

Schneider Electric
Whitepaper

Evolving home energy consumption

Intentions, actions
and hurdles to greater
home energy efficiency

Life Is On

Schneider
Electric

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Foreword

By Michael Lotfy Gierges,
Executive Vice President,
Home & Distribution,
Schneider Electric



In 2024, the impact of the energy crisis continued to be felt by homeowners around the world.

In the first half of the year, the average price of residential electricity across Europe was €0.29 per KWh; while this was only a 2% rise compared to costs in the latter half of 2023, these costs are still significantly higher than just a few years ago in 2021, when the average price per KWh was €0.15¹.

The impact of this was felt directly by many homeowners, particularly given the increasing electrification in our homes. This increased reliance on electrical appliances and devices in their day-to-day lives has left many looking for ways to keep their electricity bills at a manageable level.

On top of this, the impact of global warming on the planet is becoming more apparent than ever before, as disastrous wildfires, hurricanes and floods hit many parts of the world and displaced many communities throughout 2024. Consequently, the link between rising carbon emissions – namely from our energy consumption and reliance on fossil fuels – and global warming has never been stronger.

So, with homeowners looking to combat high energy bills and live more sustainable lives, improving energy efficiency in homes and buildings is a priority.

Alongside day-to-day appliances and uses – such as heating and cooling, fridges, dishwashers and washing machines – and electrical devices, new larger electrical loads, such as EV charging, are now more frequently being integrated into residential buildings. This trend is only expected to increase, as it is anticipated that one in five cars will be electric by 2030².

Consequently, homeowners are not only adapting their habits to reduce energy consumption, but they also continue to look for new solutions that can help them in doing so. Alongside heating controls and Home Energy Management systems, AI has now emerged as a new contender with the potential to revolutionize energy management in the home.

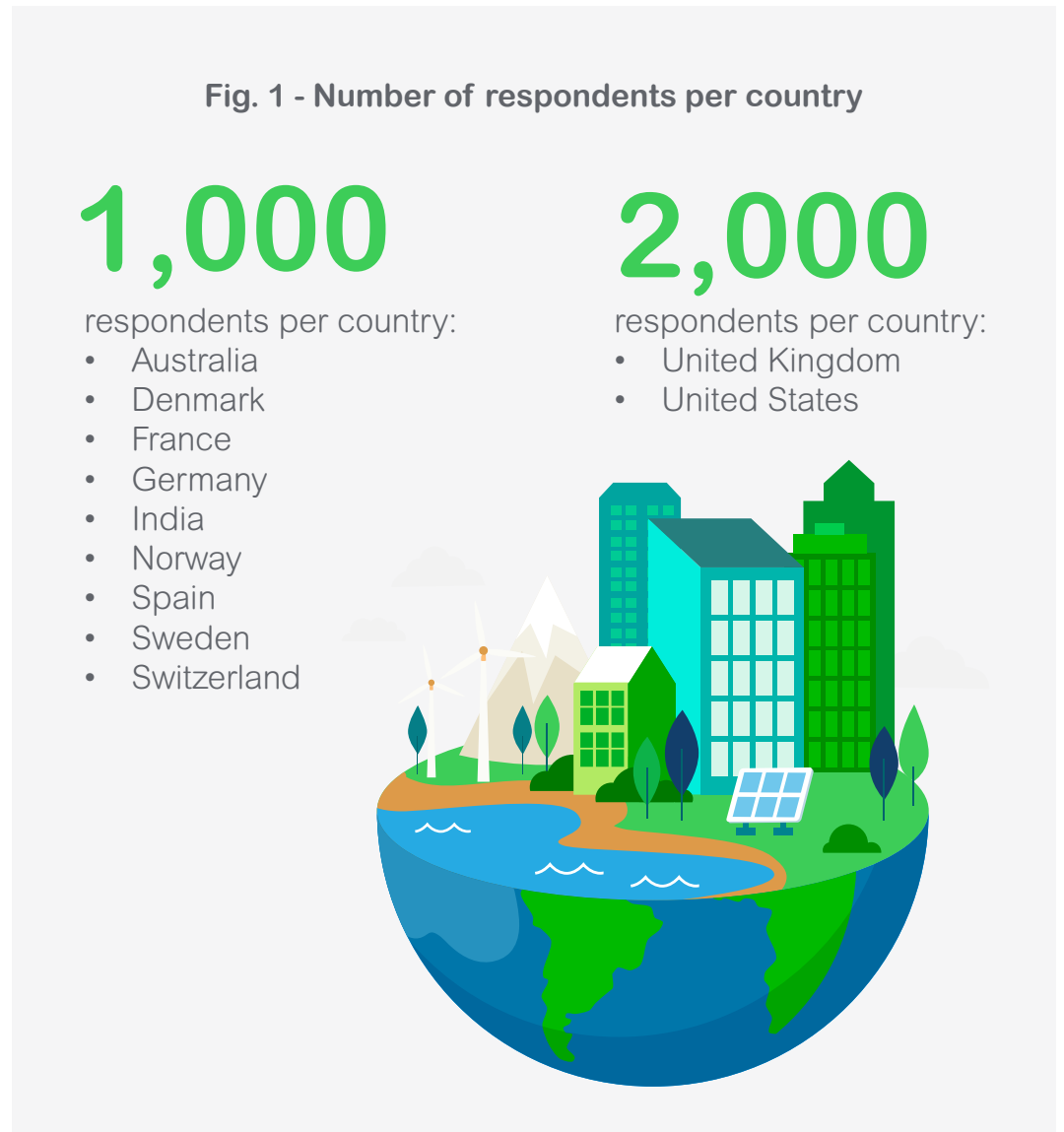
In this latest report, we explore the attitudes and behaviors of homeowners around the world to understand the pressures they currently face, their priorities when it comes to energy management and improving efficiency, and their thoughts about a sustainable future. Plus, we'll examine how smart technology providers, such as Schneider Electric, are driving the way in innovative solutions that not only will assist homeowners today but also create a better tomorrow.

¹ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics

² <https://www.iea.org/reports/global-ev-outlook-2024/executive-summary>

Methodology

A global consumer survey was conducted by Opinium on behalf of Schneider Electric amongst 13,000 respondents across 11 markets in September and October 2024:



The survey was conducted online via a survey form, in the respondents' native language with translations provided by a professional translation company. Questions that involved elements such as currency and political parties were customized for each market.

2023 Edition

The study was conducted amongst 9,000 respondents across 7 markets:

- Australia – 1,000 respondents
- France – 1,000 respondents
- Germany – 1,000 respondents
- Spain – 1,000 respondents
- Sweden – 1,000 respondents
- UK – 2,000 respondents
- USA – 2,000 respondents

2021 Edition

Respondents completed the 31-question Smart Homes and Psychology of Sustainability survey, which took an average of 16 minutes and 58 seconds to complete.

