King Baudouin Foundation

Working together for a better society

2018

Fourth edition

The Energy Poverty Barometer (2009-2016)

An initiative of the Platform Against Energy Poverty, managed by the King Baudouin Foundation

Key findings

- In 2016, 21.2% of households in Belgium suffered from at least one of the three forms of energy poverty:
  - **Measured energy poverty (mEP)**: 14.5% of households paid an energy bill that was too high in relation to their disposable income (after deduction of the cost of housing). This 'excess' of energy expenditure compared with what could be considered as 'normal' amounted to some €50 per month (depth of mEP).
  - **Hidden energy poverty (hEP)**: 4.3% of households spent twice as little on energy as equivalent households (the same composition and type of housing). Even if, for some of them (roughly 0.5%) the explanation for this might come from the relatively good insulation of their housing. For others (3.8%) this is however due to limiting energy consumption below their basic needs, situations that we have associated with hidden energy poverty. The average gap between the energy expenditure of these households and what could be considered as 'normal' was approximately €77 per month (the depth of hEP).
  - **Perceived energy poverty (pEP)**: 4.9% of households feared being incapable of heating their homes correctly.
- **The weather in 2016 was normal**. As far as energy prices were concerned, electricity witnessed a succession of increases in 2015 and 2016, mainly in Flanders. Oil and natural gas, on the other hand, which remain the main sources of heating energy, continued to fall progressively from 2014 until the second half of 2016. In the second half, tariffs began to increase again. The price of wood remained stable overall.
- The combination of these climatic and economic factors, both of which were favourable on the whole, meant that, **since 2009, the median energy bill (at constant prices) of Belgian households registered a continued fall of some 12%, to reach 139 euros per month in 2016.**
- These factors also favourably influenced the gravity of energy poverty situations (**depth of measured energy poverty and hidden energy poverty**) which **also fell continuously between 2013 and 2016.**

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- Disposable household incomes, on the other hand, were relatively stable in recent years, whilst the cost of housing continued to rise. **Overall, disposable household incomes after the deduction of housing costs fell.**
- **Although energy poverty and the risk of (general) poverty overlap to some extent, the two problems also cover different situations and types of households. The observation of previous years was also true in 2016.** In fact, more than 40% of the households identified as being in one of the three forms of energy poverty in 2016 are not recognised as being 'at risk of poverty'.
- **The types of households most affected by energy poverty are single-person households, especially the elderly, and single-parent families.** These households rely on a single income (which, for many, does not come from work) to cover their expenses, notably in terms of housing and energy. **Single-person households are growing in number, both in the population in general and among those in energy poverty.**
- **Among families with children, we observe a strong dichotomy between,** on the one hand, **families composed of two adults and one or more dependent children,** which are only slightly affected by energy poverty and, on the other hand, **single-parent families** which are substantially more affected by energy poverty.
- As far as the type of housing is concerned, the results confirm that tenants (which comprise a larger proportion of single-person households and single-parent families) are significantly more affected by energy poverty. This latest Barometer also highlights the **link between housing deterioration and the fact of being in energy poverty, especially in perceived energy poverty.**
- Regarding the health of those in energy poverty, **various analyses show that there is a link between the poor health declared by people and the fact that they are in energy poverty** (whatever the typology of household considered, it can be seen that the declared state of health is less good among households in energy poverty), although it is not possible to deduct any direct or indirect cause and effect. It is, on the other hand, shown that a combination of these two situations (poor health and energy poverty) can have an effect of mutual reinforcement.[1]

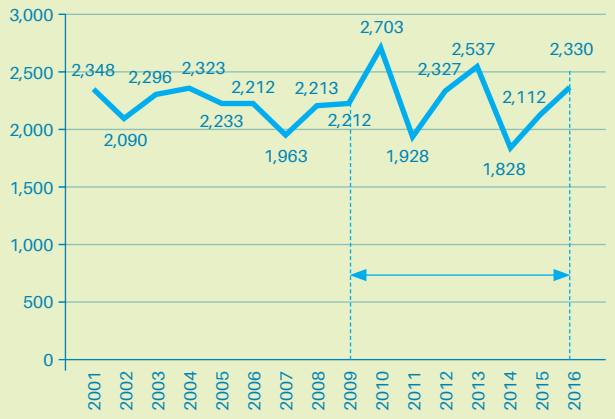
1. Huybrechs et al., 2011. La précarité énergétique en Belgique. UA-OASeS et ULB-CEESE, p.39; http://dev.ulb.ac.be/ceese/CEESE/documents/Energiearmoede%20finaal%20rapport%20FR%20tweede%20editie.pdf

Contextual factors

Climate development

The 2009-2016 period witnessed a number of climatic variations, with a cold peak in 2010 and a particularly mild year in 2014. The chart below shows the change in degree-days (DD) in 16.5 equivalents[2], which are used as an indicator of heating needs. It is observed that 2010 recorded the highest number of degree-days during this period (resulting in a greater need to heat housing) and 2014 the lowest number. 2016 was in the average of values calculated since 1985, and slightly above 2015.[3]

Chart 1. Equivalent 16.5 degree-days, 2001-2016



http://www.gaznaturel.be/fr/particulier/degres-jours

http://www.aardgas.be/nl/particulier/graaddagen

Energy prices

Following the reduction, in April 2014, in the rate of VAT applied (6% instead of 21%), the price of electricity increased several times[4]:

- on January 1st 2015, the Flemish Region increased its distribution tariffs by integrating a new component known as the 'bijdrage energiefonds' (energy fund contribution); [5]
- in August 2015, integration of company tax in the distribution tariff of the distribution network (GRD);
- on 1st September 2015 the level of VAT returned to 21% across Belgium's three regions;
- several increases were observed in Flanders during the first quarter of 2016: that of January related to the suppression of the 'free kWh'[6] and that of March related to the integration of the 'Vlaamse energieheffing' (Flemish energy levy), better known as the 'Turteltaks', in the deduction for the 'Bijdrage energiefonds' to tackle the surplus of green certificates.

2. The number of degree-days is an indicator that enables the harshness/clemency of the climate to be compared from one year to another. It measures the distance between the reference of 16.5°C and the outside temperature. The 16.5 DD equivalents enable the thermal inertia of buildings to be taken into consideration. The higher this number, the harsher the climate, and the greater the need for heat in larger buildings. 2014 recorded the lowest number of degree-days for the 2009-2015 period. (for further details on the methodology of calculation and historical data for degree-days, see: http: //www.gaznaturel.be/fr/particulier/degres-jours)
3. Over the 1985-2015 period, the average number of equivalent DDs (normal DD equivalents) was 2,301.
4. See also the VREG website for further details about this: https://infogram.com/elektriciteitsfactuur_van_een_gezin_evolutie_januari_2015___maart_2016
5. This energy contribution charged in Flanders does not apply to the social tariff. See also: https://www.vlaanderen.be/nl/bouwen-wonen-en-energie/elektriciteit-aardgas-en-verwarming/energieheffing-bijdrage-energiefonds
6. An annual social measure that granted a certain number of 'free' kWh per household in function of household composition (100 kWh per household + 100 kWh for each member of the household). The cost of this non-targeted measure was merged into the GRD's overheads (distribution and public service obligations) that were increased by so much. (Huybrechs et al., 2011. La précarité énergétique en Belgique. UA-OASeSet ULB-CEESE, p.94.; http://dev.ulb.ac.be/ceese/CEESE/documents/Energiearmoede%20finaal%20rapport%20FR%20tweede%20editie.pdf)

- after a very slight settling down in the tariffs across all three regions between April and September 2016, prices began to rise again, marked by a new adaptation to the element regulated by price (distribution, transport and contributions) on 1st January 2017.

Between January 2015 and December 2016, the average price per electric kWh[7] rose from €21.48 to €30.09 (+40.1%) in Flanders, from €21.46 to €24.53 (+14.3%) in Wallonia and from €18.09 to €20.31 (+12.3%) in the Brussels-Capital Region.

In function of the type of contract (fixed vs. variable price), this had considerable repercussions, notably in Flanders, on the energy bills for households using electricity for heating. Yet, according to the BE-SILC study, among households who had specified their heating system, a little over 6.6% used mainly electricity for heating and a further 1.5% for partially heating with electricity (notably for complementary heating).[8]

With electricity consumption of roughly 12,500 kWh for heating[9], the average household bill for heating the home exclusively by electricity could have increased (with a variable price contract and no solar panels) by €44.6 per month in Flanders, as opposed to a little over €11 per month in the two other regions.

