

# 1 Why adopt a territorial approach to climate action and resilience?

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Global warming is likely to reach 1.5 degrees Celsius as early as 2030, with a growing risk of crossing “tipping points” that trigger potentially abrupt and irreversible changes to the environment. However, both national and subnational governments’ climate actions fall short of meeting the Paris Agreement goals. An untapped opportunity lies in adopting a territorial approach to climate action and resilience, which can both improve the effectiveness of national climate policy and accelerate local climate action. This chapter introduces the concept of a territorial approach and discusses how it can be a game changer in driving the net zero transition and building systemic climate resilience.

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## The climate emergency has complex and place-specific impacts

### *The current state of global warming*

According to the latest report of the Intergovernmental Panel on Climate Change (IPCC), the global surface temperature was 1.1 degrees Celsius (°C) above pre-industrial levels over 2011-20 and is likely to reach 1.5°C between 2030 and 2052 at current rates (IPCC, 2023<sup>[1]</sup>). Total greenhouse gas (GHG) emissions were a record 54.4 gigatonnes of carbon dioxide equivalent (CO<sub>2</sub>-eq) in 2019 and have increased by 1.5% per year over the last decade (UNEP, 2022<sup>[2]</sup>). Atmospheric CO<sub>2</sub> concentrations reached 417 parts per million (ppm) in 2022, more than 50% higher than pre-industrial levels (NOAA, 2022<sup>[3]</sup>).<sup>1</sup> Such historical levels of GHG emissions will have long-lasting consequences. Many changes already in motion, particularly regarding the ocean, ice sheets and global sea level rise, will likely last for centuries to millennia (IPCC, 2022<sup>[4]</sup>).

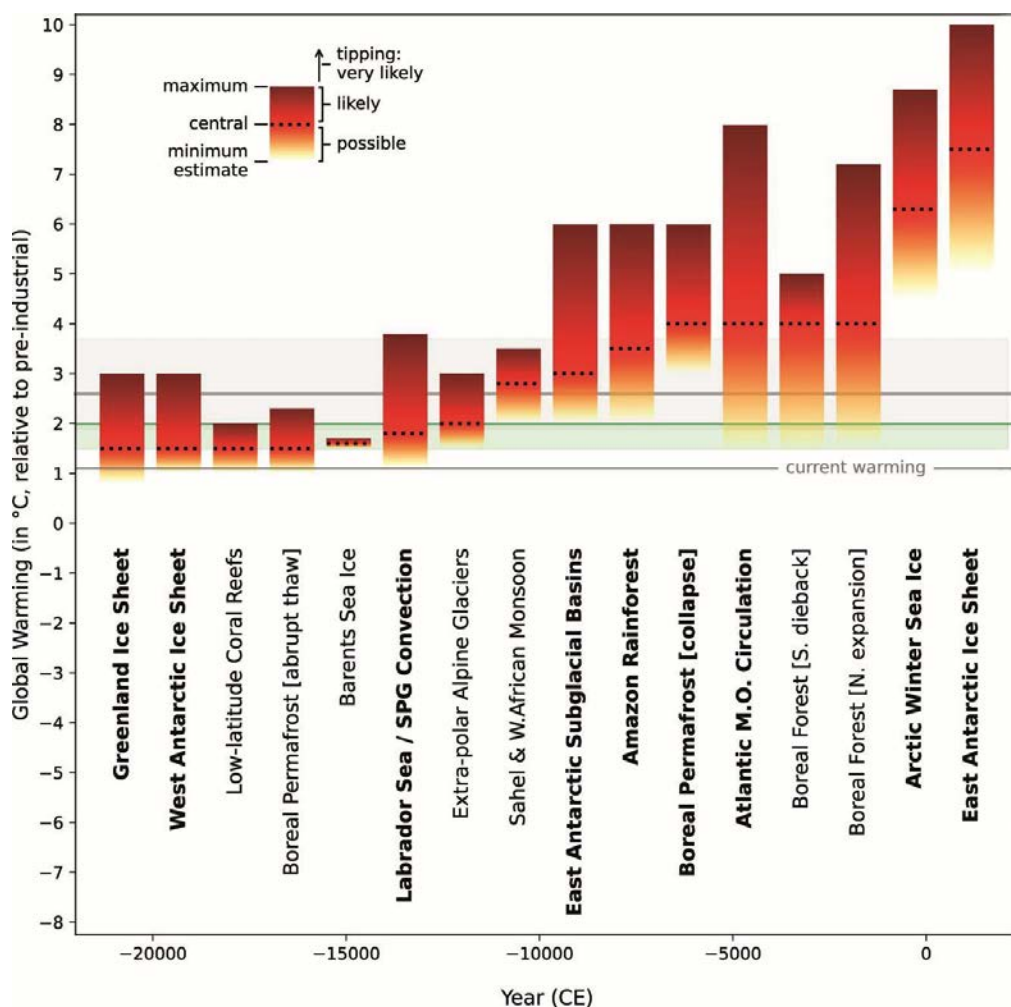
The urgency of the climate crisis is exemplified by the growing risk of crossing climate system tipping points. The IPCC defines these tipping points as “a critical threshold beyond which a system reorganises, often abruptly and/or irreversibly” (Chen, 2021<sup>[5]</sup>). At certain levels of global warming, these “points of no return” for elements of the global climate system would result in potentially abrupt and irreversible changes to the environment. Figure 1.1 shows the temperature range at which a number of tipping elements may be triggered, i.e. ranges of temperature within which the tipping points self-propel. Key examples include: the collapse of the Greenland and West Antarctic ice sheets as well as the melting of the Arctic permafrost (cryosphere); the slowdown or collapse of the Atlantic Meridional Overturning Circulation (circulation patterns); and the dieback of the Amazon rainforest and destruction of coral reefs (biosphere) (OECD, 2023<sup>[6]</sup>). Crossing tipping points could occur fast enough to defy the ability and capacity of human societies to adapt, leading to widespread and catastrophic impacts. The latest science also suggests that climate systems tipping points are likely to occur at lower levels of warming than previously thought.

Avoiding crossing tipping points requires a much faster transformation of economies and systems than has been achieved so far or is projected. It is not just about getting to net zero by any date; the shape of the pathway to get there matters hugely in lowering the risks of tipping points. Rapid and deep emission cuts are required in this decade, with a parallel emphasis on building systemic resilience to climate impacts. The cost of not acting now is likely to be prohibitive, as demonstrated later in this chapter.

