

THE CO-BENEFITS OF CLIMATE ACTION

Accelerating City-level Ambition



EXECUTIVE SUMMARY

Global emissions need to halve by 2030 and reduce to net zero by 2050 to stay in line with the 1.5°C mitigation pathway and avoid catastrophic climate change¹. Accounting for up to 70% of global emissions² and home to 55% of the global population³, cities are at the forefront of this challenge and have a vital role to play in meeting global targets. By taking actions to cut emissions and reduce vulnerabilities, cities can gain multiple co-benefits from climate action.

What is a co-benefit?

Climate co-benefits are beneficial outcomes from action that are not directly related to climate change mitigation. Such co-benefits include cleaner air, green job creation, public health benefits from active travel, and biodiversity improvement through expansion of green space. Planning climate action that also delivers co-benefits can enable cities to bolster support from key stakeholders⁴, mobilize scarce resources across city departments, and maximize opportunities to address multiple social, environmental, and economic challenges⁵.

61%
of cities reported taking actions to mitigate climate change

Cities are taking action

Every year, cities voluntarily report their climate and environmental performance data to the **CDP-ICLEI Unified Reporting System**, enabling cities to monitor their climate impact and drive climate ambition. In 2019, 861 cities from around the world disclosed their data. Of these cities, 521 (or 61%) reported taking actions to mitigate climate change, based on a list of 48 possible mitigation actions provided in the reporting system. These cities represent 73 countries and an estimated population of 500 million people, or roughly 8% of the global population. Cities identified co-benefits that were expected to result from the mitigation actions they reported, based on a list provided in the CDP-ICLEI Unified Reporting System (Box 1, page 10). This report assesses how cities are identifying and using co-benefits to support their climate action by analysing the climate mitigation actions and co-benefits that cities reported in 2019 and through case studies of cities that are actively seeking to integrate co-benefits in their climate action planning. The report also provides information on tools and resources that are available to cities looking to embed co-benefits into their climate action.

Highlights

▼ **Cities citing the co-benefits of their climate action reported 2.5 times more climate actions than cities that did not.**

2.5 times more climate actions than cities that did not

▼ **On average, almost a quarter of cities did not report co-benefits associated with their climate actions and for some actions, cities were not citing the full range of co-benefits they could be.** This may mean that cities are missing out on the opportunity to address other city priorities such as health, social inclusion and economic inequality challenges through their climate action and gain support from a wider range of city stakeholders.

24% of cities did not report co-benefits associated with their climate actions

▼ **The five most reported mitigation actions were:**

Improving building energy efficiency through retrofits



253 cities 49%

Switching to more energy-efficient street lighting



158 cities 30%

Installing on-site renewable energy generation on buildings



149 cities 29%

Increasing low or zero carbon energy generation



142 cities 27%

Improving building codes and standards for new builds



135 cities 26%

▶ **The top co-benefits of mitigation actions reported by cities were shifts to more sustainable behaviour** (reported as a co-benefit for 39% of all mitigation actions taken by cities) **and improved resource efficiency** (33%) – see Box 1 on page 10 for the full list of co-benefits and explanations and/or examples. However, the picture varies from region to region:

Most common co-benefits reported by cities, per region (measured as the % of all mitigation actions reported by cities for which each co-benefit was cited)



▶ **We recommend that cities consider how best to define co-benefits in the context of their own priorities and stakeholders and summarize a number of freely available tools to help support greater integration of co-benefits in climate policy-making.**

1. IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp. https://www.ipcc.ch/site/assets/uploads/2018/10/SR15_SPM_version_stand_alone_LR.pdf (2011).
2. UN Habitat, Global Report on Human Settlements 2011: Cities and Climate Change, <https://unhabitat.org/sites/default/files/download-manager-files/Cities%20and%20Climate%20Change%20Global%20Report%20on%20Human%20Settlements%202011.pdf> (2011).
3. United Nations. World Urbanization Prospects. Demographic Research vol. 12 197–236 <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf> (2018).
4. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).
5. Jennings, N., Fecht, D. & De Matteis, S. Co-benefits of climate change mitigation in the UK: What issues are the UK public concerned about and how can action on climate change help to address them? <https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Co-benefits-of-climate-change-mitigation-in-the-UK.pdf> (2019).

TABLE OF CONTENTS

2	Executive summary
5	City climate action: The current state of play
8	Mitigation actions and co-benefits reported by cities
27	How are cities embedding co-benefits in their climate action planning?
37	Key lessons and opportunities for cities

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CITY CLIMATE ACTION: THE CURRENT STATE OF PLAY

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To avoid catastrophic climate change, we need to reduce emissions in line with 1.5°C

When the Paris Agreement was signed at COP21 in 2015, countries around the world agreed to limit global average temperature rise to “well below” 2°C and pursue efforts to hold it to 1.5°C, above pre-industrial levels⁶. To deliver this goal, substantial and rapid decreases in global emissions are needed.

Cities have a vital role to play in the transition to a resilient and low-carbon future

Cities are at the forefront of the climate emergency – accounting for up to 70% of global emissions⁷, 80% of global gross domestic product (GDP) and 55% of the global population⁸. By 2050, two-thirds of the global population will live in cities⁹, meaning that urban climate action is only going to become more urgent as growing populations need safe and secure places to live and work.

Evidence shows that cities have huge potential to drive the transition to a low-carbon future:

- ▼ Climate action by cities with populations over 100,000 could deliver an estimated 40% of the global emissions reductions needed to limit warming to 1.5°C (based on the IPCC global carbon budgets)¹⁰.
- ▼ By focusing efforts on key mitigation actions across energy, buildings, transport and waste¹¹, cities could achieve 90-100% of the emissions reductions they need (based on the IPCC global carbon budgets) to work within a 1.5°C pathway and contribute to the goals of the Paris Agreement.

Cities across the globe, therefore, have a significant role to play in the transition to a low-carbon future, and this report examines how cities disclosing to the CDP-ICLEI Unified Reporting System are identifying co-benefits to do this.



Cities that cited co-benefits reported more than twice

2.5x

as many mitigation actions as cities that did not report co-benefits

Making the case: co-benefits as a motivator for climate action

Despite having significant potential to reduce global emissions, cities face several barriers to delivering climate action. One of these barriers is being able to make the case for climate action successfully to key decision-makers and other city stakeholders, such as local companies, to implement and embed climate actions¹². This is because cities have multiple competing priorities and climate action has often been perceived to come at the cost of other goals such as economic growth and inequality reduction¹³. Moreover, city authorities often lack full regulatory control of emissions within their boundaries, with some cities directly controlling just 4% of their carbon emissions through their own estates¹⁴.

Evidence shows that carefully planned climate action can result in multiple positive non-climate benefits in addition to climate mitigation or adaptation, such as reduced air pollution, job creation, reduced inequality and improved public health¹⁵. For example, analysis by the New Climate Institute and C40 showed that as well as reducing emissions, improving the energy efficiency of buildings worldwide could add 5.4 million net jobs. Their results also showed that shifting building heating and cooling systems to district-scale renewable energy at a global scale could prevent 300,000 air pollution-related deaths per year and create 8.3 million net jobs¹⁶.

Designing policies that tackle both climate change and other city priorities can bolster support from local stakeholders¹⁷, increasing the likelihood that the policy will be approved by decision-makers¹⁸, and therefore accelerate city climate action. A C40 survey of cities showed that non-climate co-benefits were cited over 50% of the time as being a motivator for climate action¹⁹. This aligns with our analysis of city responses to the CDP-ICLEI Unified Reporting System in 2019 which showed that, on average, **cities that cited co-benefits reported more than two times (2.5x) as many mitigation actions as cities that did not report co-benefits**, indicating that cities that understand co-benefits are delivering more climate actions.

6. UNFCCC. Paris Agreement (English). https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf (2015).
7. UN Habitat, Global Report on Human Settlements 2011: Cities and Climate Change, <https://unhabitat.org/sites/default/files/download-manager-files/Cities%20and%20Climate%20Change%20Global%20Report%20on%20Human%20Settlements%202011.pdf> (2011).
8. United Nations Department of Economic and Social Affairs. World Urbanization Prospects. Demographic Research vol. 12 197–236 <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf> (2018).
9. United Nations Department of Economic and Social Affairs. World Urbanization Prospects. Demographic Research vol. 12 197–236 <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf> (2018).
10. C40 & ARUP. Deadline 2020 How Cities Will Get the Job Done. 59 http://c40-production-images.s3.amazonaws.com/researches/images/59_C40_Deadline_2020_Report.original.pdf?1480609788%0A
11. McKinsey Center for Business and Environment & C40. Focused acceleration: A strategic approach to climate action in cities to 2030. <https://www.c40.org/researches/mckinsey-center-for-business-and-environment> (2017).
12. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).
13. Ramboll & C40. Urban Climate Action Impacts Framework. 42 https://c40-production-images.s3.amazonaws.com/other_uploads/images/1605_C40_UCAIF_report_V3.original.pdf?1518203136 (2018).
14. CDP, City-Business Climate Alliances: A step-by-step guide for developing successful collaborations, <https://6fefcbb86e61af1b2fc4-c70d8ead6ced550b4d987d7c03fcd1d.ssi.cf3.rackcdn.com/cms/reports/documents/000/004/732/original/City-Business-Climate-Alliances.pdf?1570550817> (2019)
15. Gouldson, A., Sudmant, A., Khreis, H. & Papargyropoulou, E. The Economic and Social Benefits of Low-Carbon Cities: A Systematic Review of the Evidence. *Coalit. Urban Transitions* 1–92 (2018) doi:10.1007/978-3-540-32210-8_6.
16. New Climate Institute. Climate Opportunity: More Jobs; Better Health; Liveable Cities. 63 https://newclimate.org/wp-content/uploads/2018/09/ClimateOpportunity_Full.pdf (2018).
17. Ryan, D. From commitment to action: a literature review on climate policy implementation at city level. *Clim. Change* 131, 519–529 (2015). and Dale, A. et al. Meeting the climate change challenge: local government climate action in British Columbia, Canada. *Clim. Policy* 0, 1–15 (2019).
18. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).
19. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).

MITIGATION ACTIONS AND CO-BENEFITS REPORTED BY CITIES

MITIGATION ACTIONS AND CO-BENEFITS REPORTED BY CITIES

61%
of cities were implementing climate mitigation actions

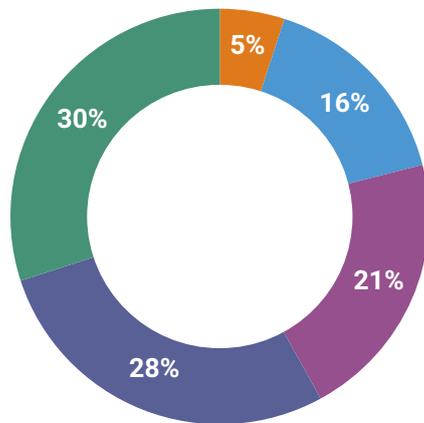
The majority (61%) of cities reporting to the CDP-ICLEI Unified Reporting System in 2019 were implementing climate mitigation actions

Out of 861 cities that disclosed in 2019, 521 reported taking climate mitigation actions. Together, these cities represent 73 countries and around 500 million people, or roughly 8% of the global population. Of these cities, 28 were in Africa, 84 were in Asia Pacific, 110 were in Europe and the Middle East, 145 were in Latin America and 154 were in North America. Cities reporting mitigation actions represented a range of economies at different income levels²⁰ - 284 were from high income countries, 175 were from upper-middle income countries and 62 were from lower-middle and low income countries.

521/861 cities
reported taking climate mitigation actions

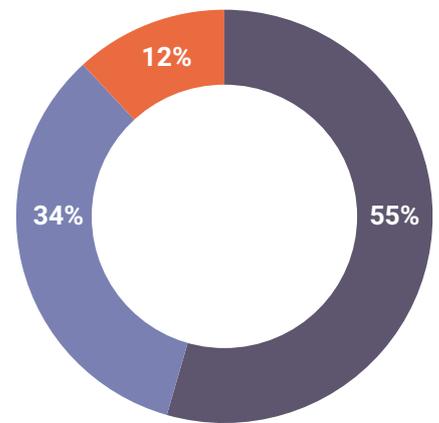
73 countries
500 million people
8% of the global population

Cities reporting climate mitigation actions by region



- Cities in Africa
- Cities in Asia Pacific
- Cities in Europe and the Middle East
- Cities in Latin America
- Cities in North America

Cities reporting climate mitigation actions by country income level



- Cities in high income countries
- Cities in upper-middle income countries
- Cities in lower-middle and low income countries

20. Classified based on country income data from the World Bank list of economies (data from June 2019: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>)

76%

of cities cited co-benefits of the actions they were implementing

Three quarters (76%) of cities that reported taking climate action cited co-benefits of the actions they were implementing

Cities identified co-benefits that were expected to result from the mitigation actions they reported, based on a list provided in the CDP-ICLEI Unified Reporting System (See Box 1²¹). We analysed the co-benefits that cities reported for mitigation actions across different regions around the world and across country income levels.

