GLOBAL COVENANT
of MAYORS *for*
CLIMATE & ENERGY

INNOVATE4CITIES

A GLOBAL CLIMATE ACTION ACCELERATOR: RESEARCH AND INNOVATION PRIORITIES

With the Paris Agreement coming into force, and the associated commitment of 197 nations around the world, including the European Union, to limit global warming to well below 2° C, governments are beginning to understand the urgency of the climate change crisis. However, current national governments commitments are not enough. Cities, supported by city networks, are rising to meet this challenge and are making bold commitments to take action, in many cases even more ambitious than those made by national governments. **Together, cities are sending a clear message that they will be a driving force in implementing the Paris Agreement.**

To deliver accelerated and more ambitious climate change action, it is critical for national and regional governments, academia, private sector, civil society organizations, and local governments to form solutions-driven and outcomes-oriented partnerships. We challenge these partners to work collaboratively through **INNOVATE4CITIES** and specifically call upon:

NATIONAL GOVERNMENTS To allocate at least one-third of their research and development budgets over the next decade to directly resolve issues which have been highlighted as city priorities for addressing climate change. We also ask that they work with cities to vertically align priorities in addressing climate change and create national energy, urban, land-use and innovation policy landscapes which provide cities the agency and capacity to take greater action.

PRIVATE SECTOR To partner with cities and local governments to generate the economic, environmental and institutional capacity in ways that provide a public benefit and meet the Sustainable Development Goals and the Paris Agreement. This can be further accelerated by unlocking proprietary data in ways that provide a public benefit and develop tools for processing large amounts of data. Companies need to work collaboratively with city practitioners to develop institutional and technological solutions that can be easily piloted and that have pathways for scalability.

ACADEMIA To recruit 10 million new students globally by 2025 in climate change related studies and help them grow into future climate leaders within all sectors of the workforce. We challenge them to evolve degree and programmatic offerings to meet new standards of knowledge creation and problem solving skills that propose and encourage interdisciplinary learning methods. Emphasis must be placed on co-generation of new knowledge which is action-oriented and addresses the implementation and research gaps as identified by cities and highlighted through the Cities and Climate Change Science Conference research and action agenda.[1]

CITIES AND LOCAL GOVERNMENTS To fully embrace their leadership role in implementing sustainable development outcomes and in building partnerships for accelerated climate action. To this end, cities and local government aim to share their experiences and need for additional capacity, financing, research, data and technology. We are working through the Global Covenant of Mayors for Climate and Energy (GCoM) to create opportunities for iterative work with all stakeholders, testing (and providing feedback for) the methods and solutions prioritized within this agenda, and to send a collective market signal to build additional capacities and accelerate investment in cities.

[1] This will inform the Intergovernmental Panel on Climate Change (IPCC) Special Report on Climate Change and Cities in the seventh assessment report (https://citiesipcc.org/beyond/campaign). Recommendations and advice need to be provided at a rate which is commensurate with the pace of city decision making, and at the scale needed by cities to meet their climate and sustainable development commitments.

LET'S GET STARTED ·····························▸

THE CHALLENGE

Despite growing awareness of the need for transformative climate action, there is still a significant gap between cities' ambition and their ability to implement actions that will reduce emissions as well as build local-level adaptive capacity and resilience. Cities are struggling with the interlinked nature of climate change impacts at the local scale. Actionable pathways are complex and methods to accelerate climate action at scale are not clearly understood. Rapid urbanization, disruptive technology, and dramatically changing climates and ecosystems present additional external challenges that impact successful implementation. Therefore, resources to ensure success are often hard for cities to access and secure.

THE OPPORTUNITY

Finance is often heralded as the silver bullet to delivering climate change action. However, to truly advance cities' efforts to achieving their stated goals, a new focus is needed around another type of resource: knowledge and innovation. Specifically, cities need the support from partners in national and regional governments, academia, business, and civil society across three key pillars: **science and research**, **innovation and technology**, and **city-level data access**.

SCIENCE & RESEARCH	INNOVATION & TECHNOLOGY	CITY-LEVEL DATA ACCESS

- **Ignite significant momentum** to produce climate change research and innovation research on and for cities.
- **Drive evidence-based action and innovation** related to climate change and sustainability in cities.
- **Create demand for detailed downscaled climate models** and science on urban systems.

