INNOVATE CITIES

GLOBAL COVENANT of MAYORS for CLIMATE & ENERGY

Bloomberg Philanthropies

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# Powering urban net-zero transitions through research and innovation: Innovate4Cities and the Urban Transitions Mission


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Director, Climate Action Innovation, Research, & Impact, GCoM

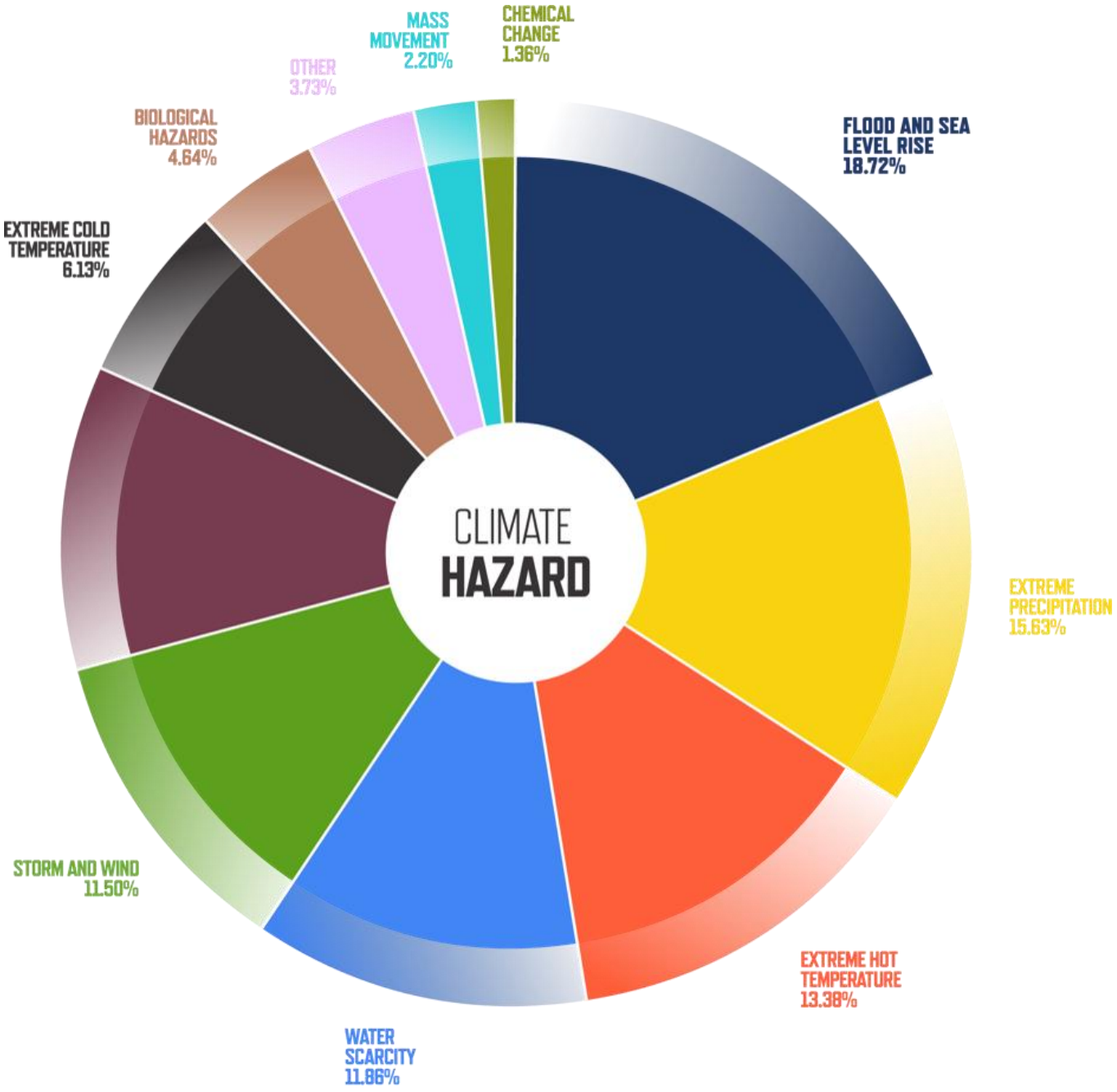

**IEA EGRD Workshop on Technologies and Innovations for the Climate-Neutral City**

15/04/2025


**By 2050, some 70% of all people on Earth will live in urban areas**

*Source: UN DESA*

# Thousands of cities face significant climate risks and hazards *today*

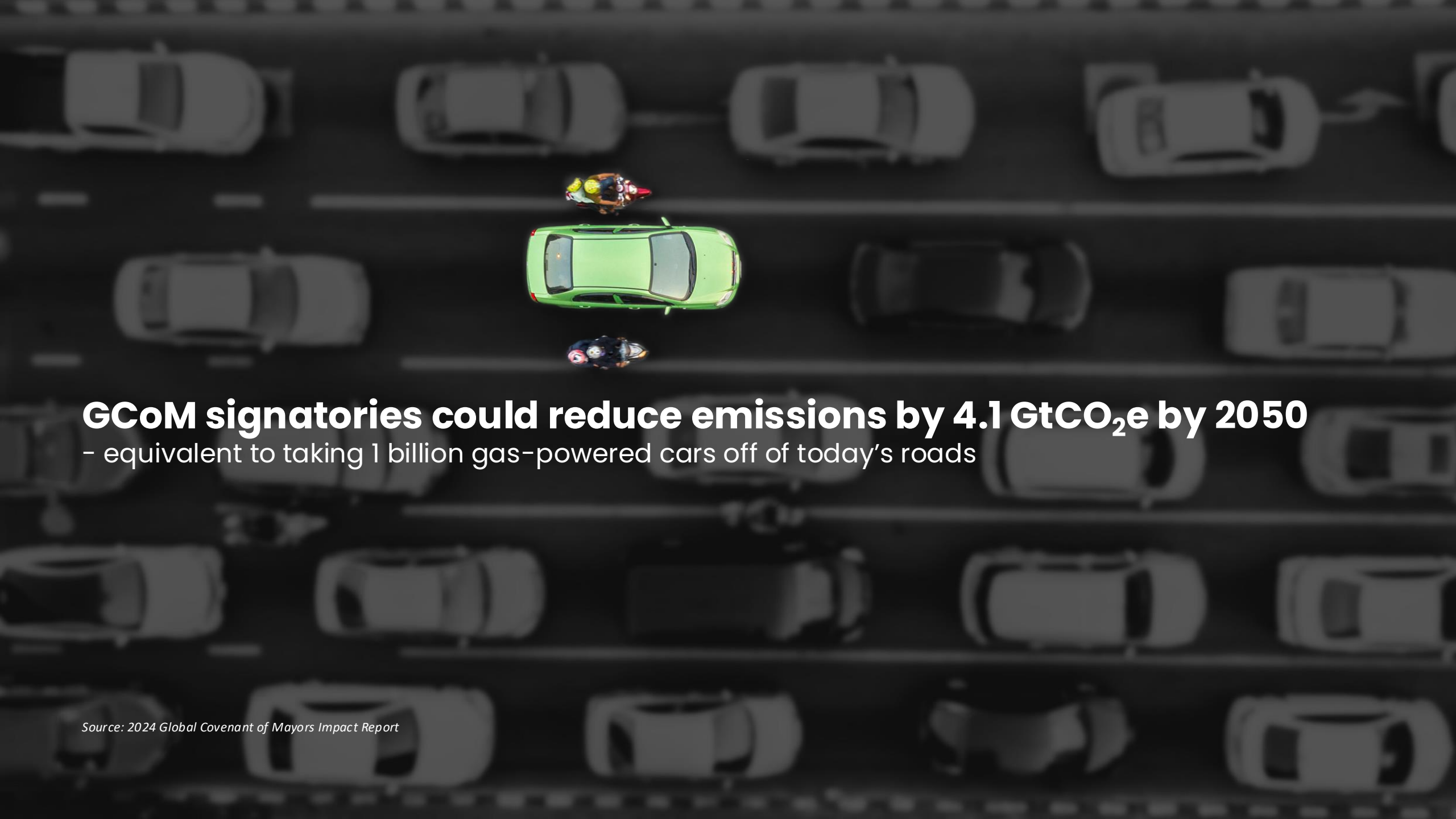



*Source: 2024 Global Covenant of Mayors Impact Report*

**And while a significant proportion of GHG emissions can be attributed to cities...**

*Source: Coalition for Urban Transitions, 2019*


