Tackling energy poverty: learning from the experience in 10 European countries

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Abstract

Before the COVID-19 outbreaks in 2020, more than 30 million Europeans could not afford to heat their home sufficiently. A strong increase in the number of households at risk of energy poverty is feared, as many face a decrease in their revenues while spending more time at home. By publishing a recommendation (C(2020) 9600 final) in October 2020, the European Commission (EC) highlighted that "energy poverty is a major challenge for the EU", acknowledging the multiple benefits of tackling energy poverty at individual (e.g. improved comfort and wellbeing) and society's (e.g. lower health expenses, reduced air pollution) level.

This paper presents the main findings from a recent study commissioned by ONPE (French observatory on energy poverty) to analyse how 10 European countries have addressed energy poverty, looking at the stakeholders involved, indicators used for monitoring, policy measures in place and about 40 good practices identified at regional or local level.

The paper first summarizes the common aspects and differences observed among the 10 countries, in the way to define and monitor energy poverty (e.g., (non-)adoption of an official definition, diversity in the national indicators, development of national observatories), as well as in the policies tackling energy poverty (e.g., dedicated schemes or specific provisions in broader renovation programmes).

Then the paper raises the challenge to define and identify best practices and illustrates the diversity of regional and local initiatives tackling energy poverty. Final discussions highlight issues emerging from the study.

Introduction

The acknowledgment of energy poverty-relevant challenges in European Union (EU) activities can be traced back to 2001, although the issue only received legal recognition in the Third Energy Package[1] in 2009. During the last 10 years there has been a shift in European policy on the issue, resulting in multiple studies, reports and strategic documents sponsored by the European Commission and the European Parliament. At the same time, various energy poverty-targeted projects have been implemented at the European and Member State level.

Still, it was only at the end of 2019, with the completion of the 'Clean Energy for all Europeans' Package[2], that the energy poverty became a policy priority at the EU level. The Package requires 'appropriate' action by EU countries, to tackle energy poverty where its presence has been identified. The EC further increased its ambition to tackle energy poverty and support EU policy action at the Member State level through the Recommendation on energy poverty (EU) 2020/1563, published as part of the wider Renovation Wave package. The Renovation Wave itself commits to the mobilization of renovation strategies as a mechanism to address energy poverty and improve housing conditions for all households. This approach has increased the focus on housing improvement in EU energy pov-

1. https://ec.europa.eu/energy/topics/markets-and-consumers/market-legislation/third-energy-package_en

2. https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

erty policy, giving additional prominence to bodies in related sectors, such as the Building Stock Observatory, the Horizon Europe Mission on Cities and the EU Covenant of Mayors Office.

Before the COVID-19 outbreaks in 2020, more than 30 million Europeans could not afford to heat their home sufficiently. A strong increase in the number of households at risk of energy poverty is feared, as many households face a decrease in their revenues while spending more time at home. It is still too early to get validated statistics to assess quantitatively the impacts that the current crisis has on the energy poverty situation in Europe. Measures are needed on short term to face the current emergency (see e.g., Bouzarovski *et al.* 2020), but also through structural approaches to tackle energy poverty on a longer run.

This paper presents the main findings from a recent study to analyse how 10 European countries have addressed energy poverty, looking at the stakeholders involved, indicators used for monitoring, policy measures in place and about 40 good practices identified at regional or local level.

After a brief presentation of the objectives and methodology of the study, the paper summarizes the common aspects and differences observed among the 10 countries. Then it discusses the challenge to define and identify 'good practices' and illustrates the diversity of approaches used to tackle energy poverty through a selection of cases, with a focus on those related to energy efficiency and accompanying measures.

The conclusion builds on the current trends, showing an advancing knowledge of the various dimensions of energy poverty that might not always be reflected in policy design and implementation.

Objectives and methodology of the study

CONTEXT AND OBJECTIVES

Created in 2011 following the French environment law named Grenelle II, the French Observatory on Energy Poverty (ONPE) is chaired and coordinated by ADEME (French agency for ecological transition) and gathers 29 partners including the State, the national Energy Ombudsman, associations of public authorities, the main energy companies, the National Agency for Improving Housing (ANAH), NGOs and other stakeholders. Its main objectives are to get a shared, reliable and documented knowledge on energy poverty related to housing and mobility. Its missions are to gather, process and produce data, to lead debates and disseminate information and works on energy poverty, for all kinds of stakeholders.

ONPE activities are organised with 5 thematic working groups, including one dealing with issues and exchanges at European level. The scope of this working group includes sharing information and updates on European legislations and communications, relevant European projects (e.g., from the Horizon 2020 programme), exchanges with European experts. In October 2020, the working group has launched a benchmark on good practices about policies and measures to tackle energy poverty in Europe on which this article is based.

This study aimed at producing a brochure gathering the most up-to-date available information from 10 European countries selected for their relevancy on energy poverty issues (especially if they have a dedicated national observatory or regular publications of energy poverty trends) and providing a diversity of context and approaches to tackle energy poverty. The main objective was to provide French and European stakeholders involved in the energy poverty field with informative syntheses on each country, with a focus on analysing the context, governance and types of policies and measures tackling energy poverty. These country factsheets were thus meant to be complementary to the ones prepared earlier by the European Energy Poverty Observatory (EPOV) that had a focus on statistics (see EPOV 2020). The factsheets are put together in a brochure enabling a dynamic approach, making it easy to add further countries or updates. The files will be available on the ONPE website[3], with a French and an English versions, and includes annexes briefly explaining the methodology, definitions, etc. and documenting all the sources used to prepare the factsheets.

METHODOLOGY

This study was not meant to be an in-depth cross-country comparison analysis to detect policies and measures that could be relevant to be considered for France. However, providing a full and concise picture of the reality of energy poverty and related policies and measures in various countries favours experience sharing and provides a basis for more detailed analyses and exchanges. We selected four main topics to form these overviews, each topic being summarized in one page: 1) context and governance; 2) indicators and trends; 3) main national policies and measures; 4) best practices (with a focus on local initiatives and projects).

