

OECD Submission to the Sharm el-Sheikh mitigation ambition and implementation work programme

Focus on Cities: buildings and urban systems

March 2024

Together with governments, policy makers and citizens, the OECD works on establishing evidence-based international standards and finding solutions to a range of social, economic and environmental challenges. From improving economic performance and creating jobs to fostering strong education and fighting international tax evasion, we provide a unique forum and knowledge hub for data and analysis, exchange of experiences, best-practice sharing, and advice on public policies and international standard-setting.

The OECD provides this submission in response to the call for inputs on opportunities, best practices, actionable solutions, challenges and barriers relevant to the topic of the global dialogues under the Sharm el-Sheikh mitigation ambition and implementation work programme in 2024. The mitigation work programme provides an important opportunity to raise awareness of available tools and solutions and trigger more effective mitigation efforts in the near-term, as highlighted in previous analysis by the [OECD-IEA Climate Change Expert Group](#). This submission draws on information from published OECD material related to cities, buildings, and urban systems.

For more information, see OECD work on [climate change](#), on [cities](#) and on [urbanisation](#).

Advancing a territorial approach to climate mitigation in cities

This submission sets out arguments on the role of cities in advancing the net-zero transition and presents a ‘Territorial Approach to Climate Action and Resilience’ (TACAR) as a policy framework that can effectively advance climate mitigation in cities, as a contribution to discussions under the global dialogues of UNFCCC mitigation work programme in 2024 on “Cities: buildings and urban systems”.

The decisive impact of cities in inhibiting or advancing the net-zero transition

Cities have a crucial role to play in mitigation efforts. Globally, cities account for two thirds of total energy demand and are responsible for 70% of energy-related CO₂ emissions¹. Without significant climate mitigation efforts, such shares will continue to rise at an alarming pace. Indeed, while 3.5 billion people currently reside in cities worldwide, this number is expected to grow to 5 billion by 2050. This increase will likely see global urban primary energy use grow by around 70% between 2013 and 2050, with global urban CO₂ emissions increasing by around 50% during the same period². According

¹ <https://www.iea.org/reports/empowering-cities-for-a-net-zero-future>

² OECD (2023), A Territorial Approach to Climate Action and Resilience, OECD Regional Development Studies, OECD Publishing, Paris, <https://doi.org/10.1787/1ec42b0a-en>

to OECD data, the GHG emissions from OECD metropolitan areas with more than 500 000 inhabitants grew by 25% from 1990 to 2022³.

It is estimated that local governments alone have the potential to cut up to one-third of GHG emissions in their cities⁴. In part, this is because municipalities are in charge of key policy sectors with direct impacts on reducing emissions, such as urban planning, transportation, water, and waste management. Significantly, such a green transition would provide important co-benefits, as demonstrated by a recent study that around 90% of urban emissions can be cut with existing technologies while at the same time creating more than 45 million jobs by 2050⁵. However, the successful implementation of climate mitigation policies at the city level will require effective co-ordination across all scales of government, especially through the implementation of conducive policy and legal frameworks at the national level.

Adopting a ‘territorial’ approach is key to accelerating climate mitigation at the city-level

Despite the climate emergency, it is widely recognised that policy responses from national and subnational governments are not on track to meet the Paris Agreement’s goals. The main gaps that both national and city governments face include: a siloed approach and related trade-offs, data and knowledge gaps on locally specific GHG emission reduction potential, a lack of integration and engagement of municipalities in national efforts, and capacity gaps within local administrations⁶. Relatedly, the large disparities in the volume and source of GHG emissions across cities illustrate that the pathways to achieving net-zero will differ from city-to-city. As illustrated in Figure 1, the emissions per capita in Ruhr metropolitan area (Germany) are more than 7 times higher than those in the Bogotá metropolitan area (Colombia). In cities like Boston (United States) and Madrid (Spain), the largest share of emissions come from transport, accounting for 29% and 31% of the total emissions, respectively. In contrast, emissions from the buildings sector are the largest in cities like Istanbul (Türkiye) and Rome (Italy), accounting for 38% and 58% of the total emissions, respectively.