Box 1: Climate mitigation co-benefits from the CDP-ICLEI questionnaire and explanations

Disaster preparedness - increased preparedness of a city to respond to hazards

Disaster risk reduction - reduced risk of hazards in a city

Economic growth - increasing the value of goods and services produced in the city

Ecosystem preservation and biodiversity improvement - for example, increased connectedness between green spaces

Enhanced climate change adaptation - making the city more able to withstand changes in climate

Enhanced resilience - making the city more able to quickly recover from shocks such as floods

Greening the economy - making economic activity in the city more environmentally sustainable

Improved access to and quality of mobility services and infrastructure - for example, improved access to public transport

Improved access to data for informed decision-making – collection and sharing of data that supports city officials and wider stakeholders’ decision-making

Improved public health – for example, reduced chronic and acute respiratory diseases due to improved air quality

Improved resource efficiency (e.g. food, water, energy) – meeting the needs of the city with a lower level of resource input

Improved resource quality (e.g. air, water) – for example, improved air or water quality

Improved resource security (e.g. food, water, energy) – for example, improved food, water or energy security

Job creation – new jobs created

Poverty reduction/eradication – for example, reduced fuel poverty

Promote circular economy – for example, supporting greater reuse and recycling of resources

Resource conservation (e.g. soil, water) – for example, soil or water conservation

Security of tenure – for example, increased housing security for low-income urban populations who are more likely to live in informal, poor quality, and hazard-prone settlements

Shift to more sustainable behaviours – supporting lifestyle change that not only reduces emissions but is also more sustainable in broader terms, for example, the health benefits of more active travel and changes in diet, reduced material consumption

Social community and labour improvements – for example, a stronger sense of ‘community’ for citizens, and jobs with more security and benefits

Social inclusion, social justice – engaging groups that are traditionally excluded and addressing inequalities

21. The names of the co-benefits (in red text in Box 1) were given to respondents in the questionnaire. The explanations and examples for each co-benefit (in black text in Box 1) were not given to respondents in the questionnaire guidance but have been created for this report to provide additional clarity. CDP is looking to add explanations for the co-benefits into future versions of the questionnaire guidance.

The most common mitigation actions reported by cities focus on increasing energy efficiency, generating renewable energy, and improving buildings

For each of the top mitigation actions, cities frequently report the following co-benefits*:

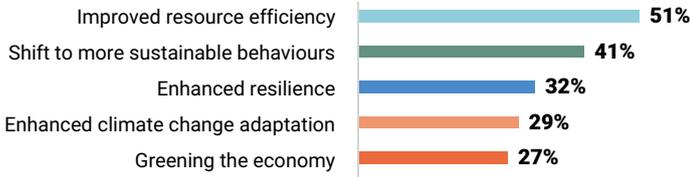
* Measured as the % of cities reporting each co-benefit for each action



253

cities are improving building energy efficiency through retrofits

Co-benefits:



158

cities are switching to more energy-efficient street lighting

Co-benefits:



149

cities are installing on-site renewable energy generation on buildings

Co-benefits:



142

cities are increasing low or zero carbon energy generation

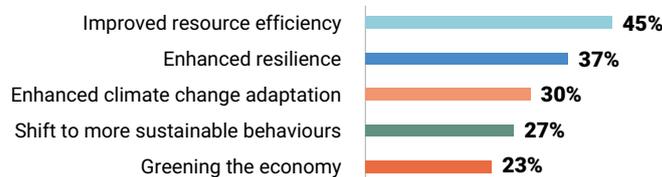
Co-benefits:



135

cities are improving building codes and standards for new builds

Co-benefits:



The prevalence of enhanced climate change adaptation as a co-benefit suggests that cities are recognising the potential for mitigation actions to address adaptation challenges at the same time. Many cities are already taking actions to adapt to climate change, with cities in Europe, Latin America, North America and Asia Pacific combining mitigation and adaptation actions in their planning²².

Prioritising policy development for climate actions that implement both mitigation and adaptation can enable cities to make more efficient use of their resources²³. Doing so also reduces the risk of implementing conflicting actions and missing key opportunities. For example, while increasing the compactness of cities can promote active and public transport, if implemented without proper consideration for adaptation needs, it could lead to reduced green space which is important for protecting cities from flooding and heat stress²⁴.



22. Grafakos, S., Trigg, K., Landauer, M., Chelleri, L. & Dhakal, S. Analytical framework to evaluate the level of integration of climate adaptation and mitigation in cities. *Climatic Change* vol. 154 87–106 <https://link.springer.com/content/pdf/10.1007/s10584-019-02394-w.pdf> (2019) and Lee, T., Yang, H. & Blok, A. Does mitigation shape adaptation? The urban climate mitigation-adaptation nexus. *Clim. Policy* 0, 1–13 (2020).

23. Grafakos, S., Trigg, K., Landauer, M., Chelleri, L. & Dhakal, S. Analytical framework to evaluate the level of integration of climate adaptation and mitigation in cities. *Climatic Change* vol. 154 87–106 <https://link.springer.com/content/pdf/10.1007/s10584-019-02394-w.pdf> (2019) and Rosenzweig, C. & Solecki, W. Action pathways for transforming cities. *Nat. Clim. Chang.* 8, 756–759 (2018).

24. Lee, T., Yang, H. & Blok, A. Does mitigation shape adaptation? The urban climate mitigation-adaptation nexus. *Clim. Policy* 0, 1–13 (2020).

City actions and co-benefits by region

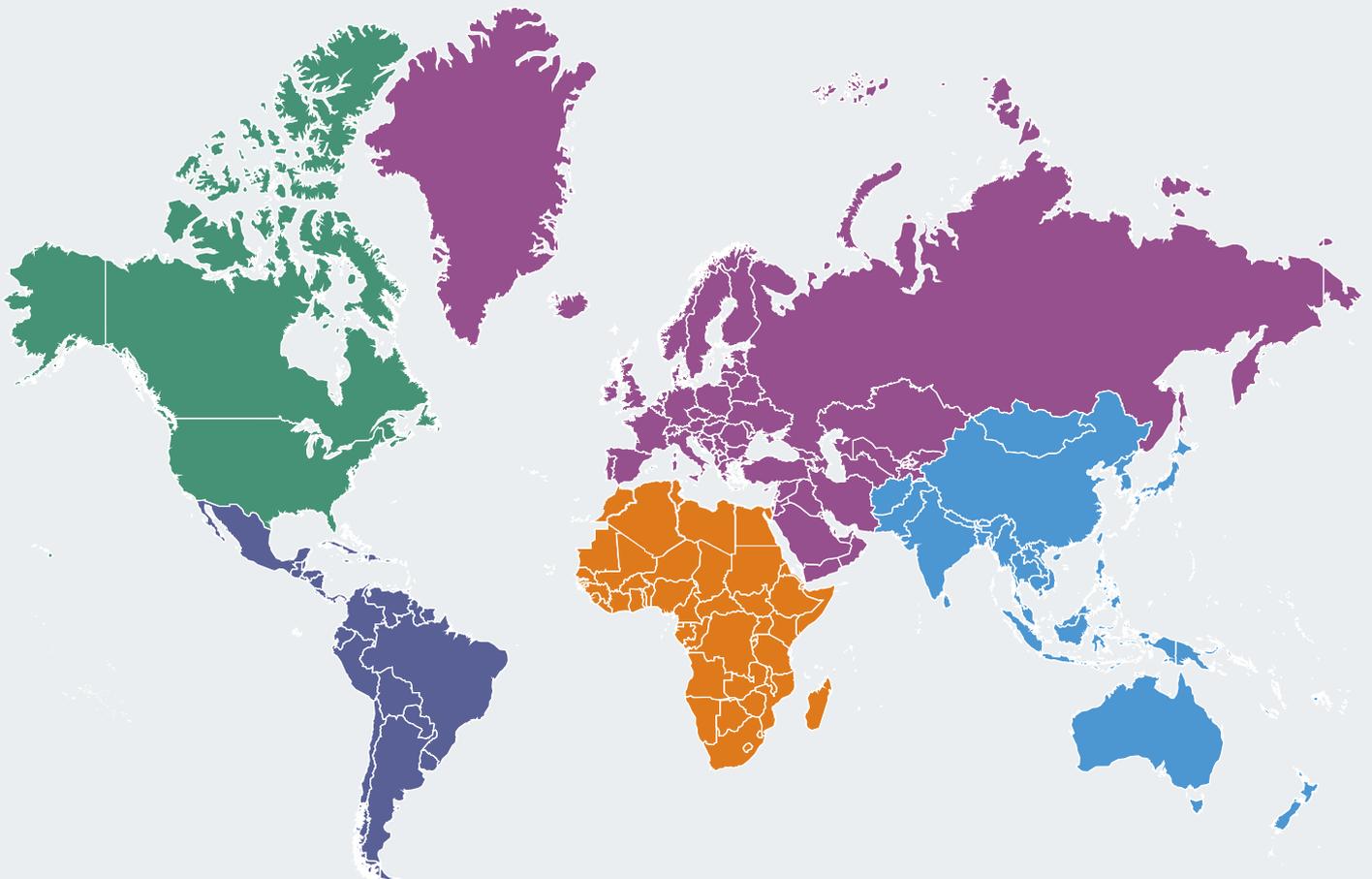
The most common mitigation actions taken by cities varied across geographic regions, suggesting that cities in these regions may have different priorities and challenges. This is aligned with previous analysis by CDP which showed that the barriers and enablers to climate adaptation action experienced by cities varied widely across regions and that there are no 'one size fits all' solutions²⁵.

Shifting to more sustainable behaviours and improved resource efficiency were among the five most cited co-benefits across all mitigation actions in all regions, but there were regional differences amongst other co-benefits cited. These variations may be partly due to varying priorities, enablers and challenges experienced by cities in different regions²⁶.

Some co-benefits were not commonly cited across all regions, including poverty reduction, disaster risk reduction and preparedness, and security of tenure. Ecosystem and biodiversity preservation was the sixth most reported co-benefit in cities in Africa but was not commonly reported by cities in other regions.

Region

- Africa
- Asia Pacific
- Europe and the Middle East²⁷
- Latin America
- North America



25. CDP, Cities at Risk, <https://www.cdp.net/en/research/global-reports/cities-at-risk> (2019)

26. CDP, Cities at Risk, <https://www.cdp.net/en/research/global-reports/cities-at-risk> (2019).

27. Only five cities in the Middle East reported mitigation actions to the CDP-ICLEI Unified Reporting System, which was too small a sample size to analyse on its own, therefore they have been grouped with cities in Europe. The cities in the Middle East are Abasan Al-Kabira (State of Palestine), Greater Amman (Jordan), Dubai (United Arab Emirates), Ramallah (State of Palestine) and Tel Aviv (Israel).



Nairobi, Kenya

AFRICA

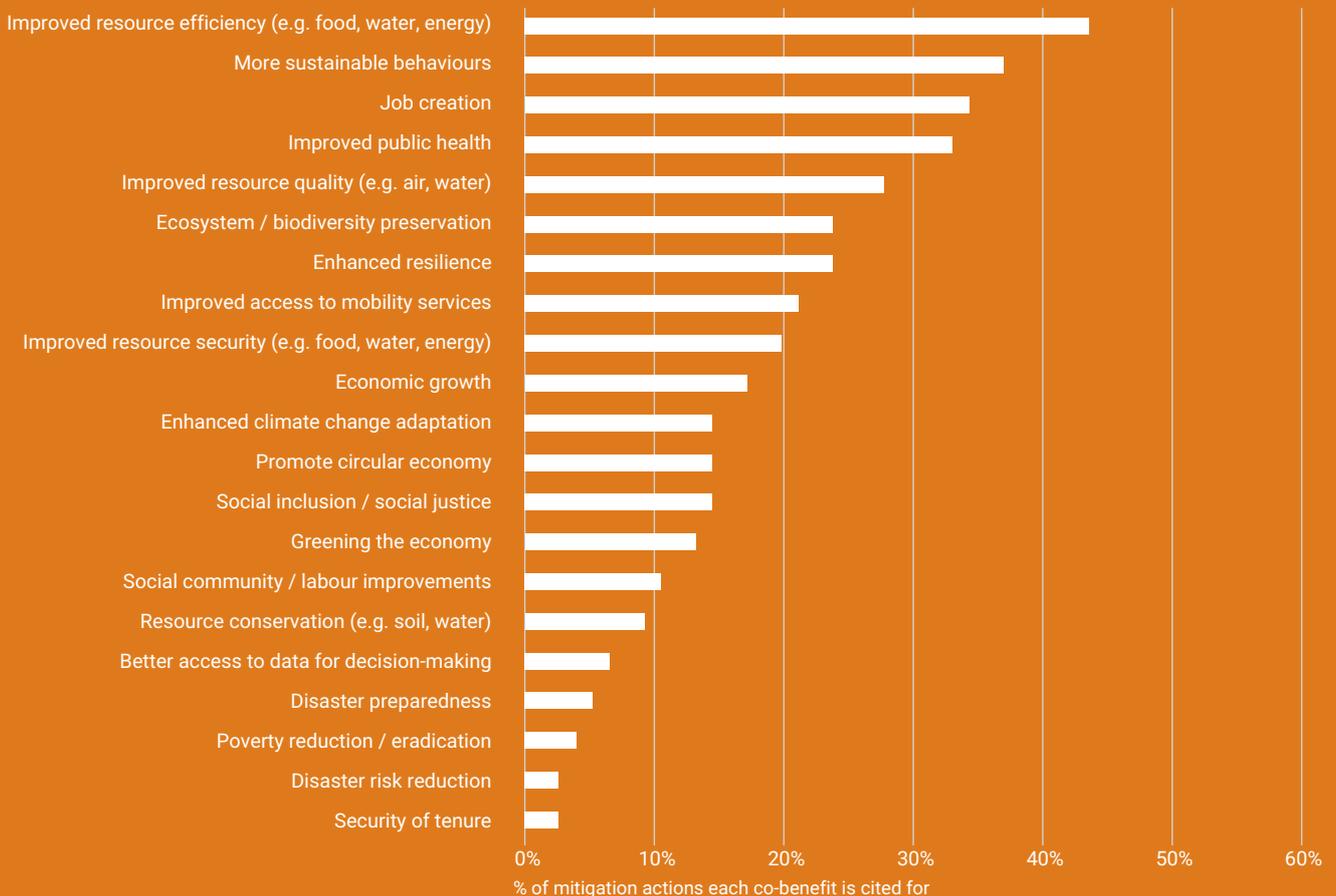
Mitigation actions

The top five mitigation actions taken by cities in Africa were:



Co-benefits

The most commonly reported co-benefits for cities in Africa across all mitigation actions were improved resource efficiency - e.g. food, water or energy (reported as a co-benefit for 43% of all mitigation actions), a shift to more sustainable behaviours (37%), job creation (34%), improved public health (33%), and improved resource quality – e.g. air or water (28%).