### *Complex climate impacts across economic and social systems*

Climate change not only has environmental effects but also poses significant risks to economic resilience, particularly in terms of threats to macroeconomic and fiscal sustainability resulting from climate-related shocks. In 2021 alone, it is estimated that extreme climate-related events had a global direct cost of EUR 265 billion (Munich Re, 2022<sup>[7]</sup>). Modelling projections for a high-end sea level rise scenario (1.3 metres) indicate that coastal flooding may incur global annual damage costs of up to USD 50 trillion – i.e. nearly 4% of global gross domestic product (GDP) – by the end of the 21<sup>st</sup> century if no adequate adaptation measures are taken (OECD, 2019<sup>[8]</sup>). Climate change is also causing massive displacements of people worldwide with enormous cost. In 2022, climate-related disasters in 151 countries were associated with a record 32.6 million internal displacements (IDMC/NRC, 2023<sup>[9]</sup>). Another study shows that the global economic impact of internal displacement was estimated at USD 21 billion with about 55 million people<sup>2</sup> living in internal displacement in 2020, or USD 370 per internally displaced person (IDP). While this figure includes the cost of providing displaced people with support for their housing, education, health and security, and accounts for their loss of income, the limited data available on the financial costs and losses linked with internal displacement means this figure is likely to be a vast underestimate (IDMC, 2021<sup>[10]</sup>).

**Figure 1.1. Global warming threshold at which the crossing of climate system tipping points becomes likely**



Note: Shaded in green is the 1.5°C-2°C Paris Agreement range of warming. The shaded area in grey shows the estimated 21<sup>st</sup>-century warming under current policies (horizontal line shows central estimates). Bars show the minimum (base, yellow); central (line, red); and maximum (top, dark red) threshold estimates for each tipping element (bold font, global; regular font, regional).

Source: McKay, D. et al. (2022<sup>[11]</sup>), "Exceeding 1.5°C global warming could trigger multiple climate tipping points", <https://doi.org/10.1126/science.abn7950> in OECD (2023<sup>[6]</sup>), *Net Zero+: Climate and Economic Resilience in a Changing World*, <https://doi.org/10.1787/da477dda-en>.

More generally, climate change creates cascading and compounding impacts on different systems in society and generates multiple interconnected consequences. *Cascading* impacts in cities are observed when a climate shock damages buildings and urban infrastructures and leads to a disruption of urban services such as transport, energy, water and food provision, resulting in impacts that are significantly higher than the initial impact. *Compounding* impacts in cities are observed when the impacts of a climate shock interact with pre-existing inequalities and vulnerabilities of urban residents, exacerbating the impacts (Matsumoto and Ledesma Bohorquez, 2023<sup>[12]</sup>). In cities, for example, such impacts stem from alterations in economic systems (e.g. production, jobs), social systems (e.g. housing, health, education), ecological systems (e.g. forests, agriculture, biodiversity, water) and urban infrastructure systems (e.g. transport, energy, water and sanitation) (Table 1.1).

**Table 1.1. Different impacts of climate shocks in cities**

Shocks (from fast to slow onset)	Direct (single) impacts	Indirect, cascading and compounding impacts	Asymmetric impacts across places and/or people
Floods and storms	<ul style="list-style-type: none"> <li>• Damages to urban infrastructure (e.g. roads, energy) and housing</li> <li>• Damages to schools and public health facilities</li> <li>• Disruption of urban services (e.g. water, energy, transport)</li> <li>• Damages to agricultural land</li> <li>• Degrading coastal ecosystems, such as mangroves or coastal reefs</li> </ul>	<ul style="list-style-type: none"> <li>• Disruption of urban services (e.g. health, food supply) due to damages to urban infrastructure (e.g. energy and transport)</li> <li>• Impacts on manufacturing supply chains (e.g. hard-disk drive manufacturing, food supply chains)</li> <li>• Locational and investment decisions of firms (in the long term)</li> <li>• Emergence of waterborne diseases</li> <li>• Changes in the demand for goods and services</li> <li>• A disruption in manufacturing supply chains that may affect places other than the one where a flood/storm is occurring</li> <li>• Loss of cultural assets and artefacts</li> <li>• Loss of sense of security among citizens</li> <li>• Displacements due to climate migration that create a higher demand for public services and increase the population living in informal settlements</li> </ul>	<ul style="list-style-type: none"> <li>• Economically and socially marginalised communities (living near rivers) may be more vulnerable to floods and damage to urban infrastructure.</li> <li>• Migration induced by floods affects the most vulnerable.</li> <li>• Children affected and more vulnerable to waterborne diseases.</li> <li>• Where mangroves are already affected, there is increased vulnerability of coastal communities.</li> </ul>
Heatwaves	<ul style="list-style-type: none"> <li>• Heat stress on human health</li> <li>• Pressure on energy, water infrastructure and supply</li> <li>• Damage to urban infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Decrease of general labour productivity for both manual and cognitive tasks</li> <li>• Extended fire weather seasons (i.e. periods of time where weather conditions are conducive to the outbreak of wildfires)</li> <li>• Increased morbidity from vector-borne diseases</li> </ul>	<ul style="list-style-type: none"> <li>• Children and the elderly are more vulnerable to heat stress.</li> <li>• Low-income households living with inadequate housing conditions (e.g. without air conditioning) are more vulnerable.</li> <li>• Psychological or mental health impacts on the most exposed population.</li> </ul>
Droughts	<ul style="list-style-type: none"> <li>• Impacts on food supply system in cities</li> <li>• Water shortages affecting the population's access to safe drinking water</li> </ul>	<ul style="list-style-type: none"> <li>• Limiting the hydropower capacity of dams</li> <li>• Changes in ecosystems' functioning</li> <li>• Changes in labour and agricultural productivity</li> <li>• Land degradation</li> <li>• Impacts on food production leading to rise in food prices</li> </ul>	<ul style="list-style-type: none"> <li>• Disruption of agricultural production leads to severe and more chronic food insecurity, increasing the propensity for malnutrition, as well as the rise of food prices. This problem is strongly concentrated in vulnerable populations.</li> </ul>
Biodiversity loss	<ul style="list-style-type: none"> <li>• Loss of ecosystem services, such as carbon sequestration and the capacity to further adapt to climate change</li> </ul>	<ul style="list-style-type: none"> <li>• Limitations for the discovery of potential treatments for diseases and health problems</li> </ul>	<ul style="list-style-type: none"> <li>• Food and nutritional security impacts may disproportionately affect vulnerable populations.</li> </ul>
Sea level rise	<ul style="list-style-type: none"> <li>• Potential damages to urban assets in coastal areas</li> <li>• Impacts on urban land use and infrastructure investment strategies</li> <li>• Accelerated coastal erosion</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal defences become increasingly expensive to adapt and maintain over time</li> <li>• Decrease of tourism-related activities</li> </ul>	<ul style="list-style-type: none"> <li>• Vulnerability is higher in Small Islands Developing States, where the most vulnerable area is the low-lying coastal zone.</li> </ul>

Source: (Matsumoto and Ledesma Bohorquez, 2023<sup>[12]</sup>), *Building Systemic Climate Resilience in Cities*, OECD Publishing, Paris.