- Tomorrow's innovations must help cities to **significantly reduce their emissions** while making them more resilient.
- **Opportunities must be scaled** to help cities catalyze, pilot, and procure new technology.
- Unique partnerships and implementation models need to create **solutions for cities of all sizes** and enhance access to technology globally, not just for well-resourced cities.

- There are **still significant data gaps** for cities to measure, plan, and monitor mitigation, adaptive capacity and resilience.
- **Key data is difficult to access** or even disaggregate from the national level.
- **Need for accurate data** so policymakers, researchers and civil society pursue, justify, and analyze the right most appropriate mitigation and adaptation policy.

GCoM launched **INNOVATE4CITIES: A GLOBAL CLIMATE ACTION ACCELERATOR**, a city-led initiative to establish a research and innovation agenda that builds off existing work done by city networks and is informed by discussions at the Cities and Climate Change Science conference. **INNOVATE4CITIES** identifies the specific data, information and technology gaps cities have prioritized, and, if addressed, would

drive science-based, technology-driven, replicable action and sustainable innovation at the scale the world demands and that cities need. This agenda seeks to harness the momentum that has been building from government, the private sector, academia, and civil society to work together to generate the data, knowledge, and technological advancements that will create a more sustainable and prosperous future.

DEVELOPING THE AGENDA — A MODEL OF COLLABORATIVE CREATION

To provide a city-driven perspective, GCoM launched a broad stakeholder engagement process to convene city officials, business leaders, and leading academics around the world. Through global workshops, direct interviews with mayors, city staff, city networks, and a review of previously generated literature, GCoM synthesized all input to identify overlapping areas of priority from cities. This work was then refined to develop the **INNOVATE4CITIES** agenda.[2]

PURPOSE OF THE AGENDA — UNLOCKING URBAN POTENTIAL

The **INNOVATE4CITIES** agenda seeks to fill the local-level knowledge, information, and technological gaps. This knowledge and innovation will arm local government practitioners to successfully make the case, and advance their efforts, with city leaders, private sector, citizens, and the financial community as they strive to undertake bold climate action, and ultimately drive resources to ensure successful delivery. The **INNOVATE4CITIES** agenda is organized around the decision-making process of local city officials and, therefore, focuses on the decision points along this policymaking continuum, highlighting the most significant sustainable development gaps that research and technology can address. The policymaking process is the basis of the agenda and is framed by four priority questions:

1 **WHY SHOULD WE TAKE CLIMATE ACTION?**

2 **HOW SHOULD WE PRIORITIZE?**

3 **WHAT SHOULD WE DO?**

4 **HOW DO WE FINANCE & SCALE CLIMATE ACTION?**

[2] The **INNOVATE4CITIES** Agenda is inclusive of a forthcoming White Paper that illustrates the details of the consultation.

CITY RESEARCH AGENDA

1 WHY SHOULD WE TAKE CLIMATE ACTION?

Cities need information to understand the potential detrimental effects of climate change on their communities and related ecosystems and how their everyday decisions contribute to climate change globally. Information which is specific to particular cities, or particular regional or geographic contexts is needed for cities to understand the scope of the problem in their local context and see themselves in the solution. Successfully identifying options (including nature-based solutions and social innovation) and justifying them requires access to information, expertise and local-level data on the science of climate change, the impacts it will have on local communities and ecosystem services, and the timelines within which action will be necessary to address the problem. Impacts on vulnerable populations must be considered so that climate action supports all residents.

RESEARCH PRIORITIES
Evidence is required to progress decision making in cities and provide a rationale to act.

- **Generation of city scale data** for development of specific observation, models, scenarios.
- **Communication of uncertainty and risk** for cities relating to climate hazards.
- **Decreasing the gap in climate relevant data** on vulnerable communities.
- **Equitable development and dissemination** of knowledge and data.
- **Calculation and communication** of economic and health effects of action vs. inaction.
- **Measures to valuate** a wide range of climate and societal co-benefits of climate solutions.