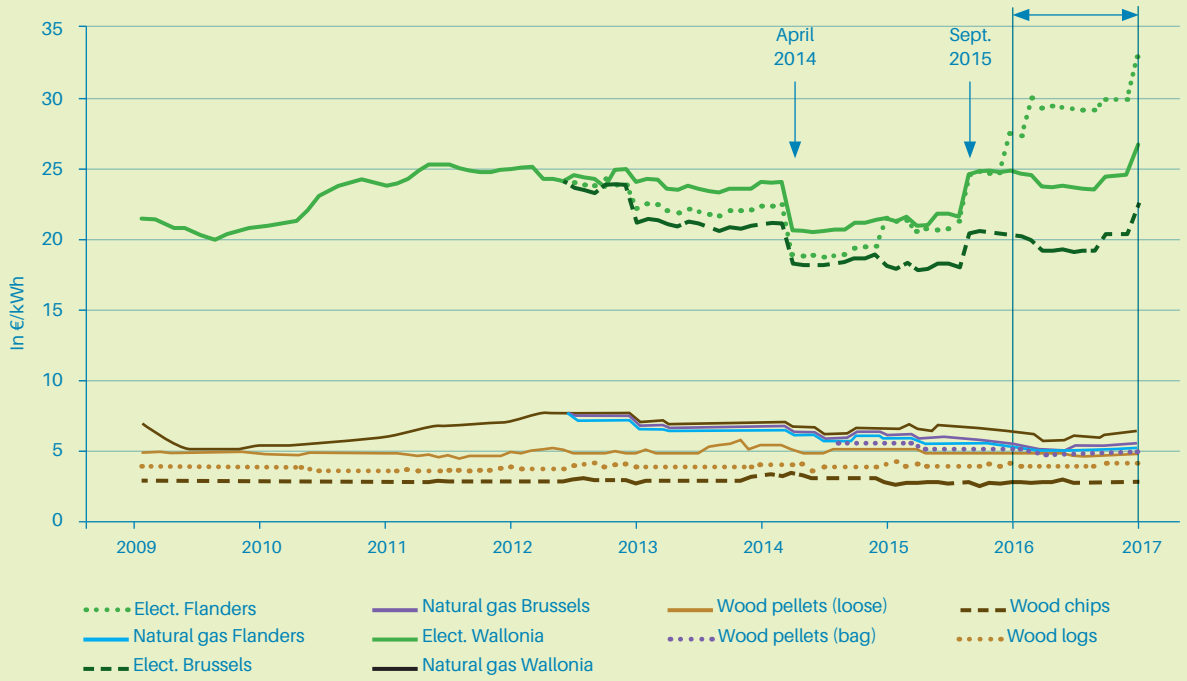
For most households, however, electricity is not used for heating and hot water (on average, it is considered that electricity represents only 30% of final household energy consumption).[10]

Regarding the main energy carriers for heating (gas and oil), **the progressive fall in prices that started in 2014 ended in 2016 with a progressive rise from the second half of the year.** The average price per kWh for natural gas at the end of 2016 was, nevertheless, lower than the price seen at the end of 2015 in each of the country's three regions.

The price of heating oil went from a historically low level in January 2016 to a price at the end of the year similar to that at the start of 2015. At constant prices, the tariffs at the end of 2016 were still below those of 2013/2014 for both natural gas (in each of the three regions) and oil.

7. On the basis of average tariffs in the Observatoire des prix de l'énergie http://www.apere.org/fr/observatoire-des-prix.
8. In 2016, roughly 86% of households used a single type of energy for heating, 12.7% used two types (e.g. gas and wood) and 0.8% used three different types (Source: BE-SILC, our calculations).
9. On the basis of consumer categories defined by the distribution networks.
10. For instance, for a household that spent €45 per month on electricity in 2014 (with a contract of variable market prices), the increase recorded would have been around €2.7 per month in Flanders (roughly +6% over 2 years), as against less than €1 per month in Wallonia and Brussels (about +2% over 2 years).

Chart 2. Energy tariffs paid by households in constant €, 2009-2017

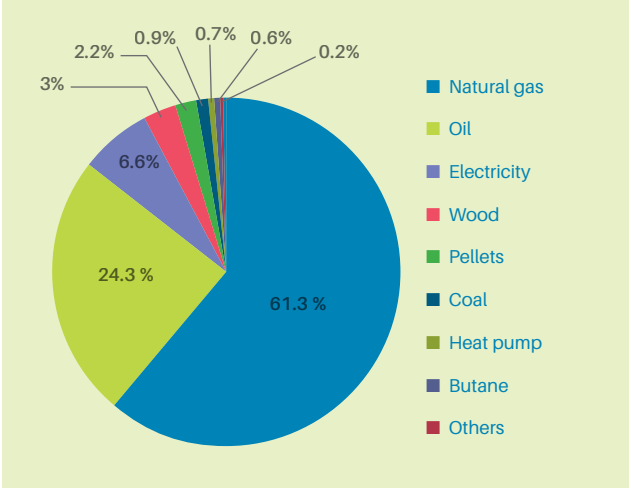


http://www.apere.org/fr/observatoire-des-prix

Regarding heating, 13.5% of households turned to several sources of energy (a little over a third of them used mainly oil, just under a third natural gas) and 86.2% used a single source (roughly two-thirds heated with only natural gas and 22% used oil).

Overall, the main source of energy used by households for heating (Chart 3) was natural gas (61.3% of households), followed by oil (24.3%) and electricity (6.6%).

Chart 3. Breakdown of main energy sources used by households for heating



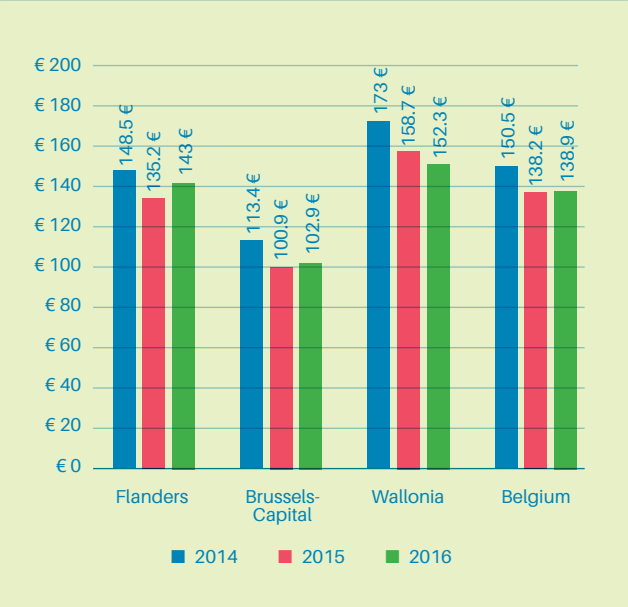
Source: BE-SILC 2016; our own calculations

Household energy bills

The median household energy bill in 2016 was €135 per month.[11]

At constant prices,[12] the median bill had stabilised vs. 2015, but there were regional differences. Thus, there was a constant fall in the energy bill for Walloon households, which also registered the highest median energy bill (€152 per month in 2016), whilst it stabilised for households in Brussels at around €103 per month, but increased again for Flemish households to reach €143 per month in 2016.

Chart 4. Changes in the median household energy bill at constant prices (Base =2013), by region (in €/month), 2014-2016



Source: BE-SILC data 2014-2016; our own calculations.

Since 2009, the median household energy bill (at constant prices) has fallen by roughly 12%.

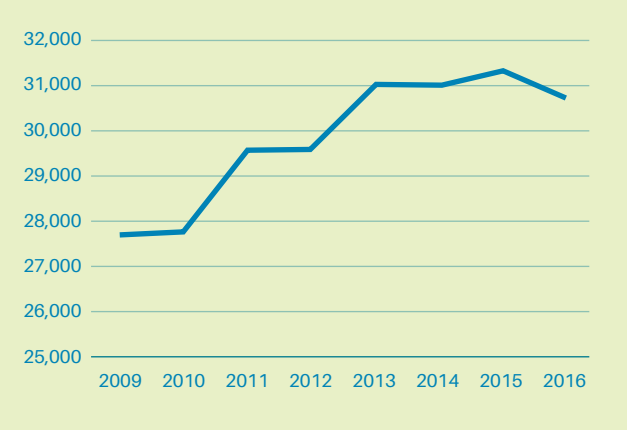
11. The median monthly energy bill was €139 in Flanders, €100 in Brussels-Capital and €148 in Wallonia. (Source: BE-SILC 2016; our own calculations.
12. The change at constant prices enables changes in costs or monetary amounts to be analysed exclusive of inflation. Amounts at constant prices are calculated by dividing the amounts at constant prices by the index of consumer prices (ICP).

Disposable household income

In 2016, the median disposable household income[13] for Belgian households was €31,675 per year, varying from €14,091 for households in the first decile to €78,574 for households in the 10th decile.

Over the period 2009-2016, median disposable incomes at constant prices progressed by approximately 11%, although they stagnated in the period 2013 to 2016 and this irrespective of the type of household: owner or tenant.

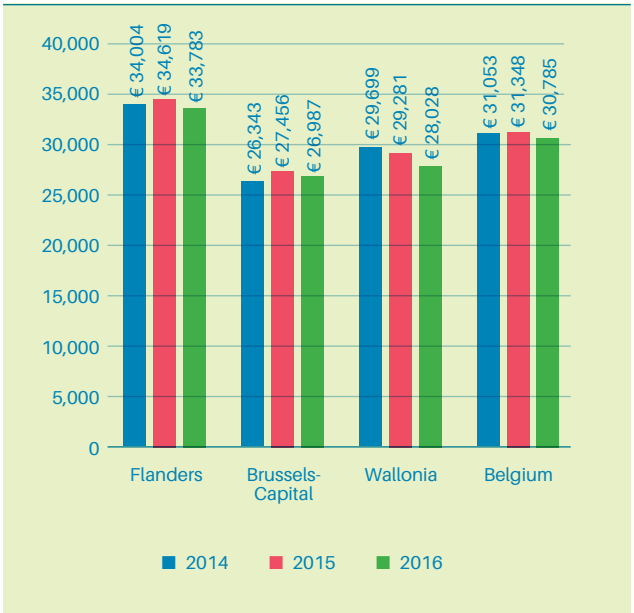
Chart 5. Changes in median disposable income at constant prices (Base = 2013) in € per year, 2009-2016



Source: BE-SILC 2009-2016; our own calculations

13. Variable HY020 in the BE-SILC survey.

Chart 6. Changes at constant prices (Base = 2013) in median disposable income for households by region, 2014-2016



Source: BE-SILC 2014-2016; our own calculations

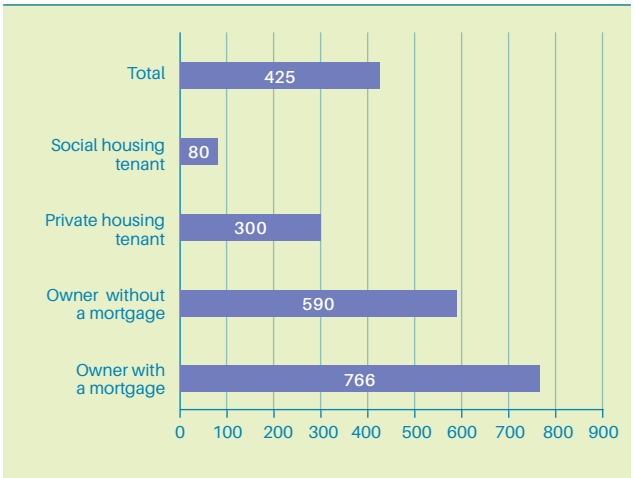
At regional level, the Brussels-Capital Region registered the lowest median disposable income and the Flemish Region the highest. From 2014, there was relative stagnation in levels, except in Wallonia where there was a slight fall.