A striking illustration of the complex cascading and compounding effects of climate-related shocks is the historic cold wave and winter storm in February 2021, which hit the south-central part of the United States, including the city of Houston, Texas, and many regions within the Southern Plains such as Arkansas and Oklahoma. Despite skyrocketing heating needs, the cold had a significant impact on exposed equipment such as wellheads, thereby affecting electricity generation. The accumulation of thick ice on trees and power lines caused over 1 000 power generator outages and deratings across the region, leaving more than 10 million people without electricity for several days. The power outage cascaded into water treatment and medical services. Moreover, homeless people, whose living conditions were already challenging, faced severe difficulties to feed and warm themselves, as some shelters shut down due to power failure. Another example is the extreme heat that swept across Europe in the summer of 2022, which caused around 4 500 deaths in Germany, more than 1 000 in Portugal, 4 000 in Spain, and more than 3 200 in the United Kingdom (WHO, 2022<sub>[13]</sub>). In London (United Kingdom), Luton Airport had to restrict flights after its runway had melted (Lombardi, Rodas and Ledesma, 2022<sub>[14]</sub>), causing unexpected economic impacts. The poorest neighbourhoods often bear the worst consequences, as they often have higher density and lack shade, green space, ventilation and air conditioning (Matsumoto and Ledesma Bohorquez, 2023<sub>[12]</sub>).

The disruptive events of recent years, including the COVID-19 pandemic and the wide-ranging implications of Russia's war of aggression against Ukraine, have also demonstrated the social and economic vulnerability of human systems and the threat that socio-economic disruptions can pose to climate policy resilience (OECD, 2023<sub>[6]</sub>). Recovery spending following the COVID-19 pandemic has presented an opportunity to enhance climate policy efforts, as OECD data show that 33% of total COVID-19 recovery spending was environmentally friendly as of April 2022, up from 21% in September 2021. However, 14% of total recovery spending still went towards mixed or environmentally harmful activities (OECD, 2022<sub>[15]</sub>). Moreover, in February 2022, Russia's war of aggression against Ukraine generated additional systemic impacts while throwing global economic recovery prospects from the COVID-19 pandemic off track. It pushed prices up substantially, especially for energy. The war has shed further light on the world's dependency on fossil fuel consumption, especially oil and gas, and has amplified calls for accelerating the energy transition by diversifying the energy matrix and improving energy efficiency (Matsumoto and Ledesma Bohorquez, 2023<sub>[12]</sub>).

### ***Climate impacts hit differently across places and people***

The rapidly changing climate, particularly climate-induced risks, has profound implications across different places and people. The climate risks are determined by a combination of hazards, exposure and vulnerability, which are highly context-specific, as they rely on a wide range of local environmental and socio-economic factors. First, past, current and future climate-related hazards vary considerably from one place to another. Second, the degree of exposure to climate events depends on the characteristics of the local area and the elements – people, assets, biodiversity – that might be located in this area (Cardona et al., 2012<sub>[16]</sub>). Last, vulnerability – the degree to which a community or system is susceptible to harm from climate change – relies on a range of local socio-economic and environmental factors (Cardona et al., 2012<sub>[16]</sub>).

Different cities and regions within a country may face different types of hazards. For example, in 2022, Australia had to tackle both extreme droughts and floods simultaneously, with certain states (South Australia, parts of Victoria) affected by droughts, while the northeastern region (parts of New South Wales and Queensland) experienced its highest amount of rainfall on record (May, 2022<sub>[17]</sub>). Geographic characteristics can also influence the climate-related risk faced by two neighbouring municipalities within the same region. For example, the French Riviera has a lower valley that faces serious flood risk due to its topography, while municipalities in the river delta are prone to landslides and beach erosion (Anthony, 2007<sub>[18]</sub>). Within cities, different neighbourhoods may be exposed to different challenges related to climate change due to varying levels of urban heat island effects, vulnerability to flooding and access to green

spaces, among others. For example, some urban centres are 5-7°C warmer than their surrounding areas due to the urban heat island effect (OECD, 2022<sup>[19]</sup>).

Marginalised communities often bear the brunt of climate impacts. Segments of the population that are marginalised due to gender, race, age, disability, income or geographic location are particularly vulnerable, both globally and within countries (OECD, 2021<sup>[20]</sup>). Low-income population groups often live in areas prone to climate change hazards or ill-equipped to face climate risks. Thus, they are likely to have a lower capacity to recover from climate shocks (OECD, 2017<sup>[21]</sup>). This challenge occurs even in countries with high average levels of economic development (OECD, 2015<sup>[22]</sup>). For example, in Europe, there are pronounced regional differences in social vulnerability and exposure to climate-related hazards. Regions with lower average socio-economic status and higher proportions of elderly people in Southeast Europe experience greater exposure to high temperatures. Moreover, some regions tend to have higher average levels of nitrogen dioxide (NO<sub>2</sub>), mostly because of the concentration of traffic and industrial activities in these locations, and poorer communities still tend to be exposed to these higher levels (EEA, 2018<sup>[23]</sup>).

From the climate mitigation point of view, the level of GHG emissions, mitigation potential and enabling conditions to achieve the net zero transition also vary across different places. This variation is influenced by factors such as differing levels of capabilities and political commitment (IPCC, 2023<sup>[11]</sup>). Moreover, the nature of economic activities driving GHG emissions can also exert a significant influence. For example, industrial regions have to undergo deep transformations to meet climate neutrality goals (OECD, 2022<sup>[19]</sup>). Furthermore, the skillsets required to drive progress towards net zero can profoundly impact a region's capacity to implement effective measures. Within OECD countries, a recent study highlighted that approximately 18% of workers engage in roles involving a substantial portion of green tasks directly contributing to environmental sustainability or GHG reduction. However, the share of those “green tasks” differs widely across regions, ranging from 7% in some regions, such as Western Greece, to around 30% in metropolitan regions such as Paris (France), Vilnius (Lithuania) and Stockholm (Sweden) (OECD, 2023<sup>[24]</sup>).

