Global Monitoring of Policies for Decarbonising Buildings

Multi-level approach

Policy Highlights

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ABOUT THE POLICY HIGHLIGHTS

The Policy Highlights offer a comprehensive summary of key findings from the 2024 OECD Global Survey on Buildings and Climate. The survey started in September 2023, and 28 countries have participated to date. Participating countries are: Belgium (Flanders), Brazil, Canada, Colombia, Costa Rica, Ivory Coast, Finland, France, Germany, Greece, Iceland, Israel, Italy, Japan, Korea, Lithuania, Mexico, the Netherlands, Norway, Philippines, Poland, Singapore, Spain, Sweden, Switzerland, Thailand, the United Kingdom, and the United States.

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Decarbonising buildings for a sustainable future

Buildings account for nearly 40% of energy-related CO_2 emissions worldwide, making them a primary target for reducing greenhouse gas emissions (UNEP, 2022[1]). In the face of rapid urbanisation - with an estimated 2.5 billion more people expected to live in urban areas by 2050 – much of the demand for new buildings will be in and around cities. Without sustainable solutions, the building sector will exacerbate carbon lock-in, further contributing to climate change (UNDESA, n.d.[2]).

The benefits of decarbonising buildings go beyond reducing greenhouse gas emissions. Studies show that for every million dollars spent on energy-efficiency initiatives, up to 30 jobs can be generated (IEA, 2020[7]). Additionally, improvements in energy-efficiency can help alleviate energy poverty, with a 1% efficiency gain correlating to a 0.21% reduction in energy poverty rates (CEB, 2019[8]). Moreover, enhancing energy-efficiency in buildings has been linked to improved public health outcomes, as evidenced by lower blood pressure among residents following energy-efficient renovations in Japan (Umishio et al., 2022[9]).

Yet, the process of decarbonising buildings presents multifaceted challenges that require customised approaches catering to the specific characteristics of the building stock.

For existing buildings, renovating the old building stock is a key task. In the EU alone, buildings constructed before 1945 account for 23% of all building stock. In buildings with multiple owners, additional complexities arise due to potentially conflicting interests. Reaching agreement on renovation plans can also be further complicated by "split incentives", where owners might be reluctant to finance energy-saving upgrades that primarily benefit tenants through lower utility bills (OECD, 2022[6]). To overcome these hurdles, it is essential to secure political buy-in and provide government support through grants, tax breaks, and targeted policies.

For new buildings, it is crucial not only to incorporate energy-efficiency measures, but also to minimise the carbon footprint upfront, notably of construction materials. To reduce the overall negative environmental impact, governments need to prioritise low-carbon materials from the start and take into account the building's entire life cycle.

Effective collaboration across all levels of government is critical.

Decarbonising buildings is a shared responsibility across global, national and local scales:

At the global level, setting overarching goals and standards, alongside sharing best practices, is key to support countries in implementing effective measures. For instance, the European Green Deal aims to achieve carbon neutrality by 2050, and initiatives such as the Fit for 55 packages and REpowerEU seek to reduce emissions and enhance energy security. Moreover, the revised Energy Performance of Buildings Directive (EPBD) focuses on renovating the worst-performing buildings and mandates all new EU buildings to be zero-emission by 2030 (European Parliament, 2024[7]).

At the national level, the involvement of numerous ministries, each with its own set of prerogatives and responsibilities, calls for policy coherence and co-ordination. The pursuit of energy-efficiency in buildings cuts across many different policy domains, encompassing energy, environment, housing, building regulations, and urban development strategies. According to the 2024 OECD Global Survey on Buildings and Climate, 93% of responding countries have at least three ministries involved in decarbonising buildings. Through collaborative efforts, these diverse policy domains can create synergies and overcome potential discrepancies, ultimately leading to a more sustainable built environment.

At the local level, cities and regions need to significantly upscale their strategies and actions towards decarbonising buildings. Cities and regions deliver 69% of climate-significant public investment (OECD, n.d.[3]) and hold critical prerogatives over policies in the built environment, especially in terms of building regulations and financial incentives. This is even more critical in large metropolitan areas, such as Tokyo, Paris and New York, where buildings account for 73%, 71% and 68% of their respective total emissions (Tokyo Metropolitan Government, 2022[4]; Ville de Paris, 2020[5]; NYC Mayor's Office and Environmental Justice, n.d.[6]).

Number of ministries/agencies responsible for policies related to the decarbonisation of buildings

2 ministries/agencies in...

Greece, Poland, Spain

3 ministries/agencies in...

Japan, Korea, Lithuania, Norway, United Kingdom, United States

4 ministries/agencies in...

Canada, Colombia, Costa Rica, Ivory Coast, Finland, France, Germany, Italy, Mexico, The Philippines, Singapore, Switzerland, Thailand

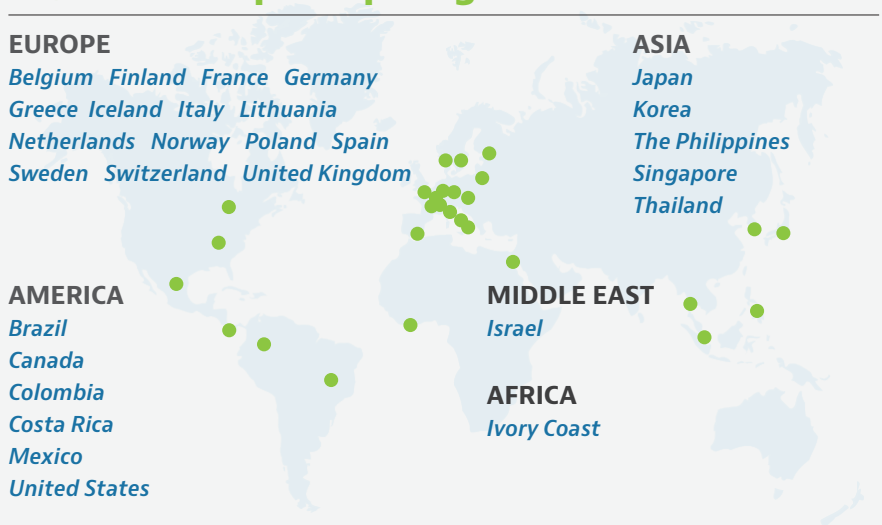
4+ ministries/agencies in...

Belgium, Brazil, Iceland, Israel, Netherlands, Sweden

2024 OECD Global Survey on Buildings and Climate

The OECD conducted a Global Survey on Buildings and Climate to collect cutting-edge and comparable data and information across 28 countries, while accounting for their varying economic sizes, geographical characteristics and governance structures. Drawing on preliminary findings, the Policy Highlights consolidate overarching insights, and offer more detailed country-specific snapshots on the policy landscape of the building sector for each respondent.

28 countries participating



EUROPE
Belgium Finland France Germany Greece Iceland Italy Lithuania Netherlands Norway Poland Spain Sweden Switzerland United Kingdom

ASIA
Japan Korea The Philippines Singapore Thailand

AMERICA
Brazil Canada Colombia Costa Rica Mexico United States

MIDDLE EAST
Israel

AFRICA
Ivory Coast

Goals and tracking system

54% of countries have included building-related commitments in their NDCs

In these countries, Nationally Determined Contributions (NDCs) include commitments to achieve zero-emission buildings, use renewable energy, and reduce whole-life cycle carbon. The commitment to achieving zero-emission in existing buildings is the most widespread theme of sustainability, consistently addressed across all relevant institutional levels and implementation mechanisms (Table 1).

46% of countries have set a target to phase out fossil fuel for heating and cooling buildings

The United Kingdom plans to eliminate fossil fuels from its heating systems by 2050: These plans include phasing out gas boilers by 2035, installing 600,000 heat pumps per year by 2028 and reducing costs of heat pumps by 25-50% by 2025 (making them as affordable to purchase and operate as current natural gas boilers).