Bangkok, Thailand

ASIA PACIFIC

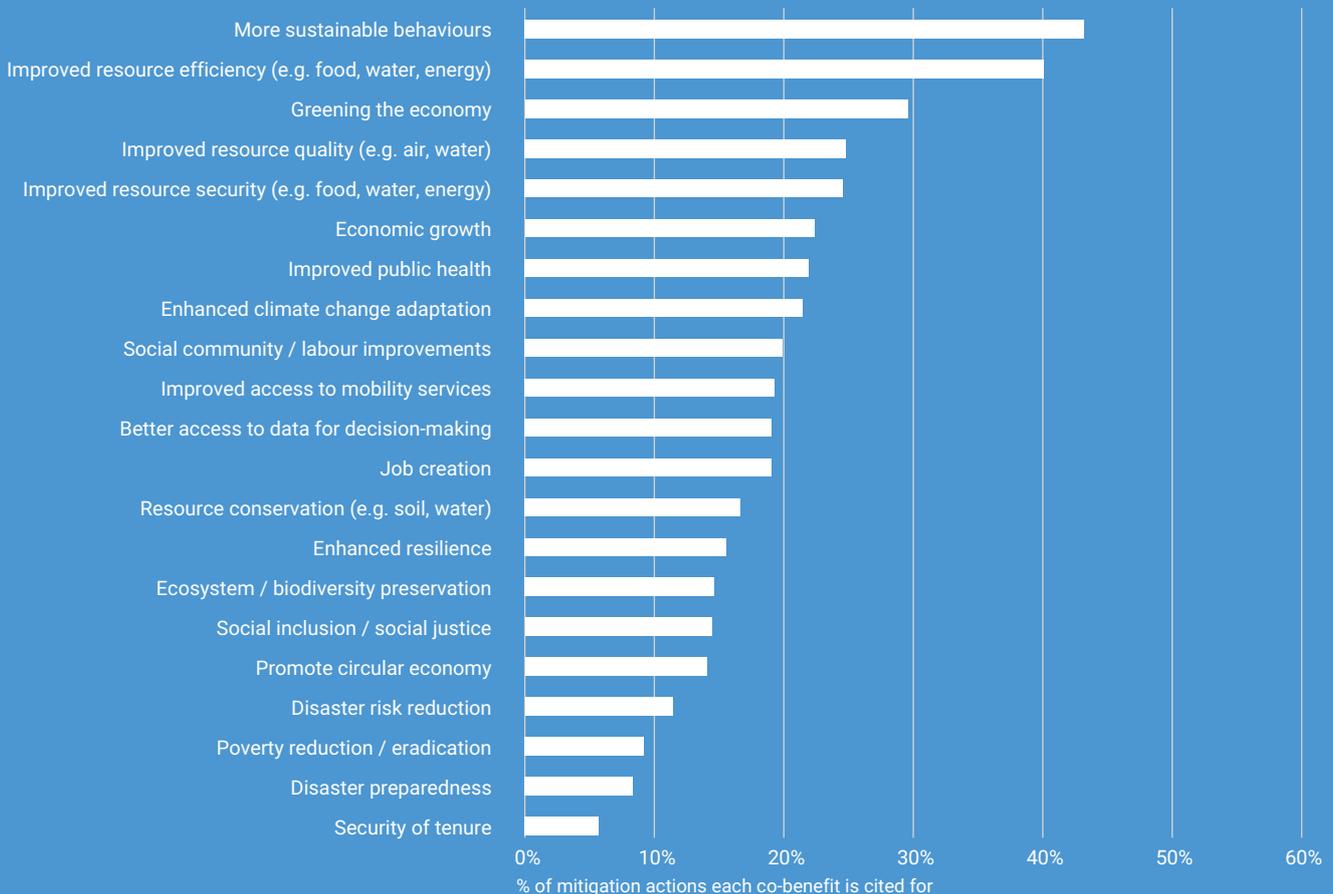
Mitigation actions

The top five mitigation actions taken by cities in Asia Pacific were:



Co-benefits

In Asia Pacific, a shift to more sustainable behaviours (reported for 43% of all mitigation actions), improved resource efficiency – e.g. food, water or energy (40%), greening the economy (29%), improved resource quality - e.g. air or water (25%), and improved resource security – e.g. food, water or energy (24%) were the most frequently recorded co-benefits across all mitigation actions.





Amsterdam, Netherlands

EUROPE AND MIDDLE EAST

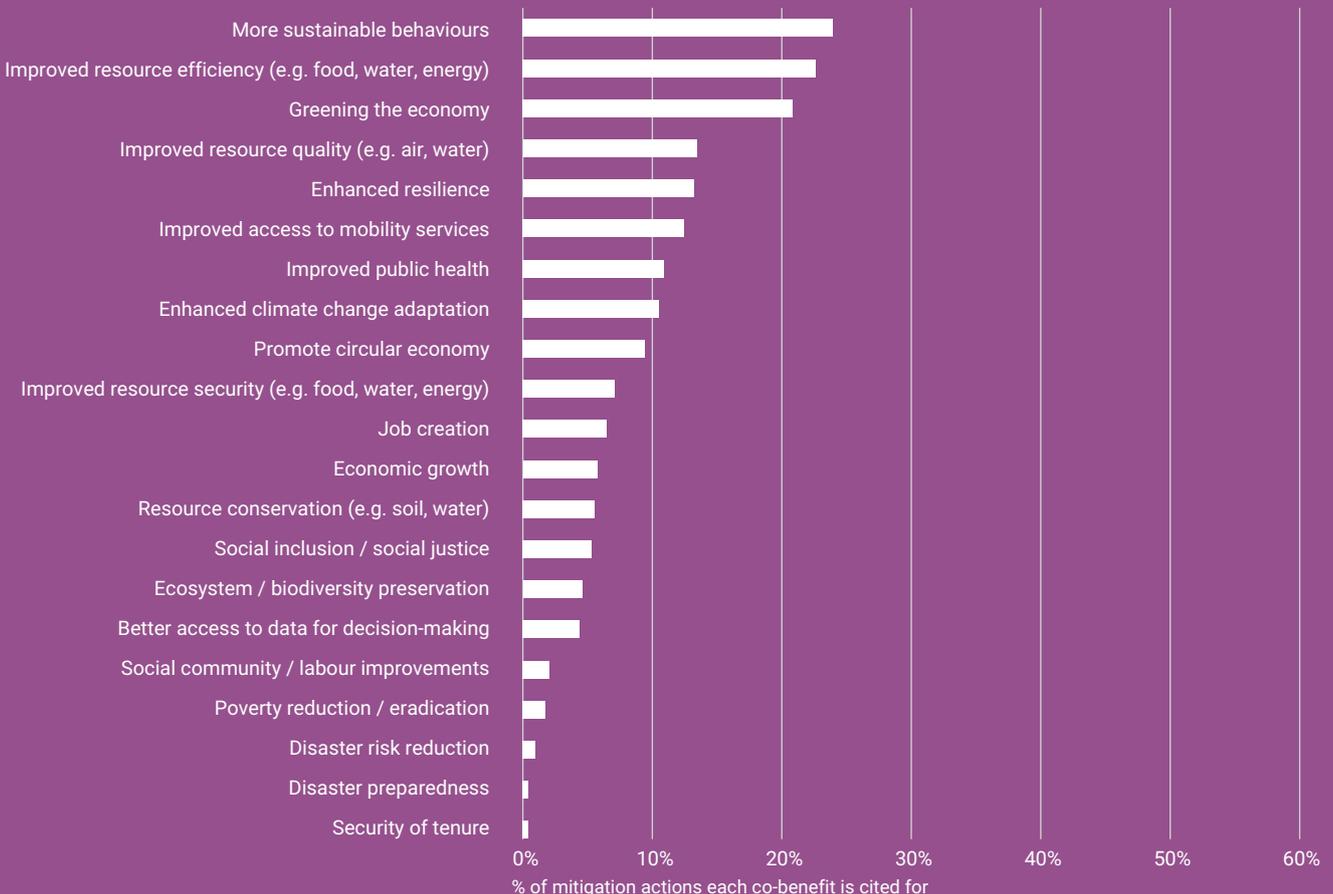
Mitigation actions

The top five mitigation actions taken by cities in Europe and the Middle East were:



Co-benefits

In Europe and Middle East, a shift to more sustainable behaviours (reported for 24% of all mitigation actions), improved resource efficiency – e.g. food, water or energy (23%), greening the economy (21%), improved resource quality – e.g. air or water (13%), and enhanced resilience (13%) were the most reported co-benefits across all mitigation actions.





Rio de Janeiro, Brazil

LATIN AMERICA

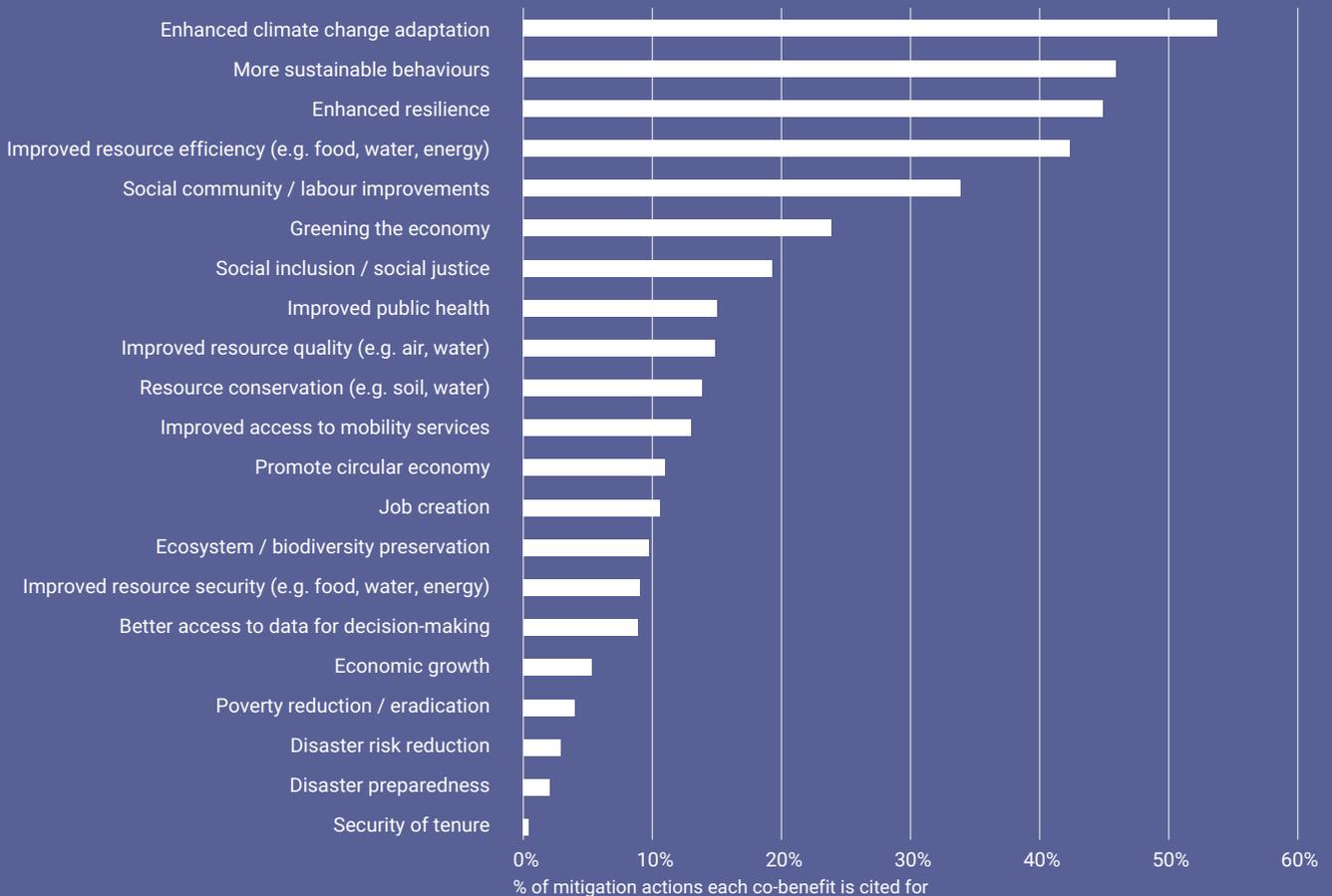
Mitigation actions

The top five mitigation actions taken by cities in Africa were:



Co-benefits

The most commonly reported co-benefits by cities in Latin America across all mitigation actions were enhanced climate change adaptation (reported for 54% of all mitigation actions), a shift to more sustainable behaviours (46%), enhanced resilience (45%), improved resource efficiency – e.g. food, water or energy (42%), and social community and labour improvements (34%).