**they are our greatest opportunity to overcome the climate emergency.**



# GCoM signatories could reduce emissions by 4.1 $GtCO_2e$ by 2050

- equivalent to taking 1 billion gas-powered cars off of today's roads

*Source: 2024 Global Covenant of Mayors Impact Report*

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# Cities globally are showing unprecedented ambition for climate & energy action

## MITIGATION

| | INVENTORY | TARGET | PLAN |
|---|---|---|---|
| | 7,963 PREVIOUS IMPACT REPORT: 6,722 | 8,946 PREVIOUS IMPACT REPORT: 8,570 | 6,882 PREVIOUS IMPACT REPORT: 6,541 |
| GROWTH | + 18.46% | + 4.39% | + 5.21% |

## ADAPTATION

| | ASSESSMENT | GOAL | PLAN |
|---|---|---|---|
| | 2,518 PREVIOUS IMPACT REPORT: 2,044 | 3,209 PREVIOUS IMPACT REPORT: 2,780 | 2,005 PREVIOUS IMPACT REPORT: 1,567 |
| GROWTH | + 23.19% | + 15.43% | + 27.95% |

## ENERGY ACCESS & POVERTY

| | ASSESSMENT | TARGET | PLAN |
|---|---|---|---|
| | 140 PREVIOUS IMPACT REPORT: 30 | 393 PREVIOUS IMPACT REPORT: 189 | 1,249 PREVIOUS IMPACT REPORT: 1,002 |
| GROWTH | + 366.67% | + 107.94% | + 24.65% |