The cost of housing

The cost of housing (essentially rent for tenants and mortgage repayments and the withholding tax for home owners) differs considerably in function of the type of occupancy in the household. It is highest for home owners with a mortgage and lowest for home owners without a mortgage.

As will be seen later, we must keep this result in perspective, given that home owners with a mortgage are mostly couples with dependent children, most of whom also have two work incomes (Charts 18 and 16), whilst most tenant households are single-person households which therefore have only one income and, for many of them, this income does not come from work (but rather a pension, unemployment benefit, etc.).

Chart 7. Median cost of housing (in €/month) according to type of home occupation, 2016



Source: BE-SILC 2016; our own calculations

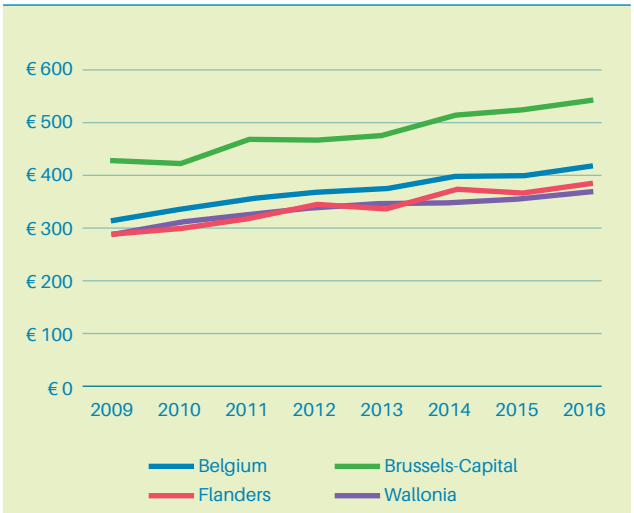
The median cost of housing was €425 per month according to the 2016 BE-SILC data and varied considerably according to area, the Brussels-Capital Region showing a much higher level than the other two regions.

Chart 8. Median monthly housing cost by region, 2016

Source: BE-SILC 2016; our own calculations.

In terms of changes, the **median cost of housing at constant prices had increased by approximately 32% since 2009** and specifically by 12% between 2013 and 2016. The increase was slightly higher in Flanders than in the other two regions.

Chart 9. Changes in the median cost of housing in Belgium and the three Regions at constant prices (Base = 2013), 2009-2016



Source: BE-SILC 2009-2016; our own calculations.

Disposable income after deduction of housing costs

It can be deduced from the preceding two points that **overall, in the period 2009-2016, disposable household income after deduction of the costs of housing and at constant prices had fallen for most households,** since the cost of housing overall was going up faster than disposable household income.

Methodology

The design of the Barometer

In order to be able to take account of the complexity of the problem as analysed in detail in the report *The State of Energy Poverty in Belgium*[14], the Barometer is based on the establishment of three types of 'synthetic' indicators.

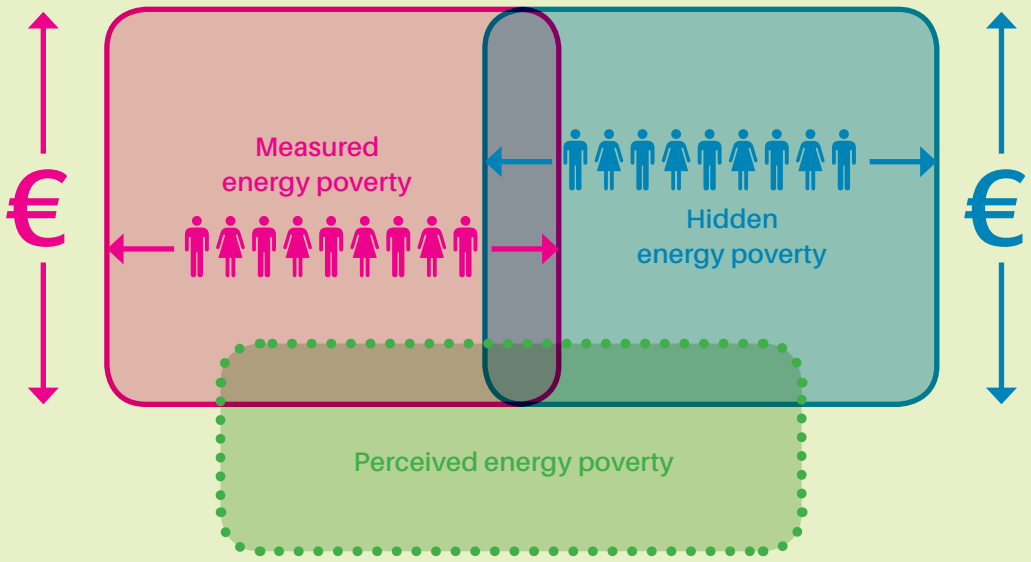
The first indicator sets out to highlight the situation of those households that devote what is considered to be too high a proportion of their household income to energy expenditure (**indicator of measured energy poverty or mEP**). The second relates to the inverse situation in which some households instead limit their energy consumption to a level below the threshold considered as acceptable for living comfortably, in order to avoid energy expenditure that is too high in relation to their income (**indicator of hidden energy poverty or hEP**).

And finally, the third indicator seeks to highlight an aspect, which is much more subjective but which nevertheless exists, which shows the number of households that claim to have insufficient money to heat their homes correctly (the **indicator of perceived energy poverty or pEP**).

The mEP and hEP indicators each have two parts. The first measures the **number** of households affected by energy poverty, namely the **extent** of the poverty. The second measures **the gap** (in €) between each of these households and the threshold established as being an acceptable limit, namely **the depth of poverty.** This is a measure of the seriousness of the situation (the so-called "energy poverty gap").

14. Huybrechs F & Meyer S (2011), *La précarité énergétique en Belgique*, OASeS-UA/ CEESE-ULB, 200p. + appendices.

Chart 10. Key indicators of the Energy Poverty Barometer



Establishing the thresholds

To calculate the number of households in measured energy poverty (mEP) or hidden energy poverty (hEP) the reasoning is based on determining a threshold of energy expenditure judged to be 'normal' in relation to the total population. In mEP the threshold determines the % above which a household's energy expenditure is judged to be too high, whilst in hEP the threshold determines a level of expenditure considered to be the minimum necessary to reach a 'standard' level of comfort.

The measured energy poverty (mEP) threshold

Calculation of the threshold for measured energy poverty (mEP) follows that which Brenda Boardman[15] applied in the past to determine her threshold of 10%. This 10% is equivalent to twice the median ratio between the necessary energy expenditure (modelling consumption and prices) and total UK people's income in 1990. A median ratio divides the population into two: half devote more than the median ratio to their energy expenditure and the other half less. By multiplying this median ratio by two, an effort is made to cover a maximum number of situations considered as acceptable and to identify those cases judged to be more problematical in terms of excessive energy expenditure in relation to household income. It seems, moreover, more intuitive for the whole population to work with a 'simple' threshold (i.e. double the median), rather than more specialised statistical notions such as the standard deviation.

Boardman's approach has been adapted to the Belgian context (since there is no existing model for estimating household energy expenditure in Belgium) and to considerations made elsewhere on the re-definition of this 'fuel poverty ratio'. The Belgian Barometer notably takes account of equivalent incomes in function of household composition, [16] of the exclusion of the highest equivalent incomes (i.e. where there is sufficient internal capacity to adapt) and takes into consideration disposable income after deduction of the cost of housing[17].

The hidden energy poverty (hEP) threshold

Regarding the methodology used for hidden energy poverty, energy expenditure for each household is compared to median household energy expenditure for households of the same composition (in terms of number of people) on the one hand and, on the other hand, the median energy expenditure for households in homes of a similar size (the number of rooms in the home). If a household spends less than half of the energy expenditure of the households of reference and is among the five first deciles of equivalent disposable income, then the household is considered as being in hidden energy poverty.

The Barometer uses the Belgian data from the EU-SILC survey on household living conditions. This survey is conducted annually with a sample of over 6,000 Belgian households and includes relatively detailed information on energy expenditure. The existence of this survey at European level also means that comparisons can be made with other EU member states regarding energy poverty.

The thresholds of measured energy poverty (mEP) and hidden energy poverty (hEP) are re-calculated each year so as to take account of circumstances that influence the entire population in a relatively similar manner (e.g. changes in energy prices, income, harshness of the climate etc.). The thresholds are thus relative rather than fixed as the Fuel Poverty Ratio has become. The mEP and hEP thresholds in this Barometer therefore represent more of a measure of inequalities between households regarding energy expenditure. It is certain that other types of indicator could also be envisaged, such as the standard minimal income or other agreed measures[18].