The distinction between points 3 and 4 is of great importance for us because experience shows that local initiatives can be more original and voluntarist than national policies (as also investigated by Creutzfeldt *et al.* 2020). Compared to other benchmarks, another important point is that our selection of best practices is based on a plurality of know-how and experience among the ONPE members representing different viewpoints. Likewise, the authors of the benchmark combine policy implementers, academic researchers and consultants.

The scope of the study was focused on energy poverty related housing. When information about measures on energy poverty related to mobility could be found, it was included in the factsheets. But no specific search was done on this. The research on energy poverty related to mobility is developing (see e.g., Bouzarovski et al. 2021; Martiskainen et al. 2021; Robinson and Mattioli 2020). However, it is rarely encompassed in current definitions of energy poverty used by the European countries, nor in the official indicators used to assess and monitor energy poverty. Subsequently, the measures tackling energy poverty related to mobility remain rare, especially at national level.

The first step was to gather information and data for each country, using official sources (e.g., National Energy and Climate Plans, websites and publications of ministries and public agencies), databases and reviews of policies and measures (e.g., EPOV database[4]; MURE[5]; Ecoserveis 2017; Ugarte *et al.* 2016), reports on energy poverty in the countries covered by the study

3. https://onpe.org/ailleurs/europe

4. https://www.energypoverty.eu/policies-measures

5. https://www.measures.odyssee-mure.eu/

Table 1. National official or implicit definitions of energy poverty.

State	Definition
France	"*are in situation of energy poverty* […] *persons who experiences in their dwelling particular difficulties to have the energy supply necessary to meet their basic needs because of the unsuitability of their resources or housing conditions*" (Environmental Law Grenelle II, 2010)
Italy	"*difficulty for buying a minimum basket of energy goods and services, or condition where access to energy services implies a diversion of resources (in terms of expenditure or income) higher than socially acceptable*" (National energy strategy, 2017)
Romania	"*impossibility of the vulnerable consumer to meet their minimum energy needs for the optimal heating of the home during the cold season*" (Law on the minimum inclusion income, 2016)
Spain	"*situation where a household is found where the basic needs for energy supplies cannot be met, as a result of an insufficient level of income and may, where appropriate, be aggravated by the availability of inefficient housing in energy*" (National energy poverty strategy, 2019)
United Kingdom	"*fuel poverty is expressed in the form of a person* [who] *is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost*" (Warm Homes and Energy Conservation Act, 2000)

or specific searches (see full list of sources in the documentation annex of the brochure).

The second step was to select the main information and national policies, as well as the best practices to be highlighted in the last page of each country factsheet. We made a pre-selection and first draft of the factsheet that was then submitted for comments to experts in each of the country, to ensure the information was up-to-date and not missing any important point. In parallel, data were processed from Eurostat and the EU-SILC survey[6] to provide harmonized indicators for one part of the page on indicators and trends, which was complemented by trend analysis and data from national indicators.

The factsheets were finally discussed with the members of the ONPE working groups for a last quality check (especially about consistency among the factsheets) and validation, before translation and publishing.

Overview of how energy poverty is tackled in the 10 countries

DEFINITIONS AND INDICATORS

A single, explicit definition of energy poverty at the European level does not exist. However, the European Commission (EC)'s website[7] highlights that the condition is often understood as the 'inability to keep the home adequately warm', pointing to the French definition (see Table 1). In the Governance Regulation of the Energy Union (Article 26), energy poverty is interpreted in the context of 'necessary domestic energy services needed to guarantee basic standards of living in the relevant national context'. EPOV[8] stated that energy poverty occurs when a household suffers from a lack of adequate energy services in the home. The EC has provided a similar recommendation as EPOV.

3 of the 10 States analysed have adopted an official definition (France, Spain and United Kingdom). 2 States have an implicit definition (Italy and Romania), i.e. a definition included in an official document but not legally recognised. 2 States are discussing the adoption of an official definition (Greece, Poland). The 3 remaining States have no official nor implicit definition of energy poverty (Belgium, Bulgaria and Germany).

Except for Romania, countries with an official or implicit definition have complemented them with indicators providing national authorities, agencies or observatories with a practical basis to assess energy poverty, monitor trends and sometimes set targets on reducing energy poverty. Two other countries have also adopted official indicators (Belgium and Greece). Table 2 presents a categorization of these indicators. As each nation of UK has adopted distinct indicators, the four UK nations appear separately in this table.

Official or implicit definitions of energy poverty reflect a similar general concept related to the capacity of meeting basic needs (sometimes with a focus on space heating, i.e. keeping homes warm enough). The national specificities arise in the details of criteria and threshold values used to set the national indicators. Analysing these specificities go beyond the scope of our study. For more discussions on indicators, see for example (Castaño-Rosa et al. 2019; Sareen et al. 2020).

NATIONAL OBSERVATORIES, STATISTICS, OR STUDIES

4 of the 10 countries have a national observatory (or alike) dedicated to energy poverty:

- **Belgium**: the national Platform Against Energy Poverty, created in 2015, is a working group hosted by the King Baudoin foundation[9] and gathering various stakeholders involved in the field. Its objectives are to assess energy poverty in Belgium, identify and disseminate good practices, carry out at least one coordinated action per year and formulate recommendations. It publishes an annual barometer focused on the trends in the national indicators of energy poverty and related drivers, with detailed analyses of national and regional data.
- **France**: ONPE, created in 2011 (see introduction above) publishes an annual dashboard on energy poverty, prepared by ADEME together with the partners of the observatory, including trends and latest updates of the energy poverty indicators and contextual indicators, as well as summaries

6. European Union Statistics on Income and Living Conditions

7. https://ec.europa.eu/energy/eu-buildings-factsheets-topics-tree/energy-poverty_en

8. https://www.energypoverty.eu/

9. https://www.kbs-frb.be/fr/Activities/Publications/2020/20200323NT

Table 2. Categorization of the national indicators used to officially assess energy poverty.

