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Policies and measures to alleviate energy poverty in Germany - learning from good practices in other European countries

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ABSTRACT

While in some European countries energy poverty is deeply embedded in state policy, in Germany there are relatively few policies that directly address energy poverty. The aim of this project is to learn from best-practice models in those other countries, by examining how five selected European countries (Denmark, France, Ireland, Sweden, and the United Kingdom) approach energy poverty in their policy making. We produce an inventory of energy poverty policy instruments and measures in these countries, which includes actions at the national and local level, as well as both government policies and private initiatives by NGOs, citizens and other organisations. We categorize these into four sub-groups: price management, support for energy efficiency, information and guidance schemes, and legislative provisions, and evaluate these policies in order to identify best-practice examples that may be interesting for the German context. These potentially transferable policies and measures are then subjected to an impact analysis using microsimulation. This analysis is based on the German Income and Expenditure Survey, a representative dataset of household income and expenditure data. Taking into account both heating energy and electricity consumption, we estimate the potential impact and beneficiaries of the chosen instruments and measures should they be applied in Germany. To conclude, we discuss how exactly instruments and measures could be implemented in Germany by taking into account lessons learned about the implementation procedures in other countries.

Introduction

Meeting energy targets and working towards climate protection produce a variety of socio-economic changes. Overall, the costs and benefits of those changes are likely unevenly distributed (Sachverständigenrat für Umweltfragen 2016). One aspect of this uneven distribution is so-called energy poverty. Energy poverty in the broadest sense is understood to mean that households are not in a position to pay their heating and electricity costs, to heat (or cool) their homes appropriately, or must impose restrictions on electricity consumption for basic needs (cooking, washing, media) (cf. Heindl 2017b; Day, Walker, and Simcock 2016). Energy poverty is an issue in many European countries and is often controversially discussed. On the one hand, designing policy instruments that leverage both climate benefits and keep redistributive effects in check is a challenge. On the other hand, this is essential for generating broad social support for the far reaching structural changes needed to meet adequate climate targets (Baumol and Oates 1975; Elkins 2005).

Schumacher, Cludius, and Förster (2016) analyze the distributional effects of energy and climate policy instruments and measures of the German energy transition that have a direct effect on private households. The energy transition ('Energiewende') describes the way in which Germany is planning to

transform its energy system towards a more efficient and largely renewable one, at the same time phasing out nuclear. The term 'Energiewende' was first coined in a study by Oeko-Institut in the 1980s. This transition is substantiated through a range of mid- and long-term targets. One key piece of legislation is the renewable energy policy supporting renewable sources through a feed-in tariff, the cost of which is levied onto consumers via a surcharge on their electricity price. This surcharge tends to be regressive, i.e. represent a higher relative burden for low-income than high-income households, since low-income households spend a larger fraction of their income on electricity (Neuhoff et al. 2013). However, Schumacher, Cludius, and Förster (2016) found that energy efficiency policies devised as part of the energy transition have the potential to offset this regressive effect.

However, the authors stress that it is important to tailor programs to different target groups so that these potentials are in fact realized for all households, including those on low incomes. A comprehensive analysis of all policies and measures of the German energy transition, i.e. also those that affect households indirectly, has not yet been attempted, primarily because of its complexity as measures interact with each other and require simultaneous economic analysis (cf. Lutz and Breitschopf 2016). A series of studies are available beyond the German context that examine how a socially responsible design of energy and climate policies can be achieved within the European Union or its member states (Pye et al. 2015; Pye et al. 2017; Schneller et al. unpublished; Schumacher et al. 2015; Urgate et al. 2016).

Unlike some other European countries, Germany has relatively few policies directly addressing energy poverty. This is due to various reasons, including the setup of the social policy system, by which certain groups receive support through monthly transfer payments where expenses for rent and heating are generally covered by authorities directly. These provisions mean that these groups are less likely to be affected by energy poverty; however, many German households may still be at risk of energy poverty. This is because expenses for electricity are not covered directly and there are many households which cannot or do not claim support from the government and, hence, may be at risk of energy poverty. The experiences of other Member States regarding energy poverty issues can therefore provide valuable insights into best practices, which may be adapted and/or established in Germany. In addition, an analysis of the existing instruments in other Member States can identify strengths and weaknesses of different types of policies and provide insights from which we can learn.

