

Felder, Lars; Haan, Peter; Bach, Stefan; Schill, Wolf-Peter

Article

Heating and electricity expenses: Saving incentives not impacting basic income recipients

DIW Weekly Report

Provided in Cooperation with:

German Institute for Economic Research (DIW Berlin)

Suggested Citation: Felder, Lars; Haan, Peter; Bach, Stefan; Schill, Wolf-Peter (2023) : Heating and electricity expenses: Saving incentives not impacting basic income recipients, DIW Weekly Report, ISSN 2568-7697, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin, Vol. 13, Iss. 14/16, pp. 113-118,
https://doi.org/10.18723/DIW_DWR:2023-14-1

This Version is available at:

<https://hdl.handle.net/10419/271684>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

AT A GLANCE

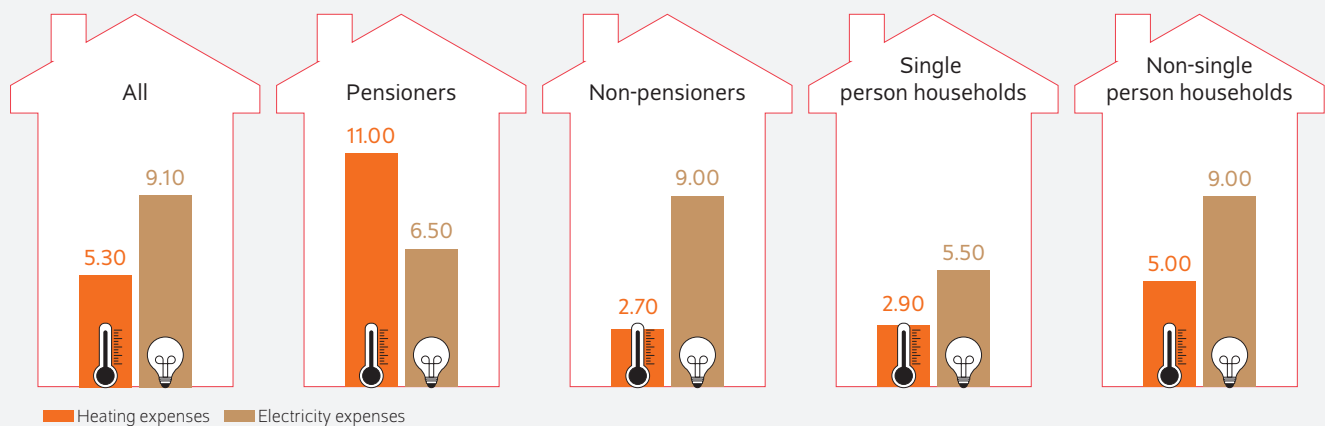
Heating and Electricity Expenses: Saving Incentives Not Impacting Basic Income Recipients

By Lars Felder, Peter Haan, Stefan Bach, and Wolf-Peter Schill

- Significantly higher incentives for basic income recipients to reduce spending on electricity compared to heating
- However, evaluation of SOEP data shows basic income households spend more on electricity than similar households not receiving basic income
- Basic income recipients have only limited opportunities to react to financial incentives
- Climate and social policy measures should consider existing possibilities for improving energy efficiency to lower bills

Basic income households spend significantly more on heating and electricity than comparable households

Monthly excess expenditure compared to non-basic income households in euros



Example: Households receiving basic income spend 9.10 euros more on electricity than comparable households not receiving basic income.

Sources: SOEP v37; authors' calculations.

© DIW Berlin 2023

FROM THE AUTHORS

“Although households receiving basic income have strong incentives to save on electricity, their electricity bills are higher than those of comparable households not receiving basic income. This can be due to older and less energy efficient devices and spending more time at home.”