Type of indicator	Belgium	France	Greece	Italy	Spain	England	Northern Ireland	Scotland	Wales
Threshold on ratios [energy expenses/ disposable income]			X				X		X
Combined thresholds on low income and high energy expenses	X	X		X	X			X	
Combined thresholds on low income and low energy efficiency of home						X			
Inability to keep homes warm	X	X			X				
Restrictions in the use of heating (e.g., too low heating consumption)	X		X	X	X				
Energy poverty gap						X		X	
Bill arrears					X				

on the main policies and measures tackling energy poverty. ONPE has its own website[10] with various resources, including factsheets on successful local initiatives, a library of studies and reports, mapping tools, etc. ONPE also organises events on energy poverty.

- **Greece**: the Greek Observatory on Energy Poverty, created in 2014, is administered by CRES (Greek energy agency) with the missions to inform both the citizens and decision-makers about energy poverty, by assessing energy poverty levels and trends, identifying the related drivers, and providing information for the design and implementation of policy measures to tackle energy poverty. The work of the observatory has supported the development of the National Action Plan for the alleviation of energy poverty. It has a dedicated space[11] on CRES website where users can find data on energy poverty in Greece (national and regional data).
- **Italy**: the Italian Observatory on Energy Poverty (OIPE), created in 2019, is coordinated by the University of Padua and gathers 54 members (members being persons, not organisations), including researchers, experts from public and private organisations and associations. Its objectives are to develop research and networking on energy poverty, gather and produce data, disseminate information, and organise events. It publishes an annual report including detailed analyses on energy poverty indicators, regional variations and specific issues (e.g. energy poverty related to mobility, energy poverty faced by migrants), and research of approaches to tackle energy poverty. The OIPE has its own website[12] including its publications and news.

In addition to these four countries with a dedicated observatory, two States publish a detailed annual report with statistics and trend analysis about energy poverty (Spain since 2019 and UK for two decades).

No source of regularly updated information on energy poverty could be found about the four remaining countries (Bulgaria, Germany, Poland and Romania). However, studies done by researchers provide an analysis of the context and an assessment of energy poverty at a point in time. See for example (Lenz and Grgurev 2017) about Bulgaria and Romania, (Schreiner 2015) about Germany, and (Sokołowski et al. 2019) about Poland.

Research and studies on energy poverty have developed in the last ten years. The data availability has also been improved by the creation of national observatories, or the practice of regular publications. However, there is a discrepancy between frontrunners (e.g., UK and France) and countries where the official approach does not distinguish energy poverty from poverty (e.g., Germany).

Moreover, among the sources identified about regularly updated information, only the ONPE dashboard includes data on the outputs from policies and measures tackling energy poverty.

SIMILARITIES AND DIFFERENCES IN THE POLICY APPROACHES AND EXPERIENCE ABOUT ENERGY POVERTY

Bulgaria and **Germany** have not adopted any definition nor indicator for energy poverty. Similarly, their social and energy legislations do not explicitly mention any energy poverty issue. In practice, energy poverty issues are mostly addressed by policies and regulations to protect vulnerable consumers or policies tackling poverty in general, without considering that energy poverty would require a specific approach.

The **Romanian** law on the minimum inclusion income includes an implicit definition of energy poverty (see Table 1), and the proposed Romanian Energy Strategy 2020–2030 includes among its objectives the protection of vulnerable consumers and the reduction of energy poverty. However, in practice so far, the general policy approach in this field does not include policy measures specific to energy poverty.

The National Energy Strategy of **Italy** addresses specifically the energy poverty topic, with an implicit definition and an indicator to assess the phenomenon. Moreover, the Italian NECP mentions the objectives to limit the rate of households at risk of energy poverty to a range between 7 to 8 %, while this rate was

10. https://onpe.org/ailleurs/europe
11. http://www.cres.gr/energy-efficiency/poverty.html
12. http://oipeosservatorio.it/en/home-en/

slightly increasing before COVID (8.6 % in 2016, 8.7 % in 2017 and 8.8 % in 2018). The NECP also mentioned that the aids to help low income households cover their energy expenses should be reinforced and made more effective (rate of use about 30 to 35 % among the eligible households). Up to now, the energy efficiency policies do not include social criteria (as part of the eligibility criteria or to adapt grant rates for example).

Poland has not yet adopted an official definition of energy poverty. But the Polish government has included from 2017 an inter-ministerial team to address the energy poverty issue. The aids for energy remain limited. However, the Clean Air programme includes the Stop Smog programme that is specially targeted on energy poor households living in individual households with heating from solid fuels. It provides them with subsidies for replacing their heating systems and the thermal retrofitting of buildings. The grant rates depend on income thresholds.

Energy poverty is explicitly recognised by **Spain** as an issue, with a national strategy to tackle energy poverty adopted by the government in April 2019, including an official definition and a detailed assessment. Policy measures to tackle energy poverty have been reinforced in the recent years. The social tariff for electricity has been replaced in 2017 with a direct payment (social voucher for electricity), complemented from 2019 with a social voucher for "thermal energy" (to help covering expenses related to space heating, domestic hot water and cooking). The main programme to improve the energy efficiency of dwellings PAREER II now includes social criteria for part of the additional grant rate for renovation works.

Energy poverty is also well recognised in **Greece**. However, the preparation of a National Action Plan for the alleviation of energy poverty initiated in 2015 has not yet been completed by the time we write this paper. Likewise, the official definition of energy poverty is not yet adopted. Improvements of the aids of energy are under consideration. There is no energy efficiency measures fully dedicated to energy poverty, but the main energy efficiency schemes for households do include a social dimension (bonus factor for actions in low income households for the Energy Efficiency Obligation Scheme, and grant rates depending on income levels for the main renovation programme).

Belgium, **France** and **UK** have a longer experience in the implementation of policies and measures to tackle energy poverty, including both aids for energy and energy efficiency policy measures specifically tackling energy poverty or with a strong social dimension. These energy efficiency programmes are done by the Regions in Belgium and by each nation in the UK.

OVERVIEW OF THE AIDS FOR ENERGY

All 10 States analysed in our study have some kind of aids to help low-income households with energy expenses. The full list of aids of energy included in the country factsheets can be found in the annex (Table 6).