The study was conducted amongst 8,019 respondents across 6 markets:

- Australia – 1,004 respondents
- France – 1,003 respondents
- Spain – 1,006 respondents
- Sweden – 1,004 respondents
- UK – 2,001 respondents
- USA – 2,001 respondents

2020 Edition

The study was conducted amongst 7,000 respondents across 6 markets:

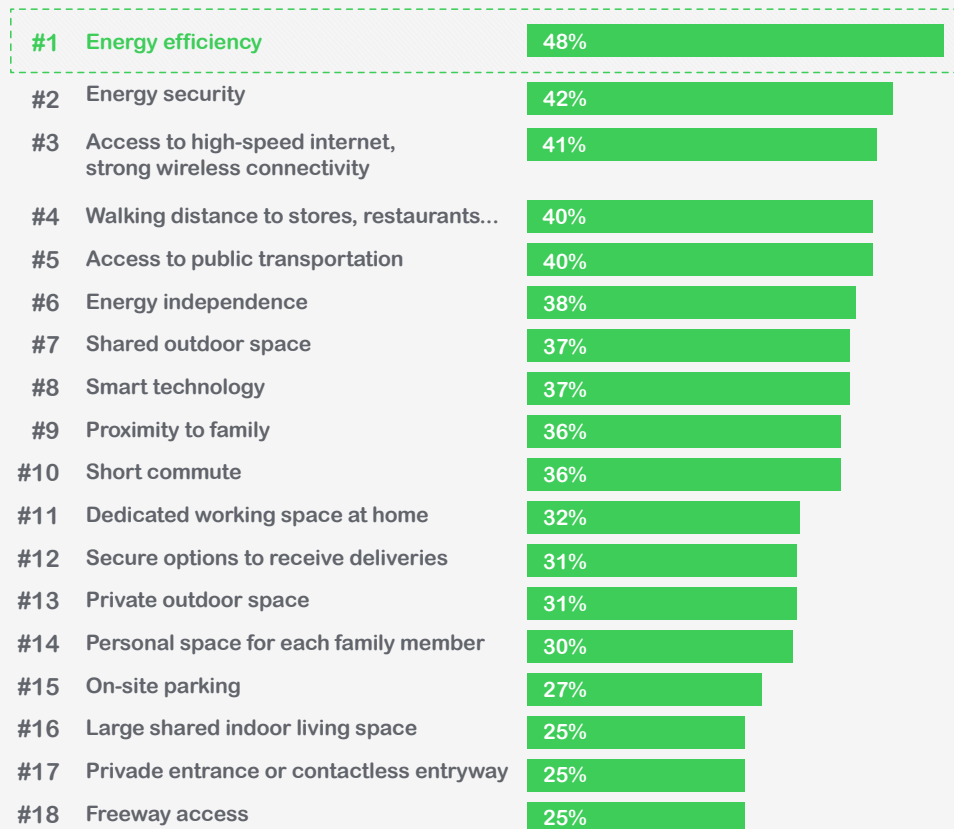
- France – 1,000 respondents
- Germany – 1,000 respondents
- Spain – 1,000 respondents
- Sweden – 1,000 respondents
- UK – 2,000 respondents
- USA – 1,000 respondents

Section #1

Energy Efficiency Top of Mind

With the dual pressures of climate change and rising energy costs, energy efficiency has rapidly emerged as a top consumer priority. Nearly half (48%) of respondents cited energy efficiency as their foremost concern, underscoring a shift in public mindset toward more sustainable living. The increasing awareness around energy consumption reflects not just environmental considerations, but also the practical desire to mitigate financial strain as utility bills soar.

Fig. 2 - Most important criteria in light of recent global events



% who say the following have become more important in the light of recent global events



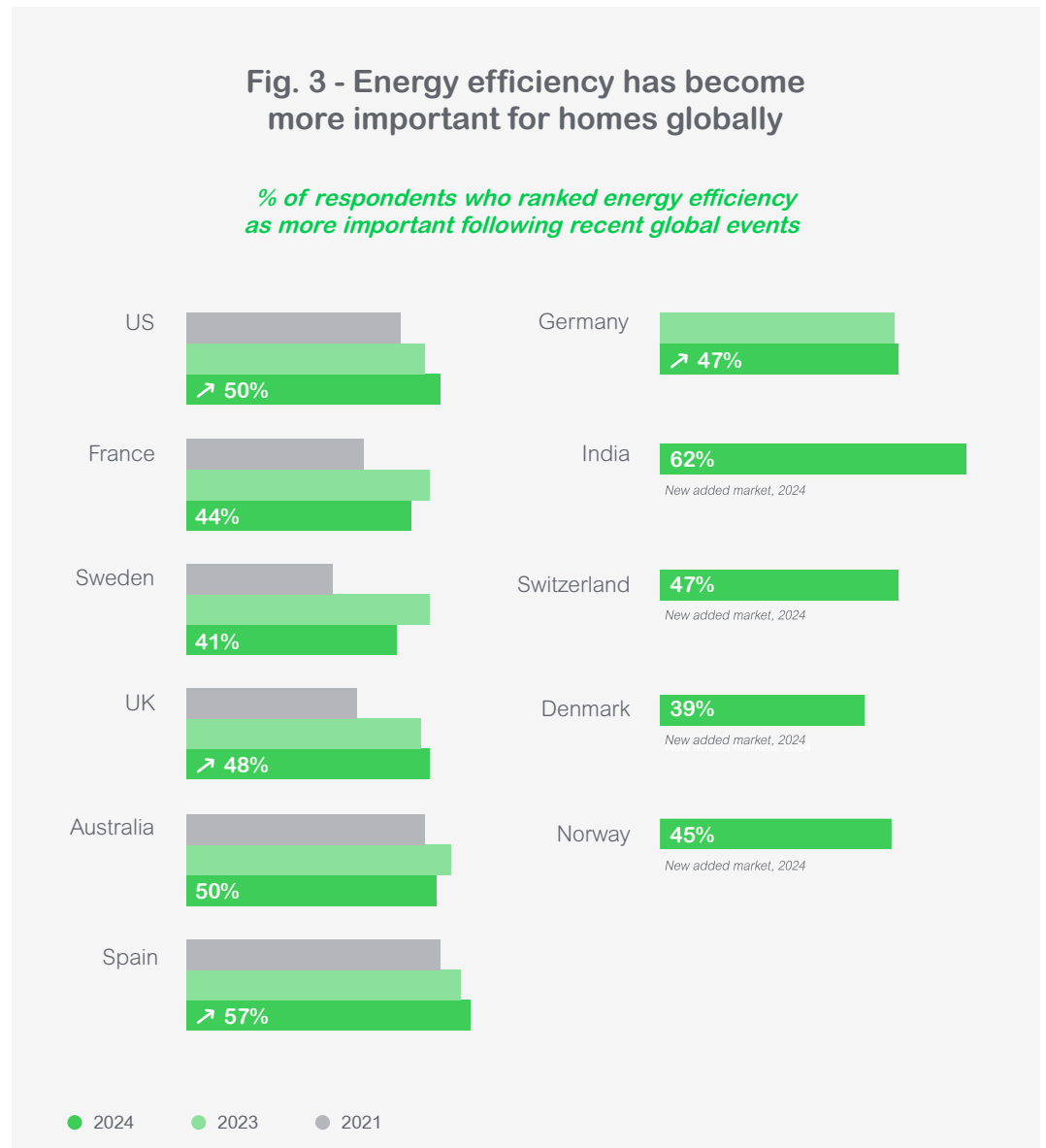
Recent geopolitical events, such as the Russian invasion of Ukraine, have amplified global energy insecurity, causing market volatility and record-high wholesale gas prices. As a result, 42% of respondents ranked energy security—the assurance of a stable and reliable energy supply—as a critical concern. The heightened focus on energy efficiency and security indicates that consumers are now looking beyond short-term cost-saving measures and prioritizing long-term resilience in their energy use.

