



Consumer study on purchase decisions regarding heating appliances

For the association of the European Heating Industry

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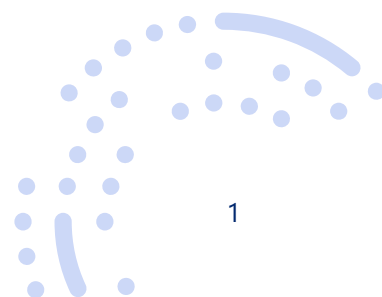
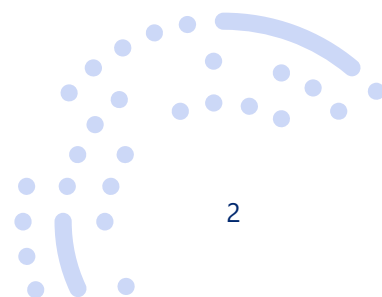




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1 Introduction

This report presents the results of a large-scale European consumer survey on purchase decisions regarding heating appliances.

When consumers want to buy a new heating appliance, there is a wide range of space heating technologies that they can choose from, including electric heat pumps, hybrid heat pumps, condensing gas boilers, biomass boilers, and CHP systems. To what extent do consumers switch to more energy efficient technologies when replacing their old appliance? Which aspects do they consider (most) important when choosing a new appliance? And, more specifically, how important is the energy class relative to other aspects (such as purchase and installation costs, brand, noise level, installer advice) in their choices? Which information sources do they consult? The present study provides insight into the consumers' decision process.

The study also zooms in on the role of the EU energy label in the purchase process. Do consumers know that there is an energy label for space heaters? Are they exposed to it when they purchase a heating appliance? How important is the energy label in their purchase decisions?

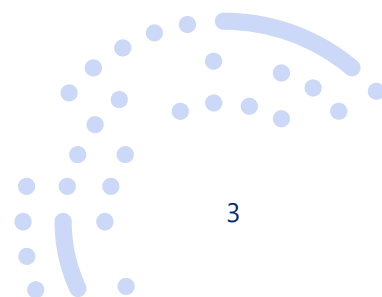
To answer these questions, a survey was administered to over 3000 recent buyers of heating appliances (boilers, heat pumps, micro CHP and hybrid systems) in five European countries.

1.1 Survey set-up

The survey consisted of four parts:

- **Part 1: screening questions;** to find out whether the respondent is in the target group;
- **Part 2: consumer decision-making process;** includes questions about, amongst others, the type of appliance purchased, whether or not it was a replacement (and if so, the type of appliance replaced and reason for the replacement), the types of appliances considered, the information search, the role of the installer, and the relative importance of various aspects in the final choice (e.g. price, energy efficiency, ease of installation, brand, etc.);
- **Part 3: role of the energy label in the decision-making process;** includes questions assessing consumers' awareness and perceived relevance of the energy label and its influence on their choice;
- **Part 4: background information;** includes questions assessing product expertise, environmental concern and socio-demographic characteristics (education, financial situation).

The survey was administered to members of Ipsos' online consumer panels in **Germany, France, Italy, Bulgaria** and **Poland**, targeting recent buyers of the heating appliances under consideration. The fieldwork was carried out between 6 and 18 August 2021. The survey took about 10 minutes to complete. The complete survey can be found in Appendix A.





1.2 Respondent sample

The survey targeted consumers, aged between 18 and 75, who purchased a boiler, heat pump, CHP system or hybrid heating system in the past 4 years (2017 or later) and who were involved in that purchase decision. In total, 3032 respondents completed the survey (approximately 600 in each of the five countries). Table 1.1 provides an overview of the sample characteristics for the total sample as well as per country.

Table 1.1. Sample characteristics

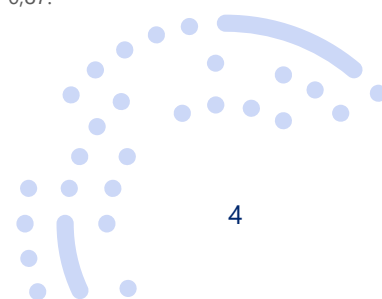
	Total	DE	FR	IT	BG	PL
Sample size (N)	3032	600	605	602	615	610
<u>Gender</u>						
Male	49.3%	50.2%	48.8%	49.5%	49.1%	49.0%
Female	50.7%	49.8%	51.2%	50.5%	50.9%	51.0%
<u>Age</u>						
18-24 years	6.7%	7.7%	6.3%	6.7%	3.4%	9.5%
25-34 years	20.0%	20.2%	22.0%	17.5%	21.5%	19.0%
35-44 years	20.2%	16.5%	16.4%	20.6%	24.2%	23.0%
45-54 years	17.9%	20.0%	20.5%	19.1%	14.5%	15.2%
55-64 years	23.3%	23.3%	12.9%	24.1%	28.6%	27.4%
65-75 years	12.0%	12.3%	22.0%	12.0%	7.8%	5.9%
<u>Education</u>						
Low (ISCED cat. 0-4)	47.5%	61.8%	38.5%	64.3%	22.6%	50.7%
High (ISCED cat. 5-8)	52.5%	38.2%	61.5%	35.7%	77.4%	49.3%
<u>Household financial situation</u> (on a scale from 1 to 5) ¹	3.27	3.51	3.29	3.09	3.18	3.30
<u>Heating systems expertise</u> (on a scale from 1 to 5) ²	2.66	2.71	2.46	2.61	2.79	2.72
<u>Concern for the environment</u> (on a scale from 1 to 5) ³	4.00	3.73	3.85	4.16	4.09	4.15

60.1% of the respondents indicated that they were very involved in the purchase decision, while 39.9% of the respondents were somewhat involved. About 6 in 10 respondents purchased a boiler in the past four years (59.7%, see Table 1.2 and Figure 1.1). 27.1% of the respondents reported to have purchased a heat pump, 7.1% a CHP system and 6.1% a hybrid system. These percentages do not correspond to sales figures, however: consumers who indicated to have purchased a heat pump, micro CHP or hybrid

¹ Financial situation ("Thinking about your household's financial situation, how easy or difficult would you say it is to make ends meet?") measured on a 5-point scale from 1 = very difficult to 5 = very easy.

² Product category expertise ("I know a great deal about heating systems", "I consider myself an expert in heating systems") measured on a 5-point scale from 1 = completely disagree to 7 = completely agree; Cronbach's alpha = 0,83.

³ Environmental concern (Thøgersen et al., 2010: "I am worried about the environment", "People should buy environmentally-friendly products", "It concerns me that people do not care enough for the environment") measured on 5-point scales from 1 = completely disagree to 7 = completely agree. Cronbach's alpha = 0,87.

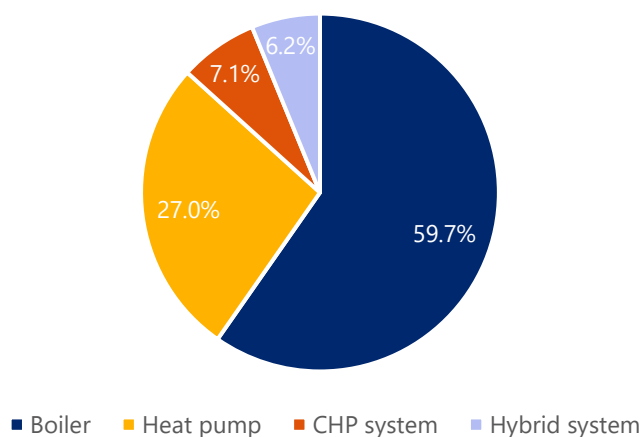




system appear overrepresented in the sample.⁴ There could be several reasons for their overrepresentation. For instance, consumers who purchased an efficient appliance might have been more eager to answer questions regarding their heating appliance compared to consumers who purchased a conventional boiler. Furthermore, as also suggested in an earlier consumer study on heating appliances⁵, consumers do not always appear to know what type of appliance they have bought. Finally, despite the fact that it was clearly stated at the beginning of the questionnaire that the questionnaire was about the purchase of central heating systems to heat your home, some respondents might have mistaken the pictures of heat pumps for air conditioners, which also might have contributed to the relatively high share of heat pump purchases in the sample.

Since consumers who are more involved in the decision process could be expected to more accurately know what type of appliance they have purchased, we also examined the purchase and switching behaviour including only those respondents who indicated that they were highly involved in the decision. This did not strongly influence the results: only slightly fewer respondents reported to have purchased a micro CHP or hybrid system (see Appendix C, section C.1). If consumers went through very different decision processes depending on the specific type of appliance they purchased, the results may not be representative for recent buyers of heating appliances. Therefore, to examine to what extent the overall results are influenced by the specific responses of overrepresented groups, we repeated all analyses excluding the respondents who reported to have purchased a CHP or hybrid system (as these products are known to reflect a tiny share of the market). This did not change the results; the substantive conclusions remained the same (see Appendix C, section C.2).

Figure 1.1. Type of appliance purchased



Base = all respondents (N = 3032).

⁴ See e.g. EHI (2020). *Heating market report 2020*.

⁵ Centerdata/Ipsos (2021). *Study on consumer understanding of the energy label for space heaters and air conditioners*. Report for the European Commission, DG Energy.

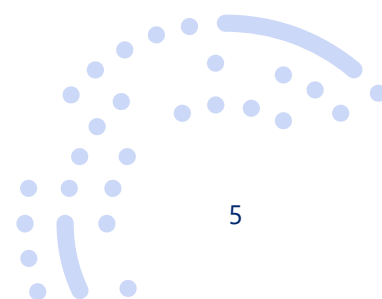
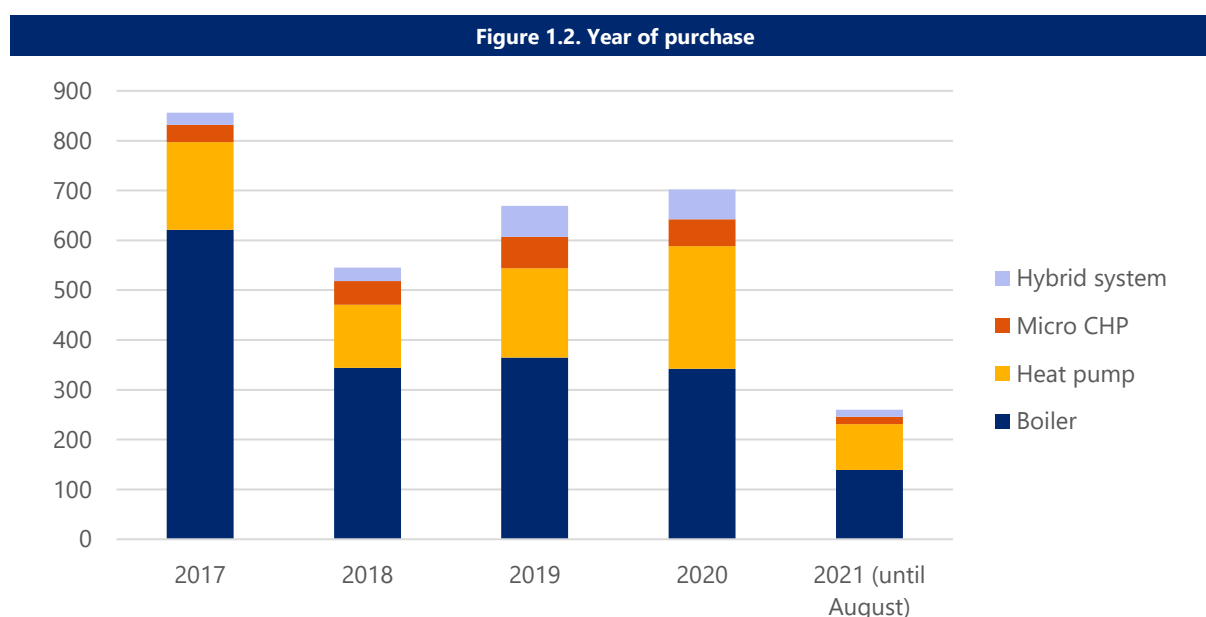




Table 1.2. Heating appliances purchased (most recent purchase)

	Total	DE	FR	IT	BG	PL
Boiler	59.7%	57.8%	64.1%	76.2%	42.6%	58.2%
Heat pump	27.0%	27.3%	28.6%	19.4%	27.5%	32.3%
Micro CHP	7.1%	8.3%	3.1%	1.3%	19.2%	3.1%
Hybrid system	6.2%	6.5%	4.1%	3.0%	10.7%	6.4%
N	3032	600	605	602	615	610

Of the 3032 appliance purchases, 260 purchases (8.6%) were reported to be made in 2021 (until August), 702 (23.2%) in 2020, 669 (22.1%) in 2019, 545 (18.0%) in 2018 and 856 (28.2%) in 2017 (see Figure 1.2).



Base = all respondents (N = 3032).

Table 1.3 shows the profile of respondents who purchased a heat pump and how this differs from the rest of the respondents. The two groups differ – statistically significantly – in terms of age, financial situation, and their level of expertise in heating systems.⁶ More specifically, heat pump buyers are somewhat younger, on average, compared to buyers of other heating appliances (44 vs. 47; see Table 1.3). In addition, their financial situation is better – 45.6% of the recent buyers of heat pumps considered it (very) easy to make ends meet, compared to 38.6% of the remainder of the respondents – and they report to have more expertise in heating systems. The two groups do not differ in terms of educational level or environmental concern (see Table 1.3).

⁶ Test for differences between recent buyers of heat pumps and other respondents: $p < .001$ (age), $p < .001$ (household financial situation), $p < .001$ (heating systems expertise).

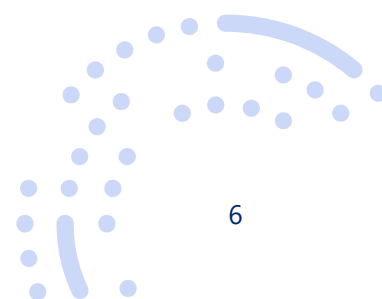
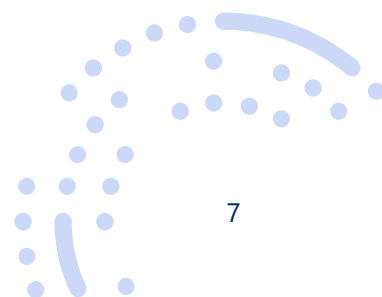




Table 1.3. Profile of respondents who purchased a heat pump (versus rest)

	Respondents who purchased a heat pump	Remainder of the respondents	Significant difference?
Sample size (N)	820	2212	
<u>Age</u>			Yes
18-24 years	7.4%	6.3%	
25-34 years	20.7%	19.5%	
35-44 years	24.8%	18.9%	
45-54 years	17.8%	18.3%	
55-64 years	20.0%	24.1%	
65-75 years	9.3%	12.8%	
Average age	44	47	
<u>Education</u>			No
Low (ISCED cat. 0-4)	47.5%	47.2%	
High (ISCED cat. 5-8)	52.5%	52.8%	
<u>Household financial situation</u> (on a scale from 1 to 5)	3.38	3.24	Yes
% (very) easy to make ends meet	45.6%	38.6%	
<u>Heating systems expertise</u> (on a scale from 1 to 5)	2.80	2.61	Yes
% (completely) agree	15.4%	11.8%	
<u>Concern for the environment</u> (on a scale from 1 to 5)	4.04	3.98	No
% (completely) agree	57.0%	56.1%	





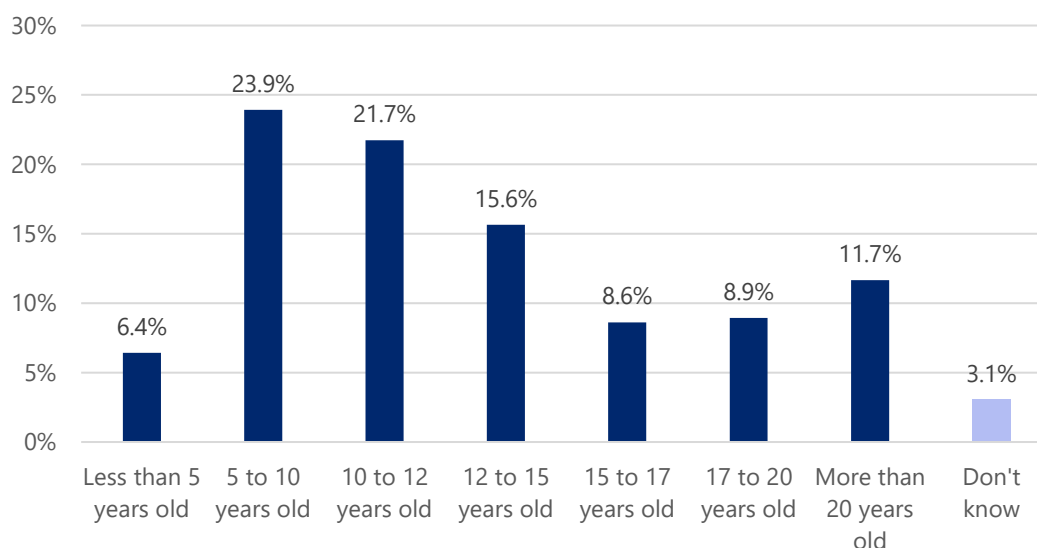
2 Consumer decision-making process

This chapter provides insight into how consumers make purchase decisions regarding heating appliances. We first zoom in on the decision *outcome* and examine to what extent consumers switch to more energy efficient technologies when they replace their old heating appliance (section 2.1). Next, we look at the decision *process*: did recent buyers take into consideration other types of appliances than the specific type of appliance that they eventually purchased, and why (not) (section 2.2)? How did they seek or receive information and advice (section 2.3)? Which aspects did they consider most important when making a choice for a certain heating appliance (section 2.4)? In answering these questions, we distinguish (among others) between the (likely) more spontaneous purchases that were made to replace a defective appliance and more planned purchases (e.g. replacement of a heating appliance that is still working).

2.1 Replacement purchases

The majority of respondents – 71.9% – purchased the heating appliance to *replace* an old appliance (see Figure 2.1). Most of the replaced appliances were (estimated to be) 5 to 10 years old (23.9%) or 10 to 12 years old (21.7%, see Figure 2.1). The age of old appliances differed significantly across the countries.⁷ Most notably, the age of the replaced appliances was lower in Bulgaria, Italy and Poland than in Germany and France (Table 2.1).

Figure 2.1. Age of the old heating appliance



Base = respondents who purchased the heating appliance to replace an old appliance (N = 2181).

⁷ Test for country differences: $p < .001$ (statistically significant).