NORTH AMERICA

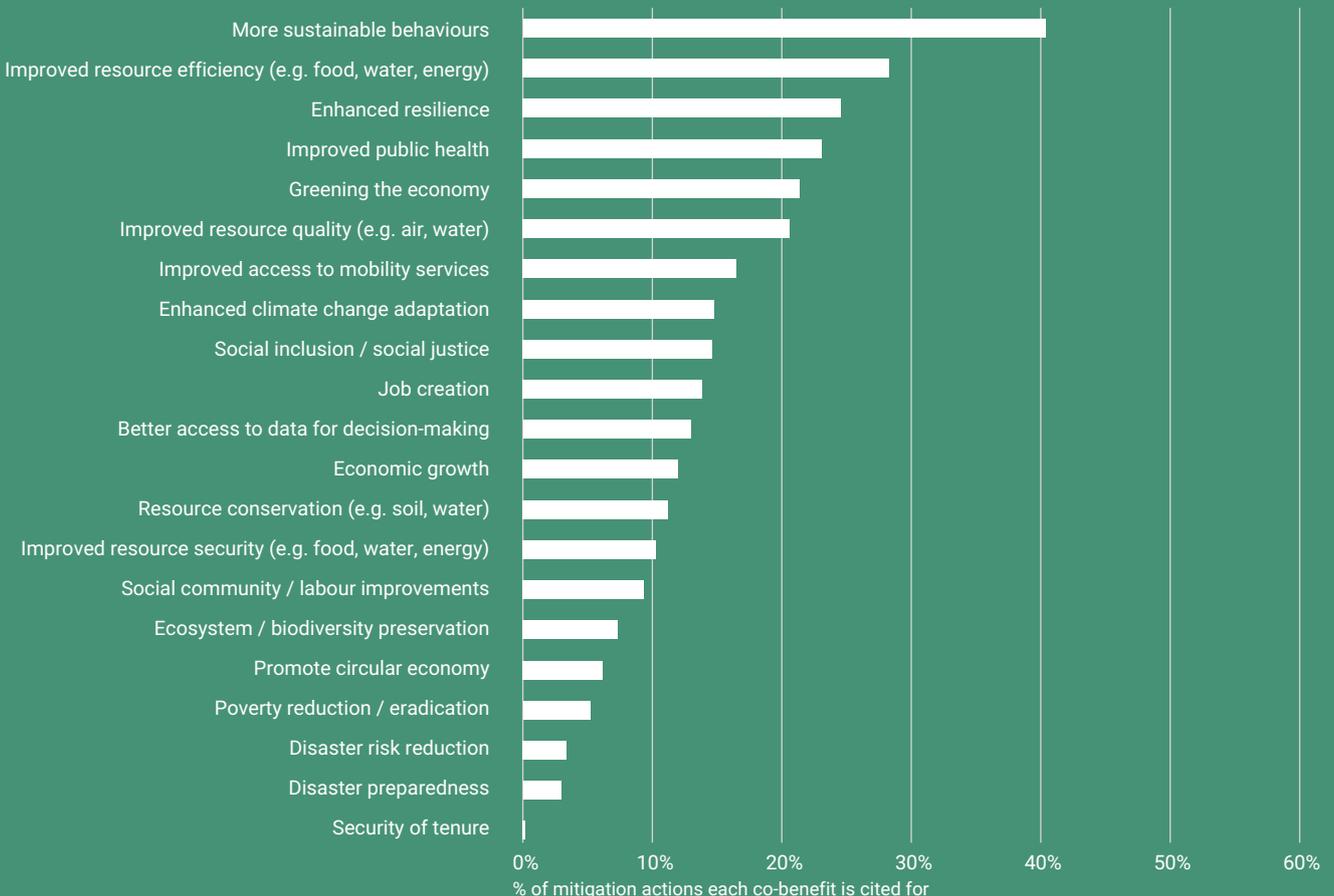
Mitigation actions

The top five mitigation actions taken by cities in Africa were:



Co-benefits

In North America, a shift to more sustainable behaviours (reported for 40% of all mitigation actions), improved resource efficiency – e.g. food, water or energy (28%), enhanced resilience (25%), improved public health (23%), and greening the economy (21%) were the most reported co-benefits across all mitigation actions.



City actions and co-benefits by income level

We analysed the mitigation actions and co-benefits that cities in different country income levels (classified based on the **World Bank list of economies**) reported to the CDP-ICLEI Unified Reporting System in 2019.

While shifting to more sustainable behaviours and improved resource efficiency were consistently cited as top co-benefits regardless of the cities' income levels, the other most common co-benefits reported for all mitigation actions varied across income levels.

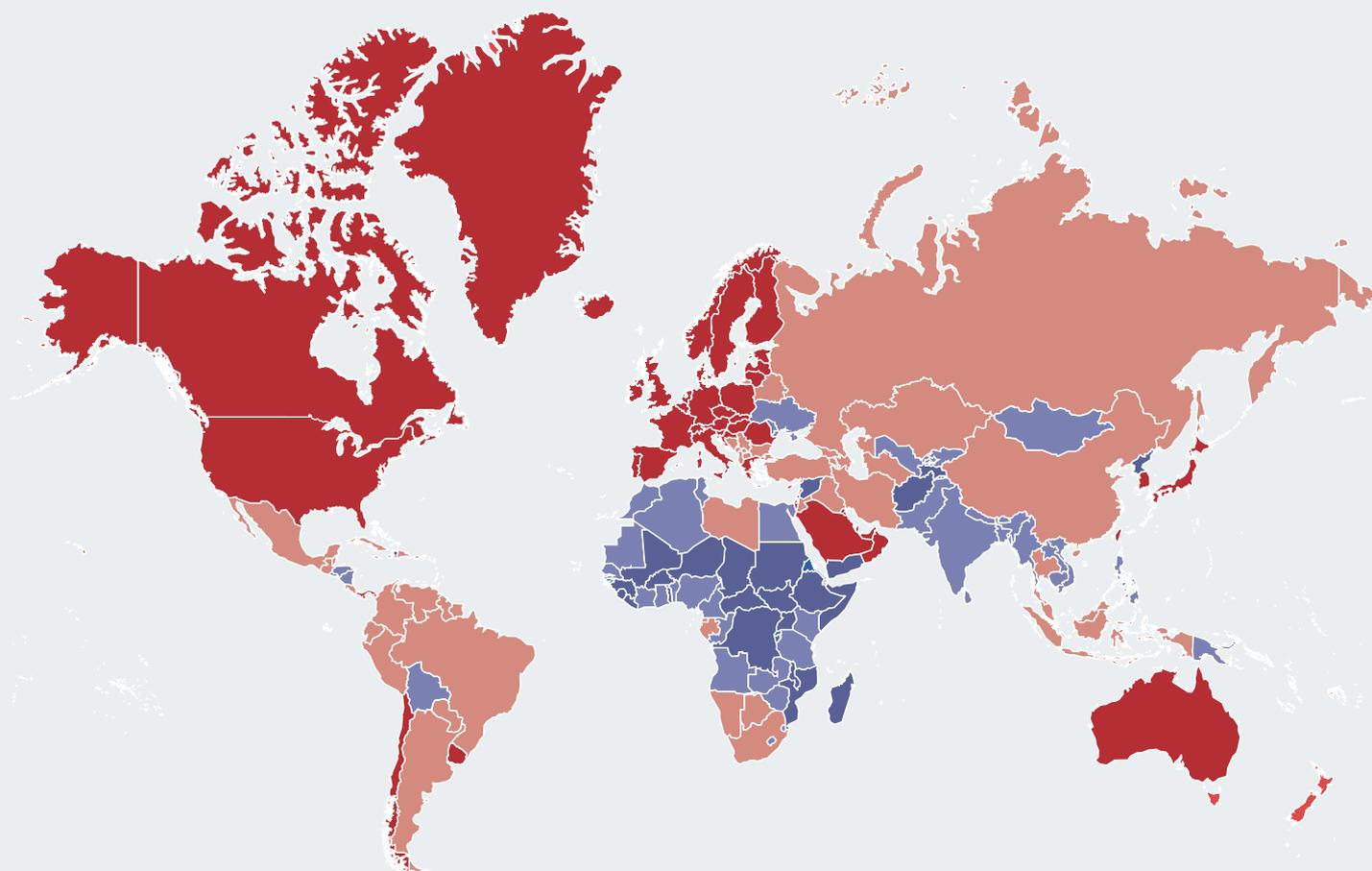
The recognition amongst cities in low and middle-income countries that climate mitigation action can enhance climate change adaptation may also reflect that cities in lower-income countries tend to have fewer resources to tackle climate-related hazards, and are hit harder by the costs of climate-related disasters²⁸, making it more of a priority for them²⁹.

Poverty reduction, disaster risk reduction and preparedness, and security of tenure co-benefits were not commonly reported by cities across all country income levels. Cities in upper-middle and high income countries cited social inclusion and social justice as co-benefits more often than cities in low and lower-middle income countries.

Income Group

- Low income*
- Lower middle income
- High income
- Upper middle income

* For the analysis in this report, we combined the cities in low income and lower-middle income countries.



28. UNISDR, Economic losses, poverty and disasters: 1998-2017, https://www.unisdr.org/files/61119_credeconomiclosses.pdf (2018).

29. Puppim De Oliveira, J. A. Learning how to align climate, environmental and development objectives in cities: Lessons from the implementation of climate co-benefits initiatives in urban Asia. J. Clean. Prod. 58, 7–14 (2013).

CITIES IN LOW AND LOWER-MIDDLE INCOME COUNTRIES

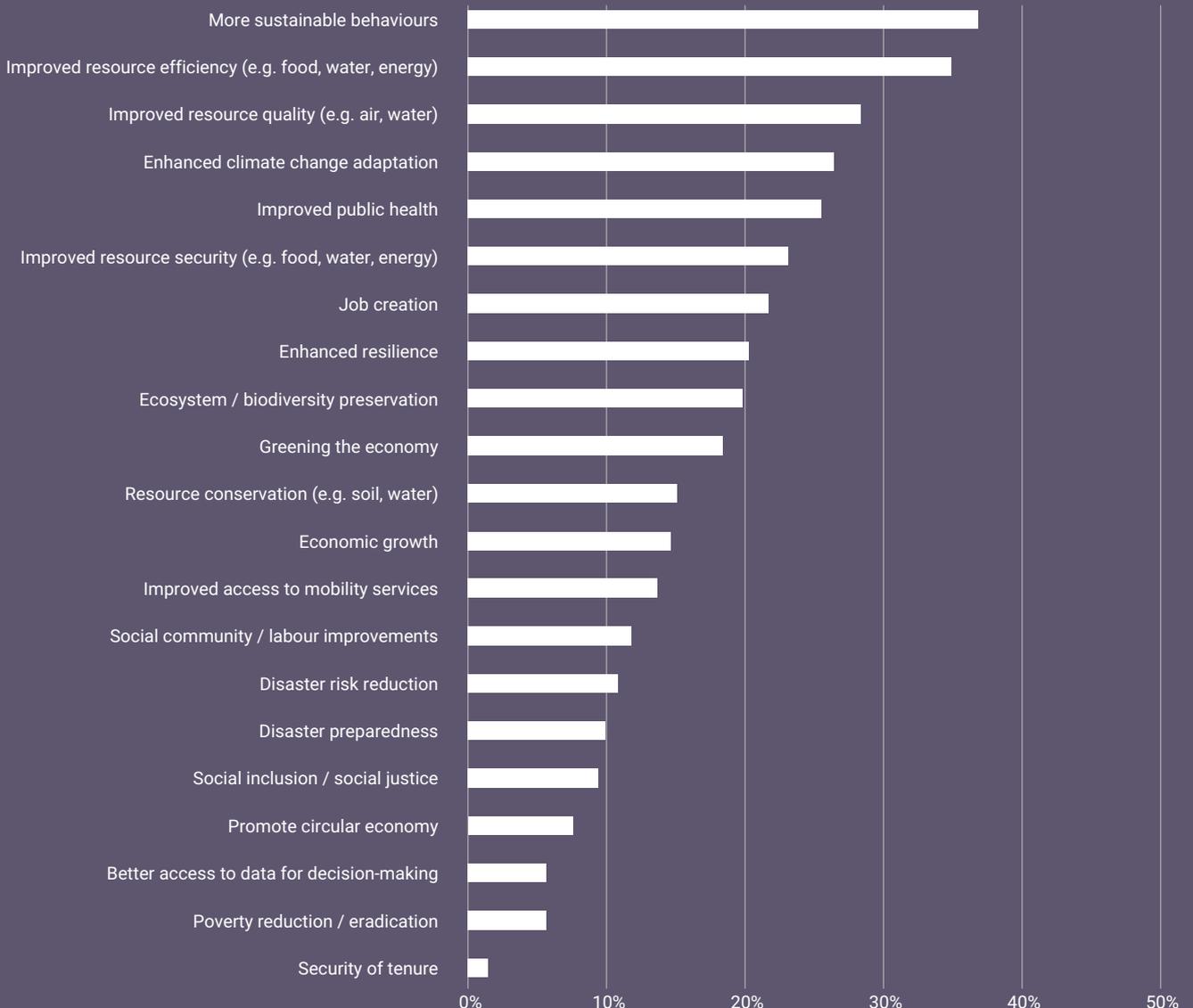
Mitigation actions

Cities in low and lower-middle income countries focused on:



Co-benefits

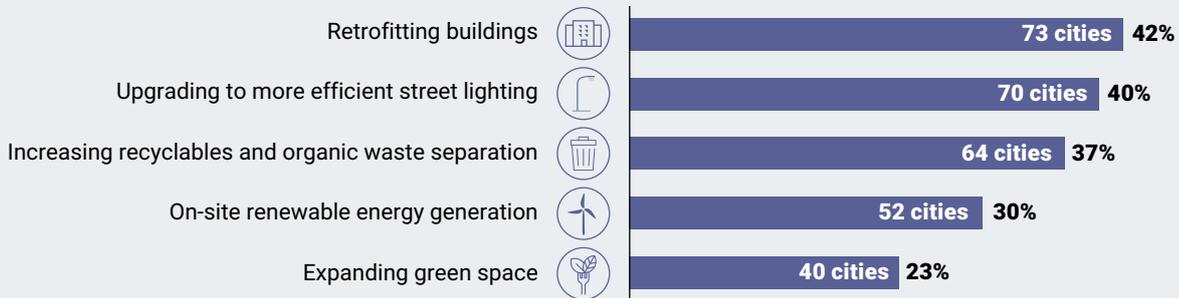
For cities in low and lower-middle income countries, shifts to more sustainable behaviours (reported as a co-benefit for 37% of all mitigation actions), improved resource efficiency (35%), improved resource quality (28%), enhanced climate change adaptation (26%) and improved public health (25%) were most frequently reported across all mitigation actions.



