

MONETARY INFORMATION TO INCREASE THE ADOPTION OF ENERGY-EFFICIENT OPTIONS: TRICK OR TREAT?

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In the context of the Paris Agreement to tackle climate change and limit the global temperature increase by 2°C (and 1.5°C if possible), all signatory countries are committed to make substantial efforts in reducing greenhouse gas (GHG) emissions. In fact, EU is committed to reduce its GHG emissions by at least 55% by 2030. One way to reduce them is to decrease energy consumption. *Energy efficiency*, or the efforts to reduce the

amount of energy used to provide a given service, is a common measure to reduce energy consumption and the environmental impacts associated with the consumption, production and transportation of energy. The European Union has set a target of an improvement of energy savings of at least 9% by 2030 compared to 2020¹.

¹<https://www.consilium.europa.eu/en/press/press-releases/2022/06/27/fit-for-55-council-agrees-on-higher-targets-for-renewables-and-energy-efficiency/>

HIGHLIGHTS

- Increasing the adoption of energy-efficient alternatives is crucial for reducing energy consumption, and therefore greenhouse gas emissions.
- Providing monetary information to consumers is a good option for increasing the adoption of energy-efficient appliances.
- In particular, lifetime energy savings information is effective for promoting the choice of highly energy-efficient washing machines and fridges.

Energy efficiency gap: the problem and the potential solutions

Although EE can reduce energy consumption in different sectors, there is often underinvestment in it. This is known as the *energy efficiency gap*. This gap can be explained by various factors (1, 2) and several policy instruments contribute to its reduction.

Different policy instruments are designed to deal with these failures and promote the adoption of energy-efficient technologies. Implementing effective EE policies is crucial for reducing energy consumption, so there is a need to understand these policy instruments and assess their effectiveness. Command and control instruments (codes and standards) establish how products should be produced in order to minimise energy consumption effectively, and price instruments are policies that directly

affect product prices. These usually includes taxes, subsidies and rebate programmes and are designed to address market failures, and they are particularly relevant for the household sector. Rebate programmes seek mainly to promote the purchase of highly efficient products. However, these price instruments are not always successful in nudging consumers towards more energy-efficient products. Finally, informational instruments include energy labels, smart meters, information feedback tools and energy audits.

Energy labels are used in almost all energy-using durable goods in the household sector. They seem to be one of the most widely applied EE policies for overcoming informational barriers. Consumers are usually willing to pay a price premium for products that carry labels of this type (3-5). The acceptance and understanding of EE labels vary from one sector, product category and country to another (6, 7).

The effectiveness of EE labels in promoting purchases of energy-efficient products has sometimes been called into question. One reason is that consumers may have difficulties in fully understanding the energy consumption information provided on labels (in kWh/year). Some authors argue that a useful way of overcoming this barrier is to convert energy consumption information into monetary information as consumers could better understand monetary information (6-10). In this way, consumers could perceive that future energy savings could offset the money invested in energy-efficient products. However, although monetary information on energy consumption seems to facilitate consumers' understanding, it is technically challenging to implement due to the complexity of the unit of measurement (energy cost or energy savings per month, per year, over the useful lifetime or per number of uses)(7).

Effectiveness of monetary information

In recent experiments, Solà et al. (9, 11) analyse how providing energy consumption information on appliances in monetary terms (in different formats) affects consumer purchases of an energy-efficient appliances. For this, two field experiments were designed: a first one provided information in terms of with **lifetime energy cost** (LEC) and the second one, in terms of **lifetime energy savings** (LES). The appliances that coincide in both experiments were fridges, washing-machines and dishwashers and they account respectively for 30.6%, 11.8% and 6.12% of energy consumption at Spanish households (12). Table 1 shows the average price of fridges based on experimental data, and the associated LES and LEC per EE level, one of the most energy-consuming appliances in Spanish households.