15. Boardman, B. (1991), Fuel Poverty: From cold homes to affordable warmth, London: Belhaven Press et Boardman, B. (2010), Fixing fuel poverty, London: Earthscan.
16. Equivalising incomes means that large families are not penalised because revenues are re-weighted in function of household composition.
17. To avoid the cost of housing influencing the results too much, an upper limit was introduced.
18. See pages 36-37 of the report: https://ec.europa.eu/energy/sites/ener/files/documents/Selecting%20Indicators%20to%20Measure%20Energy%20Poverty.pdf

The Barometer's three synthetic indicators

Measured energy poverty (mEP)

The extent of measured energy poverty

The table below shows changes in the threshold used to determine whether a household is in mEP or not. It corresponds to twice the ratio between, on the one hand, median household energy expenditure and, on the other hand, the household's median disposable income after deduction of the cost of housing. Since 2011 this threshold has been constantly falling as the overall household expenditure on energy has fallen more rapidly than disposable income after deduction of housing costs for the period.

Table 1. Changes in the median ratio of energy expenditure/ disposable income after deduction of housing costs and the threshold of measured energy poverty (mEP), 2009-2016

	2009	2010	2011	2012	2013	2014	2015	2016
Median ratio (energy expenditure/ disposable income after deduction of housing costs)	7.1%	6.8%	7.3%	7.3%	7%	6.6%	5.9%	5.9%
mEP threshold	14.2%	13.7%	14.7%	15.3%	14%	13.2%	11.8%	11.8%

Source: BE-SILC data 2009-2016; our own calculations

In 2016, 14.5% of households in Belgium were thus considered to be living in measured energy poverty. These were households belonging to the lower five deciles of equivalent incomes (D1 to D5) and whose energy bills were 11.8% above their disposable income after deduction of housing costs.

Table 2. Percentage of households affected by measured energy poverty (mEP) in Belgium and the three regions, 2009-2016

% of households in mEP	2009	2010	2011	2012	2013	2014	2015	2016
Belgium	14.6%	14.2%	14.2%	14.7%	14.0%	14.6%	14.5%	14.5%
Flemish Region	10.7%	11.0%	10.5%	12.4%	10.5%	11.2%	10.8%	11.4%
Brussels-Capital Region	13.9%	13.5%	17.6%	13.9%	15.5%	15.0%	12.8%	13.4%
Walloon region	20.0%	19.5%	19.5%	18.9%	19.1%	19.9%	22.0%	20.4%

Source: BE-SILC data 2009-2016; our own calculations

20.4% of Walloon households and 11.4% of Flemish households are considered to be living in measured energy poverty. The gap between the two regions varied little between 2009 and 2016. The reasons for the difference between the two regions lie mainly in the levels of income (lower in the Walloon Region), the size and quality of housing (larger in Wallonia with fewer attached or terraced houses) and the climate (colder weather in the Walloon Region).

Levels of mEP among households in Brussels were between those in the two other regions, despite inhabitants' lower income levels compared with the rest of the country. This difference is probably explained mainly by differences in the types of housing as a **majority of people in Brussels live in apartments.** An apartment generally means a smaller surface to heat and, in general, better energy performance compared to a house, especially a detached house. Changes in Brussels were also more marked from one year to another, showing heightened sensitivity to the economic situation, notably to the climate and energy prices. This sensitivity can be explained both by lower levels of disposable income after deduction of housing costs, giving extra importance to each euro spent or saved, and by the Brussels sample size in the EU-SILC survey (the smaller the sample, the more year-on-year changes can be marked).

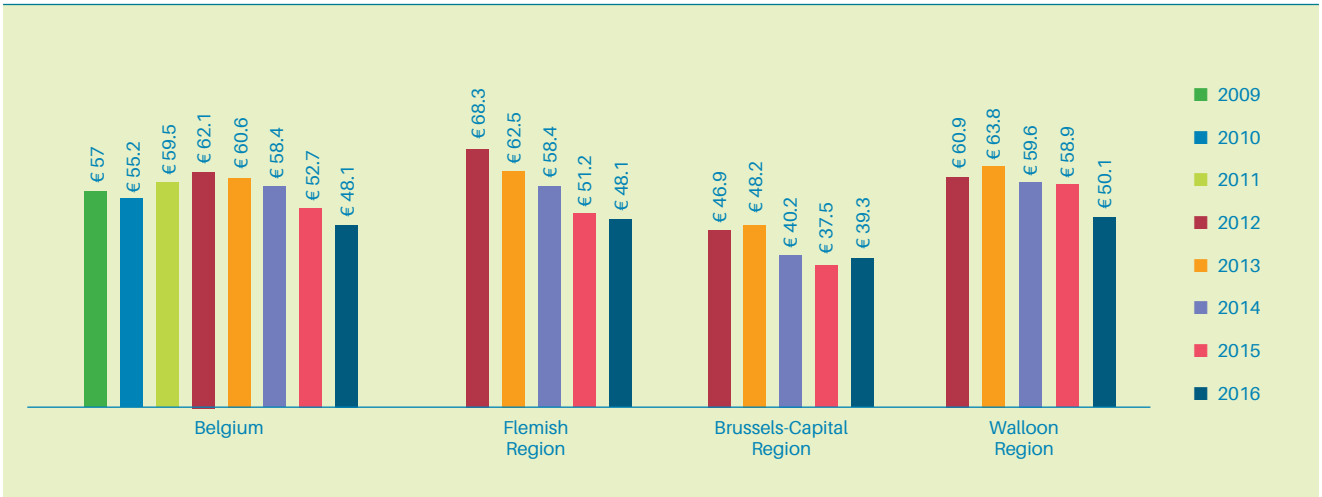
Depth of measured energy poverty

The depth of measured energy poverty (mEP) enables the gap between the energy expenditure of households identified as being in mEP and the reference value (their disposable income multiplied by the mEP threshold) to be measured. The distance is therefore measured in euros and corresponds to the amount that households in mEP spend "too much" each month for their energy bills, in relation to expenditure that would be acceptable given their disposable income (after deduction of housing costs).

2016 was the year when, on average, there was the lowest depth of mEP since 2009. This was the case for the Flemish and Walloon Regions, whereas in the Brussels-Capital Region there was a slight rise in 2016 compared with 2015. The normal climate, as well as the overall favourable energy tariffs, enabled the gravity of the situation to be contained at a level considerably lower than the peak recorded in 2012.

In the Brussels-Capital Region, the seriousness of measured energy poverty was significantly less than that calculated for the other two regions, because of the nature of housing (i.e. a high proportion of apartments).

Chart 11. Depth of mEP in Belgium and for the three regions in euros/month at constant prices (Base = 2013), 2009-2015



Source: BE-SILC data 2009-2016; our own calculations

Hidden energy poverty (hEP)

The extent of hidden energy poverty

The indicator of hidden energy poverty (hEP) aims to identify those households whose energy expenditure is judged to be "abnormally" low in relation to their disposable income. Here too, only the first five deciles of equivalent revenues are taken into consideration.

In this case, the threshold that determined whether energy expenditure was "abnormally" low was calculated taking account not only of household size (the number of people), but also the size of the home (number of rooms).

In order to avoid taking in consideration those households whose energy expenditure is justified and "normal", households with very good energy performance (relatively well insulated) were excluded from hEP calculations up until 2015. Unfortunately the 2016 data no longer include the variables necessary for this correction to be effected. In 2016, therefore, the hidden energy poverty indicator was not calculated in an identical manner to previous years.

The table below illustrates this change.

Table 3. Changes in factors included in the calculation of hidden energy poverty (hEP) in Belgium, 2012-2016

Proportion of households (Belgium):	2012	2013	2014	2015	2016
With very low energy expenditure and in the first 5 deciles of equivalent incomes	4.5%	5.2 %	4.7 %	4.4 %	4.3 %
Living in a relatively well-insulated home and in the first 5 deciles of equivalent incomes	0.7%	0.6 %	0.5 %	0.5 %	n.a.
Extent of hEP	3.8 %	4.6 %	4.2 %	3.9 %	n.a.

n.a. = not available

Source: BE-SILC data 2012-2016; our own calculations

In 2016, 4.3% of households in Belgium had energy expenditure lower than half of that of equivalent households (in terms of composition and size of the home in number of rooms) belonging to the first five deciles of equivalent incomes (Table 3).

Among these, some people lived in a relatively well-insulated home, but it was no longer possible to identify who these were in the 2016 BE-SILC survey. In 2015, they accounted for 0.5% of households.

The Brussels-Capital region registered a considerably higher proportion of households in hEP compared with the other two regions. However, the hEP thresholds were calculated taking account not only of household size, but also the size of home (number of rooms). It should, nevertheless be noted that the average surface size of homes in Brussels, with an equivalent number of rooms, is often smaller (thus needing less heating), given the considerable over-representation of apartments as against houses in the capital.

Table 4. Percentage of households in hidden energy poverty (hEP) in Belgium and the three regions, 2011-2016

% of households in hEP	2011	2012	2013	2014	2015	2016*
Belgium	**3.4 %**	**3.8 %**	**4.6 %**	**4.2 %**	**3.9 %**	**4.3 %***
Flemish Region	3.4 %	2.9 %	3.6 %	3.4 %	3.0 %	2.9 %*
Brussels-Capital Region	7.3 %	8.2 %	11.1 %	9.3 %	9.8 %	9.2 %*
Walloon Region	2.9 %	3.2 %	3.1 %	2.7 %	2.2 %	3.9 %*

* Without excluding households in relatively well-insulated homes

Source: BE-SILC data 2011-2016; our own calculations

The change in Brussels was also much more marked from one year to the next, showing a sensitivity to the economic situation, particularly the climate and energy prices. This sensitivity can be explained both by the lower disposable incomes after deduction of housing costs in Brussels, which means that every euro spent or saved is important, and by the relatively small Brussels sub-sample in the EU-SILC (the smaller the sample size, the more pronounced changes can be from year to year).