CITIES IN UPPER-MIDDLE INCOME COUNTRIES

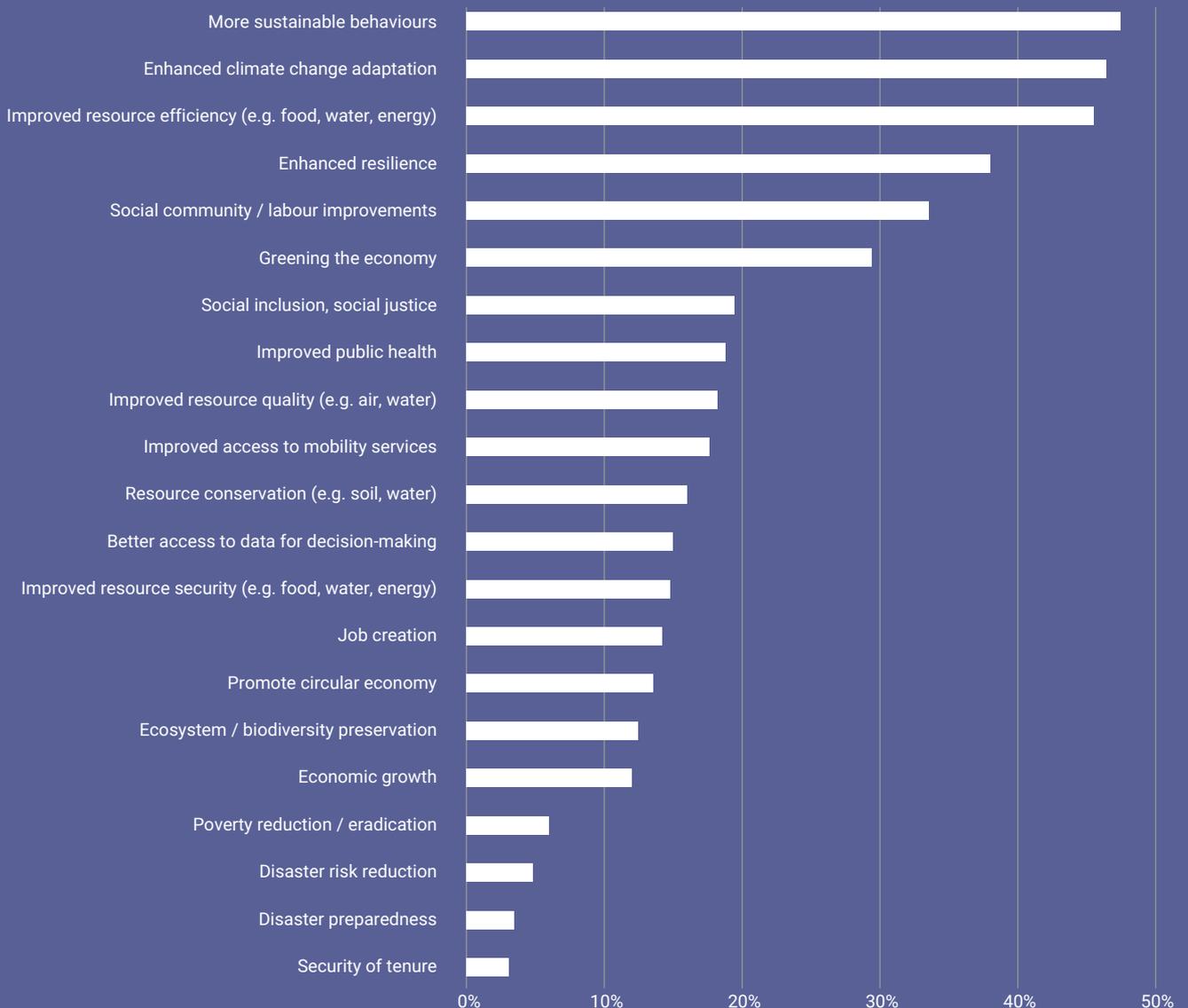
Mitigation actions

Cities in upper-middle income countries focused on:



Co-benefits

For cities in upper-middle income countries, shifts to more sustainable behaviours (reported for 47% of all mitigation actions), enhanced climate change adaptation (46%), improved resource efficiency (46%), enhanced resilience (38%), and social community and labour improvements (34%) were the most frequently cited co-benefits across all mitigation actions.



CITIES IN HIGH INCOME COUNTRIES

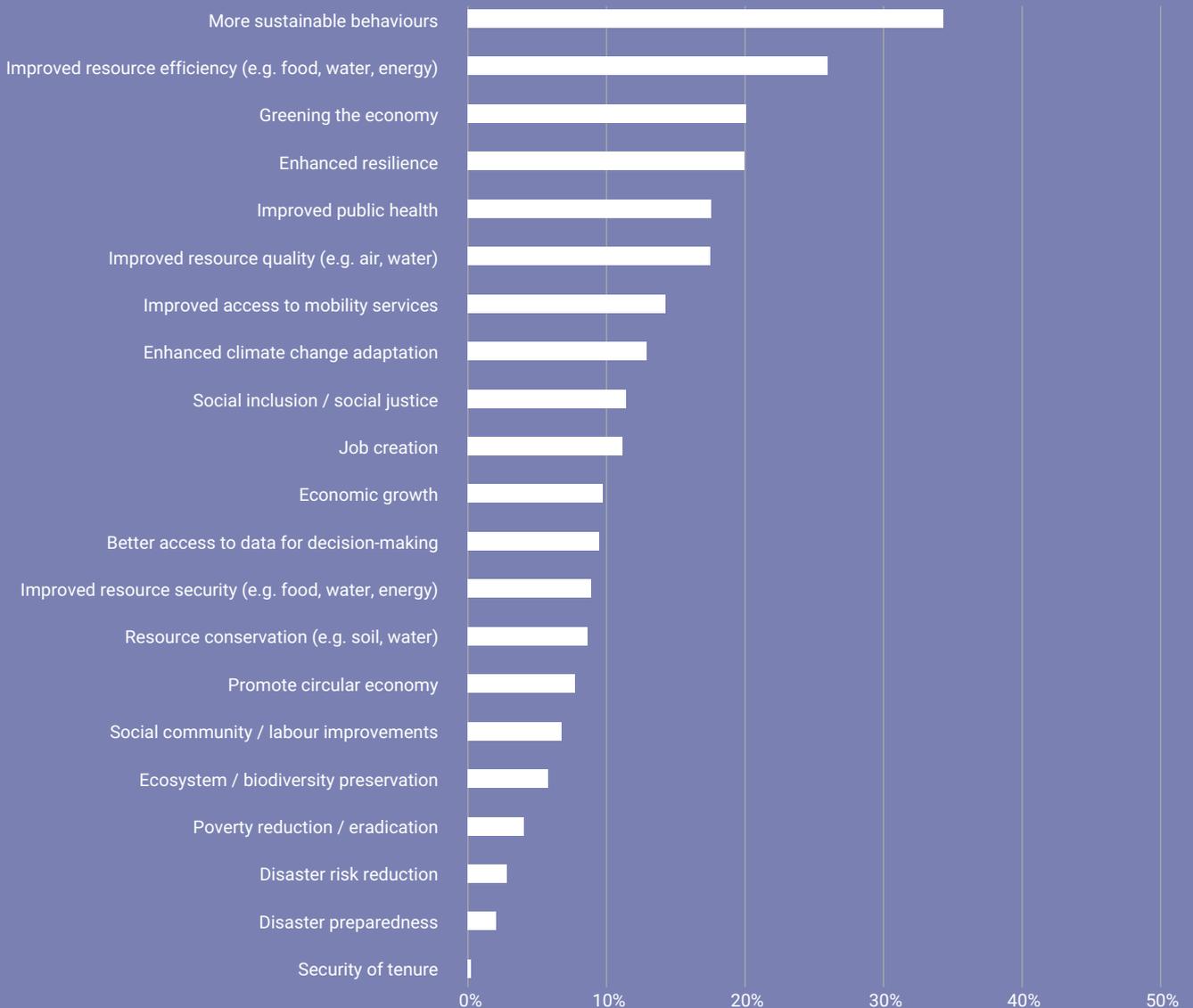
Mitigation actions

Cities in upper-middle income countries focused on:



Co-benefits

For cities in high income countries, shifts to more sustainable behaviours (reported for 34% of all mitigation actions), improved resource efficiency (26%), greening the economy (20%), enhanced resilience (20%), and improved public health (18%) were the most reported co-benefits across all mitigation actions.



GAPS IN REPORTING CO-BENEFITS

24%

of cities did not report any co-benefits for the mitigation actions they were implementing

Not all cities are identifying co-benefits of the climate actions they are taking

One quarter (24%) of cities did not report any co-benefits for the mitigation actions they were implementing. The percentage of cities not reporting any co-benefits was relatively consistent across regions – 25% in Africa, 23% in Asia Pacific, 27% in Europe and the Middle East, 21% in Latin America, and 25% in North America. Moreover, 24% of cities in low and lower-middle income countries, 21% of cities in upper-middle income countries and 26% of cities in high-income countries did not report any co-benefits for the actions they were implementing.

This suggests that there is still a gap in cities' awareness of the potential co-benefits of climate mitigation action and the opportunities for cities to embed co-benefits more in climate action planning.



Lima, Peru

For some mitigation actions, cities are not identifying the full range of co-benefits that they could be

We compared the co-benefits cited by cities for each action against the co-benefits framework developed by LSE Cities and C40³⁰. This framework was based on a comprehensive review of 287 climate co-benefits for 76 policy actions across key sectors found in published research. Using this as a basis for analysis, the chart below shows whether or not cities were citing all the potential co-benefits recommended in existing research.

 Bright green boxes indicate co-benefits that were identified in the review and also regularly reported by cities for a particular action.

 Bright red boxes indicate co-benefits that were identified in the review but were not regularly reported by cities for a particular action, suggesting that cities might not be identifying the full range of potential co-benefits for some actions.

 Blank boxes indicate where the review found that the co-benefit did not apply.

Buildings



Mitigation actions	Disaster preparedness	Disaster risk reduction	Economic growth	Ecosystem / biodiversity preservation	Enhanced climate change adaptation	Enhanced resilience	Greening the economy	Improved access to mobility services	Better access to data for decision-making	Improved public health	Improved resource efficiency (e.g. food, water, energy)	Improved resource quality (e.g. air, water)	Job creation	Poverty reduction / eradication	Promote circular economy	Resource conservation (e.g. soil, water)	More sustainable behaviours	Social community / labour improvements	Social inclusion / social justice
Building codes and standards																			
Energy efficiency/ retrofit measures																			
On-site renewable energy generation																			
Switching to low-carbon fuels																			

Community-Scale Development



Brownfield redevelopment programs																			
Compact cities																			
Urban agriculture																			

Energy Supply



Low or zero carbon energy supply generation																			
Smart grid																			

Food and Agriculture



Encourage sustainable food production and consumption																			
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Mass Transit



Improve bus infrastructure, services, and operations																			
Improve fuel economy and reduce CO ₂ from bus and/or light rail																			
Improve fuel economy and reduce CO ₂ from ferries																			
Improve fuel economy and reduce CO ₂ from trucks																			
Improve rail, metro, and tram infrastructure, services and operations																			
Smart public transport																			

Private Transport



Improve fuel economy and reduce CO ₂ from aviation																			
Improve fuel economy and reduce CO ₂ from motorized vehicles																			
Improve fuel economy and reduce CO ₂ from trucks (private)																			
Infrastructure for non-motorized transport																			
Transportation demand management																			

Waste



Waste prevention policies and programs																			
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Water



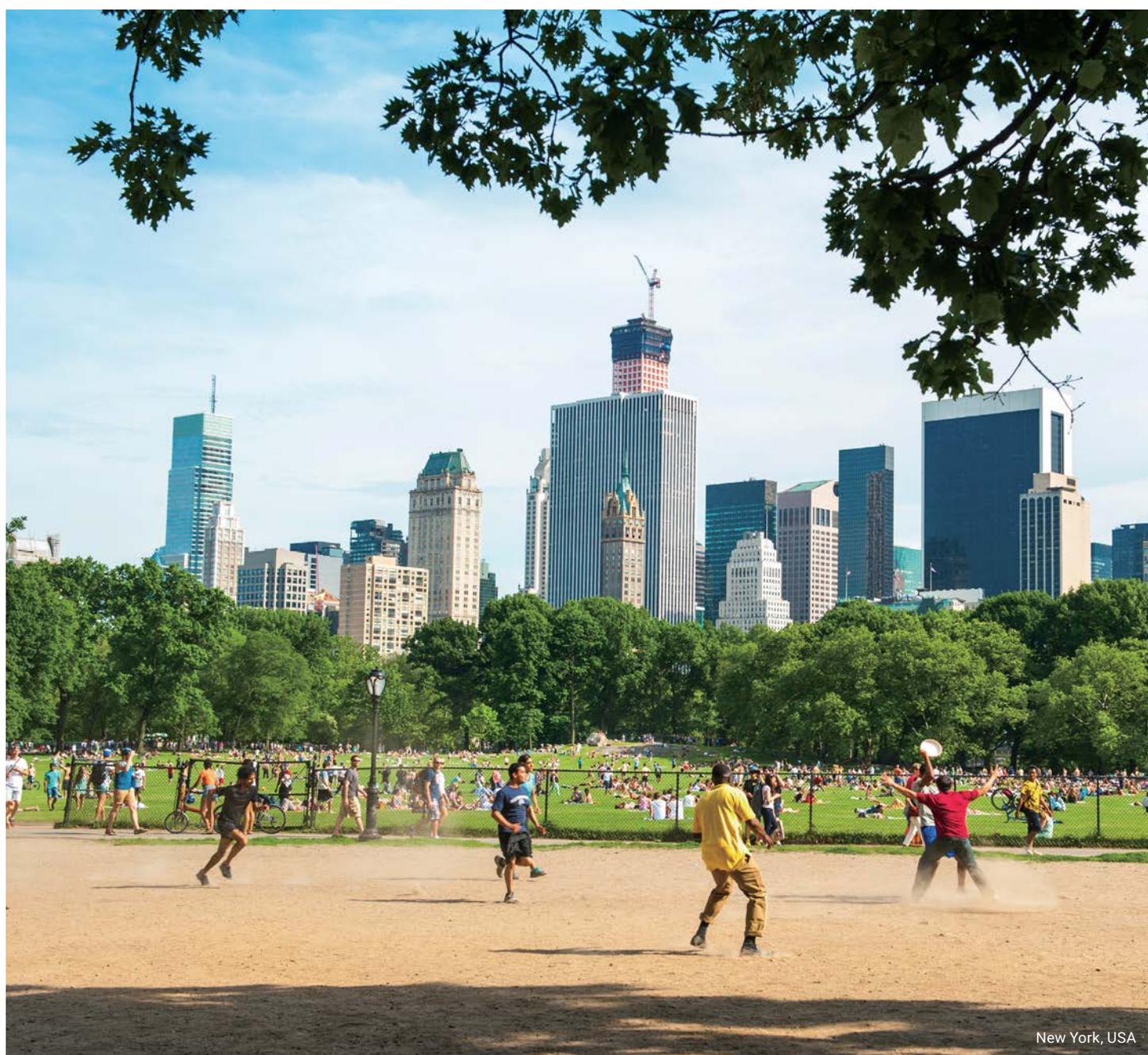
Water use efficiency projects																			
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30. LSE Cities & C40. Co-benefits of urban climate action : A framework for cities. 86 <http://eprints.lse.ac.uk/id/eprint/68876> (2016).