Spain (in 2017) and France (in 2018) have replaced their former social tariffs with direct payments. Direct payments are therefore now the dominant approach for the sample of countries we analysed. Social tariffs are mostly used for electricity.

In addition to the measures listed in Table 3, Italy implements tax reductions on the first 150 kWh per month for households and on fuels for heating in Sardinia and in the small islands and mountains areas. A tariff cap is implemented in UK since 2019. France, Greece, Italy, Spain and UK implement measures to protect vulnerable consumers from disconnections or provide aids for reconnections, mostly for electricity.

Our review of the aids for energy does not pretend to be exhaustive. It mostly includes the measures mentioned in the sections of the NECPs where Member States reported about measures in place to tackle energy poverty. It is therefore possible that we missed some measures, for example other measures in place to help with bill arrears or to protect from disconnections. For more details about reviews of aids for energy, see for example (Bouzarovski *et al.* 2020; Pye *et al.* 2015).

OVERVIEW OF NATIONAL ENERGY EFFICIENCY POLICIES & MEASURES TACKLING ENERGY POVERTY

Selecting what policies and measures are tackling energy poverty among the energy efficiency policies requires to define criteria to distinguish general energy efficiency policies and measures from energy efficiency policies and measures having a social dimension. Considering the policies mentioned by the Member States, we use the following criteria:

- **Measures focused on energy poverty**: measures whose main objective is explicitly to tackle energy poverty or including eligibility criteria making that the measure targets low-income or vulnerable households.

Table 3. Types of aids for energy in place according to the countries.

Type of aids for energy	Belgium	Bulgaria	France	Germany	Greece	Italy	Poland	Romania	Spain	UK
Direct payments to help covering energy expenses		H	All		HOil	E+G	E	H	E+Th	E+H
Social tariffs	E+G	E			E			E		
Aids to help with bill arrears	E+G		E+G	E+G						
Aids for housing that consider energy expenses				H			H*			

Scope of energy expenses eligible: All: All energy types; E: Electricity; H: Heating; H: Heating excluding electricity and natural gas; HOil; Heating oil; G: Natural gas; Th: Thermal energies (space heating, domestic hot water and cooking).*

Table 4. Number of main measures per country and per type of social dimension.

Type of social dimension	Belgium*	Bulgaria	France	Germany	Greece	Italy	Poland	Romania	Spain	UK*
Measures focused on energy poverty	1		2	1	1		1			3
Measures including social criteria	2		1	1	2		1		1	
Measures affordable for all		1				2	1	1		2

** Energy efficiency measures are the responsibility of Regions in Belgium, and of each nation in the UK. Which may explain the higher number of main measures in these States.*

- **Measures including social criteria**: measures not limited to low-income or vulnerable households, but with rates of financial incentives that depend on income levels or other social criteria.
- **Measures affordable for all**: measures open to all households, with incentive rates that do not depend on income levels or social criteria, but with conditions making it possible for low-income households to take part in the measures (e.g., high grant rates).

The full list of main energy efficiency policies and measures included in the country factsheets can be found in annex (Table 7). Most of the measures found are dealing with the renovation of dwellings (or heating systems to a lesser extent). We found very few national measures dealing with energy efficiency of appliances.

Overall, almost all the measures in place to provide aids for energy include eligibility criteria to target either low-income households or vulnerable consumers. The targeting of energy efficiency measures seems to be less developed, except when tackling energy poverty is mentioned in the main objectives of the measures.

Energy efficiency measures without particular social targeting can nevertheless contribute to tackle energy poverty. Especially in countries where the poverty rate is high and the average energy performance of the dwellings' stock is low (e.g., programmes aimed at renovating apartment blocks built during the Soviet era). Moreover, targeting criteria can make the measures more complex and less effective in terms of number of households supported.

Countries such as UK, Belgium or France with already a significant experience in experimenting various approaches for targeting energy efficiency measures could provide valuable lessons to learn from at a time where larger budgets should be available for renovation programmes and that inequities are increasing due to the impacts of the COVID outbreak.

Overview of best practices to tackle energy poverty

WHAT IS A 'BEST PRACTICE'?

Our theorisation of the concept 'best practice' in the context of energy poverty alleviation is predicated upon recent advances in knowledge on how to combat domestic energy deprivation across a variety of governance sites (Kyprianou *et al.* 2019). In that sense, best practice is understood as a coherent set of measures, underpinned by a broader policy approach, that can help reduce rates of energy poverty in an effective and efficient manner. In line with the latest knowledge on the determinants of energy poverty, we emphasise that successful best practice will seek to tackle the root drivers of the condition in a comprehensive manner – extending beyond approaches solely focusing on low incomes, high prices, energy efficiency or social exclusion (Pye *et al.* 2015). This implies that best practice measures would entail a combining different elements of recognition, procedural and distribution justice in their efforts to reduce energy poverty (Bouzarovski *et al.* 2021).

More broadly, we interpret best practice in line with Bulkeley (2006, 1029), highlighting that "the creation, dissemination, and use of best practice can be better understood as a discursive process, in which not only is new knowledge created about a policy problem, but the nature and interpretation of the policy problem itself are challenged and reframed". We understand best practices to contain elements of scalability, requiring a negotiation with the hybrid socio-technical formations in which they are situated, while contesting unequal political relations of power, introducing new policy voices, as well as building both intra- and trans-local networks of solidarity and knowledge exchange (Bouzarovski and Haarstad 2019).

HOW DID WE SELECT THE EXAMPLES FOR THE FACTSHEETS?

As the objective of our study was to produce concise factsheets, it would not have been possible to provide an exhaustive list of best practices in each of the 10 countries. Instead, the page dedicated to best practices in each factsheet includes from 3 to 6 best practices for each country, enabling a short description of each best practice.

Whenever possible, the best practices presented in the fourth page of the factsheets are local or regional initiatives. As national measures are covered in the review of main policies and measures in the third page of the factsheets.

