Designing Energy Efficiency Policies to Enhance Affordability

Examples from G7 countries
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Abstract

Energy affordability has emerged as a critical concern in the context of rising global energy prices and growing inequality in energy access. Lower-income households spend a significantly higher share of their income on energy than wealthier households, leaving them exposed to price shocks and especially vulnerable when energy prices increase. Energy efficiency can play a key role in delivering lower energy bills, reducing emissions, and enhancing resilience. However, ensuring that all households benefit requires targeted, inclusive policy design.

This issue was a central focus of an IEA workshop held in January 2025 with G7 country representatives, where affordability was identified as a key challenge. In response, this report was developed to provide practical guidance on designing energy efficiency policies that support affordability, particularly in the buildings sector.

As part of this work, the IEA conducted a survey with G7 governments to better understand the obstacles they face. On the consumer side, major challenges include the landlord-tenant split incentive, high upfront costs and administrative complexity. On the supply side, governments identified skills shortages and difficulties in reaching underserved communities.

The report analyses the affordability-focused energy efficiency policies of G7 countries. These include targeted financial support, simplified programme design, strong local delivery models, and better integration with workforce development. Embedding affordability into energy efficiency policy is critical to reducing energy poverty and ensuring people-centred energy transitions.

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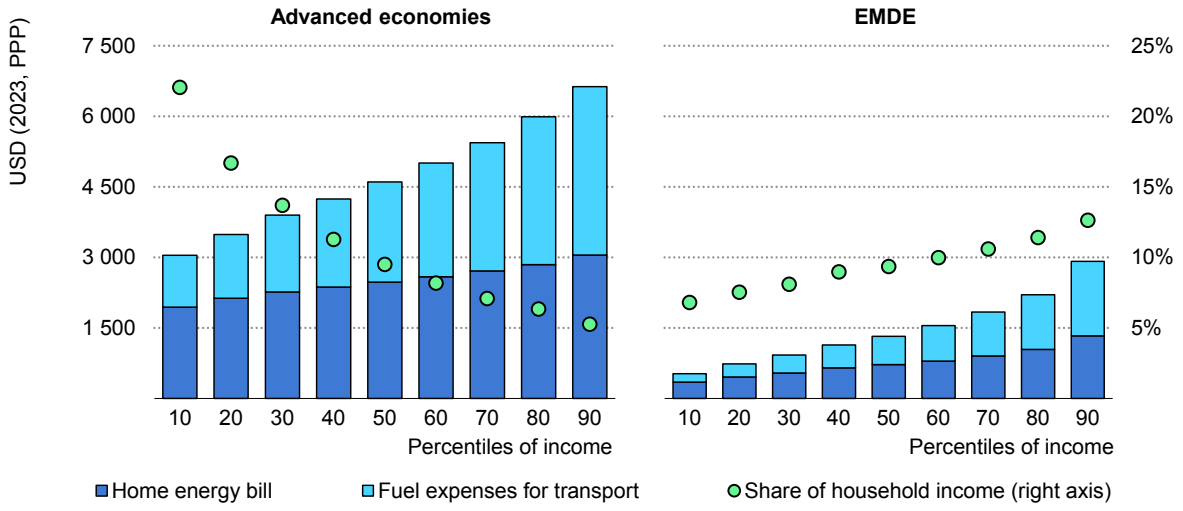
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Introduction

A central pillar of energy policy making is ensuring affordability for consumers. The latest energy crisis, which resulted in fuel price spikes worldwide, spotlighted the issue of energy costs and the impact they have on costs of living. IEA analysis estimates that energy costs amounted to around USD 10 trillion[1] in 2022 (or 1 200 per person on average), a nearly 20% increase from the average of the previous five years. Though energy costs have come down from their recent peaks, governments are also winding down support programmes that helped mitigate the impact on households and businesses. Moreover, lower-income segments of the population spend outsized shares of their income on energy and, therefore, bear disproportionate burdens from rising energy costs. The IEA estimates that the poorest 10% of households in advanced economies spend nearly a quarter of their disposable income on energy compared to the wealthiest 10%, who spend just 5% of their income on energy but consume twice as much of it. The disparity is even larger in developing economies.

Annual residential modern energy consumption by income bracket and spending as a share of households income, 2019-2023



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Source: IEA (2024), Strategies for Fair and Affordable Clean Energy Transitions.

[1] All prices will be presented in the following format: [original currency] XXX (USD XXX), where the amount in USD is calculated using the exchange rates as of 15 May 2025. The exchange rates used are:
Canadian Dollar (CAD): 1 USD = 1.4 CAD
Euro (EUR): 1 USD = 0.89 EUR
British Pound (GBP): 1 USD = 0.75 GBP
Japanese Yen (JPY): 1 USD = 142.90 JPY
In the charts, all data will be presented in USD.

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Ensuring affordability is a central part of energy policy and is key for successful energy transitions. Clean energy in fact offers one of the best solutions to address the dual challenge of energy affordability and security the world faces today, while also advancing the fight against climate change. However, there are questions around affordability and fairness that need to be addressed as part of the design of clean energy policies. Countries need to determine the distribution of costs and benefits from energy transition measures and to ensure that all segments of society benefit from them. The right balance can lead to improved social and economic outcomes for all society, while an imbalance can exacerbate inequalities and erode economic well-being and competitiveness. Failure to adequately address affordability issues will also drastically undermine public support for energy transitions.

Energy efficiency is the "first fuel" to achieve clean energy transitions in an affordable manner. Efforts to strengthen and expand efficient technologies and practices need to be scaled up significantly to meet GHG reduction targets around the world on the premise that the cheapest form of energy is the one which is not used. Notably, lower energy bills from energy efficiency measures make consumers less vulnerable to global price pressures and geopolitical supply disruptions. However, the IEA Energy Efficiency 2024 report found that the world is not on track to meet the goal set by 133 countries at COP28, held in 2023, to double energy efficiency progress by 2030. In fact, the world is estimated to have achieved only a 1% improvement in primary energy intensity in 2024, the same as in 2023 and half the level over 2010-2019. This suggests that action on energy efficiency needs to be ramped up significantly to achieve better results. Achievement of the doubling goal will bring considerable benefits, including lower energy costs by nearly 8% for consumers, reducing emissions by 6.5 billion tonnes of CO_2 and creating around 16.8 million energy efficiency jobs per year (compared to 5.27 billion jobs-year based on current announcements).

The European Union's revised Energy Efficiency Directive from 2023 puts a greater emphasis on addressing energy poverty within the context of energy efficiency measures. It directs members to take energy poverty into account when designing efficiency programmes and requires specific targeting of vulnerable communities. The Directive is expected to drive an increased focus in EU member countries on complementary measures that both address energy efficiency and tackle energy poverty.

For the residential sector, energy efficiency measures can take several different forms. Regulatory measures often come in the form of building or appliance standards. Financial incentives can cover subsidies for renovations or energy-efficient equipment. Information sharing can include public awareness campaigns as well as labelling programmes that help consumers make more informed choices.

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However, each measure comes with its own set of challenges that need to be addressed to maximise its reach and distributional impacts.

An important challenge for addressing affordability in formulating energy efficiency policies is investment costs and financing. Specifically, energy efficiency investments can require upfront costs that pay off over time through lower operating costs. In some cases, payback periods can be very short, while in others they can be much longer, impacting the calculus for households over whether to undertake investments. Moreover, the cost recovery is heavily influenced by energy prices, which can fluctuate considerably over time. Therefore, governments have an important role to play in lowering the upfront costs for households. These can take the form of grants, low-interest loans or tax deductions that mitigate financing hurdles to pursue renovations or upgrade to higher efficiency equipment or appliances. All G7 countries offer some kind of financial assistance to households to help them implement energy efficiency measures and support energy savings.

Low-income households face particular challenges in accessing financing for energy efficiency upgrades. For lower-income households, lowering energy bills though efficiency measures can have outsized benefits because energy bills often account for a higher proportion of their total spending. However, high upfront costs can prevent lower-income households from adopting these cost-saving measures. Moreover, low-income households tend to be renters rather than homeowners, who have less influence over energy efficiency improvements to their homes, more difficulty accessing financing and – depending on the lease – may not directly pay for energy usage, as it is often factored into the rent. Untargeted grants risk leaving behind households unable to afford upfront costs and disproportionately benefitting higher-income groups. Therefore, measures targeted at lower-income households, as evidenced in various forms across G7 countries, help to narrow inequalities in access to energy efficiency programmes.

Importantly, energy efficiency improvements in low-income households help alleviate the ongoing challenges of energy poverty that persist in advanced economies. The European Union for example, has created the Social Climate Fund, which will channel dedicated proceeds from its emissions trading scheme ETS2 to fund energy efficiency and renewable measures for vulnerable households.

Households also face information barriers that impede their ability to make informed decisions about energy savings options. Here too, governments can play a supportive role in bridging information gaps. For example, IEA analysis shows that more efficient air-conditioning units, which yield considerable energy savings over their lifetimes, do not always cost more than less-efficient models. However, the availability of options and lack of understanding about the differences among models can prevent consumers from making a more efficient purchase. Performance standards can exclude inefficient models from the market while labelling programmes can help users

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identify best-in-class models, ultimately leading to more energy-efficient outcomes. In addition, as households may not be aware of government programmes that can help them undertake renovations or replace outdated equipment, proactive information campaigns from the government can help raise awareness and promote uptake.

Administrative and logistical hurdles can also deter uptake of energy efficiency solutions. Government programmes often come with onerous application processes, complicated implementation plans and complex reporting requirements. Home retrofits can involve substantial amounts of time and effort that can cause inconveniences for households. Efforts by governments to streamline administrative processes and facilitate implementation with contractors can go a long way to increase interest in programmes, especially for harder-to-reach and vulnerable segments of the population, for whom these types of hurdles can create special challenges.

Another important element of affordability for energy-efficient solutions is running costs. In the case of most appliances and renovations, upfront costs can be recovered over time through lower operating costs. However, in the case of shifting from fossil fuel-based heating systems to electric heat pumps, the calculation is not always straightforward. Heat pumps are around 25% more efficient than fossil boilers for home heating and generate sizeable reductions in emissions and improvements in air quality. However, the cost recovery is heavily dependent on the retail price of natural gas relative to that of electricity. Therefore, if governments help support households switching to heat pumps, they should also promote policies that ensure that the running costs bring cost savings rather than higher bills.

Energy efficiency programmes also lead to benefits in terms of local job creation and economic development. The IEA estimates that in 2024 around 10 million people worldwide were employed in energy efficiency fields. Notably, government stimulus programmes following the Covid-19 pandemic helped support demand for services and promote job creation in the sector. At the same time, the scale of energy efficiency improvements needed to meet government energy and climate objectives suggests a skills shortage, which is already showing up in several energy efficiency areas, such as heating, ventilation, air conditioning (HVAC) and heat pump installers, construction workers and electricians. Notably, women made up less than 20% of the energy workforce in 2023. Aligning energy efficiency programmes with workforce training programmes, especially among disadvantaged groups, can drive job creation and ensure there is a trained workforce to meet demand.

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Policy descriptions

Canada

Energy efficiency has been a key priority of Canada's energy transition efforts in recent years, with a focus on improving the energy performance of homes and buildings to reduce both emissions and energy costs, strengthen climate resilience, create jobs and enhance health and comfort. Affordability pressures are particularly acute in the residential sector, as energy costs represent an increasing share of household budgets – approximately 6.4% of income on average which varies across regions. Recent policy actions have therefore focused on supporting home retrofits with energy-efficient technologies, supporting low-to-median-income households with energy-efficient upgrades and ensuring high energy performance for new buildings.

In 2022, Canada launched an economy-wide strategy to reduce emissions, the 2030 Emissions Reduction Plan, which sets an overall framework for actions across the government of Canada, including energy efficiency. In 2024, two complementary strategies were launched: Canada's Housing Plan, focused on actions to respond to the affordability crisis in the housing sector; and the Green Building Strategy, focused on how to decarbonise Canada's building sector affordably.