*Source: 2024 Global Covenant of Mayors Impact Report*

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city climate
**AMBITION**

**THE GAPS**

funding and financing
capacity
data & tools

city climate action
**IMPLEMENTATION**

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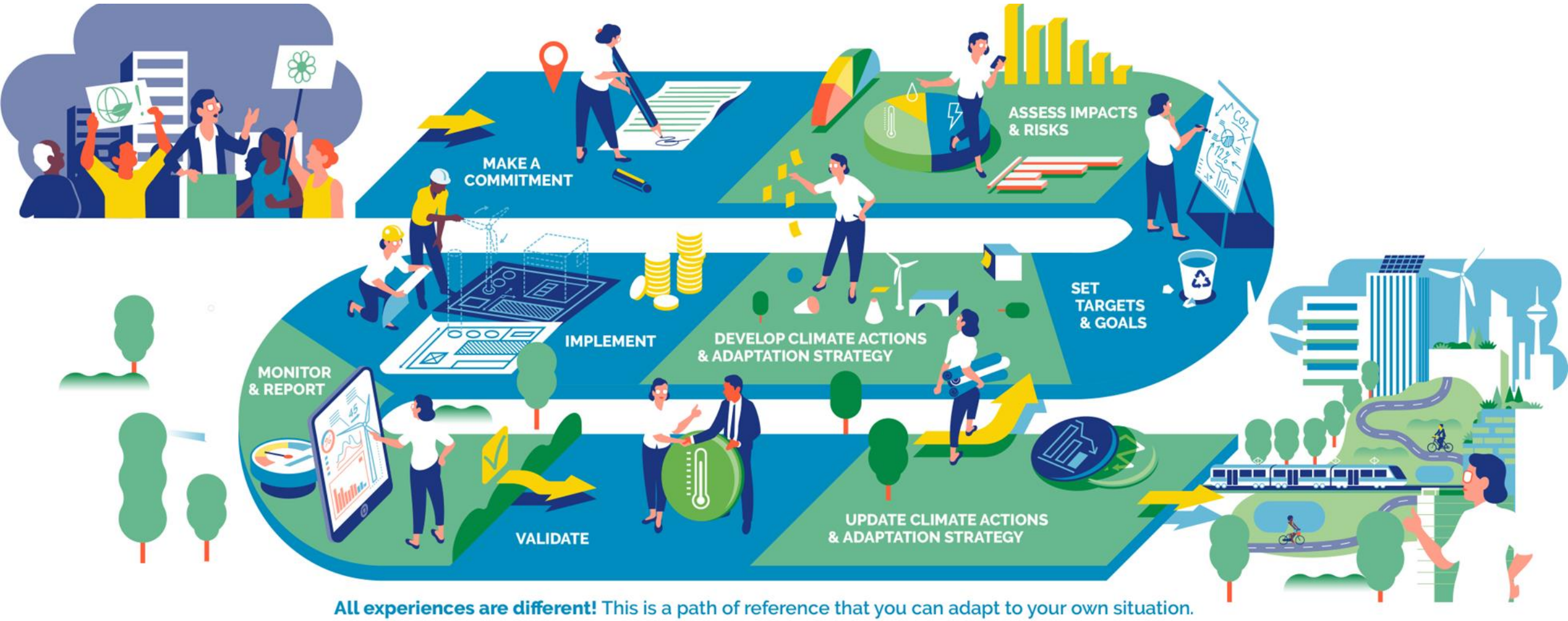
The GCoM initiative to accelerate city climate action through research, knowledge and innovation

## Setting the scene

# **The city journey:** a compass for urban climate action




**All experiences are different!** This is a path of reference that you can adapt to your own situation.

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# Global Research and Action Agenda for Cities and Climate Change Science (GRAA)

**A systems approach to research & innovation in urban planning & design utilizing city-level models to deliver just & equitable action in climate resilient development**

## What's new? 160 knowledge gaps | 259 action priorities

**Four levels, all interlinked.** Delivery approaches, pillars of justice and equity, systems approach levels, and city-level models, data, and knowledge

**Everyone is a co-generator**. Improved structure for the knowledge and innovation outputs from academia, business, civil society, and government

**Doubling down on justice and equity.** Informality, access, conflict & crisis, and sufficiency (among others) are in-focus

## Why?

**Inform the IPCC Special Report on Climate Change and Cities.** Robust structure to house peer-reviewed and grey knowledge matching report outline

**Empower city climate action.** Bridging gaps through knowledge to spur local (and multi-level) progress


- **Populate floors to** identify priority areas for action
- **Cultivate a directory** for knowledge co-generation
- **Crowdsource knowledge** where it doesn't exist/needs to grow further

# Marketplaces

Share space for connecting cities and local governments with

**cities** **business** **academia**

to identify opportunities for collaboration across the climate action journey

# Conferences

The premier convening at the nexus of cities, climate change science and policy innovation