The survey also highlights a growing trend toward more connected and self-sufficient living. For instance, 38% of respondents expressed a desire to achieve energy independence by generating their own power, while 37% placed emphasis on integrating smart technology into their homes to better monitor and manage energy usage. This interest in smart home technology points to an emerging behavioral shift, as consumers seek greater control over their energy consumption.

Lifestyle and proximity factors also influence home priorities. While 40% of respondents valued access to public transport and leisure facilities, only a quarter considered features like onsite parking or freeway access important. This suggests that urban dwellers are increasingly prioritizing convenience and sustainability in their living environments.

Global Trends in Energy Efficiency

The emphasis on energy efficiency is not confined to a single region. Globally, households in various markets are placing greater importance on reducing energy use. Notably, in India, a remarkable 62% of respondents in 2024 identified energy efficiency as their primary concern, the highest among surveyed countries. Similarly, in Spain, interest in energy efficiency rose significantly, from 50% in 2021 to 57% in 2024, reflecting heightened awareness in regions where energy costs have historically been more volatile.



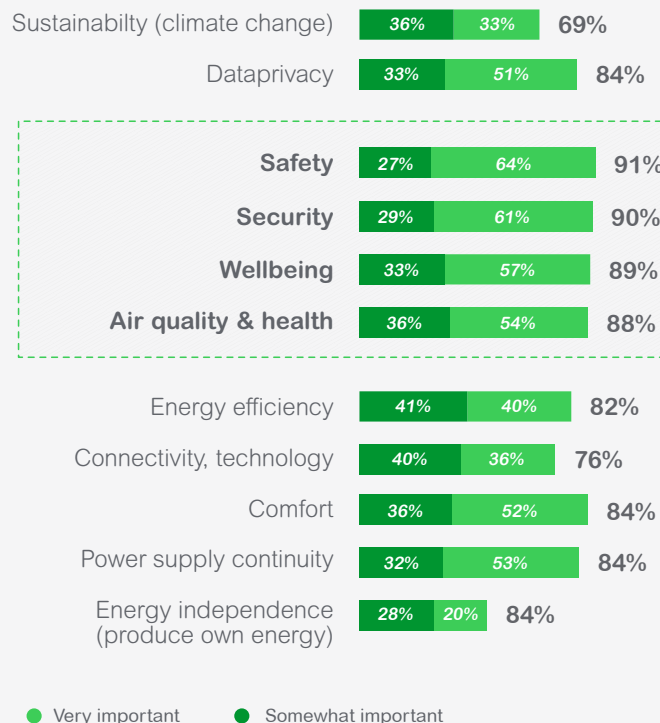
% saying energy efficiency has become more important for their home following recent global issues*, by country and year

In the UK, interest surged dramatically from just over 30% in 2021 to 48% in 2024. This uptick mirrors growing public concern over energy reliability, as seen during the energy scare of 2024 when the country faced the prospect of gas shortages. Conversely, France saw a slight dip, with concern for energy efficiency falling from 48% in 2023 to 44% in 2024—a potential indication that energy concerns may vary based on local market conditions and policy interventions.

Energy Efficiency: A Vital Component of Home Life

When asked to evaluate factors influencing daily home life, safety emerged as the highest priority, with 91% of respondents rating it as important, followed closely by security (90%), well-being (88%), and air quality (88%). Energy efficiency ranked highly too, with 82% of participants recognizing its importance in home life, and a nearly even split between those who viewed it as “somewhat important” and those who rated it as “very important.”

Fig. 4 - Most important topics in respondent homes



How important are each of the following topics to you, specifically when it comes to your home?

Interestingly, data privacy emerged as a top concern, with 84% of respondents viewing it as crucial - demonstrating that as homes become more connected, consumers are increasingly conscious of digital security risks. Despite the growing focus on sustainability, only 69% of respondents considered climate change a very important factor in their daily lives, suggesting that while climate awareness is rising, personal convenience and immediate cost savings may still take precedence.

Energy independence—the ability to produce energy at home—ranked lowest on the list of concerns, with only 49% of respondents considering it important. This may point to a gap between consumer aspirations for self-sufficiency and the perceived feasibility of achieving it.

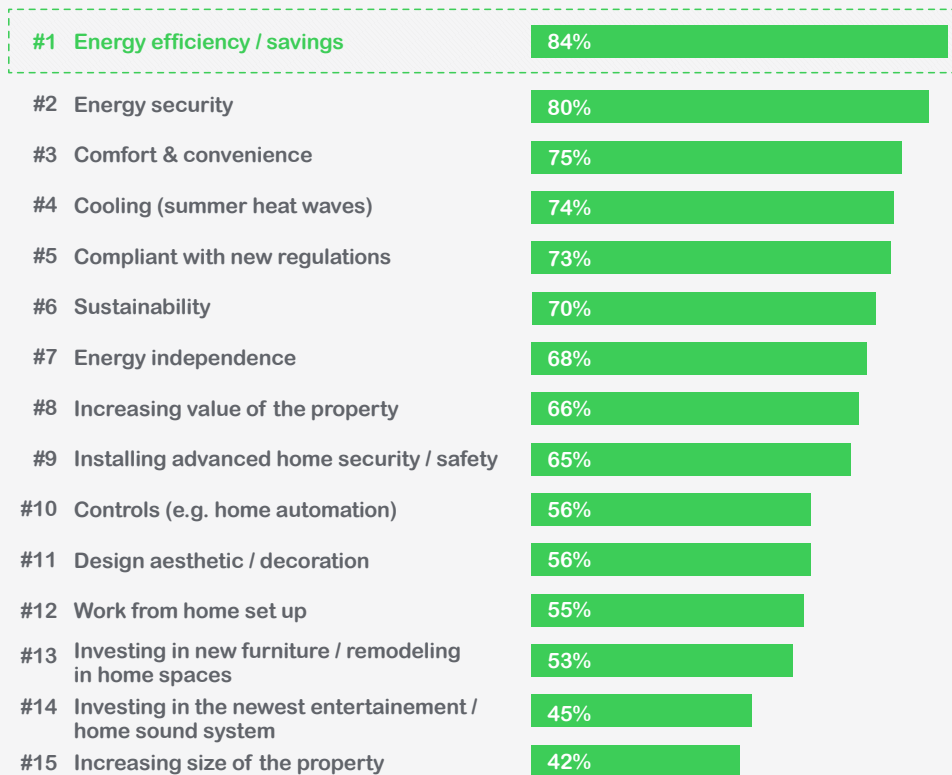
Home Improvements: Efficiency and Security Take Center Stage