— Peter Haan —

MEDIA



Audio Interview with Lars Felder (in German)
www.diw.de/mediathek

Heating and Electricity Expenses: Saving Incentives Not Impacting Basic Income Recipients

By Lars Felder, Peter Haan, Stefan Bach, and Wolf-Peter Schill

ABSTRACT

Basic income benefits cover recipients' actual heating expenses as long as they are not unusually high. In contrast, their electricity expenses are only covered via a lump sum at the standard rate. Thus, basic income recipients have weaker incentives for reducing their heating expenses than for reducing their electricity expenses. Using Socio-Economic Panel (SOEP) data, it can be seen that basic income households have higher electricity bills despite this incentive: On average, they spend five euros more on heating and nine euros more on electricity than comparable households not receiving basic income. These higher bills may be due to a lack of sufficient information about their expenses and ways to save energy, or they are unable to save due to non-energy efficient electrical appliances and longer attendance time at home. These interrelationships need to be taken into consideration when drawing up a climate policy that aims to provide savings incentives by increasing the CO₂ price; such a policy can only be effective if households are able to react to price incentives. Thus, in addition to increasing the CO₂ price, targeted subsidy programs for energy efficiency measures as well as information campaigns for households are needed.

Reasonable, actual heating expenses are generally covered by the state for households receiving *Bürgergeld* (a basic income, previously known as *Arbeitslosengeld II*) or basic income support in old age. Electricity expenses, in contrast, are covered via a lump sum included in the standard rate, irrespective of consumption. For households receiving a basic income,¹ there is a financial incentive to save electricity, but not to save heat.

Using Socio-Economic Panel (SOEP)² data, this report compares the electricity and heating expenses of basic income households with the expenses of other households, accounting for relevant differences such as income, size of residence, and household composition. The data used contain information covering up to the year 2019; thus the effects of the coronavirus pandemic or the energy crisis as a result of the war against Ukraine are not included in the study.

Differing regulations for heating and electricity expenses for basic income recipients

The basic social security system was reformed on January 1, 2023, with the introduction of *Bürgergeld*. Due to the recent significant increase in electricity and heating prices, changes to the regulations on the coverage of these expenses for basic income households were called for.³ However, the regulations remained unchanged in principle.⁴ Actual expenses for heating energy (including heating electricity) will continue to be covered as part of accommodation costs, provided the amount

¹ Basic income includes *Bürgergeld* (previously *Arbeitslosengeld II*) and basic income support in old-age as well as the following minimum benefits: welfare, income support (*Sozialgeld*), benefits under the Asylum Seekers' Benefits Act (*Asylbewerberleistungsgesetz*), subsistence assistance, and war victims' benefits. In this Weekly Report, households receiving either *Bürgergeld* or basic income support in old age are collectively referred to as basic income households.

² SOEP is an annual representative survey of private households. It began in West Germany in 1984 and expanded its scope to include the new federal states in 1990; cf. Jan Goebel et al., "The German Socio-Economic Panel (SOEP)," *Journal of Economics and Statistics* 239, no. 29 (2022): 345-360 (available online; accessed on March 3, 2023. This applies to all other online sources in this report unless stated otherwise).

³ Deutscher Bundestag Ausschuss für Arbeit und Soziales, *Ausschussdrucksache 20(11)223* (2022) (in German; available online).

⁴ In 2023, a larger group of people may have their heating costs covered. This group includes all households that could not secure their livelihood due to a sharp rise in heating expenses, even if their income would otherwise make them ineligible for social benefits.

Box 1

Basic income regulations on heating and electricity expenses

Provided they are of a reasonable amount, basic income recipients' heating bills are covered in the accommodation costs provided in the basic income; costs beyond this must be paid by the recipients themselves.¹ A nationwide heating index is used to determine if heating costs are reasonable or not, but it is ultimately subject to the discretionary decision of the local institution providing the funds. A proposal to cover actual electricity costs in full was rejected during the negotiations to introduce Bürgergeld. Electricity expenses are covered as a lump sum in the standard rate and are determined using the nationwide Sample Survey of Income and Expenditure (Einkommens- und Verbrauchsstichprobe, EVS), which is conducted every five years as laid out in the Regelbedarfsermittlungsgesetz.² For years without EVS data, the standard rate is updated according to wage and consumer price development. As in the calculation of Arbeitslosengeld II, 8.12 percent of the standard rate for adults is earmarked as a flat-rate electricity allowance. For children up to age six, 2.83 percent is earmarked; for children between six and thirteen, 4.43 percent; and for adolescents between 14 and 17, 5.07 percent. Depending on the electricity price, these electricity flat rates cover different levels of annual electricity consumption (Figure).