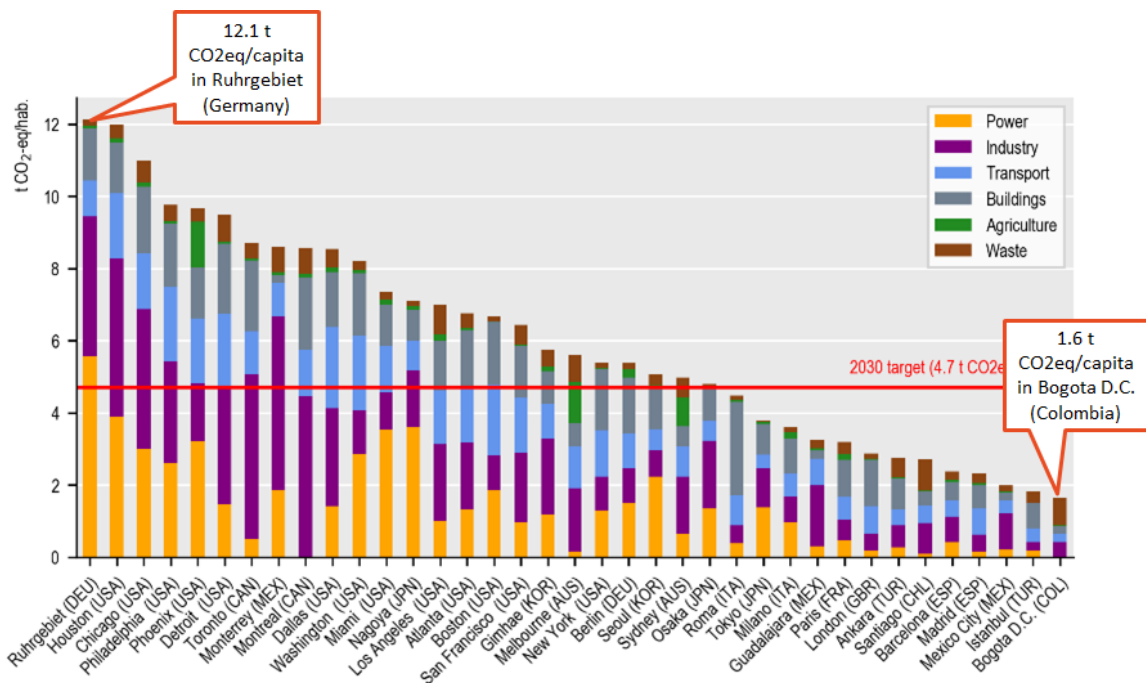
³ Ibid.

⁴ <https://urbantransitions.global/en/publication/climate-emergencyurban-opportunity>

⁵ <https://urbantransitions.global/en/publication/climate-emergencyurban-opportunity>

⁶ OECD (2023), A Territorial Approach to Climate Action and Resilience, OECD Regional Development Studies, OECD Publishing, Paris, <https://doi.org/10.1787/1ec42b0a-en>.

Figure 1 Emissions per capita by sector in OECD metropolitan areas of more than 4 million inhabitants (2022)



Source: OECD computations based on EDGAR (Emissions Database for Global Atmospheric Research) v8.0, EC-JRC IEA, 2023

The OECD argues that adopting a **territorial approach**⁷ to urban climate action and resilience can both improve the effectiveness of national climate policy and accelerate local climate action. A territorial approach can enhance a more granular understanding of local GHG emissions and help seize co-benefits and synergies through cross-sectoral and integrated climate projects that serve multiple policy objectives. These include addressing the needs of the most vulnerable population groups, enabling more efficient public investment, and fostering stronger political buy-in in cities. It can also help shape a policy environment that is more conducive to ambitious climate action from cities and regions in stronger collaboration with upper levels of government. In this regard, regional governments have a crucial role to play as intermediaries between national and local governments.

Given the territorial disparities that exist between cities in terms of their exposure to climate impacts and their varying contributions to GHG emissions, a place-based approach to achieving net-zero is necessary. By developing a comprehensive understanding of context-specific climate change drivers and impacts, cities can increase their climate mitigation potential and efforts.

In spite of the benefits of a place-based approach, recent research illustrates that it has not yet been widely adopted. An OECD analysis⁸ of the latest Nationally Determined Contributions (NDCs) (16 from OECD countries and the European Union) revealed that while most national governments have incorporated local perspectives on climate action in their NDCs, the extent to which they do so varies greatly across countries. Indeed, a limited number of countries have integrated the emissions targets set by their cities into their NDCs, while a moderate number of countries include programmes

⁷ A territorial approach to climate action and resilience is defined as ‘a comprehensive policy framework that integrates a place-based perspective into national and subnational climate policies and mainstreams climate objectives into urban, rural and regional development policies, to effectively drive climate action at all territorial scales (OECD, 2023).

⁸ OECD (2023), A Territorial Approach to Climate Action and Resilience, OECD Regional Development Studies, OECD Publishing, Paris, <https://doi.org/10.1787/1ec42b0a-en>

designed to promote local climate action in their NDCs and have incorporated local governments into the design of their NDCs. Figure 2 illustrates that national governments have room to increase the degree to which they are addressing local issues in their NDCs through a place-based approach.

