



# **BENEFITS OF URBAN CLIMATE ACTION**

Research Summary - Winter 2021

## C40 Cities

The C40 Cities Climate Leadership Group connects 90+ of the world's greatest cities which have committed to tackling climate change. We bring mayors from around the world together to learn from each other in reducing greenhouse gas emissions and creating resilient, sustainable and inclusive cities.

C40 cities represent more than 700 million urban citizens and their economies account for 25% of global GDP. Our 'deadline 2020' report sets out the critical role that the world's major cities have to play in delivering the historic Paris agreement to prevent catastrophic climate change.

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The aim of this document is to describe the current portfolio and resources produced by the Benefits team at C40 Cities.

## >>>> TIME FOR URGENT CLIMATE ACTION

Cities have a leading role to play in averting the climate crisis. Although urban areas only occupy 2% of the world's land, they account for more than 70% of global CO2 emissions. Cities are also extremely vulnerable to the impacts of climate change and are increasingly exposed to hazards such as extreme heat, flooding, rising sea levels and powerful coastal storms.

At the current rate, the global average temperature is set to exceed 1.5°C above pre-industrial levels, between 2030 and 2052. To limit global temperature rise to below 1.5°C and avoid the most significant climate change impacts, global emissions must be significantly curbed. This requires an immediate and steep decline of cities' GHG emissions by moving away from business-as-usual emissions scenarios.

**This demands ambitious and transformative actions from all cities. The time for action is now**, as measures can take many years to reach their full scale.

## >>>> THE OPPORTUNITY TOWARDS HEALTHY AND LIVEABLE CITIES

Climate action has a range of wider benefits for the health and prosperity of cities, enabling Mayors to deliver a better quality of life for their citizens. From green jobs and growth, active and happier lives, and cleaner air and water – climate actions have an immediate, tangible impact on people's lives.

Climate change mitigation is sometimes perceived to be in conflict with the development agenda. Such concerns are often founded on the observation that historically, greenhouse gas (GHG) emissions were coupled with economic development. However, recent data shows that furthering economic development was not dependent on increasing GHG emissions: global trends for GHG emissions and GDP growth were decoupled in both 2015 (Olivier et al. 2016) and 2016 (IEA, 2016a).

The misconception that the climate agenda represents a burden to the development agenda may also arise from the understanding that resources which are spent on measures

for climate action entail significant opportunity costs, in that they are not available for other uses. This perception derives largely from the fragmentation of sustainable development issues; climate change planning, in particular, is often a process which is fragmented from planning for other development objectives at the national and subnational level. Measures for the decarbonisation of the economy are often planned and assessed in isolation. These planning and policy making processes can be made more efficient if there is a greater understanding of the synergies between them. Integrated development approaches, which simultaneously advance multiple benefits across the three dimensions of sustainable development, can ensure that resources are invested efficiently to maximise the synergies between various development priorities, of which climate change mitigation is one.

The potential synergies between climate change mitigation and adaptation and other development objectives at the city level are numerous, and dependent on local context. Through these synergies, the climate change mitigation and adaptation agenda is increasingly being seen as an opportunity for cities and national governments, rather than a burden.

**Understanding and harnessing the wider benefits of climate action will allow cities to tackle multiple issues at once, delivering urban development that provides more liveable and low carbon cities. Los Angeles Green New Deal delivers a new generation's climate action plan that shows the impact of the plan on Angeleno communities' jobs, workforce development, access and equity, affordability, health and wellbeing.**

**LOS ANGELES GREEN NEW DEAL...**  
Targets around zero emission vehicles, building electrification and industrial emissions will reduce air pollution and...