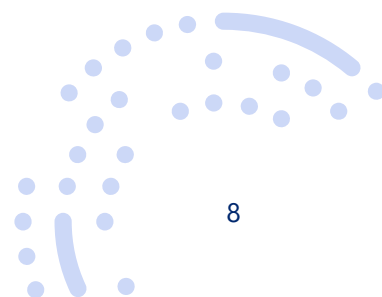




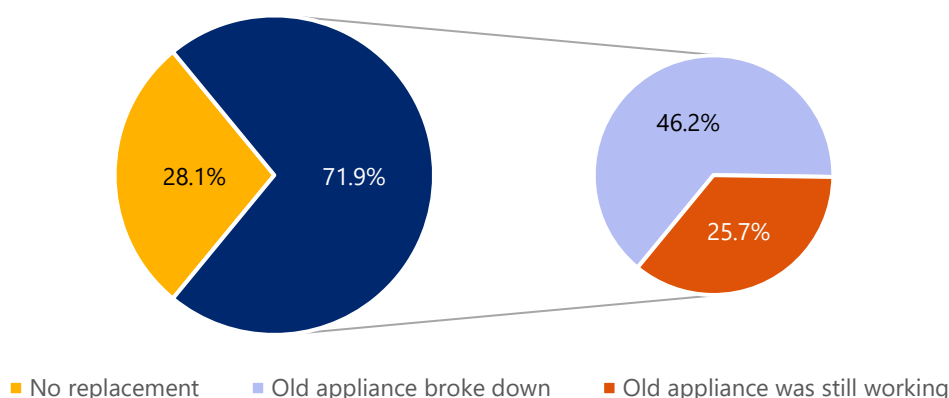
Table 2.1. Age of the old heating appliance

	Total	DE	FR	IT	BG	PL
Less than 5 years old	6.4%	3.9%	4.7%	7.3%	13.2%	5.8%
5 to 10 years old	23.9%	14.3%	14.2%	28.5%	34.1%	32.4%
10 to 12 years old	21.7%	13.2%	18.9%	24.7%	24.9%	28.2%
12 to 15 years old	15.6%	19.3%	17.6%	12.6%	12.1%	15.2%
15 to 17 years old	8.6%	10.2%	13.7%	7.5%	4.0%	6.1%
17 to 20 years old	8.9%	13.4%	10.1%	7.9%	4.8%	6.7%
More than 20 years old	11.6%	22.6%	17.1%	7.7%	4.0%	3.8%
Don't know	3.1%	3.1%	3.6%	3.8%	2.9%	1.9%
N	2181	491	444	494	273	479

Base = respondents who purchased the heating appliance to replace an old appliance (N = 2181).

In most cases, replacement purchases were made after an old heating appliance broke down (64.3% of the replacement purchases; 46.2% of the total sample). 35.7% of the respondents who purchased the heating appliance to replace an old one indicated that the old appliance was still working (25.7% of the total sample, see Figure 2.2). Among this latter group, the desire to have a more energy efficient appliance to reduce the households' heating bill (54.1%) and protect the environment (42.0%) were mentioned most frequently as reasons for the replacement (see Figure 2.3). The reasons for replacement did not differ across countries.⁸

Figure 2.2. Replacement purchases



Base = all respondents (N = 3032).

⁸ Test for country differences in reasons for replacement: all p 's > 0.05 (statistically non-significant).

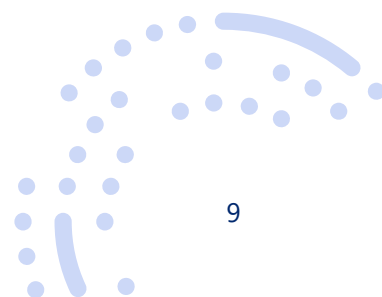
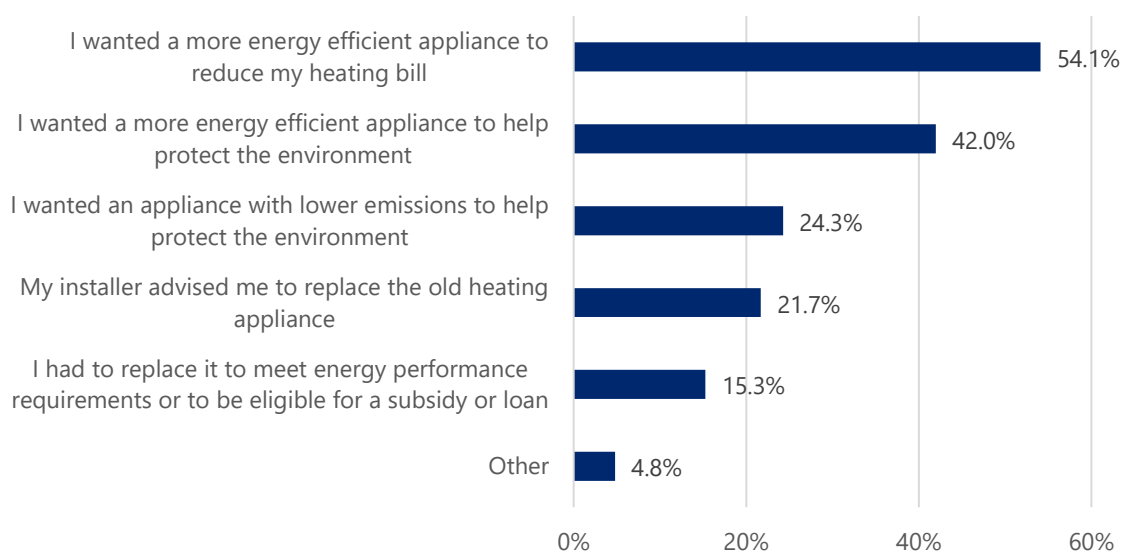




Figure 2.3. Reasons for replacing the old appliance while it was still working



Base = respondents who purchased the heating appliance to replace an appliance that was still working (N = 778).

73.0% of the respondents who made a replacement purchase bought the *same* general type of appliance – boiler, heat pump, micro CHP or hybrid system – as their old one. In 80.1% of these cases (58.5% of all replacements), an old boiler was replaced with a new boiler (see Table 2.2), and in 14.1% of these cases (10.3% of all replacements), an old heat pump was replaced with a new heat pump.

Table 2.2. Replacement behaviour

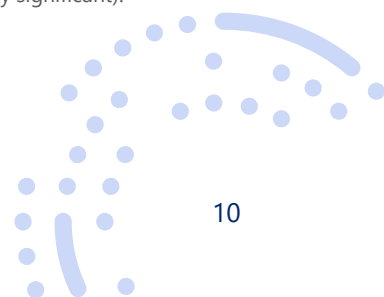
			New heating appliance			
			Boiler	Heat pump	CHP system	Hybrid system
			65.9%	21.3%	6.4%	6.4%
Old heating appliance	Boiler	70.7%	58.5%	7.7%	2.4%	2.1%
	Heat pump	15.7%	3.3%	10.3%	1.3%	0.8%
	CHP system	5.6%	1.1%	1.3%	2.1%	1.1%
	Hybrid system	3.4%	0.5%	0.4%	0.4%	2.1%
	Other	2.9%	1.7%	1.0%	0.1%	0.1%
	Don't know	1.8%	0.9%	0.6%	0.1%	0.2%

Base = respondents who purchased the heating appliance to replace an old one (N = 2181).

7.7% of the respondents who made a replacement purchase switched from a boiler to a heat pump. Other types of switches occurred relatively infrequently (see Table 2.2).

Respondents were less likely to switch to a different type of appliance if their old appliance had broken down (22.3%) compared to when it was still working (30.2%).⁹ Most notably, heat pumps relatively

⁹ Test for differences between groups (old appliance broken down vs. still working): $p < .001$ (statistically significant).





more often replaced boilers that were still working (10.4%; Table 2.3) than boilers that had broken down (6.2%; Table 2.4); which suggests that these purchases are more often planned.

Table 2.3. Replacement behaviour – old heating appliance broke down

			New heating appliance			
			Boiler	Heat pump	CHP system	Hybrid system
			66.2%	21.3%	6.3%	6.1%
Old heating appliance	Boiler	68.9%	58.9%	6.2%	2.1%	1.6%
	Heat pump	18.6%	3.8%	12.5%	1.3%	1.0%
	CHP system	5.8%	1.1%	1.1%	2.4%	1.2%
	Hybrid system	3.3%	0.4%	0.5%	0.3%	2.1%
	Other	1.7%	1.1%	0.4%	0.1%	0.1%
	Don't know	1.7%	0.9%	0.6%	0.1%	0.1%

Base = respondents who purchased the heating appliance to replace a defective appliance (N = 1403).

Table 2.4. Replacement behaviour – old heating appliance was still working

			New heating appliance			
			Boiler	Heat pump	CHP system	Hybrid system
			65.3%	21.3%	6.4%	6.9%
Old heating appliance	Boiler	73.8%	57.7%	10.4%	2.8%	2.8%
	Heat pump	10.5%	2.3%	6.4%	1.3%	0.5%
	CHP system	5.1%	1.0%	1.8%	1.5%	0.8%
	Hybrid system	3.5%	0.6%	0.3%	0.5%	2.1%
	Other	5.0%	2.6%	1.9%	0.3%	0.3%
	Don't know	2.1%	1.0%	0.5%	0.0%	0.5%

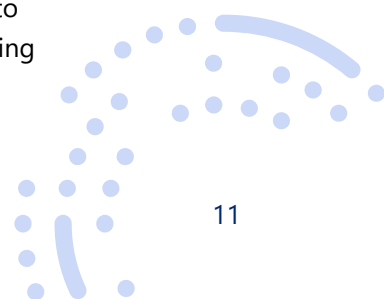
Base = respondents who purchased the heating appliance to replace an appliance that was still working (N = 778).

Table 2.5. Replacement of old boiler with new boiler

			New boiler			
			Gas	Oil	Electricity	Don't know
			81.7%	6.9%	10.3%	1.0%
Old boiler	Gas	75.5%	73.3%	0.6%	1.5%	0.1%
	Oil	10.2%	4.0%	5.9%	0.3%	0.0%
	Biomass	4.2%	2.7%	0.3%	1.1%	0.1%
	Electricity	8.2%	1.0%	0.0%	7.1%	0.1%
	Don't know	1.9%	0.7%	0.1%	0.3%	0.8%

Base = respondents who purchased a boiler to replace an old boiler (N = 1276).

Consumers also did not frequently switch between boilers using different energy sources (see Table 2.5): in 87.1% of the cases in which a new boiler was purchased to replace an old boiler, the new boiler used the same energy source as the old one. The majority of respondents who replaced an old boiler with a new one, replaced an old gas boiler with a new gas boiler (73.3%; Table 2.5). Most respondents reported to have switched from a (condensing or non-condensing) gas boiler to a condensing gas boiler (see Table 2.6). Note, however, that the share of respondents who reported to have *recently* purchased a non-condensing boiler is higher than expected, suggesting





that consumers are not always well aware of the specific type of appliance that they have purchased (see also Chapter 1).

Table 2.6. Replacement of old boiler with new boiler

			New boiler							
			Condensing gas boiler	Non-condensing gas boiler	Gas boiler (non-specified)	Condensing oil boiler	Non-condensing oil boiler	Oil boiler (non-specified)	Electric boiler	Don't know
			52.7%	22.0%	7.0%	4.3%	1.6%	0.9%	10.3%	1.0%
Old boiler	Condensing gas boiler	25.5%	21.4%	2.4%	0.9%	0.2%	0.0%	0.0%	0.4%	0.1%
	Non-condensing gas boiler	39.7%	21.3%	17.0%	0.2%	0.2%	0.2%	0.1%	0.8%	0.0%
	Gas boiler (non-specified)	10.3%	4.5%	0.7%	4.9%	0.0%	0.0%	0.0%	0.3%	0.0%
	Condensing oil boiler	4.8%	1.6%	0.1%	0.1%	2.1%	0.7%	0.1%	0.2%	0.0%
	Non-condensing oil boiler	2.8%	0.6%	0.4%	0.0%	1.0%	0.6%	0.1%	0.1%	0.0%
	Oil boiler (non-specified)	2.6%	0.8%	0.2%	0.2%	0.6%	0.1%	0.5%	0.1%	0.0%
	Biomass boiler	4.2%	1.5%	0.8%	0.5%	0.2%	0.1%	0.1%	1.1%	0.1%
	Electric boiler	8.2%	0.5%	0.3%	0.2%	0.0%	0.0%	0.0%	7.1%	0.1%
	Don't know	1.9%	0.5%	0.1%	0.1%	0.0%	0.0%	0.1%	0.3%	0.8%

Base = respondents who purchased a boiler to replace an old boiler (N = 1276).

2.2 Other types of appliances considered

About half of the respondents (53.9%) indicated that they also *considered* other types of heating appliances besides the type of appliance or system – boiler, heat pump, CHP system or hybrid system – that they eventually purchased. A third of respondents did not consider other types of appliances (33.9%), and 12.2% could not remember. Thus, of the respondents who remembered whether or not they considered other types of heating appliances than the one they purchased, 61.4% also considered other types of appliances, and 38.6% did not.

The extent to which respondents considered other types of heating appliances depended on whether their old heating appliance broke down or was still working (see Figure 2.4).¹⁰ Respondents who purchased a heating appliance to replace a defective appliance were somewhat more likely to consider alternative types of appliances (58.3%) compared to respondents who replaced a working appliance (51.0%), but – as we saw earlier – they were also more likely to eventually buy the *same* type of appliance as their old one. Compared to consumers who replaced a defective appliance, consumers who replaced a non-defective appliance seemed (slightly) more likely to already know which specific type of appliance they wanted to buy (39.6% vs. 30.2%, see Figure 2.4).

¹⁰ Test for differences between groups (old appliance broken down vs. still working): $p < .001$ (statistically significant).

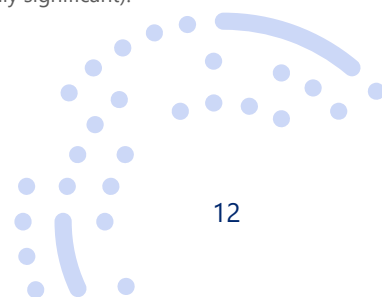
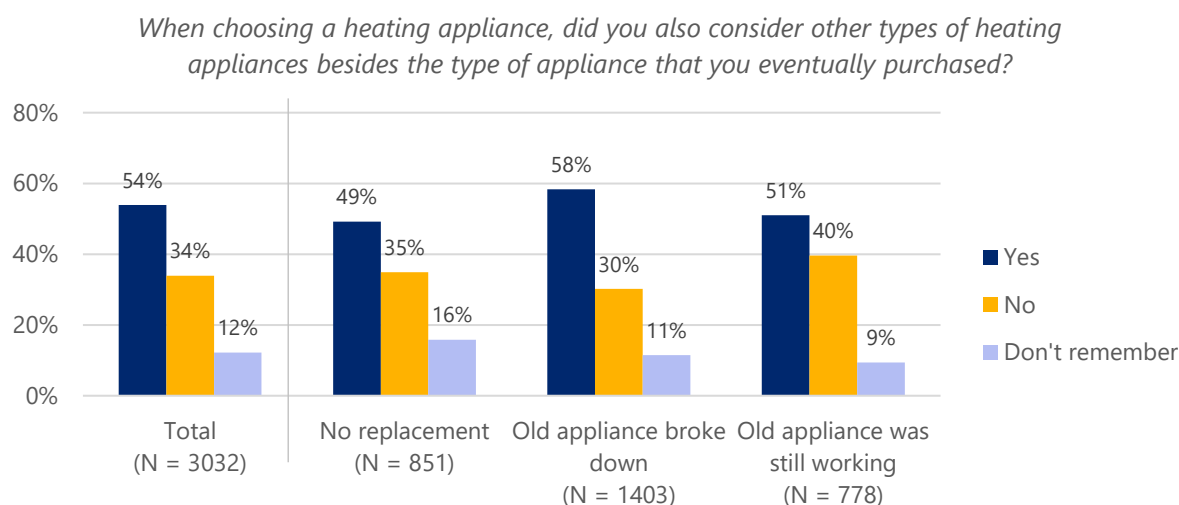




Figure 2.4. Consideration of other types of appliances



Base = all respondents (N = 3032).

A third of the respondents who purchased a boiler also considered buying a heat pump (33.2%) and 15.2% of them also considered a CHP system (see Table 2.7). 31.3% of the recent buyers of heat pumps also considered buying a boiler, and 28.3% also considered buying a CHP system (28.3%).

Table 2.7. Other types of appliances considered

Heating appliance purchased	(Other) heating appliance(s) considered				N
	Boiler	Heat pump	CHP system	Other	
Boiler	-	33.2%	15.2%	4.4%	1811
Heat pump	31.3%	-	28.3%	2.7%	820
CHP system	37.4%	47.2%	-	4.2%	214
Hybrid system	21.9%	33.7%	49.7%	1.1%	187

Base = all respondents (N = 3032).

About 4 out of 10 respondents (who remembered whether or not they had considered other types of heating appliances during their decision process) had not considered other types of appliances (38.6%). The fact that other types of appliances could not be installed in their house was mentioned by 43.3% of these respondents (16.7% of the total sample¹¹) as reason for not considering them. 28.5% (11.0% of the total sample) indicated that they were not aware of other options (e.g. because their installer did not propose other options), and 24.6% (9.5% of the total sample) did not have the time or inclination to gather information on other options (see Figure 2.5).

¹¹ Excluding respondents who did not remember whether or not they had considered other types of heating appliances (N = 2663).

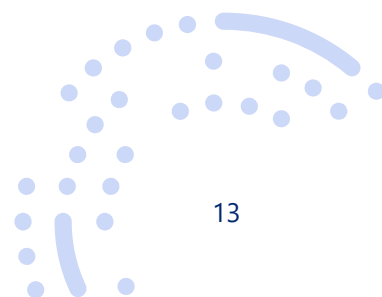
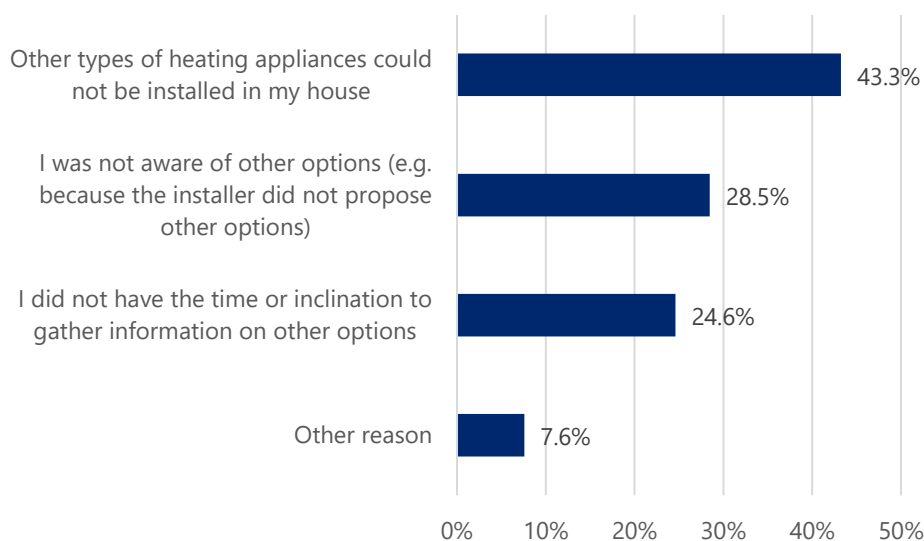




Figure 2.5. Reasons for not considering other types of heating appliances

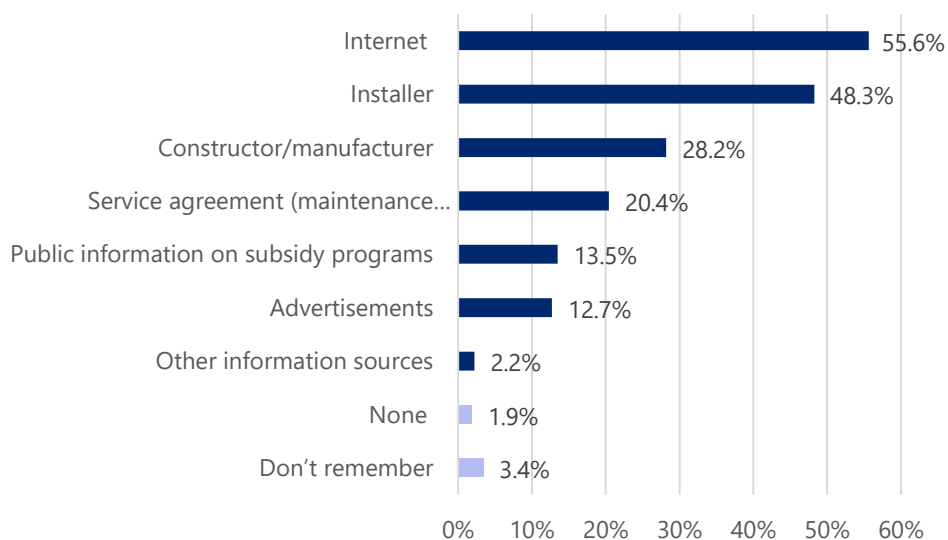


Base = respondents who did not consider other types of appliances besides the one purchased (N = 1029).