The aim of this study is therefore to elaborate on and examine instruments and measures that area already in place to combat energy poverty in a selection of EU Member States, test their applicability and transferability to the German context, and undertake a first evaluation of the expected effects. This study will focus in particular on policies which contribute to achieving the energy and climate targets while simultaneously alleviating energy poverty (cf. Ürge-Vorsatz and Tirado Herrero 2012).

In our study, we do not apply a strict definition of energy poverty (cf. Thomson, Bouzarovski, and Snell 2017; Tirado Herrero 2017 or Heindl 2013, who shows that a whole series of different definitions are used, leading to very different assessments of the number of energy-poor households in Germany). Instead, we use the chosen definition of energy poverty in the respective countries when reviewing and assessing their best-practice policies. Since our focus lies on examining instruments and measures that alleviate energy poverty, we do not provide an assessment of the situation (occurrence, depth) of energy poverty ourselves.

We focus on five countries, namely France, Ireland, Sweden, Denmark, and the United Kingdom. These countries were selected on the basis of their relative structural similarity to Germany in terms of GDP, energy consumption, climate (at least in part) and household income, as well as the fact that these countries have a number of policies and measures in place or planned that combat energy poverty.

We developed a set of guiding questions loosely modelled on Schumacher et al. (2015) to assess the (expected) impact of the policies and measures in terms of avoiding or alleviating energy poverty, its impact on overall climate goals, as well as its transferability to Germany. We carried out a results-based

evaluation that goes beyond the specific goals of individual policies and instruments and instead focus on analysing expected outcomes.

- Is the target group clear and adequately defined?
- Does the policy/scheme focus on short term symptoms or long term problems?
- Is the target group taking advantage of the policy/scheme?
- Is the policy/scheme adequately financed?
- Is there a monitoring/evaluation system in place?
- Is the policy/scheme effective or are potential improvements due to other circumstances?
- Does the policy/scheme sustainably tackle energy poverty?
- Does the policy/scheme contribute to reaching climate goals?
- Is the policy/scheme compatible with the German system of social transfer payments?
- Are the technical requirements compatible with those in Germany?

We then adopt a policy transfer concept proposed by Williams et al. (2014) which considers different modes of policy transfer and describes how a policy can be used to shape domestic policies: (i) Copying: Applying the exact same instrument in a different country, (ii) Adaptation: Adapting an instrument to suit domestic circumstances, (iii) Hybridization: Combining features of foreign and domestic instruments, (iv) Synthesis: Combining elements from a number of places to create something new, (v) Inspiration: Using design and implementation features as inspiration

Finally, we model the expected effect of the transfer of four candidate measures to the German context. The core of our analysis is a microsimulation model based on the German Income and Expenditure Survey (EVS). The EVS is an administrative data source and contains detailed information on income sources and expenditure patterns of 60,000 households. The EVS is statistically representative for all of Germany.

We use this microsimulation model to analyze the candidate measures with respect to their distributional effects across household groups. Based on our analysis we provide recommendations on whether (and to what extent) adapting best-practice policies and measures from the selected countries are likely to be suitable for alleviating energy poverty in Germany.

Policy Instruments and Measures to Alleviate Energy Poverty in Selected European Countries

Policies and measures of the selected countries were categorized in accordance with Schneller et al. (unpublished) and Pye et al. (2017) as follows: (i) Direct financial support, (ii) Support for energy efficiency measures, (iii) Information and guidance schemes, and (iv) other measures (such as legal provisions and overarching instruments).

We cover only part of the diverse instruments and measures implemented, planned or discussed in the selected countries and do not claim to be complete. For further overviews, see, for example Pye et al. (2015), Pye et al. (2017), Schneller et al. (unpublished), Schumacher et al. (2015), Urgate et al. (2016).

The Winter Fuel Payment in the UK and the Fuel Allowance in Ireland are examples of **direct financial support** measures. They are comprised of monthly or weekly payments from the government to households in the winter months. Such support is often coupled with the social welfare system (i.e.: targeted at recipients of certain benefits), but a blanket approach may also be adopted.

Direct financial support offers short-term and uncomplicated relief for the designated households. However, it does not contribute to combating the causes of energy poverty in the long term, since it does not improve the efficiency standard of housing or bring about behavioural changes. To tackle these underlying issues, direct financial support should be combined with information and advisory measures and (financial) support for investments in energy efficiency (i.e.: an adequate mix of measures

and instruments). Whether direct financial support actually reaches the relevant households depends on the definition of the target group, as well as the application process.