This gap analysis indicates that cities were not reporting all of the co-benefits that they could be. For example, measures to reduce carbon dioxide from vehicles (e.g. by shifting to low or zero carbon vehicles) are expected to improve energy security by reducing dependency on oil and exposure to price volatility³¹.

Being able to identify all of the potential co-benefits of certain mitigation actions can enable cities to address multiple city priorities simultaneously and be more efficient with limited resources by increasing coordination across city departments³². It can also help them identify and engage with relevant stakeholders in the development of climate action plans and projects.

If cities are not identifying all potential co-benefits, they may be missing key opportunities to design and implement mitigation actions that maximize positive social, economic, and environmental outcomes and thus, harness co-benefits to accelerate climate action. Our analysis suggests there is value in exploring the full range of co-benefits further, particularly how they are being considered in the design, deployment and evaluation of city climate action.



31. LSE Cities & C40. Co-benefits of urban climate action : A framework for cities. 86 <http://eprints.lse.ac.uk/id/eprint/68876> (2016).

32. Jennings, N., Fecht, D. & De Matteis, S. Co-benefits of climate change mitigation in the UK: What issues are the UK public concerned about and how can action on climate change help to address them? <https://www.imperial.ac.uk/media/imperial-college/grantham-institute/public/publications/briefing-papers/Co-benefits-of-climate-change-mitigation-in-the-UK.pdf> (2019).

**HOW ARE
CITIES
EMBEDDING
CO-BENEFITS
IN THEIR
CLIMATE
ACTION
PLANNING?**

HOW ARE CITIES EMBEDDING CO-BENEFITS IN THEIR CLIMATE ACTION PLANNING?

Larger, capital cities, which tend to have more funding, resources and capacity for implementing climate action, are often the focus of existing case studies of best practice. However, drawing lessons from large cities may not be appropriate for small and medium-sized cities that tend to have fewer resources. For these reasons, we looked at eight medium-sized cities (populations ranging from 500,000 to 5 million) that disclosed publicly in 2019 to learn how they are integrating co-benefits in their climate action plans.

These cities are:

- ▼ **Adelaide (Australia)**
- ▼ **Bristol (UK)**
- ▼ **Greater Manchester (UK)**
- ▼ **Helsinki (Finland)**
- ▼ **Indianapolis (USA)**
- ▼ **Kampala (Uganda)**
- ▼ **León de los Aldama (Mexico)**
- ▼ **Seberang Perai (Malaysia)**

These cities were chosen because they are demonstrating good practice in climate action. They have all reported an ambitious emissions reduction target and have a climate action plan to limit greenhouse gas (GHG) emissions³³. They also have a vulnerability assessment and adaptation plan³⁴. This demonstrates their ambition and that they have a plan for delivery. While these cities have their own individual approaches to climate action, tailored to their specific geographies and the challenges they face, we have drawn some key transferable lessons about how they are recognising and incorporating co-benefits in decision-making³⁵.

33. Greenhouse gas emissions are categorized into three "scopes" for accounting and reporting purposes: Scope 1 (direct emissions from burning fossil fuel), Scope 2 (indirect emissions from energy and utilities) and Scope 3 (other indirect emissions from product or service value chain). See the Greenhouse Gas Protocol for more detail: <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>.

34. Puppim De Oliveira, J. A. Learning how to align climate, environmental and development objectives in cities: Lessons from the implementation of climate co-benefits initiatives in urban Asia. J. Clean. Prod. 58, 7–14 (2013).

35. Please note that each city case study has been reviewed and approved by the city.

Adelaide, Australia

In 2015, the City of **Adelaide**, the central business district of South Australia's capital city, committed to becoming one of the world's first carbon neutral cities (based on GHG emissions associated with activities within the city boundary). The city is expected to face climate-change related hazards in the coming decades, in particular from extreme heat events and drought, including a doubling of the number of days over 40°C by 2030³⁶.

In their **Carbon Neutral Adelaide Action Plan**, a joint commitment with the State Government, the City of Adelaide made plans to reduce emissions via five pathways:

- ▾ increasing building energy efficiency
- ▾ shifting to zero carbon transport
- ▾ switching to 100% renewable energy
- ▾ reducing emissions from waste and water
- ▾ offsetting residual emissions³⁷

The City of Adelaide is already making progress. Since 2007, the city has reduced its emissions by 15% whilst growing the economy by 33% and undergoing a population increase of 33%³⁸. The first **Carbon Neutral Adelaide Status Report** demonstrates progress on the 104 actions detailed in their Plan. These actions include establishing a network of 40 electric vehicle (EV) chargers to assist in delivering a lower-carbon transport option. The City of Adelaide is also incentivising business and residential retrofits through the Sustainability Incentives Scheme which has paid \$1.2 million in rebates, contributing to a total investment of over \$10.2 million in sustainable technologies since 2015.

In progressing actions, Adelaide is already experiencing co-benefits in city liveability, platforms for innovation, costs savings to citizens, and improved energy affordability for residents and business, and the city will continue to harness these co-benefits through their climate action. For example, rolling out the network of EV chargers has enabled the city to drive innovation. This includes trialling and implementing a world-leading contactless payment system, accepting standard credit cards rather than cards limited to specific charging service brands, and developing a smart EV parking system to allocate EV car park availability in off-street car parking buildings aligned to demand during peak times.

Since July 2019, the Sustainability Incentives Scheme has offered new incentives for shared solar and electric vehicle charging with a vehicle to grid capability seeking to attract innovative energy management solutions to the city. This is expected to help with affordability for ratepayers and energy grid stabilization. Moreover, to continue to reduce emissions from their own operations, the City of Adelaide has switched to a 100% renewable electricity power purchase agreement. This will reduce the total City of Adelaide reported corporate carbon emissions by around half and is anticipated to result in a significant saving in electricity costs.

The City of Adelaide has set ambitious goals for its own organization emissions as well as those of the entire city and is implementing actions to deliver against these goals that also provide co-benefits.

Adelaide, Australia

36. Webb, L.B. and Hennessy, K. 2015, Projections for selected Australian cities, CSIRO and Bureau of Meteorology, Australia.

37. Adelaide City Council. Carbon Neutral Adelaide Action Plan 2016-2021. 1-52, <https://www.carbonneutraladelaide.com.au/> (2016).

38. Carbon Neutral Adelaide Status Report, July 2019, <https://s3-ap-southeast-2.amazonaws.com/cna-public-assets/general-downloads/95637-BSA-Carbon-Neutral-Adelaide-Status-Report-FIN.pdf> (2019).



Bristol, United Kingdom

Located in the southwest of the United Kingdom and home to nearly 500,000 people, Bristol is an established global leader on climate action. In 2004, Bristol became the first UK city to develop a climate strategy, and in 2015 it was crowned **European Green Capital**. In 2018, Bristol was the **first UK city to declare a climate emergency**, setting an ambitious goal to become carbon neutral by 2030 (Scope 1, 2 and 3 GHG emissions)³⁹. However, Bristol also faces the challenges typical of modern cities: congestion, air pollution, increasing house prices and social inequalities, with 11% of all households in Bristol living in fuel poverty.

Understanding that these problems cannot be tackled in isolation, Bristol launched its **One City plan**⁴⁰ in 2019 with the aim of addressing city issues in an integrated and decentralized way. The overarching goal is to make Bristol a “fair, healthy and sustainable city” by 2050. Bristol has acknowledged that meeting its climate change goals by 2030 will require concerted effort and action from all city stakeholders. To reflect this, the city extended the ‘One City’ approach to tackling climate change. Bristol’s **One City Climate Strategy** was commissioned by the city’s **Environmental Sustainability Board** and **launched in February 2020**. **Board members** were selected from a variety of sectors and from across Bristol’s diverse communities. The strategy was developed and continues to be updated in collaboration with multiple local stakeholders. In the strategy development phase, advice and challenge was provided by an independent body of academics and experts: the **Bristol Advisory Committee on Climate Change**. Plus, feedback was gathered at two large workshops and a 24 Hours of Climate Reality event. These were attended by 300 participants from local companies, community groups, public and third-sector organizations as well as interested individuals. The strategy was grounded in a comprehensive evidence base which is **publicly available** and it addresses both climate adaptation and mitigation and all 3 scopes of emissions.

The strategy sets out the action required in 10 key areas: transport, buildings, heat decarbonization, electricity, consumption and waste, business and the economy, public services, natural environment, food and infrastructure into dependencies. In each area, the strategy features ambitious objectives on how to phase out the use of fossil fuels and improve the resilience of the city. Furthermore, across the 10 areas there will need to be skills, funding, national action, data, infrastructure and engagement available to enable the city to take action.

This transparent and collaborative approach – founded on the city’s understanding of the co-benefits of climate action – aims to create a shared understanding of the actions needed. The strategy is set to continue and will be reviewed annually over the next decade. Bristol City Council see it as key for providing a consistent framework within which stakeholders can take action to achieve this city’s ambitious climate goals.

39. Bristol City Council, Mayor’s Climate Emergency Action Plan, <https://www.bristol.gov.uk/documents/20182/33379/Mayor%27s+Climate+Emergency+Action+Plan+2019+FINAL> (2019)

40. Bristol One City Plan. A Plan for Bristol to 2050. https://www.bristolonecity.com/wp-content/uploads/2020/01/One-City-Plan_2020.pdf (2020).



Greater Manchester, United Kingdom

Greater Manchester is a metropolitan area in the northwest of England. The city region is made up of 10 boroughs and home to 2.8 million people, making it the third largest metropolitan area in the country. Greater Manchester has been at the forefront of urban climate action in the UK, and its commitment to become **carbon neutral by 2038** (Scope 1 and 2 CO₂ emissions), 12 years ahead of the UK Government, makes it the first city-region in the country to set a science-based target that is aligned with the Paris Agreement.

Harnessing its history of social and industrial innovation, the city region is setting out to “do things differently”. Not only concerned with combatting climate change, Greater Manchester aims to promote economic growth and increase the wellbeing of its residents at the same time as part of a holistic goal “to become one of the best places in the world to grow up, get on in life and grow old”. In their **5-year Environment Plan for Greater Manchester**⁴¹ the city region is following a bold, mission-oriented approach to incorporate co-benefits in their planning and achieve multiple aims. This strategy integrates climate and environmental action across the city region’s other key sector-specific strategies and departments, including its industry, transport, housing, infrastructure, spatial planning, and air quality strategies. For example, plans to increase the energy efficiency of housing and other buildings is being coordinated through the city region’s environment, infrastructure, spatial planning, and housing strategies in acknowledgement that housing in Greater Manchester needs to transform to not only reduce emissions but to alleviate fuel poverty and reduce health issues linked to poor housing.

Through this co-benefits approach, Greater Manchester acknowledges that the challenges are interlinked and need to be addressed through an integrated approach rather than individually.

Greater Manchester, United Kingdom



Helsinki, Finland

Helsinki, the capital of Finland, sits on an archipelago of islands on the coast of the Gulf of Finland, almost the southernmost tip of the country. Climate change is already having an impact on the city, with heatwaves in 2010 and 2018 particularly affecting older and more vulnerable people in the city and resulting in increased excess deaths. Climate-related hazards such as intense rainstorms, storm surges, flooding, and heatwaves are expected to increase in frequency and intensity.

Helsinki has set an ambitious target to become **carbon neutral by 2035** (based on GHG emissions associated with activities within the city boundary). This goal will be achieved by reducing emissions in the city by 80% by 2035 and offsetting the residual 20% of emissions. The city has already made significant progress and in 2015, Helsinki had reduced its emissions by 26% compared with 1990.

In the **Carbon-neutral Helsinki 2035 Action Plan**⁴² the city aims to deliver climate action through a combination of decarbonizing the transport, buildings, consumption and economic sectors, and enhancing carbon sinks, engaging with key city stakeholders, and monitoring climate action progress.

Helsinki has used a co-benefits approach to support their decision-making on climate action. For each of the actions in their plan, they have identified other co-benefits that the action would deliver, and potential challenges to implementation. For example, they noted that the co-benefits of increasing the proportion of electric vehicles in Helsinki were improved air quality and reduced noise, but they acknowledge that this action relies on individual consumer action which can be difficult to influence. They also estimated the direct cost effects of each action to the city and to other city actors, in collaboration with consultants, and they provide an estimate of cost-efficiency for the city which they can use to compare with other actions. For example, the plan identified that recovering unused waste heat from buildings would require additional investments of €6.2 million from the city and €15.9 million from other building owners by 2035, but the annual savings are estimated to exceed the annual costs for all actors, making this an economically viable option. In their next steps, the city plans to undertake additional impact assessments, including economic impacts, for the climate actions in their plan to enable them to make informed investment decisions.

By understanding the environmental, social, and economic co-benefits and costs of individual climate actions, Helsinki will be able to make an informed decision about which actions deliver most benefits, enabling climate action to address multiple city priorities at once.