Figure 2 The role of cities and regions in the latest NDCs in OECD countries and the European Union

	Country	Assessment of cities: Is the role of cities and regions recognised in relation to:		
		GHG emissions reduction commitments	Implementation of local climate action	Engagement in the NDC planning process
Federal countries	Australia			
	Canada			
	Mexico			
	United States			
	Switzerland			
Unitary countries	Chile			
	Colombia			
	Costa Rica			
	Israel			
	Iceland			
	Japan			
	Korea			
	New Zealand			
	Norway			
	Türkiye			
	United Kingdom			
European Union				

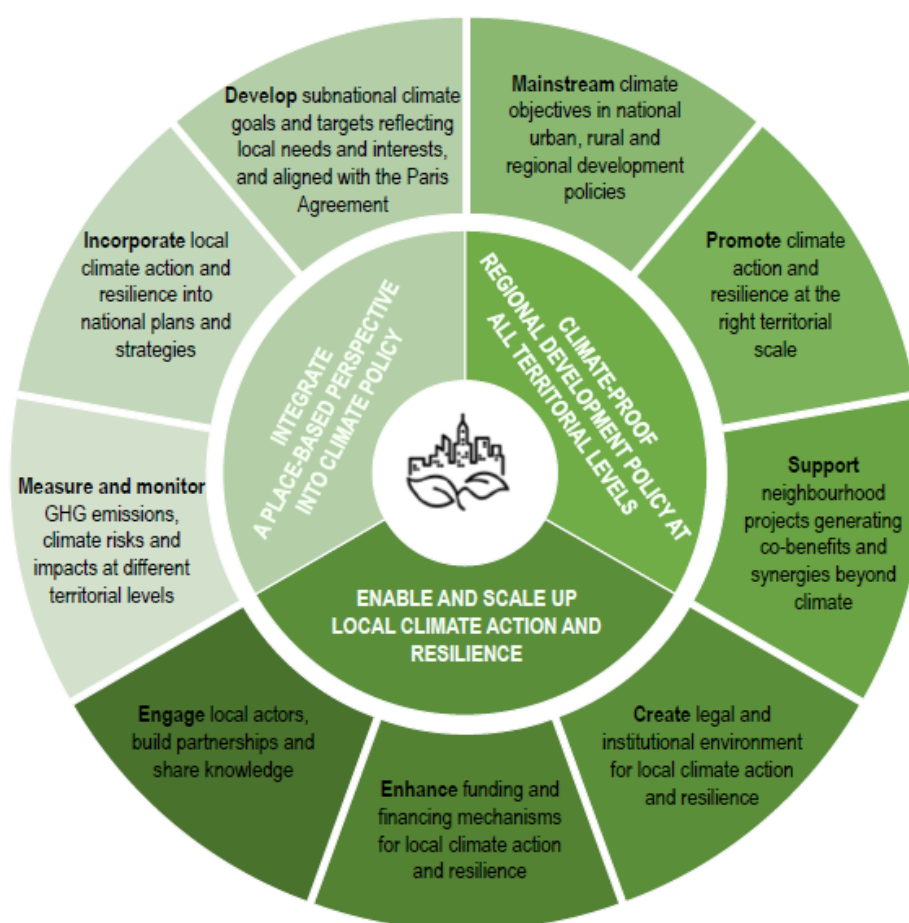
Strong attention;
 Attention;
 No attention

Source: Table derived by OECD authors from the most recent NDCs submitted to the UNFCC as of September 2023

Key actions to accelerate mitigation in cities by applying a territorial approach

The OECD framework on a territorial approach to climate action and resilience (TACAR) provides nine actions that cities could implement in order to accelerate a territorial approach to climate mitigation. These actions are derived from an analysis of 36 best practices, taken from diverse territorial scales across the globe, and are grouped into three overarching categories (Figure 3).

Figure 3 Nine recommended actions to apply a territorial approach to climate action and resilience



Source: OECD (2023), 'A Territorial Approach to Climate Action and Resilience'.

First, national leaders could adopt a place-based approach to urban climate policy as a way of accounting for the diverse opportunities and challenges of cities. In order to generate mitigation policies that are targeted to specific cities, a more granular understanding of local GHG emissions and exposure to climate risks is needed. Cities could strengthen their measuring and monitoring systems to enable the national governments to tailor their policies and strategies across places and redirect funds towards specific localities. In a related way, national policymakers could integrate local climate targets, actions, and perspectives into national climate plans. Further, subnational climate goals and targets must be developed that advance those set forth by the Paris Agreement while being sensitive to local challenges and needs.

Second, national leaders could 'climate-proof' urban development policy in order to increase mitigation at the urban level. This will require that climate objectives be mainstreamed in all urban development policies to limit conflicting interventions and avoid a siloed approach to climate mitigation. At the same time, climate mitigation efforts could be targeted to the functional urban area (FUA⁹) in order to collect highly localised perspectives, integrate land use and transport planning, and promote low-emission spatial development structures. In a similar way, climate mitigation policies

⁹ An FUA is composed of a city and its commuting zone, encompassing the economic and functional extent of cities based on people's daily movements.

that generate co-benefits and synergies at the neighbourhood level could be prioritised so as to maximise support for the most vulnerable communities.