When it comes to future home improvements, energy efficiency leads the way, with 84% of respondents highlighting it as their top priority. This reinforces the growing consumer appetite for energy-saving solutions, especially in light of ongoing energy price increases.

Energy security followed closely behind, with 80% emphasizing its importance. This trend aligns with heightened anxiety over potential energy shortages, as seen in the UK's near gas crisis in early 2025. Consumers are evidently looking for ways to make their homes not only more efficient but also more resilient in the face of energy supply uncertainties.

Beyond energy concerns, respondents also highlighted comfort and convenience (75%) and cooling solutions (74%) to cope with increasingly frequent heatwaves. Meeting new regulations (73%) and sustainability measures, such as installing green roofs and solar panels (70%), were other top considerations, indicating that many homeowners are factoring in long-term environmental compliance and cost-saving opportunities when planning home upgrades.

Fig. 5 - Most important future improvements in respondent homes



% who think the following improvements would be important to their home in the future (of homeowners/renters)

Interestingly, enhancing property value (66%) ranked only mid-tier in importance, suggesting that while financial return on investment is a consideration, it may be secondary to the more immediate benefits of energy savings and comfort. Lower-ranking concerns included expanding living spaces (42%) and installing new entertainment systems (45%), underscoring a stronger focus on practical, need-based improvements.

Section #2

Climate Change & Homes

The results of our survey indicate that consumers are increasingly conscious of the impact that energy-saving habits in the home can have – while two-thirds of responders feel it is their 'duty' to find ways of using less energy.

Fig. 6 - Most agreed with statements on home energy



New homes and housing construction should be designed with sustainability in mind

74%



I encourage my children to perform more sustainable practices at home

68%



I feel it is my duty to reduce my energy use at home

66%



I am looking for ways to reduce the amount of energy I use at home

66%



I know how to reduce the amount of energy I use at home

66%



I'm willing to sacrifice comfort to reduce my energy use at home

50%



I often discuss sustainability with my children

47%



Trying to reduce my energy use at home would require difficult lifestyle changes

47%



My children (or children around me) encourage me to be more sustainable

39%

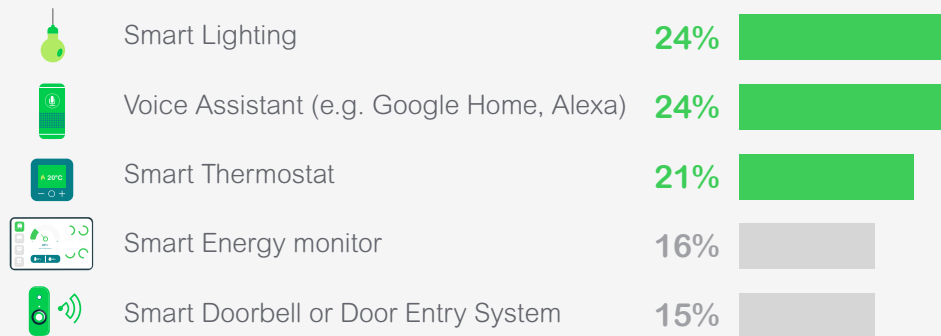
I don't want to ruin the look of my home with green technologies

36%

Many respondents say sustainability is a duty for all, including themselves

This sense of ownership when it comes to addressing the ongoing issue of global warming is strengthening year-on-year and while there are great expectations that large businesses and national governments will be the key instigators of a more sustainable future, 50% of consumers are ready to sacrifice their own personal comfort in order to play their part in a wider reduction of emissions.

Fig. 7 - Top 5 smart devices owned

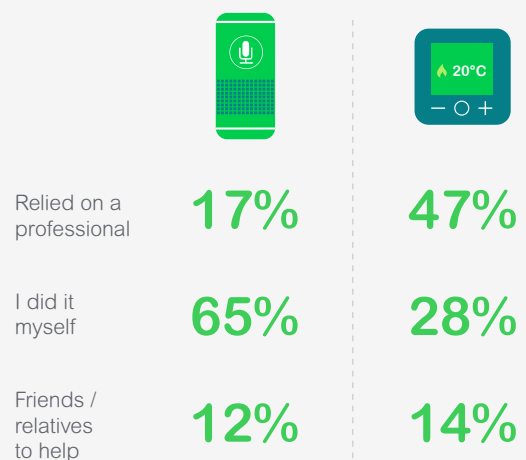


As a greater number of individuals are ready to embrace change, it's vital that they are supported to do so with clear, smart and intuitive technology built around their habits and requirements.

Smart lighting now sits at the top of the table for most popular smart device, alongside voice assistants, closing a five per cent gap from previous years and indicating a trend towards technology which can combine sustainability and convenience benefits.