Consultations will start on phasing out the most polluting fossil fuels first - oil, coal, and liquefied petroleum gas heating - beginning in 2024 for commercial buildings and in 2026 for homes, to coincide with natural cycles of equipment replacement.

About 39% of responding countries have quantitative targets for the adoption of heat pumps and 32% for rooftop PVs.

However, only 18% of countries have established targets for insulation.

Although broader goals for decarbonising buildings exist, the survey shows that relatively few countries have established quantitative goals for specific decarbonisation measures. About 39% of responding countries have quantitative targets for the adoption of heat pumps and 32% for rooftop PVs. However, only 18% of countries have established targets for insulation (Figure 1).

The Netherlands stands out because it has clear, quantitative targets for specific decarbonisation measures, as illustrated in Figure 2.

60% of countries lack monitoring frameworks to track progress on decarbonisation efforts at the local level

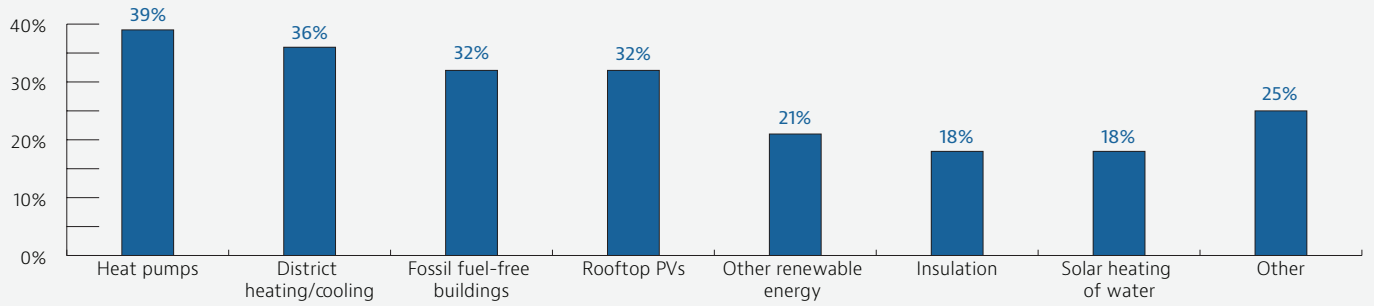
In Korea, the central government launches a "Green Building Co-ordination Support Plan" every four years, which serves as a guideline for local governments to formulate their own green building plans and report back to the central government. Each year, the central government assesses local governments' green building efforts using a national energy database. The three local governments demonstrating the most significant performance receive ministerial awards, encouraging further efforts towards energy reduction. The results of these evaluations are made publicly available on a dedicated website, ensuring transparency and easy access to information.

Table 1. **Policy areas covered in the goals and plans**

	Zero emission for new buildings	Zero emission for existing buildings	Renewable energy for new buildings	Renewable energy for existing buildings	Whole-life carbon reduction
NDC	21%	25%	0%	0%	21%
LT-LEDS	21%	29%	11%	11%	14%
Ministerial plans	14%	18%	11%	7%	11%

Source: OECD Global Survey on Buildings and Climate (2024)

Figure 1. **Quantitative targets included in long-term goals**



Source: OECD Global Survey on Buildings and Climate (2024) *(n=28)*

Figure 2. **Quantitative targets of the Netherlands**

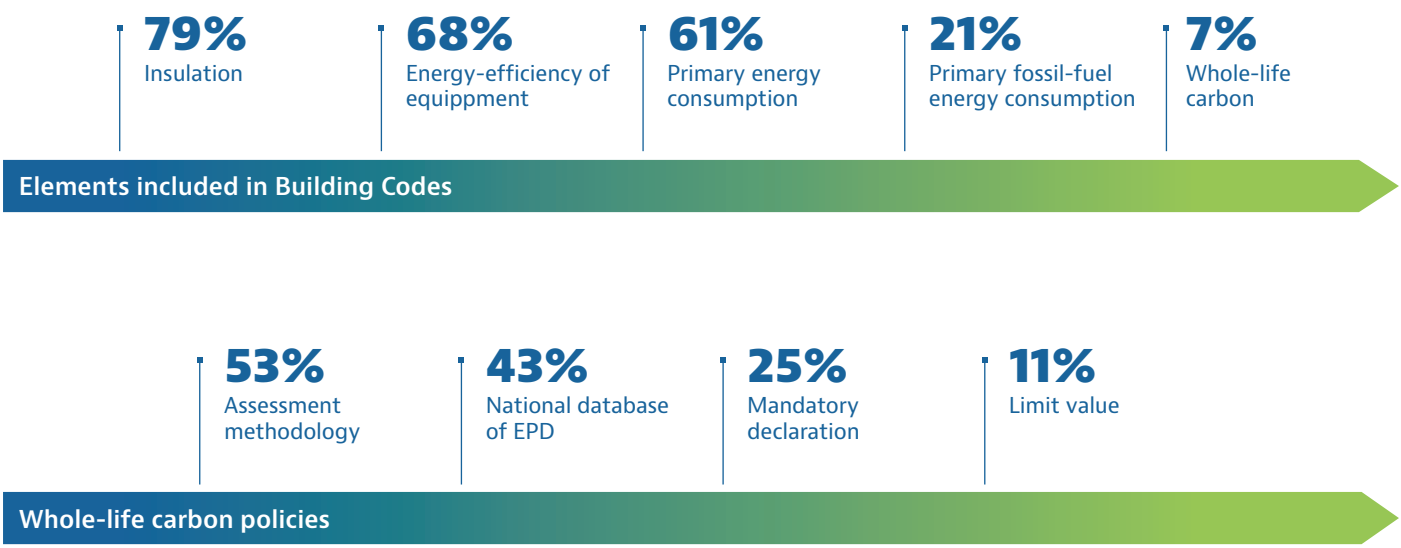
1.5 million
natural-gas free homes by 2030

1 million
hybrid heat pumps
Switch to energy efficient equipment

2.5 million
insulated homes
Reduce heating demand

500,000
households with district heating
Switch to sustainable energy source

Source: Government of the Netherlands (2022), Beleidsprogramma versnelling verduurzaming gebouwde omgeving, https://www.volkshuisvestingnederland.nl/onderwerpen/programma-verduurzaming-gebouwde-omgeving/documenten/publicaties/2022/06/01/programma-verduurzaming



Source: OECD Global Survey on Buildings and Climate (2024)
Note: n=28

Policy measures

Mandatory energy-efficiency code
89%

Financial incentives
86%

Mandatory EPC (Energy Performance Certificate)
61%

Regulation on whole-life carbon
21%

Minimum Energy Performance Standards for existing buildings (mandatory renovation)
18%

Adoption rates for policy instruments vary significantly across countries

The 2024 OECD Global Survey on Buildings and Climate shows that a majority of responding countries have implemented mandatory energy-efficiency codes (89%) and offer financial incentives such as subsidies and low-interest loans (86%). Additionally, 61% have introduced mandatory energy performance certificates or labeling programmes.

Other policies are still in their infancy. For example, only 21% of countries have regulations (mandatory declaration or limit value) on whole-life carbon, and 18% have established minimum energy performance standards (MEPS) that require mandatory renovations.

In terms of building code energy standards, insulation is the most prevalent dimension (79%), followed by equipment efficiency (68%) and primary energy consumption (61%). Yet, primary fossil-fuel energy consumption (21%) and whole-life carbon (7%) are relatively less addressed in legislative and regulatory frameworks.