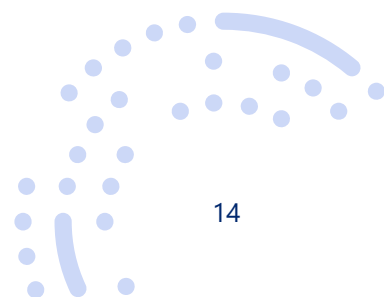
2.3 Information sources

Respondents were asked via which sources they sought or received information on heating appliances (they could select multiple information sources). Most respondents searched for information online (55.6%) and/or received information from their installer (48.3%; see Figure 2.6).

Figure 2.6. Information sources



Base = all respondents (N = 3032).





Which information sources were most frequently used differed across countries (see Table 2.8).¹² Recent buyers in Italy, Germany and France most frequently received information via their installer, while in Bulgaria and Poland, the majority of respondents looked up information online.

Table 2.8. Information sources

	Total	DE	FR	IT	BG	PL
Internet	55.6%	48.2%	38.2%	43.5%	74.6%	73.1%
Advertisements	12.7%	12.7%	9.8%	10.3%	17.7%	13.0%
Service agreement (maintenance company)	20.4%	23.5%	13.7%	19.6%	24.1%	21.2%
Constructor/manufacturer	28.2%	23.7%	27.6%	24.4%	31.1%	33.9%
Installer	48.3%	53.5%	53.7%	56.8%	35.9%	41.6%
Public information on subsidy programs	13.5%	14.3%	11.6%	8.0%	12.0%	21.3%
Other information sources	2.2%	1.5%	3.1%	1.5%	3.3%	1.6%
None	1.9%	3.5%	2.6%	1.2%	0.5%	1.5%
Don't remember	3.4%	3.5%	6.3%	2.2%	2.3%	2.8%
N	3032	600	605	602	615	610

Base = all respondents (N = 3032).

72.6% of the sample indicated that they received advice from their installer regarding which type of heating appliance to choose (see Table 2.9). 19.6% of the respondents did not receive installer advice and 7.8% did not remember. Of the respondents who remembered whether or not they received advice, 78.7% thus received advice and 21.3% did not.

Table 2.9. Installer advice

Did an installer give you advice on which type of heating appliance to choose?	Total	DE	FR	IT	BG	PL
Yes	72.6%	75.2%	75.5%	77.1%	63.7%	71.5%
No	19.6%	18.5%	17.7%	15.9%	28.1%	17.7%
Don't remember	7.8%	6.3%	6.8%	7.0%	8.1%	10.8%
N	3032	600	605	602	615	610

Base = all respondents (N = 3032).

If consumers received advice from an installer, they usually followed this advice, either completely (44.8%), or to some extent (51.5%; see Table 2.10). 3.8% of the respondents who received advice from an installer did not follow it.

¹² Test for country differences: $p < .001$ (Internet), $p = .002$ (advertisements), $p < .001$ (service agreement, $p = .001$ (constructor/manufacturer, $p < .001$ (installer), $p < .001$ (public information on subsidy programs, $p = .495$ (other information sources).

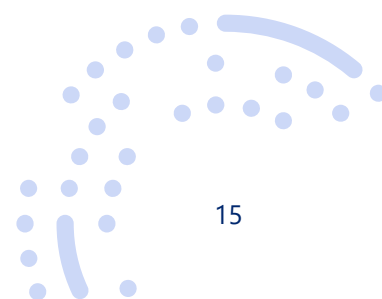
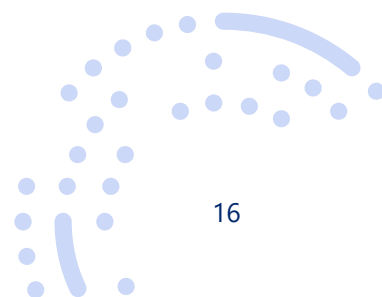




Table 2.10. Following installer advice

Did you follow the advice of the installer?	Total	DE	FR	IT	BG	PL
No, not at all	3.8%	4.7%	5.3%	3.9%	2.0%	2.8%
Yes, to some extent	51.5%	47.9%	47.7%	46.8%	51.0%	64.4%
Yes, completely	44.8%	47.5%	47.0%	49.4%	46.9%	32.8%
N	2,200	451	457	464	392	436

Base = respondents who received advice from an installer (N = 2200).



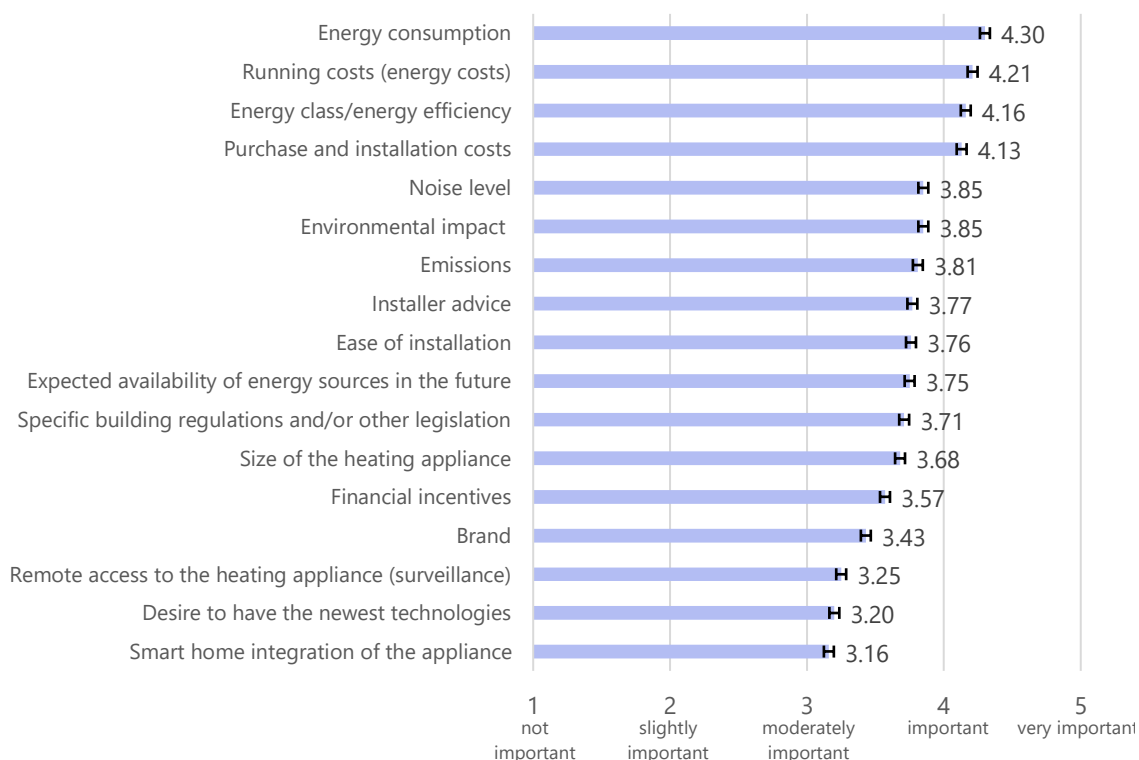


2.4 Important aspects when choosing a heating appliance

In the questionnaire, respondents rated several aspects in terms of how important the aspect was in their choice for a certain heating appliance (on a scale from 1 = not important to 5 = very important). Figure 2.7 shows the average importance ratings per aspect. The error bars in Figure 2.7 represent 95% confidence intervals. Non-overlapping error bars indicate statistically significant differences in importance between the aspects (see Appendix B for the detailed results).

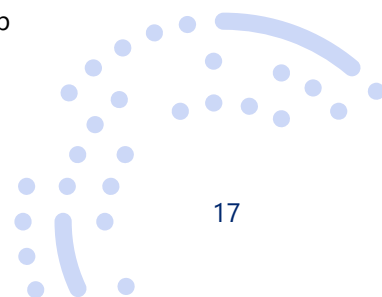
Energy consumption (importance rating = 4.30 on a 5-point scale) was perceived as the most importance aspect, on average, followed by running costs (rating = 4.21), energy class/energy efficiency (rating = 4.16) and purchase and installation costs (rating = 4.13). The noise level (rating = 3.85), environmental impact (rating = 3.85), and emissions (rating = 3.81) were perceived as slightly less important, on average, but more important than specific building regulations and/or other legislation (rating = 3.71) and the size of the appliance (rating = 3.68), with the perceived importance of installer advice (rating = 3.77), ease of installation (rating = 3.76) and the expected availability of energy sources in the future (rating = 3.75) falling in between (not statistically significantly different from either set of aspects). Having remote access to the heating appliance (rating = 3.25), the desire to have the newest technologies (rating = 3.20) and smart home integration of the appliance (rating = 3.16) were considered least important, on average.

Figure 2.7. Importance of aspects in heating appliance choices



Base = all respondents (N = 3032).

In follow-up analyses, we examined to what extent the perceived importance of the different aspects differed for (1) emergency versus planned replacements (Table 2.11), (2) heat pump





purchases versus other purchases (Table 2.12), and (3) consumers who were somewhat versus highly involved in the purchase decision (Table 2.13).

Table 2.11 compares the importance ratings of respondents who purchased the heating appliance to replace a defective appliance with those of respondents who replaced a still working appliance. Whereas both groups considered energy consumption, energy efficiency and running costs among the most important aspects, respondents who replaced a still working heating appliance found these aspects (statistically significantly) more important than respondents who replaced a defective appliance (see Table 2.11). Ease of installation, in contrast, was considered more important in the case of emergency replacements. Finally, while both groups perceived smart home integration, the desire to have the newest technologies, and having remote access to the heating appliance as the least important aspects, these were still perceived as slightly more important by respondents who replaced a defective heating appliance than by respondents whose old heating appliance was still working at the time of replacement.

Table 2.11. Perceived importance of aspects: emergency versus planned replacements

	Perceived importance of aspect (1 = not important, 5 = very important)						Significant difference?
	Old appliance had broken down (N = 1403)			Old appliance was still working (N = 778)			
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	4.00	4.06⁴	4.11	4.16	4.24³	4.31	Yes
Energy consumption	4.16	4.21¹	4.26	4.31	4.38¹	4.45	Yes
Environmental impact	3.80	3.85⁵	3.91	3.84	3.91⁵	3.98	No
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.77	3.82	3.88	3.80	3.87	3.94	No
Expected availability of energy sources in the future	3.66	3.72	3.77	3.70	3.77	3.84	No
Desire to have the newest technologies (to be a front runner)	3.25	3.31	3.36	3.09	3.16	3.23	Yes
Purchase and installation costs	4.04	4.09³	4.15	4.11	4.18⁴	4.25	No
Running costs (energy costs)	4.06	4.12²	4.17	4.21	4.28²	4.35	Yes
Ease of installation	3.78	3.84	3.89	3.67	3.74	3.82	Yes
Brand	3.42	3.47	3.52	3.31	3.38	3.46	No
Noise level	3.78	3.84	3.89	3.68	3.75	3.82	No
Installer advice	3.72	3.78	3.83	3.73	3.81	3.88	No
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.55	3.60	3.65	3.51	3.58	3.66	No
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.69	3.75	3.80	3.61	3.68	3.75	No
Smart home integration of the appliance	3.13	3.18	3.24	2.99	3.06	3.14	Yes
Remote access to the heating appliance (surveillance)	3.21	3.26	3.32	3.10	3.17	3.24	Yes
Size of the heating appliance	3.68	3.73	3.79	3.56	3.63	3.70	Yes

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

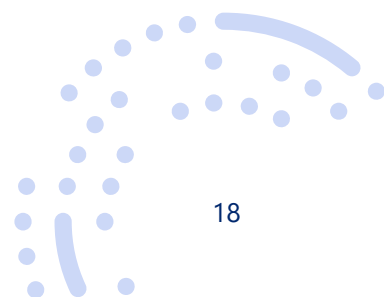


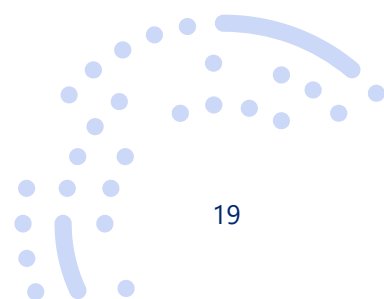


Table 2.12 compares the importance ratings of respondents who purchased a heat pump with those of the remainder of the respondents. Again, the top four important aspects are the same across the two groups (energy consumption, running costs, energy class/energy efficiency, and purchase and installation costs), but certain aspects are perceived as more or less important by buyers of heat pumps than by other respondents. In their purchase decision, buyers of heat pumps attached more importance to the expected availability of energy sources in the future and the desire to have the newest technologies than buyers of other heating appliances (see Table 2.12). Compared to other respondents, they considered the purchase and installation costs and ease of installation somewhat less important, while the noise level of the appliance was a more important factor in their decision. Finally, while smart home integration and having remote access to the heating appliance were generally perceived as less important than most other aspects by both groups, heat pump buyers considered these aspects more important than other buyers.

Table 2.12. Perceived importance of aspects: heat pump versus other purchases

	Perceived importance of aspect (1 = not important, 5 = very important)						
	Respondents who purchased a heat pump (N = 2212)			Remainder of the respondents (N = 820)			Significant difference?
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	4.10	4.17³	4.24	4.11	4.15⁴	4.19	No
Energy consumption	4.24	4.31¹	4.38	4.25	4.30¹	4.34	No
Environmental impact	3.81	3.88	3.95	3.80	3.84⁵	3.88	No
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.74	3.81	3.88	3.77	3.81	3.85	No
Expected availability of energy sources in the future	3.76	3.83	3.90	3.68	3.73	3.77	Yes
Desire to have the newest technologies (to be a front runner)	3.20	3.27	3.34	3.13	3.17	3.22	Yes
Purchase and installation costs	4.00	4.07⁴	4.14	4.11	4.15³	4.20	Yes
Running costs (energy costs)	4.13	4.20²	4.27	4.17	4.21²	4.25	No
Ease of installation	3.63	3.70	3.77	3.74	3.78	3.82	Yes
Brand	3.36	3.43	3.50	3.38	3.43	3.47	No
Noise level	3.85	3.92⁵	3.99	3.78	3.83	3.87	Yes
Installer advice	3.68	3.75	3.82	3.74	3.78	3.82	No
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.54	3.61	3.68	3.52	3.56	3.60	No
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.65	3.72	3.79	3.67	3.71	3.75	No
Smart home integration of the appliance	3.24	3.31	3.38	3.07	3.11	3.15	Yes
Remote access to the heating appliance (surveillance)	3.35	3.42	3.49	3.15	3.19	3.23	Yes
Size of the heating appliance	3.55	3.62	3.69	3.65	3.70	3.74	No

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.





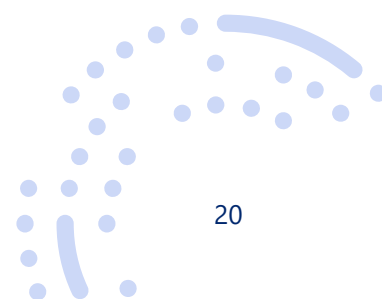
Finally, Table 2.13 compares the importance ratings of respondents who reported to be highly involved in the purchase decision with those of respondents who were somewhat less involved. The results show a consistent difference in the absolute importance ratings: highly involved respondents rated *all* aspects as (statistically significantly) more important than respondents who were less involved in the decision. The relative importance (ranking) of the aspects is largely the same in both groups, however (see Table 2.13).

Table 2.13. Perceived importance of aspects: respondents who were somewhat vs. highly involved in the decision

	Perceived importance of aspect (1 = not important, 5 = very important)						Significant difference?
	Respondents who were somewhat involved in the decision (N = 1210)			Respondents who were highly involved in the decision (N = 1822)			
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	3.93	3.98⁴	4.04	4.22	4.27³	4.32	Yes
Energy consumption	4.06	4.11¹	4.17	4.38	4.42¹	4.47	Yes
Environmental impact	3.67	3.73	3.79	3.88	3.93⁵	3.98	Yes
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.63	3.69	3.75	3.85	3.89	3.94	Yes
Expected availability of energy sources in the future	3.56	3.62	3.68	3.79	3.84	3.89	Yes
Desire to have the newest technologies (to be a front runner)	2.99	3.05	3.10	3.26	3.30	3.35	Yes
Purchase and installation costs	3.93	3.98³	4.04	4.18	4.23⁴	4.27	Yes
Running costs (energy costs)	3.98	4.04²	4.10	4.27	4.32²	4.36	Yes
Ease of installation	3.62	3.68	3.74	3.76	3.81	3.86	Yes
Brand	3.20	3.25	3.31	3.50	3.54	3.59	Yes
Noise level	3.70	3.76⁵	3.82	3.86	3.91	3.96	Yes
Installer advice	3.58	3.63	3.69	3.82	3.86	3.91	Yes
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.40	3.46	3.51	3.60	3.65	3.70	Yes
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.54	3.60	3.65	3.74	3.79	3.83	Yes
Smart home integration of the appliance	3.01	3.07	3.13	3.18	3.22	3.27	Yes
Remote access to the heating appliance (surveillance)	3.12	3.18	3.23	3.26	3.30	3.35	Yes
Size of the heating appliance	3.53	3.59	3.65	3.69	3.73	3.78	Yes

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

All in all, these results show that while certain consumer groups find certain aspects more important than others, the ranking of the aspects remains by and large the same: energy consumption, running costs, purchase and installation costs, and the energy class/energy efficiency are consistently being perceived as the most important aspects, while smart home integration of the appliance, the desire to have the newest technologies, and remote access to the heating appliance are consistently considered least important.





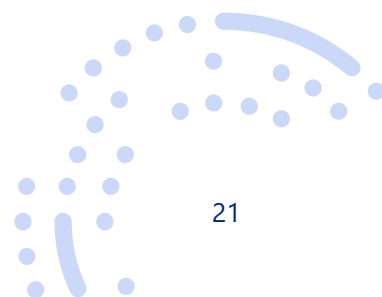
3 Role of the energy label in the decision-making process

This chapter provides insight into the role of the EU energy label in consumers' choices of heating appliances. The EU energy label for space heaters provides information about, amongst others, the energy efficiency and energy consumption of various types of heating appliances. This way, the energy label aims to help consumers make informed choices and promote the purchase of more energy efficient appliances.