2 HOW SHOULD WE PRIORITIZE?

Once cities have established a need for action, the next step is to set goals and develop a strategy to meet them. Fortunately, global and local city networks have been working for years to assemble evidence for best practices in many different city contexts. Generally, effective actions are known, but the feasibility and trade-offs between various options and the specific priorities for a certain community may not be. It is important to understand what to prioritize and why, in the context of a specific city and region. In certain cases, big ticket items will provide greater gains in efficiency, resilience and societal co-benefits. In other circumstances, implementing multiple easy wins will have greater impact. It is important for cities to understand the implications of action on different sectors and parts of society.

RESEARCH PRIORITIES
Local context needs to be built into the knowledge generated to enable cities to prioritize and act.

- **Understand co-benefits** and reduce risks for most vulnerable populations.
- **Evaluate combinations** of high-tech and low-tech innovation.
- **Determine how to incorporate informal settlements** in urban planning strategies.
- **Use of social science** in engaging a broad group of stakeholders on new initiatives from planning through implementation.
- **Explore incentives** for municipal employees to innovate and take risks with transformative decisions.
- **Investigate emerging social innovations** in cities that could be exported globally to scale solutions.
- **Develop solutions which are flexible and distributed/networked**, that can be expanded or changed as innovation progresses or financing allows.

3 WHAT SHOULD WE DO?

To be successful, a climate action plan must be secured in a solid policy strategy and bolstered by support from stakeholders who carry both a shared set of sustainability goals and the capacity to assist the city in implementing them. There are several sectors where cities have a strong role in reducing emissions and building resilience, and it is important to work with key partners and institutions who influence these sectors to propose effective solutions. In many cases, cities lack information on policy options and examples of successful implementation of "known solutions." Selecting the right approach for implementation may also require collaboration with local partners or other levels of government in new and innovative ways that are untested. Clear illustration of direct and indirect climate and societal benefits of action within these sectors can be critical in receiving approval of a particular project.

RESEARCH PRIORITIES
Research priorities that are most important entry points for city action.

Urban Planning and Design
- **Assess planning policies** to help mitigate urban heat island effect.
- **Quantify potential** for different blue/green infrastructure and nature-based solutions to reduce emissions, build adaptive capacity and resilience, provide co-benefits and address issues of biodiversity.

Buildings
- **Identify a strategic approach to retrofitting** city building stock based on building typology to reduce emissions.
- **Develop policy** to set new building standards to accelerate uptake of efficiency standards.

Energy
- **Evaluate balance between connected vs. distributed renewable systems** based on access and reliability.
- **Assess energy efficiency increases** through use of micro grids.

Water
- **Assess solutions** to address the urgency of water-scarcity, pollution and allocation in cities and their related ecosystems.
- **Explore connections** between water, energy and materials to develop sustainable solutions in urban areas.

Waste
- **Evaluate benefits** of diversion and recycling considering supply and demand.
- **Communicate community benefits** of controlled landfilling to build understanding and buy-in of waste collection systems.

Transportation
- **Explore how digital infrastructure can be built into transit systems** to connect public and private transit technology.

Food
- **Support community-based and entrepreneurial innovation** in climate smart food systems.

4 HOW DO WE FINANCE & SCALE CLIMATE ACTION?

Successful policy instruments must often be scaled to larger, more complex systems that interact with other aspects of the local and regional governance, and that impact with a city's socioeconomic fabric. At times, necessary financing can be difficult to access which is why close collaboration with other levels of government, development agencies, and financial institutions is key to maximizing climate policy creditworthiness. A clear understanding of the mechanisms which can be used to create a better landscape for financing within a city's local, regional and national context is key to ensure financing of solutions is sustainable and scalable.

RESEARCH PRIORITIES
Policy and finance instruments.

Financing
- **Collaboration and capacity building** to develop bankable projects and increase creditworthiness to de-risk investment.

Governance
- **Governance landscapes** (considering formal and informal actors) to support greater generation of greater municipal revenue.

Public Procurement
- **Strategic methods for awarding projects** which prioritize sustainability in their solution.

MOBILIZATION

SHAPING THE FUTURE

While opportunities for local action are becoming more cost-effective and best practices more accessible, cities continue to face significant challenges in responding to climate change. Institutional capacity, knowledge, finance, technology, and data gaps present real limitations, widening the gap between ambition and successful implementation of local level climate policy.

