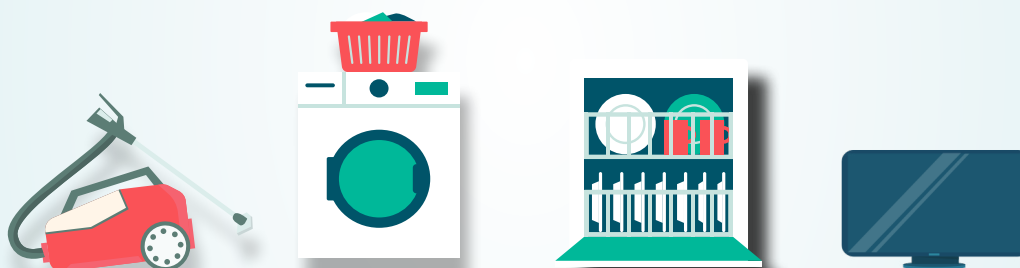




ENERGY-SAVING APPLIANCES: the silent money makers in consumers' homes



BEUC study about EU consumer savings
resulting from Ecodesign measures

1 Why this study?

For the past few decades, the Ecodesign rules and Energy labelling have contributed to reducing the energy consumption and increasing the overall sustainability of household appliances, improving their energy and resource efficiency, and helping consumers to save money and make more sustainable choices. For these reasons, the European Commission has identified these regulations as important tools to achieve the EU climate and sustainability commitments under the EU Green Deal and the Circular Economy Action Plan.

The recent geopolitical events and the ongoing energy and cost-of-living crisis have seen energy prices skyrocket and households' energy bills soar, leading to an increased interest in energy efficiency and savings. Policymakers across and beyond Europe were prompted to take steps to accelerate the transition to more efficient and more climate-friendly solutions, to reduce dependency on Russian gas and contain increasing prices.

In this context, the Ecodesign framework plays an important role. Ecodesign measures not only improve the energy efficiency of common household appliances, they also significantly cut consumers' energy bills. **In 2016, we commissioned a study** to quantify the financial benefit EU consumers get from these energy efficiency rules. **We found that consumers could save every year between €330 (just buying products covered by minimum Ecodesign rules) and €515 (choosing the energy label's top class).**

Considering the current higher energy prices and the stricter Ecodesign rules recently adopted by the European Commission, **we decided to update the 2016 study. The results confirm that Ecodesign rules greatly contribute to shielding consumers from spiralling energy prices and reducing our dependence on energy imports.**



2 Most striking results in a nutshell

Considering only energy costs (gas and electricity), in 2022, at the height of the energy crisis, an average European household could save in their energy bill:



Up to €2,450
if equipped with the
top energy classes
appliances.



Close to €900
only by using appliances
complying with mini-
mum Ecodesign energy
efficiency standards.

Even in more 'normal' times, with energy prices back to more reasonable levels, European households* can save between €650 and €1,800 every year on their energy bills thanks to Ecodesign and Energy Labelling.

Even when considering the higher purchase price of more efficient appliances (Total Cost of Ownership analysis), Ecodesign and Energy labelling rules provide large savings to European households. Today, consumers are expected to gain more than double the savings we had estimated in 2016, which were already worth between €330 and €454 every year.

Most of the savings come from a reduction in the energy consumption of space heating and lamps, which are the appliances with the highest impact on households' annual energy costs. But the lower energy consumption of other household appliances and consumer electronics such as fridges, TVs and washing machines also contribute to reducing consumers' energy bills, collectively contributing to about 15% of the total annual savings.

* A typical European household usually has around twenty household appliances.

3 Main takeaways

Ecodesign is a policy which delivers for people, especially in times of crisis. Thanks to Ecodesign measures, European households can save €650 every year on their energy costs. In 2022, at the peak of energy prices, energy costs savings increased exponentially, ranging between €850 and €2,450. Ecodesign is thus a central piece of the consumer protection puzzle also in times of crisis. Without the current Ecodesign measures, consumers would have spent close to €1,000 more on their energy bills every year marked by exceptionally high energy prices. In Germany, which recorded much higher energy prices compared to other EU Member States during the crisis, the annualised savings at the peak price reached €1,460 thanks to Ecodesign.

