

## Prepayment metering: Household experiences in Germany

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### ABSTRACT

Poor households in Germany and those that are close to the poverty line are more likely to suffer from increases in electricity costs. One consequence of this is the increasing number of cases in which the supplier disconnects a household's power. According to the Federal Network Agency (*Bundesnetzagentur*), a total of almost 359,000 interruptions of the electricity supply were caused in 2015 due to outstanding payments. In order to avoid disconnection from the electricity grid, more and more utility companies have begun to offer prepayment meters (PPMs) to their customers as a response to outstanding payments and a growing number of customers owing debts to their energy supplier. The phenomenon of an increasing number of households affected by energy poverty in Germany is new, and thus the number of PPMs is still low. As a result, experiences in this context are – compared to other countries (e.g. Great Britain) – far from extensive, and political awareness of the problem is low. This paper presents the findings of Germany's first scientific survey on experiences with the use of PPMs.

### 1. Introduction

The residential consumption of electricity is an important part of total household consumption, but also contributes to well-being and social participation. The availability of electricity can be considered as “social power” and the basis of social organization [1]. On the individual level it opens up possibilities: “the energy available to man limits what he can do, and influences what he will do” [2]. If you want to invite neighbours to your birthday party or watch a football match on TV with friends, you need electricity. For this reason the lack of access to electricity leads to circumstances that do not allow for participating in the lifestyles, customs and activities that define membership of society [3]. Furthermore, electricity is a necessary condition for using appliances at home such as cookers, washing machines, TV sets and computers. Affordable, reliable and constant utility services are basic necessities for households in modern, socially responsible societies and are a central requirement for human development.

The increase of household expenditure on electricity in Germany by about 95% between 1997 and 2017 [4] has led to rising debts to utilities, resulting in interruptions of the electricity supply. Many low-income households and those living near the poverty line suffer from increased electricity costs and a loss of real income. Taking inflation into account, the purchasing power of the money at their disposal decreases. Increases of state welfare payments in Germany have not been sufficient to keep pace with increased energy costs [5]. Comparing the evolution of various incomes with the evolution of electricity prices in

recent years (see Fig. 1), it becomes clear that pensioners and welfare recipients are particularly affected by increased electricity prices.

From 2008 until 2013 the rise of electricity prices was particularly high compared to the evolution of average net wages, social welfare and pensions. Between 2011 and 2014 electricity prices rose by around 18% from 25.3 euro cents to 29.8 euro cents [6]. As a result of these developments, during this period power disconnections increased by 12.7% [10].

According to Kreider/Sommer [11], the unemployed, pensioners, students and single parents with two or more children under the age of 6 are particularly vulnerable to energy poverty.

However, there is no official definition of energy poverty in Germany. The first study on energy poverty in Germany was written by Heindl [12], who gave a good overview of commonly used methods for measuring energy poverty. Isherwood/Hancock [13] proposed that households that spend more than 10% of their disposable income on energy can be described as energy-poor households. Disposable income is considered a key economic indicator on the household level and describes the household's budget available after income taxes. The justification for the 10% threshold is that the median of energy expenditure on disposable income was 5% at the time of the study [13]. The threshold is therefore double the median. Since this may also include households with a very high income but also a high energy consumption for luxury applications, Hills [14] developed the Low Income High Cost (LIHC) principle to determine energy poverty. According to this principle, energy poverty exists if the household's equivalised income falls below the OECD at-risk-of-poverty threshold,

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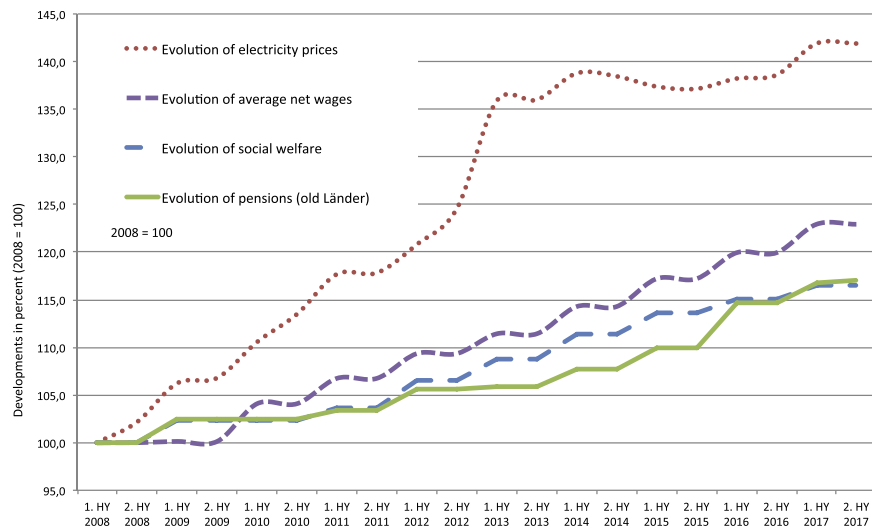


Fig. 1. The evolution of electricity prices, average net wages, social welfare spending, and pensions.