Multi-sector collaboration is critical, and the world is beginning to mobilize:

NATIONAL GOVERNMENTS   Seeing the targets set by their cities and realizing the dire warning that science is providing, national governments are beginning to look for ways to facilitate implementation of transformative solutions in cites. In May 2018, the Mission Innovation Ministerial, an initiative of 23 governments, including the European Union, invited cities to collaboratively develop an innovation roadmap that can be realized in urban areas.

PRIVATE SECTOR   Rising to the challenge, the private sector is sharing its intellectual property, expertise and investment into problem solving climate change at the urban level. At the business level, more than 800 companies with a total market value of over $16 trillion have made far reaching climate commitments, working with the partners of the We Mean Business Coalition.[3] New partnerships to make propriety data available to cities globally are now in motion including an important new partnership between Google and GCoM.

ACADEMIA   Recognizing a need to fill critical knowledge gaps and to co-design research questions and solutions to climate change in urban areas, the academic community rallied under the convening of the CitiesIPCC Conference in Edmonton, March 2018. This was the first scientific conference co-sponsored by the IPCC bringing over 700 experts together from around the world.

GLOBAL COVENANT OF MAYORS FOR CLIMATE AND ENERGY
Built by global and local city networks, and now including 9,100+ city signatories across 6 continents and more than 120 countries, representing 800 million people or roughly 10% of the global population, GCoM has developed this **INNOVATE4CITIES** accelerator. GCoM network partners are committed to working collaboratively through this process to bring in direct city input and experience to drive a co-developed agenda.

[3] http://www.wemeanbusinesscoalition.org/

The **INNOVATE4CITIES** agenda is a starting point for the Global Covenant of Mayors and our partners. By working together with city leaders to develop the tools, insights, and capabilities to bridge the local government commitment gap and deliver the action, we can make significant progress in securing a climate safe world and meeting the goals of the Paris Agreement. We aim to advance **INNOVATE4CITIES**, maintaining it as an ever-evolving set of priorities and partnerships that will be refined through even broader engagement as research questions are answered and data gaps are filled while new ones emerge. We welcome your contributions to better understand the next innovative solution, insight, research question, technology or institutional innovation you believe will be the catalyst for even more ambitious climate action at the urban level.