## **Governments at all levels are facing challenges in transitioning towards net zero and enhancing climate resilience**

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 goals. This section lays out the main gaps that both national and subnational governments are facing on their journey towards the net zero transition and in terms of enhancing climate resilience, highlighting the lack of a “place-based” perspective in climate policy as well as the lack of climate objectives in traditional “place-based” policies (i.e. urban, rural and regional development policies).

### ***Challenges for national governments***

The alarming global warming trend underscores the critical need for immediate and drastic measures to curb emissions so that they reach their peak before 2025 at the latest and drop by 43% by 2030, in accordance with the commitment set by countries in the Paris Agreement (UNFCCC, 2015<sup>[25]</sup>). Since the adoption of the agreement in 2015, 130 countries, collectively responsible for 90% of global GHG emissions, have committed to carbon neutrality<sup>3</sup> by mid-century. However, as of today, national governments' climate pledges still fall collectively short of the Paris Agreement goals. It is estimated that they can only potentially limit global warming to around 2.5°C by the end of the century – missing the Paris Agreement's 2.0°C or 1.5°C goal (OECD, 2021<sup>[26]</sup>; 2023<sup>[6]</sup>). Regarding climate adaptation, even though over 80 countries have established adaptation plans, strategies, laws and policies (OECD, 2023<sup>[6]</sup>), many of these rely heavily on scarce international climate funds and multilateral finance (UNEP, 2022<sup>[27]</sup>).

National governments have a crucial role in setting and implementing a national policy framework that translates global commitments into ambitious national goals and targets. However, several key challenges have been identified from the literature review:

- **A silo approach and related trade-offs.** National climate action mainly occurs on a sector-by-sector basis, which can lead to conflicting policies, competing priorities and unintended consequences, ultimately undermining overall policy effectiveness. For example, investing in renewable energy, such as solar farms, may conflict with efforts to protect forests and agricultural land. Moreover, inconsistent regulations and incentives (e.g. building codes, fossil fuel subsidies) across sectors can create confusion for subnational governments, businesses, residents and other stakeholders who must navigate a complex policy landscape.
- **Data and knowledge gaps.** There is a lack of comparable data that could help better understand locally specific GHG emission reduction potential as well as locally specific climate impacts and risks. Although 22 OECD countries have carried out climate risk assessments at the national level (OECD, forthcoming<sup>[28]</sup>), it is claimed that downscaled climate data are often lacking (Tuhkanen, Vilbiks and Piirsalu, 2020<sup>[29]</sup>). While common methodologies are gaining ground (see Chapter 4), not all cities use a standard methodology to report GHG emissions, even within the same country, which can hinder comparability and alignment between and across levels of government and sectors. This may also affect the ability of national governments to tailor their climate policies to local contexts, undermining the effectiveness of national climate policies.
- **Disconnect with cities and regions.** There is a lack of integration and engagement of local and regional governments in national efforts towards the net zero transition and enhancing resilience. For instance, among the 193 nationally determined contributions (NDCs) that exist globally, 70 have little or no urban content (UN-Habitat, 2022<sup>[30]</sup>). This may imply that national governments have not always recognised the potential of local climate action. The limited place-based response to climate impacts, or a one-size-fits-all approach in climate policy across a whole country, may not be effective and could potentially lead to an unequal or inefficient distribution of resources for the implementation of climate plans and strategies. Moreover, engagement of local and regional governments is limited or not systematically integrated into national climate action. This highlights a strategic need for national governments to strengthen their engagement with cities and regions by removing barriers against, setting incentives for, coordinating with, and scaling up innovative climate action by cities and regions.

### ***Challenges for cities and regions***

Addressing climate change is a global challenge that has local impacts based on specific local conditions. It requires immediate, transformative and co-ordinated action from all levels of government and in co-operation with diverse stakeholders. Cities and regions have already been playing a critical role. For example, in 2019, local and regional governments accounted for 63% of climate-significant public expenditure and 69% of climate-significant public investment in 33 OECD countries and European Union (EU) countries (OECD, 2022<sup>[31]</sup>).

However, despite the increasing evidence that climate change is affecting people's lives in every corner of the world, tackling climate change is not necessarily a priority for all levels of government, especially for local and regional governments if climate change is perceived as a solely global issue. Many cities and regions still do not consider climate as a top priority in their agendas (CDP, 2021<sup>[32]</sup>). For example, according to the Net Zero Tracker (2023<sup>[33]</sup>) – a global initiative that tracks more than 1 100 cities with a population over 500 000 inhabitants – net zero target setting has not yet spread widely beyond high-income countries in Asia, Europe and North America. Moreover, not all cities and regions are equally equipped to implement climate action, partly due to gaps in knowledge, capacity and funding. Small- and

medium-sized cities and towns also tend to have less support from higher levels of government and fewer direct opportunities for peer learning (OECD, 2020<sup>[34]</sup>).

Major challenges for cities and regions that do not always engage in implementing national climate goals include the following, identified from the literature review:

- **Competing priorities and weak political buy-in.** Cities and regions juggle many urgent priorities (e.g. job creation, the cost of living crisis, housing affordability, etc.), which can prevent them from allocating sufficient resources to the climate agenda. In some cities and regions, climate mitigation, in particular, is still considered a purely global issue, as reducing GHG emissions may not bring immediate and tangible benefits to local constituencies. On the climate adaptation front, the process of planning and implementing adaptation measures can be subject to significant local political influences and varying priorities. Most decisions of local representatives are made according to the expectations of their constituents, which may differ from the imperative of climate adaptation, especially since public awareness of climate risks is relatively low (Khatibi et al., 2021<sup>[35]</sup>). Lobbying at the local level often targets decisions related to actions such as land development or zoning (CoE, 2017<sup>[36]</sup>), which can undermine adaptation measures or increase the vulnerability of people and infrastructure (e.g. construction in high-risk areas) (UNEP, 2017<sup>[37]</sup>). For example, mayors may want to expand their cities by building housing estates and permeabilising soils when their cities are already prone to flooding or are exposed to other climate risks. Even when the risks are understood, politicians tend to focus on short-term emergency responses rather than on long-term adaptation solutions due to financial implications and political consequences (Ray Biswas and Rahman, 2023<sup>[38]</sup>). These resilience-diminishing choices can be partly explained by the dichotomy between the short-term electoral cycles and the long-term outcome of adaptation measures (Averchenkova, Plyska and Wahlgren, 2022<sup>[39]</sup>). Little interest from local decision makers in climate change can result in the absence of a dedicated department in the municipal administration, limited knowledge about the issue and the perception that climate-related matters have to be addressed at the national level (Zea-Reyes, Olivotto and Bergh, 2021<sup>[40]</sup>; OECD, 2023, forthcoming<sup>[41]</sup>).
- **Lack of alignment and co-ordination among and across levels of government.** Local climate action is sometimes hampered in a broader regional and national context. National standards and regulations may not be adapted to local issues or undermine local adaptation actions. For example, in Hungary, nature-based solutions are not integrated into infrastructure planning and regulation at the national level, which hinders their deployment (OECD, forthcoming<sup>[42]</sup>). The lack of a mandate or unclear allocation of the responsibility and role of local authorities in climate action can also prevent them from taking action. For example, while local authorities could invest in adaptation measures to limit damages from climate events, they may not assume such a role due to a lack of explicit mandate stipulated in legal frameworks. Moreover, post-disaster damage is often covered by national entities, which does not encourage local authorities to bear the cost of climate adaptation (OECD, 2023, forthcoming<sup>[41]</sup>). Moreover, limited co-ordination across municipal departments such as land use, transport, environment and housing can undermine the implementation of policies set at the national level. This issue is further exacerbated by horizontal fragmentation within municipalities, especially in large metropolitan areas (see more detailed discussion in Chapter 4).
- **Capacity gaps.** Many cities and regions struggle to translate declared ambitions into concrete climate actions and measures that speak to the local context and the needs of local communities and stakeholders. This gap stems from various factors, including limited resources, inadequate guidance and a perceived rigidity in policy frameworks (LGA, 2022<sup>[43]</sup>). Cities and regions are often seeking specialised assistance and technical expertise in climate finance and investment planning, given the complexity of funding and financial frameworks. They are also in need of peer-to-peer learning networks to increase their knowledge and operational capacity for local climate action



(Liakou et al., 2022<sup>[44]</sup>). In addition, there are stark disparities in subnational government climate-significant expenditure and investment across OECD countries, with a lack of funding and financing for subnational climate action in general (see more detailed discussion in Chapter 4).

- **Data and knowledge gaps** exist not only at the national level but also at the local and regional levels. The lack of comprehensive GHG emission monitoring and reporting frameworks at the local and regional levels is an obstacle to demonstrating to national policy makers that subnational governments can make a significant contribution to national targets. On adaptation, the lack of localised data makes it difficult to raise awareness among local policy makers and citizens about climate-related risks and the need for a net zero transition and enhancing climate resilience. Local authorities often lack adequate data to carry out climate risk assessments at the local level. The lack of data and information regarding local future climate threats is one of the main barriers faced by local authorities when planning adaptation actions. Projection of future climate impacts at the local level remains very challenging as it requires strong meteorological and modelling skills (Matsumoto and Ledesma Bohorquez, 2023<sup>[12]</sup>). Moreover, poor understanding of the potential or perceived negative impacts of climate action at specific locations can raise questions on the fairness of climate action. For example, cities and regions that are specialised in energy-intensive industries (e.g. cement, steel) may face difficulties in dealing with high levels of emissions, waste and pollution (OECD, 2019<sup>[45]</sup>). Some cities and regions (as well as countries) may feel that it is unfair to apply global and national targets to their domestic/local conditions as every climate action creates differentiated impacts across places and people and it is a challenging task to reach a consensus on a “fair” transition.

## Definition and potential benefits of a territorial approach to climate action and resilience

The climate emergency, the insufficient level of climate action at all levels of government and the lack of a “place-based” perspective in climate policy call for a renewed approach. An immediate and untapped opportunity lies in adopting a territorial approach to climate action and resilience, which can both improve the effectiveness of national climate policy and accelerate local climate action. This section presents the concept of a territorial approach and discusses how it can help respond to complex climate challenges, drive the net zero transition and enhance climate resilience.

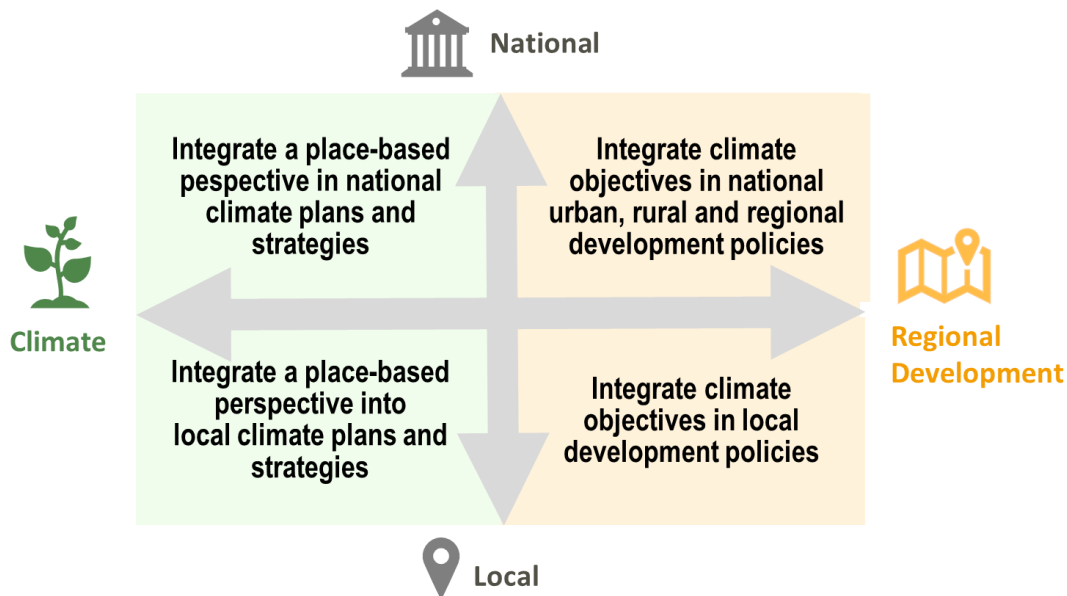
### **Definition**

A territorial approach to climate action and resilience is defined as a comprehensive policy framework that integrates a place-based perspective of national and subnational climate policies and mainstreams climate objectives in urban, rural and regional development policies to effectively drive climate action at all territorial scales (Figure 1.2).