The depth of hidden energy poverty

The depth of hidden energy poverty (hEP) measures the gap between the energy expenditure of households identified as being in hEP from their reference value (their disposable income multiplied by the hEP threshold). The gap is therefore measured in euros and corresponds to the amount that households spend "too much" per month for their energy bills in relation to the energy expenditure judged to be "normal" for households of an equivalent composition and a home of similar size. In a manner of speaking, the depth represents the additional budget that households in hEP would have to devote to their energy expenditure to reach a "normal" minimum in relation to similar households. **At constant prices, the depth of hEP fell overall by 20% between 2013 and 2016.**

Table 5. Depth of hEP at constant prices (Base = 2013) for Belgium and the three regions (2012-2016)

€/month (at constant prices):	2012	2013	2014	2015	2016*
Belgium	**95.9**	**93.6**	**85.5**	**75.9**	**74.7***
Flemish Region	95.3	95.8	88.5	77.6	75.4*
Brussels-Capital Region	91.7	90.3	83.4	74.4	73.4*
Walloon Region	101.7	95.1	83.2	76.0	75.4*

* The value of hEP for 2016 is not strictly comparable with that of previous years as it was not possible to exclude from the hEP indicator those households in homes that were relatively well-insulated.

Source: BE-SILC data 2012-2016; our own calculations

Perceived energy poverty (pEP)

This indicator takes the proportion of households that declare "having financial difficulties to heat their homes correctly". To be coherent with the other two indicators of mPE and hEP, pEP only uses households from the first five deciles of equivalent incomes.

Table 6. Proportion of households affected by pEP in Belgium and the three regions (2009-2016)

Percentage of households in pEP:	2009	2010	2011	2012	2013	2014	2015	2016
Belgium	**4.7%**	**5.2%**	**6.0%**	**6.5%**	**5.7%**	**5.3%**	**5.1%**	**4.9%**
Flemish Region	1.8%	2.0%	2.7%	3.1%	3.3%	2.3%	2.4%	2.4%
Brussels-Capital Region	11.1%	12.7%	13.2%	14.3%	10.2%	10.8%	8.1%	8.5%
Walloon Region	6.9%	7.1%	8.3%	8.4%	7.4%	7.4%	7.9%	7.2%

Source: BE-SILC 2009-2016; our own calculations

After a continual increase up to 2012, the proportion of households saying that they had difficulty in heating their homes correctly is falling slightly.

The change in pEP is difficult to interpret because it results from a multitude of factors that could be different from one household to another in function of their particular situation. Nevertheless, the change seems to be in line with changes in two important parameters for the energy bill: energy prices (or changes in tariffs estimated by the households) and the climate.

Different realities

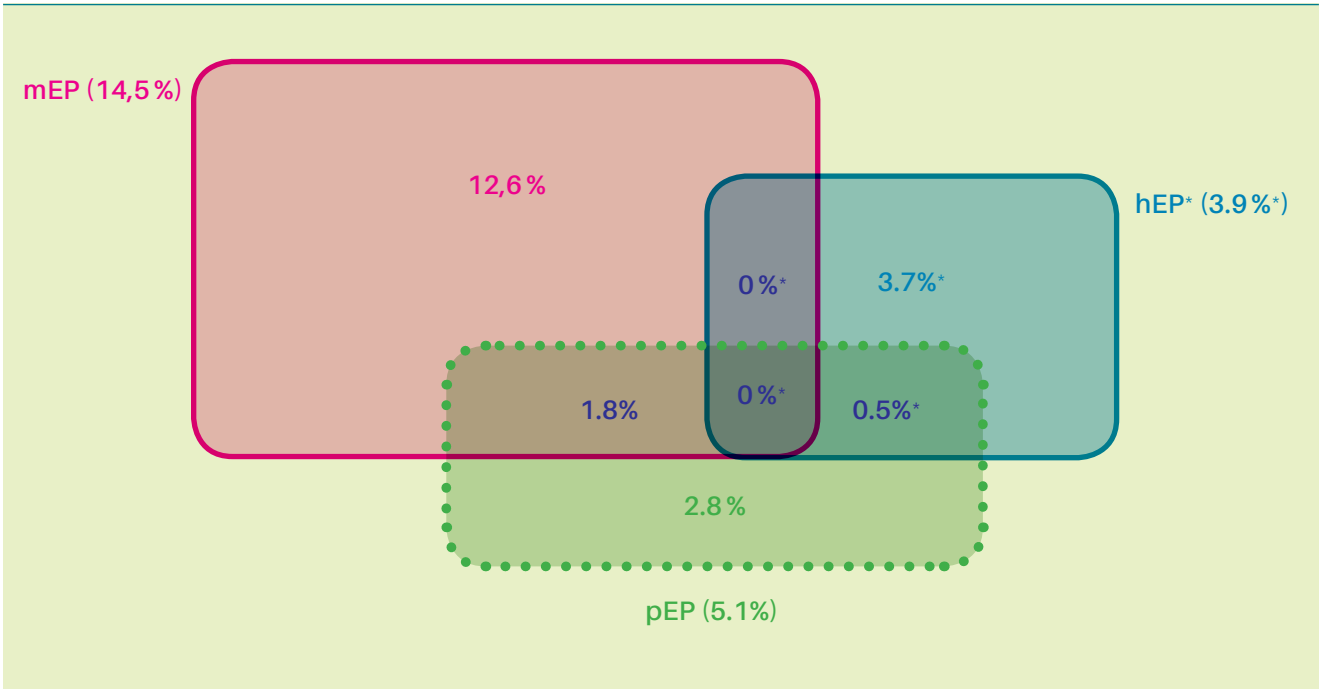
In order to verify that the three indicators of energy poverty identified a particular situation, an analysis was conducted to see whether there was any overlap between the categories. The results show that there is little overlap, as seen in the chart below for 2016, apart from a certain overlap between mEP and pEP, in which 1.9% of households were found to be in both categories.

Methodologically speaking, the 2016 hidden energy poverty indicator (hEP) was slightly different from that calculated in previous years since it was not possible to exclude households living in relatively well-insulated homes. Chart 12 below cannot, therefore, be strictly compared with similar charts from previous years.

By taking account of the overlaps, **a total of 21.2% of Belgian households** were potentially **affected by one or other form of energy poverty in 2016, of which 18.8% were affected by an "objectivised" form** (mEP or hEP) **and 2.7% by an essentially "subjective" form** (only pEP).

Overall, these percentages have been stable since 2013, despite the fall in household energy expenditure.

Chart 12. Overlap between the three forms of energy expenditure (2016)



* In 2016, the hidden energy poverty indicator was calculated slightly differently from in previous years since the variables enabling households in relatively well-insulated homes to be excluded no longer appeared in the 2016 BE-SILC questionnaire.

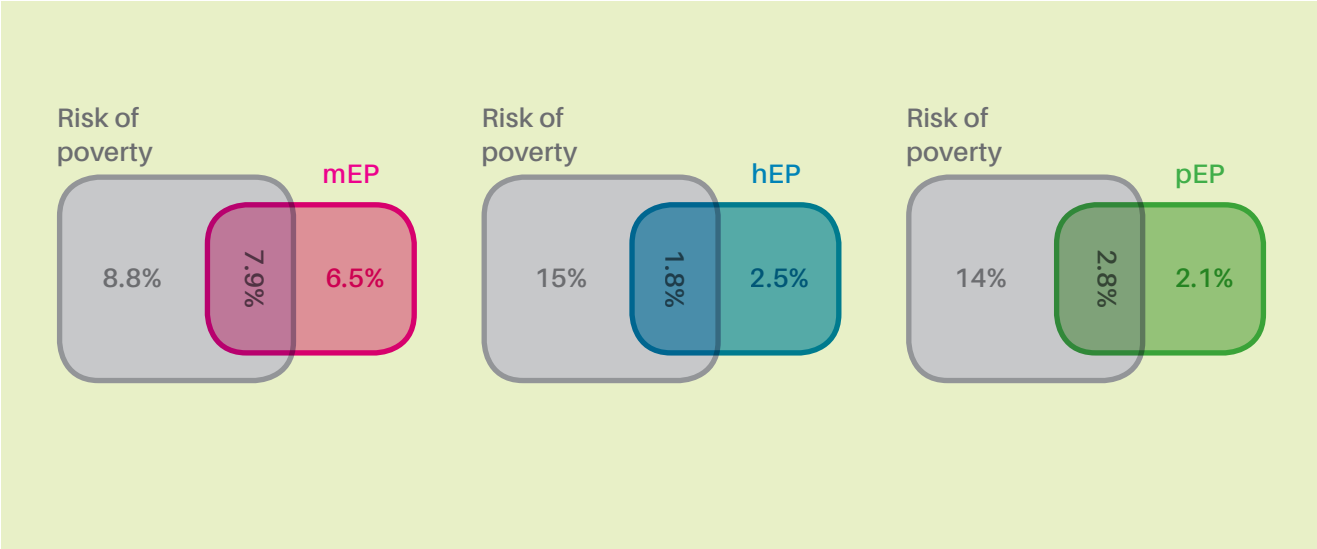
Source: BE-SILC 2016; our own calculations

A link between energy poverty and (generalised) poverty, but no duplication

Energy poverty and the risk of (generalised) poverty

The observation, made in previous years, about a link between "a risk of poverty" and the three forms of energy poverty was once more true in 2016, but there was, nevertheless, a considerable proportion of households in energy poverty that were not "at risk of general poverty".