The sources used to identify these best practices include the EPOV database of Policies and Measures, and reviews of local or regional measures and initiatives tackling energy poverty such as (Ecoserveis 2017; Ugarte *et al.* 2016; Gangale and Mengolini 2019). When possible, we also made some specific search from national sources. And we also exchanged with national contacts who made further suggestions of examples. Our searches were not meant to be exhaustive. Especially because local and regional initiatives are not often documented

in English (and sometimes not even documented in national language), and can therefore be difficult to find.

Depending on the country analysed, the results from our searches went from cases where it was difficult to find at least three best practices up to cases where there were many more than six best practices worth highlighting. In case of difficulties to find local or regional examples, we extended the search to European projects with actions done in the country. In case of too many best practices identified, we used the following subjective criteria to select the six ones presented in the factsheets, giving a preference to:

- initiatives supporting lasting effects (i.e. helping households with achieving energy savings or get decent living conditions without increasing energy consumption): this preference explains the high share of initiatives dealing with improving the energy efficiency of dwellings (see Table 5);
- initiatives with a clear potential of replicability;
- initiatives with an original design (e.g., in the approach used, specific targeting).

Moreover, we tried to overall reflect the diversity of objectives, targets, approaches, etc. found in the best practices identified.

A DIVERSITY OF EXAMPLES

Due to the approach used to search and select examples of best practices, the resulting sample of 64 best practices is not meant to be representative. Instead, the objective was to gather a diversity examples as shown in Table 5 where the best practices were categorised according to their main objective or target. A special category "European projects" is also used to distinguish when implementation of European projects in the country was used instead of initiatives locally initiated. This set of 64 best practices include the examples presented in the fourth page of the ten factsheets, as well as initiatives complementary to the main measures and included in the third page of the factsheets. Such complementary initiatives include for example networks of actors, research works, training schemes. The full of best practices and complementary initiatives included in the country factsheets can be found in annex (Table 8).

Conclusions and discussions

The preparation of country factsheets on policies and measures to tackle energy poverty provided insights on the similarities and differences in the context and approaches used by 10 European countries in this field. It enabled to identify a large number of policies and measures at national, regional and local levels.

The verification of the information about policies and measures identified from various sources showed that many measures are 'in the making', being constantly revised and changed in line with political priorities and implementation experience. The country factsheets are therefore a snapshot of the status in the 10 countries as of 2020. It is very likely that many countries will adapt or complement their policies or measures to face the social and economic crisis resulting from the COVID outbreak. The factsheets might then be partially outdated soon. However, they can be a useful benchmark or baseline about the situation before the COVID outbreak.

The review of the national policies showed quite a lot of disconnect between what happens at the EU level and measures taken within the countries. When tackling energy poverty or providing support to vulnerable households, the first policies implemented are about incomes or direct aids to help cover energy expenses. Implementing the Energy Efficiency First principle (as promoted in the Governance Regulation of the

Table 5. Type and number of best practices selected in each country.

Type of best practice	Belgium	Bulgaria	France	Germany	Greece	Italy	Poland	Romania	Spain	UK
Aids for energy				1	1	1				1
Avoiding disconnection				1						
Identifying energy poor households and providing tailored support			3							
Providing tailored energy advice	1	1		2					1	3
Providing low-cost energy saving actions	1								1	
Energy efficiency of appliances	1									
Energy efficiency of heating systems		1								
Energy efficiency of dwellings	3		4			2		1	1	1
RES for electricity						1	1			
Tacking energy poverty related to mobility			2							
European projects		4				2	2	1		
Network of actors	2	1							1	1
Research works				1	1		1	2	1	1
Training or capacity building	1			1					1	1
Other									1	1

Energy Union) in the field of energy poverty would imply to assess whether energy efficiency measures can be as or more cost-effective than aids for energy when aiming at alleviating energy poverty. Currently, renovation policies are often beyond the reach of the most vulnerable households. The targeting of renovation programmes is less developed than the targeting of the aids for energy.

The search for information done for this study also confirmed that it is difficult to talk about "best practice" in the case of any individual measure, given that most actions do not address energy poverty comprehensively: a best practice landscape includes multiple measures and more comprehensive approaches.

The quest for best practice highlighted the added value of national observatories in gathering examples from regional and local initiatives that are less systematically documented than national measures.

Last but not least, it was particularly difficult to find quantitative data about the policies and measures. In many cases, data about budgets, number of beneficiaries or participants, outputs and impacts are not available in sources easy to find. Therefore, it seems very likely that evaluations remain rare. Which creates limitations for sharing experiences, identifying success and failures, and supporting policy improvements.

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Annex

Table 6. Full list of main measures about aids for energy included in the country factsheets.