The increase in the standard rate as part of the introduction of the Bürgergeld also increased the amount intended for electricity expenses. If water is produced decentrally in a household, for example via an instantaneous water heater, then households can apply for a supplement for additional needs, which, depending on the standard needs level, amounts to a maximum of 2.3 percent of the standard rate for adults and, depending on age, from 1.4 percent of the standard rate for children aged 14 to 17, to 1.2 percent for children aged six to 13, and to a minimum of 0.8 percent of the standard rate for children under six.³

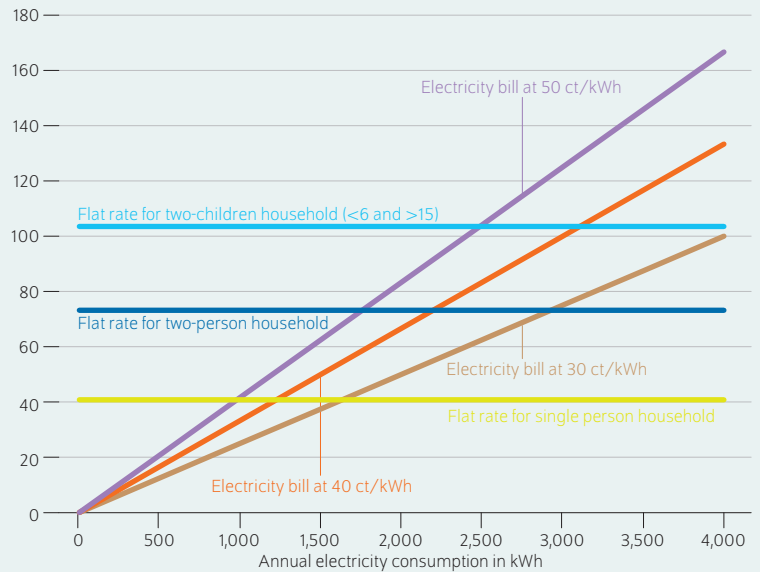
¹ § 35 in Deutscher Bundestag, *Zwölftes Buch Sozialgesetzbuch (SGB XII) vom 16. Dezember 2022* (2022) (in German; available online).
² § 1 in Deutscher Bundestag, *Gesetz zur Ermittlung der Regelbedarfe nach § 28 des Zwölften Buches Sozialgesetzbuch (Regelbedarfs-Ermittlungsgesetz – RBEG)* (2020) (in German; available online).
³ § 21 in Deutscher Bundestag, *Zwölftes Buch Sozialgesetzbuch (SGB XII) vom 16. Dezember 2022* (2022) (in German; available online).

is deemed reasonable.⁵ Households' electricity expenses, in contrast, will continue to be compensated at a flat rate independent of actual consumption.⁶ Single adults receive 40.75 euros per month; couples each receive 36.61 euros per

⁵ The *Heizspiegel* (heating price index) and other similar data collections are used to determine if costs are reasonable. These data can be used to determine comparative values for energy consumption and heating expenses of residential buildings. In individual cases, the values can be disputed if they do not account for relevant characteristics.
⁶ §§ 5 and 6 in Deutscher Bundestag, *Gesetz zur Ermittlung der Regelbedarfe nach § 28 des Zwölften Buches Sozialgesetzbuch (Regelbedarfs-Ermittlungsgesetz – RBEG)* (2022) (in German; available online).

Figure

Electricity flat rates in the Bürgergeld and monthly electricity bills for different household types at various electricity prices
 In euros per month



Note: Electricity flat rates for 2023 compared to the monthly electricity bills for various assumed electricity prices; fixed tariff components are included in the prices per kilowatt hour for simplicity.

Source: Regelbedarfsermittlungsgesetz (RBEG).

© DIW Berlin 2023

At an electricity price of 40 cents per kilowatt hour, the flat rate granted to single person households corresponds to an annual electricity consumption of 1,223 kilowatt hours.

month; and between 8.99 and 21.30 euros are received per child, depending on age (Box 1).