People view some smart tech much more likely to require expert help

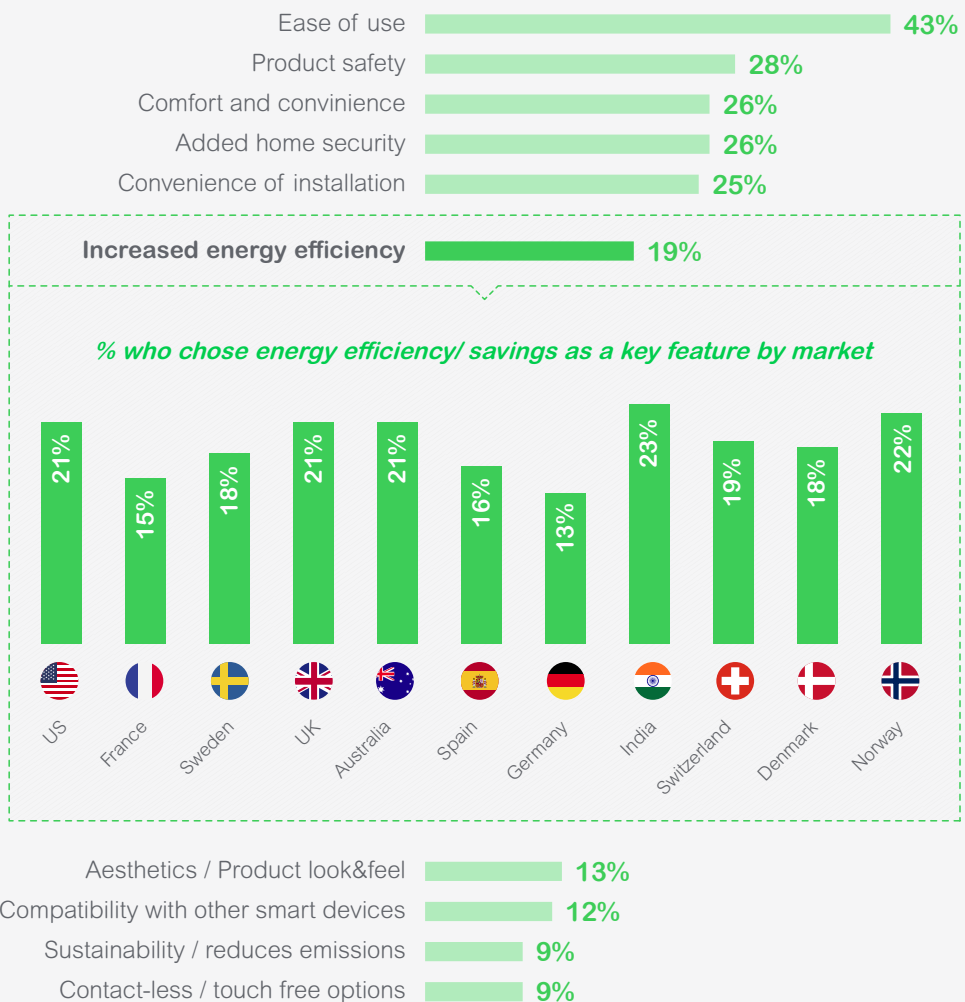
Fig. 8 - Setting up a voice assistant and a smart thermostat



With smart thermostats still the third most popular smart device, followed again by smart energy monitor systems, there is a consistent indication that energy-saving smart tech is a consumer priority. But what are the key traits that smart home tech can have to ensure it resonates with homeowners?

It's no surprise to see 'ease of use' listed as the top attribute [stat pg20 report] considering the need for all ages and demographics to embrace smart tech's energy-saving properties in the home.

Fig. 9 - Top 10 attributes for smart home tech

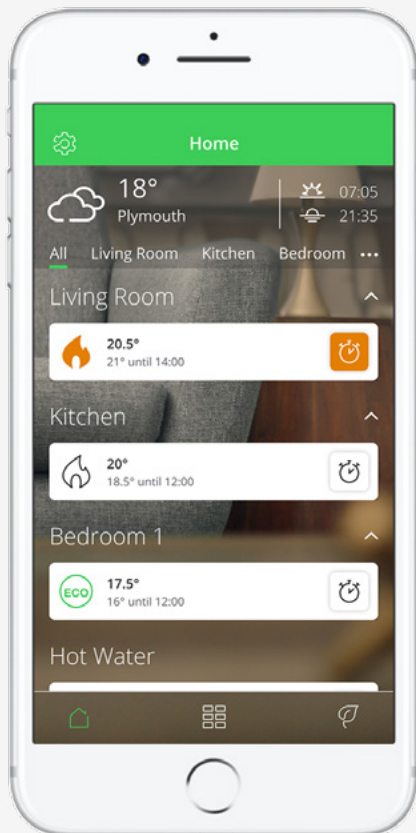


What personal commitments do you currently have to reduce your carbon footprint / help tackle climate change? Select all that apply.

This is followed by the need for products which are safe and convenient. However, one of the most interesting findings is that ‘increased energy efficiency’ is seen as a more desirable attribute (19%) than aesthetics (13%). As we strive for a smarter, more energy-efficient future, challenges remain.

A shift of this magnitude, encompassing changes in focus and behavior, inevitably raises questions about cost and accessibility. Currently, 52% of respondents agree with the statement that “smart home technology is too expensive.” Additionally, 41% do not believe that “smart home devices help me save money.” These perceptions highlight the need for continued efforts to make smart technology more affordable and accessible to all.

Despite these hurdles, the broader trend points to a growing willingness to embrace technology that can transform how we manage energy consumption and reduce carbon emissions.



Take Wiser, Schneider Electric’s Home Energy Management System, for example. This system optimizes heating performance through features such as optimum stop and weather compensation. By reducing the workload and runtime of the boiler, they help achieve the desired heat levels more efficiently. When a gas boiler runs less frequently, carbon emissions are significantly reduced. Another impactful step is lowering the system’s flow temperature, further cutting emissions.

As the saying goes, knowledge is power. Engaging in regular conversations about actionable changes within the home is essential to reducing personal carbon footprints.

Fortunately, advancements in technology and greater environmental awareness are enabling us to make meaningful changes at the household level—changes that will shape a more sustainable future for our planet.

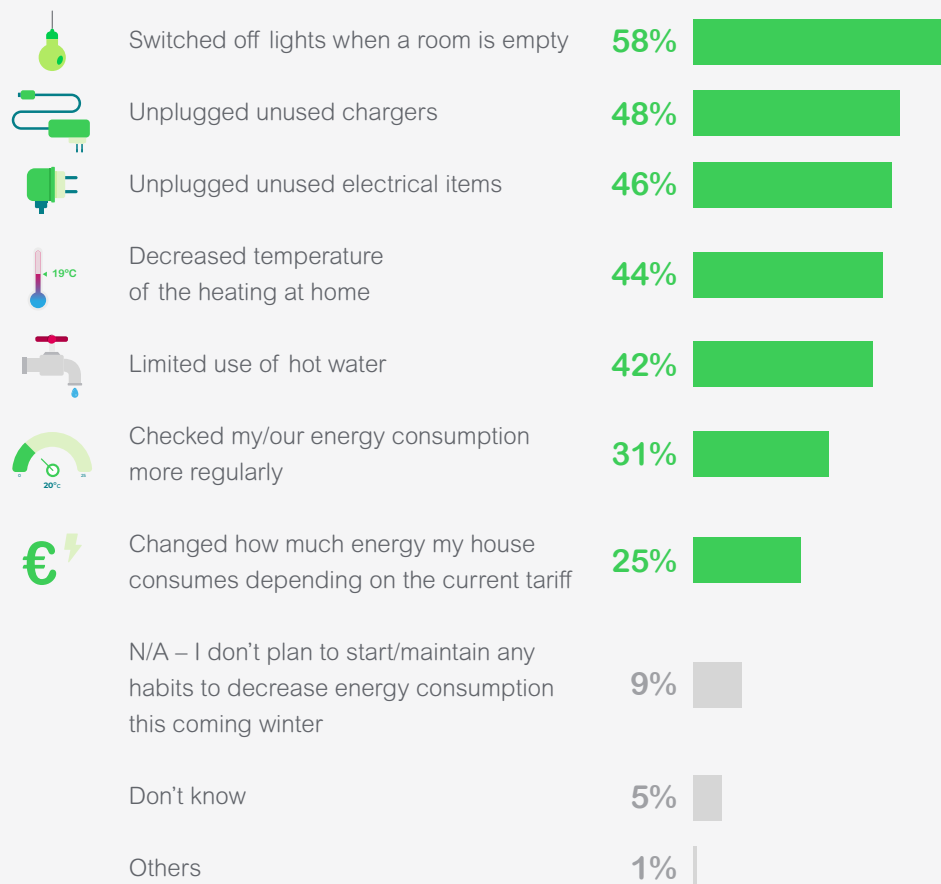
Section #3

Home Energy Actions

With the global energy crisis showing no signs of abating, homeowners have a vital role to play in managing energy consumption at a domestic level.