Regarding whole-life cycle policies, half of responding countries have standardised methodologies for assessing building life cycle GHG emissions. Approximately 43% use national carbon footprint databases or environmental product declarations for building materials and equipment. However, only 25% and 11% have set up mandatory declarations or limit value regulations on life cycle CO_2 emissions, respectively.

53% of countries have put stricter standards on public buildings than on private buildings

In **Lithuania**, since November 2024, newly constructed public buildings must be made of at least 50% wood and organic materials. Additionally, from 2025 onward, public buildings must comply with specific sustainable building schemes such as BREEAM and LEED (Ministry of Environment Republic of Lithuania, n.d.[11]).

In **Singapore**, the GreenGov.SG initiative aims to achieve ambitious targets in carbon abatement and resource efficiency while encouraging green projects. Since 2021, all new and retrofitted buildings in the public sector must meet the Green Mark Platinum Super Low Energy ("SLE") standard, which represents the highest level of energy performance in Singapore. To date, 39 buildings have achieved this standard, achieving at least 60% energy savings compared to 2005 levels (Ministry of Sustainability and the Environment of Singapore, 2022[12]).

In **Brazil**, since 2014, new federal buildings and renovations exceeding 500m² must attain level A in the National Label of Energy Conservation for Buildings. Additionally, as per Ordinance 23 of 2015, federal institutions must develop Sustainable Logistic Plans, ensuring that building maintenance procurement prioritises energy, water, and paper savings, among other sustainable strategies (Ministry of Mines and Energy of Brazil, 2020[13]).

Cost for new measures is the main challenge for new buildings

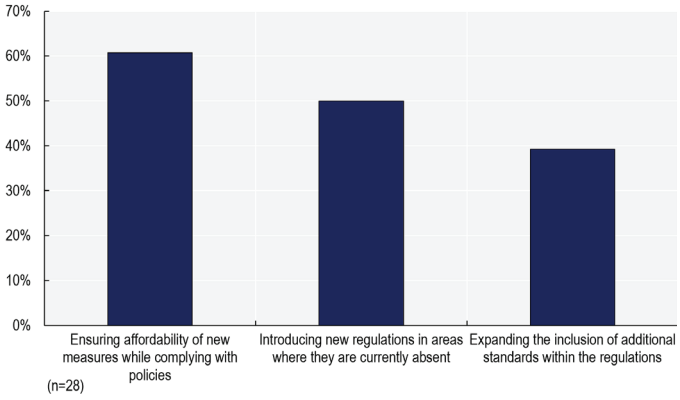
The introduction of regulations for new buildings presents significant challenges, including from a financial, investment and cost-of-living standpoint. According to 60% of responding countries, the most significant challenge lies in making new measures economically feasible for residents while still complying with requirements (Figure 3).

A lack of enabling conditions and established standards further hinders the implementation of new regulations in many countries. Bridging this gap requires not only formulating the regulations, but also creating the necessary infrastructure and ensuring compliance. For example, integrating whole-life carbon assessments into building regulations is difficult without prior knowledge on life cycle carbon evaluations or access to relevant databases.

In response to such gaps and the complexity of implementing whole-life carbon measures, some countries are taking an incremental, step-by-step approach.

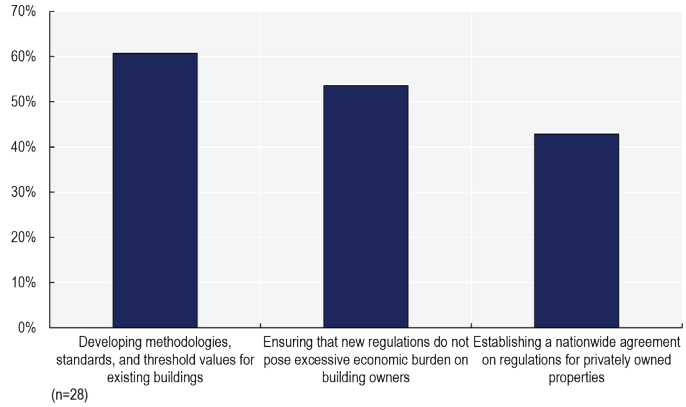
54% of countries have started developing life cycle assessment (LCA) methodologies and 46% countries have worked on developing LCA databases. Some countries – notably Finland, France, the Netherlands, Norway and Sweden – which started this process earlier, have put in place concrete measures such as declaration and limit value requirements addressing the whole-life carbon of buildings (Table 2). Table 3 provides a detailed overview of the specific LCA regulations in these countries.

Figure 3. **Top 3 challenges in regulatory measures for new buildings**



Source: OECD Global Survey on Buildings and Climate (2024)

Figure 4. **Top 3 challenges in regulatory measures for existing buildings**



Source: OECD Global Survey on Buildings and Climate (2024)

Table 2. Incremental measures for whole-life carbon

LCA methodology	LCA database	Mandatory declaration	Limit value
Costa Rica, Finland, France, Germany, Israel Italy, Japan, the Netherlands, Norway, the Philippines, Poland, Singapore, Sweden, Switzerland, Thailand	Brazil, Costa Rica, Finland, France, Germany, Japan, the Netherlands, the Philippines, Poland, Sweden, Switzerland, Thailand, the United States	Finland, France, Italy, the Netherlands, Norway, Sweden	Finland, France, the Netherlands

Source: OECD Global Survey on Buildings and Climate (2024)

Table 3. Examples of whole-life carbon regulations in countries

Category	Finland	France	The Netherlands	Norway	Sweden
Year	2025	2022	2018	2023	2022
Regulation / Standards	Building Act	RE2020	MPG	TEK17	Climate Declaration 2022
Target Buildings	New buildings	New residential and office, and education buildings	New residential buildings, and offices	New buildings, Renovation for existing buildings	New buildings
Upfront carbon / whole-life carbon	Whole-life carbon	Whole-life carbon	Whole-life carbon	Upfront carbon	Upfront carbon
Regulatory measures	Declaration, Limit value	Declaration, Limit value	Declaration, Limit value	Declaration	Declaration

Source: OECD Global Survey on Buildings and Climate (2024)

Regulatory challenges in accelerating renovation

Meeting climate goals in the building sector requires renovating buildings at unprecedented rates and depths. Recognising the importance of accelerating renovation, the proposed revision of the EU's Energy Performance of Buildings Directives has introduced Minimum Energy Performance Standards (MEPS). The goal of MEPS is to eliminate the worst-performing buildings by setting a future compliance date or using trigger points such as the sale or rental of the property (European Commission, 2021[18]; RAP, 2023[19]).

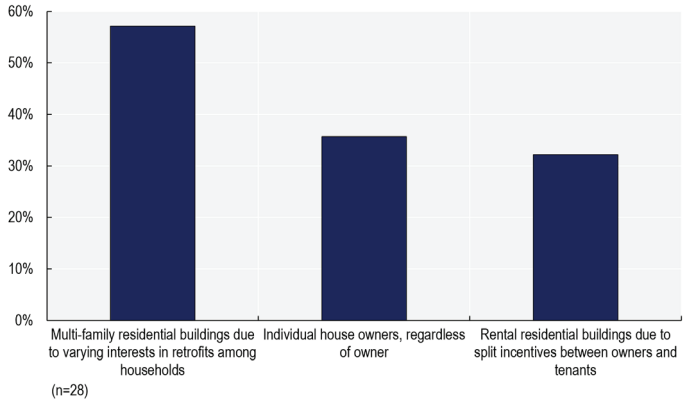
According to the 2024 OECD Global Survey on Buildings and Climate, only 18% of countries currently have such MEPS for existing buildings. The top three challenges to introducing MEPS identified by respondents are: i) the development of tailored methodologies and standards for diverse types of buildings (61%), ii) ensuring that the regulations do not impose financial burdens on building owners (54%); and iii) securing nationwide consensus on regulations for privately owned buildings (43%) (Figure 4).