Large-scale consumer studies have examined this, by presenting consumers with a product set consisting of appliances that carry energy labels and asking them to make a choice, for example. Findings indeed indicate that the energy label effectively informs consumers about the energy efficiency of products and steers consumers towards more energy efficient alternatives, including heating appliances.¹³ However, this conclusion – that the energy label promotes energy efficient choices – relies on the assumption that consumers are actually *exposed to* the energy labels of heating appliances prior to making their purchase. For many household products – such as washing machines, vacuum cleaners, and light bulbs – this indeed seems highly plausible; for such products, consumers may frequently search for and compare product information and make purchase decisions themselves, which should greatly increase the likelihood that consumers see the (mandatory) energy label. However, in contrast to products such as vacuum cleaners, consumers may be much less likely to be exposed to energy labels of heating appliances. Specifically, these appliances may be often purchased indirectly via an installer, and as a result, consumers may be less inclined to search for product information (including energy labels) of different options themselves and instead rely on the information supplied by the installer, who may not always show the energy labels of different options to consumers (or provide extensive information about this). If consumers indeed only rarely see the energy labels of different heating appliances, this would suggest that the energy label might not be very successful in informing consumers of the energy efficiency of these appliances and therefore it might not lead to more efficient purchases. This potential issue might be exacerbated when consumers do not have much time to plan their purchase (i.e., when their heating appliance breaks down and they need to quickly replace it), as this may further decrease the likelihood that consumers search for, or receive, information about the energy labels of different products. These consumers are more likely to choose an appliance similar to the one they are replacing, as shown in Chapter 2.

The abovementioned ideas are tested in the present chapter. More specifically, we first examine to what extent consumers are aware of the energy classes of their heating appliances, and to what extent they replace their old appliances with appliances with higher energy classes (section 3.1). Next, we examine to what extent recent buyers of heating appliances are aware of the existing energy labels for heating appliances (section 3.2). Finally, we analyse whether recent buyers were exposed to the energy label before their purchase and, if so, how important the label was in their decision (section 3.3).

¹³ Centerdata consortium (2019). *Study on consumer understanding of the energy label for air conditioners and heat pumps ≤ 12 kW*. Research report for DG Energy.





3.1 Awareness of energy classes of old and new appliances

The majority of the respondents (62.2%) reported to know the energy class of the heating appliance that they recently bought. The findings, however, suggest that a substantial portion of these respondents think their heating appliance has a higher energy class than it probably actually has: for instance, about a third of the respondents who purchased a boiler (32.0%) believe their boiler to have an energy class higher than A (i.e. A+, A++ or A+++).

18.0% of the respondents who purchased the heating appliance to replace an old appliance reported the energy classes of their old as well as their new heating appliance (N = 393).¹⁴ Most respondents found out about the energy class of their old appliance in the documentation that came with the appliance or received this information from their installer (see Table 3.1).

Table 3.1. Information sources

How did you find out about the energy class of your old heating appliance (the one you replaced)?	Old appliance was less than 5 years old	Old appliance was more than 5 years old
In the documentation that came with the appliance	43.5%	N/A
My installer told me	28.3%	74.5%
I remember it from when I purchased it	6.5%	N/A
I looked it up on the Internet (e.g. using a product name/code or serial number)	10.9%	N/A
I calculated it using a tool on the Internet	3.3%	5.8%
I read it on the label for installed heating appliances given by the installer, maintenance company or chimney sweeper	6.5%	17.3%
Other	1.1%	2.4%
N	92	329

Base = respondents who reported knowing the energy class of their old appliance (N = 421).

About two third of the respondents who reported knowing the energy classes of both their old and new appliance – 64.6% – purchased a heating appliance that had a *higher* energy class than their old appliance; 29.8% purchased a heating appliance with the same energy class. Only in 5.6% of the cases, an old heating appliance was replaced with an appliance having a lower energy class. The complete switching matrix is provided in Table 3.2. Even though the reported classes may not be an accurate reflection of the actual energy classes of old and new appliances, these findings suggest that consumers generally aim to purchase appliances with better energy classes than their old ones, and often believe – accurately or not – that they have done so.

¹⁴ Respondents who indicated that their old heating appliance was more than five years old and reported that they found the energy class in the documentation that came with the appliance, remembered it from when they purchased the appliance, or looked it up on the Internet were excluded from this analysis.

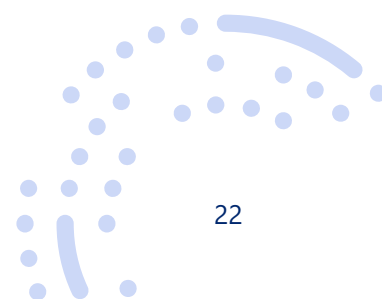




Table 3.2. Energy class of old versus new heating appliance

		Energy class of the new heating appliance						
		A+++	A++	A+	A	B	C	D
Energy class of the old heating appliance	A+++	10.2%	1.8%	0.5%	0.3%	0.3%	0.0%	0.0%
	A++	4.8%	11.2%	1.8%	0.0%	0.0%	0.0%	0.0%
	A+	6.6%	7.4%	6.6%	0.8%	0.3%	0.0%	0.0%
	A	3.3%	8.1%	5.1%	1.0%	0.0%	0.0%	0.0%
	B	1.8%	4.3%	2.8%	1.0%	0.3%	0.0%	0.0%
	C	1.8%	2.5%	2.0%	1.3%	0.0%	0.3%	0.0%
	D	1.0%	2.3%	1.3%	0.3%	0.5%	0.0%	0.3%
	E	0.0%	0.0%	0.8%	0.5%	0.5%	0.0%	0.3%
F	0.3%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%	
G	0.5%	0.3%	1.0%	0.8%	0.0%	0.0%	0.3%	

Base = respondents who reported knowing the energy classes of both their old and new appliance (N = 393).

3.2 Energy label awareness

We also assessed to what extent respondents were familiar with the EU energy label in general, and the specific energy labels for space heaters. First, respondents were exposed to some examples of energy labels (for a washing machine and a refrigerator) and asked whether they had seen the energy label before. 92.9% of the respondents recognized the label: half of the respondents indicated that they had seen the energy label many times before (49.9%) and 44.0% reported to have seen it a few times. 7.1% had never seen the energy label before.

Next, respondents were presented with the energy labels for boilers, heat pumps and CHP systems. The majority of recent buyers of heating appliances also recognized these labels: 77.3% of the respondents (thought they) had seen (some of) the labels before. 22.7% of the respondents, in contrast, did not recognize any of the presented labels for heating appliances. The extent to which respondents recognized energy labels for heating appliances differed from country to country, ranging from 66.3% in France up to 87.8% in Bulgaria (see Table 3.3).¹⁵ Label recognition did not strongly depend on whether the purchase was made because an old heating appliance broke down (78.9%) or seemed planned (i.e. when the new heating appliance did not replace an old appliance, or the old appliance was still working; 76.0%).¹⁶

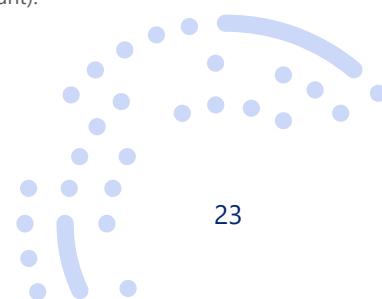
Table 3.3. Energy label awareness, per country

	Total	DE	FR	IT	BG	PL
Have you seen any of these labels for heating appliances before? % "Yes"	77.3%	69.8%	66.3%	84.9%	87.8%	77.7%
N	3032	600	605	602	615	610

Base = all respondents (N = 3032).

¹⁵ Test for country differences: $p < .001$ (statistically significant).

¹⁶ Test for differences between groups (old appliance broke down vs. rest): $p < .057$ (marginally significant).

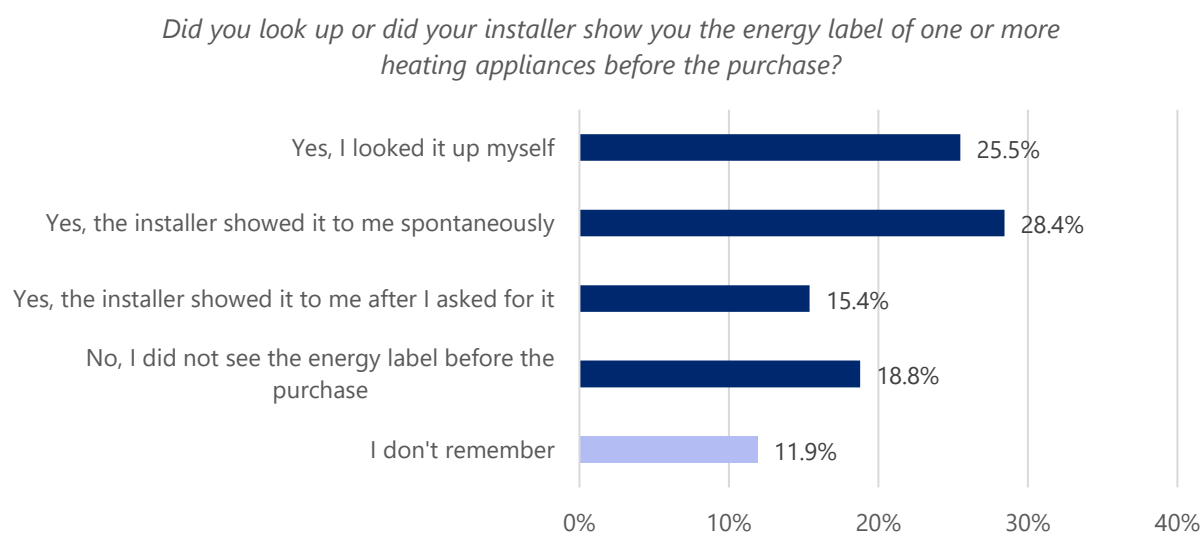




3.3 Role of the energy label in the purchase decision

About 7 in 10 respondents had been exposed to the energy label during the purchase process. In only 28.4% of the cases, the installer showed the label spontaneously (see Figure 3.1). A quarter of the respondents (25.5%) looked up the energy label themselves and 15.4% had asked their installer to show it to them. About 1 in 5 consumers indicated that they did not see the energy label before the purchase (18.8%), and 11.9% did not remember.

Figure 3.1. Exposure to the energy label



Base = all respondents (N = 3032).

Table 3.4 breaks down the results for respondents who received advice (versus not) and followed it (versus not).¹⁷ Of the respondents who received and followed advice, only about a third of the respondents indicated that the installer showed the energy label to them spontaneously (33.9% and 32.0%; see Table 3.4). Interestingly, respondents who did not receive advice from an installer *and* respondents who received advice and followed it completely were *least* likely to be exposed to the energy label before their purchase (21.3% and 24.1%, respectively). Respondents who received advice from an installer but did not follow it were *most* likely to have seen the energy label before their purchase: they most frequently looked up the energy label themselves (41.0%; see Table 3.4).¹⁸ It thus seems that the less consumers trust the received advice, the more likely it is that they are exposed to the energy label before the purchase, either because they look it up themselves or because they ask their installer to show it to them. Consumers who fully trust the installers' advice seem to feel less urge to look up the energy label themselves or ask for it if the installer doesn't show the label to them spontaneously.

¹⁷ Test for differences in responses between the four groups: $p < .001$.

¹⁸ Note, however, that the number of observations is low (N = 83). This result must be interpreted with caution.

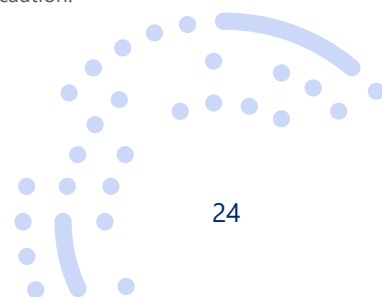




Table 3.4. Exposure to the energy label, depending on advice received and followed

<i>Did you look up or did your installer show you the energy label of one or more heating appliances before the purchase?</i>	Respondents who did not receive advice ¹⁹	Respondents who received advice but did not follow it	Respondents who received advice and followed it to some extent	Respondents who received advice and followed it completely
Yes, I looked it up myself	33.3%	41.0%	27.1%	18.8%
Yes, the installer showed it to me spontaneously	17.0%	24.1%	33.9%	32.0%
Yes, the installer showed it to me after I asked for it	15.6%	24.1%	16.7%	13.7%
No, I did not see the energy label before the purchase	21.3% ^a	6.0% ^c	14.7% ^b	24.1% ^a
I don't remember	12.8%	4.8%	7.6%	11.5%
N	595	83	1132	985

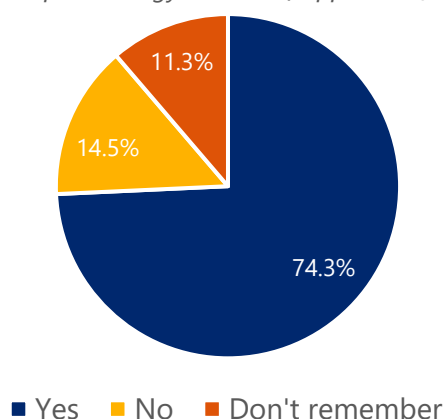
Base = respondents who remembered whether or not they had received advice from an installer (N = 2795).

Different superscripts (a, b, etc.) indicate that percentages are significantly different at $p < .05$.

The respondents who saw the energy label before their purchase (either because it was shown to them or because they looked it up themselves) received questions about the role of the energy label in their purchase decision. 74.3% of the respondents who saw the energy label indicated that it played a role in their decision; for 14.5%, the energy label did not play a role in their decision; and 11.3% did not remember (see Figure 3.2). Overall, 63.6% of the respondents who were exposed to the energy label before the purchase considered the label important (39.2%) or very important (24.4%). Only 1.5% of the respondents (who saw the label) indicated that the energy label was not important (see Figure 3.3).

Figure 3.2. Use of the energy label in the purchase decision

Did the energy label play a role in your decision (e.g. did you use it to look up the energy class of a certain heating appliance, or to compare energy classes of appliances)?



Base = respondents who were exposed to the energy label before the purchase (N = 2102).

¹⁹ Note that respondents who did not receive advice may still have received *information* from installers.

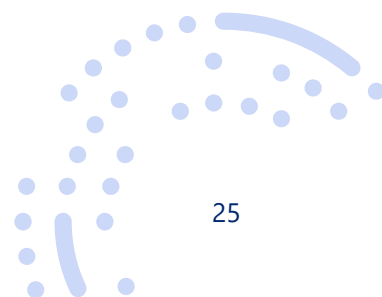
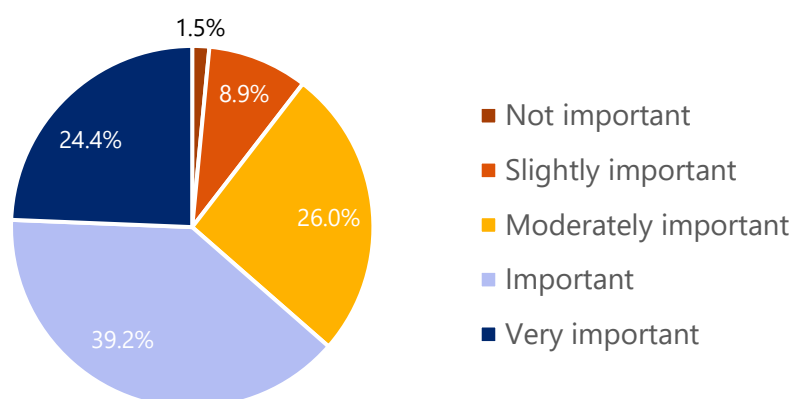




Figure 3.3. Importance of the energy label

How important was the energy label to you when choosing a heating appliance?



Base = respondents who were exposed to the energy label before the purchase (N = 2102).

Several follow-up analyses were conducted to gain insight into whether and how the perceived importance of the energy label for space heaters differed across consumer groups. More specifically, it was tested to what extent the usage and perceived importance of the energy label in the purchase decision depended on (1) the extent to which respondents received and followed advice, and (2) whether or not the appliance was purchased to replace a defective appliance.

First of all, the results revealed that the reported usage and perceived importance of the energy label for space heaters significantly depended on the extent to which respondents received and followed advice from an installer.²⁰ Respondents who received and followed the advice were more likely to use the energy label in their decision as compared to respondents who did not receive advice from an installer (see Table 3.5). The perceived importance of the energy label increased the more respondents followed the installer's advice: Respondents who received advice and followed it completely considered the energy label more important (average importance rating = 4.0) as compared to respondents who followed the advice to some extent (average importance rating = 3.7), or not at all (average importance rating = 3.1). Thus, respondents who (completely) followed the installer's advice were less likely to be exposed to the energy label as compared to respondents who did not follow the received advice (see above), but *if* they were exposed to the energy label, they found it more important.

²⁰ Test for differences between groups (i.e. respondents who did not receive advice vs. received advice but did not follow it vs. received advice and followed it to some extent vs. received advice and followed it completely): $p < .001$ (energy label usage; statistically significant) and $p < .001$ (perceived importance of the label; statistically significant).

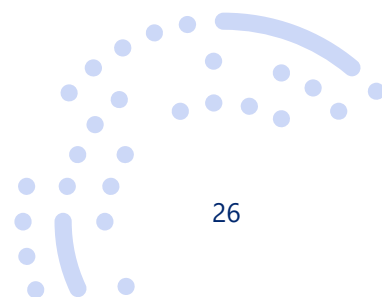




Table 3.5. Importance of the energy label, depending on advice received and followed

	Respondents who did not receive advice ²¹	Respondents who received advice but did not follow it	Respondents who received advice and followed it to some extent	Respondents who received advice and followed it completely
Did the energy label play a role in your decision? % "Yes"	65.8% ^b	73.0% ^{ab}	78.9% ^a	77.6% ^a
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important)	3.7 ^b	3.1 ^c	3.7 ^b	4.0 ^a
N	392	74	880	635

Base = respondents who remembered whether or not they had received advice from an installer and were exposed to the energy label before their purchase (N = 1981). Different superscripts (a, b, etc.) indicate that percentages are significantly different at $p < .05$.

We also investigated whether the energy label plays a more important role in planned (versus emergency) replacements. Whereas the results revealed that consumers were less likely to switch to a different type of heating appliance if their old appliance had broken down (versus not; see Chapter 2), they do not support the idea that the energy label plays a less important role in such more spontaneous replacement decisions than in planned purchases. In fact, respondents who had bought the heating appliance to replace an old appliance that had broken down reported slightly *more* frequently that the energy label had played a role in their purchase decision (77.0%) compared to other respondents (71.7%; see Table 3.6).²² At the same time, the two groups rated the energy label as equally important, on average (Table 3.6).²³

Table 3.6. Importance of the energy label, per purchase type

	Respondents who purchased the heating appliance to replace a defective appliance	Remainder of the respondents
Did the energy label play a role in your decision? % "Yes"	77.0%	71.7%
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important)	3.7	3.8
N	1033	1069

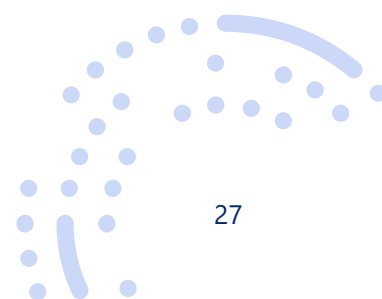
Base = respondents who were exposed to the energy label before the purchase (N = 2102).

Finally, we examined whether consumers who were exposed to the energy label before their purchase made different purchase decisions compared to consumers who did not see the label. The results, summarized in Table 3.7, reveal that consumers who were exposed to the energy label were significantly more likely to consider other types of appliances besides the one they eventually purchased (70.1% vs. 36.2%). Heat pump purchases are also higher in this group (29.7% vs. 19.5%). Furthermore, zooming in on the respondents who made a replacement purchase (see Table 3.7; right

²¹ Note that respondents who did not receive advice may still have received *information* from installers.

²² Test for differences between groups (old appliance broke down vs. rest): $p = .006$ (statistically significant).