In Germany, certain groups of households living on low incomes or otherwise in need of government support, receive transfer payments to cover their day-to-day living expenses. For these households heating costs are reimbursed directly, whereas electricity has to be paid for out of the household budget by all households. This is part of the reason why existing measures to alleviate energy poverty in Germany focus primarily on reducing electricity consumption (rather than heating).

Measures and instruments that support the implementation of **energy efficiency measures** directly address factors that contribute to energy poverty by increasing the efficiency standard of the dwelling, the heating system or electrical appliances. By reducing overall energy consumption they also contribute to meeting long-term energy and climate targets. Whether the desired target groups are reached and the tenant-landlord dilemma is resolved depends on the design of the respective instruments. A target-group-specific implementation is important for households affected by energy poverty, considering the multiple and specific barriers to implementing energy efficiency measures for this group (e.g.: no financial resources for investments, information deficits, multiple financial problems, cf. Heindl 2017a). One such example is the French Habiter Mieux program which provides funding for thermal renovations in the private and public housing sector.

In Germany, energy efficiency support programs for dwellings are in general not specifically targeted at low-income households. In terms of electricity use specifically, however, the electricity saving check is a program that directly targets low-income households, combining the installation of electricity saving equipment with informational measures.

The effectiveness of any policy or measure combating energy poverty is reliant upon the information about those schemes being made readily available to their target groups. **Information and guidance schemes**, if properly designed (e.g. using the relevant information channels, overcoming language barriers), address low-income households directly. They can be understood as a low-threshold, easy access offer and are related to and often a necessary add-on to more direct (e.g.: financial) instruments.

The advantage of information and guidance schemes is that they can focus directly on the cause of the problem and disclose appropriate information adapted to the needs of targeted households and local conditions. Personal consultations (peer-to-peer) are accepted as successful means of communication (Zeroual 2015). In the case of providing advice on electricity savings, for example, information is often passed on in conversations and thus reaches a larger number of family and community members.

In the UK and Ireland a number of charity organisations and NGOs disseminate information in conjunction with government websites and helplines, which also provide a medium for applying for grants, for example. In Germany, a range of institutions, such as charities or consumer advocacy groups, provide information and guidance on energy-related issues.

There are also a number of **other measures** that are related to the alleviation of energy poverty, such as provisions related to the technical setup of energy supply or legal provisions related to the protection of vulnerable customers. In several countries, including the UK and Denmark, regulations are in place that protect customers from being disconnected from gas and electricity. Pay-as-you-go meters, widely in operation in the UK, also provide more control over payment to consumers.

While avoiding disconnections from electricity and gas supply does not address the causes of energy poverty or financial hardship, it prevents additional problems for the affected households, who are often confronted with a multitude of problems that have a negative impact on daily life (Heindl and Liessem 2017), and losing access to electricity only further exacerbates these issues.

The advantage of pre-paid systems is that households with debts that cannot pay their electricity bills can still be supplied with electricity and have control over the credit balance. In combination with information and advisory measures, efficiency gains are also possible.

Policy Assessment and Transfer Results

A detailed assessment of the policies and measures assessed along the set of guiding questions can be found in Cludius et al. (2018). In sum, our assessment reveals several essential aspects that energy poverty measures instruments should fulfil in order to qualify as best-practice examples and may then be transferred to the German context. In addition to having a long-term focus, generating energy savings through efficiency gains and behavioural changes, and adequately addressing the target group of low-income households (including households just above the income threshold who do not receive transfer payments), we have learned that policies are particularly promising if they offer a combination of information and financial investment incentives – or if a relevant policy mix is in place.

In terms of implementation, policies and measures addressing energy poverty should be implemented preferably at the local or regional level or even peer-to-peer, so that local conditions can be adequately addressed. When transferring such policies and measures to Germany, it is important that they avoid or address split incentives, which are relevant because Germany has a very high rental market share. Finally, the best-practice measures chosen should not replace social security policy, but rather design energy and climate policy in a way that minimizes distortive effects.

Not all of these aspects can always be met simultaneously in one instrument or measure. In many cases it makes sense to set priorities, e.g.: when direct relief of energy-poor households is necessary. However, it is essential to pay attention to all of these aspects in order to design effective instruments or set up an adequate policy mix in the long term.