Data sources: [6–9]

and the equivalent energy expenditure is higher than the median in this field. The equivalised income is a recalculation by taking differences in household sizes and composition into account. This way it is possible to consider that households with many members are likely to need a higher income to achieve the same standard of living as households with fewer members. Using France as an example, Imbert et al. [15] confirmed that these indicators can also be used in other countries with good data availability. Deller [16] provided an EU-wide map of energy affordability using energy expenditure shares. The map reveals that shares of energy expenditure in the EU vary widely. Deller concludes that these variations suggest that a single expenditure-based EU-wide metric of fuel poverty would be problematic.

Although there is no standard definition of fuel poverty or energy poverty, the definition of energy poverty used in this text is the inability to attain a socially and materially necessitated level of domestic energy services [17], and is linked with difficulties in affording basic levels of energy needed in households for cooking, lighting and other appliances due to low income levels [18,19].

Prepayment meters (PPMs) are often seen as a way to provide electricity to customers with high energy debts. The concept is similar to prepaid mobile phones: customers purchase credit at an outlet, which they use to top up their meter. PPMs are widely used in Great Britain, where the number of customers paying for their electricity by prepayment doubled from 7% in 1996 to 16% in 2015 [20]. To date, more than four million British households use prepayment for electricity [21]. Usually, these meters are installed to manage customer debt. In the second quarter of 2017, around 39% of UK consumers who were in debt repaid via a PPM [22]. A higher price per kilowatt hour or a fixed amount per month is usually paid for debt repayment. Studies in the UK prove that PPM customers are generally more likely to be fuel poor or vulnerable to becoming fuel poor. This leads to external costs for the individual and society as well, through reduced living standards, or even physical or mental health issues [23]. For the societal acceptance of the German energy transition it is of great importance to take social aspects into account. The process of transition must therefore not be at the expense of vulnerable households. Investigating the issue of who will benefit from new energy systems, who will lose, and whose lives and livelihoods will be put at risk are aspects of social exclusion [24]. Such social exclusion may go hand in hand with electricity debts and even with using a PPM. Higher price schedules and fewer competitive pricing choices discriminate against PPM users and significantly expose them to the main disadvantage of PPMs: the risk of self-disconnection. If the credit runs out, energy supply is usually shut off.

In accordance with Article 3 (7) and (8) of the Electricity Markets Directive (2009/72/EC) [25], appropriate measures against energy poverty must be taken for vulnerable consumers. For this reason, several agencies in EU Member States record and monitor the number of disconnections among non-prepayment customers. Unfortunately, no comparable effort is made to capture the extent (and the drivers) of self-disconnection among prepayment customers. Self-disconnection is an inherent part of the technical peculiarity of PPMs. When the credit is used up, the power supply usually ends, which de facto corresponds to a self-disconnection. If a customer fails to recharge his PPM in time because they are ill or on holiday, the credit may be used up and the power supply will be interrupted. The widespread use of PPMs should therefore not lead to a disguising of the problem or even to a superficial success in the fight against energy poverty. Therefore, it is essential to obtain sound empirical knowledge on the extent and consequences of self-disconnection. This is particularly important because, in Germany, there is no assessment process to help determine the household's circumstances (including whether there is a serious risk to health from self-disconnection) before any PPM is installed for debt-related reasons.

Research in the fields of welfare and consumer protection has unanimously recommended that PPMs should only be installed if customers agree. Currently, the supplier can also install it without the customer's consent. However, it would be important for the customer to choose between the installation of a PPM and power disconnection by the supplier.

The most urgent wish of users – across all studies – refers to the costs for the PPM. As such, the additional costs should be kept to a minimum. The cost-neutral use of PPMs has therefore been recommended. This also applies to special charges, such to release the meter after self-locking or to recharge the credit. Cost neutrality increases potential customer satisfaction and acceptance. It is also conceivable that the additional costs could be allocated to network fees and thus paid by all customers.

The problem of energy poverty has received little attention in Germany up to this point. In the UK, by contrast, research focusing on energy poverty has been conducted for around 35 years [11]. Several studies in the UK have explored the extent and the drivers of self-disconnection and have been summarised by Brutscher [26]. According to this summary, it can be concluded that the results from these studies vary significantly. It is therefore unclear whether or not self-disconnection is a widespread phenomenon, and whether financial constraints are at the core of most self-disconnections [26]. Nevertheless, due to the absence of the need to pay annual supplementary compensation because of electricity debt (exact monthly consumption billing)

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