These strategies include a variety of new or renewed programmes. In particular, the Canada Green Building Strategy provides pathways to increase the uptake of energy efficiency in both building retrofits and new construction, with consideration for how that can be done in a way that also enhances affordability. Energy efficiency considerations are also included in housing and construction programmes, such as the Affordable Housing Fund and the Apartment Construction Loan Program.

Oil to Heat Pump Affordability Program (OHPA)

The Oil to Heat Pump Affordability Program (OHPA) was launched by the government of Canada in March 2023 to support low- to median-income households in replacing oil-based heating systems with energy-efficient electric heat pumps. The OHPA focuses on oil heating due to its high cost in Canada compared to natural gas and electricity, as well as its significantly higher emissions. The programme is available nationwide but has a geographical focus on Canada's Atlantic region, where home heating oil use is highest.

The programme provides upfront grants of up to CAD 15 000 (around USD 11 000) to cover most of the costs of heat pump purchase and installation. Applicants have six months from the time of receiving the grant to complete the installation of the heat pump system. The funding can be combined with additional financial assistance from other existing federal, provincial, territorial, and utility programs. Beyond making

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available additional funding to participants, co-delivery arrangements simplify the application process by allowing homeowners to apply directly through provincial or territorial programmes. Co-delivery also enables provinces and territories to tailor outreach and service delivery to the specific needs of their residents, improving access, especially for hard-to-reach households.

The programme targets households that are more vulnerable to fluctuations in heating oil prices. To be eligible, applicants must show proof they have purchased 500 litres of heating oil over the past 12 months and that their household income after tax falls below the median in their province of residence. Beyond improving energy efficiency, the programme delivers broader social benefits related to energy security, as oil-heated homes do not have the winter shut-off protections that are available for electricity and gas heating. The programme also addressed safety risks associated with the removal of oil tanks such as leakage.

Affordability implications

OHPA addresses affordability barriers by reducing the high upfront costs associated with switching from oil heating to electric heat pumps, which are considerably more cost-effective. In some co-delivered programs, participants benefit from direct install services wherein the delivery organisation handles all the logistics associated with planning and paying for switching to heat pump systems. This approach enables low-to-median-income households to retrofit their homes at no cost and without the burden of co-ordinating with multiple contractors. By partnering with provinces and territories through co-delivery agreements, the programme further enhances affordability by leveraging additional financial contributions and existing outreach mechanisms to reach remote communities.

Results and tracking

The primary metric used to track the results of the programme is household cost savings, which are assessed through reductions in heating oil use and bill savings. The programme also monitors GHG emissions reductions based on estimated decreased heating oil use from heat pump installations. Applicant feedback is collected through surveys to evaluate user experience, identify barriers in the application process and inform future programme improvements.

Since March 2023, over 17 000 grants have been issued under the programme, totalling CAD 168.3 million (USD 120.2 million), and resulting in the installation of around 16 000 new heat pumps. These actions have led to a total reduction of around 45 000 metric tonnes of CO_2 – equivalent to removing 13 703 gasoline cars from the road. To date, programme participants see average annual savings of CAD 1 337 (USD 955) on household heating bills per year. Additionally, the programme is projected to deliver annual energy savings of around 0.1 TWh and annual emission reductions ranging from 16 000 to 51 000 metric tonnes of CO_2 across Canada.

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Key challenges

In general, one of the main barriers facing low-income households when seeking to invest in energy efficiency improvements is the high upfront costs and lack of access to capital. Canada's Oil to Heat Pump policy addresses these barriers through targeted upfront grants or direct install programmes.

To ensure that all eligible households are able to access to the programme in areas with infrastructure and connectivity barriers (including in remote, rural, northern and Indigenous communities) the programme provides flexible application options, including offline submissions and alternative proof-of-ownership documentation.

To increase awareness and uptake, Canada collaborates with co-delivery partners so that Indigenous communities who have expressed interest in the programme can access funding, and, where applicable, may directly enter into agreements with Indigenous communities interested in community-scale heat pump projects.

The Canadian government addresses barriers related to awareness of the programme by implementing a marketing strategy with diverse approaches, including national ad campaigns, and paid and targeted marketing on radio and social media.

Challenges	• ensuring awareness and uptake among eligible households • accessibility in remote and Indigenous communities • co-ordination between different delivery models across public authorities • limitations in eligibility (only homeowners are eligible; other relatively high-cost and polluting fossil fuels like diesel and propane are excluded)
Success factors	• upfront grant or direct install approach • flexible application options (offline submissions and alternative proof-of-ownership and proof of oil usage documentation) • increased financial and access benefits derived from co-delivery agreements across all provinces and territories
Measures of success	Since March 2023: • 17 300 grants issued • 16 000 households with new heat pumps installed • CAD 168.3 million (USD 120.2 million) issued • around 45 000 metric tonnes total GHG reduction – equivalent to approximately 13 700 gasoline cars off the road • annual savings of CAD 1 337 (USD 955) on household heating bills per year • provinces and territories involved in delivering the program (co-delivery agreements with seven jurisdictions) • projects delivered by proponents are going to low-to median-income households
Target	• low- to median-income households that use oil in their main heating system

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Canada Greener Homes Affordability Programme (CGHAP)

An announced project under the Canada Green Building Strategy is the Canada Greener Homes Affordability Program (CGHAP), which will start operations in 2025. It will provide CAD 800 million (USD 600 million) over five years to help low- to median-income Canadian households, including renters (subject to landlord consent), upgrade their homes to increase energy efficiency, reduce greenhouse gas emissions and lower household energy expenses. Unlike previous programmes, CGHAP will use a direct install approach, where programme administrators manage contractor payments and ensure fully funded retrofits for participants. This means the delivery organisation will handle all logistics related to planning and executing the retrofits, making it easier for low- to median-income households to upgrade their homes at no cost. Participants will not be required to pay out of pocket or co-ordinate with multiple contractors to complete retrofit projects. The programme also emphasises co-delivery with provinces and territories, ensuring a regionally responsive implementation strategy. The programme also includes dedicated support for residential energy efficiency in Indigenous communities. Funding will flow directly to regional, distinctions-based Indigenous organisations (First Nations, Métis, and Inuit), using existing financial agreements to reduce administrative burden and support self-determined priority setting.

Affordability implications

CGHAP is specifically designed to overcome financial and logistical barriers that low- to median-income households face in accessing efficiency retrofits. Traditional programmes often require upfront capital, which can exclude lower-income groups. They also may require participants to independently identify, contact and schedule visits from a suite of energy and retrofit professions (e.g., Energy Advisors, technical contractors). This type of process that can be out of reach for households facing barriers such as language, family and work obligations or lack of trust of utilities and governments. The direct install approach eliminates both financial and other barriers by covering retrofit costs upfront, as well as managing all parts of the retrofit process including paying contractors. As nearly half of the population is below the median income and two-thirds of households in the bottom income quartile are renters, this measure will significantly expand access to energy efficiency interventions. These households will benefit from lower energy bills from energy savings.

Results and tracking

CGHAP is expected to deliver significant cost savings and environmental benefits. The hands-on involvement of administrators is also expected to mitigate risks of misinformation and ensure that participants receive tailored retrofits. Additional co-benefits include improved indoor air quality, enhanced climate resilience and home safety and increased consumer education on energy efficiency.

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The evaluation strategy is based on a combination of metrics that assess energy cost savings, reductions in GHG emissions and participant satisfaction. The administrator will collect data on energy consumption before and after retrofits, tracking the cost savings and environmental impact. Additionally, surveys and feedback mechanisms will be used to assess participant experiences and identify barriers. Given the decentralised nature of CGHAP, tracking metrics will be coordinated with provincial and territorial partners to ensure consistency and alignment with regional energy policies.

Key challenges

Several challenges exist in designing and implementing CGHAP. The primary challenge is securing co-delivery agreements across provinces and territories, as there are regional variations in energy infrastructure, housing stock and tenant laws. Ensuring outreach to historically underserved populations requires targeted engagement strategies and partnerships with community organisations. Lastly, managing programme logistics (co-ordinating qualified installers, overseeing retrofit quality and preventing bad actors from misleading participants) will require robust administrative oversight.

Challenges	• accessibility in remote and Indigenous communities, as well as reaching tenants • co-ordination between different public authorities • managing programme logistics (co-ordinating qualified installers, overseeing retrofit quality and preventing bad actors from misleading participants)
Success factors	• direct install approach • co-delivery agreements across all provinces and territories
Measures of success	• CAD 800 million (USD 600 million) over 5 years • provinces and territories involved in delivering the programme • projects delivered by proponents are going to low-to median-income households • programme participants see annual savings on household heating bills • higher total annual energy savings across Canada • investments under this programme contribute to reduced GHG emissions in Canada
Target	• low- to median-income households, including homeowners and tenants

France

France's energy efficiency policies are closely aligned with the objectives of the revised European Energy Efficiency Directive (EED). The EED introduced a broad set of ambitious targets, including stricter energy consumption limits for 2030, reinforced building renovation requirements for public sector entities, binding energy savings obligations and the application of the "energy efficiency first" principle across

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sectors. These objectives are integrated into France's national climate and energy planning framework, primarily through the National Energy and Climate Plan (NECP), which outlines the country's strategy for achieving both EU and national energy and climate targets. Complementing the NECP are two key instruments: the National Low-Carbon Strategy (SNBC [Stratégie Nationale Bas-Carbone]), which sets the long-term trajectory for achieving carbon neutrality by 2050; and the Multi-Annual Energy Plan (PPE [Programmation pluriannuelle de l'énergie]), which defines the medium-term priorities for energy production, consumption, and efficiency.

France has made progress in improving energy efficiency in the residential sector, with final energy consumption decreasing by 2.7 % in 2023 compared to 2022. Key drivers of this progress are the government's investment in building renovation, which represents a major pillar of the French energy efficiency policy, and the implementation of the energy sufficiency plan.

Energy poverty indicators show that the share of the population unable to keep their homes adequately warm doubled from 6.0% in 2021 to more than 12% in 2023. This sharp increase, driven by surging energy prices linked to the energy crisis, disproportionately affected vulnerable groups: In 2021, 15.5% of the population was at risk of poverty and 6.5% of lower middle-income households (in deciles 4-5) reported being unable to afford adequate heating. These figures highlight the urgent need for policies that combine energy efficiency improvements with targeted affordability measures, particularly for the most exposed households.

MaPrimeRénov'

MaPrimeRénov' (MPR) is a grant scheme aimed at supporting households undertaking energy-efficient renovations of their homes. From 2024, MPR has had two main pathways: a flat rate grant for space and water heating that can be used also for thermal insulation, ventilation or energy auditing work (e.g. window replacements, heating system upgrades), and a grant for major renovations proportional to the cost of the work. This second option is complemented by mandatory advisory services (Mon Accompagnateur Rénov'), provided to help households undertake major renovations.

All MPR energy renovation grants delivered by the National Housing Agency (Anah [Agence nationale de l'habitat]) take account of household income.

For home renovations, households are also eligible for the White Certificate Scheme (CEE [Certificats d'économies d'énergie]), discussed in a later section. In order to ease the access to both these programmes, a single application to Anah can deliver both MPR and CEE grants.

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Affordability implications

MPR, along with the CEE scheme, ensures financial accessibility by offering grants based on household income level. Lowest-income households receive the highest level of subsidies, with grant amounts covering up to 90% of eligible renovation expenses in some cases. The programme divides households into four income levels, and thresholds vary based on the number of household members and their location.

In 2025, the flat rate grant option became available to all homeowners, including landlords, except for higher-income households. It defines the grant amount between EUR 400 (USD 450) and EUR 11 000 (USD 12 300), based on income level and type of renovation work (such as connection to a heating network, geothermal heat pump and individual solar water heater).