Third, national leaders could enable and scale-up local climate action and resilience. These actions could be delivered by establishing a legal and institutional environment that is conducive to climate action and resilience at the urban level, diversifying funding and financing sources for urban mitigation action, and increasing stakeholder involvement by prioritising local public participation in national climate policymaking.

Applying a territorial approach to decarbonising buildings in cities

Buildings are a major source of energy-related CO₂ emissions, contributing nearly 40% globally. This figure is even more concerning in cities, where buildings account for a staggering share of total emissions: 73% in Tokyo, 71% in Paris, and 68% in New York. With rapid worldwide urbanisation driving demand for new buildings concentrated in and around cities, there is an urgent need for mitigation strategies.

Cities are leading the charge to decarbonise buildings. According to the 2024 OECD Global Survey on Buildings and Climate¹⁰, 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)¹¹, which indicated that 88% of cities and regions are demanding higher energy-efficiency standards than those enforced at the national level.

Buildings are shaped by local conditions such as the climate and available resources. Heating methods depend on local factors such as accessible heat sources. For instance, district heating is suitable for areas with residual heat from sources like ports or data centres, whereas electrification through solar panels and heat pumps is more feasible elsewhere¹². In recognition of such diverse local contexts, applying a territorial approach is therefore crucial for seeking the most effective solutions for decarbonising buildings.

Beyond reducing carbon emissions, decarbonising buildings produces numerous co-benefits, particularly in improving social well-being and enhancing public health outcomes. By increasing energy efficiency in buildings, decarbonisation measures can reduce household energy expenditures and thus alleviate energy poverty. Better insulation can also generate improvements in household health by improving indoor air quality and allowing for adequate indoor temperatures. Further, retrofitting buildings can lead to job creation in the renewable energy sector, thus fostering an equitable net-zero transition. Cities are particularly well-positioned to generate such co-benefits, thanks to their proximity to citizens and their ability to avoid sectoral silos by pursuing integrated solutions.

A territorial approach can also help facilitate collaboration between local and national governments, as illustrated by the development of whole life-cycle carbon assessments (LCAs). While many cities may lack the technical knowledge and resource to carry out LCA assessments of their own, national governments can facilitate their action through the creation national LCA regulations, the development of LCA databases, and the creation of compliance measures. More generally, national

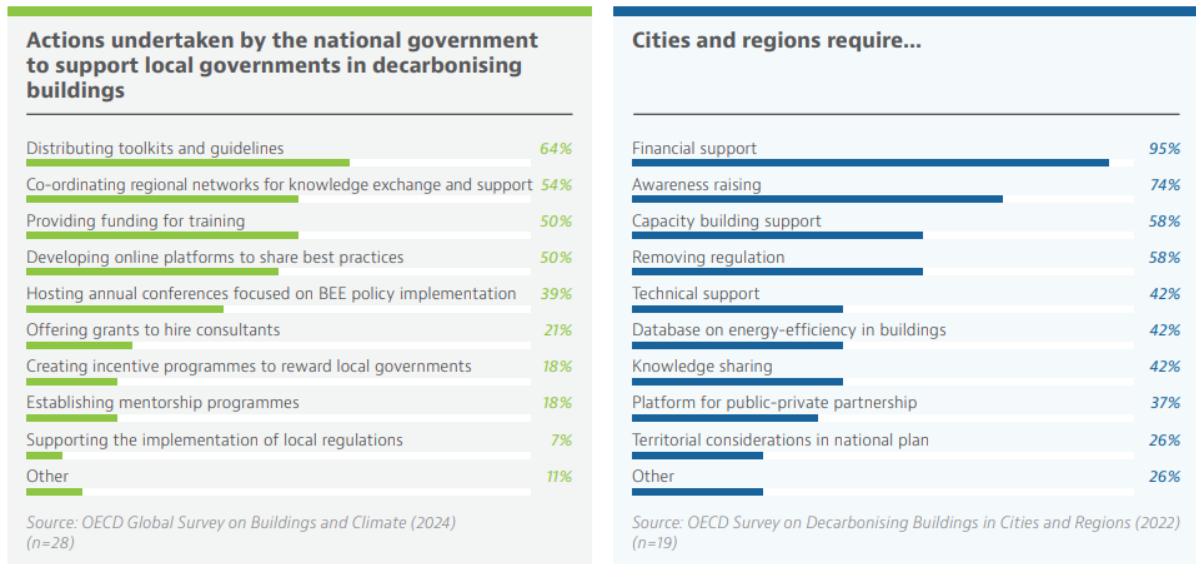
¹⁰ OECD (2024), Global Monitoring of Policies for Decarbonising Buildings: Multi-level approach, Policy Highlights, <https://www.oecd.org/cfe/cities/energy-efficiency-cities.htm>.