Introducing MEPS to renovate the worst-performing building stock demands a careful and incremental approach to ensure that businesses and communities can progressively and smoothly adapt to change. Consequently, just like the implementation of LCA, countries that have already introduced MEPs have proceeded with incremental regulations, accompanied by a clear roadmap (Table 4).

Furthermore, financial incentives can play a key role in encouraging deep retrofits in various types of buildings. According to the results of the survey, multi-family residential buildings are particularly in need of such incentives. The initiation of retrofit projects in these buildings often face challenges due to differing interests among households. Similarly, individual homeowners, regardless of their ownership status, need financial support to manage the considerable costs associated with deep retrofits. Furthermore, rental residential buildings encounter a complex situation with split incentives between owners and tenants. This situation underscores the importance of financial incentives in bridging this gap and facilitating retrofits to improve energy-efficiency and sustainability (Figure 5).

In response to this intricate challenge of split incentives, Germany is implementing a carbon pricing strategy that applies to both landlords and tenants, proportionate to the carbon footprint of their buildings. This approach aims to incentivise renovations by assigning a larger portion of the carbon tax to landlords of less energy-efficient buildings that have higher carbon footprints, while tenants contribute a smaller portion (Federal Ministry for Economic Affairs and Climate Action of Germany, 2022[22]).

Figure 5. Top 3 types of buildings that need financial incentives the most to encourage deep retrofits



Source: OECD Global Survey on Buildings and Climate (2024)

Table 4. Examples of countries with Minimum Energy Performance Standards (MEPS) for existing buildings

Category	France	England, Wales	Netherlands
Target buildings	1) Residential buildings for rent 2) Tertiary buildings	1) Residential buildings 2) Non-residential buildings	Office buildings
Trigger points	1) Rent for residential buildings 2) Annual reporting for tertiary buildings	Rent, Date (1 April 2018, 1 April 2020, 1 April 2023)	Date (1 January 2023)
Minimum Energy	1. **Residential buildings:** In metropolitan France, to be eligible for rent, a dwelling must: · *From January 2023, final energy per square meter of living space per year, is less than 450 kWh/m² ;* · *From January 1, 2025, have at least a class F ;* · *From January 1, 2028, have at least a class E ;* · *From January 1, 2034, have at least a class D .* 2. **Tertiary buildings:** Éco Énergie Tertiaire mandates a progressive reduction of final energy consumption for the entire tertiary sector by at least -40% by 2030, -50% by 2040, -60% by 2050, compared to a reference year chosen by the owner or lessee, between 2010 and 2019.	1. **Residential buildings:** Since 1 April 2018, private landlords may not rent domestic properties on new tenancies to new or existing tenants if the Energy-efficiency Certificate (EPC) rating is below E (unless an exemption applies).From 1 April 2020 the prohibition on renting F and G properties will extend to all relevant properties, even where there has been no change in tenancy. 2. **Non-residential buildings:** Since April 1, 2018, non-domestic landlords could only grant new tenancies or extend/renew existing ones if their property had at least an EPC E rating, unless exempt. Starting April 1, 2023, this requirement applies to all privately rented non-domestic properties, regardless of tenancy changes.	Since 2023, every office building in the Netherlands larger than 100m² is required to have at least energy label C (the use of energy with a primary fossil energy in an office building is no more than 225 kWh per m² per year). This applies to existing buildings.

Source: OECD Global Survey on Buildings and Climate (2024)

Countries have different policy priorities based on climate and building conditions

Heating and cooling needs differ across countries

Several factors contribute to the diverse approaches taken by countries in terms of decarbonising buildings. Per capita emissions from space heating and cooling vary significantly across countries, influenced by factors such as the climate (represented by heating and cooling degree days) and the energy-efficiency of their heating and cooling systems in place.

Countries tailor their heating and cooling strategies according to their specific climatic conditions. Table 5 categorises countries into three groups based on their priorities: i) countries that prioritise heating (i.e., Finland, Sweden), ii) countries with emphasis on both heating and cooling (i.e., Greece, Japan, Spain), and iii) countries that focus primarily on cooling (i.e., Brazil). In general, countries prioritising heating tend to report considerably higher per capita emissions associated with space heating compared to those linked to cooling (i.e., Germany, France, Finland).

Conversely, countries focusing on both heating and cooling display comparable per capita emission levels for both space heating and cooling (i.e., Japan, Greece) (Figure 6).

Variations in building stock age and rates of new construction also explain differing approaches to decarbonisation efforts

Countries such as Japan, Canada, and Mexico prioritise new buildings due to their high rates of new construction, and comparatively fewer existing older buildings than other countries. In such countries, decarbonisation policies are essential to prevent the long-term lock-in of buildings dependent on fossil fuels, especially given their extended expectancy. Conversely, other countries such as Finland, Italy, and the United Kingdom prioritise existing buildings, as they have lower annual rates of construction, and a significantly higher share of old residential buildings. In the EU, 65% of existing buildings were constructed before 1980 and buildings built before 1945 leak 5 times more energy than modern ones (Figure 7 and 8).

Despite the challenges posed by their energy demand, some countries have made significant efforts to decarbonise buildings

Countries such as Canada, Finland, and Sweden have managed to reduce their heating emissions over the past two decades, although their colder climates naturally result in higher demands for heating (Figure 9).

Table 5. Clustering of countries according to heating or/and cooling priorities (current focus)

Priorities	Country
Heating	Belgium, Canada, Finland, France, Germany, Iceland, Italy, Lithuania, Netherlands, Norway, Philippines, Poland, Sweden, Switzerland, United Kingdom, United States
Heating & cooling	Colombia, Greece, Japan, Spain
Cooling	Brazil, Costa Rica, Ivory Coast, Israel, Mexico, Singapore, Thailand

Source: OECD Global Survey on Buildings and Climate (2024)

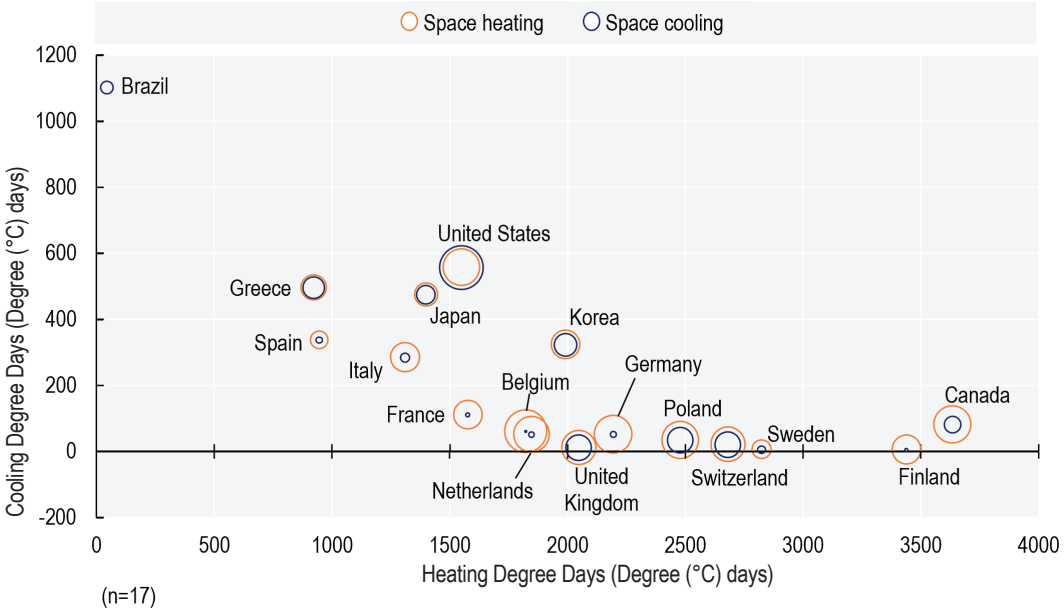


Figure 6. **Residential space heating and space cooling emissions per capita** (2021)

Source: OECD Global Survey on Buildings and Climate (2024)

Note: The reference degree for Heating Degree Days is 16 degrees (°C). The reference degree for Cooling Degree Days is 21 degrees (°C).