The grant for major renovations is available to all owner-occupied households. It covers a percentage of renovation costs between 10% and 80% of the estimated cost for the renovation work (capped according to the type of work carried out), depending on household income level, the initial energy performance rating of homes (with higher grants for the lowest energy performance classes), and the degree of energy performance class upgrade achieved through renovation. Additionally, an extra 10% is available for homes with the worst energy performance. Applicants must undertake at least two types of thermal insulation work and they are systematically accompanied by the third-party assistance provider Mon Accompagnateur Rénov' to offer technical and administrative guidance. The programme aims to support 40 TWh of energy savings, with at least 50% of this effort targeted toward energy-poor households.

Results and tracking

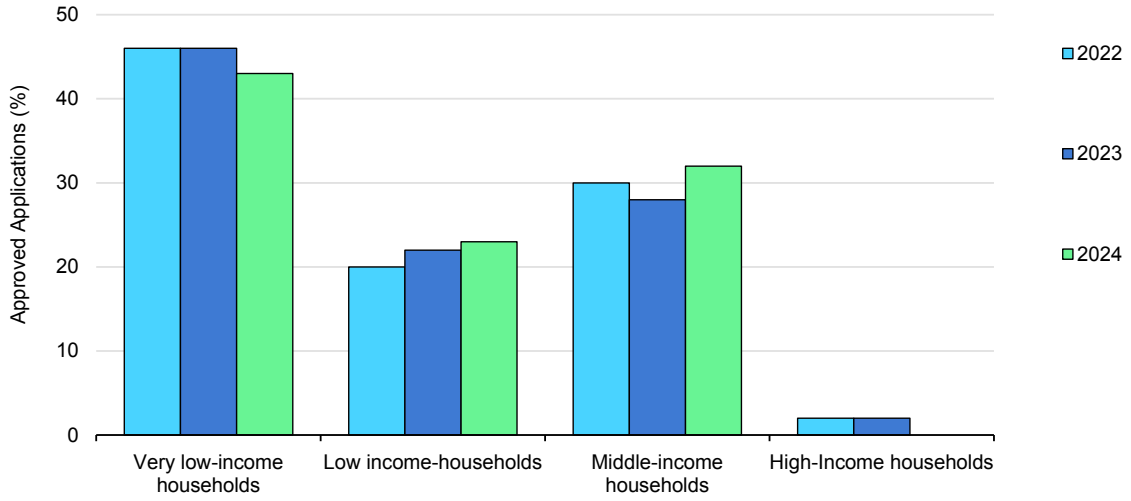
In 2024, 2.5 million flat rate grant applications were approved, amounting to EUR 0.95 billion (USD 1.15 billion). In the same year, 48 000 major renovation grants amounting to EUR 1.79 billion (USD 2 billion) were accepted.

France is also tracking grant expenditure per income level, since the design of the policy established differentiated reimbursement rates based on fixed income brackets. In the three years 2022 to 2024, the MaPrimeRénov' programme consistently directed support towards households with lower incomes. For its 5th period (2022-25), 36% of the energy-saving obligation should be dedicated to low-income households.

In both 2022 and 2023, very low-income households accounted for 46% of beneficiaries, while low-income and middle-income groups represented around 22–24% and 28–30%, respectively. In 2024, this pattern continued, with very low and low-income households together representing the majority of approved applications. These results highlight the programme's strong social focus, ensuring that support reaches those most in need.

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Rates of approved applications by income deciles, 2022 to 2024



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Source: IEA analysis based on Anah (2022).

The effectiveness of MPR is monitored through tracking application volumes, grant disbursements and energy savings achieved. Key performance indicators include the number of households benefitting from renovations, the extent of efficiency improvements and cost savings for participants. The one-stop shops, discussed in the following section, provide additional oversight, ensuring that renovations align with best practices. Income-based segmentation allows targeted determination of whether funds are reaching the most financially vulnerable groups, ensuring social equity in the programme's impact.

Key challenges

Two key challenges facing renovation subsidy programmes are household awareness of their existence and administrative hurdles associated with applying for them. France has attempted to address both these through a concerted outreach campaign to households as well as the one-stop-shops for building renovations created through the France Rénov' programme. These shops, available across almost 600 locations nationwide, provide free and accessible services to all households and are supported by over 2 600 trained advisors. They offer general guidance on energy renovations and available financial support, as well as personalised advice, including one-hour consultations to assess renovation needs and identify appropriate funding opportunities. One-stop-shops also assist households in accessing MaPrimeRénov' grants, with application support fully integrated into the service. By consolidating previously fragmented renovation support into a single, user-friendly system, France Rénov' helps to reduce the administrative burden for households. It also offers assistance in designing the renovation project and increases awareness of available incentives.

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Challenges	• ensuring awareness and uptake among eligible households • simplifying administrative processes for applicants • managing effective targeting to ensure funds reach the most vulnerable households • co-ordinating renovations in condominiums where multiple owners must agree
Success factors	• income-based grant system ensuring financial accessibility • one-stop-shop approach (France Rénov') to streamline applications and provide technical assistance • mandatory advisory services (Mon Accompagnateur Rénov') for major renovations to ensure quality improvements • dedicated funding for condominiums to facilitate collective renovations
Measures of success for the year 2024	• around 250 000 flat rate grant applications approved in 2024, total amount of grant of more than EUR 0.95 billion (USD 1 billion) generating a total amount of renovation work of about EUR 2.94 billion (USD 3.3 billion) • more than 90 000 major renovation grants engaged EUR 2.4 billion (USD 2.7 billion) generating EUR 3.74 billion (USD 4.2 billion) of renovation work in 2024 • EUR 330 million (USD 370 million) allocated for MaPrime Rénov' Copropriété (38 000 applications approved) • 42% of beneficiaries from very low-income households, 25% from low-income households, 33% from middle-income households • publicly tracked energy savings and efficiency improvements • increased accessibility due to advisory services and streamlined application process
Targets	• low- to middle-income owner-occupied households • landlords eligible for flat rate grants • co-owned apartment buildings eligible for collective renovations through MaPrime Rénov' Copropriété

Source: Bilan MaPrimeRénov' (2024).

White Certificate Scheme (CEE)

The White Certificate Scheme, or Certificats d'Économie d'Énergie (CEE), is one of France's primary tools for achieving energy demand reduction and climate goals. Launched in 2006 and currently in its fifth period (2022-25), it has an estimated annual cost of EUR 5 to 6 billion (USD 6 to 7 billion). The cumulative energy-saving target set by the government for this period is 3 100 actualised and cumulated terawatt-hours (TWh), out of which 1 130 TWh is dedicated to energy poverty certificates. In 2023, the yearly saving goal corresponded to 534 TWh.

CEE is a market-based mechanism that mandates energy suppliers to achieve specific energy savings targets by implementing energy efficiency measures themselves, financially supporting consumers in undertaking qualifying renovations, contributing to eligible national programmes, or purchasing certificates on the open market. The obligated parties are suppliers of electricity, gas, heating, cooling or domestic fuel, and fuel distributors exceeding a sales threshold. Suppliers are free to

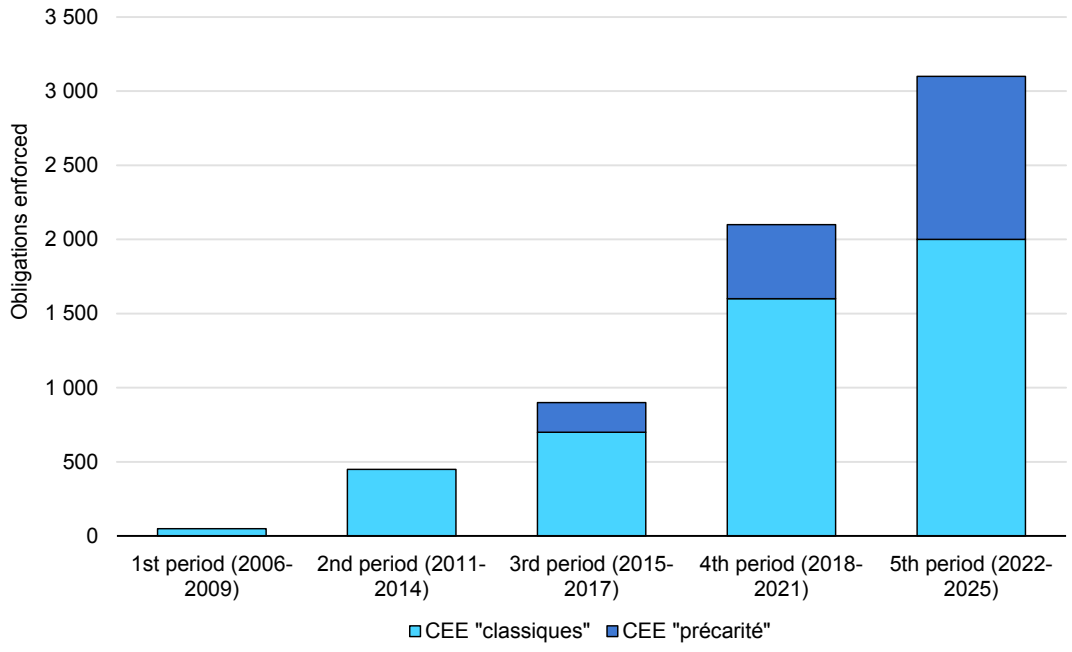
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select the actions to meet their targets, such as informing customers how to reduce energy consumption, running promotional programmes and providing incentives to customers. The CEE scheme supports more than 200 standardised renovation actions across sectors such as housing, transport, agriculture and industry. These range from insulation and heating upgrades to hot water systems and ventilation improvements. The scheme distinguishes between two types of certificates: CEE "classiques", which apply to all consumers and aim to promote general energy efficiency, and CEE "précarité énergétique", which specifically target low-income households, directing a portion of the obligations toward measures that reduce energy poverty. This dual structure ensures both broad energy savings and social equity objectives are addressed.

Suppliers and distributors exceeding their targets can trade energy savings certificates as required for compliance. If obligated parties fail to meet their targets, they face substantial penalties.

In addition to suppliers, several other actors can generate and sell certificates. These include local authorities, social housing providers, Anah and mixed-economy companies involved in energy efficiency or third-party financing.

CEE's mandated obligations per period



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Source: IEA analysis based on Ministère de l'Économie, des Finances et de la Souveraineté Industrielle et Numérique (2023).

This chart shows the growing obligations of France's energy suppliers to achieve energy savings under the White Certificate Scheme (CEE) across five periods from 2006 to 2025. It highlights a steady increase in total obligations, with a significant rise

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in the latest periods: starting in 2015, a portion of these obligations has specifically targeted energy-poor households ("CEE précarité"), reflecting a growing focus on social equity in energy efficiency policies. The growth in CEE obligations reflects France's increasing commitment to energy efficiency, driven by climate goals, rising energy costs and the need to address social inequalities through targeted support for vulnerable households.

Affordability implications

The scheme subsidises energy efficiency improvements such as heating system replacements and insulation upgrades, reducing household energy bills. Tenants are also eligible.

Within the CEE "précarité" obligations, three dedicated programmes target energy poverty with a combined budget of EUR 364 million (USD 409 million) and an expected cumulative impact of over 48 TWh of energy savings:

- SLIME is a local support programme with a budget of EUR 56 million (USD 63 million) that identifies and assists energy-poor households through outreach, referrals and personalised guidance, aiming to generate 7 TWh of energy savings by connecting them to existing aid and energy efficiency measures.
- Toits d'Abord 2 with a budget of EUR 8 million (USD 9 million) supports the construction of high energy performance social housing by state-approved associations, aiming to save 1 TWh.
- Mon Accompagnateur Rénov': complementary to the CEE framework and with a budget of EUR 300 million (USD 337 million), the programme aims to support 40 TWh of energy savings, with at least 50% of this effort targeted toward energy-poor households.

Results and tracking

The scheme has delivered substantial energy savings and improvements in residential energy efficiency. Over the last five phases, it has facilitated the replacement of approximately 1.8 million heating systems and the insulation of 2 million homes. In the four-year period from 2018-to 2021, the programme delivered 800 000 heat system replacements and the insulation of 2 million houses, with a budget of approximately EUR 4 billion (USD 4.6 billion) per year.