Helsinki, Finland

Indianapolis, USA

Indianapolis, the state capital of Indiana, is a flat, low-lying city surrounded by hills with a population of just under one million.

The city has experienced multiple extreme weather events in the past decade, including an ice storm in 2011, a heatwave and drought in 2012, and extremely cold winters, with wind chill temperatures as low as -30 to -40 °C in 2014 and 2018. By 2050, Indianapolis is expected to be warmer and to experience more days of intense rainfall due to climate change. At the same time, the city faces serious air quality, poverty and social vulnerability challenges, with 9% of Indianapolis' population on low incomes and more than one mile from the nearest supermarket and 20% of children in the city experiencing food insecurity. In some parts of the city, socially vulnerable populations (which the city has identified based on 12 socioeconomic factors including income, age, access to a car and education) are expected to be the most severely impacted by both extreme heat and flooding.

Not only does Indianapolis need to take urgent climate action, it needs to address social inequality, vulnerability and other city challenges.

In **Thrive Indianapolis**⁴³, the inaugural sustainability plan published in 2019, the city aims to reduce emissions to net zero by 2050 (Scope 1 and 2 GHG emissions) whilst also increasing community resilience and reducing social inequalities. To do this, they use a co-benefits approach which treats reduction in GHG emissions as just one of many beneficial outcomes of the actions they are implementing to achieve their overall goal to build a thriving, sustainable and resilient city.

For each of the actions in their plan, they assess whether the action would reduce inequality, improve public health, create jobs, reduce greenhouse gas emissions and increase the resilience of vulnerable populations. For example, one of the mitigation actions that the city is implementing aims to help communities overcome barriers to installing solar energy through education and support. This action is designed to reduce emissions, create jobs, reduce social inequality and increase resilience in socially vulnerable populations in the city all at the same time⁴⁴.

Indianapolis is already making progress. Between 2010 and 2016, Indianapolis reduced its GHG emissions from 16.4 million metric tons of CO₂ equivalent (MtCO_{2e}) to 14.6 MtCO_{2e}, putting the city 11% on the way towards becoming carbon neutral, despite the population growing by 4% during the same period. In 2020, Indianapolis launched a commission to advise the City-County Council on how to deliver climate and environmental action that embraces environmental justice principles, acknowledging that negative environmental impacts tend to affect low-income communities and communities of color the most.

Tasked with social and climate challenges, delivering climate action that works for citizens is essential. A clear understanding of co-benefits enables Indianapolis to identify and choose appropriate actions to achieve this.

Indianapolis, USA

43. City of Indianapolis. Thrive Indianapolis. <https://static1.squarespace.com/static/5b4ead40c3c16a711ae78401/t/5c704aa4fa0d6033019e373a/1550863041205/2019CPSR001-ThriveIndianapolis-web.pdf> (2019).

44. City of Indianapolis. Thrive Indianapolis. <https://static1.squarespace.com/static/5b4ead40c3c16a711ae78401/t/5c704aa4fa0d6033019e373a/1550863041205/2019CPSR001-ThriveIndianapolis-web.pdf> (2019).



Kampala, Uganda

Kampala, the capital of Uganda, is a city of 1.5 million people sitting on the northern shores of Lake Victoria. As Uganda's main economic hub, the city is undergoing rapid urbanization and the Greater Kampala Metropolitan Area is expected to grow from 3.5 million in 2015 to 8-10 million people by 2035⁴⁵.

Kampala is already feeling the effects of climate change, with increasingly erratic and intense rainfall events and an increase in average temperature of 1.5°C between 1950 and 2005. The city estimates that under business-as-usual scenarios, its emissions will increase by 55% between 2020 and 2030. Meanwhile, the costs of climate adaptation in Kampala are predicted to increase from US\$7.3 million in 2013 to US\$33-102 million by 2050⁴⁶. But the city also faces other pressures, including unsustainable natural resource use, settlement building in risk-prone areas, and air and water pollution. Kampala knows it needs to urgently address all of these issues to achieve its ambition of becoming a "thriving, attractive and sustainable city".

In the **Kampala Climate Change Action plan**⁴⁷, published in 2016, the city aims to not only map out a low-carbon development pathway, including reducing emissions by 22% from the city's business-as-usual scenario by 2030 (both direct and indirect GHG emissions), and improve the city's capacity to adapt to climate change, but to harness the co-benefits of climate action and turn them into opportunities for the city. They plan to achieve this by mainstreaming climate action across all city sectors. They have also identified the co-benefits of different climate actions. For example, in their action plan, they have identified that actions aimed at reducing congestion and travel times, and increasing sustainable transport systems will not only reduce emissions but save costs for households, create green jobs and improve air quality.

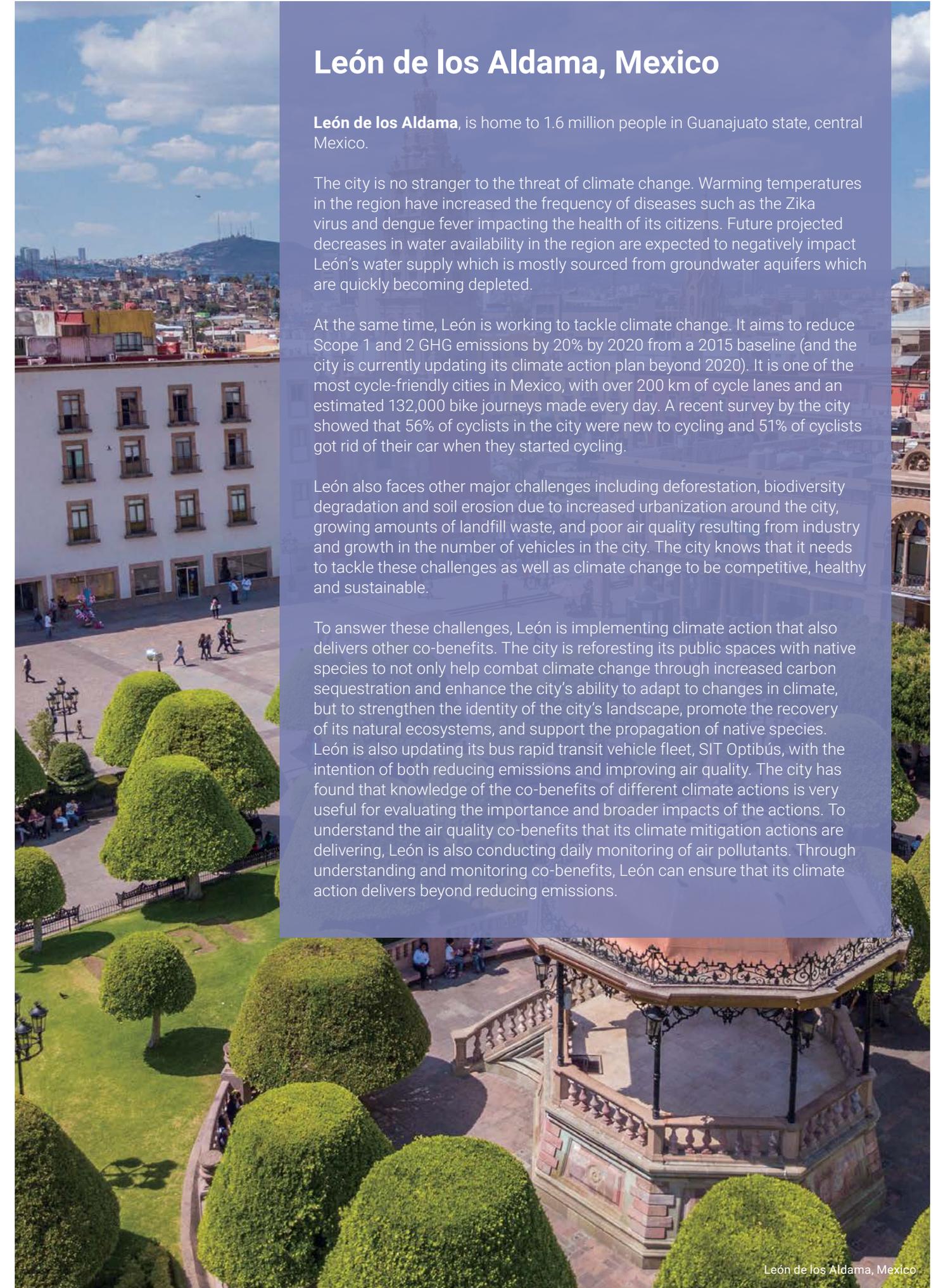
Kampala has also remained accountable in its climate action by detailing the timescale, implementation method (for example, government policies, public-private partnerships or communication campaigns), and the actors responsible for each action. Progress will be monitored through indicators including the number of stakeholders reporting actions, pilot projects undertaken, and innovative ideas and technology solutions developed and implemented.

Climate action is key to Kampala remaining a safe and secure place to live and work. Using a co-benefits approach to climate action enables Kampala to effectively mitigate and adapt to climate change whilst also knowing that actions it is taking contribute to the city becoming thriving, attractive and sustainable for all within its boundaries.

45. Kampala Capital City Authority. Kampala Climate Change Action. <https://www.kcca.go.ug/uDocs/Kampala-Climate-Change-Action.pdf> (2016).

46. Kampala Capital City Authority. Kampala Climate Change Action. <https://www.kcca.go.ug/uDocs/Kampala-Climate-Change-Action.pdf> (2016).

34 47. Kampala Capital City Authority. Kampala Climate Change Action. <https://www.kcca.go.ug/uDocs/Kampala-Climate-Change-Action.pdf> (2016).



León de los Aldama, Mexico

León de los Aldama, is home to 1.6 million people in Guanajuato state, central Mexico.

The city is no stranger to the threat of climate change. Warming temperatures in the region have increased the frequency of diseases such as the Zika virus and dengue fever impacting the health of its citizens. Future projected decreases in water availability in the region are expected to negatively impact León's water supply which is mostly sourced from groundwater aquifers which are quickly becoming depleted.

At the same time, León is working to tackle climate change. It aims to reduce Scope 1 and 2 GHG emissions by 20% by 2020 from a 2015 baseline (and the city is currently updating its climate action plan beyond 2020). It is one of the most cycle-friendly cities in Mexico, with over 200 km of cycle lanes and an estimated 132,000 bike journeys made every day. A recent survey by the city showed that 56% of cyclists in the city were new to cycling and 51% of cyclists got rid of their car when they started cycling.

León also faces other major challenges including deforestation, biodiversity degradation and soil erosion due to increased urbanization around the city, growing amounts of landfill waste, and poor air quality resulting from industry and growth in the number of vehicles in the city. The city knows that it needs to tackle these challenges as well as climate change to be competitive, healthy and sustainable.

To answer these challenges, León is implementing climate action that also delivers other co-benefits. The city is reforesting its public spaces with native species to not only help combat climate change through increased carbon sequestration and enhance the city's ability to adapt to changes in climate, but to strengthen the identity of the city's landscape, promote the recovery of its natural ecosystems, and support the propagation of native species. León is also updating its bus rapid transit vehicle fleet, SIT Optibús, with the intention of both reducing emissions and improving air quality. The city has found that knowledge of the co-benefits of different climate actions is very useful for evaluating the importance and broader impacts of the actions. To understand the air quality co-benefits that its climate mitigation actions are delivering, León is also conducting daily monitoring of air pollutants. Through understanding and monitoring co-benefits, León can ensure that its climate action delivers beyond reducing emissions.



Seberang Perai, Malaysia

Seberang Perai is a city of one million people in the Penang region of the Malay Peninsula. It is a relatively flat city, sitting at the intersection of the Perai river and the country's west coast and lined with mangrove swamps.

Like countless other cities, climate change will have a serious impact on Seberang Perai. Average temperatures in the city are expected to increase by 1.5 °C by 2030, exacerbating the risks of heat stress. The city is also vulnerable to flood events and experienced twice as many floods in 2017 compared to 2015. Seberang Perai also faces a number of other challenges, including an ageing population (the number of citizens aged over 60 is expected to double over the next decade), economic vulnerability (16% of households are financially vulnerable), growing inequality, and urban sprawl, which has led to increased car dependency. At the same time, there are exciting and tangible opportunities for the city to grow a green economy and expand solar power generation⁴⁸.

In their **Penang 2030 plan**⁴⁹, published in 2019, Seberang Perai and Penang have harnessed a co-benefits approach to action by setting a holistic overarching goal to become a "family-focused, green and smart state" by 2030. To achieve this goal, they plan to implement not just climate mitigation and adaptation actions, including reducing GHG emissions intensity by 50% by 2022 (Scope 1 GHG emissions), but also to improve citizens' quality of life, deliver economic growth, reduce inequalities, and increase connectivity and smart technologies at the same time.

To track their progress in delivering these goals, the city has identified multiple measurable targets for each action in their plan. For example, one action set out is to increase the readiness of local manufacturing industries for the digital age and the green economy. The city provides three measurable targets to assess their progress on this action, including that 1,000 small and medium enterprises participate in a capacity-building programme, zero manufacturing firms report talent recruitment as an obstacle to growth, and 50 new green technology patents are registered by local companies.

Not only is Seberang Perai adopting a co-benefits approach to develop policies that will achieve multiple priorities at the same time, they have set clear performance metrics to allow them to track progress in the delivery of their plans. Such proactive climate action will be key to the city's resilience to climate shocks, and transition to a green and low carbon economy.

48. Penang 2030 Unit. Penang 2030. https://www.penang2030.com/files/The%20Penang2030%20Guide_First%20Edition%202019_eBook_.pdf (2019).

49. Penang 2030 Unit. Penang 2030. https://www.penang2030.com/files/The%20Penang2030%20Guide_First%20Edition%202019_eBook_.pdf (2019).

KEY LESSONS AND OPPORTUNITIES FOR CITIES



Cities can maximize opportunities from taking climate action by integrating co-benefits in their planning

Integrating co-benefits into city-level climate action planning enables cities to address multiple priorities simultaneously⁵⁰ and to encourage buy-in from key city stakeholders, such as companies and local communities⁵¹. This can help cities accelerate actions to reduce their emissions, which is vital for limiting global temperature warming to 1.5°C⁵².