Place-based policies incorporate a set of co-ordinated actions specifically designed for a particular city or region, making the most of their unique assets and strengths (OECD, 2021<sup>[26]</sup>). Therefore, integrating a place-based perspective into climate policies means that governments shift away from sectoral and one-size-fits-all measures and move towards multi-sectoral and context-specific measures. A prerequisite to adopting such a place-based perspective is to better understand local GHG emissions and reduction potential, as well as place-specific climate impacts and risks. Localising national climate goals, targets and strategies, i.e. developing a set of climate goals, targets and strategies at the regional and local scales, which are coherent with national ones but are also adapted to the local circumstances, is also an essential element of a territorial approach.

Mainstreaming climate objectives into urban, rural and regional development policies implies that urban, rural and regional development can become climate-proof. This can sometimes mean a fundamental shift in development priorities, including allocating resources towards climate-proof developments. For instance, in urban areas, this entails initiatives such as retrofitting buildings for energy efficiency and integrating nature into urban infrastructure development. In rural areas, a possible focus lies in ensuring sustainable mobility and building on the competitive advantages of rural regions in producing renewable energy.

**Figure 1.2. A conceptual diagram of a territorial approach to climate action and resilience**



Climate change must be tackled through all levels of government and thus, effective local climate action cannot be conceived in isolation from national policies. A territorial approach aims to combine top-down and bottom-up measures to maximise policy performance at different territorial scales. Implementing a territorial approach to climate action and resilience requires effective multi-level governance mechanisms, including setting and implementing ambitious national goals and targets that integrate local climate action by defining clear roles and responsibilities of subnational governments, national legal and institutional frameworks that allow for innovative local climate action, stronger funding and financing mechanisms to support and scale up subnational climate action, and a subnational enabling environment that facilitates partnerships and mutual learning.

### ***How can a territorial approach respond to climate challenges?***

A territorial approach to climate action and resilience can be a “game changer” by responding to the challenges described in the previous section. Key benefits of a territorial approach identified via a literature review are summarised below (Table 1.2).

- First, a territorial approach helps promote integrated climate action across sectors and thus makes a more efficient use of public expenditure and investments compared with a silo approach. In particular, place-based climate action can help link mitigation and adaptation measures and generate synergies, including between cities and neighbouring peri-urban and rural areas. For instance, a territorial approach can integrate measures regarding habitat restoration (wetlands, coastal and marine areas), “sponge” infrastructure such as retention ponds and permeable surfaces, sustainable and circular use of resources and land, energy efficiency retrofits or local

nature-based solutions that boost biodiversity, while enhancing human well-being and reducing exposure to climate-related extreme events, including sea level rise and extreme heat and precipitation (Bush and Doyon, 2019<sup>[46]</sup>; OECD, 2021<sup>[47]</sup>). For national governments, it is thus essential to engage cities and regions and to support their climate action, as it can enhance the overall effectiveness of climate action at the national scale.

- Second, a territorial approach grounded in a more granular understanding of climate impacts and risks can enhance systemic climate resilience for the most vulnerable people and places. Due to structural inequalities in terms of exposure to climate risks, the poor, elderly and economically vulnerable populations and places are likely to be hit the hardest by climate change impacts. By applying a territorial approach to climate action, national governments can identify areas and people with the greatest needs, whether to climate risks or to changes in employment and economic structure due to the net zero transition, minimise disproportionate negative impacts and ensure the net zero transition is just.
- Third, a territorial approach can help seize co-benefits and synergies through cross-sectoral and integrated climate projects that serve multiple policy objectives, enabling stronger political buy-in. Channelling green investment towards the right location not only contributes to environmental sustainability but can also boost local economic growth potential, which is even more important in light of the recovery from COVID-19. For example, local green jobs can be created by implementing low-carbon policies such as retrofitting existing building stock for improved energy efficiency and deploying renewable energy installations, both of which would build systemic climate resilience (OECD, 2023<sup>[24]</sup>). The net zero transition will also place new demands on workers and firms, especially where local economies, such as extractive industries, are heavily dependent on fossil fuels, which can create a new growth potential, such as creating new jobs. This requires a concerted effort towards reskilling and upskilling the workforce for emerging green industries. National governments can foster innovation and entrepreneurship by supporting green clusters that build on local knowledge as well as existing industries and workers.
- Finally, a territorial approach can 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. By fostering co-ordination and collaboration across different levels of government, this approach enables the pooling of resources, knowledge and expertise. This, in turn, facilitates the development and implementation of innovative climate strategies at the local and regional levels, ultimately leading to a more effective and integrated response to climate change. It can also bridge local governments' capacity gaps by facilitating localised data and knowledge exchange across cities. Moreover, cities and regions can apply a territorial approach within their own geography to tailor their climate policies to further disaggregated territorial scales such as neighbourhoods, districts and communities to address their specific needs and improve overall policy impact.

**Table 1.2. How can a territorial approach to climate action and resilience benefit national, regional and local governments?**

Governments	Policy challenges to drive the net zero transition and enhance resilience	How a territorial approach can help respond to the challenges
National	<ul style="list-style-type: none"> <li>• A silo approach and related trade-offs</li> <li>• Data and knowledge gaps</li> <li>• Disconnect with cities and regions</li> </ul>	<ul style="list-style-type: none"> <li>• A territorial approach can promote integrated climate action across sectors and thus make public investment more efficient, e.g. linking mitigation and adaptation measures and generate synergies.</li> <li>• A territorial approach can enhance a more granular understanding of local GHG emissions, local challenges and exposure to climate risks, which can enhance systemic climate resilience for the most vulnerable people and places.</li> <li>• Engaging and supporting cities and regions can enhance the overall level of climate action as a country.</li> </ul>
Regional and local	<ul style="list-style-type: none"> <li>• Competing priorities and weak political buy-in</li> <li>• Lack of alignment and co-ordination among and across levels of government</li> <li>• Capacity gaps</li> <li>• Data and knowledge gaps</li> </ul>	<ul style="list-style-type: none"> <li>• A territorial approach can help seize co-benefits and synergies through cross-sectoral/integrated climate projects which serve multiple policy objectives at specific locations.</li> <li>• A territorial approach can provide them with a more favourable policy environment to take ambitious climate action.</li> <li>• A territorial approach can foster co-ordination and collaboration across different levels of government, which enables the pooling of resources, knowledge and expertise.</li> </ul>