In 2023 alone, more than 500 000 heating system replacement projects were completed under the scheme, with a total of EUR 2.8 billion (USD 3.2 billion) in grants disbursed. This will enable the benefitting households to save EUR 963 million (approximately USD 1.1 billion) per year on their energy bills (based on 2021 energy prices).

CEE is monitored through a certification-based system, where energy savings are calculated and verified before white certificates are issued. More than 210

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standardised actions define eligible measures, with adjustments every five years to account for technological advancements and policy shifts. The data collected by the government include the volume of certificates issued, compliance rates among obligated parties and the proportion of savings allocated to energy-poor households.

Key challenges

The CEE scheme faces several challenges. Ensuring that obligated parties meet their targets while preventing market manipulation requires strong regulatory oversight. Additionally, reaching energy-poor households remains complex, as identifying and engaging vulnerable populations requires targeted outreach efforts. The evolving nature of energy efficiency standards necessitates frequent adjustments to eligible measures, creating administrative complexity.

Challenges	• ensuring compliance among obligated parties while preventing market manipulation • identifying and engaging energy-poor households • managing administrative complexity due to frequent updates to eligible measures
Success factors	• market-based mechanism allowing flexibility for energy suppliers • dedicated funding for energy poverty through targeted programmes (Slime+, Toits d'Abord 2, Mon accompagnateur France Rénov') • certification-based monitoring system ensuring accountability
Measures of success	• EUR 5-6 billion (USD 6-7 billion) estimated annual cost (2022-25) • 3 100 TWh total energy savings targeted (2022-25), with 1 130 TWh allocated to energy poverty • 1.8 million heating systems replaced since scheme inception • 2 million homes insulated between 2018 and 2021 (EUR 4 billion [USD 4.6 billion] annual budget) • Slime+ disbursed EUR 56 million (USD 63 million), targeting 7 TWh of savings • Toits d'Abord 2 budgeted EUR 8 million (USD 9 million), aiming for 1 TWh of savings
Targets	• all households, including tenants • focus on low-income households through dedicated sub-programmes • social housing initiatives under Toits d'Abord 2

United Kingdom[2]

In the United Kingdom, energy poverty is a devolved issue, with responsibilities for alleviation in each nation (England, Northern Ireland, Scotland and Wales). In England energy poverty is measured through a low income, low energy efficiency (LILEE) metric, which identifies households that have an income 60% below the median household income, and that also live in homes with poor energy performance

[2] While the United Kingdom uses the term “fuel poverty”, this report employs the term energy poverty interchangeably. While there is no agreed threshold of energy poverty, it generally refers to disadvantaged individuals, families or communities who are unable to afford some defined level of energy service.

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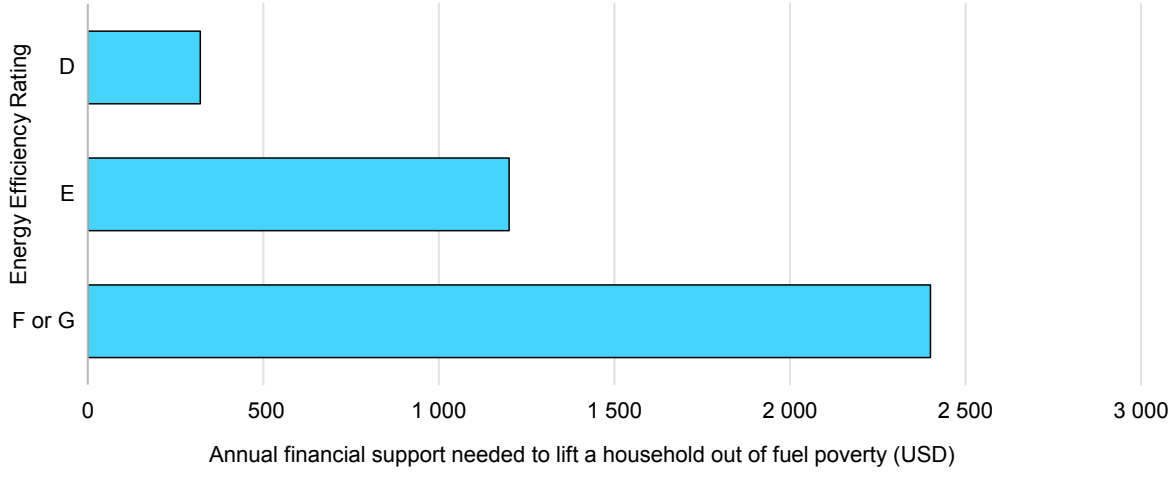
(measured with Energy Performance Certificate ratings between Bands D and G). Currently, 2.7 million households in England are living in fuel poverty (around 11% of households).

A closely related issue is energy affordability, which is measured by whether a household spends more than 10% of its income on energy. Based on this criterion, in 2024 around 32% (9 million) of households in the United Kingdom struggled with energy affordability. However, this metric is highly sensitive to fluctuations in energy prices. Government interventions are aimed at alleviating fuel poverty, recognising it as a structural problem where low-income households are trapped in the poorest-quality housing. These interventions address this structural issue with two separate packages of measures that provide direct energy bill support to qualified households as well energy efficiency and heating upgrades.

In 2014, the government legislated a fuel poverty target for England to ensure that as many fuel-poor homes as reasonably practicable achieve a minimum energy efficiency rating of at least Band C by 2030. This framing of the target recognises that the main sustainable way to address fuel poverty is through improving energy efficiency. In 2024, more than 9 out of 10 of low-income households had achieved a rating of Band D or higher, while more than half achieved Band C.

There is often a relationship between a home's energy performance and the severity of fuel poverty experienced by its occupants. Poorly insulated, inefficient homes keep residents in high-cost, low-comfort living conditions. The fuel poverty gap (i.e. the annual financial support needed to lift a household out of fuel poverty) stands at approximately GBP 1 800 (USD 2 400) for homes rated Band F or G. In contrast, in a Band D-rated home, that gap drops to around GBP 200 (USD 320). This significant difference illustrates that the worse a home's energy efficiency, the deeper the fuel poverty, and highlights the importance of targeting the worst-performing homes.

Severity of fuel poverty in the United Kingdom by building energy performance, 2023



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Source: IEA analysis based on Department for Energy Security & Net Zero (2023).

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Energy Company Obligation (ECO4)

The United Kingdom has imposed an Energy Company Obligation (ECO) on large energy providers to offer energy bill savings to households since 2013. The latest phase, ECO4, runs from 2022 to 2026, and allocates a total of GBP 4 billion (USD 5 billion) distributed evenly across each year to energy efficiency improvements for low-income households living in the least efficient homes, according to the UK energy performance standards. Similar to the White Certificate Scheme in France, the ECO4 programme mandates that obligated energy suppliers achieve energy-saving targets by funding home improvements such as insulation, heating system upgrades and renewable energy installations. Unlike previous iterations, ECO4 prioritises deeper retrofit measures, ensuring long-term energy savings and emissions reductions.

Affordability implications

ECO4 directly targets affordability by reducing energy costs for low-income households. The scheme is designed to improve energy efficiency in homes that are hardest to heat, preventing fuel poverty and reducing overall household energy expenditures. Eligibility criteria are determined using means-tested benefits: if a household receives some form of welfare support, their income has already been verified, so it can access the programme.

The programme is fully funded by energy suppliers and does not require direct contributions from beneficiaries, making it accessible to those who are most in need. Energy suppliers fund the programme through charges on ratepayer bills amounting to around GBP 41 (USD 50) annually under ECO4. Moreover, the scheme prioritises properties rated Energy Performance Certificate (EPC) Band D or lower, with the goal of elevating these homes to Band C or higher, in support of the energy poverty reduction targets.

Results and tracking

The results of the programme have been significant. Since 2013, under the obligation scheme, over 4 million measures have been installed in 2.5 million homes (or 9% of all households in the UK). Since April 2022, ECO4 has delivered over 750 000 interventions, generating bill savings of around GBP 430 (USD 570) per year for households.

ECO4 is closely monitored through supplier reporting, government audits and third-party assessments. Energy suppliers must demonstrate compliance with energy-saving targets by submitting verified project data. The programme also tracks improvements in EPC ratings, bill reductions and emissions reductions to ensure accountability and effectiveness. Regular evaluations help refine the scheme and ensure it delivers maximum benefits to vulnerable households.

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Key challenges

ECO4 faces several challenges, including streamlining delivery processes and maintaining supplier compliance. The complexity of whole-home retrofits, which involve installing multiple coordinated energy efficiency measures based on a comprehensive assessment of a property's needs, requires skilled labour, and shortages in the workforce can slow implementation. Ensuring that energy suppliers meet their obligations while preventing delays and inefficiencies remains a key focus. Additionally, balancing cost-effectiveness with the need for deep retrofits is an ongoing policy consideration as these upgrades deliver greater bill savings per home but their higher upfront costs limit the number of households that can be supported within the same budget. Looking ahead, securing long-term funding and integrating ECO4 with emerging energy efficiency policies will be critical to sustaining its impact.

Lastly, reaching households that are less likely to be cost-effective, such as those in remote rural areas or with specific needs, can be more challenging. Some vulnerable households may require more complex and costly interventions, making them less likely to be treated under a supplier obligation.

Challenges	• engaging hard-to-reach households • streamlining delivery processes • maintaining supplier compliance • workforce shortages • balancing cost-effectiveness with the need for deep retrofits • securing long-term funding • reaching remote rural areas that are less likely to be cost-effective
Success factors	• fully funded intervention • income eligibility is verified though other existing welfare support, avoiding extra bureaucracy • prioritises deeper retrofit measures
Measures of success	• 4 million energy efficiency improvements delivered in 2.5 million homes (9% of all GB households) since 2013 • 500 000+ interventions delivered under ECO4 since April 2022 • annual bill savings of GBP 430 (USD 570) per household from ECO4 interventions
Target	• low-income households living in the least efficient homes

Warm Homes: Social Housing Fund

Since supplier obligations are a market-driven mechanism focused on energy-poor households, energy companies will likely focus on properties that are the most cost-effective to treat. As a result, these schemes need to be complemented by other programmes, such as those run by local authorities, which may be more effective in reaching households that are less likely to be cost-effective, for example homes in remote rural areas and households with specific needs or vulnerabilities.

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In this context, the Warm Homes: Social Housing Fund (WH:SHF) is a grant scheme, part of the broader Warm Homes Plan, aimed at improving the efficiency of social housing specifically.

The WH:SHF allocated over GBP 1 billion (USD 1.33 billion) in funding between 2021 and 2025 over different phases (Waves) to support social housing providers in upgrading their properties. The type of eligible upgrades includes heat pump installations, solar panels, insulation improvements and enhanced glazing. The primary goal is to raise the energy performance of social housing to EPC C by 2030, aligning with the UK's fuel poverty reduction targets.

Social housing providers need to match 50% of the funding, ensuring a cost-sharing mechanism that promotes cost-effective investment. Moreover, the WH:SHF is supported by regulations that impose minimum energy efficiency standards for social housing (the Decent Homes Standard from 2000 establishing minimum efficiency requirements for social housing). There is also free support offered to social housing providers under the Retrofit Information, Support and Expertise programme that covers application support, training and delivery guidance.

Affordability implications

The WH:SHF has a clear fuel poverty focus since it directly targets tenants of social housing. Since its launch, WH:SHF has led to widespread energy efficiency improvements in social housing, generating an average of GBP 400 (USD 540) savings per year on energy bills for households which is roughly equivalent to two and a half months' worth of energy bill savings.

Results and tracking

Since 2020, the WH:SHF programme has progressed through multiple funding waves, starting with a GBP 62 million (USD 80 million) demonstrator project in 2021. Wave 1 received GBP 179 million (USD 240 million). Wave 2.1 allocated GBP 778 million (USD 1 billion), targeting 90 000 qualifying houses between April 2023 and September 2025. An additional GBP 75.5 million (USD 100 million) will reach 8 800 more homes from April 2024 to March 2026 under Wave 2.2.