Our findings show that while homeowners are well versed in making everyday behavioral changes (58% of respondents routinely switch off lights when a room is empty, 48% unplug unused chargers, and 46% unplug electrical items that aren't in use) there is work still to do when it comes to adoption of practices that can make a real difference to a home's energy output.

Fig. 10 - Behavior changes target reduction of energy waste

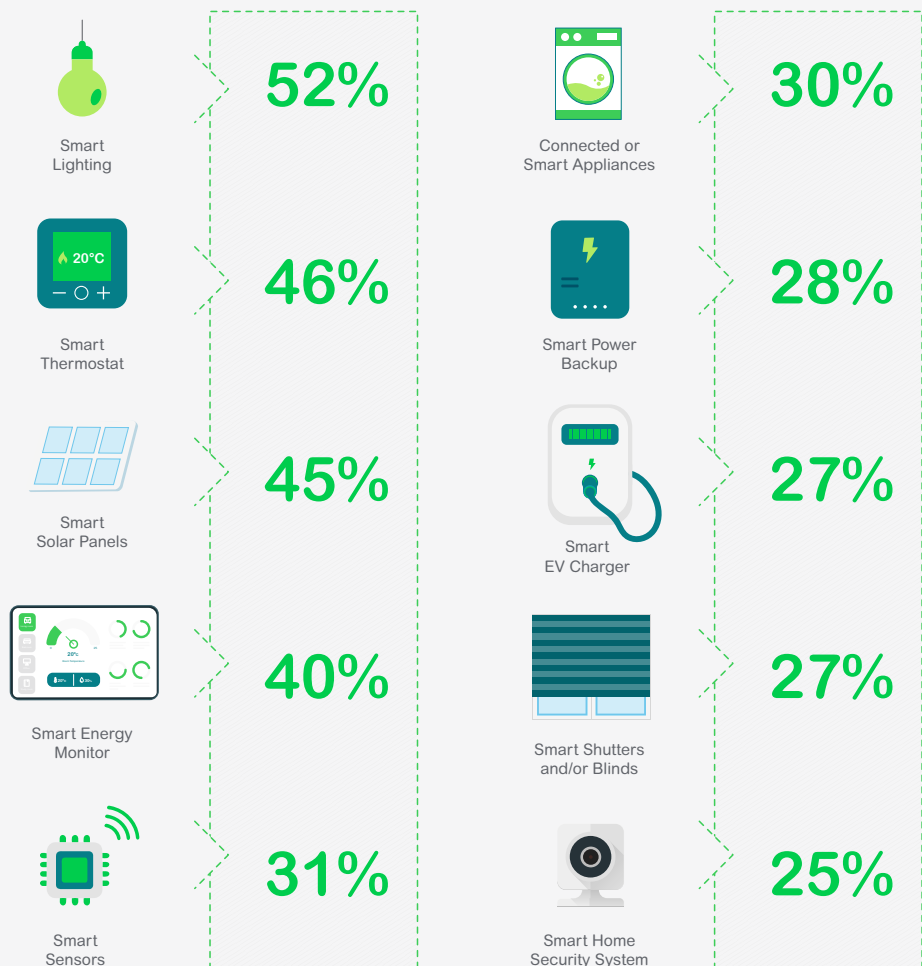


Which, if any, of the following do you intend to do this coming winter (2024) to decrease energy consumption?

Given the increasing prevalence of next-generation technology in many aspects of our lives, it is no surprise that a growing number of homeowners are choosing to invest in smart home technology to improve efficiencies across their property.

However, a truly effective smart home strategy requires multiple devices working in synchronicity. Therefore, the level of technological integration differed considerably across respondents to our survey.

Fig. 11 - Respondents' views on smart home devices to further reduce energy consumption



Which smart home tech do you think make a home more sustainable and energy efficient (top 10; % who agree smart home devices make a home more sustainable)?



While smart technology is designed to be easy to install and user-friendly, the level of knowledge needed to integrate the solution within the home differs from product to product.

According to our findings, 65% of respondents set up their home's voice assistant by themselves. This is in stark contrast to smart thermostats (28% of all respondents), with 47% relying on a professional. The perceived complexity of setting up systems such as smart thermostats could be a barrier to their wider roll-out in domestic settings. Other barriers to the adoption of smart home technology identified by our survey include perceptions that it is too expensive (52% of all respondents); it makes a home more susceptible to cybercrime (46%); and that it is too complicated to use (33%). Indeed, our research found that ease of use was the most desirable attribute or homeowners looking to invest in smart home technology, with nearly half (43%) listing it as their primary deciding factor during the purchasing process.

Other key attributes sought after by homeowners include product safety (28%), comfort and convenience (26%) and additional home security (26%).

Nearly one-fifth (19%) of all respondents identified increased energy efficiency as a primary benefit of smart home technology, with a further 42% agreeing that smart home devices are an easy way of reducing energy use. This is a positive sign that a growing cohort of consumers are looking at more innovative ways of improving their home's sustainability, upon which smart technology integration can make a demonstrable difference.