State	Measure type	Main national aids for energy
Belgium	Aids for bill arrears	Gas-Electricity Fund, aid to cover bill arrears. All households facing difficulties to pay energy bills are eligible.
Belgium	Social tariff	Social tariffs for electricity and natural gas. Eligibility based on social benefits.
Bulgaria	Aids for energy expenses	Winter Supplement, one-time payment per year for heating bills. Main eligibility criterion is income level, with secondary criteria including health status, age, etc.
Bulgaria	Social tariff	Social tariff for electricity for vulnerable consumers.
France	Aids for bill arrears	Solidarity Fund for Housing, aids for households facing difficulties to pay their dwelling expenses, including for energy bills.
France	Aids for energy expenses	Energy check, sent once a year to eligible households (based on income level). It can be used to pay energy bills or energy efficiency works.
France	Protecting from disconnection	Obligation for electricity and gas suppliers to maintain supply during the winter period.
Germany	Aids for bill arrears	Loans for the payment of electricity or gas arrears, for households at risk of disconnection. Eligibility based on social benefits.
Germany	Aids for housing (including energy)	Housing allowance includes aids for covering heating costs, for low-income households, depending on the income level.
Greece	Aids for energy expenses	Heating oil allowance. Eligibility based on income level and criteria on the dwelling (e.g., property value).
Greece	Protecting from disconnection	Regulatory measures for the protection of energy poor households (disconnection protection and energy bill support with 300kWh coupon). Eligibility based on income level (focus on households in extreme poverty).
Greece	Social tariff	Social tariff for electricity. Eligibility based on income level and criteria on the dwelling (e.g., property value).
Italy	Aids for energy expenses	Electricity and gas bonuses. Eligibility based on income level. Reduction of energy bills according to household size (and climate zone for gas).
Italy	Aids for energy expenses	“physical distress bonus”, specific discount on electricity bill for persons whose survival depends on life-saving medical equipment.
Italy	Protecting from disconnection	Regulation for electricity suppliers to use power reduction instead of disconnection, in case of bill arrears (for electricity).
Italy	Tax reduction	Reduced excise duties on electricity for the first 150 kWh per month (whole Italy) and on fuels for heating (for Sardinia and in the small islands and mountains areas).
Poland	Aids for energy expenses	Energy allowance, monthly aid for electricity bills. Eligibility based on housing allowance and location (in practice limited to small apartments).
Poland	Aids for housing (including energy)	Housing allowance is designed to help cover the expenses related to the dwelling, including for heating (but not for electricity and gas bills). Eligibility based on income level and criteria related to the dwelling.
Poland	Protecting from disconnection	Vulnerable consumers can have prepayment meters installed at no extra cost.
Romania	Aids for energy expenses	Heating benefits, monthly aid for heating costs during the heating season. Eligibility mostly based on income levels. Aid rates also depend on income levels.
Romania	Protecting from disconnection	continuous supply of electricity for vulnerable customers due to health reasons.
Romania	Social tariff	Social tariff for electricity. Eligibility based on income level.
Spain	Aids for energy expenses	Social voucher for electricity: aid equivalent to a reduced electricity tariff for a given amount of kWh per year (depending on household size). Eligibility based on type of power subscription and social criteria. Beneficiaries can also use an extended period to pay their bill arrears.
Spain	Aids for energy expenses	Social voucher for heating, aid for paying the costs for heating, domestic hot water and cooking, whatever the type of energy used. Focused on vulnerable consumers.
Spain	Protecting from disconnection	Households eligible to the social voucher for electricity and including a child less than 16 years old or a person with a disability cannot be disconnected (for electricity).
United Kingdom	Aids for energy expenses	Winter Fuel Payment: A tax-free annual payment to help older people with their winter fuel bills.
United Kingdom	Aids for energy expenses	Cold Weather payments: made from the Social Fund (DWP) to certain recipients of social welfare support during periods of very cold weather (over 7-day periods).
United Kingdom	Aids for energy expenses	Warm Homes Discount: set rebate for the electricity bills provided by electricity suppliers to eligible households.
United Kingdom	Other	Energy tariff cap: tariff cap for electricity and gas for households.

Table 7. Full list of main energy efficiency policies and measures included in the country factsheets.

State	Social dimension	Main national energy efficiency policies & measures tackling energy poverty
Belgium	Focused on energy poverty	Obligation on DSO for electricity (Flanders): the scheme includes specific obligations to provide protected consumers with offers of free energy advice, vouchers for efficient appliances and bonus grants for insulation works or replacement of heating systems.
Belgium	Including social criteria	Renopack (Wallonia): loan with 0%-interest rate for energy renovations, eligibility criteria include a threshold on income level.
Belgium	Including social criteria	Energy premium (Brussels region): grants for energy renovations, with grant rates depending on income levels and types of works.
Bulgaria	Measures affordable for all	National Program for Energy Efficiency of Multifamily Residential Buildings, with no specific social criteria. The grant rate makes it possible for low-income households to take part in it.
France	Focused on energy poverty	"Living Better 'Serenity' " programme, providing grants for energy renovations to households with income below given thresholds.
France	Focused on energy poverty	White Certificates scheme including a dedicated energy saving target for actions in low-income households, and a bonus for actions done in very low-income households.
France	Including social criteria	"MaPrimeRénov' " programme, providing grants for energy renovations with grant rates depending on income level and action types.
Germany	Focused on energy poverty	Regional funding programmes for construction or renovation of affordable housing for low-income households.
Germany	Including social criteria	Checks for energy visits/consulting services (making the services free for low-income households).
Greece	Focused on energy poverty	Targeted scheme to replace heating oil boilers for low-income households.
Greece	Including social criteria	Energy Efficiency Obligation Scheme, including a bonus factor (*1.4) for actions doe in low-income households.
Greece	Including social criteria	"Save at home" renovation programme, with grant rates depending on income level.
Italy	Measures affordable for all	Ecobonus and superbonus for energy renovations: this tax credit scheme does not include social criteria on eligibility or grant rate, however options have been added from 2017 so that the tax credit can be transferred to a third party in case of low-income households. Moreover, the very high aid rate of the superbonus decided in May 2020 can help low-income households to use the scheme.
Italy	Measures affordable for all	Thermal Energy Account (Conto Termico) can be used by households for RES heating systems or high efficiency heating systems, which can reduce energy bills.
Poland	Including social criteria	'Clean Air' programme aiming at phasing out solid fuels for heating, and targeted at individual houses. The supplementary level of grands depends on income level (focus on low-income households).
Poland	Focused on energy poverty	Stop Smog programme, part of the Clean Air programme explicitly focused on energy poor (low income) households living in individual houses.
Poland	Measures affordable for all	Thermomodernisation bonus: grants for the renovation of dwellings (no social criteria), mostly used by housing cooperatives and communities for multifamily buildings.
Romania	Measures affordable for all	Thermal rehabilitation of residential buildings financed by bank loans with a government guarantee, providing owners with a lower interest rate. 10 % of the loan needs to be financed by the beneficiaries.
Romania	Measures affordable for all	Multiannual National Programme for Improving the Energy Performance of Blocks of Flats.
Spain	Including social criteria	PAREER II: national programme for the renovation of buildings, with an additional incentive rate that depends on social criteria.
United Kingdom	Focused on energy poverty	Energy Company Obligation increasingly focused (100 % since 2018) on low income households.
United Kingdom	Focused on energy poverty	NEST: Fuel poverty and energy efficiency grant programme in Wales, that offers free home energy efficiency improvements for households receiving social benefits (or under health criteria) and living in inefficient dwellings.
United Kingdom	Focused on energy poverty	HEEPS (Home Energy Efficiency Programmes for Scotland): The programme involves different streams of funding, including area-based schemes that fund local authorities to develop and deliver energy efficiency programmes (mainly solid wall insulation) in areas with high levels of fuel poverty (joint schemes with the Energy Company Obligation).
United Kingdom	Measures affordable for all	MEES (Minimum Energy Efficiency Standards) regulations apply to any privately rented homes in England and Wales (with a similar regulation in Scotland). Landlords of dwellings banded F or G must do energy efficiency works of at least €4,100 (from 2020, this applies even when the tenants stay in place).
United Kingdom	Measures affordable for all	Green Homes Grants: Post-Covid-19 vouchers for homeowners in England to help pay energy efficiency improvements. For households receiving certain benefits, the grant could be up to 100 % (programme scrapped only after a year of delivery, by March 2021).