The WH:SHF performance evaluation is conducted through metrics including energy savings, tenant bill reductions and housing stock improvements. The progress is assessed based on Energy Performance Certificate upgrades, with a focus on transitioning Band F- and G-rated properties to Band C. A transparent system for tracking the progress of funding is available, ensuring accountability. Housing providers must submit data on retrofitted properties, which creates a solid database to inform future regulatory developments.

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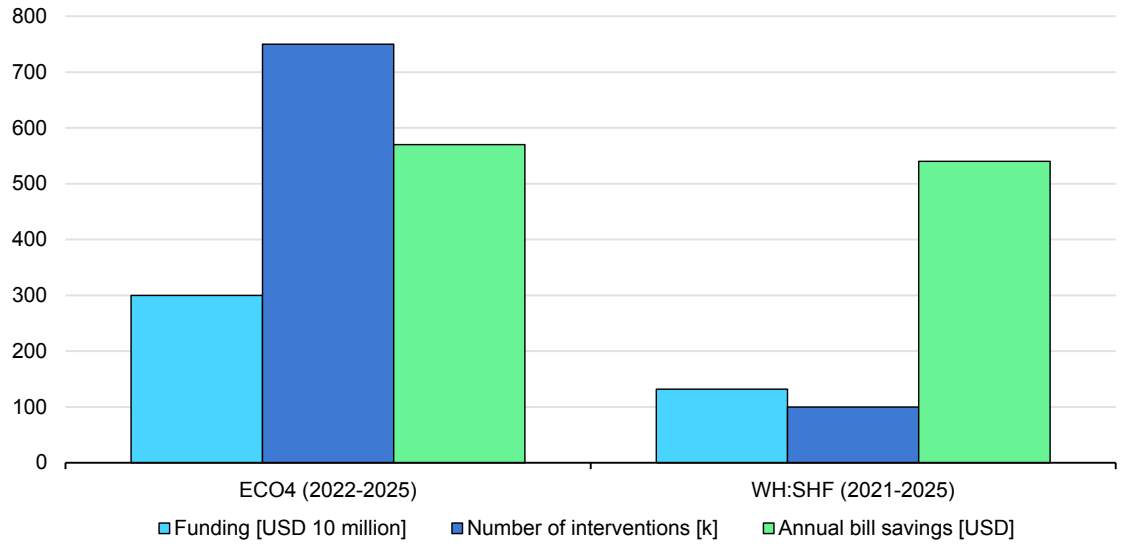
Key challenges

Several challenges impact WH:SHF implementation. First, the co-ordination of funding across diverse housing providers requires efficient administrative processes. Moreover, the complexity of upgrading older social housing stock, including structural limitations and retrofit disruption for residents, constitutes an additional obstacle.

Lastly, the increase of workforce capacity to meet retrofitting demands is also a challenge because skilled labour shortages can have major impacts on implementation speed.

Challenges	• co-ordination of funding across diverse housing providers • complexity of retrofitting older social housing stock • disruption for tenants during works • shortages of skilled labour impacting delivery speed • potential bill increases from electrification (e.g. heat pumps)
Success factors	• cost-sharing mechanism with social housing providers promotes cost-effective investment • supported by regulatory minimum standards for social housing
Measures of success	• GBP 400 (USD 540) average annual energy bill savings per household • total funding allocated: GBP 1 billion (USD 1.33 billion) across waves
Target	• upgrade social housing to EPC Band C by 2030

Comparison of policy performance in the United Kingdom, 2024



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Sources: IEA analysis based on Department for Energy Security & Net Zero (2025) and Department for Energy Security & Net Zero (2024).

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Germany

Energy consumption in buildings accounts for around 35% of overall energy use in Germany, mainly due to space and water heating. Around 80% of heating systems are fossil fuel-based and only 14% use district heating networks. Moreover, Germany's building stock is relatively old, with 68% built before 1978, necessitating the need for energy-efficient renovations of existing buildings. The federal government provides various funding arrangements to support energy efficiency improvements aimed at reducing costs for households, improving comfort and lowering emissions.

Germany's current strategy for decarbonising the buildings sector is based on the 2024 amendments to the existing 2020 Buildings Energy Act. It requires that 65% of energy used in new heating systems come from renewable sources by 2026 or 2028 (depending on when municipal heating plans are developed). Heat pumps are strongly promoted with the ambitious target of 500 000 installations per year from 2024. The Federal Funding for Energy-Efficient Buildings (BEG) supports renovation and energy-efficient new buildings, complemented by government-backed consumer advice centres that offer consultations on energy efficiency improvements.

Federal Funding Programme for Efficient Buildings

The Federal Funding Programme for Efficient Buildings (BEG) is one of the main initiatives under Germany's energy efficiency and climate protection strategy. It provides financial incentives for energy-efficient renovations and new construction. It aims at reducing carbon emissions in the buildings sector, which accounts for nearly a fifth of Germany's greenhouse gas emissions. The programme consists of four workstreams: 1) full energy-efficient renovations of residential buildings; 2) full energy-efficient renovations of commercial buildings; 3) renovations with individual measures for residential and commercial buildings; and 4) climate-friendly new buildings.

Funding for BEG is provided either as a grant for individual measures or as a low-interest loan with supporting repayment grants from federal funds for full renovations. Since February 2024, greater funding has become available for renewable heating systems based on income level as an "income-based bonus" along with a "speed bonus" for very old, inefficient heating systems. The funding under BEG can be combined with other incentives: owner-occupied homes with household income under EUR 90 000 (USD 101 000) can obtain an additional loan interest rate reduction during the initial fixed-interest period.

Affordability implications

BEG can lower the costs for homeowners, landlords, and public entities to undertake energy-efficient and climate-friendly solutions to homes. Additional funding is

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available for early adoption of new heating technologies and deep renovations because the federal government wants to prioritise these types of interventions. Moreover, supplementary grants and interest rate reductions are available for low-income individuals.

Results and tracking

The programme has successfully financed thousands of energy-saving projects, reducing energy consumption in buildings. Additionally, the programme supports job creation in the energy efficiency sector.

To track the policy, BEG incorporates monitoring mechanisms to ensure transparency. The recipients are required to demonstrate compliance with national and EU-wide buildings energy standards, verified through independent audits and periodic policy evaluation measures in terms of energy savings as well as emissions reductions and cost-effectiveness.

Key challenges

Similar to other European countries, Germany has a generally old building stock. Therefore, the scale and cost of transitioning the building stock to energy-efficient levels is high. Since 60% of housing consists of rented units, reaching tenants is also challenging given divergent costs and incentives to undertake retrofits (landlords usually bear upfront costs and benefit from higher property values, while tenants usually receive the energy savings benefits mainly through lower energy bills and improved indoor comfort).

In this context, BEG has promoted efficient construction and renovation. However, challenges related to bureaucracy remain, since the applications require complex documentation, which can create obstacles. Moreover, homeowners frequently resist heat pump installations due to high upfront costs as well as concerns over higher operating costs (in 2024 electricity remained significantly more expensive than natural gas for households in Germany); this reluctance slows down widespread adoption. Regional disparities also pose challenges, as affordability varies significantly by location.

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Challenges	• high cost and scale of retrofitting Germany's old building stock • reaching tenants in a housing market where 60% of units are rented • bureaucratic complexity, particularly for vulnerable groups • high upfront and operating cost of heat pumps • regional disparities in affordability impacting programme accessibility
Success factors	• multiple funding options, including grants and low-interest loans with repayment support • additional funding incentives for early adoption of renewable heating and deep renovations (income-based bonus and speed bonus) • compatibility with other financial incentives, increasing affordability for owner-occupied homes below EUR 90 000 (USD 101 000) taxable income • strong compliance mechanisms ensuring adherence to national and EU energy standards
Measures of success	• thousands of energy-saving projects financed, reducing building energy consumption • job creation in the energy efficiency sector
Targets	• homeowners, landlords and public entities undertaking energy efficiency and climate-friendly renovations • low-income households eligible for supplementary grants and interest rate reductions • tenants indirectly benefitting from energy efficiency improvements in rented housing

Energy-Saving Check (Stromspar-Check)

Germany's Energy-Saving Check (Stromspar-Check) is a targeted programme designed to support low-income households in reducing their energy consumption and energy and water bills. It does so by offering free at-home consultations to low-income households. The consultants providing the training are people who were previously facing long-term unemployment. The consultations include calculations of a household's energy savings potential, individual advice for consumers, free issuance and installation of energy savings devices, and – under certain conditions – financial support for the replacement of outdated refrigerators. The programme started in 2008. The current project period spans between 2023 and 2026 for a total budget of EUR 41 million (USD 46 million). The programme involves multiple in-home visits. After initial contact by phone, energy consultants perform a first evaluation of the household's situation, looking at energy consumption and potential savings. A second visit is conducted to install minor efficiency measures based on the first visit's results. Lastly, a monitoring process provides crucial follow-up checks to assess the result of the advice and possible adjustments. This structured approach, which provides implementation and monitoring of energy efficiency solutions helps to ensure that households effectively reduce energy consumption.

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Affordability implications

By providing at-home consultations free of charge, the programme is able to overcome barriers that low-income households can face in accessing energy efficiency service providers. The programme also helps low-income households undertake replacement of older, less-efficient appliances by offering the equipment and installation free of charge. Moreover, by targeting people facing long-term unemployment to be trained as consultants, the Stromspar-Check also provides employment relief to a vulnerable group, through a peer-to-peer approach that has proven to be highly effective.

Results and tracking

Since 2008, the Stromspar-Check has provided 463 000 home visits that delivered tangible energy savings for households. By implementing simple improvements, participating households save EUR 215 (USD 241) on average on energy costs every year (long-term household savings over EUR 2.000). It has also trained 650 electricity savings consultants nationwide. The improvements are significant, especially considering the relatively low budget of this project compared to similar energy efficiency state-wide initiatives.

Key challenges

Limited awareness of the programme remains a barrier to participation. Additionally, while small-scale efficiency measures provide immediate benefits, structural changes such as deep building renovations require additional financial support and cannot be addressed through Stromspar-Check or similar initiatives.

Challenges	• limited awareness of the programme, reducing participation rates • programme scope limited to small-scale efficiency measures, excluding deep renovations that require additional financial support
Success factors	• free at-home consultations removing financial barriers for low-income households • structured multi-visit approach ensuring implementation and follow-up monitoring • free issuance and installation of energy-saving devices and financial support for the replacement of outdated refrigerators • employment support by training long-term unemployed individuals as energy consultants
Measures of success	• 463 000 home visits conducted since 2008 • average energy cost savings of EUR 215 (USD 241) per participating household per year • 650 electricity savings consultants trained nationwide
Targets	• low-income households seeking to reduce energy and water bills • long-term unemployed individuals trained as energy consultants

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Italy

Italy addresses energy affordability through a range of measures aimed at mitigating energy poverty. However, these measures have been developed within the policy frameworks for energy market regulation, renewables and energy efficiency, rather than as part of a dedicated national strategy for energy poverty. In response to a European Commission requirement, the Italian government has begun to develop an energy poverty strategy through the establishment of a national observatory. Based on EU definitions, Italy considers energy poverty as the percentage of households with unpaid utility bills and which are unable to keep their homes adequately warm. This analysis is conducted both across the entire population and specifically within the group of people at risk of poverty. Additionally, Italy applies an evaluation approach that assesses how effectively policies and measures direct resources for energy efficiency improvements towards projects with a higher social impact potential (i.e. positive discrimination).

Numerous measures are currently in force to comply with achievement of the EU Energy Efficiency Directive (EED) requirements, including white certificate schemes, financial incentives and information campaigns. Though Italy's energy efficiency incentives at present focus primarily on meeting energy efficiency improvement targets and stimulating economic recovery in the construction sector, these policies are currently under revision to introduce a more targeted approach to tackling energy poverty.