Actual incurred heating costs are covered extensively to ensure that basic income recipients' minimum needs are met. This way, all households eligible for basic income support are guaranteed to be able to heat their homes. However, no incentives for reducing consumption are provided, which is a disadvantage from an energy and climate policy perspective. The situation is different for electricity expenses: Due to the flat-rate coverage independent of actual consumption,

Table 1

Basic income households in comparison

| | All | Basic income households |
|---|--------|-------------------------|
| Number of people in household | 2.0 | 1.9 |
| Average age in years | 54.2 | 48.3 |
| Living space in m ² | 97.6 | 65.2 |
| In percent | | |
| Share of renter households | 53 | 95 |
| Share of households with members 65+ | 37 | 19 |
| Share of households in dwellings built before 1948 | 23 | 20 |
| Share of households in dwellings built between 1949 and 1971 | 26 | 34 |
| Share of households in dwellings built between 1972 and 1990 | 23 | 23 |
| Share of households in dwellings built after 1991 | 19 | 9 |
| Share of households in dwellings with unknown construction date | 9 | 14 |
| Share of households with gas heating | 46 | 41 |
| Share of households with oil heating | 25 | 17 |
| Share of households with district heating | 15 | 32 |
| Share of households with electric heating | 6 | 6 |
| Share of households with wood heating | 4 | 2 |
| Share of households with other heating system | 4 | 2 |
| Number of households in sample | 18,977 | 1,138 |

Notes: The ages of all household members 13 or older were averaged for the total average age. Other heating systems include liquid gas, solar, geothermal, coal, and biomass heating (excluding wood). Households in institutional housing such as retirement homes are excluded from the analysis.

Source: SOEP v37 for 2019.

© DIW Berlin 2023

there is a financial incentive to reduce electricity consumption. From a social policy perspective, however, this regulation can become problematic if individual households have significantly disproportionate electricity expenses or if rising electricity tariffs burden households.

However, it is questionable whether the social and climate policy goals can be implemented at all. For this, it is necessary that the households have all relevant information on the regulations as well as on their heating and electricity expenses. Additionally, they must be able to adjust their consumption, which depends on many factors, among them: usage behavior, the energy efficiency of their appliances and the heating system, the energy efficiency of the building, and the size of the residence. More efficient appliances or heating systems as well as energy-efficient renovations usually require large investments, which renter households cannot undertake on their own.

Basic income recipients live in smaller residences and are more often renters

A simple comparison of the average electricity and heating expenses of basic income and non-basic income households lacks informative power, as households differ in some characteristics that are relevant for energy consumption (Table 1) and can have a strong influence on electricity and heating expenses.

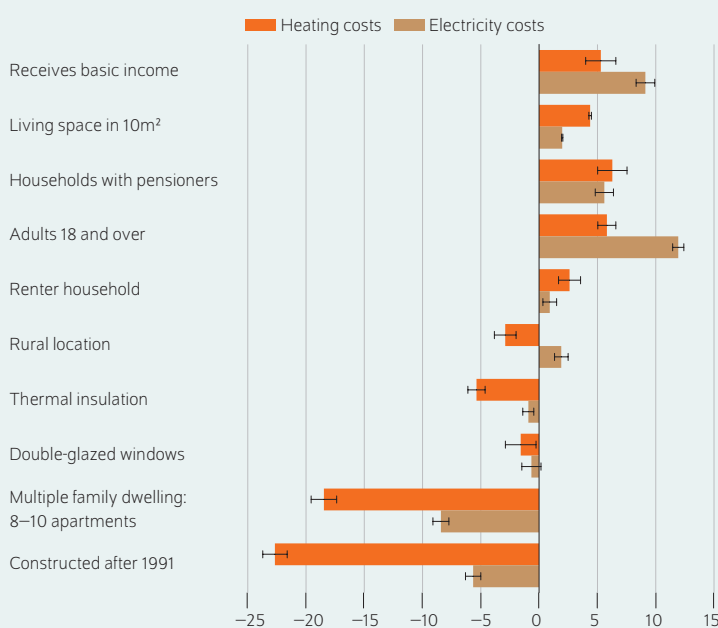
The average number of individuals in a household barely differs between basic income and non-basic income households and between different incomes and is about two persons each. Basic income recipients, however, are significantly younger. The average age of all household members is around 48 years for basic income households, which is almost six years below the average for all households.⁷ This is also reflected in the fact that people of retirement age are significantly less likely to live in a household receiving basic income. Furthermore, basic income households live in smaller dwellings: On average, their residences are 65 square meters, while the average for the total population is nearly 98 square meters. The vast majority of basic income households are renters who more frequently live in older buildings. Furthermore, they use district heating significantly more often than gas or oil.