**PREVENT 1,650 PREMATURE DEATHS** annually



**PREVENT 660** Respiratory and CVD hospital admissions annually



**SAVE \$ 16 BILLION** from prevented deaths and hospital admissions annually

SUSTAINABLE DEVELOPMENT GOALS (SDGs)	TYPICAL MEASURES FOR CLIMATE CHANGE ACTION AND LINKAGES TO SDGs		
	ENERGY SUPPLY (renewable and decentralised technologies)	ENERGY EFFICIENCY (e.g. in buildings and industry)	TRANSPORT (modal shift to public transport)
<b>1. NO POVERTY</b> 	▲ Energy access boosts productivity & participation	▲ Reduce household energy bills	▲ Accessibility and mobility for poorer communities
<b>3. GOOD HEALTH AND WELL-BEING</b> 	▲ Reduce air pollution and health risks	▲ Reduce indoor air pollution and sick building syndrome	▲ Reduce air pollution and health risks; potential physical activity benefits
<b>4. QUALITY EDUCATION</b> 	▲ Enhance conditions for learning	▲ Enhance conditions for learning	▲ Enhance access to educational institutions
<b>5. GENDER EQUALITY</b> 	▲ Successful introduction of programmes for reducing emissions depends on empowerment and participation of women in the household		▲ Increased accessibility for marginalised groups and people
<b>7. AFFORDABLE AND CLEAN ENERGY</b> 	▲▼ Energy security (affordability depends on policy options)	▲ Reduce energy consumption and bills	
<b>8. DECENT WORK AND ECONOMIC GROWTH</b> 	▲▼ Creation of decent jobs and new industries (Depends on policy options to avoid adverse outcomes of job losses in older industries)		
<b>9. INDUSTRY, INNOVATION AND INFRASTRUCTURE</b> 	▲ Catalyse local enterprise and industries	▲ Improve efficiency and competitiveness of industry	▲ Develop long-term, sustainable infrastructure
<b>10. REDUCED INEQUALITIES</b> 	▲ Decentralised energy favours access for marginalised communities	▲ Energy expenditure burden is greater for lower income groups	▲▼ Lower income groups most disadvantaged for mobility (depends on policies to prevent gentrification)
<b>11. SUSTAINABLE CITIES AND COMMUNITIES</b> 	▲ Technology suitable for long-term needs of cities and inhabitants	▲ Investments extend useable lifetime of built environment	▲ Infrastructure suitable for long-term needs of cities and inhabitants
<b>13. CLIMATE ACTION</b> 	▲ Decarbonise cities; improve resilience to natural hazards	▲ Decarbonise cities; improve resilience to extreme weather	▲ Decarbonise cities

Demonstration of some selected synergies between climate and development agendas - Opportunity 2030, C40 Cities, 2018.