Chart 13. Overlap between the three forms of energy poverty and the risk of (general) poverty in 2016



NB: Overlap with hidden energy poverty in 2016 cannot directly be compared with that in previous years. hEP was calculated slightly differently in 2016 since the variables enabling households living in relatively well-insulated homes were no longer covered in the BE-SILC questionnaire.

Source: BE-SILC 2016; our own calculations

Energy poverty and deciles of equivalent incomes

Equalising incomes involves taking account of household composition. For instance, a household comprising two adults and one child that has the same income as a single-person household does not have the same power of purchase.

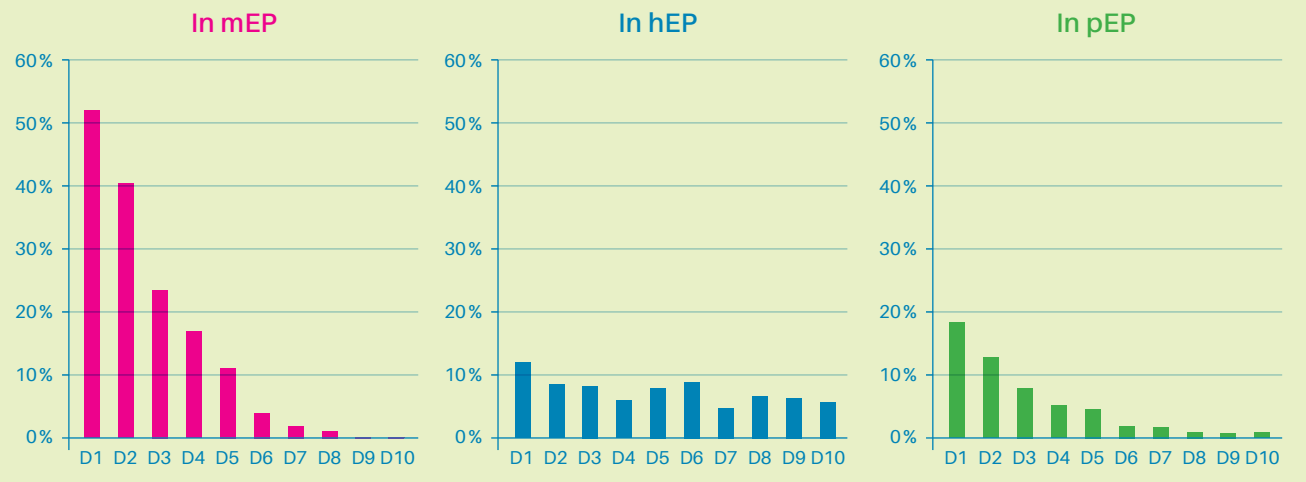
Using deciles enables the population to be divided into 10 income categories. The first decile (D1) covers the 10% of households with the lowest incomes, whilst the 10th decile (D10) covers the 10% of households with the highest incomes.

We worked with deciles of equivalent incomes to analyse the link between household income and the fact of being in energy poverty.

The following graphs take for each of the three forms of energy poverty, the proportion of households in energy poverty for each decile of equivalent income if one were to suppress the hypothesis that only households with the lowest incomes (deciles D1 to D5) could be in energy poverty.

Given that the subsamples for each decile were limited, the results must be treated with caution. Nevertheless, it can be seen rather clearly that the least favoured households (D1 to D3) are also those at greatest risk of being in energy poverty, whatever its form, even though situations of energy poverty exist for each decile.

Chart 14. Percentage of households in mEP, hEP or pEP by decile of equivalent incomes, 2016



* In 2016, the hidden energy poverty indicator (hEP) could not be calculated in the same was as previous years since it was not possible to exclude households living in a relatively well-insulated home. These data are therefore not strictly comparable with data from previous years.

Source: BE-SILC 2016; our own calculations

By taking account of all households, whatever the decile of their equivalent income, the values calculated for all three indicators would be slightly higher than those covered in the Barometer, which only considers households in the first five deciles of equivalent incomes. (Table 7).

This observation is true above all for hidden energy poverty (hEP) whilst in most cases the low consumption of better off households is very likely to relate to their greater capacity to invest in the energy performance of their home and equipment, or perhaps because of prolonged absences from home, rather than to any real restriction in relation to basic needs.

Table 7. Extent of energy poverty among all households vs. only households in the first 5 deciles of equivalent incomes, 2016

Indicator	Extent calculated among all households	Extent among only the first 5 deciles of equivalent incomes
mEP	15.3 %	14.5 %
hEP*	7.6 %*	4.3 %*
pEP	5.6 %	4.9 %

* hEP calculated without excluding households living in relatively well-insulated homes.

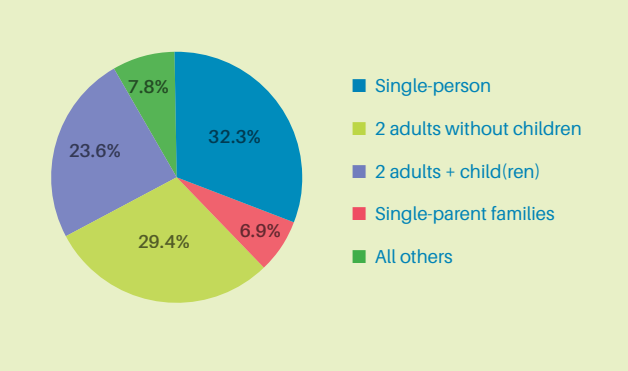
Source: BE-SILC 2016; our own calculations

The volatility of energy prices and unforeseen fluctuations in consumption due, for instance, to climatic variations, etc., can lead to difficulties in paying energy bills, even amongst the best-off households (see pEP). Nevertheless, in the event of such difficulties the internal resources of these better-off households generally preclude them from enduring this situation for any length of time and from falling into more structural energy poverty.

Households more affected by energy poverty: single-parent families and single-person (elderly) households

Single-person households account for almost a third of households living in energy poverty and single-parent families a further 7% (Chart 15). **The proportion of single-person households in the BE-SILC population has been growing since 2014.**[19]

Chart 15. Profile of the 2016 BE-SILC sample by household composition



(N = 5,905 households)
Source: BE-SILC 2016; our own calculations

These two types of household are significantly more affected by energy poverty, as can be seen in Table 8. Whilst 14.5% of all households are in measured energy poverty (mEP), 28% of single-person households and 18.6% of single-parent families are in mEP, as against only 4.7% of households comprising two adults and one or more dependent children.

19. 30.4% in 2014; 31.2% in 2015 and 32.3% in 2016 (Source: BE-SILC 2014-2016; our own calculations.)

Table 8. Energy poverty by household composition

Household type	% Households in mEP	% Households in hEP*	% Households in pEP
Single-person	28.0 %	6.3 %	7.2 %
Single-parent families	18.6 %	7.6 %	11.0 %
2 adults without children	9.5 %	3.1 %	2.2 %
2 adults with child(ren)	4.7 %	2.2 %	2.9 %
Others	3.5 %	3.7 %	6.4 %
All households	**14.5 %**	**4.3 %**	**4.9 %**

N = 5,905 households

Source: BE-SILC 2016; own calculations

In fact, single-parent families and single-person households have to pay their energy bills[20] and the cost of housing[21] from just a single income.

Moreover, **the income of these households is less often work-related** (Chart 16) and lower. **One third of single-parent families have no income from work at all** and, among single-person households, almost all of those aged 65+ live on their pension. **As far as single-person households under 65 years old, almost half of the women and a little over a third of the men have no income from work.**

20. Overall the median household energy bill was €135/month in 2016, but varied from €96 /month for a man aged under 65 living alone to €164/month for the other households without any dependent children. Single-parent families had a median bill of €125/month whilst families with 2 adults and 2 dependent children paid €155/month. (Source: BE-SILC 2016; our own calculations.)

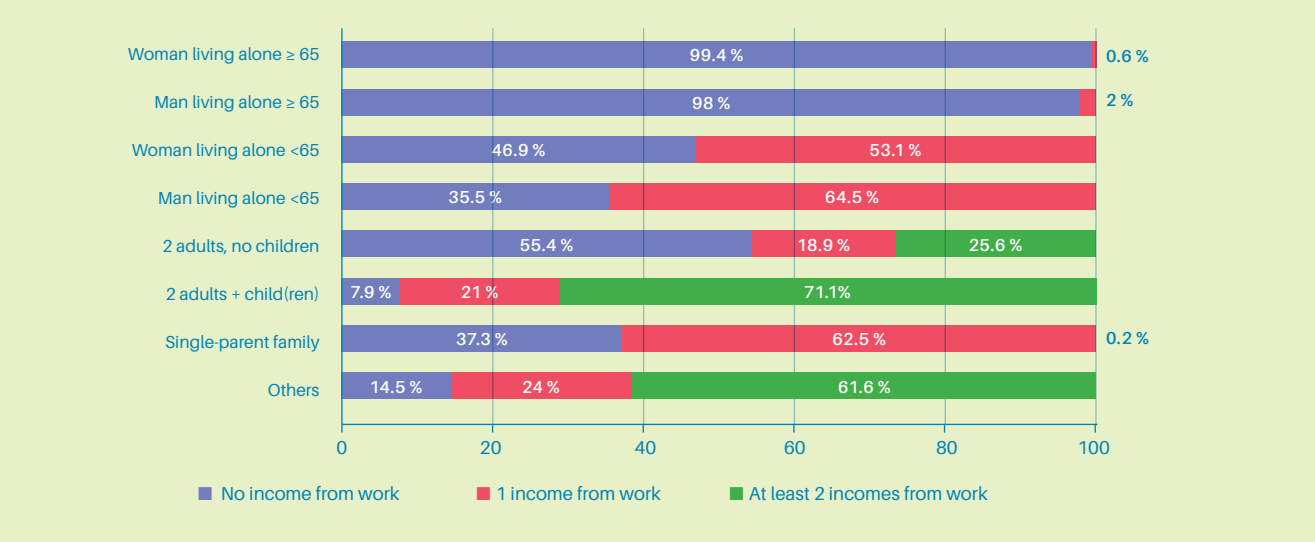
21. The median cost of housing was €425/month overall, but varied between €100-€120 for single-person households and couples aged 65+ to €782/month for families with 2 adults and 2 dependent children. The median cost for housing for single-parent families as €528/month (Source: BE-SILC 2016; our own calculations.)