A territorial approach can be applied in different policy fields of climate action and resilience. Below is a selection of fields of opportunities for an innovative territorial approach, both on climate mitigation and adaptation and both at the national and subnational scales, which will be further discussed in Chapter 4:

- Integrating **land use, housing and transport policies**, including within and across urban and rural areas. The enforcement (or lack) of local land use planning has critical impacts on mitigation (e.g. urban sprawl, renewable energy on rooftops or at the urban periphery, transport planning and service delivery in cities, between rural and urban areas and in low-density areas) as well as on the degree to which climate-related extreme weather events affect local communities and economies. However, climate-friendly and risk-sensitive land use (e.g. denser urban areas, mixed-use development, home-job proximity, land use restrictions in hazard-prone areas) may not always be fully taken into consideration in other sectoral policies. For example, housing policy may often prioritise the supply of affordable housing units with less consideration of their location by placing large housing developments in poorly serviced areas on the urban periphery and neglecting core concepts such as transit-oriented and resilient development. Similarly, climate change mitigation policies that aim to reduce emissions across the board, without considering local contexts or the need for a just transition, may promote place-blind and sectoral outcomes that negatively impact local economies, undermine local support and hinder climate action.
- Investing in **nature-based, climate-resilient infrastructure** to address location-specific climate challenges. Cities and regions can transition from predominantly ubiquitous “grey”, human-built infrastructure to “green”, nature-based solutions, which can enhance systemic resilience to extreme weather events such as heatwaves and flooding and address water scarcity and water security, while yielding well-being and environmental co-benefits (OECD, 2020<sup>[48]</sup>). For example, cities have a broad range of financial tools and incentives (e.g. property taxes, value capture tools, congestion charges and parking fees) at their disposal to enhance climate-resilient urban infrastructure (OECD, 2019<sup>[49]</sup>; 2021<sup>[26]</sup>).
- Promoting **energy efficiency retrofits in residential and office buildings**. Buildings are a major source of final energy consumption in urban areas. In 2021, buildings accounted for 33% of global energy-related and process-related CO<sub>2</sub> emissions (8% from the use of fossil fuels in buildings, 19% from the generation of electricity and heat used in buildings and 6% from the manufacture of

materials used in buildings construction) (IEA, 2022<sup>[50]</sup>). In most countries, national governments oversee the process of setting a framework for energy efficiency investments, including building standards. Such national efforts, of which many have seen an important increase as part of COVID-19 recovery efforts, can be complemented with effective subnational actions based on the ability of subnational governments to factor in local elements and leverage policy authority over buildings. Examples of such subnational actions include tailored urban standards and energy efficiency retrofit projects, such as the emissions limit in New York, United States, for existing large buildings, retrofitting government-owned buildings in Berlin, Germany, and the large-scale tower renewal programme in Toronto, Canada.

- Scaling up the **generation and use of clean energy** in cities and rural areas. As the costs of renewable energy generation have plummeted in recent years, more and more cities and regions around the world are deploying clean energy technologies at varying scales. Subnational governments, especially municipal authorities, cannot always directly decarbonise energy supply and consumption and may instead rely on measures taken by the national government (CUT, 2019<sup>[51]</sup>). However, they can often engage in other means of procuring clean energy, for instance through power purchase agreements with third-party renewable producers, leveraging publicly owned utilities, or through decentralised on-site generation of electricity (e.g. rooftop photovoltaics) and heat (e.g. biogas at local landfill sites and wastewater treatment plants). Rural regions, particularly remote areas, are at the forefront of renewable electricity production, as a larger group of individuals are becoming owners of renewable energy production facilities and potentially increasing profit margins.

### ***The OECD's ongoing initiatives related to a territorial approach to climate action and resilience***

The OECD has played a key role in analysing the global, national, subnational and sectoral dimensions of climate change, with a place-based dimension always being an essential element. The following initiatives represent some of the most recent and relevant efforts:

- The **International Programme for Action on Climate** (IPAC). Since 2021, the programme has been supporting countries in monitoring and evaluating climate policies with the goal of strengthening and co-ordinating their climate action. The subnational dimension has not yet been part of the monitoring framework but is within the scope of future development (OECD, 2022<sup>[52]</sup>).
- The **Inclusive Forum on Carbon Mitigation Approaches** (IFCMA). Established in January 2023, this initiative is designed to help improve the global impact of emissions reduction efforts around the world through better data and information sharing, evidence-based mutual learning and inclusive multilateral dialogue. It brings together all relevant policy perspectives from a diverse range of countries around the world, participating on an equal footing basis, to take stock of and consider the effectiveness of different carbon mitigation approaches (OECD, 2023<sup>[53]</sup>).
- The **Horizontal Project on Climate and Economic Resilience in a Changing World**. The project draws on the multidisciplinary reach of the OECD to support governments in driving the swift transformational change needed to tackle climate change. The first phase of the programme concluded in 2023 with the launch of the OECD report *Net Zero+: Climate and Economic Resilience in a Changing World* (2023<sup>[6]</sup>). The report discusses, among other issues, the role of cities and regions in building resilience to climate shocks and provides a framework for understanding and enhancing systemic climate resilience in cities. The report offers state-of-the-art evidence-based analysis and guidance for governments on developing effective planning, financing, and policy co-ordination mechanisms to help them better mitigate, prepare for, recover from and adapt to economic and social shocks related to climate change (OECD, 2023<sup>[6]</sup>).
- The **National Urban Policy Programme** (NUPP). This joint initiative of the OECD, the United Nations Human Settlements Programme (UN-Habitat) and the Cities Alliance aims to support the

development and implementation of national urban policies (NUPs) globally. The programme monitors NUPs through a global survey. The latest edition was launched in 2021 and analysed the extent to which NUPs address climate adaptation and mitigation, and related challenges and co-ordination mechanisms. In particular, the report has revealed that climate action features prominently in most NUPs within traditional urban planning priorities (e.g. the built environment) and a growing share of NUPs is exploring innovative mechanisms, such as local GHG emission inventories. Countries have also recognised that urban climate interventions generate multiple related benefits such as more sustainable mobility and reduced pollution. Countries have highlighted knowledge gaps and the lack of co-ordination as key challenges in integrating climate change issues in NUPs (OECD/UN-Habitat/Cities Alliance, 2021<sup>[54]</sup>).