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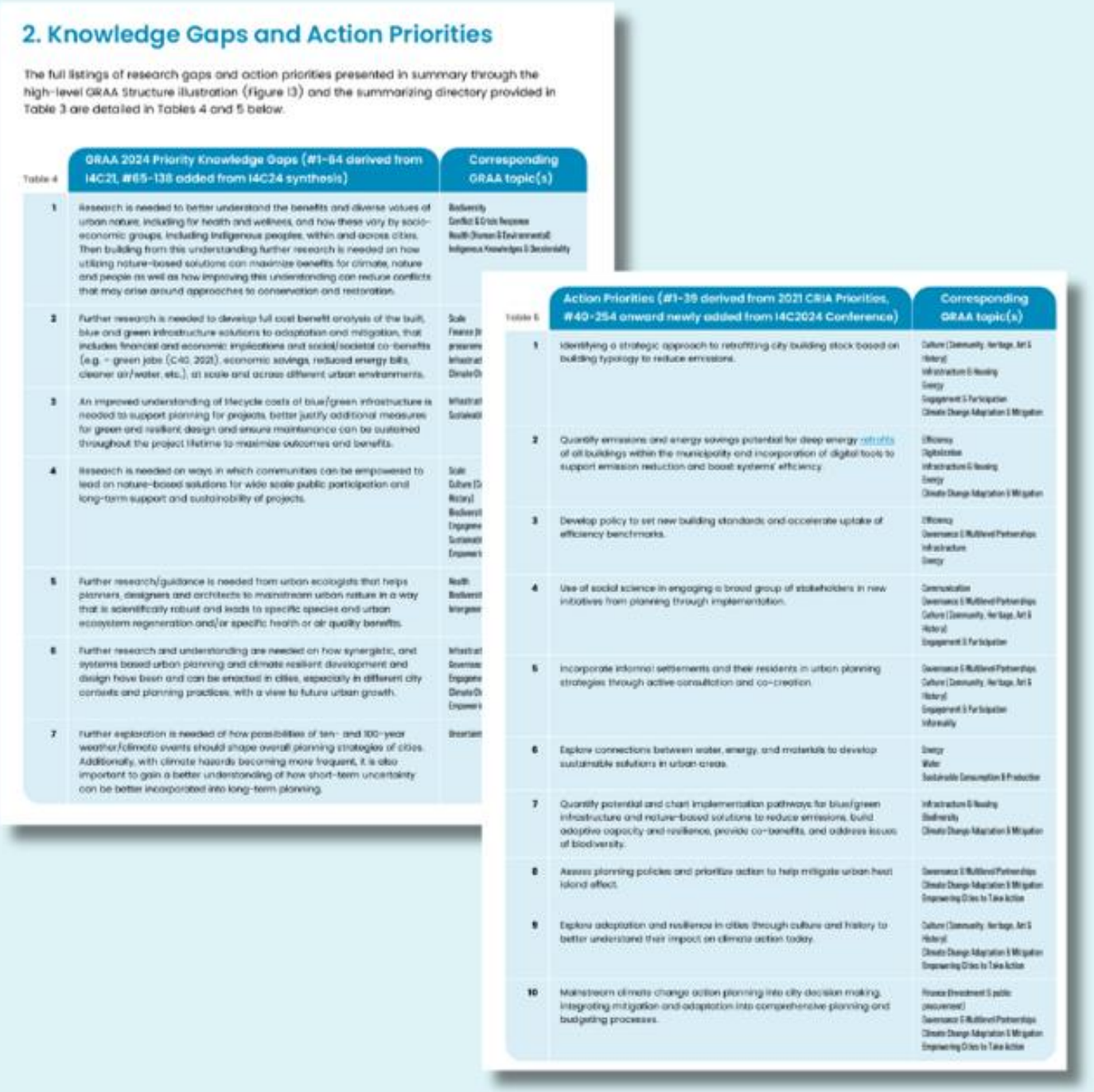
# 2024 GRAA

# Priority Knowledge Gaps
# Action Priorities

- 160 research gaps & 259 action priorities identified
- Builds on 2018-2021 GRAA & 2021 CRIA findings
- Requires investment from academia, business, government & city stakeholders
- **The full listings of research gaps and action priorities presented in summary through the high-level GRAA Structure illustration and the summarizing directory provided in Table 3 are detailed in Tables 4 and 5 to the right.**



## 2. Knowledge Gaps and Action Priorities

The full listings of research gaps and action priorities presented in summary through the high-level GRAA Structure illustration (Figure 13) and the summarizing directory provided in Table 3 are detailed in Tables 4 and 5 below.