²³ Test for differences between groups (old appliance broke down vs. rest): $p = .360$.





part), the share of respondents who purchased the same (general) type of appliance as their old one was statistically significantly lower among consumers who were exposed to the energy label (69.3%) than among consumers who did not see this label (82.2%). However, the percentage of consumers who reported to have switched from a boiler to a heat pump did not differ between the two groups (8.4% vs. 7.0%).²⁴ Note that while these results show that consumers who were exposed to the energy label were more likely to consider various types of appliances and eventually purchase a heat pump, this does not provide evidence of a *causal* effect of exposure to the energy label. Causality may run in reverse direction; consumers who consider multiple types of appliances may also be more likely to be exposed to the energy label, for instance. It could also be that other factors, such as a person’s need for information, increase both the likelihood of seeing the energy label before the purchase and the likelihood of considering different types of appliances, explaining the relationship between the two.

Table 3.7. Purchase behaviour of consumers who were exposed (vs. not exposed) to the energy label before the purchase

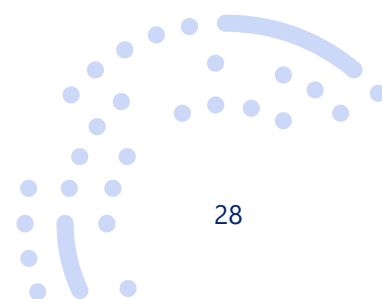
	All respondents		Respondents who replaced an old appliance	
	Considered other types of appliances besides the one eventually purchased (yes/no)	Purchased a heat pump (yes/no)	Purchased the same type of appliance (yes/no)	Switched from a boiler to a heat pump (yes/no)
Exposed to the energy label before the purchase: ²⁵				
No (N = 569)	36.2% ^b	19.5% ^b	82.2% ^a	7.0% ^a
Yes (N = 2102)	70.1% ^a	29.7% ^a	69.3% ^b	8.4% ^a
Total	62.9%	27.6%	72.1%	8.1%

Different superscripts (a, b) – column-wise – indicate that percentages are significantly different at $p < .05$. Answers from respondents who did not remember whether or not they had seen the energy label before the purchase were removed from this analysis.

We also compared the reported purchase behaviour of consumers who were exposed to the energy label and indicated that it played an important or very important role in their purchase decision with the purchase behaviour of consumers who also saw the label but considered it less important. The results in Table 3.8 reveal no differences between the two groups. That is, respondents who reported that the energy label was (very) important in their decision were equally likely to consider other types of appliances (70.2% vs. 69.9%) and were equally likely to purchase a heat pump (30.2% vs. 28.9%) as

²⁴ Compared to respondents who were not exposed to the energy label before the purchase, respondents who did see the energy label more frequently reported to have switched from a boiler to a hybrid system (2.7% vs. 0.5%; $p = .016$), but also more frequently reported to have switched from a heat pump to a boiler (4.0% vs. 1.9%; $p = .046$). Other differences in switching behaviour between the two groups are not statistically significant.

²⁵ Categorisation based on Q30 “Did you look up or did your installer show you the energy label of one or more heating appliances before the purchase?”. Yes = (1) Yes, I looked it up myself, (2) Yes, the installer showed it to me spontaneously, (3) Yes, the installer showed it to me after I asked for it. No = (4) No, I did not see the energy label before the purchase. Answers from respondents who did not remember whether or not they had seen the energy label before the purchase were removed from the analysis.





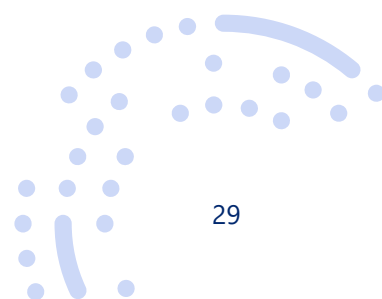
compared to respondents who considered the energy label less important (Table 3.8; left part). Similarly, among the respondents who replaced an old appliance (see Table 3.8; right part), the share of respondents who purchased the same type of appliance (70.0% vs. 68.2%) and the share of respondents who switched from a boiler to a heat pump (8.7% vs. 7.9%) did not significantly differ between the two groups. This seems to provide further evidence of a discrepancy between the perceived importance of the energy label and the reported switching behaviour.

Table 3.8. Purchase behaviour of consumers who consider the energy label more vs. less important

	Respondents who were exposed to the energy label (N = 2102)		Respondents who replaced an old appliance and were exposed to the energy label (N = 1546)	
	Considered other types of appliances besides the one eventually purchased (yes/no)	Purchased a heat pump (yes/no)	Purchased the same type of appliance (yes/no)	Switched from a boiler to a heat pump (yes/no)
Perceived importance of the energy label in the decision (if exposed to it): ²⁶				
Low (N = 766)	69.9% ^a	28.9% ^a	68.2% ^a	7.9% ^a
High (N = 1336)	70.2% ^a	30.2% ^a	70.0% ^a	8.7% ^a
Total	70.1%	29.7%	69.3%	8.4%

Different superscripts (a, b) – column-wise – indicate that percentages are significantly different at $p < .05$.

²⁶ Categorisation based on Q32 “How important was the energy label to you when choosing a heating appliance?”. Low importance = (1) not important, (2) slightly important, (3) moderately important; high importance = (4) important, (5) very important.





4 Conclusion

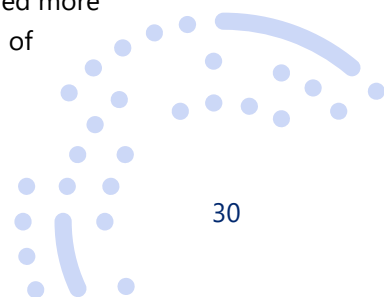
This study aimed to provide insight into the consumers' decision process regarding the purchase of heating appliances and the role of the energy label in this process.

The findings show that while more than 70% of consumers who were exposed to the energy label before their purchase indicated that the label played a role in their purchase decision, the energy label did not steer a majority of them towards a more efficient technology. In fact, the share of recent buyers who actually switched to a more efficient technology seems rather low: only 7.7% of the respondents replaced a boiler with a more efficient heat pump, for instance. When restricting the group to those who had replaced an appliance that was still working, in which case it is more likely that the purchase was planned and not done in a situation of emergency, this proportion is only slightly higher; about 10%.

Regardless of the reason for buying a new appliance, about 60% of the recent buyers indicated that they also considered other types of heating appliances besides the type of appliance or system that they eventually purchased. Yet, the vast majority of consumers ultimately purchased the same type of heating appliance as their old one. Predictably, consumers' choices appeared even more "sticky" in the case of an emergency replacement: consumers were less likely to switch to a different type of appliance if their old heating appliance has broken down (22.3%) compared to when it was still working (30.2%). One of the possible explanations for this relates to the ease of installation, which was perceived as slightly more important among consumers whose old appliance had broken down than among consumers whose old appliance was still working. Furthermore, while both groups perceived energy consumption and efficiency and running costs as important aspects in their decision, these aspects were considered (statistically significantly) less important among consumers who replaced a defective appliance, which might also explain their slightly greater tendency to stick to the same type of appliance.

One potential explanation for the apparent discrepancy between the reported importance of energy efficiency and the energy label and consumers' actual purchase behaviour relates to how consumers use the energy label. Whereas the majority of respondents indicated that the energy label was important to them when choosing a heating appliance, this does not necessarily mean that they used the label to *compare* appliances or technologies. Consumers might simply appreciate the *informative* function of the label – i.e. the label informs them about the energy class of the appliance that they are interested in buying – rather than use it as a tool to compare the efficiency of appliances or technologies. Further research may test this idea and provide deeper insight into the (causal) effect of the energy label – and potential changes to it to optimize its effectiveness – on consumers' purchase decisions regarding heating appliances.

Furthermore, interestingly, a substantial share (43.3%) of the recent buyers who did not consider other types of heating appliances besides the appliance that they eventually purchased believed that other types of appliances could not be installed in their house. Further research might shed more light on whether this is related to technical issues, such as an insufficient insulation of

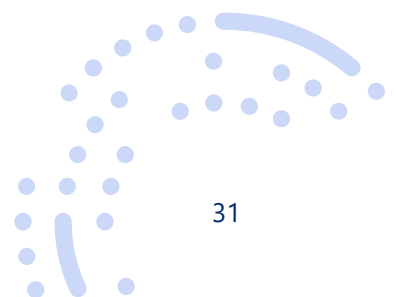




the building or a radiator system that is not adequate for low temperatures, or non-technical reasons, such as a lack of information.

Finally, the study confirms the decisive role of professional advice in consumers' decision process. About 8 in 10 recent buyers received advice from an installer, and an overwhelming majority also followed this advice, either completely (44.8%), or to some extent (51.5%). While being equally likely to be exposed to the energy label before the purchase, consumers who received and followed advice from an installer were more likely to use the energy label in their decision as compared to consumers who did not receive advice, which suggests that installers may play an important role in the effectiveness of the energy label, for example, by increasing consumer understanding of the label.

Taken together, this research points to several potential barriers that may prevent consumers from switching to more efficient heating technologies, and that prevent the energy label from being effective in encouraging such switches. Future research may provide deeper insight into the extent to which these (and other) barriers explain the limited switching behaviour, and how they can be overcome.





Appendix A: Questionnaire

Study specifications

Respondent sample	Recent buyers of heating appliances (boilers, heat pumps, micro CPH, hybrid systems), age 18-75
Country sample	Germany, France, Italy, Bulgaria and Poland
Sample size	N = 600 per country
Survey duration	Ca. 10 minutes

Part 1. Screening questions

This questionnaire is about how consumers make purchase decisions regarding heating appliances. It takes about 10 minutes to complete.

Q1. What is your age?

@scripter: drop down menu, 18+

Q2. What is your gender?

1 Male

2 Female

3 Other

Q3. This questionnaire is specifically about the purchase of central heating systems to heat your home, namely boilers, heat pumps, combined heat and power (CHP) systems, and combinations of these (hybrid systems). These appliances may also provide hot water (or not).

The questionnaire is not about heaters that you use to heat a single room, such as a wood stove or portable electric heater, nor about boilers that provide hot water only (water boilers).

A **boiler** heats water to heat your home through radiators or floor heating. The most common boilers run on gas, but they may also run on oil, biomass (e.g. wood pellets or wood chips) or electricity.

@scripter: insert <BOIL_1.jpg> and <BOIL_2.jpg>

A **heat pump** uses heat from the outside air, ground, or groundwater to heat your home through radiators or floor heating. Heat pumps mostly run on electricity, but may also run on gas.

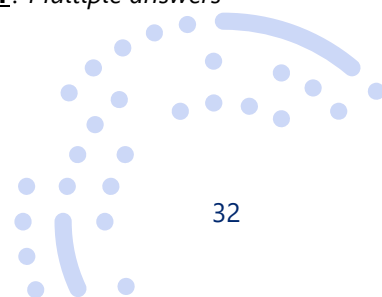
@scripter: insert <HP_1.jpg> and <HP_2.jpg>

Combined heat and power (CHP) systems generate heat and electricity simultaneously using an engine or fuel cell that runs on one fuel (e.g. gas or biomass). CHP solutions for home use are called micro CHP. The heat emitted by producing electricity is used to heat your home.

@scripter: insert <CHP_1.jpg>

Did you/your household purchase any of these heating appliances **in 2017 or later**? *Multiple answers possible.*

1 Yes, a boiler





- 2 Yes, a heat pump
- 3 Yes, a CHP system
- 4 Yes, a combination of the abovementioned appliances (a hybrid system)
- 5 No, none of these → screen out

Q4. How involved were you in the purchase decision?

@scripter: only show response options selected in Q3.

	(1) Not involved	(2) Somewhat involved	(3) Very involved
Boiler	0	0	0
Heat pump	0	0	0
CHP system	0	0	0
Hybrid system (a combination of appliances)	0	0	0

@scripter: if respondent selects "not involved" in all cases, then screen-out.

If $Q3 < 4$ and $Q4 > 1$ for more than 1 appliance:

Q5. Which of these heating appliances did you purchase most recently? If you purchased multiple heating appliances at the same time, just pick one appliance. The following questions will be about that appliance.

@scripter: only show response options selected in Q3, where $Q4 > 1$.

- 1 Boiler
- 2 Heat pump
- 3 CHP system
- 4 A combination of appliances (a hybrid system)

@scripter: Identify most recent purchase for remainder of questionnaire:

If $Q3 = 1$ & $Q4 > 1$, then $X1 = 1$ (boiler)

If $Q3 = 2$ & $Q4 > 1$, then $X1 = 2$ (heat pump)

If $Q3 = 3$ & $Q4 > 1$, then $X1 = 3$ (CHP system)

If $Q3 = 4$ & $Q4 > 1$, then $X1 = 4$ (hybrid system)

Replace $X1$ if respondent was involved in purchase decisions for multiple appliances:

If $Q5 = 1$, then $X1 = 1$ (boiler)

If $Q5 = 2$, then $X1 = 2$ (heat pump)

If $Q5 = 3$, then $X1 = 3$ (CHP system)

If $Q5 = 4$, then $X1 = 4$ (hybrid system)

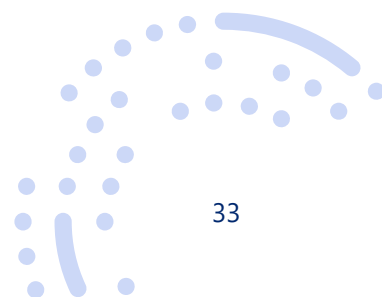
Part 2. Consumer decision-making process

The next questions are about the heating appliance that you have recently bought. We would like to ask you a couple of questions about the type of appliance that you purchased, and about how you made that decision.

If $X1 = 1$ (boiler):

Q6. Which source of energy does the boiler use?

- 1 Gas
- 2 Oil





- 3 Biomass (such as pellets or wood chips) → *screen-out*
- 4 Electricity
- 99 I don't know

If X1 = 1 (boiler) and Q6 < 4:

- Q7. What type of boiler did you purchase?
- 1 A condensing boiler
 - 2 A non-condensing boiler
 - 99 I don't know

If X1 = 2 (heat pump):

- Q8 What type of heat pump did you purchase?
- 1 Electric heat pump
 - 2 Gas-fired heat pump
 - 99 I don't know

If X1 = 3 (micro CHP):

- Q9. What type of combined heat and power (CHP) system did you purchase?
- 1 Fuel cell basedⁱ¹
 - 2 Other
 - 99 I don't know

@scripter: add mouse roll-over:

ⁱ¹ A fuel cell based micro CHP system uses a fuel cell to produce both electricity and heat from the same energy source. A fuel cell is a device that converts the chemical energy of a fuel (hydrogen, natural gas, methanol, etc.) and an oxidant (air or oxygen) into electricity. In principle, a fuel cell works much like a battery. Unlike a battery however, a fuel cell does not run down or require recharging. It will produce electricity and heat as long as fuel and an oxidizer are supplied.

If X1 = 4 (hybrid system):

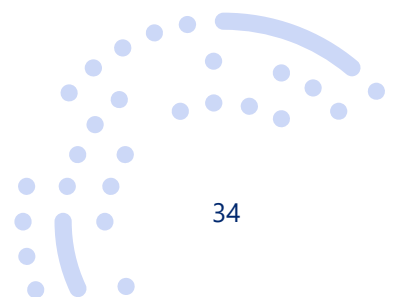
- Q10. What combination of heating appliances did you purchase?
- 1 A combination of a heat pump and a boiler
 - 2 Other
 - 99 I don't know

Q11. In which year did you purchase the heating appliance?

- 1 2021
- 2 2020
- 3 2019
- 4 2018
- 5 2017

Q12. Did you buy the heating appliance to *replace* an old one?

- 1 Yes
- 2 No





If Q12 = 2 (no replacement):

Q13. Did you buy the heating appliance for a newly built home?

- 1 Yes
- 2 No

If Q12 = 1 (replacement):

Q14. Did the old heating appliance break down or was it still working?

- 1 The old heating appliance broke down
- 2 The old heating appliance was still working

If Q12 = 1 (replacement) & 14 = 2 (old appliance still working):

Q15. Why did you decide to replace the old heating appliance? *Multiple answers possible.*

@scripter: please randomize response options (except "other, namely...").

- 1 My installer advised me to replace the old heating appliance
- 2 I wanted a more energy efficient appliance (i.e. with a better energy class) to help protect the environment
- 3 I wanted an appliance with lower emissions (e.g. of carbon dioxide (CO²) and/or nitrogen oxide (NO_x)) to help protect the environment
- 4 I wanted a more energy efficient appliance (i.e. with a better energy class) to reduce my heating bill
- 5 I had to replace it to meet energy performance requirements or be eligible for a subsidy or loan
- 6 Other, namely ...

If Q12 = 1 (replacement):

Q16. What type of appliance was the old heating appliance (i.e. the appliance that was replaced)?

- 1 A boilerⁱ¹
- 2 a heat pumpⁱ²
- 3 A CHP systemⁱ³
- 4 A combination of the abovementioned appliances (a hybrid system)
- 5 Other, namely...
- 99 I don't know

@scripter: add mouse roll-overs:

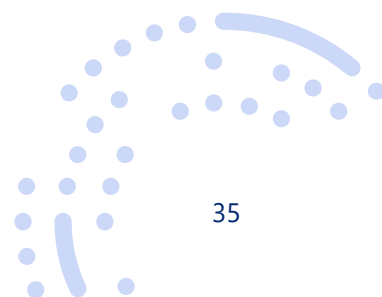
ⁱ¹ A **boiler** heats water to heat your home through radiators or floor heating. The most common boilers run on gas, but they may also run on oil, biomass (e.g. wood pellets or wood chips) or electricity.

ⁱ² A **heat pump** uses heat from the outside air, ground, or groundwater to heat your home through radiators or floor heating. Heat pumps mostly run on electricity, but may also run on gas.

ⁱ³ **Combined heat and power (CHP) systems** generate heat and electricity simultaneously using an engine or fuel cell that runs on one fuel (e.g. gas or biomass). CHP solutions for home use are called micro CHP. The heat emitted by producing electricity is used to heat your home.

If Q12 = 1 (replacement):

Q17. How old was the heating appliance when it was replaced?





- 1 less than 5 years old
- 2 5 to 10 years old
- 3 10 to 12 years old
- 4 12 to 15 years old
- 5 15 to 17 years old
- 4 17 to 20 years old
- 5 more than 20 years old
- 99 I don't know

If Q12 = 1 (replacement) and Q16 = 1 (boiler):

Q18. What source of energy did your old boiler use?

- 1 Gas
- 2 Oil
- 3 Biomass (such as pellets or wood chips)
- 4 Electricity
- 99 I don't know

If Q12 = 1 (replacement) and Q16 = 1 (boiler) and Q18 < 4:

Q19. What type of boiler was your old boiler?

- 1 Condensing boiler
- 2 Non-condensing boiler
- 99 I don't know

Q20. When you want to buy a new heating appliance, there's a wide range of heating technologies to choose from, including electric heat pumps, hybrid heat pumps, condensing gas boilers, biomass boilers, and CHP systems.

When choosing a heating appliance, did you also consider other types of heating appliances besides the type of appliance that you eventually purchased?

- 1 Yes
- 2 No
- 99 I don't remember

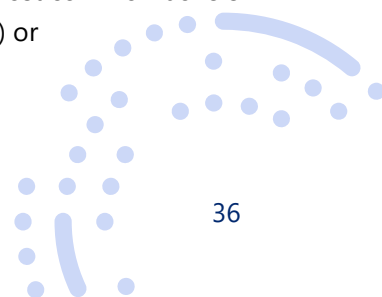
If Q20 = 1 (other types considered):

Q21. What other type(s) of heating appliances did you consider, besides the type of appliance that you eventually purchased? *Multiple answers possible.*

- 1 If $X1 \neq 1$ (boiler not purchased), then: Boilerⁱ¹
- 2 If $X1 \neq 2$ (heat pump not purchased), then: Heat pumpⁱ²
- 3 If $X1 \neq 3$ (micro CHP not purchased), then: CHP systemⁱ³
- 4 Other, namely ...