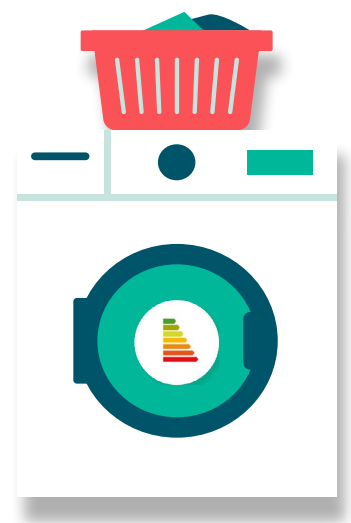
Also, when considering the purchase price and running costs of household appliances (i.e Total Cost of Ownership, TCO) there are still significant cost savings thanks to Ecodesign measures.¹

In this TCO scenario, consumers save up to €620 on their energy bills just thanks to the fact that their household appliances meet the most recent minimum energy efficiency requirements. This is nearly double the savings that we had estimated in our 2016 study.

Financial benefits are even more impressive if people opt for the top-class appliances, despite a higher purchase price. By choosing appliances in the top class of the energy label, annual savings almost double, reducing annual costs by €950 on average, if considering the current high price situation and expected future price decline. For example, consumers would save up to €680 annually if they were equipped with a top-class heat pump instead of a non-condensing gas boiler. This represents 70% of the potential total annual savings in the 'Best Available Technique' scenario for the central price scenario.

The biggest savings are achieved by the most energy-guzzling appliances, which are heaters and lighting. Thanks to Ecodesign energy efficiency rules, these appliances became more efficient, saving consumers around €520 euros every year (85 % of the total annual savings). However, savings stemming from other appliances are also significant. Indeed, consumers save around €100 every year from the energy efficiency gains acquired through Ecodesign for appliances other than heating and lighting, such as TVs, washing machines, dishwashers, and vacuum cleaners.²

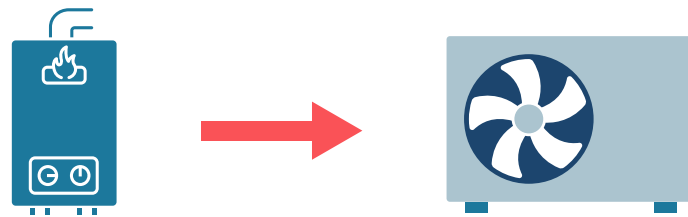
Overall, from an energy efficiency perspective, it pays off to purchase more efficient household appliances, even when the initial purchasing prices are higher. Looking at broader sustainability impacts, such as waste generation and resource efficiency, it is however often better to wait for the end of an appliance's lifespan before switching to a new, more efficient one. This is especially true for household appliances where energy efficiency gains do not necessarily translate into very significant monetary savings (for instance TVs or vacuum cleaners).



¹ This refers to the results of the Total Cost of Ownership Analysis (TCO) which considers the appliances' purchase price, running costs and energy costs.

² The report considers a list of products that are most likely to be found in an average European household, and that are regulated by the Ecodesign and Energy Labelling. These include: a portable electric room heater; Refrigerating appliances; An electric oven with electric hobs; A washing machine; A dishwasher; A vacuum cleaner; Two electronic displays (1 TV and 1 monitor); A complex set-top-box; A desktop and/or laptop computer; A home inkjet printer; Air conditioning unit; A coffee machine, router and tablet (each of which are indirectly regulated for their standby power use).

Switching from gas boiler to heat pump as central heating system can slash consumers' energy bills and contribute to heating decarbonisation. Even if a heat pump is considerably more expensive than a gas boiler, consumers switching from a B class gas condensing boiler to an A+++ electric heat pump save around €385 every year in energy costs. The higher price of a heat pump is recovered within ten years after purchase.