Cities around the world are already identifying the co-benefits of the climate actions they are taking. We analysed data from 521 cities that reported climate mitigation actions to the CDP-ICLEI Unified Reporting System in 2019. This analysis indicated that 76% of these cities reported co-benefits with these actions. The most common co-benefits that cities identified were shifting to more sustainable behaviours, improved resource efficiency, enhanced resilience, enhanced climate change adaptation and greening the economy. This shows that cities across global regions and income levels are identifying co-benefits, which should enable them to encourage local stakeholder buy-in⁵³, promote more efficient use of resources across departments, and accelerate climate action⁵⁴. However, further research is needed to assess how this is playing out in practice among cities disclosing to the CDP-ICLEI Unified Reporting System.

Although the majority of cities were reporting co-benefits, approximately a quarter of cities reporting mitigation actions across all regions and income levels did not report any co-benefits and for some actions, cities were not reporting the full range of co-benefits that they potentially could be. This suggests that cities may be missing key opportunities to get people on board⁵⁵ and implement action that also addresses other city priorities such as health, inequality and economic growth⁵⁶.



Hanoi, Vietnam

50. Gouldson, A., Sudmant, A., Khreis, H. & Papargyropoulou, E. The Economic and Social Benefits of Low-Carbon Cities: A Systematic Review of the Evidence. *Coalit. Urban Transitions* 1–92 (2018) doi:10.1007/978-3-540-32210-8_6.
51. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).
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There are transferable lessons to learn from cities that are already integrating co-benefits into their climate action planning

By studying the climate action plans of eight ambitious cities that are actively seeking to embed co-benefits into their decision making, we can identify some transferable lessons to enable cities to harness co-benefits to accelerate their climate action.

- Approaching climate action in a holistic and integrated way, where reducing emissions is one of many city priorities which is implemented across all other city sectors, can enable climate action to be achieved whilst most cost-effectively addressing other challenges such as health, social inequality and air quality (e.g. Indianapolis and Seberang Perai).
- Collaborating with key local stakeholders is a powerful way to ensure that your climate action planning reflects the needs and priorities of local companies, organizations and communities and enables cities to identify opportunities to address more than one challenge at the same time (e.g. Bristol).
- Quantifying the co-benefits of different mitigation actions enables cities to objectively assess which actions will be most appropriate for them and will yield the most beneficial outcomes (e.g. Helsinki).

Resources are available to enable cities to embed co-benefits into their climate action planning

We have reviewed and gathered some of the latest tools and resources to enable cities to integrate co-benefits in their climate action planning. On top of these, an essential first step is for cities to decide how they want to define and communicate about co-benefits.

Whilst this report uses the term 'co-benefits' to describe the non-climate beneficial outcomes of climate actions, many different definitions have been used by cities and researchers to describe it, including 'win-win' opportunities, 'ancillary benefits', 'secondary benefits' and 'mainstreaming'⁵⁷. How cities define and communicate climate action and its associated co-benefits can be important for encouraging buy-in from stakeholders⁵⁸.

Strategies for defining and communicating co-benefits:

- Even if a city's main goal is delivering climate action, framing climate action as the top priority of a policy and other non-climate outcomes as less important secondary co-benefits may not be effective for getting buy-in from city stakeholders who are managing multiple priorities and may not consider climate action to be their primary focus⁵⁹. The case studies show that some cities frame climate action in a more holistic 'one city' approach where it is one of many city goals, including economic growth and reducing inequality. For example, Bristol aims to deliver emissions reductions together with economic growth, improved health, connectivity, and education to achieve its goal to be a "fair, healthy and sustainable city" by 2050⁶⁰.
- It can be useful to differentiate between deliberate and unintended co-benefits to ensure that any unintended co-benefits are identified and built into future climate action planning and monitoring⁶¹. If the co-benefit is deliberate, it is also useful to know whether it is;
 - a non-climate co-benefit arising from policies where climate benefits are the primary objective of the policy,
 - a climate co-benefit arising from policies where non-climate benefits are the primary objective,
 - or a co-benefit arising from an integrated policy approach which intentionally targets both climate and non-climate benefits equally⁶².
- It is important to acknowledge that some mitigation actions can have negative impacts if not carefully implemented. For example, expanding green spaces in an area might result in an increase in local house prices and risk increasing inequality. Cities need to address these impacts and build in measures to mitigate them during climate action planning⁶³.

We recommend that policy-makers consider their choice of terminology when communicating co-benefits to key stakeholders, given their specific context and who they are trying to engage with.

57. LSE Cities & C40. Co-benefits of urban climate action: A framework for cities. 86 <http://eprints.lse.ac.uk/id/eprint/68876> (2016) and Ürge-Vorsatz, D., Herrero, S. T., Dubash, N. K. & Lecocq, F. Measuring the Co-Benefits of Climate Change Mitigation. Annual Review of Environment and Resources vol. 39 549–582 <https://www.annualreviews.org/doi/pdf/10.1146/annurev-environ-031312-125456> (2014) and Karlsson, M., Alfredsson, E. & Westling, N. Climate policy co-benefits: a review. Climate Policy vol. 0 1–25 <https://doi.org/10.1080/14693062.2020.1724070> (2020).

58. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).

59. Ramboll & C40. Urban Climate Action Impacts Framework. 42 https://c40-production-images.s3.amazonaws.com/other_uploads/images/1605_C40_UCAIF_report_V3.original.pdf?1518203136 (2018) and Howden-Chapman, P., Keall, M., Whitwell, K. & Chapman, R. Evaluating natural experiments to measure the co-benefits of urban policy interventions to reduce carbon emissions in New Zealand. Sci. Total Environ. 700, 134408 (2020).

60. Bristol One City Plan. A Plan for Bristol to 2050. https://www.bristolonecity.com/wp-content/uploads/2020/01/One-City-Plan_2020.pdf (2020).

61. LSE Cities & C40. Co-benefits of urban climate action: A framework for cities. 86 <http://eprints.lse.ac.uk/id/eprint/68876> (2016).

62. LSE Cities & C40. Co-benefits of urban climate action: A framework for cities. 86 <http://eprints.lse.ac.uk/id/eprint/68876> (2016).

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There are a range of free tools and frameworks available to enable cities to adopt co-benefits in climate action planning and to make the case for action

Tools and frameworks that enable cities to identify co-benefits

Ramboll and C40 Urban Climate Action Impacts Framework (UCAIF)⁶⁴

Developed in 2018, based on the co-benefits review by LSE Cities and C40⁶⁵, this framework was designed to enable cities to trace a pathway from a policy action to all possible impacts (co-benefits and costs) and to standardize how urban climate action co-benefits are defined and measured to allow comparison between cities.

Useful features:

- ▼ Considers positive and negative impacts of actions
- ▼ Accounts for integration of climate mitigation and adaptation
- ▼ Recognizes that impact pathways are context-specific and integrates Sustainable Development Goals
- ▼ Provides advice on how to measure co-benefits

Ashden Co-benefits Toolkit⁶⁶

Developed in 2019, this toolkit was designed to provide UK local authorities with resources to enable them to identify co-benefits and make the case for climate action to key decision-makers.

Useful features:

- ▼ Provides case studies of climate actions taken by other UK cities that have delivered co-benefits
- ▼ This tool is specific for UK cities and local authorities

MC³ Climate Action Co-Benefits Model⁶⁷

Developed in 2018, this model is a series of systems models mapping out the linkages, co-benefits and negative impacts of different climate actions based on interview data from 11 local authorities in British Columbia.

Useful features:

- ▼ Considers positive and negative impacts of actions
- ▼ Focuses on both mitigation and adaptation

C40 Inclusive Planning Toolbox⁶⁸

Developed in 2019, this toolbox offers a roadmap to help cities assess the needs of different urban communities and to design fairer and more equitable climate actions.

Useful features:

- ▼ Includes an Excel-based tool which provides a qualitative assessment of the potential benefits and barriers of 17 climate actions, including in terms of health and wellbeing, education, economic prosperity, and civil society.

64. Ramboll & C40. Urban Climate Action Impacts Framework. 42 https://c40-production-images.s3.amazonaws.com/other_uploads/images/1605_C40_UCAIF_report_V3.original.pdf?1518203136 (2018).

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67. Newell, R., Dale, A. & Roseland, M. The International Journal of Climate Change: Impacts and Responses Climate Action Co-benefits and Integrated Community Planning Uncovering the Synergies and Trade-Offs. 10, (2018).

68. C40 Inclusive Planning Toolbox (<https://resourcecentre.c40.org/resources/inclusive-planning>)

Tools that enable cities to quantify co-benefits

C40 Benefits toolkit⁶⁹

Since 2017, C40 has developed seven **tools** designed to quantify the co-benefits of building energy retrofits, walking and cycling, waste segregation and treatment, cool roofs initiatives, implementation of bus rapid transit systems, congestion pricing, and climate and air quality actions.

Useful features:

- ▼ Excel-based tools that cities can use themselves. However, training is recommended before using the climate and air quality actions tool
- ▼ Accounts for quantification of GHG emissions reductions and multiple co-benefits, including creation of jobs, improvements in health and reductions in mortality

Siemens City Performance Tool

This interactive tool assesses over 70 different technologies that could be implemented in the building, energy and transport sectors to find which is most cost-effective and delivers most environmental and economic co-benefits.

Useful features:

- ▼ Provides a free, simplified version of the tool which assesses 45 technologies for a range of set city types and estimates which will reduce the most GHG emissions, improve air quality and create jobs

Deciding which tool or framework a city might want to use will depend on what they are trying to achieve. For example, if a city wants to create buy-in from key decision-makers for climate policies that they have already developed and are trying to implement, the Ashden Co-benefits Toolkit may be useful for helping to make a strong and persuasive case for climate action. If a city is in the process of developing a climate action policy and wants support to identify and incorporate other non-climate co-benefits to optimize the policy, they would probably find the UCAIF, or MC³ Climate Action Co-Benefits Model more useful. Please note that the Ashden Co-benefits Toolkit and the MC³ Climate Action Co-Benefits Model are based on country-specific data and may not be applicable more broadly. If a city wants to quantify the expected co-benefits from policy actions to decide which actions would deliver the most benefits, they would find the C40 Benefits toolkits or Siemens City Performance Tool most useful.



69. C40 Cities. Benefits of Urban Climate: Research Summary - Spring 2020, <https://drive.google.com/file/d/1weQxbZhmoBQk4BiNrCxX720EumQo350K/view> (2020).

Collecting evidence of co-benefits is important for making an effective case for climate action

Collecting data on the co-benefits of climate actions is important for weighing up which actions deliver the most beneficial outcomes⁷⁰, tracking progress, and providing evidence to make a convincing case for climate action to decision-makers and stakeholders⁷¹. Developing an evidence base of the co-benefits of policy actions tends to involve collecting data on a set of indicators that are chosen to be representative of the co-benefit being assessed. For example, in New York City's **OneNYC plan**, they have a range of **measurable indicators** that they are using to track progress on the action plan and the co-benefits of these actions.

The **Urban Climate Action Impact Framework** provides a practical guide to enable cities to monitor co-benefits, including how to balance collecting the ideal dataset with the data that is available to cities⁷². They recommend that cities should prioritize:

- ▶ Collecting data on the co-benefits of a policy after it has been implemented (ex-post evidence) but that data predicting the co-benefits of a policy action before it has been implemented (ex-ante evidence) is also useful.
- ▶ Collecting direct measurements of different co-benefits indicators but where this is not possible, using proxy data from other cities with similar characteristics (e.g. geographical setting, population size, income etc.) that have implemented similar policies, or calculating co-benefits using established scientific relationships or assumptions.
- ▶ Collecting multiple measurements of the same co-benefit to increase the certainty that the impact of a policy being observed is real.

One of the challenges of using proxy data from other cities as evidence for implementing climate action is that it can take many years before clear and measurable co-benefits are available. For example, in a recent report by C40, they analysed evidence of co-benefits from city climate actions that had been implemented 10 years earlier⁷³. This demonstrates the importance of collecting data on co-benefits as early as possible, both in the policy design and implementation stages.

As well as collecting quantifiable evidence, anecdotal and qualitative evidence such as case studies (for example the **Ashden Co-benefits Toolkit** or **C40's Inclusive Planning Toolbox**), can also play an important role in convincing decision-makers on policy action⁷⁴.

Cities can take immediate action to reduce their emissions and gain co-benefits

To avoid catastrophic climate change, global emissions need to reduce to net zero by 2050 at the latest⁷⁵. To contribute to this goal, cities need to start making significant and rapid emissions reductions now. Delivering climate action that also provides other beneficial outcomes can encourage buy-in from stakeholders, promote equitable implementation of actions, and provide solutions to multiple city challenges simultaneously and cost-effectively, helping to accelerate climate action. This report shows that while cities are making progress to integrate co-benefits in their climate action, there are still plenty of opportunities for cities to harness co-benefits further to build a healthier, more equal, and low carbon future for their citizens.

70. Ramboll & C40. Urban Climate Action Impacts Framework. 42 https://c40-production-images.s3.amazonaws.com/other_uploads/images/1605_C40_UCAIF_report_V3.original.pdf?1518203136 (2018).

71. C40. Unlocking climate action in mega cities. <http://www.c40.org/researches/unlocking-climate-action-in-megacities> (2016).

72. Ramboll & C40. Urban Climate Action Impacts Framework. 42 https://c40-production-images.s3.amazonaws.com/other_uploads/images/1605_C40_UCAIF_report_V3.original.pdf?1518203136 (2018).

73. C40. Benefits of climate action: piloting a global approach (Final report). <https://drive.google.com/file/d/0B1VfKggXc6qOQ2syT1FsQTkwRm8/view> (2017).

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75. IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp. https://www.ipcc.ch/site/assets/uploads/2018/10/SR15_SPM_version_stand_alone_LR.pdf

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