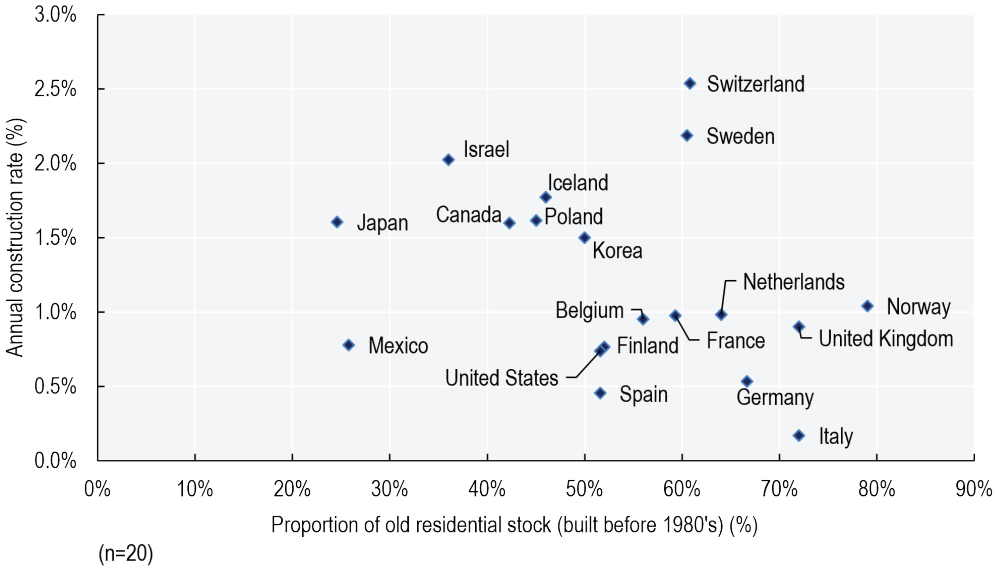


Figure 7. **Old residential building stock and annual construction rate**

Source: OECD Global Survey on Buildings and Climate (2024)

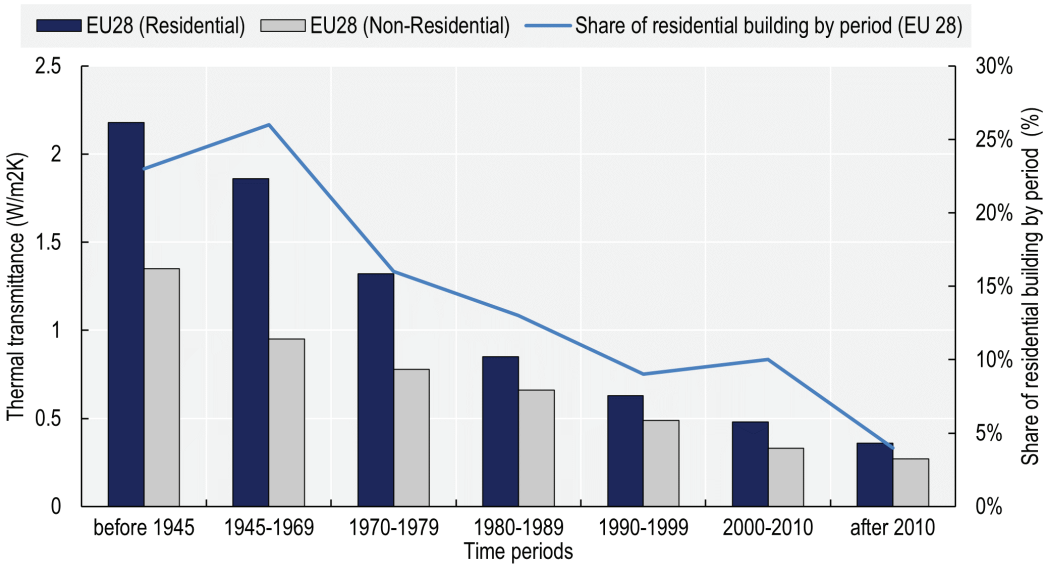


Figure 8. **Thermal transmittance value of external wall by building age** (W/m²K), 2017

Source: EC, EU Buildings Database, https://ec.europa.eu/energy/eu-buildings-database_en

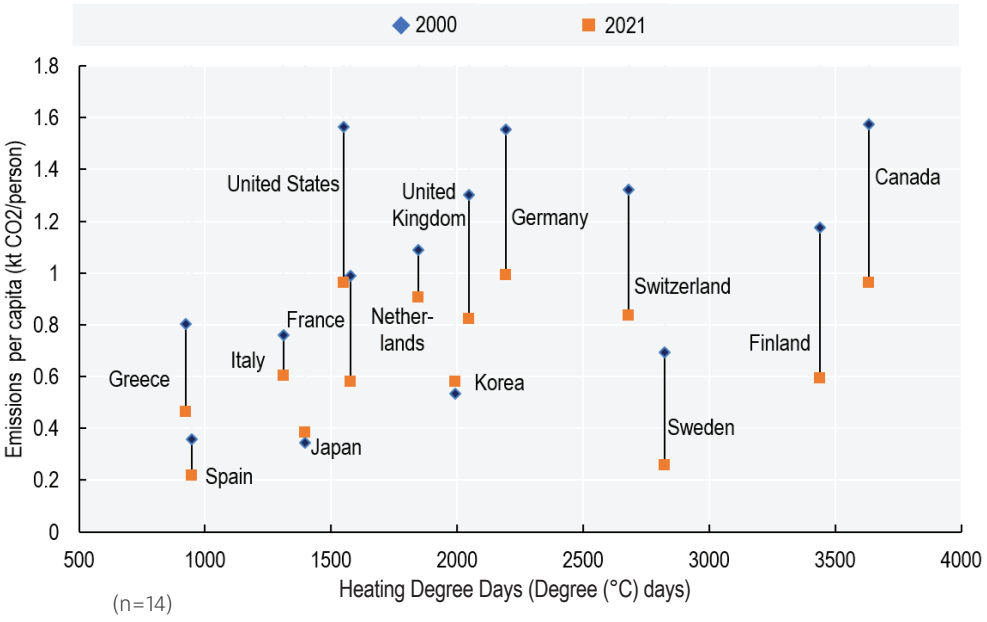


Figure 9. **Residential space heating emissions per capita** (2000 and 2021)

Source: IEA (2023), Energy End-uses and Efficiency Indicators Data Explorer, IEA, Paris https://www.iea.org/data-and-statistics/data-tools/energy-end-uses-and-efficiency-indicators-data-explorer; IEA (2023), Weather, Climate and Energy Tracker, IEA, Paris https://www.iea.org/data-and-statistics/data-tools/weather-climate-and-energy-tracker

Note: The reference degree for Heating Degree Days is 16 degrees (°C). The reference degree for Cooling Degree Days is 21 degrees (°C).