Basic income recipients spend more on electricity and heating

A multivariate regression analysis is used to compare households' heating and electricity expenses in detail (Box 2). The sample includes all Socio-Economic Panel (SOEP) respondents and, thus, is representative of the German population.⁸ Using this method, the influence of characteristics such as

Figure 1

Influence of selected characteristics on monthly heating and electricity costs
In euros



Note: The vertical lines indicate the 95 percent confidence interval. This means that the actual value is within the interval in 95 percent of cases.

Source: SOEP v37.

© DIW Berlin 2023

On average, basic income households pay almost nine euros more for electricity and five euros more for heating per month than comparable households.

⁷ The average age is the average of all household members 13 years or older.

⁸ The results of a comparison with households below the median income or with the poorest 20 percent of households that do not receive basic income differ only minimally.

residence size or household size can be taken into account. Differences in income or use of time are also considered. As there is no information about how respondents actually spend their time, the hours worked are used instead. In this way, basic income households can be compared with households that are structurally similar.

It can be seen that basic income households, on average, spend around five euros more on heating and nine euros more on electricity than similar households (Figure 1). Expenses differ by other characteristics as well, independent of basic income. A higher net household income entails higher spending on electricity and heating. Households with a monthly net income of 3,000 euros spend around three euros more on electricity than households with an income of 1,000 euros with otherwise comparable characteristics. Expenses increase with the size of the residence and the number of individuals in the household. For every additional adult 18 or older, monthly electricity expenses increase by around 12 euros and monthly heating expenses by around six euros. Households with at least one person receiving a pension income have higher bills, possibly because these individuals spend more time at home during working hours. Modern insulation, in contrast, leads to reduced spending on electricity and heating. The same is true for households living in new buildings and, in general, for households living in buildings with many apartments compared to households living in detached houses.

Basic income households thus have significantly higher electricity and heating expenses than similar households. Households would have been expected to save more on electricity costs than on heating costs; the price incentives do not seem to be working.⁹

Relevant subgroups have higher expenses

From a sociopolitical perspective, it is interesting to see which household types in particular are shouldering higher electricity and heating costs. An evaluation of the data by various household types confirms previous results (Figure 2).¹⁰ The classification “all” shows the average additional expenditures of all households. Due to the smaller sample in some of the subgroups, the uncertainty is larger, hence the 95 percent confidence interval shown is also wider. There is a particularly large difference in additional heating expenses between basic income and non-basic income households if at least one person with a pension income lives in the basic income household. This may be due to the fact that older people spend a significant amount of time at home, regardless of whether they receive basic income support. This may

⁹ Other studies come to similar results. For example, Heindl et al. shows that basic income households hardly react to increasing electricity prices and generally spend more on electricity than is provided in the lump sum of the basic income benefit. Peter Heindl, “Zum Stromkonsum von Haushalten in Grundsicherung: Eine empirische Analyse für Deutschland,” *Perspektiven der Wirtschaftspolitik* 18, no. 4 (2017): 348-367 (in German; available online).

¹⁰ Relevant household characteristics are also controlled for, such as income, size of residence, or hours worked.

Box 2

Empirical analysis

The data for the empirical analysis originates from SOEP survey years 2011 through 2020 (SOEP v37), with the data on electricity and heating costs referring to the respective previous year (2010 to 2019). To ensure comparability, data on electricity and heating costs from 2015 are not used due to a one-time deviation in the questionnaire design. Households are considered basic income recipients for the previous survey year if they report having received Arbeitslosengeld II or an old-age pension in the previous year.