¹¹ OECD (2022), Decarbonising Buildings in Cities and Regions, OECD Regional Development Studies, OECD Publishing, Paris, <https://www.oecd.org/publications/decarbonising-buildings-in-cities-and-regions-a48ce566-en.htm>.

¹² OECD (2023), Decarbonising homes in cities in the Netherlands: A neighbourhood approach, OECD Regional Development Studies, OECD Publishing, Paris, <https://doi.org/10.1787/b94727de-en>

policymakers have already taken steps to support cities in their efforts to decarbonise buildings through financial support, knowledge-sharing platforms, and by creating conducive policy and legislative environments that take into account the locally unique and diverse contexts (Figure 4).

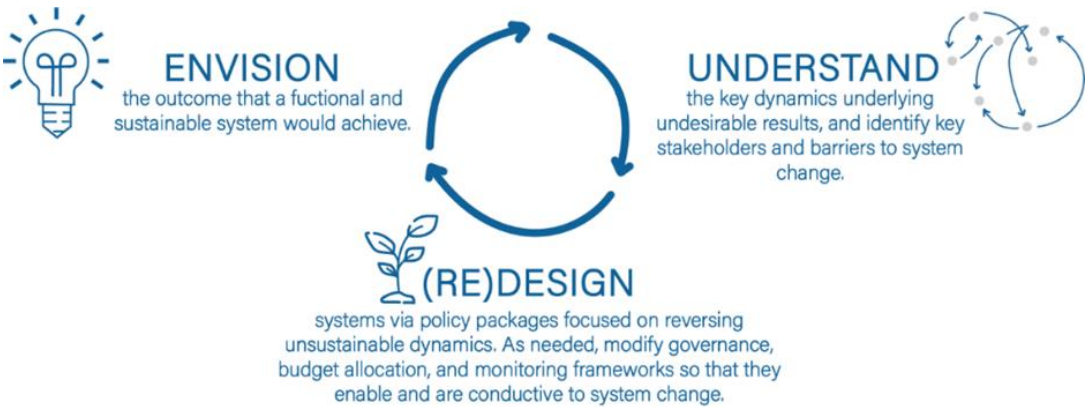
Figure 4 National government’s support to local governments in decarbonising buildings



Systems innovation for net zero in cities and regions

Based on systems thinking insights, the OECD has developed [a 3-step process](#) (Figure 5) to support governments in the identification and implementation of transformative policies to reach net-zero targets. To date, the process has been applied to the passenger transport sector, with a focus on “breaking” the feedback loops underlying car dependency.

Figure 2 Systems innovation for net zero: a 3-step process to identify transformative policies

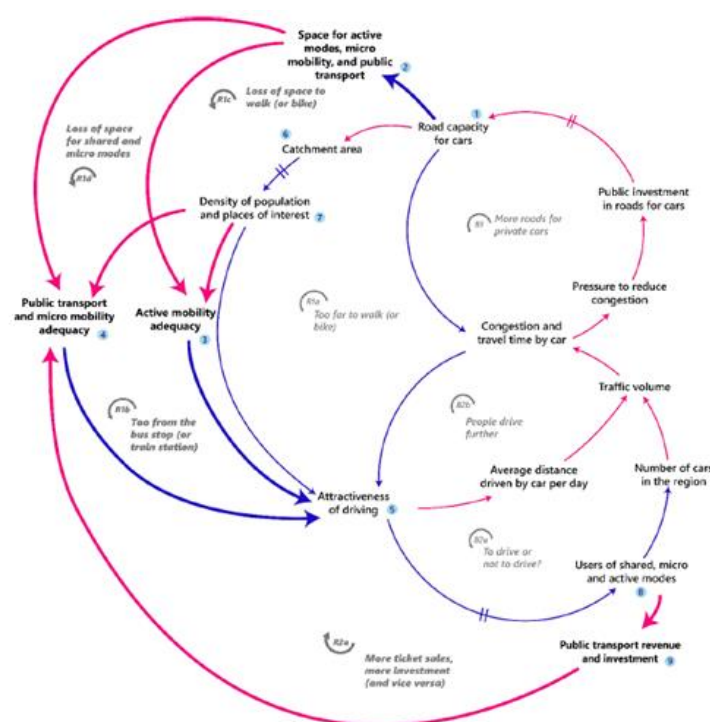


Source: OECD (2021), Transport Strategies for Net-Zero Systems by Design, OECD Publishing, Paris, <https://doi.org/10.1787/0a20f779-en>.