@scripter: add mouse roll-overs:

ⁱ¹ A **boiler** heats water to heat your home through radiators or floor heating. The most common boilers run on gas, but they may also run on oil, biomass (e.g. wood pellets or wood chips) or electricity.





ⁱ² A **heat pump** uses heat from the outside air, ground, or groundwater to heat your home through radiators or floor heating. Heat pumps mostly run on electricity, but may also run on gas.

ⁱ³ **Combined heat and power (CHP) systems** generate heat and electricity simultaneously using an engine or fuel cell that runs on one fuel (e.g. gas or biomass). CHP solutions for home use are called micro CHP. The heat emitted by producing electricity is used to heat your home.

If Q20 = 2 (other types not considered):

Q22. Why did you *not* consider other types of heating appliances? *Multiple answers possible.*

- 1 I was not aware of other options (e.g. because the installer did not propose other options)
- 2 I did not have the time or inclination to gather information on other options
- 3 Other types of heating appliances could not be installed in my house
- 4 Other, namely...

Q23. Via which sources did you seek or receive information on heating appliances?

- 1 Internet
- 2 Advertisements
- 3 Service agreement (maintenance company)
- 4 Constructor/manufacturer
- 5 Installer
- 6 Public information on subsidy programs
- 7 Other, namely...
- 98 None
- 99 I don't remember

Q24. Did an installer give you advice on which type of heating appliance to choose?

- 1 Yes
- 2 No
- 99 I don't remember

If Q24 = 1 (yes):

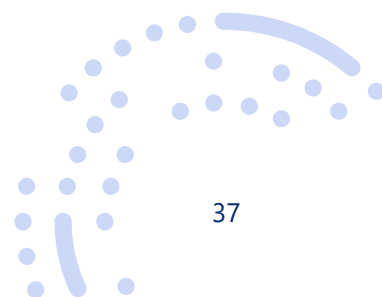
Q25. Did you follow the advice of the installer?

- 1 No, not at all
- 2 Yes, to some extent
- 3 Yes, completely

Q26. Below, you see several aspects that may have played a role in your choice for a certain heating appliance. Some of these aspects may have been important or even decisive in your choice, while other aspects may have been less important or not important at all. Please indicate, for each aspect, how important or unimportant it was in your choice.

@scripter: please randomize order of aspects.

- Energy class/energy efficiency
- Energy consumption





- Environmental impact
- Emissions (e.g. of carbon dioxide (CO²) and/or nitrogen oxide (NO_x))
- Expected availability of energy sources in the future
- Desire to have the newest technologies (to be a front runner)
- Purchase and installation costs
- Running costs (energy costs)
- Ease of installation
- Brand
- Noise level
- Installer advice
- Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)
- Specific building regulations (e.g. energy performance requirements) and/or other legislation
- Smart home integration of the applianceⁱ¹
- Remote access to the heating appliance (surveillance)
- Size of the heating appliance

@scripter: please add mouse roll-over:

ⁱ¹ Smart home systems use internet-connected devices to monitor and control various things throughout your house, such as lights, cameras, thermostats, and more. The devices are connected to each other and are accessible through one main point, like a smartphone or a computer. A heating appliance can be part of such a smart home system.

- 1 Not important
- 2 Slightly important
- 3 Moderately important
- 4 Important
- 5 Very important

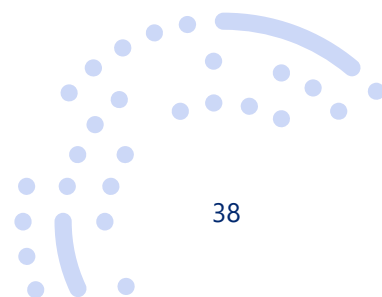
Q27. Are there any factors that were not shown on the previous screen that were (very) important in your choice for a certain heating appliance?

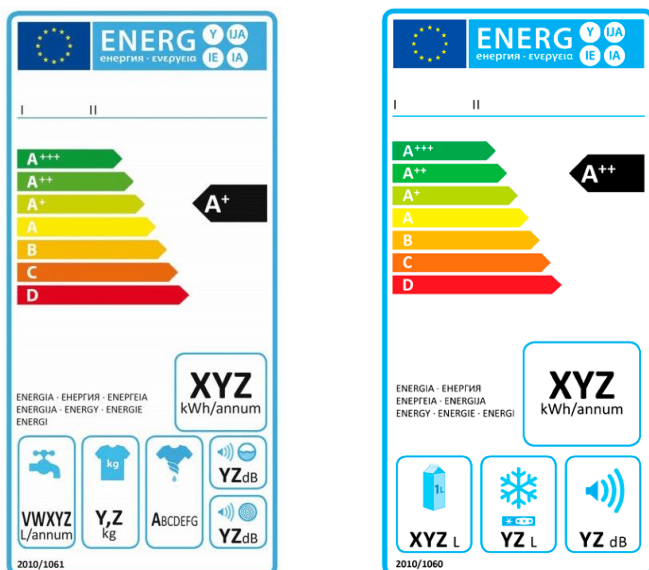
- 1 Yes, namely...
- 2 No

Part 3. Role of the energy label in the decision-making process

Q28. The EU energy label is an EU-wide label that appears on a variety of household appliances to inform consumers about their energy efficiency, amongst others. Here, you see examples of energy labels for washing machines (left) and refrigerators (right).

@scripter: insert <EL_wash.jpg> (left) and <EL_refr.jpg> (right).



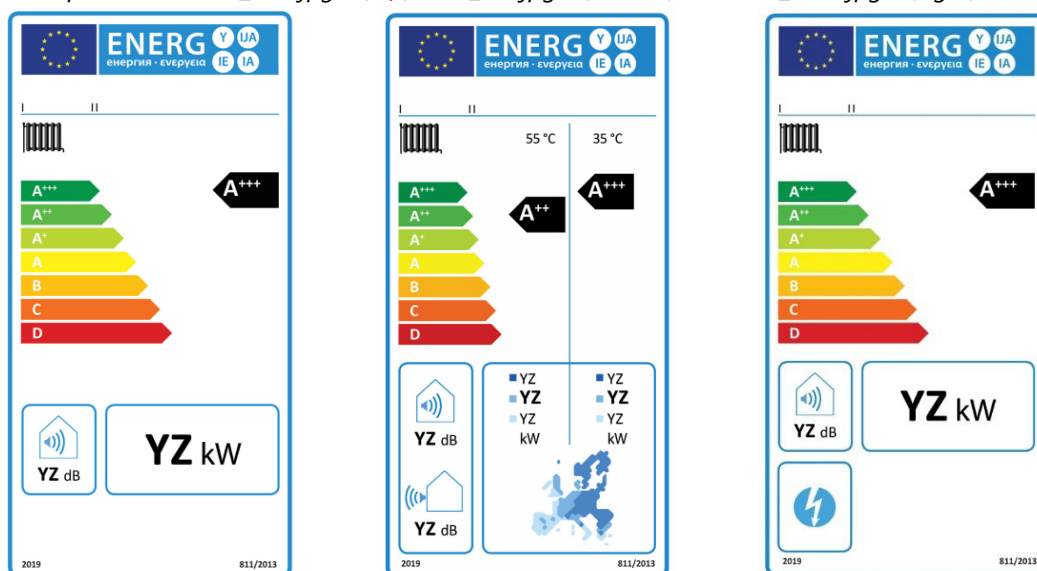


Have you seen the EU energy label before?

- 1 No, I've never seen it
- 2 Yes, I've seen it a few times
- 3 Yes, I've seen it many times

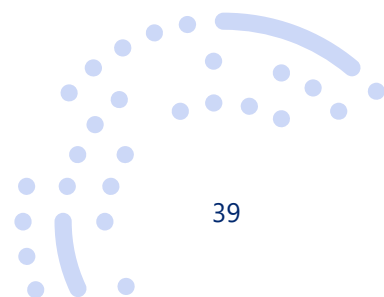
Q29. Many heating appliances also carry an energy label. Here, you see examples of energy labels for boilers (left), heat pumps (middle) and CHP systems (right). The energy label displays the energy class of the heating appliance on a scale from A+++ to D.

@scripter: insert <EL_boil.jpg> (left), <EL_HP.jpg> (middle) and <EL_CHP.jpg> (right).



Have you seen any of these labels for heating appliances before?

- 1 No, certainly not
- 2 No, I think not
- 3 Yes, I think so
- 4 Yes, certainly so





You have recently purchased a heating appliance. The following questions are about the role of the energy label in that purchase decision. *If you have purchased more than one heating appliance in the past four years, please answer the questions for your most recent purchase.*

Q30. Did you look up or did your installer show you the energy label of one or more heating appliances before the purchase?

- 1 Yes, I looked it up myself
- 2 Yes, the installer showed it to me spontaneously
- 3 Yes, the installer showed it to me after I asked for it
- 4 No, I did not see the energy label before the purchase
- 99 I don't remember

If Q30 < 4:

Q31. Did the energy label play a role in your decision (e.g. did you use it to look up the energy class of a certain heating appliance, or to compare energy classes of appliances)?

- 1 Yes
- 2 No
- 99 I don't remember

If Q30 < 4:

Q32. How important was the energy label to you when choosing a heating appliance?

- 1 Not important
- 2 Slightly important
- 3 Moderately important
- 4 Important
- 5 Very important

Q33. Do you know the energy class of the heating appliance that you purchased?

- 1 Yes, namely [*@scripter*: dropdown: A+++, A++, A+, A, B, C, D, E, F, G]
- 2 No

If Q12 = 1 (replacement):

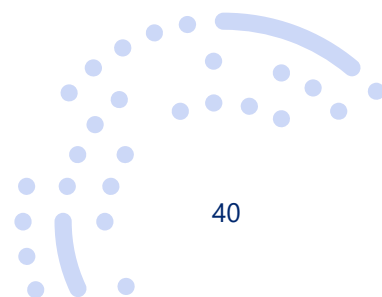
Q34. Do you know the energy class of your old heating appliance (the one you replaced)?

- 1 Yes, namely [*@scripter*: dropdown: A+++, A++, A+, A, B, C, D, E, F, G]
- 2 No

If Q12 = 1 (replacement) and Q34 = 1 (yes):

Q35. How did you find out about the energy class of your old heating appliance (the one you replaced)?

- 1 In the documentation that came with the appliance
- 2 My installer told me
- 3 I remember it from when I purchased it
- 4 I looked it up on the Internet (e.g. using a product name/code or serial number)
- 5 I calculated it using a tool on the Internetⁱ¹





6 I read it on the label for installed heating appliances given by the installer, maintenance company or chimney sweeperⁱ¹

7 Other, namely...

@scripter: please add mouse roll-over:

ⁱ¹ In Italy, the association Assotermica has developed a free tool – also available in a smart phone app format – that allows installers as well as consumers to identify the energy class of a boiler. The installer or the consumer can rate the efficiency of a boiler based on the information on the boiler itself and/or by referring to the maintenance booklet, where a record is kept of the regular maintenance of the boiler.

Part 4. Background information

Finally, we would like to ask you some more general questions about yourself.

Q36. Please indicate to what extent you agree or disagree with the following statements.

Q36_1. I know a great deal about heating systems.

Q36_2. I consider myself an expert in heating systems.

Q36_3. I trust the installer as s/he is the real expert in heating systems.

@scripter: columns

1 1. Completely disagree

2 2.

3 3.

4 4.

5 5. Completely agree

Q37. Please indicate how much you agree or disagree with the following statements.

Q37_1. I am worried about the environment

Q37_2. People should buy environmentally-friendly products

Q37_3. It concerns me that people do not care enough for the environment

@scripter: columns

1 1. Completely disagree

2 2.

3 3.

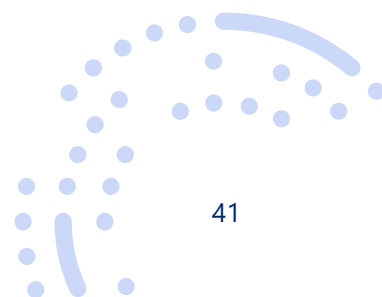
4 4.

5 5. Completely agree

Q38. What is the highest level of education you have successfully completed (usually by obtaining a certificate or diploma)

@scripter: insert country specific list (ISCED classification)

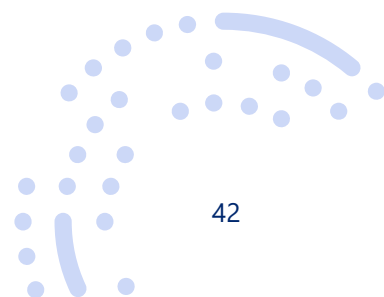
99 Don't know/no answer





Q39. Thinking about your household's financial situation, how easy or difficult would you say it is to make ends meet?

- 1 Very easy
- 2 Fairly easy
- 3 Neither easy nor difficult
- 4 Fairly difficult
- 5 Very difficult
- 99 I don't know

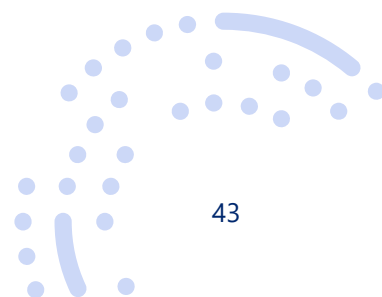




Appendix B: Perceived importance of aspects

	Perceived importance of aspect (1 = not important, 5 = very important)		
	Lower bound	Mean	Upper bound
Energy consumption	4.26	4.30	4.34
Running costs (energy costs)	4.17	4.21	4.24
Energy class/energy efficiency	4.12	4.16	4.19
Purchase and installation costs	4.09	4.13	4.17
Noise level	3.81	3.85	3.89
Environmental impact	3.81	3.85	3.89
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.78	3.81	3.85
Installer advice	3.73	3.77	3.81
Ease of installation	3.72	3.76	3.79
Expected availability of energy sources in the future	3.72	3.75	3.79
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.67	3.71	3.75
Size of the heating appliance	3.64	3.68	3.71
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.54	3.57	3.61
Brand	3.39	3.43	3.46
Remote access to the heating appliance (surveillance)	3.22	3.25	3.29
Desire to have the newest technologies (to be a front runner)	3.16	3.20	3.24
Smart home integration of the appliance	3.13	3.16	3.20

Base = all respondents (N = 3032).





Appendix C: Robustness checks

This appendix presents the results of several robustness checks of the results. Section C.1 shows the replacement behaviour including only the respondents who were highly involved in the purchase decision (i.e. excluding the respondents who were “somewhat” involved in the decision). Section C.2 presents the results of the analyses including only the respondents who reported to have purchased a boiler or heat pump (i.e. excluding the respondents who reported to have bought a CHP system or hybrid system).

C.1 Purchase and replacement behaviour of respondents who were highly involved in the decision

Table C.1. Heating appliances purchased (most recent purchase)

	Total	DE	FR	IT	BG	PL
Boiler	62.2%	61.3%	63.4%	75.0%	46.2%	62.4%
Heat pump	26.6%	25.5%	29.7%	20.1%	28.4%	29.7%
Micro CHP	5.8%	7.9%	2.9%	1.2%	16.7%	2.2%
Hybrid system	5.4%	5.3%	3.9%	3.6%	8.8%	5.7%
N	1822	318	380	412	342	370

Table C.2. Replacement behaviour

		New heating appliance				
		Boiler	Heat pump	CHP system	Hybrid system	
		68.6%	19.9%	5.6%	5.9%	
Old heating appliance	Boiler	75.3%	62.6%	8.5%	2.0%	2.2%
	Heat pump	13.1%	2.5%	8.8%	1.1%	0.7%
	CHP system	4.3%	0.9%	0.8%	2.0%	0.6%
	Hybrid system	3.3%	0.4%	0.3%	0.4%	2.2%
	Other	3.1%	1.9%	0.9%	0.1%	0.2%
	Don't know	0.9%	0.3%	0.5%	0.0%	0.1%

Base = respondents who purchased the heating appliance to replace an old one (N = 1337).

Table C.3. Replacement behaviour – old heating appliance broke down

		New heating appliance				
		Boiler	Heat pump	CHP system	Hybrid system	
		69.0%	20.0%	5.5%	5.6%	
Old heating appliance	Boiler	74.4%	63.5%	7.4%	1.8%	1.7%
	Heat pump	15.6%	2.9%	10.8%	1.1%	0.8%
	CHP system	4.5%	0.8%	0.6%	2.3%	0.7%
	Hybrid system	3.0%	0.2%	0.4%	0.2%	2.2%
	Other	1.3%	1.0%	0.2%	0.0%	0.1%
	Don't know	1.1%	0.5%	0.6%	0.0%	0.0%

Base = respondents who purchased the heating appliance to replace a defective appliance (N = 825).

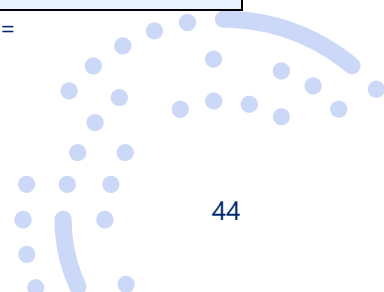




Table C.4. Replacement behaviour – old heating appliance was still working

			New heating appliance			
			Boiler	Heat pump	CHP system	Hybrid system
			68.0%	19.7%	5.9%	6.4%
Old heating appliance	Boiler	76.8%	61.1%	10.4%	2.3%	2.9%
	Heat pump	9.0%	1.8%	5.7%	1.2%	0.4%
	CHP system	4.1%	1.0%	1.2%	1.6%	0.4%
	Hybrid system	3.7%	0.8%	0.2%	0.6%	2.1%
	Other	5.9%	3.3%	2.0%	0.2%	0.4%
	Don't know	0.6%	0.0%	0.4%	0.0%	0.2%

Base = respondents who purchased the heating appliance to replace an appliance that was still working (N = 512).

Table C.5. Replacement of old boiler with new boiler

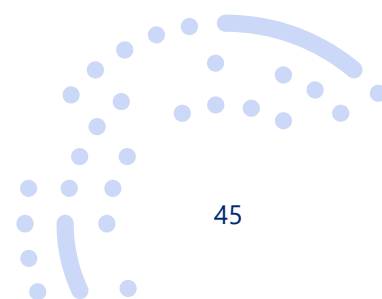
			New boiler			
			Gas	Oil	Electricity	Don't know
			84.6%	6.1%	9.0%	0.4%
Old boiler	Gas	78.7%	76.9%	0.5%	1.2%	0.1%
	Oil	8.7%	3.2%	5.1%	0.4%	0.0%
	Biomass	4.3%	2.9%	0.4%	1.1%	0.0%
	Electricity	6.9%	0.7%	0.0%	6.2%	0.0%
	Don't know	1.3%	0.8%	0.1%	0.1%	0.2%

Base = respondents who purchased a boiler to replace an old boiler (N = 837).