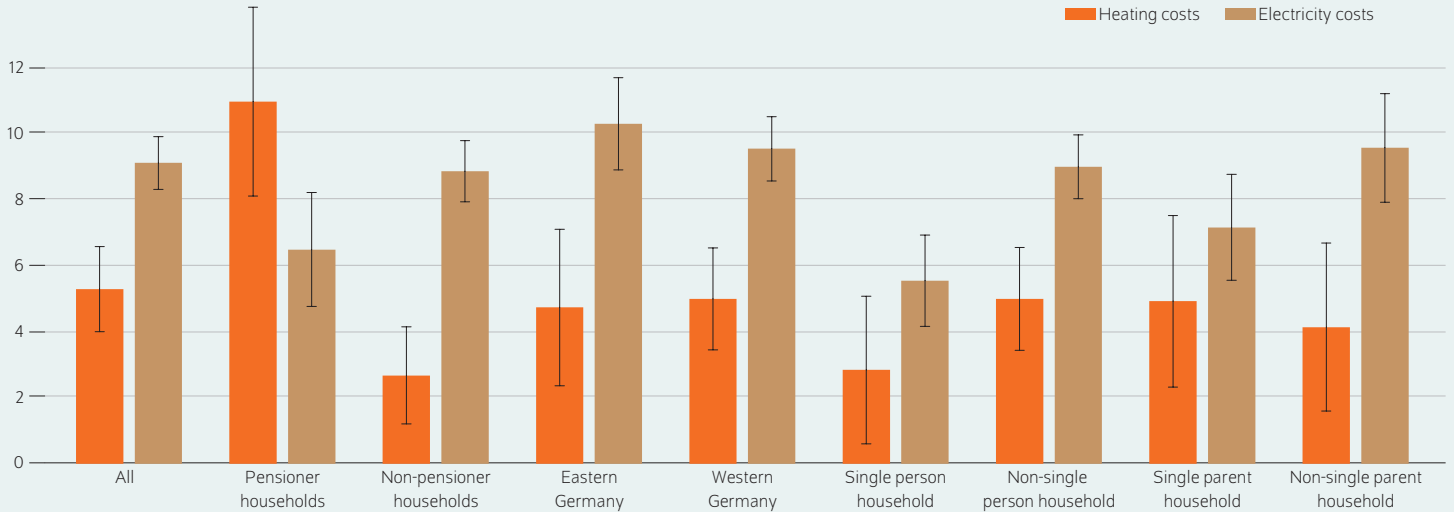
Further SOEP data was used for the regression analysis. Information on household heating sources was queried only in 2015 and 2020; this information is carried over to previous years. All households surveyed in the years that contain information on all necessary expenditures and characteristics are used in the regression analyses. For the heterogeneity analyses, the observations are divided into two subgroups based on relevant characteristics (Figure 2). For the difference between single parent and non-single parent households, only households with children are considered. In all regressions, the following characteristics are considered: Household net income (linear and non-linear), number of and age of persons in the household, average age, size of residence in square meters, urban residence, type of heating system, renter household, federal state, thermal insulation, double-glazed windows, hours worked (linear and non-linear), house type by number of residences, year of construction of dwelling, and share of women in the household. In addition, the effect of each survey year is considered.

explain pensioners’ higher heating energy demand, which results in higher expenses for basic income households than for the comparison households, especially in the case of a poorly renovated or insulated residence. For the case of electricity, on the other hand, the additional expenses are lower for basic income pensioner households. This is likely due to differences in usage behavior.

In contrast, there are no relevant differences between basic income and non-basic income households in eastern and western Germany. In the group of single person households, basic income households’ additional heating and electricity expenses are quite low. Apparently, less energy efficient dwellings or electrical appliances are less important for single person households than for multi-person households. Single parent households have lower additional electricity expenses, while non-single parent households have lower additional heating expenses. All households without children were excluded from the estimate. Thus, uncertainty increases further here and the differences are not statistically significant.

Figure 2

Heating and electricity costs of basic income households compared to similar households in selected groups
In euros per month



Note: The vertical lines indicate the 95 percent confidence interval. This means that the actual value is within the interval in 95 percent of cases.

Source: SOEP v37.

© DIW Berlin 2023

Compared to all other groups, basic income households pay substantially more than similar households.