## >>>> C40 BENEFITS RESEARCH: MAKING THE CASE FOR CLIMATE ACTION

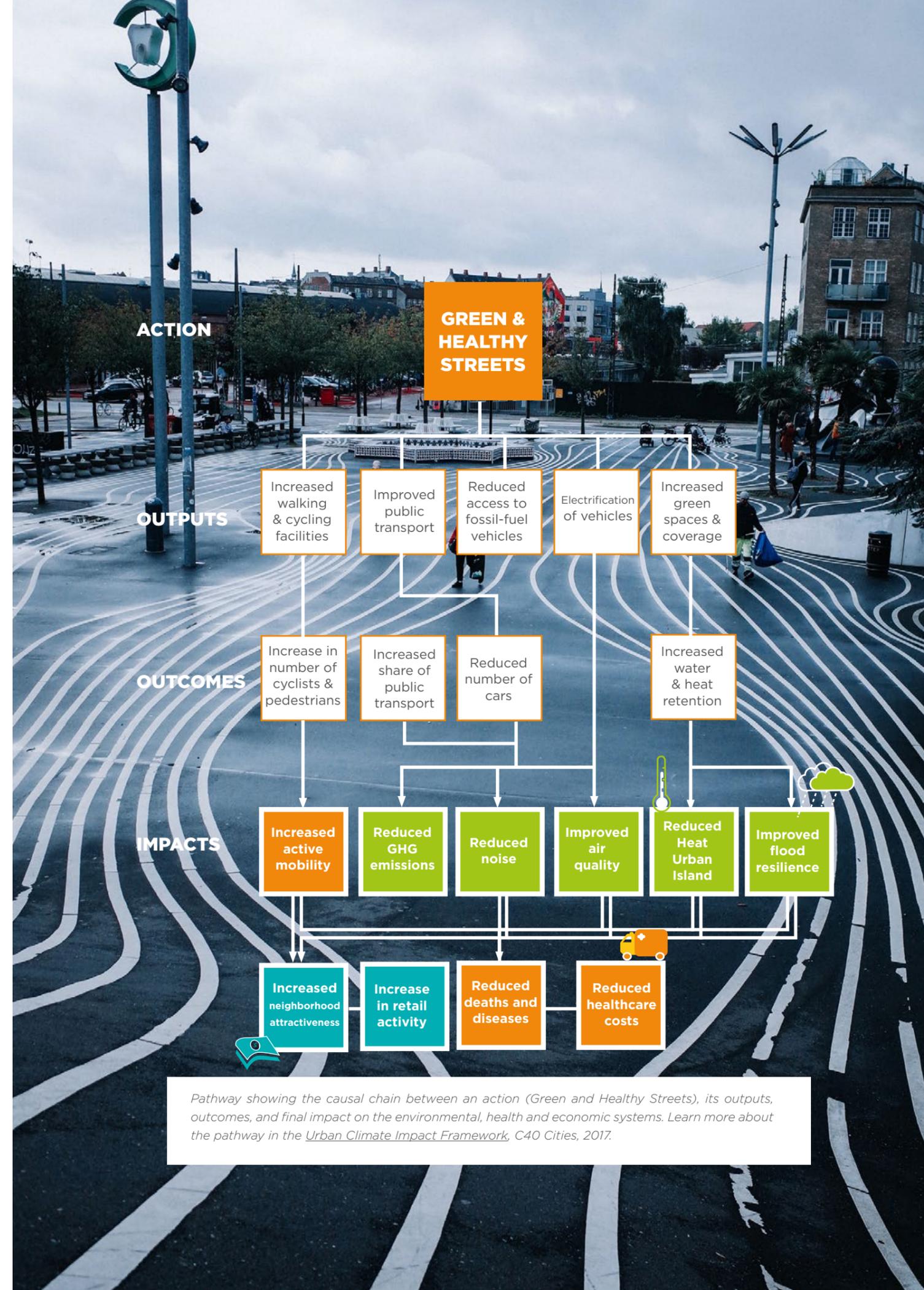
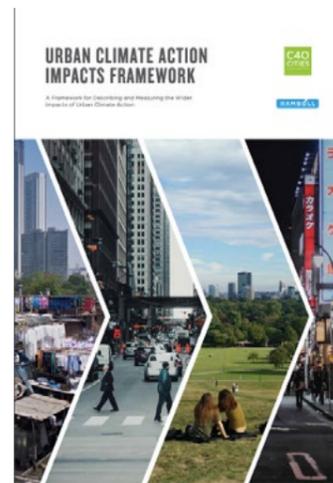
The C40 research report, *Unlocking Climate Action in Megacities* (C40-Arup Partnership, 2015), identifies the leading six challenges preventing action. Making the case for action is one of the main challenges, as climate change is often seen as competing with a range of more immediate and tangible issues, such as a lack of affordable housing, poverty, unemployment, and poor health. Without a holistic and persuasive case that articulates how climate action contributes to these priorities, it is challenging to attract the support required.

In order to meet the challenges posed by climate change, cities need to take bold action at a large scale. C40 supports cities in making the case for ambitious climate action by harnessing the wider benefits on health, equity, economy and security - in areas such as energy, transport, buildings, urban planning and adaptation. The Benefits research team works to frame how to measure the benefits of climate action, develop modelling tools, and sharing the experience of cities worldwide.

## >>> A common framework: Coordination and standardisation for global efforts on Benefits Research

C40 Research team undertook ground-breaking research to develop and test a standard approach to measuring the benefits of climate action. The framework shows how city priorities, climate action and social, economic and environmental benefits interlink and can be modelled through a causal chain.

Read more : [Urban Climate Impact Framework](#), C40 Cities, 2017.



Pathway showing the causal chain between an action (Green and Healthy Streets), its outputs, outcomes, and final impact on the environmental, health and economic systems. Learn more about the pathway in the *Urban Climate Impact Framework*, C40 Cities, 2017.

## >>>> BENEFITS IN ACTION: THE CASE FOR A GREEN AND JUST COVID19 RECOVERY

The C40 Global Mayors COVID-19 Recovery Task Force advocates for a post-COVID stimulus that supports a green and just recovery - one that is consistent with limiting global heating to below 1.5°C while reducing urban air pollution and supporting job creation.

To provide decision-makers with more information on how stimulus packages may affect cities, this report compares how urban greenhouse gas emissions, health and jobs could fare under a green and just recovery compared to a return to a pre-COVID business-as-usual scenario, or a scenario where the world opts to spend stimulus funding on a high-carbon recovery.