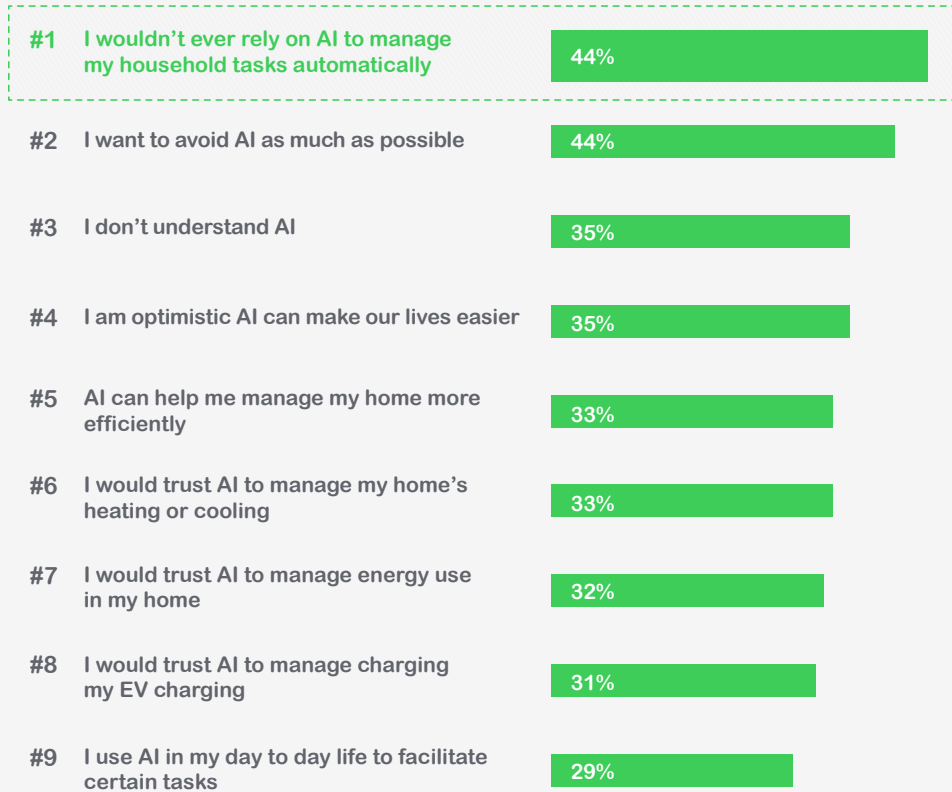
Among the solutions identified by consumers as most likely to have the biggest impact on a home's sustainability and energy efficiency are smart lighting (52% of respondents); smart thermostat (46%); smart solar panels (45%); and smart energy monitors (40%).

Will AI find a place in the smart homes of the future?

The past 18 months has seen an explosion in the range of artificial intelligence (AI) platforms available to the everyday user. From generative content platforms such as ChatGPT to AI-driven powered predictions on popular search engines, technology which was once seen as a preserve of science fiction movies is now an everyday staple.

However, that isn't to say homeowners are ready to integrate it into a wider suite of smart home solutions. Our survey found that 44% of consumers would be unwilling to rely on AI to manage household tasks automatically, while 41% said they wanted to avoid AI as much as possible. But as AI becomes an increasingly ubiquitous facet of our day-to-day lives, could familiarity eventually lead to more willingness among homeowners to embrace some AI in the home?

Fig. 12 - Respondents' sentiment regarding AI



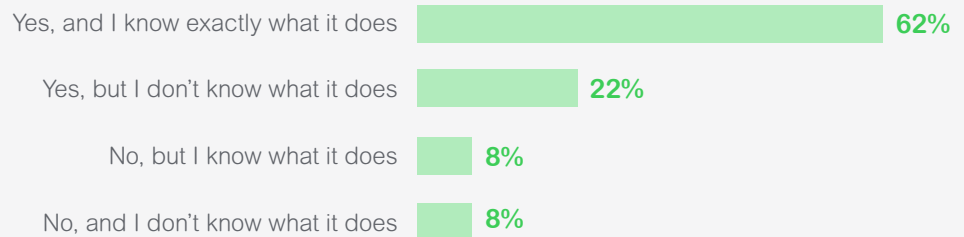
% who agree with the following statements

Section #4

Understanding the Role of the Electrical Panel

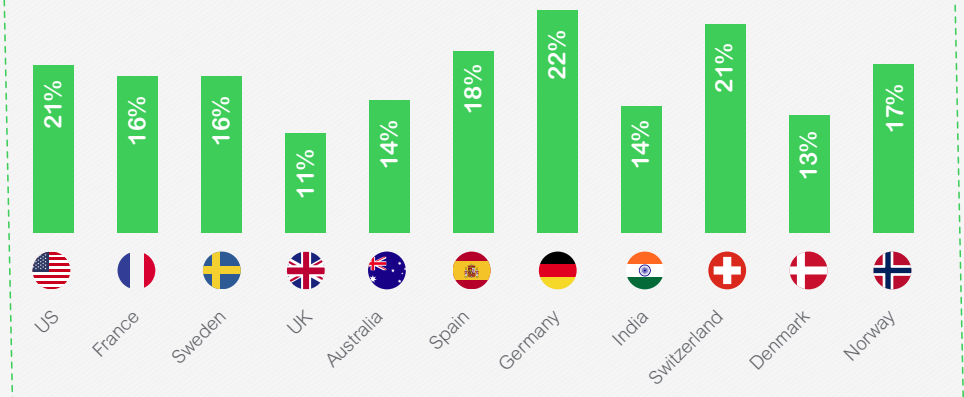
Most people have only a vague understanding of how important the electrical panel is to daily life. While our report highlights 62% of respondents know the location of their panel and understand its purpose, a considerable 22% admitted that although they know where the panel is, they are unsure of its function. Even more concerning, 16% stated that they do not know the location of their electrical panel at all.

Fig. 13 - Do you know where your electrical panel is?



NET: No 16%

% who say they don't know where it is



NET: Doesn't know what it does 30%

Do you know where your electrical panel is?

% who say they don't know where it is

Our research also pointed to widespread uncertainty regarding whether installing smart energy devices requires upgrading an electrical panel. Among those who had already added technologies such as electric vehicle chargers or heat pumps, 33% confirmed that they had upgraded their panel, but 19% expressed uncertainty about whether such an upgrade had been necessary. For those contemplating future installations, only 21% were confident that a panel upgrade would be required, revealing a notable gap in consumer understanding of modern energy demands.

Fig. 14 - When you installed smart energy devices, did you upgrade your electrical panel?