Table 8. Full list of best practices and complementary initiatives included in the country factsheets.

State	Type of initiative	Explanations
Belgium	Efficient appliances	"Papillon" project in Flanders (cooperation between social bodies and manufacturers to provide low-income households with a service of efficient appliances (leasing approach).
Belgium	Efficient dwelling	"Rent and insulation premium" (Flanders): specific grants for private-rented dwellings to accompany obligations in the Housing Code about minimum roof insulation and phasing out single glazing.
Belgium	Efficient dwelling	"Green loans" (Brussels region): loans with interest rate of 0 to 2 % for energy renovations of dwellings (for owners or tenants).
Belgium	Efficient dwelling	"Benoveren" ("Better renovation") (Flanders): programme targeting the renovation of the oldest dwellings (often occupied by low-income households).
Belgium	Energy advice	"Plan for Preventive Action related to Energy" (Wallonia): energy advice to reduce energy bills and about aids available.
Belgium	Low-cost EE actions	"MEBAR II" (Wallonia): grants for energy efficiency actions up to 1,365 euros per household.
Belgium	Network of actors	"Samenlevingsopbouw" ("Community building") (Flanders): network gathering 8 NGOs developing local initiatives for affordable and efficient housing.
Belgium	Network of actors	RWADE (network for a sustainable access to energy) (Wallonia): network of 11 NGOs advocating for the rights on access to energy.
Belgium	Training	Training programmes for social workers and households about access to energy and solutions to reduce energy bills. Examples: "Eco Watchers" project, "Vigilance Network", Support Centre "SocialEnergie".
Bulgaria	Energy advice	Joint project of the Plovdiv Energy Agency and Schneider Electric to offering tailored energy advice and energy-saving devices to vulnerable households.
Bulgaria	European project	POWERPOOR: Design, development and implementation of pilot energy poor support programmes/schemes.
Bulgaria	European project	ACHIEVE (Action in low-income Households to Improve Energy Efficiency through Visits and Energy diagnosis).
Bulgaria	European project	REACH (Reduce Energy Use and Change Habits).
Bulgaria	European project	FIESTA (Family intelligent Energy Saving Target Action).
Bulgaria	European project	ENERGISE (European network for Research, Good Practice, and Innovation for Sustainable Energy).
Bulgaria	Heating systems	Sofia Municipality campaign to replace solid fuel stoves for free for low income households.
Bulgaria	Network of actors	Municipal Energy Efficiency Network (EcoEnergy), cooperation between local authorities to develop activities including among others energy advice for households.
France	Efficient dwelling	Energy-Solidarity Pact, scheme offering low-income households with a turnkey service for renovation works (e.g., 1 euro for loft insulation).
France	Efficient dwelling	"Roof first" scheme of the Abbé Pierre Foundation, supporting projects to provide people in situations of exclusion with a decent dwelling by renovating dwellings.
France	Efficient dwelling	Programmes providing technical support and training for DIY renovation works (e.g., programme of the Compagnons Bâtisseurs).
France	Efficient dwelling	Specific aids (grants or loans) for renovation works related to social schemes or schemes tackling indecent housing, possibly combined with other aids for energy renovations.
France	Identifying and tailored support	Schemes developed by NGOs and/or local authorities to identify households at risk of energy poverty and providing tailored support about available aids (e.g., SLIME).
France	Identifying and tailored support	DEPAR programme of La Poste (French post company) providing support to local authorities for identifying households at risk of energy poverty and organising on-site visits for energy advice (+ energy saving devices) and assessing technical and financial scenarios for renovation works.
France	Identifying and tailored support	Landlords-tenants mediation on energy, programme identifying households at risk of energy poverty and including a specific support for tenants including on-site visits (social and energy advice + energy saving devices + possibly technical support for DIY actions) and mediation towards the landlord to discuss the implementation of renovation works.
France	Mobility	PEnD-AURA programme tackling energy poverty related to mobility through pilot projects to assess the feasibility and replicability of actions including information, promotion of biking, car sharing, on-demand public transports, mobile apps to assess transport costs.
France	Mobility	Wimoov, associations developing digital mobility platforms, with a focus on ensuring mobility for all citizen. Development of digital tools for social workers to help people with mobility issues, and training of mobility advisors.
Germany	Aids for energy	Local support for the payment of energy bills by consumer associations ("Enercity Härtefonds Hannover").
Germany	Avoiding disconnection	Local measures to prevent disconnections, such as power limiters ("1.000 Watt Lösung für Köln"), or prepaid meters (e.g., EnergieRevolte GmbH in Düren).
Germany	Energy advice	Energy consultancy services in foreign languages for migrants in Hanover.
Germany	Energy advice	Caritas Electricity Saving Check, free visits for energy advice and energy saving devices + energy advisors are former long-term unemployed persons trained for the scheme.
Germany	Research	« SoKo Energiewende » Research program, study of the socio-political consequences of the energy transition in Germany (cf. distributive effects).
Germany	Training	Training on energy savings for building caretakers in Bremen, by real estate developer Gewoba.
Greece	Aids for energy	Bill payments in Attica Region: support provided to households eligible to the social residential tariff and with a valid debt settlement arrangement (100 euros per household in 2016, 150 euros per household in 2017).
Greece	Research	Report by the Heinrich Boell Stiftung about Energy Poverty in Greece, providing a review of the context indicators, policies, and policy recommendations.
Italy	Aids for energy	Some municipalities have developed complementary financial aids to help energy poor households with their heating bills.