Table 1 summarizes those policy instruments and measures which address these aspects in the investigated countries. It presents individual examples from the different countries, discusses why these instruments and measures were selected, shows prevailing limitations and investigates their transferability to the German context.

Table 1. Selected best-practice examples

Selected best-practice examples	Empirical examples	Why was this example selected?	Prevailing limitations	Transferability to the German context
Direct financial support				
Reimbursement of heating costs	- Household Benefit Package for people over 70 (Ireland) - Heating costs reimbursement for households on small pensions (Denmark)	- Target group well defined -Extends direct and continuing support to additional vulnerable groups	- Does not address causes of energy poverty -Does not contribute to long-term climate goals	Hybridization of the current German reimbursement system (with the Irish and Danish systems)
Reduction of electricity prices / costs for certain groups	-Social tariff model (France) - Government Electricity Rebate (UK)	- Target group well defined -Extends direct and continuing support to additional vulnerable groups	- Does not address causes of energy poverty -Does not contribute to long-term climate goals	Some German electricity suppliers already offer tariffs with social components; adaptation at national could be possible
Support for energy efficiency measures				

Selected best-practice examples	Empirical examples	Why was this example selected?	Prevailing limitations	Transferability to the German context
Support for renovation measures for homeowners with low income or little savings	- Habiter Mieux, social funds for thermal energy renovation (France) - Warmth and Wellbeing (Ireland) - Affordable Warmth Grants (UK)	- Targeted - Sustainably addresses one of the causes of energy poverty - Contributes to overall climate goals - Often implemented locally	- Depending on design, access to capital may still be an issue - Not likely to incentivize deep renovations - Rent may rise due to deep renovations	Adaptation of Irish, French, and English examples
Electricity saving support (information and/or small investive measures)	- SLIME (France)	- Targeted - Addresses one of the causes of energy poverty - Contributes to overall climate goals - Often implemented peer-to-peer	- Number of households that are reached limited to date - Overall climate effects could be higher	Hybridization of the German electricity saving check and similar programs in other countries
Information and guidance schemes				
Information on energy saving measures	- Keep Well and Warm and The Warm Charity information programme (Ireland) - Secours Catholique and EDF (France)	- Targeted - Often local and peer-to-peer - Has the potential to reduce energy consumption in the long term	- Financial barriers to implementation of measures may remain	Already exists in Germany, can learn from implementation in other countries
Easier to understand electricity bills	- Denmark - Sweden	- Awareness raising - Incentives to reduce consumption through comparisons with bills of similar households - May induce behavioural change	- Does not directly address the target group - Financial barriers to implementation of measures may remain	Could be adapted to the German context
Other measures				
Consumer protection against power cut-offs	- Energy Safety Net (UK) - Winter Truce Program (France) - Legislative provisions in Denmark and Sweden	- Targeted - Provides immediate support and avoids exacerbating problems	- Does not sustainably address causes of energy poverty or reduce energy consumption in the long term -Does not contribute to long-term climate goals	Some provisions already in place in Germany, can learn from implementation in other countries
Metering	- UK (pay as you go meter, smart meters) - Denmark (smart meters)	- Directly effective for target group - Cost control and direct feedback	- Does not tackle underlying causes of energy poverty - May encourage self-disconnection	Pay as you go already piloted in Germany, could be rolled out along with smart meters

Microsimulation Results

Based on this analysis of best-practice examples, four instruments and measures were selected for an in-depth analysis of their potential effects in Germany. We modelled two measures and instruments from the category "direct financial support" and two from the category "support for energy efficiency