OECD analysis (2022)¹³ (2021)¹⁴ identifies three dynamics underlying car dependency in cities, namely induced car demand, urban sprawl, and a low-attractiveness trap for sustainable transport modes (Figure 6). The analysis also identifies three policies with the potential to “break” such dynamics in urban systems, namely:

- road space reallocation, away from private motorised vehicles and towards active and shared modes. Figure 6 illustrates how the policy can “break” the dynamic of induced car demand;
- the integration between active (incl. micro mobility) and shared modes; and
- communication efforts to increase the public support for the policies’ above.

Figure 6 Systems dynamics underlying car dependency



Note: The coloured arrows show the relationship between variables. A pink arrow between variables means that they vary in the same direction: an increase in a variable leads to an increase in the variable it points at; a decrease in a variable leads to a decrease in the variable it points at. A blue arrow means that variables vary in the opposite direction: an increase in a variable leads to a decrease in the variable it points at; a decrease in a variable leads to an increase in the variable it points at. Each loop label (e.g. B1) denotes a feedback loop. A feedback loop is either reinforcing (R) or balancing (B).

Source: OECD (2022), *Redesigning Ireland’s Transport for Net Zero: Towards Systems that Work for People and the Planet*, OECD Publishing, Paris, <https://doi.org/10.1787/b798a4c1-en>.

The process was applied to four Irish territories in 2022 to identify the policies with the most potential to decarbonise the passenger transport sector. The report recommendations led to the revision of the transport section of the national Climate Action Plan. The perspective (and targets) in the Plan changed from an-almost-exclusive focus on improving vehicles (electrification), to the importance of enabling the conditions for people to use active and shared modes, instead of private cars (via policies

¹³ OECD (2022), *Redesigning Ireland’s Transport for Net Zero: Towards Systems that Work for People and the Planet*, OECD Publishing, Paris, <https://doi.org/10.1787/b798a4c1-en>.

¹⁴ OECD (2021), *Transport Strategies for Net-Zero Systems by Design*, OECD Publishing, Paris, <https://doi.org/10.1787/0a20f779-en>.

such as road space reallocation). The OECD analysis in Ireland (OECD, 2022)¹⁵ applied the 3 steps of the OECD process to identify the systems structure underlying car dependency and high emissions and assess how (and whether) different policies transform this structure.

The OECD is currently working on two case studies, in Catalonia (Spain) and Dublin (Ireland). Results from both case studies will be available at the end of 2024. Inspired by work carried out by the OECD for transforming policies in the transport system in Ireland, the Catalan Government has partnered with the OECD to develop a shared agenda for a sustainable mobility system, in the context of the region's innovation strategy ([RIS3CAT](#)). The OECD is conducting a case study to identify transformative policies to reduce emissions in the passenger transport sector while improving life quality in the region. The study will inform the co-design and implementation of a shared agenda for a sustainable passenger transport system in Catalonia.

The OECD is also supporting the Dublin City Council (DCC) in the implementation of its Climate Action Plan (CAP), in the context of the EU Mission 100 Climate Neutral and Smart Cities. The CAP aims to trigger behaviour change towards more sustainable lifestyles and acknowledges the need to spark (and to nurture) systems change, so that systems contribute to making sustainable choices the most convenient options. The OECD is contributing to enabling conditions to embrace a challenge-led and systemic approach to implementing the CAP. A challenge-led approach is a way of working focused on the enabling conditions necessary for cross-sectoral collaboration to address complex societal issues which individual actors are unable to solve on their own.

For more information see: [Ireland](#), [Catalonia](#), [Dublin](#)

Climate, urbanisation and environment

The OECD serves as the Secretariat of the Sahel and West Africa Club (SWAC). The Climate, Urbanisation, and Environment programme (CUE) of SWAC collaborates with local, national, and regional stakeholders to navigate the complex transitions of climate and urbanisation in the region. Some recent work by the SWAC/CUE relevant for the 2024 dialogues under the UNFCCC mitigation work programme is set out below. This work provides essential tools, methodologies, and data for African decision-makers as they navigate the challenges of rapid urbanisation, and its profound effects on resilience, sustainability, and the quality of life for inhabitants. Whilst these deliverables relate to the African continent, lessons can be relevant to other cities globally.