Table 4

| | GRAA 2024 Priority Knowledge Gaps (#1-84 derived from I4C21, #85-138 added from I4C24 synthesis) | Corresponding GRAA topic(s) |
|---|---|---|
| 1 | Research is needed to better understand the benefits and diverse values of urban nature, including for health and wellness, and how these vary by socio-economic groups, including Indigenous peoples, within and across cities. Then building from this understanding further research is needed on how utilizing nature-based solutions can maximize benefits for climate, nature and people as well as how improving this understanding can reduce conflicts that may arise around approaches to conservation and restoration. | Biodiversity<br>Conflict & Crisis Response<br>Health (Human & Environmental)<br>Indigenous Knowledges & Decoloniality |
| 2 | Further research is needed to develop full cost benefit analysis of the built, blue and green infrastructure solutions to adaptation and mitigation, that includes financial and economic implications and social/societal co-benefits (e.g. – green jobs (C40, 2021), economic savings, reduced energy bills, cleaner air/water, etc.), at scale and across different urban environments. | Scale<br>Finance & [illegible]<br>preserves<br>Infrastruct<br>Climate Ch |
| 3 | An improved understanding of lifecycle costs of blue/green infrastructure is needed to support planning for projects, better justify additional measures for green and resilient design and ensure maintenance can be sustained throughout the project lifetime to maximize outcomes and benefits. | Infrastruct<br>Sustainabi |
| 4 | Research is needed on ways in which communities can be empowered to lead on nature-based solutions for wide scale public participation and long-term support and sustainability of projects. | Scale<br>Culture (Co<br>History)<br>Biodiversit<br>Engagem<br>Sustainabi<br>Empower |
| 5 | Further research/guidance is needed from urban ecologists that helps planners, designers and architects to mainstream urban nature in a way that is scientifically robust and leads to specific species and urban ecosystem regeneration and/or specific health or air quality benefits. | Health<br>Biodiversit<br>Intergen |
| 6 | Further research and understanding are needed on how synergistic, and systems based urban planning and climate resilient development and design have been and can be enacted in cities, especially in different city contexts and planning practices, with a view to future urban growth. | Infrastruct<br>Governan<br>Engagem<br>Climate Ch<br>Empower |
| 7 | Further exploration is needed of how possibilities of ten- and 100-year weather/climate events should shape overall planning strategies of cities. Additionally, with climate hazards becoming more frequent, it is also important to gain a better understanding of how short-term uncertainty can be better incorporated into long-term planning. | Uncertain |

Table 5

| | Action Priorities (#1-39 derived from 2021 CRIA Priorities, #40-254 onward newly added from I4C2024 Conference) | Corresponding GRAA topic(s) |
|---|---|---|
| 1 | Identifying a strategic approach to retrofitting city building stock based on building typology to reduce emissions. | Culture (Community, Heritage, Art & History)<br>Infrastructure & Housing<br>Energy<br>Engagement & Participation<br>Climate Change Adaptation & Mitigation |
| 2 | Quantify emissions and energy savings potential for deep energy retrofits of all buildings within the municipality and incorporation of digital tools to support emission reduction and boost systems' efficiency. | Efficiency<br>Digitalization<br>Infrastructure & Housing<br>Energy<br>Climate Change Adaptation & Mitigation |
| 3 | Develop policy to set new building standards and accelerate uptake of efficiency benchmarks. | Efficiency<br>Governance & Multilateral Partnerships<br>Infrastructure<br>Energy |
| 4 | Use of social science in engaging a broad group of stakeholders in new initiatives from planning through implementation. | Communication<br>Governance & Multilateral Partnerships<br>Culture (Community, Heritage, Art & History)<br>Engagement & Participation |
| 5 | Incorporate informal settlements and their residents in urban planning strategies through active consultation and co-creation. | Governance & Multilateral Partnerships<br>Culture (Community, Heritage, Art & History)<br>Engagement & Participation<br>Informality |
| 6 | Explore connections between water, energy, and materials to develop sustainable solutions in urban areas. | Energy<br>Water<br>Sustainable Consumption & Production |
| 7 | Quantify potential and chart implementation pathways for blue/green infrastructure and nature-based solutions to reduce emissions, build adaptive capacity and resilience, provide co-benefits, and address issues of biodiversity. | Infrastructure & Housing<br>Biodiversity<br>Climate Change Adaptation & Mitigation |
| 8 | Assess planning policies and prioritize action to help mitigate urban heat island effect. | Governance & Multilateral Partnerships<br>Climate Change Adaptation & Mitigation<br>Empowering Cities to Take Action |
| 9 | Explore adaptation and resilience in cities through culture and history to better understand their impact on climate action today. | Culture (Community, Heritage, Art & History)<br>Climate Change Adaptation & Mitigation<br>Empowering Cities to Take Action |
| 10 | Mainstream climate change action planning into city decision making, integrating mitigation and adaptation into comprehensive planning and budgeting processes. | Finance (Investment & public procurement)<br>Governance & Multilateral Partnerships<br>Climate Change Adaptation & Mitigation<br>Empowering Cities to Take Action |