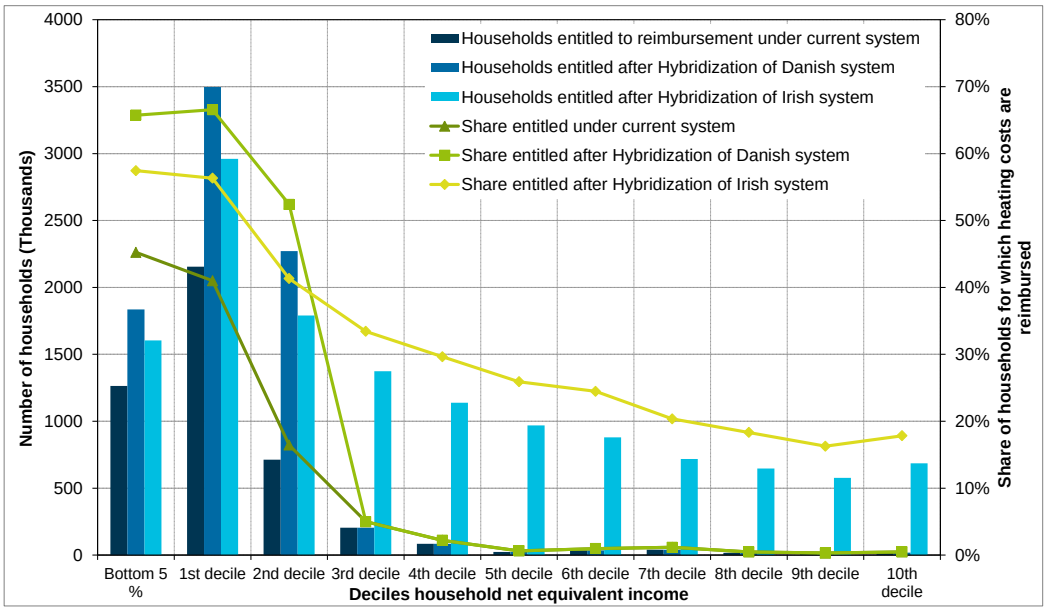
measures," where two of the measures and instruments will have an effect on heating energy consumption and costs and two will have an effect on electricity consumption. In the following, we discuss the application of two of the best-practice measures to the German context using a microsimulation model based on the German Income and Expenditure Survey (EVS). For detailed results on further instruments and measures please refer to Cludius et al. (2018).

Extending the Reimbursement of Heating Costs to Additional Groups

Households in Germany receiving long-term unemployment or basic social security support are generally reimbursed for heating costs. This applies to approximately 3 million households. The recipients of heating cost reimbursement are concentrated in the lower income deciles and represent approximately 40% of households in the first income decile and 15% of households in the second income decile (Figure 1). Two further scenarios are modelled in which additional households are entitled to reimbursement of heating costs. First, we add those households eligible under the Danish model (cf. Table 1), i.e.: households on small pensions (defined as pensioners in the lower two income lines). Secondly, we adopt the target group of the Irish Household Benefit Package and extend the reimbursement of heating costs to all households whose head of household is 70 years or older.

In both scenarios, the number of households entitled to reimbursement of heating costs increases. When hybridizing the Danish system, as expected, additional recipients are concentrated in the first two income deciles. In the case of hybridization of the Irish approach, they are spread across all income groups, but with a more pronounced increase in the lower deciles (Figure 1).

Figure 1. Households that receive reimbursement for their heating expenditure by income decile



Source: Microsimulation using the German Income and Expenditure Survey 2013 (EVS 2013); scientific use file provided by the Research Data Centre (FDZ) of the federal and regional statistical offices