**The message is clear: the world has an opportunity to recover from the global pandemic in a way that makes our cities greener and more just places to live.**

So far, national decision-makers have opted for a high-carbon recovery. To date, only 3 - 5% of an estimated US\$12 - \$15 trillion in international COVID stimulus funding is committed to green initiatives. This means that almost all of the current COVID stimulus funding is propping up a high-carbon recovery - likely leading us toward catastrophic climate change and missing an unprecedented opportunity for change. The C40 Mayoral Task Force urges decision-makers to re-consider and invest in lower emissions, cleaner air and more jobs.

The research finds that:

- Stimulus funding that supports a green and just recovery offers a means to keep global heating below 1.5°C, and could reduce air pollution by as much as 29% between 2020-2030 compared to a return to business-as-usual. In contrast, investing an equivalent amount of stimulus funding in a high-carbon recovery would undoubtedly accelerate global heating.
- Across the nearly 100 cities in the C40 network and their supply chains, a green and just recovery could also create over 50 million good, sustainable jobs by 2025 - over a third more than would be created by investing equivalent funds into a high-carbon recovery.

This research also shows that the timing of a green and just recovery matters, and presents a clear case for early investment. Modelling of the impacts of an 'accelerated green recovery' where faster capital investment enables accelerated climate action over the next five years, compared to a 'slow green recovery' where action happens at a slower pace over 15 years, shows that:

- An 'accelerated green recovery' could lead to half the per capita greenhouse gas emissions of a 'slow green recovery' by 2030, meaning that an 'accelerated green recovery' provides C40 cities with a greater chance of meeting their climate commitments and limiting global heating to 1.5°C.
- An 'accelerated green recovery' could avert almost twice as many premature deaths (1.8 times as many) due to air pollution between 2020 and 2030, compared to a 'slow green recovery'.

Capital investments that are made early on under an 'accelerated green recovery' could create over 80 million good, sustainable jobs by 2023, across the nearly 100 cities in the C40 network and their supply chains - more than double a 'slow green recovery'. At a time of mass unemployment and economic hardship in many parts of the world, generating jobs now will benefit millions of families.

Read our global research [here](#), and our Canada focus [here](#).

### A just and green economy in Canada would :

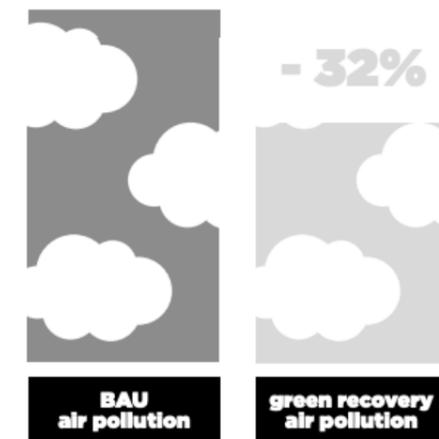


Reduce greenhouse gas (GHG) emissions by two-thirds by 2030 compared with a business-as-usual scenario, making it possible for Canada to deliver on its commitment to help prevent a global temperature rise above 1.5°C.



**+ 2.9 million jobs by 2030**

Support and create more than 2.9 million good, sustainable jobs by 2030 across 12 major Canadian cities and their supply chains.



Reduce air pollution by as much as 32% in major Canadian cities over the next 10 years, which could prevent up to 3,950 premature deaths.



**+ C\$ 37 billion economy benefits by 2030**

Deliver wider economic benefits of more than CAD 37 billion over the next 10 years from premature deaths averted by improving air quality and encouraging active mobility measures across major Canadian cities.



## **Library of tools to evaluate the Benefits of climate action**

Drawing on the existing evidence-base and working with leading experts, we developed methodologies to enable cities to quantify the health and economic benefits of climate and air quality action. The tools and learning materials are tested by cities to ensure their usability worldwide.

**CITIES ARE FACING A CLIMATE AND AIR QUALITY CRISIS**

**70%**  
GLOBAL GHG EMISSIONS

Cities account for more than 70% of global CO<sub>2</sub> emissions.

**1.5 DEGREES**

In 2016, C40 adopted 1.5°C as the only viable science-based target for humanity's long-term future.

**7 MILLION DEATHS**

Globally, estimates show that 7million premature deaths are caused by air pollution every year

**95% UNSAFE EXPOSURE**

95% of the population in C40 cities is exposed to unsafe air quality.