- The **OECD Subnational Government Climate Finance Hub**.<sup>4</sup> This initiative aims to provide a one-stop shop that compiles qualitative and quantitative information to provide a comprehensive picture of regional and local climate finance on both the expenditure and revenue sides at the macro and micro levels. It has three main objectives: better measuring how much subnational governments spend and invest in climate action; better understanding how subnational climate action is funded and financed, in other words, better identifying the different sources of revenue that can help meet the needs of the green transition (international, national and own-revenue sources); and identifying how additional public and private sources of funding and financing can be mobilised. The hub comprises a new and unique database with data on subnational climate-significant expenditure and investment in 33 OECD and EU countries. It also includes a compendium of fiscal tools – mainly provided by international and national governments – that support subnational climate action for adaptation and mitigation in the OECD and the European Union (e.g. climate or green funds). It also proposes a set of six guidelines with concrete recommendations to help regions and municipalities develop a green budgeting practice. This is accompanied by an inventory of existing subnational green budgeting practices in OECD countries and the European Union, case studies and a self-assessment tool.
- The **OECD Principles on Rural Policy**. Adopted by the Regional Development Policy Committee in 2019, the rural principles crystallise over 20 years of the OECD’s work on rural development and were developed through a comprehensive review process with OECD member countries and key stakeholders. They are targeted at national ministries dealing with rural areas, rural policies and sustainable development, subnational levels of government and stakeholders involved in or affected by rural policy (e.g. from civil society, the private sector, academia or financial institutions). Several principles, including Principle 1 “Maximise the potential of all rural areas”, Principle 4 “Set a forward-looking vision for rural policies” and Principle 8 “Strengthen the social, economics, ecological and cultural resilience of rural communities”, recognise the role of rural areas in tackling climate change (OECD, 2019<sup>[55]</sup>).
- The **OECD Principles on Urban Policy** and its **Implementation Toolkit**. Adopted by the Regional Development Policy Committee in 2019, the principles consolidate the lessons from the past 20 years and more of work on cities to guide policy makers in building smart, sustainable and inclusive cities. The principles were welcomed by mayors and ministers during the 7<sup>th</sup> OECD Roundtable of Mayors and Ministers held on 19 March 2019 in Athens, Greece. Mayors, ministers and partner institutions are committed to supporting the implementation of the principles through the Athens Pledge. Principle 5 “Leverage the potential of cities of all sizes for advancing environmental quality and the transition to a low-carbon economy” explicitly recognises the pivotal role of cities in addressing climate change. Moreover, the Implementation Toolkit, launched in 2022, aims to support cities, regions and countries in their efforts to use the principles as a driver of policy reform in diverse urban policy contexts. It includes a self-assessment tool that provides guiding questions and indicators to assess the state of play of urban policy frameworks and a policy database which offers a selection of more than 60 leading examples of national and subnational governments using the principles to reshape urban policy (OECD, 2019<sup>[56]</sup>; 2022<sup>[57]</sup>).

The **OECD Recommendation on Regional Development Policy**. Adopted in 2023, the OECD recommendation provides countries with a comprehensive policy framework to support the design and implementation of effective regional development policies. It considers that regional development policy is a long-term, cross-sectoral, multi-level policy that aims to improve the contribution of all regions to national performance and reduce inequalities between places and between people. The recommendation also calls for mainstreaming climate action into regional development agendas. It underscores the relevance of urban, rural and regional climate action as a major driver in achieving net zero carbon emissions and facilitating the green transition (Box 1.1).

### Box 1.1. The OECD Recommendation on Regional Development Policy

The OECD Recommendation on Regional Development Policy, adopted on 8 June 2023 by the OECD Council at Ministerial Level, provides countries with a comprehensive policy framework to support the design and implementation of effective regional development policies. It considers that regional development policy is a long-term, cross-sectoral, multi-level policy that aims to improve the contribution of all regions to national performance and reduce inequalities between places and between people. The recommendation will be used to review regional development policy frameworks in OECD member countries and beyond.

The recommendation rests on ten complementary pillars of regional development policy. These are: i) designing and implementing a regional development strategy; ii) targeting the appropriate territorial scale; iii) engaging with communities and stakeholders to co-produce; iv) making regions more resilient; v) promoting territorial data; vi) establishing sound multi-level governance systems; vii) strengthening capacities; viii) mobilising financial resources; ix) promoting integrity; and x) fostering performance management.

The recommendation acknowledges the role of regional development policy to address the asymmetric impact of global megatrends and shocks and deliver a sustainable and just green transition.

**Figure 1.3. Ten pillars of regional development policy**



Source: OECD (2023<sup>[58]</sup>), *Recommendation of the Council on Regional Development Policy*, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0492>.

This report builds on the overall OECD work on climate and urban policy to further advance the understanding of the crucial role played by cities and regions in addressing climate change. To do so, the rest of the report proposes a new territorial climate indicator framework (Chapter 2) and applies it to conduct a comparative analysis of GHG emissions, climate impacts and vulnerabilities at the subnational scale (Chapter 3). The report also assesses current climate policies at different levels of government and presents recommended actions to enhance climate action through a territorial approach (Chapter 4).

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## Notes

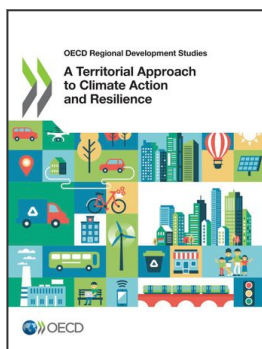
<sup>1</sup> Prior to the Industrial Revolution, CO<sub>2</sub> levels were consistently around 280 ppm for almost 6,000 years of human civilization. CO<sub>2</sub> levels are now comparable to the Pliocene Climatic Optimum, between 4.1 and 4.5 million years ago, when they were close to, or above 400 ppm. During that time, sea levels were between 5 and 25 meters higher than today and temperatures then averaged 7 degrees Fahrenheit higher than in pre-industrial times (NOAA, 2022<sub>[3]</sub>).

<sup>2</sup> The assessment was made for 18 countries with 55 million people living in internal displacement in 2020 as a result of conflict, violence and disasters, including climate-related disasters (IDMC, 2021<sub>[10]</sub>).

<sup>3</sup> In this report, “carbon neutrality” refers to having a balance between emitting carbon and absorbing carbon from the atmosphere in carbon sinks. Removing CO<sub>2</sub> from the atmosphere and then storing it is known as “carbon sequestration” (European Parliament, 2019<sup>[62]</sup>). “Net zero” involves multiple GHG emissions and places much more focus on reducing carbon emissions as much as possible first and only offsetting unavoidable, residual GHG emissions.

<sup>4</sup> See <https://www.oecd.org/regional/sngclimatefinancehub.htm>.





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