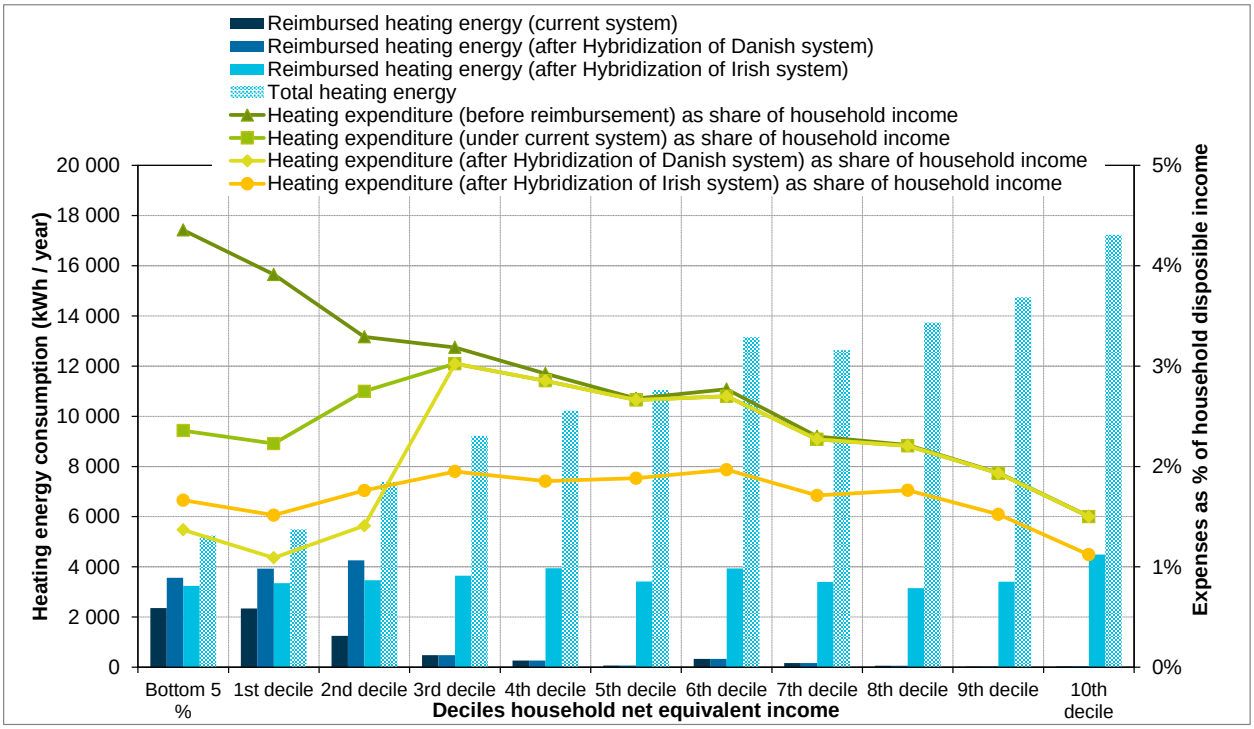
Figure 2 shows the amount of heating energy eligible for reimbursement and the associated financial impacts (measured in percent of disposable income). The bars showing eligible heating energy under the different systems indicate that under the current system, about 40% of the heating energy used in the first decile and 15% of heating energy used in the second decile is reimbursed. When additional households become eligible as per the Danish definition, i.e. all those households on small pensions, eligibility in the first income decile increases to two thirds and in the second decile to about half of heating

energy used. When, in addition to the households currently eligible, all households whose head of household is older than 70 receive reimbursement (hybridization of the Irish system), a significant share of heating energy used in all deciles becomes eligible, but eligibility is still concentrated in the bottom deciles.

The curves describing financial impacts show that the current regulation in Germany leads to a more equitable (progressive) distribution of expenditure compared to the top curve showing hypothetical expenditure of households if no reimbursement existed. In the case of hybridization of the Danish approach, households in the lowest two income deciles receive additional support, as indicated by the bottom yellow curve. Households in these two deciles now pay (on average) less for heating than all other income groups. When the Irish approach is hybridized, the entire curve becomes flatter and households in all income deciles spend roughly the same share of disposable income on heating energy (with the exception of the top two deciles).

Besides effects on household expenditure, the cost of the system to the government (and ultimately the tax payer) is also important. Since more households are covered after hybridization of the Danish and Irish approach than under the current system, costs would increase from about €2 billion under the current system to about €3.5 billion when pensioners on low incomes are included (Danish approach). When all households are included whose head of household is older than 70 (Irish approach), costs increase to €11 billion.

Figure 2. Reimbursed heating energy and resulting heating expenditures as a share of household income under the different scenarios



Source: Microsimulation using the German Income and Expenditure Survey 2013 (EVS 2013); scientific use file provided by the Research Data Centre (FDZ) of the federal and regional statistical offices

The reimbursement of heating costs contributes to the short-term relief of the households reached, but does not combat the causes of energy poverty. Rehdanz and Stöwhase (2008) show that the reimbursement of heating costs leads to a higher relative heating energy consumption for reimbursed households. As noted above, it is therefore important to combine the heating cost reimbursement with

information and guidance schemes. Another possibility is the inclusion of climate policy objectives (if possible) in social security regulations. The planned introduction of a climate component in the housing allowance is one example (BBSR 2017).