The table continues on the next page . . . →

State	Type of initiative	Explanations
Italy	Efficient dwelling	EnerSHIFT (Energy Social Housing Innovative Financing Tender) project, showing examples of co-financing with European funds (ERDF) for the renovation of social housing using energy performance contracting with ESCos (Ligura Region).
Italy	Efficient dwelling	LEMON (Less Energy More Opportunities) project, also with co-funding from ERDF and promoting energy performance contracting in social housing, including an agreement between the social housing body and tenants about an increase in the rent for a limited period of time, the increase in the rent being lower than the energy savings.
Italy	European project	GREENABILITY (Green Abilities to Tacke Social Issues): vocational programme for social workers and volunteers of NGOs.
Italy	European project	ENPOR (Actions to Mitigate Energy Poverty in the Private Rented Sector).
Italy	RES	"Energy income" measure (reddito energetico) (under development) to establish a revolving fund for the provision of capital contributions of 100 % of the investment cost of domestic PV equipment (up to 20 kW) for low-income households Pilot project in Porto Torres.
Poland	European project	FinSH (Financial and Support Instruments for Fuel Poverty in Social Housing).
Poland	European project	EVALUATE (Energy Vulnerability and Urban Transitions in Europe).
Poland	RES	FINE Power Engineering – Civic ENERGY is an incubation model for creating social energy cooperatives. It aims to launch a model energy community, recognising the potential for small-scale energy as a solution for people at risk of energy poverty in rural areas.
Poland	Research	The Energy Poverty project of the Polish Institute for Structural Research (IBS) involved the development and adaptation of energy poverty indicators for Poland, reviewed current policies and made policy recommendations.
Romania	Efficient dwelling	UNDP-GEF Technical Assistance for improving energy efficiency in low income households and communities in Romania: the project supported the recognition of the 'energy poverty' topic, the training of building professionals, pilot projects for dwelling renovation, technical documentation.
Romania	European project	SMART4NZEB (Strengthening clusters Management Activities and Running Trans-national for implementation of nearly Zero Energy Buildings).
Romania	Research	REELIH (Residential Energy Efficiency for Low Income Households): this international project included a case study in Romania.
Romania	Research	EnPoweR (Mitigating GHG Emissions through energy poverty alleviation in Romania): the project is to develop tailored solutions to alleviate energy poverty in Romania, starting with an interactive online map of the Cluj region to raise awareness about energy poverty.
Spain	Efficient dwelling	Local programmes for renovating the dwellings of vulnerable households (e.g., in Barcelona).
Spain	Energy advice	Local energy centres in Barcelona focused on helping vulnerable households. Objective to identify persons at risk of energy poverty and not yet helped by the social services or charities.
Spain	Low-cost EE actions	CAFacció project, campaign for low-cost renovation works for members of micro-financing communities. The members of such community put together their (money) savings to be able to lend money when a member needs it.
Spain	Network of actors	Allianz against energy poverty and Energy Poverty Group: networks of NGOs and associations, campaigning for the recognition and action on energy poverty.
Spain	Other	Energy Bank: public-private partnership that gathers donations from persons, companies or other entities who share part of their energy savings to fund actions for vulnerable households.
Spain	Research	Good practices catalogue of local initiatives tackling energy poverty (done in the Catalonia Region), that aimed at examining how municipal social services address energy poverty.
Spain	Training	REPEX project, led by the Association of Environmental Sciences, to raise awareness about the links between unemployment and energy poverty. The approach is to reduce unemployment by creating jobs for renovating dwellings of vulnerable households.
United Kingdom	Aids for energy	Grants to pay off energy debts: People who are in debt to their energy supplier can get a grant from a charitable trust to help pay it off.
United Kingdom	Efficient dwelling	Wigan Council AWARM scheme, comprehensive free support programme for eligible households in Wigan, including help to improve the efficiency of the home, benefit entitlement checks, boiler replacements, loft and wall insulation and draught proofing, a handy person service, electric oil filled radiators, a keep warm pack, home, an energy tariff check, etc.
United Kingdom	Energy advice	LEAP (Local Energy Advice Partnership): free service done by energy advisors who can offer simple energy and money saving advice, install free simple energy saving measures (e.g., LED light bulbs and draught-proofing during a LEAP follow up home visit), check people are on the best energy tariff via a dedicated energy switching service, and help people find funding for further energy-saving home improvements.
United Kingdom	Energy advice	NEA's Warm and Safe Homes Advice Service: free support service providing advice to residents in England and Wales on their energy bills and keeping warm and safe in their home. The scheme also offers advice workshops direct to householders and training to frontline staff.
United Kingdom	Energy advice	Belfast Warm and Well Project, helping local people struggling to keep their home warm during the winter, by offering advice and practical support.
United Kingdom	Network of actors	Several networks of NGOs, associations, etc. campaigning for action on energy poverty (e.g., End Fuel Poverty Coalition, Age UK).
United Kingdom	Other	Changeworks delivers fuel poverty outreach projects and carries out research in Scotland.
United Kingdom	Research	Several initiatives to develop research on energy poverty, including the Fuel Poverty Research Network and the Centre for Sustainable Energy.
United Kingdom	Training	Empowered by Energy: small-scale pilot project, run in partnership with UK Power Networks, supports people with mental health issues. Workshops are held online by NEA and expert partners who work closely with refugees. The workshops help to create confident 'energy champions' who can share practical tips with others on sustaining safe and warm homes, without unnecessarily falling into energy debt. The workshops aim to build a self-sustaining support network to embed useful life skills and make communities more resilient.