Those businesses and academic partners who wish to support the **INNOVATE4CITIES** agenda should endorse this work and join us in working with national governments to channel research and innovation funding to support the work of cities. **With this in mind, the Global Covenant of Mayors aims to:**
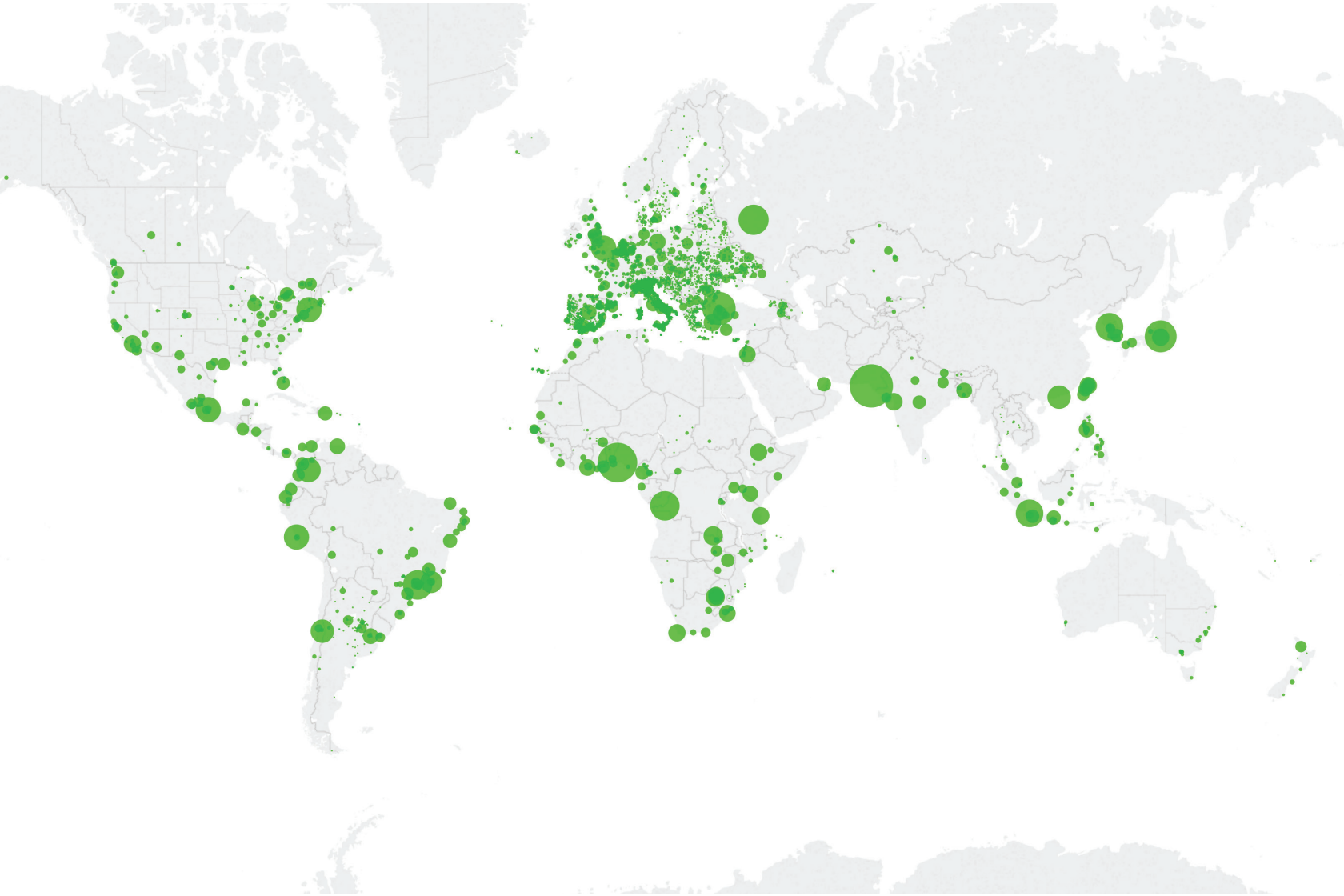
- **Advocate to National Governments for Commitments** to specific, targeted funding towards research and innovation on cities and climate change;

- **Support a New Initiative within the Mission Innovation Ministerial** that focuses on cities and climate change research and development across multiple sectors;

- **Develop Partnerships with Visionary Businesses** to increase the free flow of information and pilot new technologies in cities;

- **Build Greater International Collaboration** between city networks, academic institutions, and philanthropy for more integrated approaches in generating the science, knowledge and innovation required for a more prosperous, climate resilient world;

- **Coordinate Research and Innovation** across member city networks and help drive new funding, approaches, and partnerships;

- **Establish a Scientific Advisory Committee** to coordinate the academic response to the agenda; and

- **Build Momentum through the Edmonton Declaration**, a direct call to action from cities which has already been endorsed by more than 4,000 cities.

THE INNOVATE4CITIES MODEL

ACADEMIA GOVERNMENTS PRIVATE SECTOR CITIES

OPPORTUNITY PILLARS and **KNOWLEDGE & INNOVATION GENERATION**

CITY RESEARCH AGENDA

WHY? HOW? WHAT? SCALE?

PARTNERSHIPS

FINANCING   GOVERNANCE

SUSTAINABLE & LIVEABLE CITIES

GLOBAL COVENANT
of **MAYORS** *for*
CLIMATE & **ENERGY**

MISSION STATEMENT

The Global Covenant of Mayors serves cities and local governments by mobilizing and supporting ambitious, measurable, planned climate and energy action in their communities by working with city/regional networks, national governments and other partners to achieve our vision.

ABOUT US

The Global Covenant of Mayors for Climate and Energy is the largest global coalition of cities and local governments voluntarily committed to actively combatting climate change and transitioning to a low-carbon and climate resilient economy. Led by UN Secretary-General's Special Envoy for Climate Action, Michael R. Bloomberg, and European Commission Vice President, Maroš Šefčovič, in partnership with local, regional and global city networks, the Global Covenant has thousands of city signatories across 6 continents and more than 120 countries, representing over 700 million people or nearly 10% of the global population. Learn more at: **WWW.GLOBALCOVENANTOFMAYORS.ORG**

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