Fiscal deductions: Ecobonus and Superbonus

The Superbonus and Ecobonus schemes have been Italy's flagship policies for energy efficiency improvements in buildings, although the current government is progressively phasing them out. These fiscal incentives provide tax deductions to homeowners for energy efficiency interventions. Among Italian energy efficiency policies, building retrofitting fiscal deductions are expected to generate by far the largest energy-saving interventions in the period 2021-2030.

The Ecobonus, introduced by the 2007 budget law, offers support in the form of fiscal deductions ranging from 50% to 85%, depending on the type of intervention and dwelling, over a 10-year period. The Superbonus, initially introduced as a 110% tax deduction over five years, was launched as part of Italy's post-COVID-19 economic recovery plan in 2020. However, the programmes have evolved since then, with substantial changes implemented to gradually reduce the amount of tax incentives to 36% (50% in the case of residential home use) in 2025 and 30% (36% in the case of residential home use) in 2026 and 2027 for the Ecobonus and to 65% (by 2025) for the Superbonus, according to the budget law 2025. Derogations apply in cases where the project is not completed, specifically when the invoice discount or tax credit transfer options are used. Both the Ecobonus and Superbonus cover planning, construction and renovation-related service costs.

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The Ecobonus initially did not include options for invoice discounts and tax credit transfers; these mechanisms were gradually introduced and refined between 2016 and 2019, before being limited by subsequent regulations in 2023. In contrast, the Superbonus was introduced from the start with the possibility of invoice discount and tax credit transfer. The Superbonus, however, has stricter eligibility criteria: the Conventional Energy Performance Certificate (Conventional APE [Attestato di Prestazione Energetica]) is a special type of energy certificate required only for accessing the Superbonus. Unlike the standard APE, it evaluates the entire building's energy performance (not just individual units) before and after renovation, using standardised conditions to objectively measure the improvement. Its main purpose is to verify the mandatory upgrade by at least two energy classes.

Affordability implications

Ecobonus and Superbonus incentives aim to make energy efficiency improvements more financially accessible for all households, addressing barriers related to the high upfront costs of interventions. Although the Superbonus almost exclusively addresses residential buildings, incentives are available for the energy retrofitting of social housing and buildings partially owned or in use by commercial and industrial organisations (residential share of the building must still exceed 50%).

Most importantly, the mechanisms of tax credit transfers and invoice discounts have allowed lower-income households to participate, even if they had little or no taxable income. The ability to transfer credits to financial institutions has meant that some households could undertake renovation actions without any upfront costs, thanks to the 110% rate. The reforms introduced in 2023-2024 removed these options due to budget constraints. Further reforms under planning will introduce preferential treatment for economically disadvantaged households, putting a stronger focus on tackling energy poverty through energy efficiency improvements, in line with the revised EED.

Results and tracking

The Superbonus led to a pronounced increase in retrofitting activities, with over EUR 120 billion (USD 130 billion) in investments by the end of 2024. While it successfully mobilised financial resources and improved building efficiency, concerns over cost-effectiveness and fiscal sustainability led to a reduction in the deduction rate in 2023-2024. The Ecobonus remains a steady contributor to annual energy savings, accounting for approximately 55% of energy savings complying with the EED targets.

The Superbonus mobilised a significant amount of investment even in the most disadvantaged regions, where investment levels as a share of GDP were in line with the national average.

Data on investments, number of projects and energy savings achieved show that the incentives have not always been directed towards newer buildings. This evidence

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suggests a potential sub-optimal distribution, given the connection between age and energy performance of the building.

Key challenges

Challenges which emerged during the implementation of the Ecobonus and Superbonus informed future iterations of the programmes. To start, the distributional effects raised concern, as uptake was significantly higher in the wealthier northern regions, where households had greater financial resources and administrative support. In contrast, interventions in the southern regions—often more energy-poor—proved more complex and costly due to structural barriers such as irregular building registries, lower access to credit and limited technical capacity. As a result, the schemes risked exacerbating existing regional inequalities rather than reducing them.

More broadly, the high fiscal burden of the programmes for the government proved difficult to sustain. As a result, the government not only lowered the level of coverage under programmes, but also did away with the tax credit transfers and invoice discounts, which proved difficult to track and monitor. While the programmes provide fiscal relief for lower-income households, there is a risk that those households that lack upfront capital will face outsized barriers to access the scheme. Additional ongoing reforms aim at targeting resources for lower-income households and ensuring the long-term fiscal sustainability of the scheme.

Lastly, while the introduction of an EPC requirement for the Superbonus ensures that funded renovations achieve notable energy efficiency improvements, enforcement challenges—such as fraudulent claims and administrative burdens on tax authorities—have led to tighter regulations. The elimination of tax credit transfers in 2023-2024 was partly aimed at addressing these concerns while ensuring that funds are used effectively.

Challenges	• regional inequalities • high fiscal burden on the government • risk of lower-income households facing barriers due to the removal of mechanisms that previously eliminated upfront costs • fraudulent claims and administrative burdens on tax authorities
Success factors	• significant mobilisation of investment • strong contribution to annual energy savings • requirement for pre- and post-renovation Energy Performance Certificate (EPC) audits • policy evolution towards prioritising economically disadvantaged households in line with the revised Energy Efficiency Directive (EED)
Measures of success	• EUR 120 billion (USD 130 billion) in investments by the end of 2024 • generated 55% of energy savings aligned with EED obligations
Target	• homeowners, including those in social housing and third-sector entities

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Thermal Account

Established in 2012 and later reformed, the Thermal Account (Conto Termico) is a multi-sector financial incentive programme designed to support energy efficiency improvements and the integration of small-scale renewable energy projects through direct grants. The programme offers grants covering 40% to 65% of eligible project costs, depending on the type of intervention: the grant coverage builds up to 55% of eligible costs for energy efficiency improvements, such as thermal insulation or building envelope upgrades, and up to 65% for small-scale renewable heat production systems and high-efficiency technologies, including the installation of heat pumps and solar thermal systems. It is most often available to public administration buildings, which have a wider variety of interventions that can be subsidised compared to private households.

Affordability implications

Unlike tax deductions, the Thermal Account provides direct grants, making it more accessible to low-income households that lack sufficient taxable income. Moreover, it allows third-sector entities, like cooperatives and nonprofits, to apply for funding; this provision has outsized benefits for energy-poor segments of the population. Funding is mainly issued to public entities and social housing which serves low-income households.

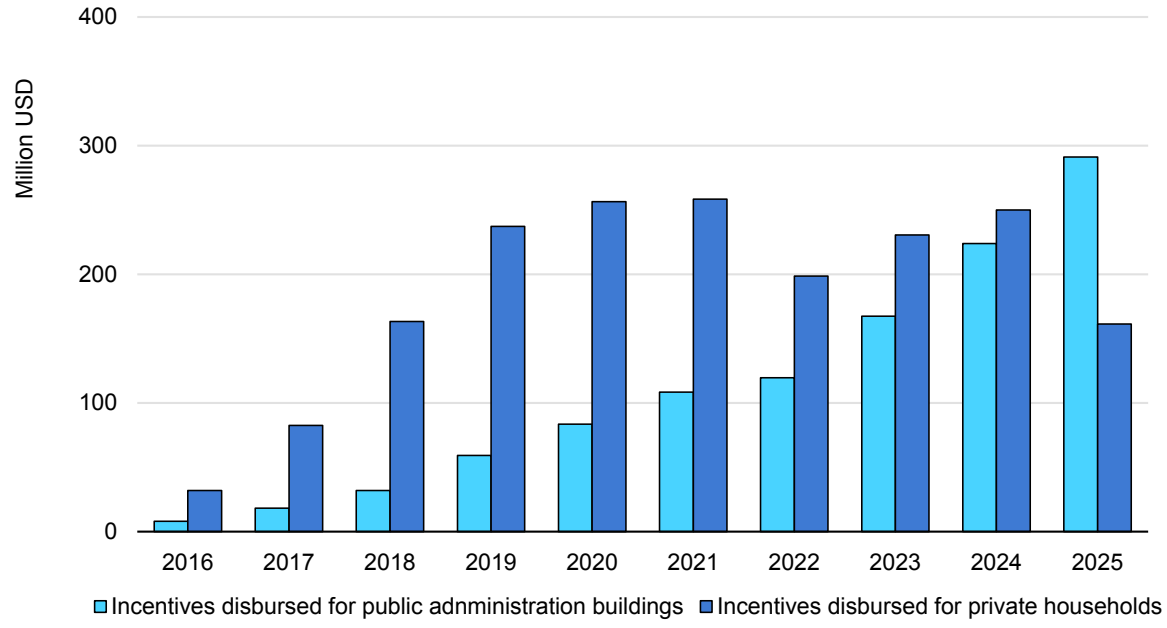
The renewed version of the Thermal Account (Thermal Account 3.0) will introduce greater accessibility for Third-Sector Entities – such as cooperative and nonprofit organisations' buildings – by equating them with public administration buildings in terms of access to incentives.

Results and tracking

From 2016 to 2025, the programme successfully disbursed almost EUR 2.7 billion (USD 3 billion), mainly funding heating system upgrades, solar thermal installations and building envelope improvements. Additionally, the programme has supported approximately 7 000 projects in social housing. A series of adjustments over the years led to a gradual shift in grant disbursement: while initially dominated by private households, incentives for public administration buildings steadily increased year by year, eventually surpassing those allocated to the private sector.

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Comparison of thermal account incentives disbursement between private households and public administration buildings



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Source: IEA analysis based on GSE (2025).

Unlike tax-based incentives like Ecobonus and Superbonus – monitored by the tax authority (Agenzia delle Entrate) – the Conto Termico is managed by the state-owned energy operator GSE, which oversees applications, verifies technical compliance and directly disburses grants. Data at the regional level are also available, showing balanced fund distributions across different areas.

Key challenges

Despite its successes, the programme has encountered some implementation challenges. The complexity of the application process can be time-consuming and discourages smaller organisations from applying. In addition, annual funding limitations may create bottlenecks, causing delays in project approvals. The upcoming Thermal Account 3.0 aims to address these issues by simplifying application procedures and expanding eligibility to include collective self-consumption projects (like shared solar photovoltaic panels on a condo) and energy communities, thereby broadening access to funding.

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Challenges	• complex application process, discouraging smaller organisations from applying • annual funding limitations creating bottlenecks and delays in project approvals
Success factors	• direct grants instead of tax deductions, increasing accessibility for low-income households • higher reimbursement rates for public institutions, municipalities and third-sector entities • dedicated energy agency overseeing compliance, reducing misuse and ensuring transparency
Measures of success	• from 2016 to 2025, the programme successfully disbursed almost EUR 2.7 billion (USD 3 billion) • 70 000 projects supported in social housing
Target	• Public institutions, municipalities and third-sector entities (e.g. social and citizen cooperatives)

Japan

Japan's energy efficiency strategy is driven by the principles of safety, energy security, economic efficiency and environmental sustainability. Japan is also one of the most energy-efficient economies in the world. The government has promoted energy efficiency through various financial incentives and regulatory measures. By 2030, Japan plans to reduce its energy use by 720 TWh of which 35% of the reduction expected to come from the residential sector, representing a substantial cut from the 3,600 TWh consumed in 2013

Energy efficiency regulation

Japan has introduced several regulatory requirements to drive energy performance improvements. Among the most significant is the Energy Conservation Act, in place and revised since 1979, which requires large enterprises to report their energy usage and comply with approved efficiency standards. The Buildings Conservation Act, introduced in 2015 and revised in 2022, mandates that newly constructed and significantly renovated structures meet minimum energy performance requirements. All residential and commercial buildings must adhere to the required EPC standard, ensuring that insulation, cooling, heating and lighting systems reach prescribed levels of efficiency.

The Building Energy Efficiency Act has also been updated. From 2025 onwards, it obligates houses and small-scale buildings to conform to established energy efficiency standards.