Chart 17 details median equivalent income of households in function of household composition and clearly shows that single-parent families and single-person households registered **the lowest equivalent incomes,** except for men aged under 65 in single-person households.

Women in single-person households had systematically lower equivalent incomes than men, whatever their age, but the gap is more significant for the under 65 year-olds.

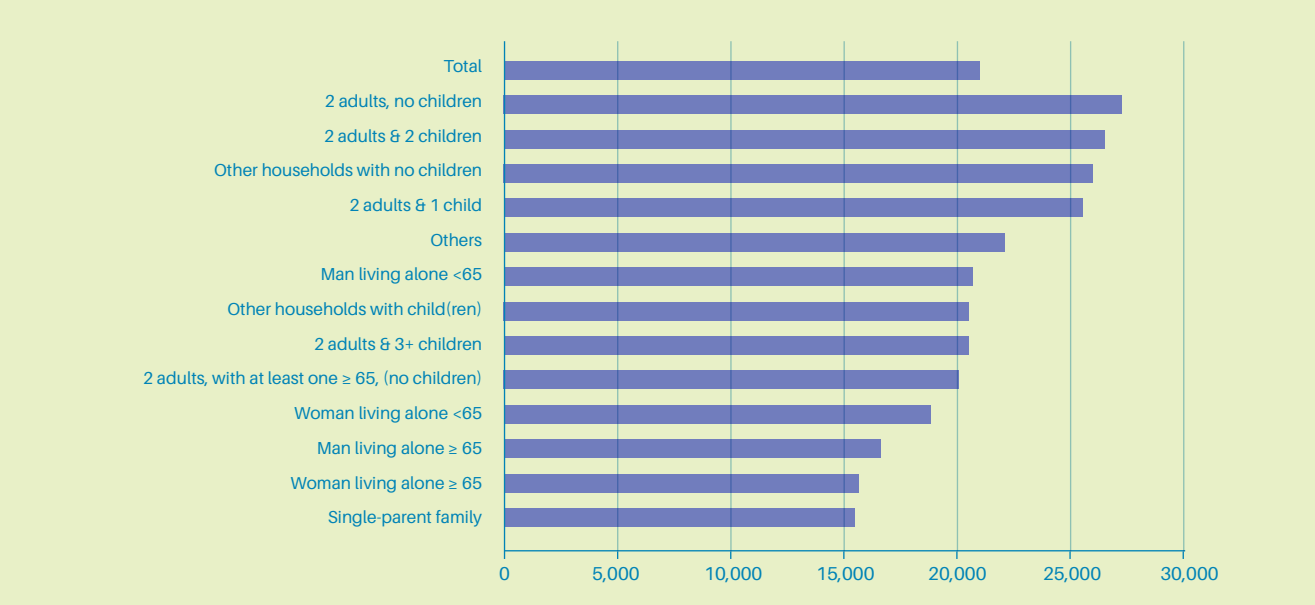
Single-person households and single-parent households were also more often **tenants** than families of two adults with one or more dependent children (Chart 18).

Chart 16. Household composition and the number of incomes from work per household, 2016



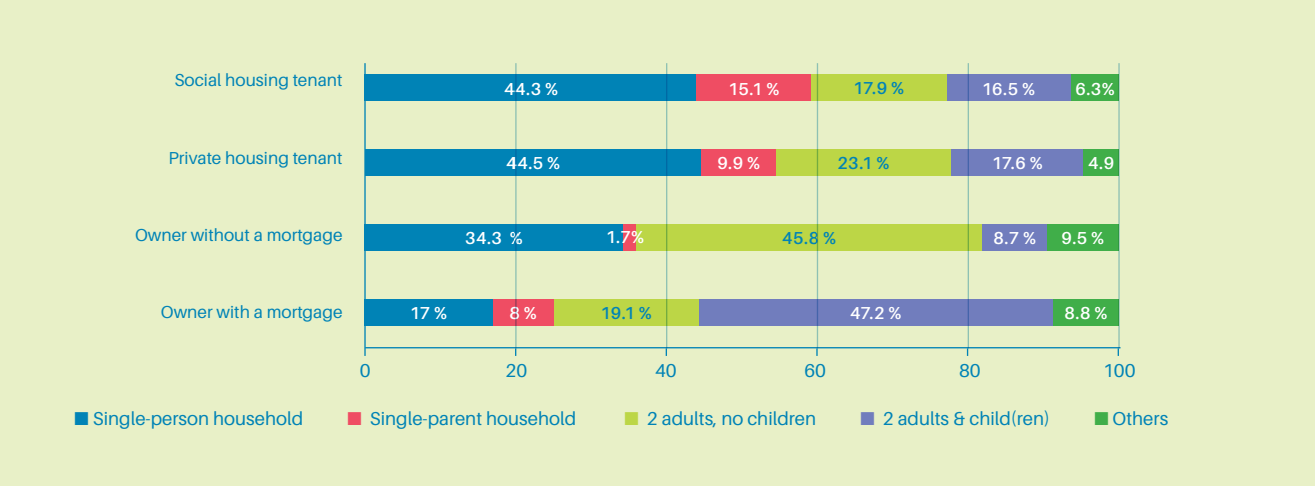
Source: BE-SILC 2016; our own calculations

Chart 17. Median equivalent income according to household composition, 2016



Source: BE-SILC 2016; our own calculations

Chart 18. Type of home occupancy by household composition, 2016



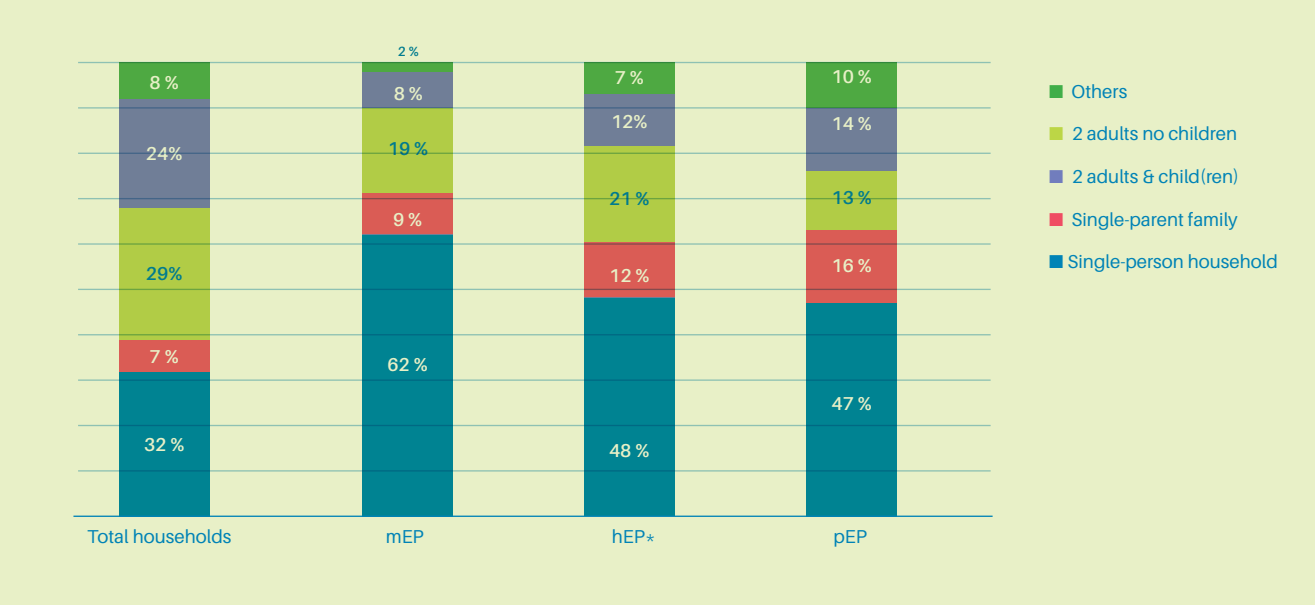
Source: BE-SILC 2016; our own calculations

Focus on single-person households

Single-person households accounted for 62% of households in measured energy poverty (mEP), just under half of those in hidden energy poverty (hEP) and in perceived energy poverty (pEP), whilst they represented just under a third of all households in the total sample. The proportion of single-person households in mEP and pEP had **increased slightly** compared with 2015 as had their share in the total population[22].

22.30.4% in 2014; 31.2% in 2015 and 32.3% on 2016 (Source: BE-SILC 2014-2016; our own calculations.)