The monetary information was tested in different ways. In the first field experiment, the LES information was provided through a monetary



	Average price	Average lifetime energy savings	Average lifetime energy cost
A+++	1019,39€	416,65€	324,66€
A++	776,22€	305,54€	473,59€
A+	520,96€	262,40€	519,49€

Table 1: Average sales prices, average lifetime energy savings (LES) and average lifetime energy cost (LEC) for fridges

label, explanations by sales staff, and a combination of both. In the second field experiment, the LEC information was provided in two ways: a monetary label only, and a monetary label with sales staff explanations.

The effectiveness of providing monetary information on LES and LEC was found to depend on the appliance and the specific way in which information was provided. More precisely, LES information provided by sales staff and the combination of a monetary label and information from sales staff seem to be effective for fridges, while for washing machines it is only effective when the information is provided via a monetary

label. Surprisingly, no effect was found for dishwashers. One explanation could be that consumers are not as concerned about energy efficiency for dishwashers as they are for fridges and washing machines. A second explanation could be that not all households have a dishwasher since they do not consider it a necessary appliance. In the case of LEC information, providing monetary information by sales staff only and by sales staff plus a supplementary label is effective in increasing purchases of A++ washing machines, fridges and dishwashers.

Table 2 provides a summary of the effectiveness of LEC and LES monetary information found in the literature. As can be seen, the findings suggest that there is no clear consensus on the

effectiveness of monetary information and that this instrument is very sensitive to design features such as the product type, the consumer idiosyncrasy. Some of the evidence outlined in Table 2,

shows that monetary information could be effective (13–17), may have a negative effect (18), or even no effect (19, 20), and other indicates that it may depend on the product category (8, 10).

Authors	Appliance	Monetary information on energy cost	Monetary information on energy savings
Kallbekken et al. (8)	Tumble drier	V	
	Freezer	.	
Stadelman and Schubert (10)	Tumble drier	V	
	Freezer	.	
Deutsch (16)	Washing machine	V	
Blasch et al. (14)	Fridge	V	
Carroll et al. (19)	Tumble drier	.	
Skourtous et al. (20)	Fridge	X	
Allcott and Sweeney (13)	Water heater	V	
Blasch et al. (14)	Fridge		
Bull (15)	Washing machine	V	
Heinzle (17)	Televisions	V	
D'Adda et al. (18)	Fridge	V	
Solà et al. (9)	Washing machine	X	V
	Fridge		V
	Dishwasher		.
Solà et al. (11)	Washing machine	*	
	Fridge	*	
	Dishwasher	*	
	Tumble-drier	*	

Table 2: Summary of the effectiveness of monetary information based on the literature

Note: * means that the effectiveness of the monetary information on those appliances depend on the format and the EE level of the appliance. A point "." means that the appliance was studied, but no effect was found on the analysis of the effectiveness of the monetary information tested, while "V" and "X" means that the monetary information had a positive and negative effect respectively.

While LES monetary information yields better results than LEC monetary information, the challenges that an implementation of a monetary label with LES information may present should be considered. Estimating savings requires a benchmark (such as for example the maximum energy consumption for each

product category, which may change over time. A label with such information would not be complex to implement as it would have to be updated regularly. However, a monetary label based on cost may be easier to implement. The time scale used to estimate monetary information is also relevant. De Ayala and

Solà (7) make an interesting summary of the pros and cons of using different time scales (per year or month, per lifetime, per use), and underline that lifetime scale information is striking and a familiar concept to consumers, while the con is that consumers do not rely on this estimation.

Concluding remarks

In conclusion, it can be argued that monetary information can be useful to increase the adoption of energy-efficient appliances, but the magnitude of its effectiveness depends on the unit of measure (lifetime energy savings

or lifetime energy costs), the type of appliance and other factors such as the technical attributes of the product or the country analysed.

One of the challenges faced by European monetary labels is how to apply them in different EU countries, given that each country may have different energy

prices. One practical suggestion could be to include a QR code in EE labels. This code can link to energy costs over the lifetime of each appliance based on the average electricity price in each particular country.

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