By fiscal year (FY) 2030, new buildings and homes will be expected to meet the ZEH (Zero Energy Houses) and ZEB (Zero Energy Buildings) standards. This will involve tightening the Top Runner standards and introducing consistent guidelines to support this transition. Under the Energy Conservation Act, the Top Runner Programme

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establishes target criteria for manufacturers and importers of equipment and appliances, requiring the weighted average energy consumption of shipped products to meet or exceed the best-performing models within a specified timeframe. Products such as air conditioners, water heaters, windows, sashes and insulation materials must meet progressively stricter efficiency criteria. As best-in-class models demonstrate proof of concept, increased production can create economies of scale to lower costs for more widespread deployment.

By 2050, Japan aims for all existing buildings and houses to achieve average energy performance levels equivalent to ZEH and ZEB standards. This ambitious target will be supported through comprehensive renovation efforts and the widespread adoption of high-efficiency equipment and technologies.

Affordability implications

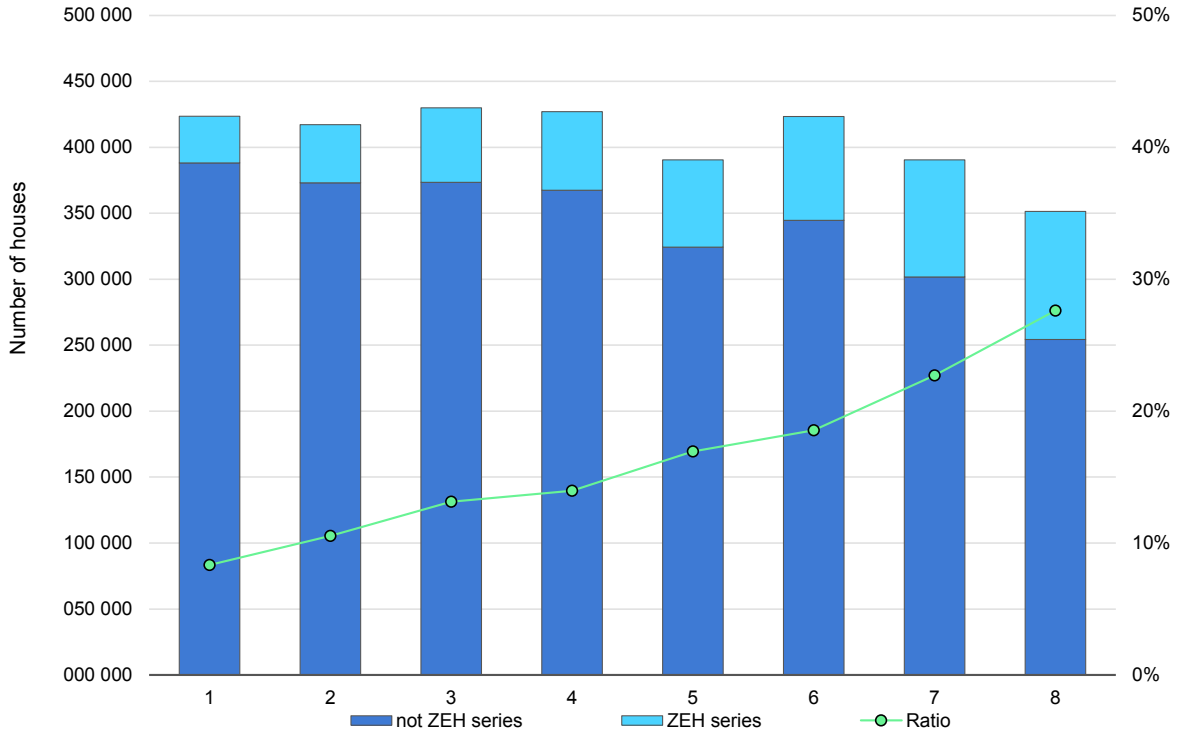
Japan's regulatory approach to energy efficiency is based on the premise that the setting of ambitious standards can drive widespread energy savings, lowering energy bills for consumers. The country's success in lowering energy consumption over the past few decades supports this case. However, the standards-based approach can lead to affordability challenges if the upfront costs of building renovations or new builds rise based on general inflationary conditions. As such, subsidies can play a complementary role to lower the costs for obligated parties.

Results and tracking

Top Runner programme compliance is monitored through periodic evaluations, and manufacturers that fail to meet targets face penalties. This regulatory approach has resulted in substantial energy savings; for example, air conditioner energy efficiency has improved by approximately 30% since 2001. Moreover, the concept of ZEB and ZEH has evolved into a "ZEB series" framework, allowing for a step-by-step approach based on actual performance. The first level, "ZEB Ready," targets 50% energy savings compared to reference values; the next level, "Nearly ZEB," exceeds 50% savings; and the highest level, "(Net) ZEB," achieves 100% energy reduction. In this context, the share of new houses meeting any of the ZEH series criteria reached 27.6% in 2023, meaning they comply with at least one of the three performance thresholds outlined above.

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Percentage of ZEH series of new construction, 2016-2023



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Source: IEA analysis based on Ministry of Economy, Trade and Industry (METI) (2023).

Key challenges

While Japan's regulatory framework has been effective in improving energy efficiency, challenges remain. The cost of compliance for property owners and businesses is a concern, requiring support through financial incentives and advisory services. Additionally, retrofitting older residential and commercial properties remains difficult due to structural constraints and high costs. Further integration of smart technology and renewable energy sources will be essential in achieving future energy savings. Expanding regulatory measures to include emerging energy-efficient technologies and improving public awareness will play key roles in reaching Japan's 2050 decarbonisation goals.

ZEH are designed to achieve a net zero energy balance by minimising energy consumption and maximising on-site renewable energy generation. Japan is currently revising the definition of ZEH to further advance zero-energy initiatives. This includes significantly enhancing energy-saving performance and promoting greater self-consumption of solar power.

To support this shift, a new policy framework will be introduced to encourage the construction and supply of homes that meet higher energy efficiency standards. Additionally, the Housing Performance Indication System will be upgraded to reflect these elevated requirements.

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Challenges	• the cost of compliance for small property owners and businesses • retrofitting older residential and commercial properties remains difficult due to structural constraints • further integration of smart technology and renewable energy sources • further promoting zero-energy including self-consumption solar power generation
Success factors	• robust compliance system to track and enforce energy efficiency regulations • periodic inspections and audits ensure adherence to energy performance standards • integrated promotion of regulation and support
Measures of success	• air conditioner energy efficiency improved by approximately 30% since 2001 • the number of houses meeting ZEH series criteria reached 27.6% in 2023
Target	• builders and developers of ZEH/ZEB-compliant new construction • manufacturers and importers of equipment and appliances

Energy efficiency subsidy package

Under the Green Transformation (GX) initiative, the government has launched the "GX of living", allocating JPY 2 trillion (USD 14 billion) over two years to support energy efficiency upgrades. Key areas of investment include retrofitting homes with high-insulation windows, heat pumps, clean energy vehicles and promoting ZEH and ZEB.

In 2025, Japan will provide a range of financial support measures to encourage households and businesses to adopt energy-saving solutions. New buildings for households with children that meet the ZEH standard can receive up to JPY 385 000 (USD 2 700), which can increase to more than JPY 1.6 million (USD 10 000) for new construction that meets a standard beyond ZEH.

Property owners may receive up to JPY 2 million (USD 14 000) for window insulation (the price for replacing single windows in Japan ranges between JPYXXX (USD 500 to 2 000) depending on the glazing chosen). Households can also benefit from grants of between JPY 400 000 (USD 2 800)and JPY 600 000 (USD 4 200) for home renovations including heat insulation of windows, floors (average cost for floor insulation is JPY 7 000 [USD 50] per m^2) and installation of high-efficiency water heaters such as heat pumps. Specialised programmes for rental apartments offer JPY 70 000 (USD 500) to cover the installation of energy-efficient water heaters.

Affordability implications

Japan’s energy efficiency incentives attempt to lower costs and promote energy efficiency upgrades for all households. The objective is to make energy-efficient

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homes more affordable by reducing upfront costs and increasing demand, allowing all homeowners and renters to benefit from long-term energy savings.

Results and tracking

The energy efficiency measures introduced by the Japanese government target major sources of household carbon emissions, particularly heating and cooling. Through incentive programmes, Japan has supported the development of energy-efficient residential buildings and renovation projects. By integrating regulatory and financial mechanisms, the government encourages both new construction and retrofits to meet strict efficiency standards.

Key challenges

Despite the success of Japan's energy efficiency initiatives, challenges remain. The installation of heat pumps and efficient water heaters in small apartments is particularly difficult due to space constraints. To address this, the government promotes alternative solutions such as high-efficiency gas water heaters where heat pumps are not viable. A combination of cost reductions and financial support will be needed to achieve long-term carbon neutrality goals and ensure the full participation of households in energy efficiency improvements.

Challenges	• space constraints limiting the installation of heat pumps and efficient water heaters in small apartments • need for alternative solutions (e.g., high-efficiency gas water heaters or smaller heat pumps suitable for narrow spaces) • ensuring cost reductions and financial support to sustain long-term carbon neutrality goals
Success factors	• large-scale funding, JPY 2 trillion (USD 14 billion) over two years • financial incentives for new ZEH buildings (JPY 600 000–1.6 million [USD 4 200 – 11 200]) and home retrofits (JPY 400 000–600 000 [USD 2 800 – 4 200]) • dedicated support for insulation (up to JPY 2 million [USD 14 000] for window insulation) and energy-efficient water heaters in rental apartments (JPY 70 000 [USD 490]) • integrated regulatory and financial mechanisms for new construction and renovations
Target	• all households, to promote universal access to energy efficiency upgrades.

United States

In the United States, the Department of Energy (DOE) is leading several initiatives to support energy efficiency upgrades in homes, including those of low-income households. Recently however, the Trump Administration has indicated that it may terminate these initiatives due to concerns around consumer choice and cost. In recent years, the country has continued to register progress in its energy efficiency efforts, with a 3.5% improvement in 2023 relative to the previous year and an

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average annual improvement of 2.3% from 2010 to 2022. In the residential buildings sector, energy intensity per floor area improved by 1.1% between 2015 and 2020. However, low-income households still face outsized challenges in paying their energy bills, with an estimated quarter of low-income households spending over 15% of their incomes on energy.

In 2020, there were 123.5 million residential dwellings in the United States. Of these, 35% were built after 1990 and 8% after 2010; 62% are single-family homes. The US Energy Information Administration's 2020 residential energy consumption survey found that 34–million households (27% of all US households) live in "energy insecurity".

Weatherization Assistance Program

The US Department of Energy's (DOE) Weatherization Assistance Program (WAP) has operated for almost 50 years and remains the nation's largest energy efficiency programme. The overarching aim is to reduce energy costs by improving efficiency in low-income homes while safeguarding health and safety. By focusing on building systems, WAP seeks to reduce the energy burden of households and to ensure sustainable, long-term savings.

Created in 1976 under the Energy Conservation and Production Act, WAP allocates grants to all 50 states, the District of Columbia, Native American tribes and the five inhabited US territories. These grants support over 700 local weatherisation providers nationwide. WAP employs advanced diagnostic tools, such as blower doors and infrared cameras, to identify cost-effective energy efficiency measures in single-family homes, manufactured homes and multifamily buildings. Certified inspectors verify that completed work adheres to rigorous standard work specifications, ensuring both energy savings and improved indoor air quality. The programme also offers critical workforce development opportunities, as local organisations often partner with contractors and trades, boosting employment while directly benefitting vulnerable communities.