Conclusion: Support climate policy price incentives with information campaigns and support measures

The German government covers the actual incurred heating costs of households receiving a basic income. In contrast, electricity expenses are covered via a lump sum at a standard rate. Thus, there is an incentive for basic income recipients to save electricity, but not heat.

A comparison of similar households with and without basic income shows that basic income recipients spend five euros more per month on average for heating and nine euros for electricity than comparable households that do not receive basic income. Thus, basic income households do not seem to react to the existing incentives to save electricity. This may be because households are unaware of exactly how much they spend on electricity because specific savings measures and potentials are unknown, or because they are unable to save due to non-energy efficient appliances. In the case of basic income recipients and other low-income households, their limited financial scope also plays a role.

These findings could be relevant for designing climate policy, which will be driven by increasing prices on CO₂ emissions via a European or German emissions trading scheme, which will make fossil fuels and electricity more expensive. If households cannot react to the savings incentives for the aforementioned reasons, then climate policy is likely to be ineffective for this group.

Therefore, information campaigns are important for making incentives and saving possibilities more transparent. Such measures should be accompanied by subsidy programs that make it easier for basic income households with low incomes to purchase more energy-efficient appliances. Furthermore, energy-efficient building refurbishment needs to be more effectively promoted.¹¹

¹¹ In particular, the tenant-landlord dilemma must be taken into account: Investment decisions for energy-efficient building refurbishments must be made by the landlords, while savings in heating energy are made by the tenants. Landlords can pass on refurbishment costs to the rent via the modernization surcharge; however, this surcharge is not directly related to the actual heating energy saved. Cf. Stefan Bach et al., "CO₂-Bepreisung im Wärme- und Verkehrssektor: Diskussion von Wirkungen und alternativen Entlastungsoptionen," *DIW Politikberatung kompakt* 140 (2019) (in German; available online).

Stefan Bach is Research Associate in the Publics Economics Department at DIW Berlin | sbach@diw.de

Lars Felder is Research Assistant in the Publics Economics Department at DIW Berlin | lfelder@diw.de

Peter Haan is Head of the Publics Economics Department at DIW Berlin | phaan@diw.de

Wolf-Peter Schill is Deputy Head of the Energy, Transportation, Environment Department at DIW Berlin | wschill@diw.de

JEL: Q41, H53, D31

Keywords: energy cost, heating cost, social transfers, income distribution

LEGAL AND EDITORIAL DETAILS



DIW Berlin — Deutsches Institut für Wirtschaftsforschung e.V.

Mohrenstraße 58, 10117 Berlin

www.diw.de

Phone: +49 30 897 89-0 Fax: -200

Volume 13 April 19, 2023

Publishers

Prof. Dr. Tomaso Duso; Sabine Fiedler; Prof. Marcel Fratzscher, Ph.D.;
Prof. Dr. Peter Haan; Prof. Dr. Claudia Kemfert; Prof. Dr. Alexander S. Kritikos;
Prof. Dr. Alexander Kriwoluzky; Prof. Dr. Lukas Menkhoff; Prof. Karsten
Neuhoff, Ph.D.; Prof. Dr. Carsten Schröder; Prof. Dr. Katharina Wrohlich

Editors-in-chief

Prof. Dr. Pio Baake; Claudia Cohnen-Beck; Sebastian Kollmann;
Kristina van Deuverden

Reviewer

Dr. Markus Grabka

Editorial staff

Rebecca Buhner; Dr. Hella Engerer; Ulrike Fokken; Petra Jasper; Kevin Kunze;
Sandra Tubik

Layout

Roman Wilhelm, Stefanie Reeg, Eva Kretschmer, DIW Berlin

Cover design

© imageBROKER / Steffen Diemer

Composition

Satz-Rechen-Zentrum Hartmann + Heenemann GmbH & Co. KG, Berlin

ISSN 2568-7697

Reprint and further distribution—including excerpts—with complete
reference and consignment of a specimen copy to DIW Berlin's
Customer Service (kundenservice@diw.de) only.

Subscribe to our DIW and/or Weekly Report Newsletter at

www.diw.de/newsletter_en