Ecodesign contributes to the EU energy efficiency objectives and to making Europe more resilient against external energy shocks. Ecodesign measures, along with Energy Labelling, have been estimated to bring energy savings of approximately 230 Mtoe by 2030.³ This equals the total annual energy consumption of France.⁴ This fact shows that consumers do have a role to play in the green transition, provided they can easily switch to energy-efficient appliances.

These financial and energy savings are expected to rise thanks to the proposed Ecodesign for Sustainable Products Regulation (ESPR). Under the proposal, Ecodesign measures will be expanded to more product groups and other very significant cost impacts, including durability, reparability, and reliability. The further savings that could be achieved through these new measures could be investigated in a follow-up study.

4 What should policymakers make of these results?

The European Commission should invest more in Ecodesign. This policy tool delivers on the ground, and it is crucial it is given the political attention it deserves. The working plan currently under public consultation to identify priority measures under the future ESPR is very ambitious, as it considers many new products and sustainability aspects. The development of these product-specific rules is a resource- and time-intensive process which requires the necessary expertise from the Commission and all stakeholders involved. Therefore, it is essential the political ambition is matched with adequate resources (staff and budget) on the Commission's side and for market surveillance authorities to enable them to promptly implement the ESPR and ensure effective compliance and enforcement.

The Commission should continue involving civil society in the development of Ecodesign rules. The consumer movement has a crucial role to play in raising awareness, making sustainable consumer choices easier, and putting pressure on the supply side of the market to deliver sustainable products and services. BEUC and its sister organisation ANEC have contributed to the development of ambitious Ecodesign rules for over 15 years, effectively representing the consumers' perspective in the policy discussions. We have contributed to the development and revisions of many Ecodesign and Energy Labelling Regulations, making sure consumers' needs were duly represented over the years. For example, we effectively advocated for Ecodesign measures making household appliances more durable and repairable for consumers. The

³ https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labeling-rules-and-requirements/energy-label-and-ecodesign/about_en

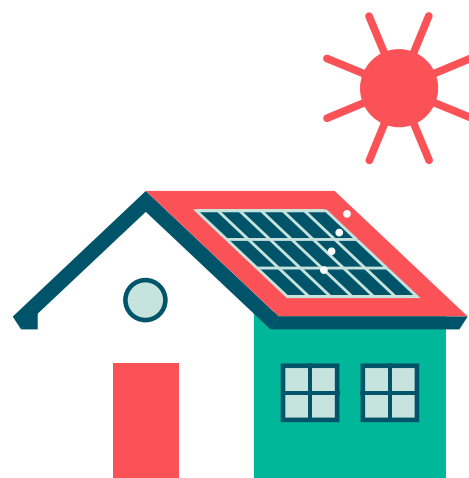
⁴ <https://yearbook.enerdata.net/total-energy/world-consumption-statistics.html>

energy label has also been rescaled in 2019, after we had long called for such an update, which enabled consumers to better understand how much energy their appliances consume. It is essential the consumers' voice will continue to be adequately represented in the years to come, also through increased financial resources.

The institutions should promptly adopt and roll out the ESPR proposal, and ensure it is properly enforced. Thanks to Ecodesign, consumers benefit from more energy-efficient household appliances. It is now time to bring this policy tool to the next level and achieve even bigger savings for consumer. For example, it is estimated that German households could save 3.67 billion euros per year if their televisions, smartphones, washing machines and notebooks were more durable.⁵ The ESPR proposal provides a good framework to enable this shift and make durable and sustainable products the norm, extending the scope of Ecodesign and addressing more sustainability aspects. Besides a swift adoption of the ESPR proposal, it is essential that the Commission quickly identifies the products and measures to prioritise for new implementing regulations. To ensure consumers can benefit from more sustainable products and non-sustainable options do not enter the EU market, adequate measures must be adopted to strengthen market surveillance and custom controls. The full list of our key recommendations on the ESPR is summarised in [our checklist](#).