**GHG EMISSIONS AND AIR POLLUTION HAVE COMMON SOURCES**



**CLEAN TRANSPORT, BUILDINGS & INDUSTRIES WILL REDUCE EMISSIONS AND IMPROVE HEALTH**

**CLEAN TRANSPORT**

**25% GHG REDUCTION** **19% PM<sub>2.5</sub> REDUCTION**

**86K PREMATURE DEATHS AVERTED** **\$76 - 224 BILLION ECONOMIC IMPACT**

**CLEAN BUILDINGS & INDUSTRY**

**61% GHG REDUCTION** **30% PM<sub>2.5</sub> REDUCTION**

**137K PREMATURE DEATHS AVERTED** **\$122 - 359 BILLION ECONOMIC IMPACT**

**ZERO CARBON GRID**

To be successful, clean transport, buildings and industry must be underpinned by a decarbonised grid

If all C40 cities achieved clean transport, buildings and industry, underpinned by a decarbonised grid, PM<sub>2.5</sub> levels in these cities would drop by 49% on average, while reducing their GHG emissions by a significant 87%. This could save 223,000 lives from improved air quality, each year. Learn more here: [Toward a Healthier World - Connecting the Dots Between Climate, Air Quality and Health, C40, 2019.](#)

**>>>> CLIMATE, AIR QUALITY AND HEALTH**

Globally, estimates show that 7 million premature deaths every year are caused by ambient (4.2 million deaths) and household (3.8 million deaths) air pollution (WHO, 2019).

C40 Cities has worked with 30 cities in collaboration with BuroHappold, London School of Hygiene & Tropical Medicine (LSHTM) and Cambridge Environmental Research Consultants (CERC) to develop a methodology to enable cities to effectively and efficiently undertake a rapid assessment of the health benefits of climate and air quality actions on transport, buildings, industry and energy:

- > Reduction in air pollution
- > Premature deaths avoided per year
- > Life years gained
- > Increase in life expectancy
- > Reduction in respiratory and cardiovascular hospital admissions
- > Value of avoided deaths
- > Healthcare costs savings

**RESOURCES :**

The **tool and learning material** are available on demand, in English or Spanish. Several tools are available based on the level of granularity and number of actions assessed by the city. The BUCA tool (2017) gives a quick assessment of single city actions at a high level, while the Pathways AQ tool (2021) gives a comprehensive assessment of a climate action plan's impact on air pollution, but requires significantly more data and time to use.

**Call to action:** If all C40 cities achieved clean transport, buildings and industry, underpinned by a decarbonised grid, PM<sub>2.5</sub> levels in these cities would drop by 49% on average, while reducing their GHG emissions by a significant 87%. This could save 223,000 lives from improved air quality, each year.

Thirty participating C40 cities have trialled the methodologies and proposed ambitious measures for the transport, buildings and energy sectors that tackle both air pollution and GHG emissions. Learn more here: [Toward a Healthier World - Connecting the Dots Between Climate, Air Quality and Health, C40, 2019.](#)

**Integrating air quality in the Climate Action Plan:** Greenhouse gas (GHG) emissions and air pollution have many common sources. They also share solutions. By integrating air quality management and climate action planning processes, cities can meet local air quality goals and climate goals, while improving residents' quality of life. Consult the guide and summary for policy makers [here](#).

**Case Studies available on the [Benefits page](#):**

Complete Climate Action Plans assessments (2021): [Johannesburg](#) • [Buenos Aires](#) • [Addis Abbaba](#) • [Guadalajara](#) • [Accra](#) • [Lima](#) • [Chengdu](#)

**Transport electrification:**

- Bangalore 2020 - Electrification of the Bus Fleet
- Kolkata 2020 - Electrification of the Bus Fleet
- Jakarta 2020 - Electrification of the Bus Fleet
- Medellin 2020 - Electrification of the Bus Fleet
- Rio de Janeiro 2019 - Electrification of the Bus Fleet
- Chennai 2018 - Electrification of the Bus Fleet
- Quito 2018- Electrification of the Bus Fleet
- Ho Chi Minh City 2018 - Upgrading the Bus Fleet from Diesel to CNG / Promoting the Uptake of E-bikes
- Salvador 2017 - Upgrading the Municipal Bus Fleet

**Transport vehicle standards and low emission zone:**

- Addis Ababa 2020 - Setting Vehicle Standards
- Venice 2018 - City-Wide Low-Emissions Action
- Quezon City 2018 - Enforcement of Vehicle Emissions Regulations
- Paris 2017 - Fossil-Free Zone