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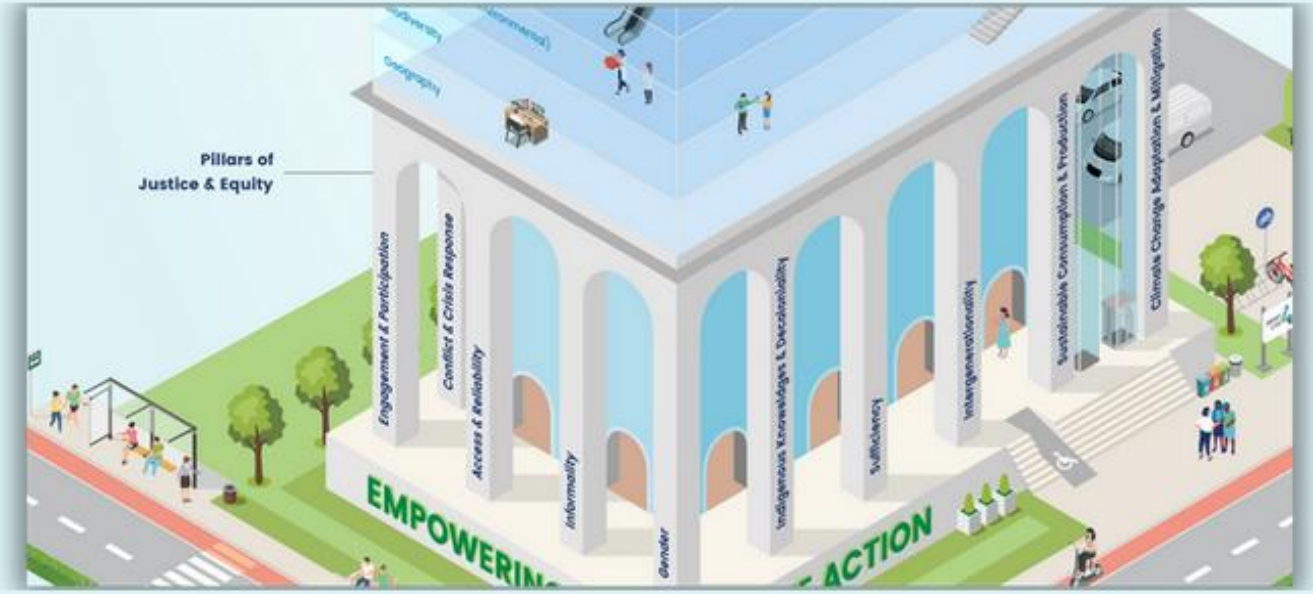
## Pillars of Justice & Equity:

# Climate Change Adaptation and Mitigation




### Climate Change Adaptation and Mitigation

| GRAA Heading | Climate Change Adaptation and Mitigation |
|---|---|
| Description | Included within the Pillars of Justice & Equity in the 2024 GRAA structure, adaptation in response to the effects of climate change and mitigation of the causes of climate change must be considered as a response to prior actions taken without full consideration of justice & equity dimensions. |
| Reference in previous GRAA | Included as a cross-cutting issue of the 2021 CRIA, but not the 2018 or 2021 GRAA. |
| Knowledge Gap/ issues described | Achieving climate adaptation and mitigation goals requires the development and implementation of targeted technologies and strategies, addressing specific issues across all systems to reduce GHG emissions. Resolving incongruity between urban development and climate response requires recognition of not only emissions but biodiversity loss across species. Across human populations, the distribution of resources and attention to adaptation and mitigation efforts require increased analysis and evidence-based coordination to integrate interventions where possible and resolve disparities in the equity of response delivered both within cities and across regions. |
| Knowledge Gaps | 2, 8, 10, 15, 17, 21, 24, 27, 35, 41, 42, 45, 54, 55, 73, 74, 75, 101, 102, 155 |
| Action Priorities | 1, 2, 7, 8, 9, 10, 12, 13, 14, 36, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 190, 258 |

| | | |
|---|---|---|
| **155** | Much of the focus on innovation has historically been driven by economic or technological factors, but there is limited research on how a human-centered approach can reshape the goals of innovation for sustainability and equity. Research is required to explore how grounding innovation in human needs can lead to more equitable and sustainable outcomes in areas such as health, environment, and climate adaptation. | Climate Adaptation & Mitigation<br>Culture (Community, Heritage, Art & History)<br>Health (Human and Environmental) |
| **258** | Local governments should plan all action in accordance with 1.5°C overshoot scenarios expected within the next generation, financing local level development across all sectors at speed and scale exceeding that of the national-level multilateral dialogue. | Climate Change Adaptation & Mitigation<br>Culture (Community, Heritage, Art & History) \| Engagement & Participation<br>Empowering Cities for Action<br>Finance (Investment & public procurement)<br>Governance & Multilevel Partnerships<br>Intergenerationality<br>Risk \| Sufficiency \| Uncertainty |