The European Commission and Member States should phase out inefficient heating appliances and support consumers in the switch to more sustainable heating options. Our study shows that opting for an electric heat pump instead of a fossil fuel boiler makes economic sense. Phasing out fossil fuels boilers is an important piece of the puzzle that will allow financial benefits to reach consumers, along with reducing the use of energy through adequate home insulation and retrofits. To guarantee consumers an easy switch to more sustainable heating options it is essential to [set the right framework conditions](#). At the same time, efforts must be scaled up to increase energy efficiency in heating and cooling and make sure consumers can easily identify the most efficient heating option on the market, through the introduction of a single energy label for fossil fuels boilers and heat pumps.

National and local authorities should help consumers access renewable energy applications to enable further savings. If you are equipped with solar panels, running a washing machine, a dishwasher, or a heat pump during the day when the sun shines has a great potential to reduce costs. In 2022, households equipped with solar photovoltaics and heat pumps reportedly cut their energy bills by 84%.⁶ Further savings can be achieved switching to demand-response contract, where consumption is shifted to the moments of the day when electricity prices are lower (i.e., running a dishwasher in the middle of the night when overall electricity consumption is much lower). Consumers need adequate public support to install more efficient devices and access household renewables at an affordable price. Consumer groups play an important role in advising people to make the switch and should continue to be supported in their work. This is the case under the EU-funded projects [CLEAR X](#) and [STEP](#), where BEUC and its members are involved.



⁵ <https://www.vzbv.de/pressemitteilungen/studie-zu-langlebigkeit-von-produkten-qualitaet-zahlt-sich-aus>

⁶ <https://www.solarpowereurope.org/press-releases/new-report-solar-pv-heat-pump-combos-saved-europeans-up-to-84-on-household-energy-bills-in-2022>

5 How did we get these results?

The study investigates how Ecodesign and Energy Labelling rules affect the savings in energy costs and total cost of ownership (TCO) of the most common appliances in EU households. The analysis is performed assessing the energy cost savings and TCO of a **counterfactual scenario** where Ecodesign rules do not exist, against an **Ecodesign scenario**, where products meet the minimum energy performance standards set in the respective Ecodesign instruments, and a **Best Available Technique (BAT) scenario**, where products have the highest available energy efficient class on the energy label.

The energy price assumptions are crucial to calculating the financial savings that can be achieved by Ecodesign and more energy-efficient products. Compared to the 2016 study, this update considers three main price scenarios:

- **Low price scenario** – considering pre-crisis prices.
- **Central price scenario** – approximating the impact of the current high price situation and expected future price decline.
- **High price scenario** – considering the peak of the energy prices in 2022.

The analysis provides estimates on the **EU27 average**, as well as more specific figures for three EU Member States with different price characteristics in the last few years:

- **Germany** (high electricity prices, average gas prices pre-crisis, highest price peak during crisis)
- **Spain** (average electricity prices, above average gas prices pre-crisis, lowest price peak of the three Member States)
- **Czech Republic** (average pre-crisis prices, high electricity and gas prices during the crisis).

We have addressed the specific situation of central heating systems comparing the TCO of gas boilers and heat pumps and identifying the payback period of each appliance, depending on their estimated purchase price and running costs.

A sensitivity analysis was also performed at the end to test the robustness of the results against different levels of consumption. It shows that Ecodesign and Energy Labelling rules remain beneficial, to different degrees, for both lighter and heavier use of appliances.

The figures represented in this report consider a hypothetical European household equipped with appliances that are compliant with the most recent Ecodesigned and Energy labelling legislation. This means that not all EU households currently fulfil these conditions. The results should be interpreted as a reference for potential energy savings resulting from ecodesigned and energy-labelled appliances in the central price scenario.

The full study was carried out by Trinomics and is available [here](#).



Published in May 2023 by BEUC



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Co-funded by the European Union

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