Table C.6. Replacement of old boiler with new boiler

			New boiler							
			Condensing gas boiler	Non-condensing gas boiler	Gas boiler (non-specified)	Condensing oil boiler	Non-condensing oil boiler	Oil boiler (non-specified)	Electric boiler	Don't know
			55.0%	24.1%	5.5%	3.8%	1.9%	0.4%	9.0%	0.4%
Old boiler	Condensing gas boiler	23.1%	19.7%	2.3%	0.6%	0.0%	0.0%	0.0%	0.4%	0.1%
	Non-condensing gas boiler	46.4%	25.7%	19.2%	0.1%	0.2%	0.1%	0.1%	0.8%	0.0%
	Gas boiler (non-specified)	9.3%	4.5%	0.7%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%
	Condensing oil boiler	3.8%	0.8%	0.1%	0.1%	1.8%	0.8%	0.0%	0.1%	0.0%
	Non-condensing oil boiler	3.5%	0.7%	0.6%	0.0%	1.2%	0.8%	0.0%	0.1%	0.0%
	Oil boiler (non-specified)	1.4%	0.7%	0.0%	0.1%	0.5%	0.0%	0.0%	0.1%	0.0%
	Biomass boiler	4.3%	1.7%	0.8%	0.4%	0.1%	0.1%	0.1%	1.1%	0.0%
	Electric boiler	6.9%	0.5%	0.2%	0.0%	0.0%	0.0%	0.0%	6.2%	0.0%
	Don't know	1.3%	0.6%	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%	0.2%

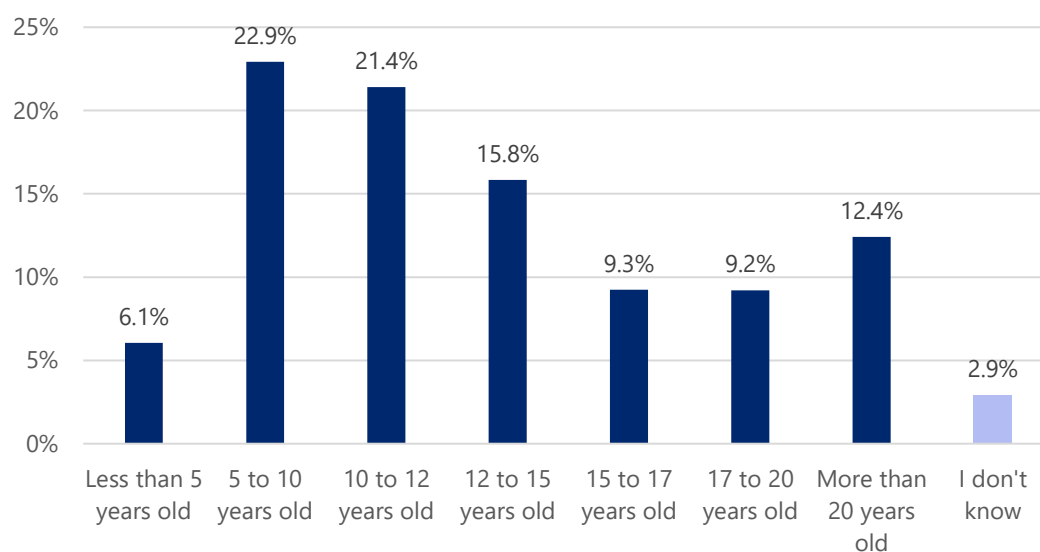
Base = respondents who purchased a boiler to replace an old boiler (N = 837).





C.2 Analyses including respondents who purchased a heat pump or boiler

Figure C.1. Age of the old heating appliance



Base = respondents who purchased the heating appliance to replace an old appliance (N = 1902).

Table C.7. Age of the old heating appliance

	Total	DE	FR	IT	BG	PL
Less than 5 years old	6.0%	3.6%	4.2%	6.8%	14.0%	6.0%
5 to 10 years old	22.9%	13.5%	12.0%	28.3%	32.6%	32.6%
10 to 12 years old	21.4%	11.8%	19.6%	24.5%	25.3%	27.4%
12 to 15 years old	15.8%	18.6%	18.3%	12.6%	13.5%	15.3%
15 to 17 years old	9.3%	10.8%	13.9%	7.9%	5.1%	6.5%
17 to 20 years old	9.2%	14.5%	9.8%	7.9%	5.1%	6.7%
More than 20 years old	12.4%	24.3%	18.3%	8.1%	3.4%	3.7%
Don't know	2.9%	2.9%	3.9%	4.0%	1.1%	1.6%
N	2,181	491	444	494	273	479

Base = respondents who purchased the heating appliance to replace an old appliance (N = 1902).

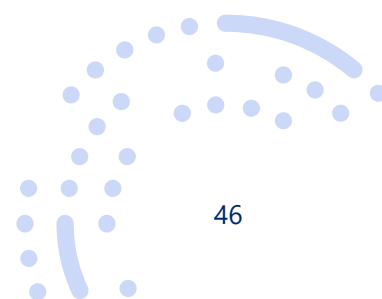
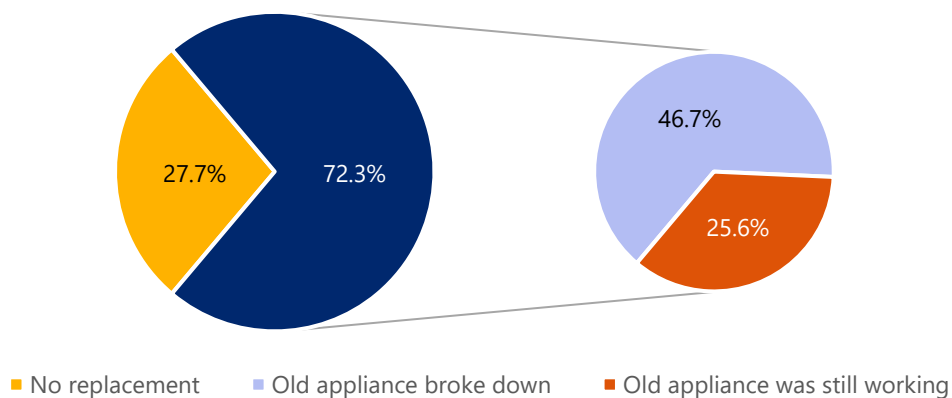


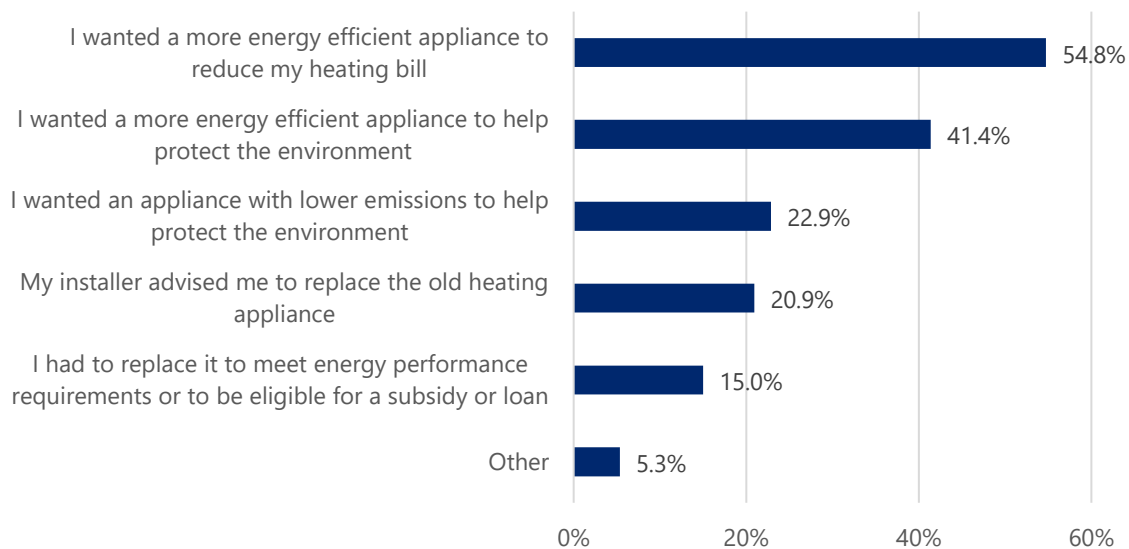


Figure C.2. Replacement purchases



Base = all respondents (N = 2631).

Figure C.3. Reasons for replacing the old appliance while it was still working



Base = respondents who purchased the heating appliance to replace an appliance that was still working (N = 674).

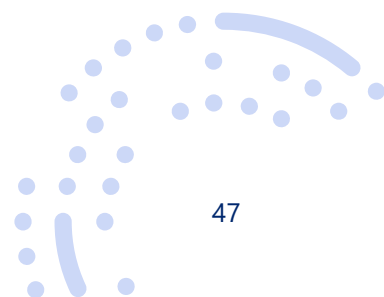
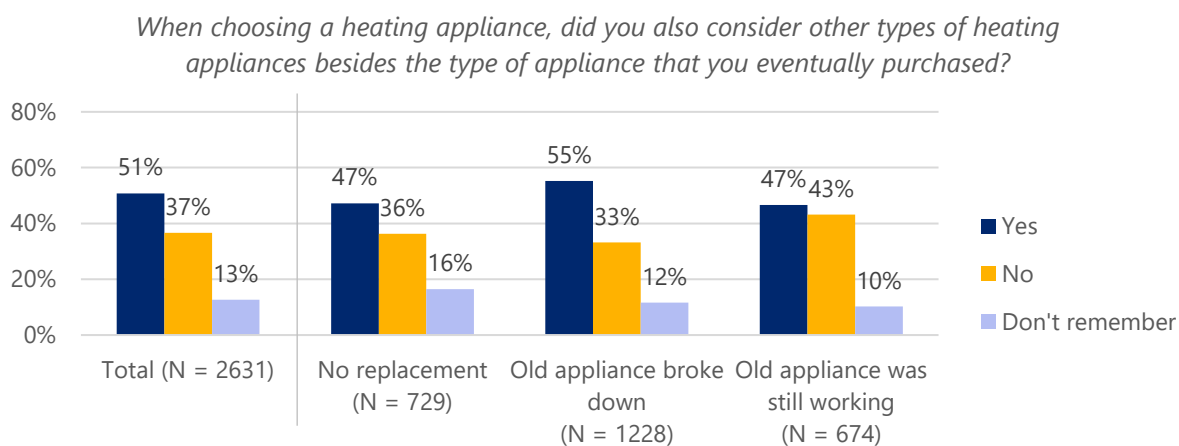


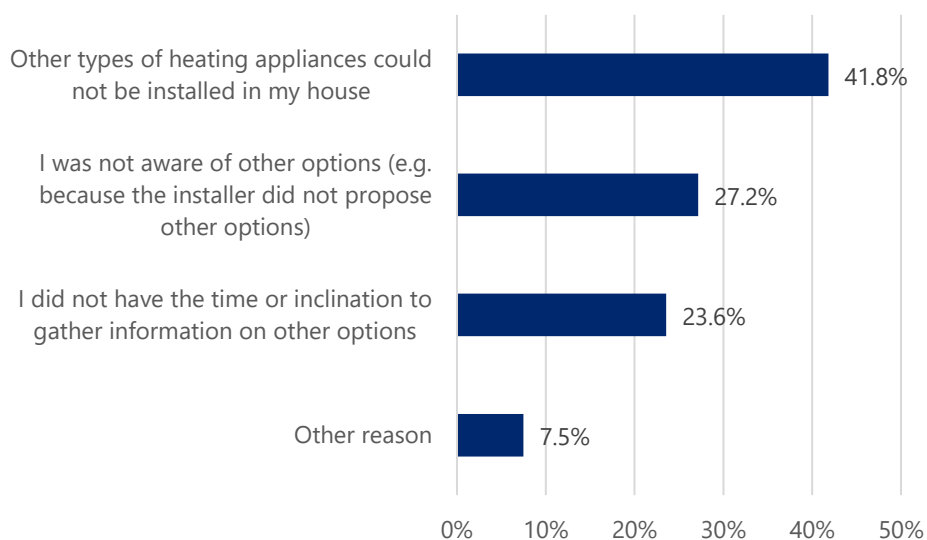


Figure C.4. Consideration of other types of appliances



Base = respondents who purchased the heating appliance to replace an old one (N = 2631).

Figure C.5. Reasons for not considering other types of heating appliances



Base = respondents who did not consider other types of appliances besides the one purchased (N = 1029).

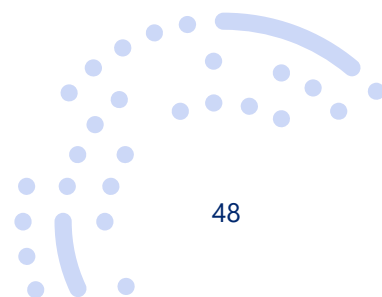
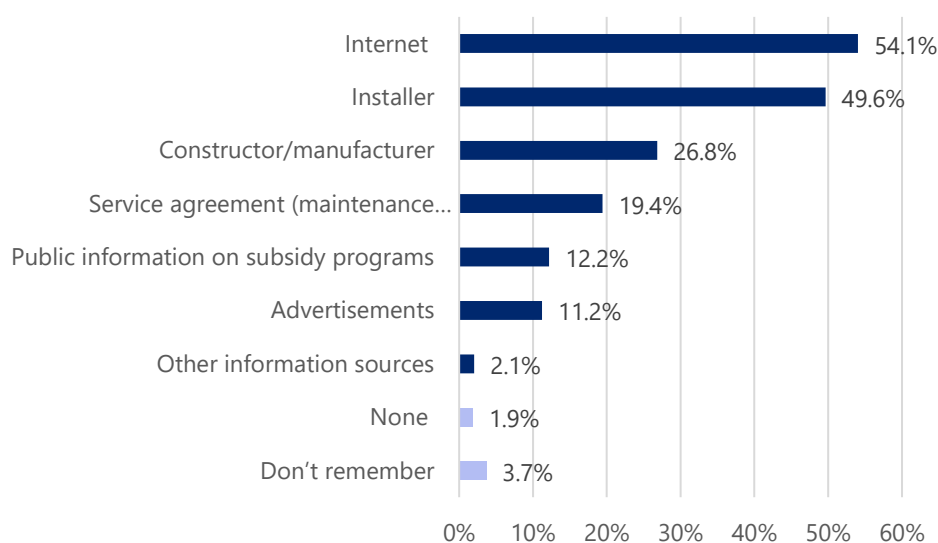




Figure C.6. Information sources



Base = all respondents (N = 2631).

Table C.8. Information sources

	Total	DE	FR	IT	BG	PL
Internet	54.1%	47.6%	36.4%	43.6%	74.5%	73.0%
Advertisements	11.2%	10.8%	8.6%	9.6%	16.2%	12.1%
Service agreement (maintenance company)	19.4%	22.1%	12.3%	19.4%	24.4%	20.3%
Constructor/manufacturer	26.8%	22.9%	26.0%	22.9%	29.5%	33.3%
Installer	49.6%	54.6%	54.0%	56.9%	36.9%	42.9%
Public information on subsidy programs	12.2%	12.3%	10.3%	7.1%	10.4%	20.7%
Other information sources	2.3%	1.8%	3.2%	1.4%	3.5%	1.8%
None	2.1%	3.9%	2.9%	1.2%	0.5%	1.6%
Don't remember	3.7%	3.7%	6.8%	2.3%	2.3%	3.1%
N						

Base = all respondents (N = 2631).

Table C.9. Installer advice

<i>Did an installer give you advice on which type of heating appliance to choose?</i>	Total	DE	FR	IT	BG	PL
Yes	72.4%	74.2%	74.5%	77.3%	63.6%	70.7%
No	19.6%	19.2%	18.5%	15.5%	28.3%	18.5%
Don't remember	8.0%	6.7%	7.0%	7.3%	8.1%	10.9%
N	2,631	511	561	576	431	552

Base = all respondents (N = 2631).

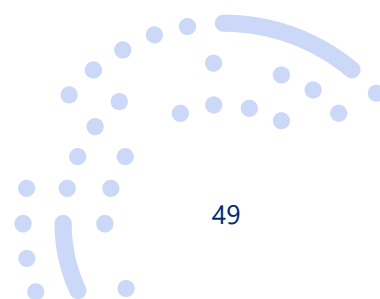


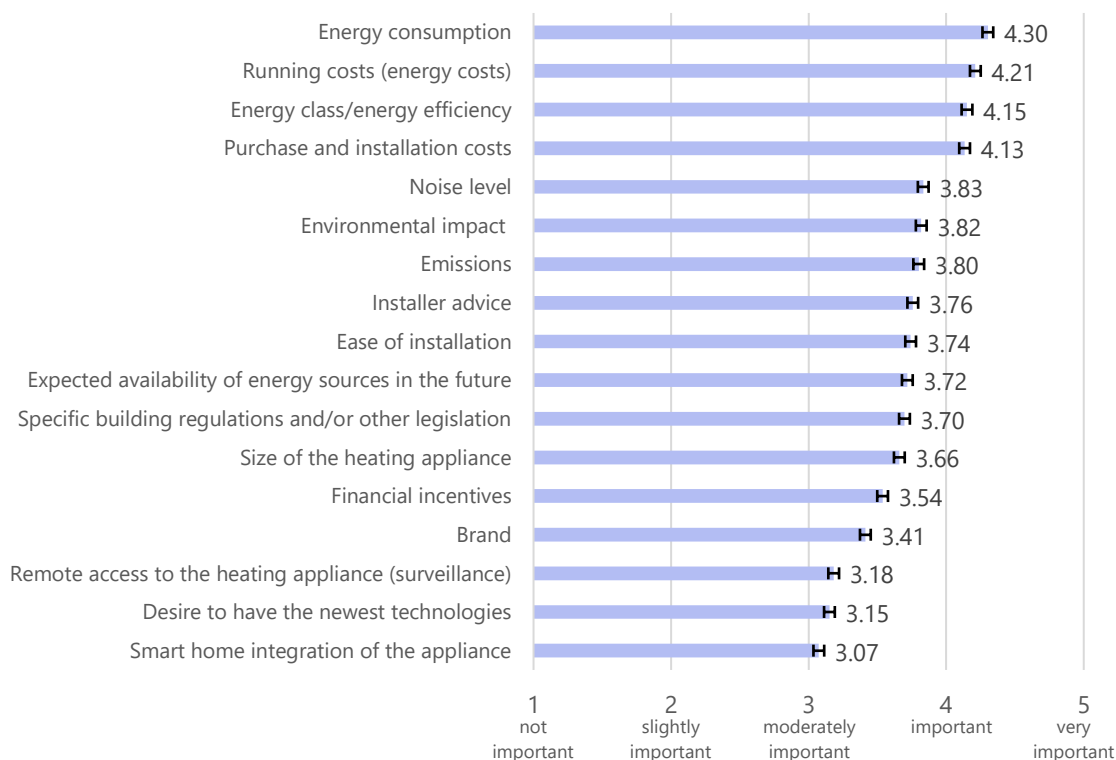


Table C.10. Following installer advice

Did you follow the advice of the installer?	Total	DE	FR	IT	BG	PL
No, not at all	3.9%	5.0%	5.7%	3.8%	2.2%	2.3%
Yes, to some extent	49.8%	46.2%	45.7%	46.5%	46.7%	63.8%
Yes, completely	46.2%	48.8%	48.6%	49.7%	51.1%	33.8%
N	1,906	379	418	445	274	390

Base = respondents who received advice from an installer (N = 1906).

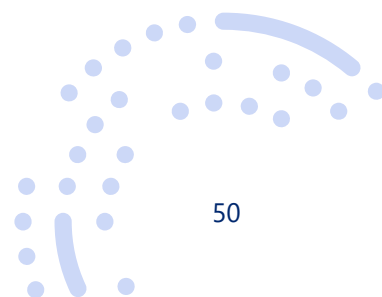
Figure C.7. Importance of aspects in heating appliance choices



Base = all respondents (N = 2631).