# Data Portal for Cities: a free tool to access data and build GHG inventories

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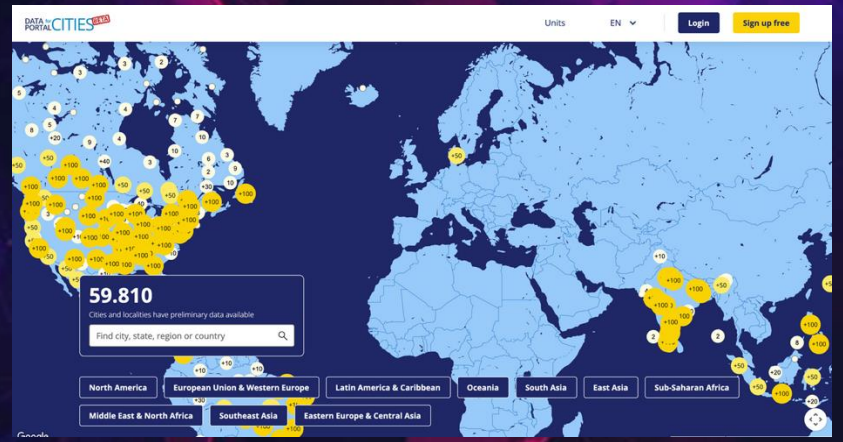
**Leveraging leading technologies**
Transportation data from Google's Environmental Insights Explorer (EIE) has been integrated, providing cities worldwide with insights into activity and emissions

**Empowering local leadership**
Integrates data from SEEG (Greenhouse Gas Emissions Estimation System) specifically for Brazilian cities, enabling them to access detailed, high-quality local GHG data.

**Streamlining global best practice**
Being improved with the learnings from the Green Resilient Cities Model supporting Brazil's climate leadership.

**Open data and interoperability**
The tool is owned by GCoM and seamlessly integrated with reporting platforms such as CDP-ICLEI Track.




dataportalforcities.org

# Announcing the
# ***AIx City Climate Action*** / Hackathon 2025

Two data-driven, action-oriented themes:

1. ***Expand energy access and alleviate energy poverty*** by designing innovative ways to help cities ensure reliable, affordable, and sustainable energy for all, especially in vulnerable communities

2. ***Identify actions and track implementation*** to reduce greenhouse gas emissions and build resilience being led by cities around the world.

**KICKOFF**
22 May 2025

**DEEP DIVE**
02 July 2025
*Córdoba, Argentina*

**DEADLINE**
01 Sep 2025

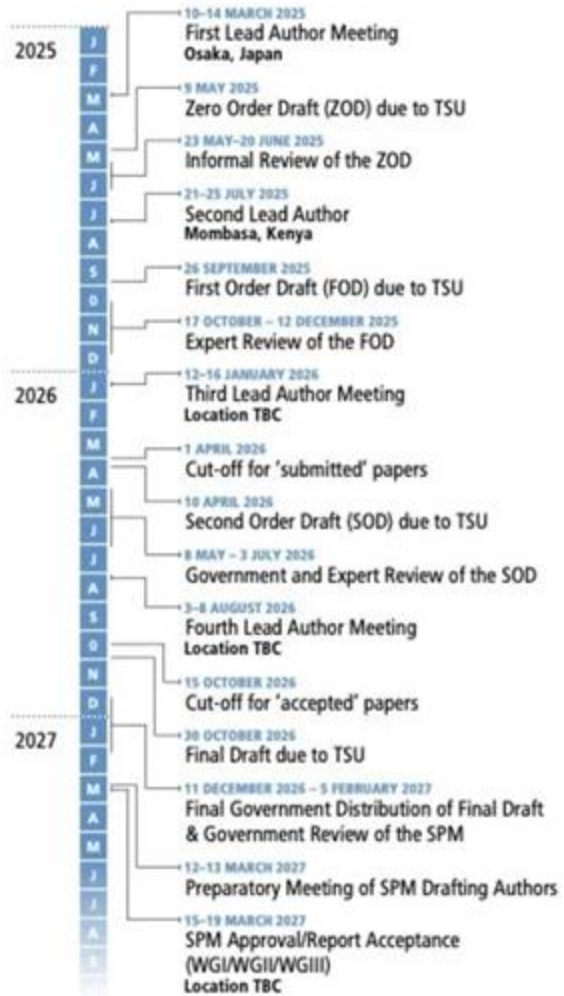
**FINALE**
NYC Climate Week

**PRIZE**
city pairing and support for implementation

Co-funded by the European Union

# IPCC Special Report on Climate Change and Cities

## Timeline




### The UTM and GCoM roadmap to informing SR Cities

- **Documenting evidence-based reports** from UTM + GCoM and mapping them to different SR Cities chapters
- **Documenting existing knowledge generated that is not in a report but should be pulled in** as a standalone or specific case study to inform chapters
- **New knowledge products that need to be produced with UTM collaboration**
  - In progress:
    - I4C Book
    - Climate Innovation Readiness Navigator profiles for Oceania / Canada
    - UCCRN case studies
  - To consider:
    - UTM and partners literature review (grey and peer-reviewed) aligned to SR Cities chapters

# Linking Innovate4Cities and the Urban Transitions Mission

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URBAN TRANSITIONS MISSION

**7 UTM Clusters**

| Data & scenarios | Energy (including renewables) | Governance | Finance | Mobility | Nature-based solutions | Water |
|---|---|---|---|---|---|---|

**10 shared priorities**

| Governance | Innovative governance | Urban planning and design | Sustainable resource management | Sustainable infrastructure | Health and well-being | City-scale data | Resilience and adaptive capacity | Economy and financing | Digitalization | Systems approach |
|---|---|---|---|---|---|---|---|---|---|---|