Existing buildings

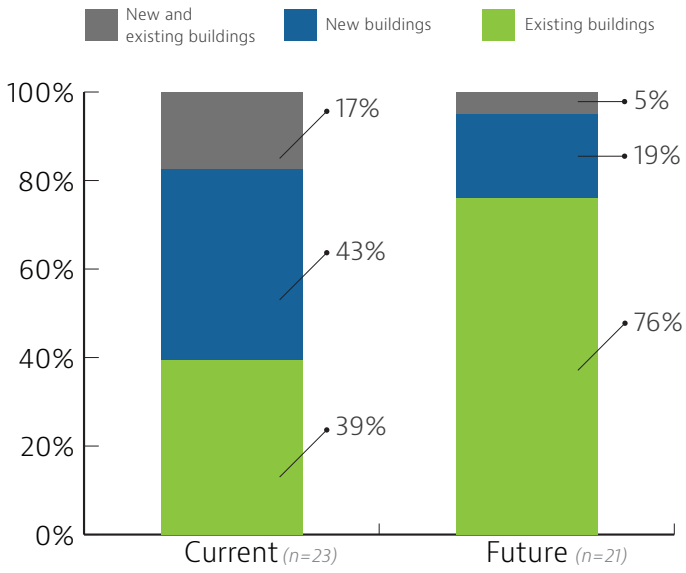
76% of countries have reported that they will prioritise existing buildings over new ones in the future.

Looking to the future, 76% of responding countries have indicated a shift in focus towards prioritising existing buildings. This marks a significant surge from the current share of 39%. Conversely, the proportion of surveyed countries that will prioritise interventions for new constructions in the future is set to decline, with only 19% compared to the current 43% (Figure 10).

Countries that shift from prioritising new buildings to existing buildings:

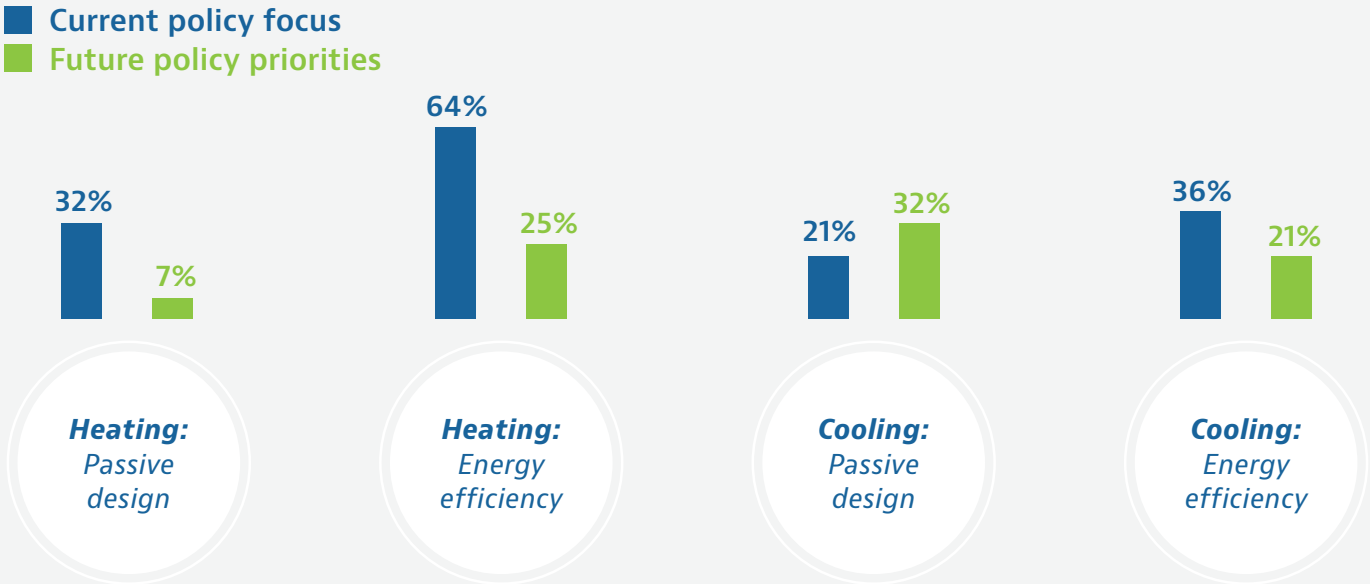
- *Belgium (Flanders)*
- *Canada*
- *Colombia*
- *Costa Rica*
- *France*
- *Israel*
- *Japan*
- *Lithuania*
- *The Philippines*
- *Singapore*
- *Spain*
- *Thailand*

Figure 10. **Policy priorities on new and existing buildings**



Source: OECD Global Survey on Buildings and Climate (2024)

Shift of policy priorities



Embodied carbon & circularity

Countries are planning on putting a stronger focus on the embodied carbon and the circularity of building materials in future policies.

Our survey discerns the following trends as the foremost shifts in policy priorities:

There is a notable surge in the emphasis placed on embodied carbon, which has risen from 14% to 43%, alongside a substantial increase in prioritising circularity of building materials, rising from 11% to 68%.

Cooling

14% of countries are shifting their focus from heating to cooling

Certain countries are reorienting their focus from heating to cooling in future (e.g. Finland, France, Italy, and the United Kingdom). The emphasis on passive design aimed at reducing cooling demand increases from its current level of 21% presently to 32% in the future. The exponential surge in cooling degree days underscores the need to redirect attention towards cooling methods, especially within urban areas, to address the challenges posed by climate change and urban heat island effects (Figure 11 and 12).

Figure 11. **Significant increase of Cooling Degree Days over the past 40 years in EU cities**

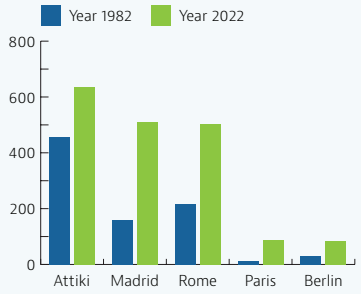
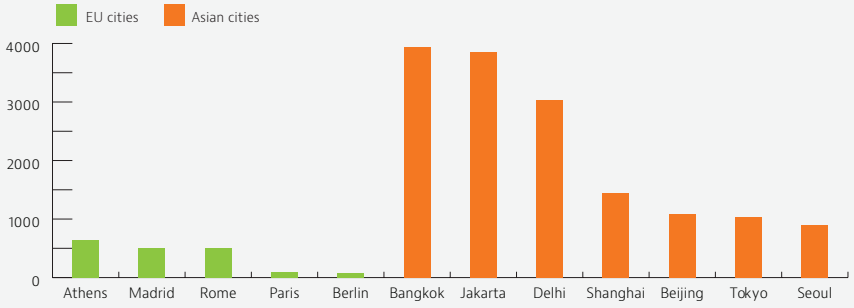
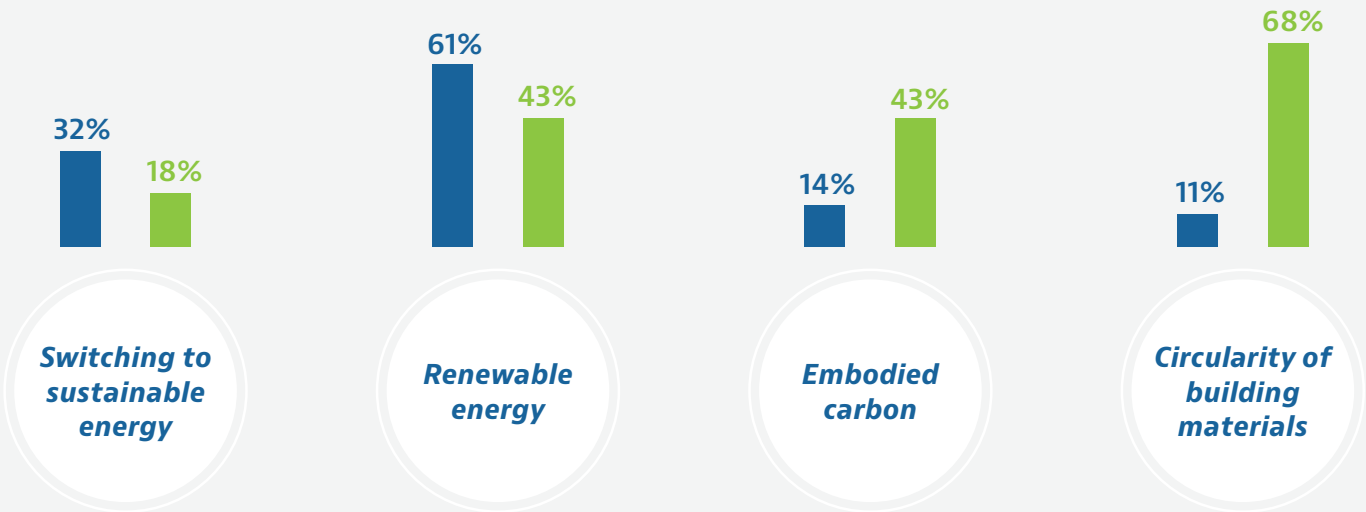