Table C.11. Perceived importance of aspects

	Perceived importance of aspect (1 = not important, 5 = very important)		
	Lower bound	Mean	Upper bound
Energy consumption	4.26	4.30	4.34
Running costs (energy costs)	4.17	4.21	4.25
Energy class/energy efficiency	4.11	4.15	4.19
Purchase and installation costs	4.09	4.13	4.17
Environmental impact	3.79	3.83	3.87
Noise level	3.78	3.82	3.86
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.76	3.80	3.84
Installer advice	3.72	3.76	3.80





	Perceived importance of aspect (1 = not important, 5 = very important)		
	Lower bound	Mean	Upper bound
Ease of installation	3.70	3.74	3.78
Expected availability of energy sources in the future	3.68	3.72	3.76
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.66	3.70	3.74
Size of the heating appliance	3.62	3.66	3.70
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.50	3.54	3.58
Brand	3.37	3.41	3.45
Remote access to the heating appliance (surveillance)	3.14	3.18	3.22
Desire to have the newest technologies (to be a front runner)	3.11	3.15	3.19
Smart home integration of the appliance	3.04	3.07	3.11

Base = all respondents (N = 2631). Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

Table C.12. Perceived importance of aspects: emergency versus planned replacements

	Perceived importance of aspect (1 = not important, 5 = very important)						
	Old appliance had broken down (N = 1228)			Old appliance was still working (N = 674)			Significant difference?
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	4.00	4.06⁴	4.11	4.14	4.21³	4.29	Yes
Energy consumption	4.16	4.22¹	4.28	4.30	4.37¹	4.45	Yes
Environmental impact	3.77	3.83⁵	3.89	3.79	3.87⁵	3.95	No
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.76	3.82	3.88	3.76	3.84	3.92	No
Expected availability of energy sources in the future	3.63	3.69	3.75	3.65	3.72	3.80	No
Desire to have the newest technologies (to be a front runner)	3.19	3.25	3.31	3.03	3.11	3.18	Yes
Purchase and installation costs	4.05	4.11³	4.17	4.10	4.18⁴	4.25	No
Running costs (energy costs)	4.07	4.13²	4.18	4.19	4.27²	4.34	Yes
Ease of installation	3.77	3.83	3.88	3.63	3.71	3.78	Yes
Brand	3.37	3.43	3.49	3.29	3.37	3.45	No
Noise level	3.77	3.82	3.88	3.60	3.68	3.75	Yes
Installer advice	3.71	3.77	3.82	3.71	3.79	3.87	No
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.50	3.56	3.62	3.48	3.55	3.63	No
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.68	3.74	3.80	3.57	3.65	3.72	No*
Smart home integration of the appliance	3.03	3.09	3.15	2.89	2.97	3.05	Yes
Remote access to the heating appliance (surveillance)	3.14	3.20	3.25	3.00	3.07	3.15	Yes
Size of the heating appliance	3.66	3.72	3.78	3.52	3.59	3.67	Yes

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

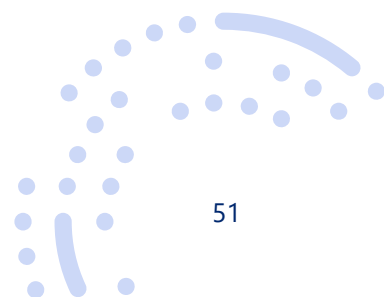




Table C.13. Perceived importance of aspects: heat pump versus other purchases

	Perceived importance of aspect (1 = not important, 5 = very important)						
	Respondents who purchased a heat pump (N = 1811)			Respondents who purchased a boiler (N = 820)			Significant difference?
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	4.10	4.17³	4.24	4.09	4.14⁴	4.19	No
Energy consumption	4.24	4.31¹	4.38	4.25	4.30¹	4.35	No
Environmental impact	3.81	3.88	3.95	3.77	3.81⁵	3.86	No
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.74	3.81	3.88	3.75	3.80	3.84	No
Expected availability of energy sources in the future	3.76	3.83	3.90	3.62	3.67	3.72	Yes
Desire to have the newest technologies (to be a front runner)	3.20	3.27	3.34	3.05	3.10	3.14	Yes
Purchase and installation costs	4.00	4.07⁴	4.14	4.12	4.16³	4.21	Yes
Running costs (energy costs)	4.13	4.20²	4.27	4.17	4.22²	4.26	No
Ease of installation	3.63	3.70	3.77	3.71	3.76	3.81	No
Brand	3.36	3.43	3.50	3.36	3.40	3.45	No
Noise level	3.85	3.92⁵	3.99	3.73	3.77	3.82	Yes
Installer advice	3.68	3.75	3.82	3.71	3.76	3.81	No
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.54	3.61	3.68	3.46	3.50	3.55	Yes
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.65	3.72	3.79	3.64	3.69	3.73	No
Smart home integration of the appliance	3.24	3.31	3.38	2.92	2.97	3.02	Yes
Remote access to the heating appliance (surveillance)	3.35	3.42	3.49	3.03	3.08	3.12	Yes
Size of the heating appliance	3.55	3.62	3.69	3.63	3.68	3.72	No

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

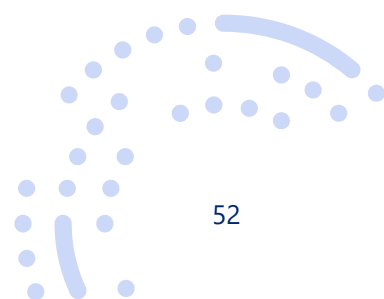




Table C.14. Perceived importance of aspects: respondents who were somewhat vs. highly involved in the decision

	Perceived importance of aspect (1 = not important, 5 = very important)						
	Respondents who were somewhat involved in the decision (N = 1013)			Respondents who were highly involved in the decision (N = 1618)			Significant difference?
	Lower bound	Mean	Upper bound	Lower bound	Mean	Upper bound	
Energy class/energy efficiency	3.91	3.98	4.04	4.21	4.26	4.31	Yes
Energy consumption	4.05	4.12	4.18	4.37	4.42	4.47	Yes
Environmental impact	3.65	3.72	3.78	3.86	3.91	3.96	Yes
Emissions (e.g. of carbon dioxide (CO ₂) and/or nitrogen oxide (NO _x))	3.62	3.68	3.74	3.82	3.87	3.92	Yes
Expected availability of energy sources in the future	3.52	3.58	3.65	3.75	3.80	3.85	Yes
Desire to have the newest technologies (to be a front runner)	2.93	3.00	3.06	3.20	3.25	3.30	Yes
Purchase and installation costs	3.93	3.99	4.05	4.18	4.22	4.27	Yes
Running costs (energy costs)	3.98	4.05	4.11	4.27	4.32	4.37	Yes
Ease of installation	3.61	3.67	3.73	3.74	3.79	3.84	Yes
Brand	3.17	3.23	3.29	3.48	3.53	3.58	Yes
Noise level	3.66	3.73	3.79	3.83	3.88	3.93	Yes
Installer advice	3.56	3.62	3.68	3.79	3.84	3.89	Yes
Financial incentives (e.g. eligibility for a subsidy, zero-interest loan, or tax reduction)	3.36	3.42	3.49	3.56	3.61	3.66	Yes
Specific building regulations (e.g. energy performance requirements) and/or other legislation	3.53	3.59	3.65	3.71	3.76	3.81	Yes
Smart home integration of the appliance	2.91	2.97	3.03	3.09	3.14	3.19	Yes
Remote access to the heating appliance (surveillance)	3.04	3.10	3.16	3.18	3.23	3.28	Yes
Size of the heating appliance	3.52	3.58	3.64	3.66	3.71	3.76	Yes

Mean importance ratings with 95% confidence intervals. Non-overlapping confidence intervals indicate statistically significant differences in the perceived importance of aspects.

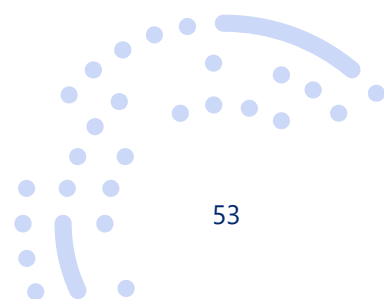




Table C.15. Energy class of old versus new heating appliance

Energy class of the old heating appliance	Energy class of the new heating appliance						
	A+++	A++	A+	A	B	C	D
A+++	9.4%	1.3%	0.6%	0.3%	0.0%	0.0%	0.0%
A++	4.4%	11.3%	1.6%	0.0%	0.0%	0.0%	0.0%
A+	6.3%	6.3%	8.2%	0.3%	0.3%	0.0%	0.0%
A	3.1%	8.5%	5.7%	1.3%	0.0%	0.0%	0.0%
B	1.6%	4.1%	2.8%	1.3%	0.3%	0.0%	0.0%
C	1.9%	2.8%	1.9%	1.6%	0.0%	0.3%	0.0%
D	1.3%	2.5%	1.6%	0.3%	0.6%	0.0%	0.3%
E	0.0%	0.0%	0.9%	0.3%	0.6%	0.0%	0.0%
F	0.3%	1.3%	0.3%	0.0%	0.0%	0.0%	0.0%
G	0.0%	0.3%	0.9%	0.6%	0.0%	0.0%	0.3%

Base = respondents who reported knowing the energy class of both their old and new appliance (N = 318).

Table C.16. Information sources

How did you find out about the energy class of your old heating appliance (the one you replaced)?	Old appliance was less than 5 years old	Old appliance was more than 5 years old
In the documentation that came with the appliance	42.9%	N/A
My installer told me	28.6%	75.6%
I remember it from when I purchased it	5.2%	N/A
I looked it up on the Internet (e.g. using a product name/code or serial number)	13.0%	N/A
I calculated it using a tool on the Internet	2.6%	4.1%
I read it on the label for installed heating appliances given by the installer, maintenance company or chimney sweeper	6.5%	17.3%
Other	1.3%	3.0%
N	77	266

Base = respondents who reported knowing the energy class of their old appliance (N = 343).

Table C.17. Energy label awareness, per country

	Total	DE	FR	IT	BG	PL
Have you seen any of these labels for heating appliances before? % "Yes"	75.8%	66.7%	64.5%	84.9%	87.5%	76.8%
N	2,631	511	561	576	431	552

Base = all respondents (N = 2631).

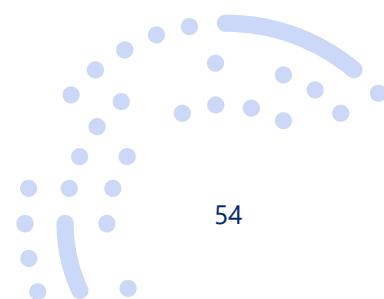
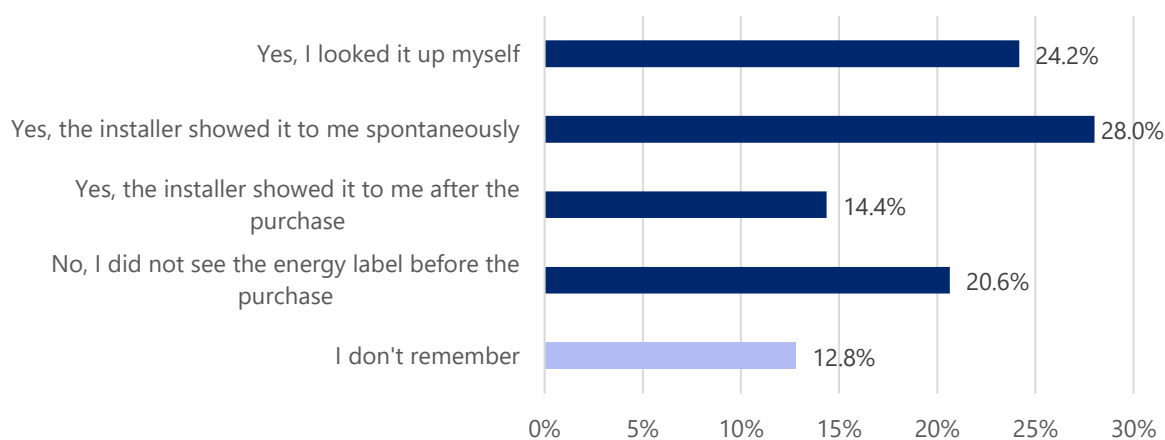




Figure C.8. Exposure to the energy label

Did you look up or did your installer show you the energy label of one or more heating appliances before the purchase?



Base = all respondents (N = 2631).

Table C.18. Exposure to the energy label, depending on advice received and followed

<i>Did you look up or did your installer show you the energy label of one or more heating appliances before the purchase?</i>	Respondents who <i>did not</i> receive advice	Respondents who received advice but <i>did not</i> follow it	Respondents who received advice and followed it <i>to some extent</i>	Respondents who received advice and followed it <i>completely</i>
Yes, I looked it up myself	32.4%	42.7%	26.3%	16.7%
Yes, the installer showed it to me spontaneously	17.3%	25.3%	32.3%	32.2%
Yes, the installer showed it to me after I asked for it	13.6%	20.0%	16.5%	12.8%
No, I did not see the energy label before the purchase	23.7% ^a	6.7% ^c	16.4% ^b	25.9% ^a
I don't remember	13.0%	5.3%	8.4%	12.4%
N	515	75	950	881

Base = respondents who remembered whether or not they had received advice from an installer (N = 2421).

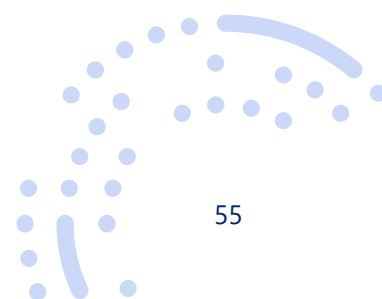
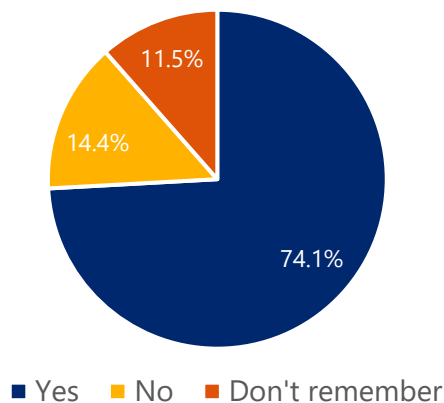




Figure C.9. Use of the energy label in the purchase decision

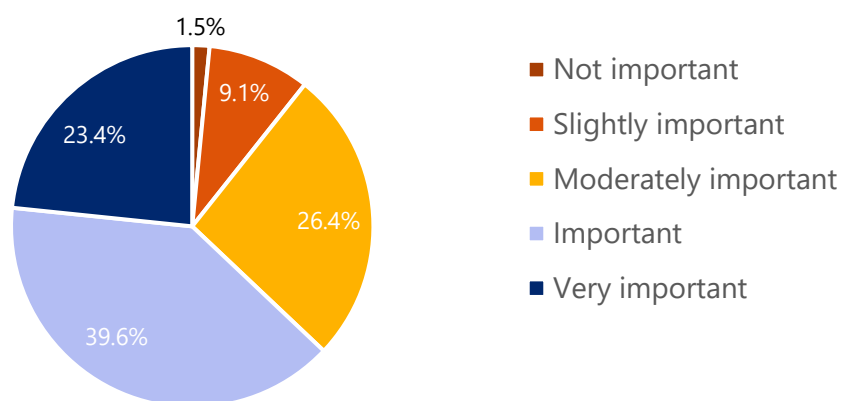
Did the energy label play a role in your decision (e.g. did you use it to look up the energy class of a certain heating appliance, or to compare energy classes of appliances)?



Base = respondents who were exposed to the energy label before the purchase (N = 1751).

Figure C.10. Importance of the energy label

How important was the energy label to you when choosing a heating appliance?



Base = respondents who were exposed to the energy label before the purchase (N = 1751).

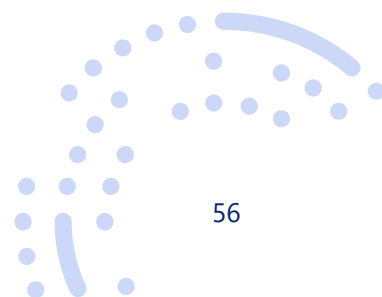




Table C.19. Importance of the energy label, depending on advice received and followed

	Respondents who did not receive advice ²⁷	Respondents who received advice but did not follow it	Respondents who received advice and followed it to some extent	Respondents who received advice and followed it completely
Did the energy label play a role in your decision? % "Yes" ²⁸	65.6% ^b	72.7% ^{ab}	79.0% ^a	77.4% ^a
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important) ²⁹	3.7 ^b	3.1 ^c	3.7 ^b	3.9 ^a
N	326	66	714	544

Base = respondents who remembered whether or not they had received advice from an installer and were exposed to the energy label before their purchase (N = 1650). Different superscripts (a, b, etc.) indicate that percentages are significantly different at $p < .05$.

Table C.20. Importance of the energy label, per purchase type

	Respondents who purchased the heating appliance to replace a defective appliance	Remainder of the respondents
Did the energy label play a role in your decision? % "Yes" ³⁰	76.8%	71.5%
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important) ³¹	3.7	3.8
N	869	882

Base = respondents who were exposed to the energy label before the purchase (N = 1751).

Table C.21. Usage and importance of the energy label, for consumers who purchased an appliance with a higher vs. the same or lower energy class than their old appliance

	Respondents who purchased an appliance with a higher energy class than their old appliance	Respondents who purchased an appliance with the same or lower energy class than their old appliance
Did the energy label play a role in your decision? % "Yes" ³²	81.4%	74.0%
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important) ³³	3.7	3.7
N	172	104

Base = respondents who reported to know the energy class of both their old and their new heating appliance and were exposed to the energy label before the purchase (N = 276).

²⁷ Note that respondents who did not receive advice may still have received *information* from installers.

²⁸ $p < .001$ (statistically significant).

²⁹ $p < .001$ (statistically significant).

³⁰ $p < .013$ (statistically significant).

³¹ $p = .438$.

³² $p = .150$.

³³ $p = .910$.

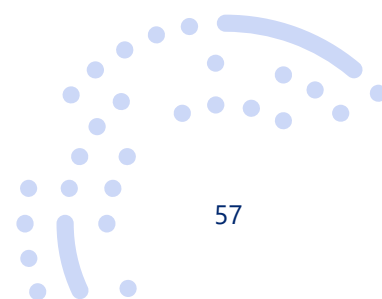




Table C.22. Importance of the energy label for respondents who purchased a different vs. the same type of appliance as their old one

	Respondents who purchased the same type of appliance	Respondents who purchased a different type of appliance	Respondents who switched from a boiler to a heat pump
Did the energy label play a role in your decision? % "Yes" ³⁴	74.4%	73.3%	73.1%
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important) ³⁵	3.7	3.7	3.8
N	1039	255	130

Base = respondents who purchased the appliance as replacement and were exposed to the energy label before the purchase (N = 1294).

Table C.23. Importance of the energy label for respondents who purchased a heat pump (vs. another type of appliance)

	Respondents who purchased a heat pump	Respondents who purchased a boiler
Did the energy label play a role in your decision? % "Yes" ³⁶	74.1%	74.1%
How important was the energy label to you when choosing a heating appliance? (1 = not important, 5 = very important) ³⁷	3.8	3.7
N	625	1126

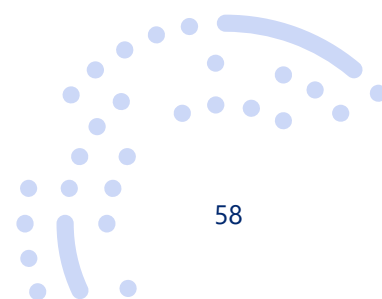
Base = respondents who were exposed to the energy label before the purchase (N = 1751).

³⁴ $p = .678$.

³⁵ $p = .354$.

³⁶ $p = .827$.

³⁷ $p = .148$.





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