Extending the Electricity Saving Check to Additional Groups

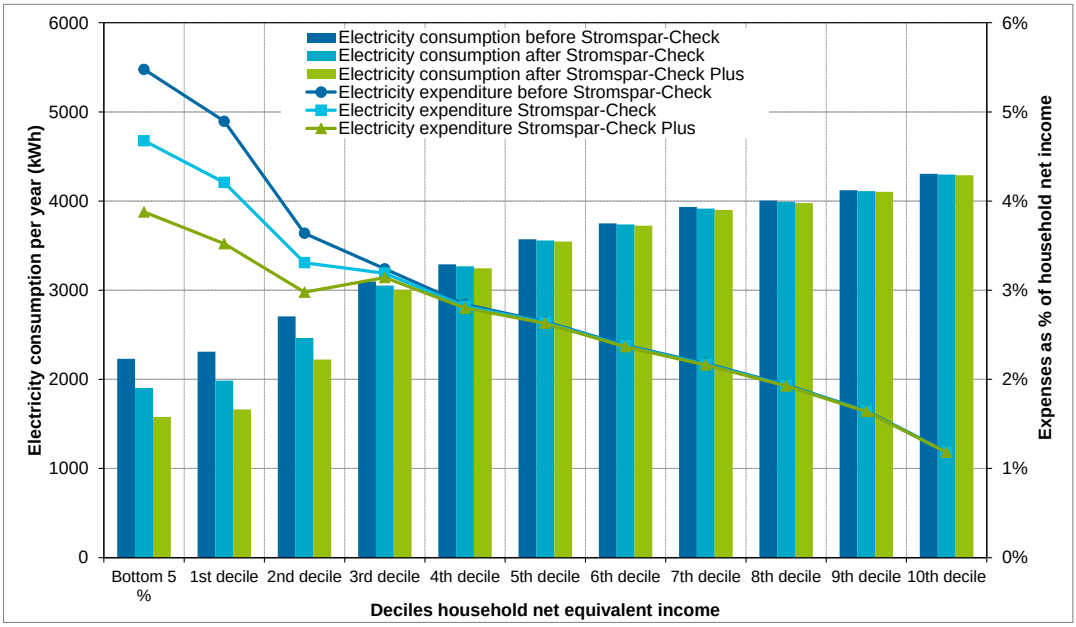
Under the electricity saving check, households with low incomes receive advice on saving energy and water in their own homes, as well as "emergency aids" such as switchable plugboards, LEDs, etc. Since the beginning of December 2008, approximately 250,000 households received advise nationwide (Stromspar-Check 2017). Similar projects can be found across Europe and through the Achieve (2014) project this instrument was successfully piloted in a number of other countries.

Until 2017, the electricity saving check was open to all households receiving transfer payments in the form of long-term unemployment benefits, basic security or housing benefits. In mid-2017, the target group of the instrument was expanded to include households that receive child allowance as well as households on low incomes or pensions who do not receive transfer payments.

As a result, the target group of the instrument increased from approximately 4.5 million to 8.5 million. Especially in the first income decile, almost 100% of households can now benefit from this instrument, as opposed to about 50% under the old rule. Also, in the second decile, the proportion of eligible households increases from about 20% to approximately 60% (Figure 3).

Seifried and Albert-Seifried (2015) and Tews (2012) estimate the electricity savings from the instrument at 14-15% of total consumption. Moreover, the Electricity Saving Check Plus (a scrapping programme for old refrigerators) is estimated to lead to additional savings of around 15% (Seifried and Albert-Seifried 2015). Figure 3 shows the savings that can be achieved in an average household at the different income deciles. The instrument is clearly progressive, as the relative spending of low-income households on electricity is reduced, while the spending of high-income households remains unchanged.

Figure 3. Impact of the electricity saving check on electricity consumption and disposable income



Source: Microsimulation using the German Income and Expenditure Survey 2013 (EVS 2013); scientific use file provided by the Research Data Centre (FDZ) of the federal and regional statistical offices

Conclusion

The aim of this project is to learn from best practice in instruments and measures to combat energy poverty in five selected European countries and to present a first impact analysis of their potential implementation in the German context. Our assessment identifies six essential aspects which should be met (at least in part) in order to recommend an application in Germany. Measures and instruments should (i) have a long-term focus and generate energy savings through efficiency gains and behavioural changes, (ii) address the target group of low-income households (including households just above the income threshold who do not receive transfer payments), iii) offer a combination of information and financial investment incentives where possible, iv) be implemented preferably at the local or regional level or even peer-to-peer, so that local conditions can be adequately addressed, v) avoid the landlord/tenant dilemma (relevant, as Germany has a very high tenant market share), vi) not replace social policy but focus on energy efficiency and behaviour in a way not to distort distributional effects.