Figure 12. **Cooling Degree Days in EU and Asian Cities in 2022**



Source: OECD calculations based on Eurostat (2023), Cooling and heating degree days by NUTS 3 regions – annual data; Japan Meteorological Agency (2024), World Weather Data Tool, https://www.data.jma.go.jp/gmd/cpd/monitor/dailyview/graph_mkhtml_d.php?&n=48455&p=183&s=7&r=0&y=2022&m=7&d=2&e=0&k=0



Public-Private Partnerships

More than half (54%) of responding countries have set up government funding programmes to help small and medium-sized businesses (SMEs), but further support is needed.

Stricter energy codes require skilled contractors and sufficient funds for new building projects and renovations. With 68% of countries facing a shortage of skilled labour, national governments are stepping in to provide training and assistance to SMEs in designing zero-energy buildings, installing energy-efficient equipment, and calculating life cycle CO_2 emissions. Public-private partnerships offer a promising avenue for governments to collaborate with private sector entities, tackling resource and labour shortages while ensuring that buildings meet energy standards effectively (Figure 13).

Public-private partnerships also play a pivotal role in enhancing the co-benefits of decarbonising buildings. For instance, the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT) exemplifies this approach through its public-private-academia collaboration. Their research on insulation and health has led to the creation of accessible materials, such as manga, to facilitate broader dissemination of knowledge among SMEs and citizens.

Awareness raising material (manga) in Japan

Source: Ministry of Land, Infrastructure, Transport and Tourism, Japan (2024)

Horizontal co-ordination

Considering the large number of entities involved in the decarbonisation agenda, horizontal co-ordination across ministries and agencies within the government structure is crucial in delineating a cohesive long-term vision and mobilising resources to assist subnational governments.

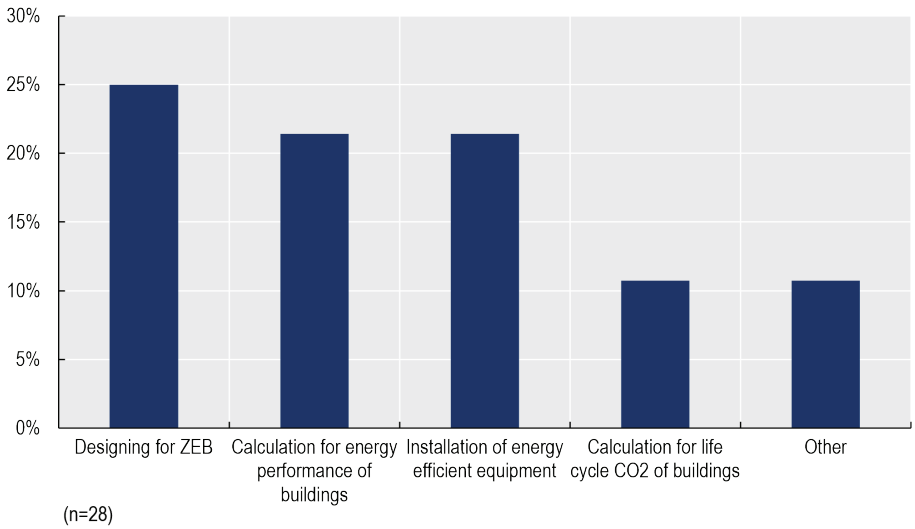
Over half (54%) of responding countries have horizontal co-ordination strategies in place aimed at addressing energy poverty and inequalities through the decarbonisation of buildings.

According to the OECD (2022[6]), national governments can play a vital role in promoting a whole-of-government and multi-level governance approach in decarbonising buildings. This approach is particularly important in addressing the issue of energy poverty in disadvantaged communities, where access to energy-efficient buildings and resources is often limited.

The National Observatory on Energy Poverty in Italy stands as a prime example of horizontal co-ordination.

This institute engages various agencies such as the Ministry of Environment and Energy Security, the Ministry of Labour and Social Policies, the Ministry of Infrastructure and Transport, local governments and the regulatory authority for energy, networks, and the environment. Its functions include monitoring energy poverty at a national level, facilitating the exchange of experiences among regions, local administrations, research institutions, and stakeholders, co-ordinating cohesive strategies to alleviate energy poverty nationwide, and implementing initiatives such as tax relief aimed at incentivising energy-efficient measures for buildings.

Figure 13. **Percentage of countries having government funding programmes to train skills for SMEs**



Source: OECD Global Survey on Buildings and Climate (2024)

Vertical co-ordination

82% of responding countries are supporting local governments.

Key measures include distributing toolkits and guidelines (64%), co-ordinating regional networks for knowledge exchange and support (54%), developing online platforms to share best practices (50%), and providing funding for training (50%).

However, 74% of responding cities think they do not receive enough support from national governments.

According to the OECD Survey on Decarbonising Buildings in Cities and Regions (2022), cities and regions are calling for additional support from national governments to scale up pilot projects and raise public awareness (OECD, 2022[21]). Effective policy implementation requires co-ordinated actions at both national and subnational levels to achieve the desired outcomes and leverage synergies through a whole-of-government and multi-level governance approach.

43% of national governments are implementing neighbourhood approach.

The energy transition in the built environment comes with a range of technical, social, regulatory, and financial challenges that are difficult to foresee in advance. By launching neighbourhood-scale pilot projects, cities can test and refine measures on a smaller scale before implementing them more broadly.

According to the 2024 OECD Global Survey on Buildings and Climate, 43% of responding countries are implementing a neighbourhood approach to test out effective measures. For example, the Netherlands' Programma Aardgasvrije Wijken (PAW) acts as an intermediary between different ministries and local municipalities. The PAW has facilitated collaboration and resource sharing through multi-level governance structures, allowing municipalities to tailor solutions based on their specific local conditions, and helping implement economically and technically viable measures (PAW, n.d.[27]).

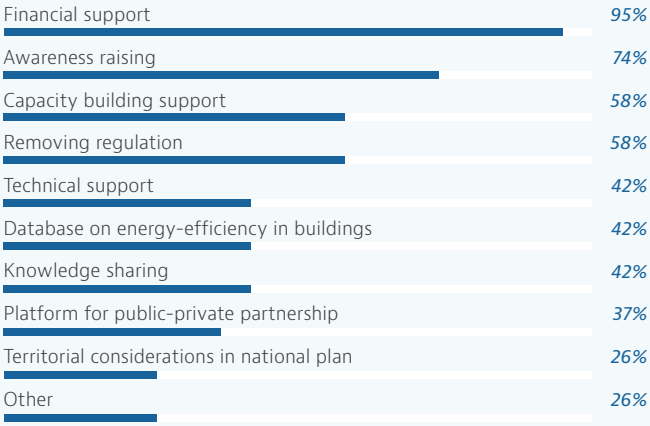
Furthermore, the similarity in building stock within neighbourhoods can lead to economies of scale, making the collective installation of heat solutions more feasible. Leveraging neighbourhood-level communication and social influence encourages behavioural change among residents, while initiatives like neighbourhood ambassadors and dedicated neighbourhood counsellors facilitate effective community engagement and collaboration (OECD, 2023[22]).