**Grounded in broader agendas**





# 2023–2024: A structure for knowledge generation – UTM priorities, themes and tactics

| Shared priorities for the Urban Transitions Mission |
|---|
| Innovative governance |
| Urban planning and design |
| Sustainable resource management |
| Sustainable infrastructure |
| Health and well-being |
| City-scale data |
| Resilience and adaptive capacity |
| Economy and financing |
| Digitalization |
| Systems approach |

**Positive Energy Districts and Neighbourhoods**
transforming the urban energy system

**Circular Urban Economies**
an integrated approach for urban greening and circularity transitions

**15-minute Cities**
rethinking the urban mobility system and space

| Data & scenarios | Energy (including renewables) | Governance | Finance | Mobility | Nature-based solutions | Water |
|---|---|---|---|---|---|---|
| | | ☑ | | | | |
| | ☑ | | | ☑ | ☑ | ☑ |
| | | | | | ☑ | ☑ |
| | ☑ | | | ☑ | ☑ | ☑ |
| *Forthcoming pending further planning and UTM cohort demand* | | | | | | |
| ☑ | | | | | | |
| | | | | | ☑ | ☑ |
| | | | ☑ | | | |
| | ☑ | | | ☑ | | |
| *Forthcoming pending further planning and UTM cohort demand* | | | | | | |

**Future Clusters to be considered for inclusion based on UTM cohort demand – including waste**

# Urban Transitions Mission Research Clusters

*Convening urban research to accelerate the net-zero urban transition*

**Link academics, researchers, universities & think tanks with UTM cities** around priorities and themes

**Identify past, present, and future knowledge** generation opportunities to fill priority gaps

Encouraged to **address UTM city-specific priorities** and contribute outputs relevant to the next IPCC Assessment Report cycle

Cities TCP
Decarbonising Cities & Communities

Call open to academics, researchers, universities, and think tanks

**Collaboration with Cities-TCP** and launch of 3 research action groups on UTMC platform:

- Blended finance
- Energy infrastructures
- Data and scenarios

# Reinforcing UTM links with the GRAA *and* SR Cities

| *Shared priorities for the Urban Transitions Mission* | *Data & scenarios* | *Energy (including renewables)* | *Governance* | *Finance* | *Mobility* | *Nature-based solutions* | *Water* |
|---|---|---|---|---|---|---|---|
| Innovative governance | | | ☑ | | | | |
| Urban planning and design | | ☑ | | | ☑ | ☑ | ☑ |
| Sustainable resource management | | | | | | ☑ | ☑ |
| Sustainable infrastructure | | ☑ | | | ☑ | ☑ | ☑ |
| Health and well-being | *Forthcoming pending further planning and UTM cohort demand* | | | | | | |
| City-scale data | | | | | | | |
| Resilience and adaptive capacity | ☑ | | | | | ☑ | ☑ |
| Economy and financing | | | | ☑ | | | |
| Digitalization | | ☑ | | | ☑ | | |
| Systems approach | *Forthcoming pending further planning and UTM cohort demand* | | | | | | |

## GRAA Gaps and Priorities

**City-level models, data, and knowledge**
- Digitalization
- Information integrity
- Efficiency
- Centralization
- Uncertainty
- Scale
- Communication
- Risk

**Systems approach levels**
- Finance
- Multi-level Partnerships
- Culture
- Infrastructure
- Waste
- Mobility
- Energy
- Food
- Water
- Health
- Biodiversity
- Geography

**Pillars of Justice and Equity**
- Informality
- Indigenous Knowledges & Decoloniality
- Intergenerationality
- Adaptation & Mitigation
- Consumption & Production
- Engagement & Participation
- Conflict & Crisis

# Futureproofed UTM priorities, linked with the GRAA and SR Cities

| | | City-level models, data, and knowledge | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Digitalization (incl.data) | Information integrity | Efficiency | Centralization | Uncertainty | Scale | Communication | Risk |
| System approach levels | Governance and Multi-level Partnerships | ☑ | ☑ | ☑ | | | ☑ | | |
| | Finance | ☑ | | | | | ☑ | ☑ | ☑ |
| | Infrastructure (incl. housing) | ☑ | | ☑ | | ☑ | | ☑ | ☑ |
| | Mobility | ☑ | | ☑ | ☑ | | ☑ | ☑ | ☑ |
| | Energy | ☑ | | ☑ | ☑ | | ☑ | ☑ | |
| | Biodiversity | | | ☑ | | | | | ☑ |
| | Water | | | | | | | | |
| | Health (incl.wellbeing) | | | | | | | | |
| | Waste | | | | | | | | |
| | Food | | | | | | | | |
| | Culture | | | | | | | | |

**Pillars of justice & equity**
Informality | Indigenous Knowledges & Decoloniality | Intergenerationality | Climate Change Adaptation & Mitigation | Sustainable Consumption & Production | Engagement & Participation | Conflict & Crisis Management

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# Q&As

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