Chart 19. Profile of households in measured (mEP), hidden (hEP*) and perceived (pEP) energy poverty according to household composition, 2016



* hEP calculated without excluding households in relatively well-insulated homes.
Source: BE-SILC 2016; our own calculations

Focus on families with children

Overall, families with children seem to be less affected by the various forms of energy poverty. Nevertheless, a rather large dichotomy is observed in function of family composition:

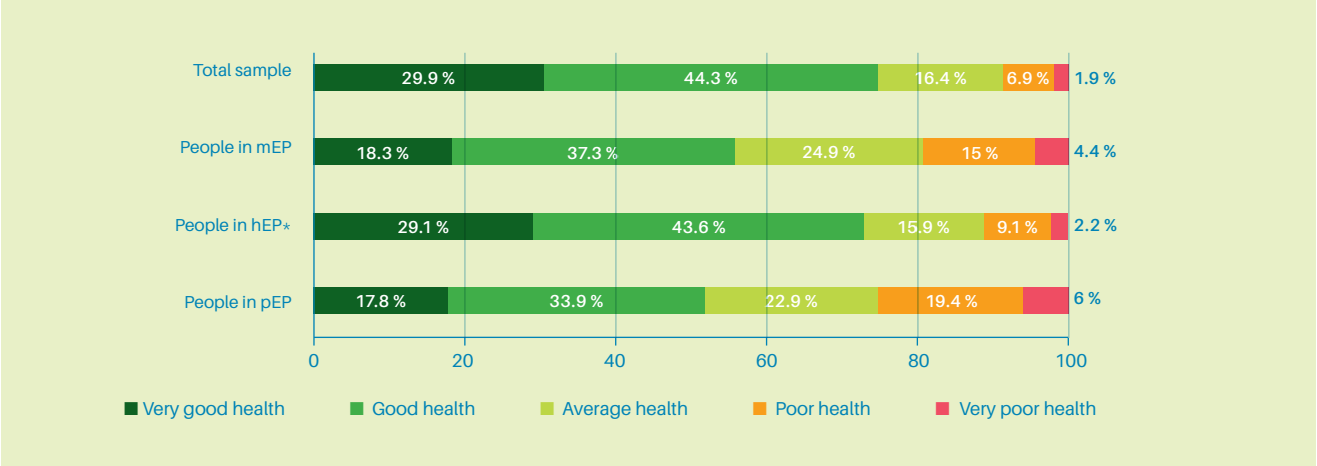
- **Single-parent families were considerably more affected** by all three types of energy poverty and were also among households with the lowest equivalent incomes. A third of these families depend on non-work related income and 55% of them are tenants.
- **Families of two adults and one or more dependent children were considerably less affected** by all three types of energy poverty. They were among the households with the highest equivalent incomes, 71% had two work-related incomes and 75% of them were home owners.

Energy poverty and poor health

Even if it is not certain that being poor health is likely to cause energy poverty or, inversely, that energy poverty damages people's health, **several cross-analyses clearly show a link between the two factors.** Overall, people who declared being in less good health, suffering from chronic illness or incapacity after an illness lasting longer than 6 months were over-represented in the populations identified as being in energy poverty.

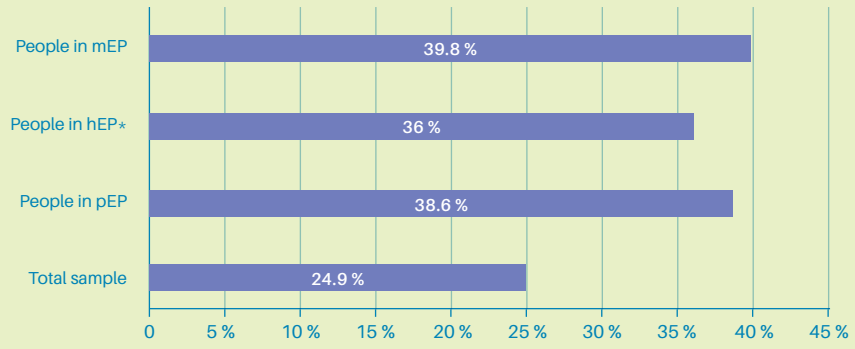
Fewer than 9% of all citizens in the sample claimed to be in poor or very poor health (shown respectively in dark orange and red in Chart 20). However, **if one observes the groups in energy poverty, it can be seen that those in poor or very poor health were over-represented,** with 19.4% in mEP, 11.3% in hEP* and 25.4% in pEP, compared with 8.8% for the total sample.

Chart 20. Declared state of health and measured (mEP), hidden (hEP*) and perceived (pEP) energy poverty, 2016



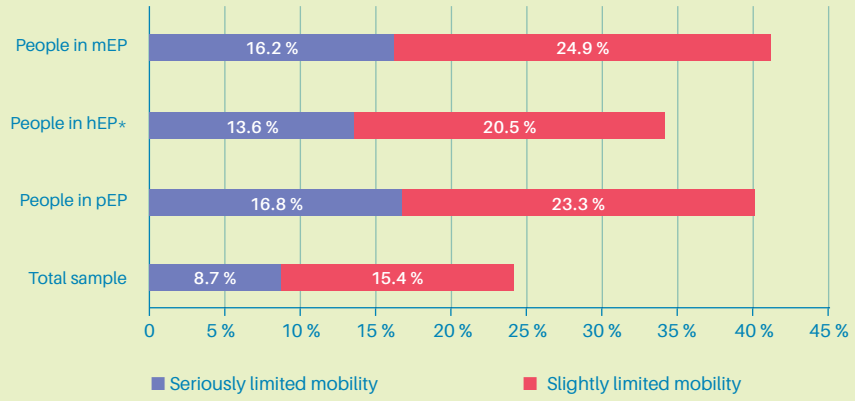
N (total sample) = 11,054 individuals – Source: BE-SILC 2016 and our own calculations

Chart 21. People claiming to suffer from illness or chronic ill health and in measured (mEP), hidden (hEP*) or perceived (pEP) energy poverty



N (total sample) = 11,054 individuals – Source: BE-SILC 2016 and our own calculations

Chart 22. People claiming to have limited mobility due to an illness of 6 months or more and in measured (mEP), hidden (hEP*) or perceived (pEP) energy poverty



N (total sample) = 11,054 individuals – Source: BE-SILC 2016 and our own calculations

People claiming to suffer from an illness or a chronic health problem also appeared to be more affected by energy poverty. This group accounted for less than a quarter in the total population but 38.6% of those in measured energy poverty (mEP), 36% of those in hidden energy poverty (hEP*) and 39.8% of those in perceived energy poverty (pEP).

People claiming to suffer from limited mobility following an illness of 6 months or more were also over-represented among those in energy poverty compared with the total population: they accounted for less than a quarter of the total population, but over 40% of those in measured energy poverty (mEP), 34% of those in hidden energy poverty (hEP*) and 41% of those in perceived energy poverty (pEP).

Overall, therefore, it can be observed that there were poorer levels of declared health among people in energy poverty compared with those not in energy poverty. This is true for whichever type of household composition is considered.

Links with the type of home occupancy

Type of home occupancy

The 2016 BE-SILC sample comprised 66.6% of home owners (31.2% with an on-going mortgage and 35.4% without a mortgage) and 33.4% of tenants (9.4% in social housing and 24.0% in private rental).

Tenants were considerably over-represented across all three forms of energy poverty. They accounted for a higher proportion of single-person households and single-parent families (see Chart 18) which overall had lower disposable equivalent incomes (see Chart 17).

Since 2013, the gap between home owners and tenants relating to mEP had gradually widened: the percentage of home owners affected has been slowly but continually falling (from 11.4% in 2013 to 10.6% in 2016), whilst the proportion of tenants in mEP has been gradually rising (from 19.8% in 2013 to 22.4% in 2016).

Table 9. Proportion of households in energy poverty according to type of home occupancy

Type of home occupancy:	% in mEP	% in hEP*	% in pEP
Owner with a mortgage	*5.8 %*	*1.5 %*	*2.3 %*
Owner without a mortgage	*14.7 %*	*3.6 %*	*2.2 %*
All owners	**10.6 %**	**2.6 %**	**2.2 %**
Private housing tenant	*21.9 %*	*6.8 %*	*9.7 %*
Social housing tenant	*23.5 %*	*9.7 %*	*11.5 %*
All tenants	**22.4 %**	**7.6 %**	**10.2 %**
Total sample	**14.5 %**	**4.3 %**	**4.9 %**

Source: BE-SILC 2016 and our own calculations

The difference observed between owners with and without a mortgage, notably in relation to measured energy poverty (mEP), can be accounted for by the household composition. Households with mortgages were mostly families of two adults and one or more dependent children (see Chart 18) and with relatively high disposable incomes (chart 17). Owners without mortgages comprised mainly of households of two adults but no dependent children, and one third were single-person (notably elderly) households.

In terms of pEP, there was no change in the indicator for home owners overall, whilst there was a sight fall amongst private housing tenants. In the last two years, there was an inversion in the proportions of social housing tenants and private housing tenants, the former increasing and the latter falling.

Poor housing and energy poverty

Cross-analyses between the variables in which respondents declared that they were suffering from a deterioration in their home (e.g. roof leakages, mould, rotten wood) and the fact of being in energy poverty showed a link between a situation of energy poverty and a greater likelihood of having poor housing. This was particularly the case regarding perceived energy poverty.

Table 10. Presence of factors of housing deterioration and energy poverty

State of deterioration in home:	Total sample	Households in mEP	Households in hEP*	Households in pEP
Leaks in the roof	5.6 %	8.3 %	9.5 %	15.6 %
Humidity on walls or floor	14.9 %	18.5 %	18.2 %	32.1 %
Rotten wood	3.4 %	5.1 %	4.7 %	11.6 %

Source: BE-SILC 2016 and our own calculations

Colophon

Title The Energy Poverty Barometer (2009-2016)

Cette publication est également disponible en français sous le titre: Baromètre de la précarité énergétique (2009-2016).
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