Additionally, with funding ranging from EUR 4 to 5 million per neighbourhood, the PAW has provided crucial financial support for the successful implementation of decarbonisation projects (PBL, 2021[28]). Overall, the neighbourhood approach through the PAW has demonstrated the potential for scalable and sustainable solutions to decarbonise buildings.

Actions undertaken by the national government to support local governments in decarbonising buildings

Source: OECD Global Survey on Buildings and Climate (2024) (n=28)

Cities and regions require...



Source: OECD Survey on Decarbonising Buildings in Cities and Regions (2022) (n=19)

The Netherlands' PAW (Natural gas-free neighbourhood programme)

66 pilot neighbourhoods

Multi-stakeholder partnership

Staff are seconded from both national and local officials.

Flexible Funding

Municipalities were given the liberty to allocate the funds according to their own needs.

"Do you think a neighbourhood approach is also useful for insulation, (hybrid) heat pump and PVs?"

84% Yes

5% No

11% Not sure

(n=19)

1. Collective demand, profitable business case
2. Behavioural change, social influence

Source: OECD (2023), Decarbonising Homes in Cities in the Netherlands: A Neighbourhood Approach

Cities are spearheading innovative actions

Cities are leading the charge to decarbonise buildings. According to the 2024 OECD Global Survey on Buildings and Climate, 54% of responding countries reported that **cities are implementing more ambitious policy instruments than their respective national governments.** This reinforces a trend highlighted by the OECD Survey on Decarbonising Buildings in Cities and Regions (2022), which had indicated that 88% of cities and regions are demanding higher energy-efficiency standards than those required at the national level (OECD, 2022[21]).

Buildings are shaped by local conditions such as the climate and available resources. Heating methods depend on factors such as accessible heat sources. District heating is suitable for areas with residual heat from sources like ports or data centers, whereas electrification through solar panels and heat pumps is more feasible elsewhere (OECD, 2023[22]). Policy environments also vary, impacting the effectiveness of policy implementation. Therefore, understanding local contexts is crucial for decarbonising building solutions and enhancing overall urban infrastructure.

54% **of responded countries replied that cities implement more ambitious policy instruments than national government.**

Source: OECD Survey on Decarbonising Buildings in Cities and Regions (2022)

88% **of responded cities/regions are already demanding higher energy-efficiency standards than the national level requires.**

Source: OECD Survey on Decarbonising Buildings in Cities and Regions (2022)

Helsinki (Finland)

Helsinki has implemented limit values on construction 2 years ahead of the national government's 2025 plan. The city applies a limit on the life-cycle carbon footprint of buildings, starting with multi-story apartment houses. Compliance with this carbon footprint limit is now a requirement in new city plans, potentially affecting plot draws and allocations. As of June 20, 2023, building permits must adhere to a limit of 16.0 kg CO_2e/m^2/year over a 50-year period. The calculation, based on the Ministry of the Environment's low-carbon assessment method and Helsinki's instructions, is required during the building-permit phase and updated at the building acceptance stage (City of Helsinki, n.d.[23]).

Vancouver (Canada)

Vancouver is committed to halving carbon emissions from buildings by 2030 compared to 2007 levels. Spearheading this effort, Vancouver has implemented carbon limits for large existing commercial buildings as part of its Zero Emissions Retrofit Strategy (City of Vancouver, 2022[24]). Starting from 2023, commercial buildings exceeding 100,000 square feet are required to report their annual energy use and carbon emissions. Starting from January 2024, this obligation extends to large multi-family buildings of the same size. Subsequently, beginning in June 2026, specific GHG emission limits will be enforced for commercial offices and retail buildings of the same size: 25 kg CO_2e/m^2/year for office spaces and 14 kg CO_2e/m^2/year for retail establishments (City of Vancouver, n.d.[25]).

Tokyo (Japan)

Tokyo uses carbon pricing to drive building decarbonisation via its Cap-and-Trade Programme. Launched in April 2010 by the Tokyo Metropolitan Government (TMG), this programme marks Japan's first mandatory Emissions Trading System (ETS), covering approximately 20% of the metropolitan area's emissions. It targets CO_2 emissions from large buildings, factories, heat suppliers, and other high fossil fuel-consuming facilities. These buildings must reduce emissions below specific baselines, with credits awarded for surpassing reduction targets. In 2021, the programme led to a 33% reduction in emissions from covered facilities compared to base-year levels, an achievement attributed to energy-efficiency measures and the adoption of low-carbon energy solutions. Base-year emissions are calculated as the average over any three consecutive fiscal years selected between 2002 and 2007 (Tokyo Metropolitan Government, n.d.[26]).

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Country Profiles on Decarbonising Buildings

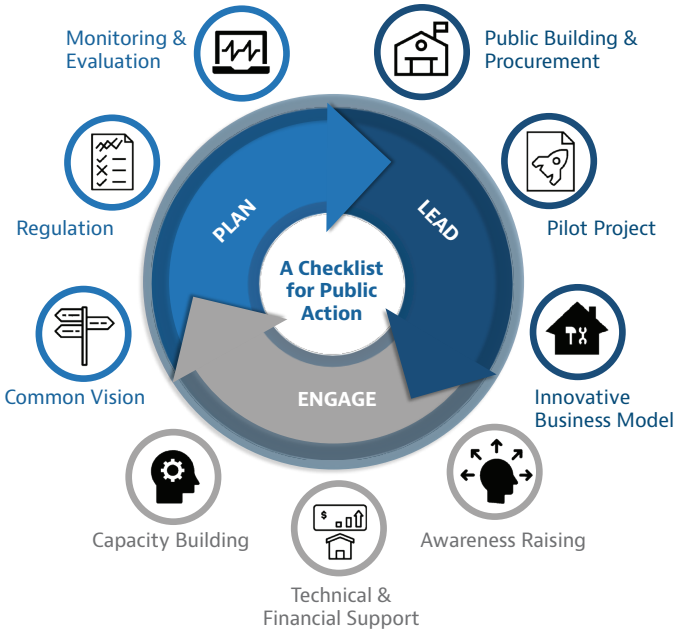
ABOUT THE OECD PROGRAMME ON DECARBONISING BUILDINGS IN CITIES AND REGIONS

The OECD Programme on Decarbonising Buildings in Cities and Regions is dedicated to supporting cities, regions and countries in their efforts to decarbonise buildings. It offers policy analysis and fosters policy dialogues on various topics including energy-efficiency, whole-life carbon, and the digitalisation of buildings.

In 2022, the programme released a synthesis report titled "Decarbonising Buildings in Cities and Regions", providing a comprehensive overview of strategies and best practices, with a policy checklist for both national and subnational governments. Building on this framework, the programme delved into a case study on "Decarbonising Homes in Cities in the Netherlands: A Neighbourhood Approach" published in 2023.

The programme undertook a first-ever global country survey on multi-level policies to decarbonise buildings, the preliminary findings of which were unveiled during COP28 in December 2023, marking a crucial step in the global conversation on building decarbonisation. Further findings of the survey were highlighted at the Global Forum on Buildings and Climate

OECD CHECKLIST FOR MULTI-LEVEL ACTION



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