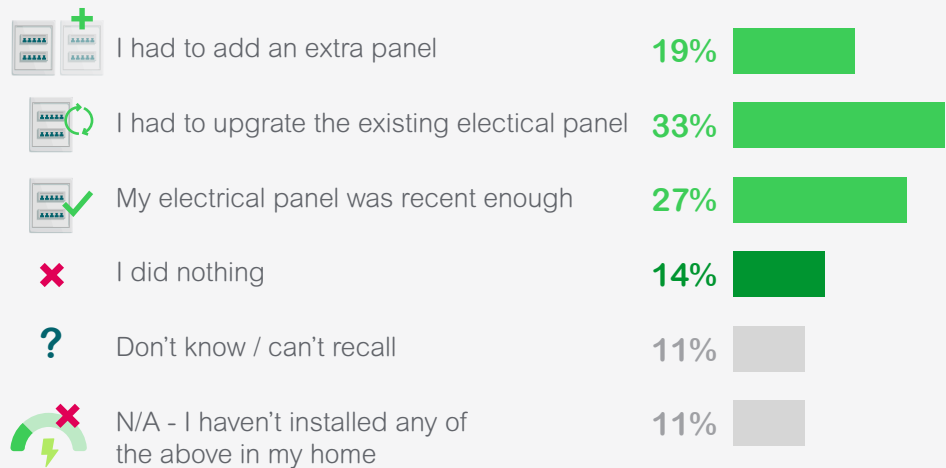
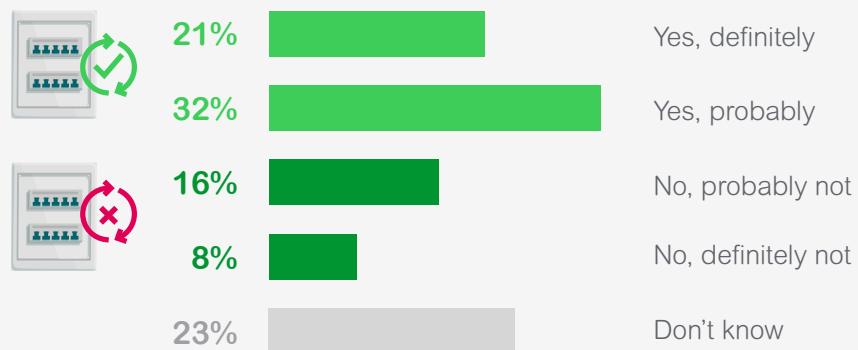


Fig. 17 - If you were to install smart energy devices, do you think you would need to upgrade your electrical panel?



When you installed smart energy devices, did you upgrade your electrical panel?

If you were to install smart energy devices, do you think you would need to upgrade your electrical panel?

This often-overlooked device ensures that electricity is properly distributed throughout the home, delivering the correct amount of power to various areas while also serving as a critical safeguard against electrical fires.

Acting as the central controller of a home's electrical system, it operates quietly behind the scenes, typically out of sight, yet constantly working to manage and protect the flow of electricity day and night.

What is an Electrical Panel?

An electrical panel, often referred to as a circuit breaker box, serves as the central hub for distributing power throughout a home. It controls the flow of electricity from the utility provider to different circuits in the house, ensuring that each area receives a safe and balanced supply. Modern panels go beyond merely distributing power—they manage energy loads, safeguard against electrical hazards, and increasingly play a pivotal role in integrating renewable energy sources such as solar panels and battery storage.

Over the past century, the electrical panel has evolved from a simple fuse box to a sophisticated energy management system. Today, it not only provides safety by preventing overloads and short circuits but also supports the growing electrification of homes with electric vehicles (EVs), heat pumps, and smart energy devices.

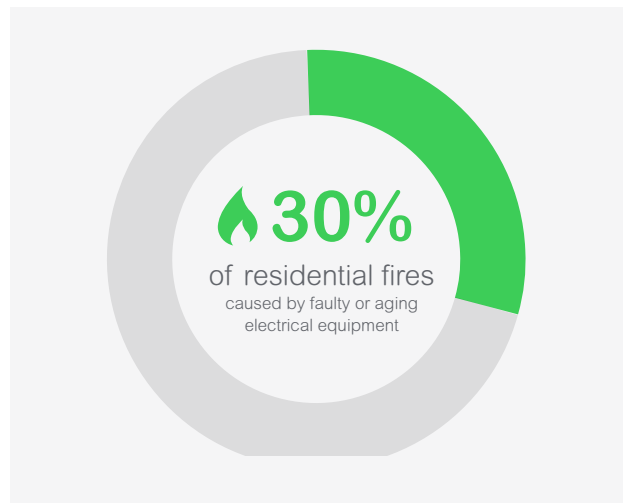
The Importance of the Electrical Panel

The electrical panel is often overlooked until a power issue arises. However, its importance in ensuring household safety cannot be overstated.

According to the European Fire Safety Council, faulty or aging electrical equipment causes up to 30% of residential fires in Europe³.

By acting as a barrier against electrical overloads, the panel reduces the risk of such hazards. It achieves this through circuit breakers that trip when excessive current is detected, protecting people and property from potential harm.

³ <https://www.europeanfiresafetyalliance.org/publications/white-paper-residential-electrical-safety/>



Furthermore, as the energy landscape shifts towards sustainability, the panel's role is expanding. It is now a key player in energy efficiency, enabling households to manage their energy usage, reduce costs, and contribute to a lower-carbon future. Smart panels, like those offered by Schneider Electric, can optimize energy consumption by coordinating when and how energy is used, especially in homes with solar power and battery systems.

The Panel of the Future

As homes become smarter and greener, electrical panels will take on even more responsibilities. Future-ready panels will not only manage complex loads from renewable energy sources but also enhance energy resilience. They will act as communication hubs, interfacing with the grid to balance energy supply and demand while helping homeowners lower their carbon footprint.



Conclusion

Build Understanding and Deploy Technology Effectively

It is clear that the ramifications of the energy crisis are still ongoing, and **consumers still feel the need to actively make changes to and within their home**, as well as to the habits and behaviors in order to combat this.

While improving energy efficiency and increasing electrification in homes is understandably front of mind for consumers, as this is where they feel the direct impact on their wallets/finances, it is important that we do not lose sight of the ultimate goal, which is to reduce carbon emissions and achieve Net Zero.

With residential buildings accounting for 20% of total carbon emissions globally⁴, and almost of this generated from heating and hot water usage⁵, it is paramount that homes are upgraded with technology that can make a difference. This is not just renewable technologies such as heat pumps and solar panels, but also solutions including Home Energy Management Systems like Wiser, which can optimize energy efficiency. With the ongoing electrification of homes, Home Energy Management Systems will become essential to manage loads efficiently and safely, while also helping consumers to run their appliances and devices in the most cost-effective way possible via automation.

However, **AI has a key role to play too**. While automation works by following a series of rule-based processes, AI differs in that it is able to account for variable factors when managing energy and optimizing energy savings and learns over time to improve performance. This will be pivotal in supporting consumers in making adjustments to their energy consumption that will actually make a difference. Gone will be the assumption that turning off the lights will save energy, and in its place will be data-driven changes make a significant difference – both when it comes to helping make energy bills manageable and also helping to reduce carbon emissions.

At Schneider Electric, we are proud to be leading the way in offering these innovative solutions to customers, as well as helping to raise awareness and educate them on their benefits. New technology, such as AI, isn't something that homeowners should be afraid of; instead, when used in the right way, this technology can be embraced to create a better future for the next generation.

References

¹ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Electricity_price_statistics

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³ <https://www.europeanfiresafetyalliance.org/publications/white-paper-residential-electrical-safety/>

⁴ <https://www.ice.com/insights/sustainable-finance/exploring-the-intersection-of-real-estate-carbon-emissions-and-housing-affordability>

⁵ <https://www.iea.org/energy-system/buildings/heating>

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