Affordability implications

Low-income households in the United States typically spend around 12% of their annual income on energy, compared to roughly 3% for higher-income households. WAP aims to reduce this disproportionate burden by providing energy efficiency services to both renters and homeowners who meet specific income criteria. Eligibility primarily includes households with incomes at or below 200% of the federal poverty level. Households receiving Supplemental Security Income (SSI), qualify under Department of Energy guidelines. States and territories may also apply the criteria from the Low-Income Home Energy Assistance Program (LIHEAP), which considers households earning up to 60% of the state median income. Additionally, applicants that meet the income requirements of the Department of Housing and Urban Development

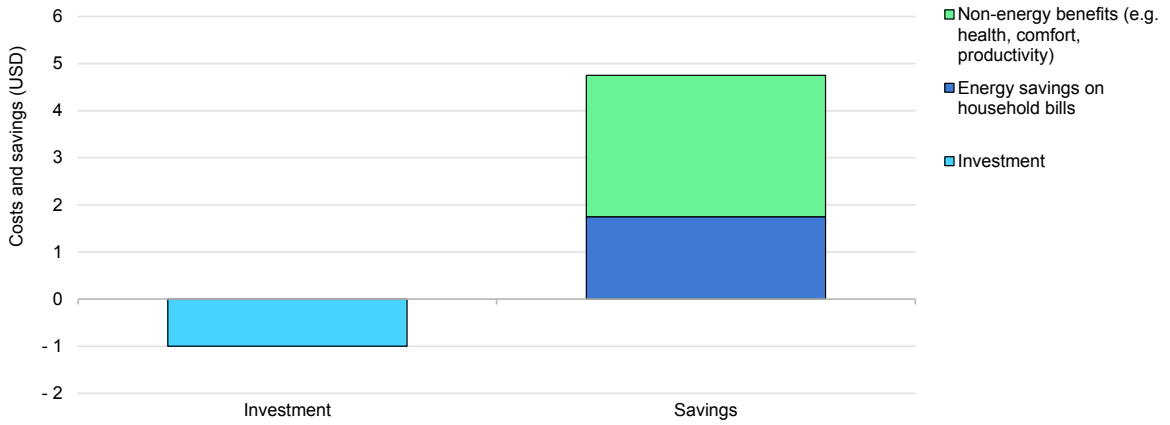
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(HUD) means-tested programmes can be eligible. By prioritising elderly residents, families with children or members with disabilities, high energy users and households facing a high energy burden, WAP alleviates a considerable financial strain.

Results and tracking

Households can save an average of USD 372 annually on energy bills through WAP. For every dollar invested, the programme is estimated to return USD 1.72 in energy benefits and USD 2.78 in non-energy benefits, which include improvements in health, safety and comfort. In addition, the programme generates annual medical expense reductions of USD 514 per household on average. It also reduces missed workdays equivalent to USD 538 per year. Since its inception, WAP has provided weatherisation services to over 7.2 million homes, supporting approximately 8 500 jobs.

Return on Investment for every dollar spent in the US Weatherization Program, 2024



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Source: IEA analysis based on US Department of Energy (2021).

To maintain transparency and quality, the DOE utilises a comprehensive monitoring system, requiring grantees to conduct annual on-site reviews of sub-grantees. These reviews encompass expenditure tracking, verification of eligibility, production rates and quality control inspections to ensure that funds are spent appropriately and that intended outcomes are achieved.

Key challenges

More than 39.5 million households are eligible for WAP; however not all dwellings are suitable for immediate intervention due to repair or rehabilitation needs outside the scope of the programme. New funding, such as the Weatherization Readiness Fund, aims to address some of these barriers.

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Other challenges relate to the fluctuations in funding levels across time as well as workforce limitations, since the availability of contractors and certified quality control inspectors willing to work in weatherisation is limited.

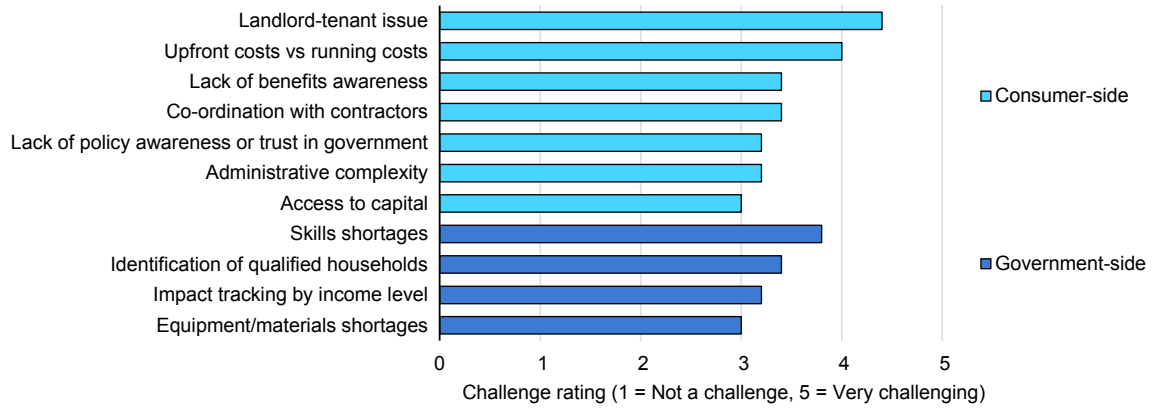
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Addressing affordability challenges across G7 countries

To support a better understanding of the challenges involved in designing energy efficiency policies to maximise affordability benefits, the IEA conducted a survey of policy makers in the G7 countries. Each country was asked to rate the extent to which a set of barriers presents challenges in their country on a scale of 1 to 5 (1=not a challenge, 5=very challenging). The types of challenges were divided between consumer-side barriers and government/supply-side barriers.

For consumer-side barriers, it is noteworthy that all seven listed barriers were rated as somewhat challenging. Governments found that addressing landlord-tenant dilemmas of split incentives as well as the disparities in upfront costs relative to cost-recovery timeframes are particularly challenging issues. In terms of supply-side barriers, skills shortages followed by the identification of qualified households were seen as the most challenging obstacles for programme success.

Rankings of key barriers facing energy efficiency policy implementation in the G7



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Key learnings

- **Develop targeted programmes for the poorest households.**

Low-income households face not only an outsized share of energy costs relative to their incomes but also encounter greater barriers in accessing services and financing for energy-efficient upgrades to their homes. Therefore, targeted programmes that apply only to low-income households offer a critical opportunity to bridge this gap.

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- **Undertake policy design to offer outsized benefits to lower-income households.**

Broader programmes to support energy efficiency upgrades, either through regulatory measures or financial incentives, have important benefits for lowering energy bills and supporting affordability across the general population. Financial incentives, in particular, help households manage the upfront costs of renovations or home/appliance upgrades, which then reap generous paybacks through savings on energy bills. As Japan has demonstrated, such measures can result in increased availability of energy-efficient equipment and materials, thereby lowering costs of adoption and supporting the case for more stringent standards. Nonetheless, lower-income households face more barriers in accessing these benefits due to a number of factors, including information asymmetries or more difficulty financing upfront costs (despite cost reductions from financial incentives). Therefore, offering financial incentives for home renovations or other energy efficiency measures on a graduated scale, where low-income households receive higher levels of support compared to higher-income homes, can support more progressive outcomes. For example, France's MaPrimeRénov' sets several thresholds of eligibility based on income level and size of households, in order that the lowest and most disadvantaged households receive the largest share of benefits.

- **Simplify application processes and lower logistical barriers to accessing programmes.**

Despite the energy cost savings that energy efficiency measures can bring for households, many households do not choose to undertake changes. Often, administrative procedures for accessing programmes, such as onerous paperwork or complex reporting requirements, serve as impediments. In other cases, access to energy consultants or contractors is a restraint as are the time and effort required to co-ordinate with them. Several countries have implemented solutions within the design of their programmes to help mitigate the impact of such barriers. For example, the Canada Greener Homes Affordability Program has a "Direct Install" approach under which programme administrators deal directly with contractors and oversee applications and verifications, pay the full cost of retrofits directly to contractors, and manage the logistical implementation of retrofits. This means that households have only a single point of contact to manage the work. Elsewhere, France set up the France Rénov' free, one-stop shop for building renovations as a legal obligation to simplify the ability of households to undertake renovations under the flagship MaPrimeRénov' programme.

- **Ensure robust monitoring of programmes and tracking of results to avoid escalating costs and to preserve value for investments.**

The fiscal sustainability of programmes is crucial to their ability to reach the maximum number of households. In this regard, it is essential to ensure a strong monitoring and evaluation of energy efficiency programmes to support value for money, curb inflationary pressures within programmes and keep housing costs down. Under the original framework of Italy's Superbonus, for instance, the highly generous payments

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reduced incentives for prioritising cost savings in renovations and limited resources available to verify claims led to ballooning costs for the state budget. Meanwhile, the United Kingdom closely monitors the ECO4 scheme through supplier reporting, government audits and third-party assessments, allowing for regular updates and improvements to the scheme over time to help guarantee the desired outcomes. Germany undertakes similar monitoring under its Federal Funding Programme for Efficient Buildings.

- **Pursue regular evaluations of programmes and implement improvements through an iterative approach.**

Effective policy programme design often requires an iterative approach that creates room for evaluation and improvement. Importantly, programmes that prove effective for supporting energy efficiency uptake among the broader population can then be narrowed in scope to give higher priority to low-income households, as Germany did under its 2021 BEG programme, by introducing in 2024 a sub-category that funds renewable energy heating systems based on income level. Both France and the United Kingdom implemented their energy supplier obligations under a phased approach, with the option to pursue reforms under each subsequent phase to better target low-income households. For instance, France increased the energy poverty sub-target under each implementation period of its White Certificate Scheme. Japan is similarly pursuing a phased approach to building standards and Top Runner standards to implement gradual upgrades. Italy has undertaken a number of changes to its Superbonus programme in a short period to manage the programme's fiscal impact and to better target the benefits to those most in need.

- **Leverage local partners in programme implementation.**

Low-income households can often be the hardest to reach for energy efficiency measures. Moreover, the federal government's reach at the local level, where implementation takes place, can be limited. Therefore, partnering with local entities for outreach and implementation, leveraging their existing expertise and relationships, can help expand the reach of programmes and better target local efforts. Local governments can also offer an important source of supplementary funding that in aggregate can promote more effective cost support for consumers. For instance, Canada offers a federal funding matching programme for provincial or territorial contributions under its Oil to Heat Pump Affordability Program. The programme also partners with Indigenous community groups to more effectively ensure Indigenous inclusion in projects. The Canada Greener Homes Affordability Program also relies on provinces and territories to support implementation. It works with dependable community partners to build trust in the programme and targets communications to underserved populations. Elsewhere, the US Weatherization Assistance Program also uses partner organisations and service providers at the state, tribal and territorial level to vet and implement renovations to low-income homes. States in turn partner with around 800 local agencies for implementation.

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- **Identify opportunities for local job creation, targeting vulnerable or disadvantaged groups.**

Energy transition policies present an important opportunity to improve people's livelihoods by creating jobs. Energy efficiency policies, in particular, offer employment potential for low-skilled workers who can offer advice or undertake renovations based on skills training, thereby benefitting lower-income segments of the population. For example, Germany implements its Stromspar-Check by training people facing long-term unemployment to serve as energy consultants under the programme. The US Weatherization Assistance programme is also estimated to support around 8 500 jobs throughout the country, based on local contractors and technicians that undertake renovation work. Such programmes have spillover effects by promoting local economic development and job creation through manufacturing of materials and equipment needed to implement energy efficiency programmes.

- **Prioritise outreach to low-income and harder-to-reach households.**

Economically disadvantaged communities are often systematically left out of opportunities offered to the broader population. Therefore, trust in government programmes may be lower and access to information and pathways to utilise government programmes can be limited. Therefore, proactive communications campaigns are needed as part of the energy efficiency programmes in order to raise awareness and support more effective implementation. In Canada, the OHPA has dedicated components to increase accessibility and inclusivity within the programme. These include a dedicated application stream for Indigenous populations, a flexible application process that includes both online and offline options to reach people with different digital literacy levels, and the leveraging of local governments to help increase awareness among hard-to-reach populations. The CGHAP also requires that delivery organisations have dedicated communications and outreach to underserved communities.

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