**Buildings and energy:**

- Lima - Switching restaurant cooking stoves to more efficient technology
- Mexico City 2018 - Regulating Industrial Emissions
- Durban 2018 - Regulating Industrial Emissions
- Santiago 2017 - Replacing Wood-Burning Stoves
- Johannesburg 2017 - Electrification of Informal Settlements

## >>>> COAL-FREE CITIES: THE HEALTH AND ECONOMIC CASE FOR AN ENERGY REVOLUTION

Phasing out coal is the single biggest step we can take to keep global heating below the 1.5°C threshold. Coal is the largest source of electricity in the world – and the largest source of greenhouse gas emissions, accounting for more than 30% of energy-related CO<sub>2</sub>.

Cities are at the centre of the global energy transition. They account for two-thirds of global energy use – meaning they both influence and are influenced by the shift from coal to clean energy, and the impact of this on climate, health and prosperity.

The research team has modelled new evidence for the urban case for a rapid coal phaseout. C40's analysis provides compelling evidence of the adverse impact of coal-fired electricity on GHG emissions, air pollution and health, jobs and the cost of energy. The findings, which describe impacts on **60 C40 cities across 27 countries between 2020 and 2030**, are based on detailed city by- city modelling and present a clear urban case for the rapid phase-out of coal and transition to clean energy. Resources are available for all 61 cities on:

-  > Reduction in CO<sub>2</sub> emissions
- > Reduction in air pollution
-  > Premature deaths avoided per year
- > Premature and low-weight birth
- > Asthma new and emergency cases
- > Years of lives lost with disabilities
-  > Value of avoided deaths
- > Healthcare costs savings
- > Days of sick leave
- > Cost of electricity with several energy sources
- > Jobs created

Based on currently announced national coal policies, 264,900 people could die prematurely due to air pollution caused by coal-fired power plants. With a rapid transition to clean energy, many of these lives could be saved. Coal affects all aspects of residents' health, contributing to 121,100 preterm births, 93,600 new asthma cases among children

and 247,900 asthma emergency visits. As many as 353,400 years of life will be affected by diabetes, stroke and chronic respiratory diseases due to air pollution from coal plants.

The scale of the ambition gap is huge. Our research shows that to stay in line with a 1.5°C scenario coal capacity in and around C40 cities needs to decrease by 61% between 2020 and 2030. However, current coal plans within 500 km of C40 cities will actually increase coal capacity by 4% over this period.

Phasing out coal will deliver a green, just and prosperous future. A rapid phase-out of coal in favour of renewable, zero-carbon technologies could create 6.4 million jobs – which is 1.1 million more jobs than would be created under current plans. Many cities are already realising this opportunity – and making sure no-one is left behind as they do. This means engaging and upskilling the communities that will be affected by the transition and ensuring that green jobs are accessible.