On this basis, the following instruments/measures were selected as examples for an in-depth analysis for transfer to Germany, including a potential impact analysis.

1. Extending the reimbursement of heating costs to other population groups: This could be envisaged as a hybridization of existing practices in Germany and the Household Benefit Package from Ireland or the reimbursement of heating costs for households on small pensions from Denmark. Our microsimulation analysis reveals that under the current heating cost refund scheme in Germany, 60% of households in the first income decile and 85% of households in the second income decile do not receive heating cost subsidies. The analysis also shows that heating energy costs for low-income households represent a significantly higher burden in relation to disposable income than for higher-income households. Heating cost reimbursement reduces this regressive effect, especially for households in the first income decile, but the second decile still shows an above-average burden. Expanding the reimbursement of heating costs to include households with small pensions in line with the Danish model would significantly ease the burden on other lower

income households. If the reimbursement is extended to include all households with a head of household beyond 70 years of age (Irish model), the burden on households would be reduced in all deciles. However, such a general expansion would lead to considerable additional costs for municipalities. In order to reduce the costs for municipalities, to combat the causes of energy poverty in the long term, and to comply with the German national energy and climate policy goals, it is advisable to combine reimbursement with information or support measures, such as a heating energy check or energy advice. Moreover, it would be beneficial to consider climate aspects - as far as possible - in social policy making. One example for this is the planned climate component in housing subsidies.

2. Extending the electricity saving check: The existing electricity saving check was extended to additional groups (beyond the target group of transfer recipients) in June 2017 which resulted in a doubling of eligible households. Microsimulation analysis shows that this can further increase the positive effects of the electricity saving check, especially in the lower two income deciles. So far, 5-10% of eligible households have used the electricity saving check. The higher the percentage of households reached within the target group, the more progressive the instrument will be. The idea of the electricity-saving check was adopted for a project at the EU level and implemented and followed-up upon in various Member States.

Further microsimulation results in Cludius et al. (2018) investigate the introduction of an electricity allowance by which the first 1000 kWh of consumption per year are charged at a reduced rate and consumption above this threshold charged at a higher rate. Furthermore, support for energy efficiency measures directly targeted at low-income households or households with little financial means is analyzed. Results show that these instruments have the potential to reduce the risk of energy poverty, but that their specific configuration needs to take into account national circumstances (e.g.: an important rental market in Germany).It is also recommended that these instruments are combined with information and guidance schemes.

Other relevant instruments and measures which were not investigated using a microsimulation, but still provide positive examples of potential transferability include integrated information and guidance schemes for energy renovation measures involving craftsmen and industrial associations, as practiced in Denmark and discussed for German application. Increased consumer protection measures that prevent power cut-offs are another example. They are currently implemented in particular in the UK by installing prepaid meters, but also in Denmark and Sweden. Heindl and Liessem (2017) examine the reasons for power cut-offs in Germany and point out that not only financial, but also cognitive and psychological factors play a role, which could be addressed by information and counselling measures. Furthermore, the simplified presentation of electricity bills, such as those available in Denmark or Sweden, or the Danish model of an integrated contact point for complaints about energy supply of any kind, are among the instruments and measures that could be considered for application to Germany.

This paper shows that mutual learning is useful and effective for the design and implementation of instruments and measures. There is currently no uniform definition of energy poverty in the EU or its Member States and there are substantial differences between Member States in terms of political and social systems, past efforts on reducing energy poverty as well as climatic and structural conditions. The basic aspects of energy poverty, however, are similar and allow for adaptation, hybridization or inspiration of instruments and measures to reduce or avoid energy poverty across national boundaries. This study focussed on learning from other countries for the German context, but learning can take place bilaterally. The German electricity savings check, for example, serves as a pioneer of further EU and Member State initiatives, in particular since it emphasizes a local, peer-to-peer approach.

There is no simple solution that works for all target groups, provides short- and long-term aid and incentives, reduces or avoids poverty in socio-political terms, and contributes to the achievement of

energy and climate policy goals. It will continue to be a challenge to pursue all these objectives in an integrated approach. To this end, it is important for social policy to develop alongside energy and climate policy and, conversely, for energy and climate policy to be designed in a socially compatible manner. The transformation of energy systems requires a socially sustainable (re)development beyond its system boundaries and an exchange of experiences and mutual learning across political and geographical borders can allow us to do just that.

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