Towards sustainable, accessible and inclusive mobility in Ghana: A gendered approach

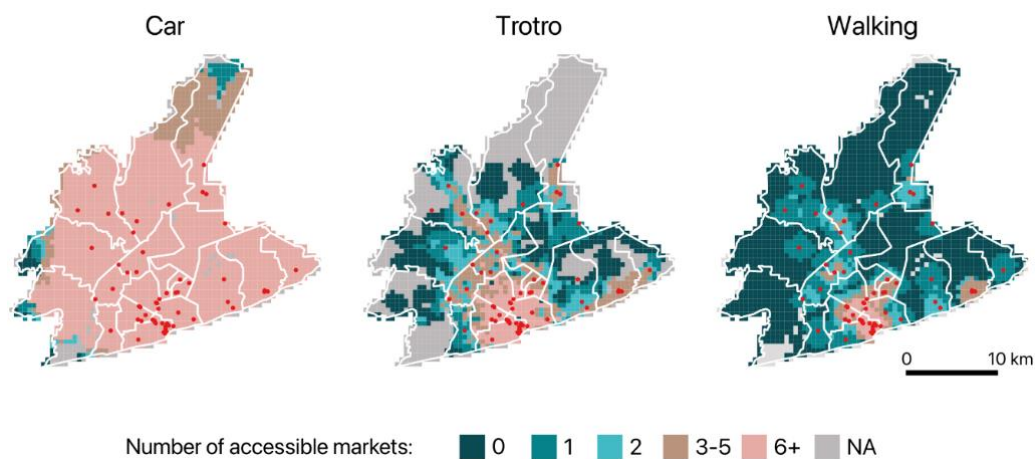
SWAC/CUE is collaborating with the Greater Accra Public Transport Executive (the coordinating body for transportation in the metropolitan area), the Accra Metropolitan Assembly, and the Ministry of Local Governments to analyse and model the accessibility and sustainability of the transportation systems in the rapidly urbanising cities of Accra and Kumasi. Currently, these cities' transportation networks face significant challenges such as peak-hour congestion, escalating car ownership, increasing emissions, rising pollution levels, and a growing number of accidents. All of which deteriorates the quality of life. Importantly, all the modelling of this project relied almost entirely on open-source data and software. As a result, the code and analysis can be replicated in any city, where data exists.

¹⁵ OECD (2022), Redesigning Ireland's Transport for Net Zero: Towards Systems that Work for People and the Planet, OECD Publishing, Paris, <https://doi.org/10.1787/b798a4c1-en>.

Key insights from the project will be published [in a series of policy briefs](#).

- A **best practice** adopted in Accra and Kumasi is using spatial accessibility models to pinpoint gaps in accessing essential services through various modes across the cities. This approach helps evaluate the risk of car dependency. The map below illustrates these findings, showcasing the number of accessible markets within 30-minutes by car, trotros (privately operated minibuses), and walking in Central Accra (see Figure 7). In Central Accra, cars provide the most extensive access, with trotros following suit, albeit decreasing in availability outside of the Central Business District. Walking offers the least accessibility in most parts of Central Accra. Through this analysis, it becomes evident that there is a risk of car dependency and that today's transport system is far from inclusive in Accra and Kumasi, since most people walk or ride *trotros*.

Figure 7 Access to markets within 30 minutes in Central Accra by mode



Note: Accra is divided into 500-meter grid cells, where red dots represent the locations of markets, both formal and informal. A dark green grid cell indicates that no markets can be reached within a 30-minute from that cell. Conversely, lighter greens to pink cells indicate areas where individuals can reach one or more markets within the designated 30-minute timeframe. Source: OECD calculations using (Open Street Map, 2022^[1]; European Commission; et al., 2021^[2]; MapIT, 2023^[3]; DigitalTransport4Africa, 2015^[4]).

- **Another best practice** in Accra and Kumasi is to combine accessibility model results with population density data to evaluate how many people are impacted by these gaps. Around 28% of the Greater Accra population resides in areas that face difficulties in accessing any essential services – i.e., cannot access any market, primary schools, or healthcare facility in 30 minute-walk, one of the most commonly used modes.
- **Creating proximity is one solution of many to fill accessibility gaps in Greater Accra and Kumasi.** Urbanisation has been rapid, and so far, this expansion has mainly been residential. The result is relatively dense peri-urban residential areas that are frequently situated at a considerable distance from essential services, sometimes exceeding nine kilometres. Bringing services – such as primary schools and healthcare facilities - closer to where people live is one solution for local authorities to enhance accessibility via non-car modes on the periphery. Local actors are using accessibility models to identify the best locations to boost access.

