with social authorities to be able to properly confirm energy poverty and act accordingly.

To conclude, this suggests that acquiring a comprehensive understanding of effective strategies for the implementation of the directive is crucial to make it a success.

PHOTOS: ISTOCK

8. POLICY RECOMMENDATIONS

This chapter synthesises the knowledge and learnings throughout the report on how best to tackle energy poverty in a Nordic context while promoting climate targets. This chapter includes a set of guiding recommendations and attention points regarding the future work on energy poverty in the Nordic countries. Depending on how the revised Energy Efficiency Directive is implemented at the national level, various actors will be the focus of the following policy recommendations, which are elaborated upon in four distinct themes:

Develop a clear and shared definition of energy poverty:

- **Clarify how to understand and work with energy poverty in continuation of the implementation of the energy efficiency directive, the electricity market directive and the regulation of the Social Climate Fund.** A stronger and shared understanding of energy poverty at the national level in the Nordics strengthens national efforts, particularly in determining focal points for the implementation of the revised energy efficiency directive. This includes balancing affordability and other social considerations, energy efficiency, as well as energy security.
- **Initiate national work to interpret and translate recently provided EU guidance** in the Nordic context. Be aware of differences across national contexts that might generate a need for national targeting.

Develop a set of indicators to reflect the multidimensional concept of energy poverty – at national and Nordic level:

- **Select a set of indicators to mirror the local context and its complexity.** That will include data accessibility as well as barriers in terms of data access and rights that might hamper policy measures aimed at tackling energy poverty. Moreover, triangulation of indicators is necessary since one-dimensional indicators are generally flawed, and energy poverty is a multidimensional problem with many nuances. The defining indicators should be based on a bottom-up approach where in-depth data validate the relevance of indicators. Data from indicators should be used to develop effective and targeted measures to prevent and mitigate energy poverty.
- **Indicators need to be supplemented by more in-depth data.** While indicators can serve a purpose in terms of international comparison and assessment at an overall level, there is a need for more in-depth approaches to complement the overarching numbers and support targeting and reach of policy measures.
- **Consider using and establishing national data** to supplement or replace EU indicators. The Nordic countries gather detailed administrative data on individual and household level that potentially can be used to create more nuanced indicators and identification.

Establish a clear governance structure:

- **Responsibility for the implementation of energy poverty should be clearly anchored in one governmental department,** selected with respect to local challenges and ambitions. The anchoring supports the clarification of roles and responsibilities.
- **Due to the multidimensional nature of energy poverty, there is a need to establish collaboration across different departments** and combining areas of expertise is necessary. This approach aims to reach target groups and ensure a comprehensive, holistic understanding of the complexities and multidimensionality of the problem.
- **Nordic collaboration can help further work on energy poverty** in each of the Nordic countries. Although the countries differ somewhat, they face similar challenges regarding their work with energy poverty and can benefit from mutual knowledge-sharing. A shared Nordic perspective, allowing for local nuances, coupled with a cross-comparative methodology and a dedicated platform for knowledge exchange in the Nordics support the implementation.

Strengthened knowledge about what works:

- **Establish more knowledge on how different measures work** and what impact they have on different target groups. The effectiveness of mitigation measures varies among different target groups, highlighting the need for more tailored solutions. Renovation can benefit low-quality housing, especially for certain groups. However, households with low energy consumption may find monetary subsidies more helpful than renovation measures.
- **Establish an understanding of whether the 'full package' of applied measures adequately reflects and addresses challenges and needs** in your country in relation to energy poverty as well as the broader social efforts. There is a need, among other considerations, to distinguish between short-term emergency measures and initiatives aimed at addressing the root causes of energy poverty [148]. While emergency policy measures have served as temporary stabilisers in a time of energy crisis, the focus would benefit from shifting towards policies aimed at tackling energy poverty while being aligned with medium- and long-term climate and energy goals. Given the recent years' energy crisis, this might require policy evaluation and increased focus on mistargeting and adverse incentive structures.
- **Share lessons learned across the Nordics to build more knowledge.** This study has highlighted a need for more knowledge about how energy poverty can be interpreted, its implications for estimating prevalence, and consequently, the identification of the most effective mitigation measures for specific target groups. Various actors from different sectors across the Nordics emphasize the need for shared knowledge to support the national implementation.

148. U 2023 COM recommendation (C/2023/4080). https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=OJ:L_202302407 (Addressing root causes, Section II).

9. APPENDIX

9.1 Organisations participating in the qualitative data collection

The table below lists the organisations participating in interviews and/or the virtual workshop. The study does not necessarily reflect the opinions of the contributing organisations and should not be interpreted as a formal contribution to the political discussion from the organisations listed below.).

Name of organisation	Country / Institution
Danish Ministry of Climate, Energy and Utilities	Denmark
Danish Energy Agency	Denmark
Energiforetagen (industry organisation)	Sweden
Energimarknadsinspeksjonen (utility regulator)	Sweden
Energy authority (Energiavrasto)	Finland
Finnish Energy (Energiateollisuus, Gaia)	Finland
Gaia	Finland
Ålands elandelslag Ab	Åland Islands
Fornybar Norge	Norway
Fridtjof Nansen Institute	Norway
The Norwegian Energy Regulatory Authority	Norway
The Norwegian Water Resources and Energy Directorate	Norway

Samorka, Icelandic sector association	Iceland
Ministry of the Environment, Energy and Climate	Iceland
Energy Poverty Advisory Hub (EPAH)	European Commission
DG ENER	European Commission
Bank of Italy	Italy

ABOUT THIS PUBLICATION

Energy poverty in the Nordic countries

http://doi.org/10.6027/NER2024-02

Cover photo: iStock
Layout: Mette Agger Tang

Published: March 2024

ACKNOWLEDGEMENTS

This publication was funded by the Nordic Council of Ministers. Nordic Energy Research, which operates the Secretariat of the Nordic Electricity Markets Group (EMG), a working group under the Nordic Council of Ministers, coordinated this report. Andrea Stengel at Nordic Energy Research was the coordinator of the project.

Ramboll Consultancy was commissioned to perform this study by Nordic Energy Research on behalf of the Nordic Electricity Market Group.

Our gratitude extends to the European Joint Research Centre for permitting the use of their statistics on the issue.

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Proofreading
The report was proofread by Pia Sander, Sprog & Web, Denmark.

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