City shapes and climate change in Africa

Africa is undergoing an unprecedented urban and climate transition. Given the right conditions, urban forms can encourage greater sustainability, resilience and liveability in the coming decades. Using novel techniques and newly available data, this report¹⁶ fills in existing data gaps by producing measures of compactness for 5 625 urban agglomerations, along with other urban form attributes. Even though urbanisation is often unplanned and uncoordinated, a promising trend has emerged: very large cities (of over 4 million inhabitants) are more compact, on average, than larger (1 million to 4 million inhabitants) and intermediate cities (50 000 to 1 million inhabitants). Moreover, less compact agglomerations tend to have smaller buildings (in terms of footprint), flat, low skylines (in terms of height), less built centres (reflecting a less optimal use of space) and polycentric patterns (i.e. multiple centres, rather than a single, monocentric city). This report analyses the consequences of less compact agglomerations for sustainability and liveability. The disadvantages include higher energy demand, less accessibility to services and opportunities, less walkable urban landscapes and greater car dependency, in addition to higher outdoor air pollution. It also considers the potential trade-offs with resilience; for example, compactness can lead to a loss of green space and an increase of urban heat island effects. The analysis presented in this report enables decisionmakers to pinpoint potential areas of action using data to boost sustainability and resilience, as well as for monitoring and evaluating progress.

Boosting African cities' resilience to climate change - The role of green spaces

There is a notable scarcity of data regarding the availability of green spaces within African urban areas, despite their importance for future sustainability and resilience. This analysis¹⁷ aims to address this gap by leveraging new and innovative data sources to estimate the presence of green spaces within 5,625 African urban agglomerations with populations of 10,000 or more, which is regularly updated by SWAC/CUE.

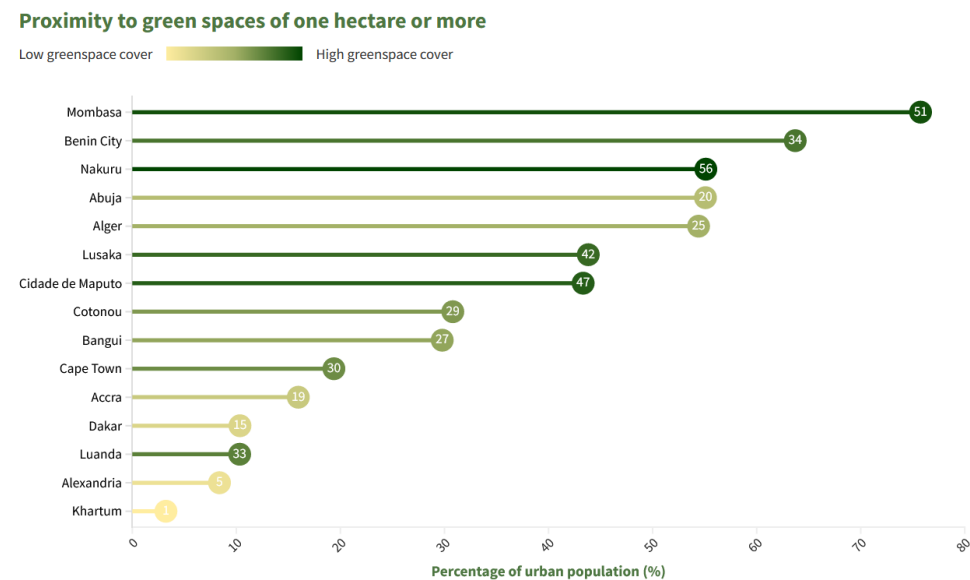
- A **key challenge for African cities** is that as urban areas expand and become more densely populated, green spaces tend to diminish, heightening vulnerability to climate change and compromising the liveability of these cities. However, a **potential solution** is to adopt vertical growth strategies, such as constructing taller buildings, offers a promising approach to minimise loss of green spaces.
- Increasing green spaces are an **opportunity to** mitigate air pollution in African cities, which is particularly crucial for public health as outdoor air pollution levels continue to rise.
- **Another opportunity** is for green spaces to enhance resilience to climate events, such as heat waves, depends on their distribution throughout the city and the proportion of the population residing in close proximity to them. For instance, while green spaces may have a limited impact on mitigating heat waves in cities like Khartoum, where only a small fraction of the population resides near such areas, they can serve as effective nature-based solutions in cities like Abuja, where a larger percentage of the population can benefit from their cooling effects.
- A **best practice is to recognise the difference between availability of green space and proximity to green space**. This is illustrated by the comparison between Abuja and Accra, where both cities have similar amounts of green space covering approximately 16% of their

¹⁶ Anderson, B., R. Prieto Curiel and J. Patiño Quinchía (2023), "City shapes and climate change in Africa", West African Papers, No. 40, OECD Publishing, Paris, <https://doi.org/10.1787/a944a930-en>.

¹⁷ Anderson, B., J. Patiño Quinchía and R. Prieto Curiel (2022), "Boosting African cities' resilience to climate change: The role of green spaces", West African Papers, No. 37, OECD Publishing, Paris, <https://doi.org/10.1787/3303cfb3-en>

urban footprint, yet the proportion of the population residing within proximity to these spaces differs significantly (Figure 8 as an example).

Figure 8: Accessibility to large green spaces



Source: Anderson, B., J. et. al (2022), "Boosting African cities' resilience to climate change: The role of green spaces"