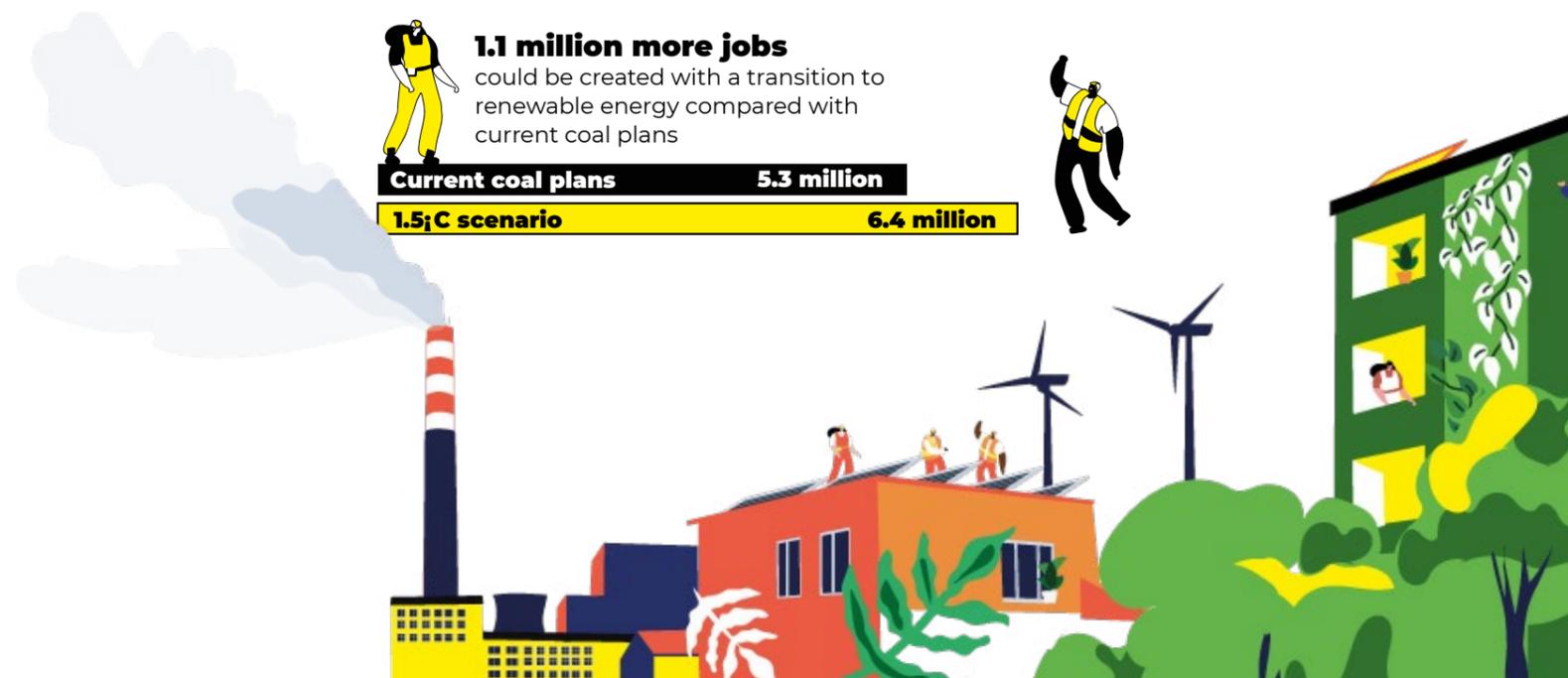
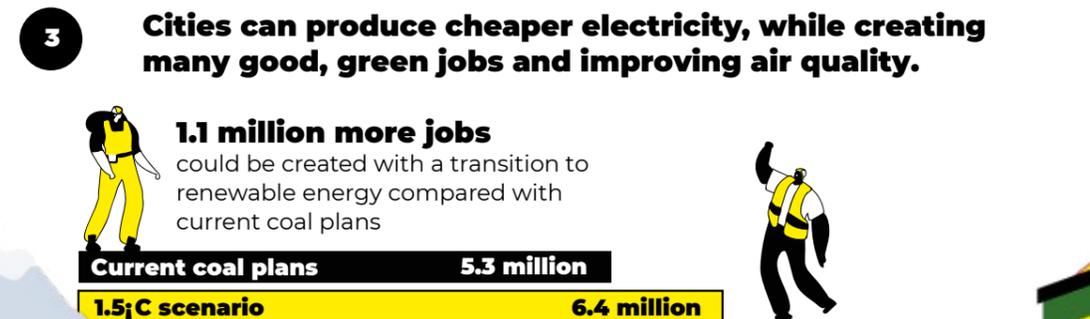
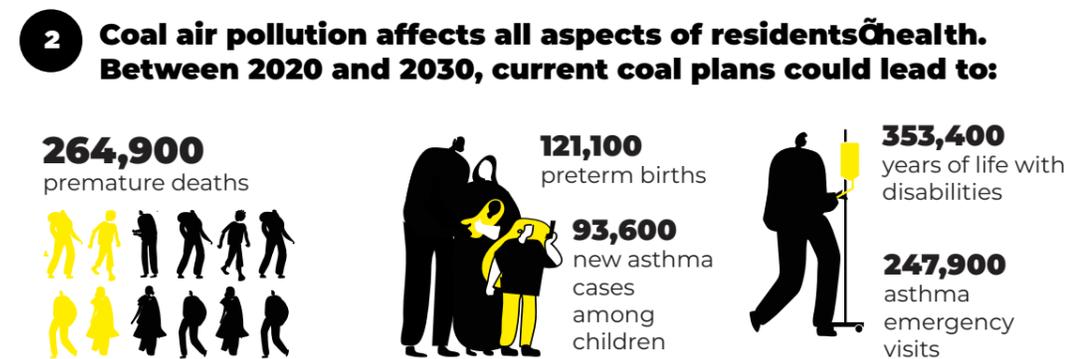
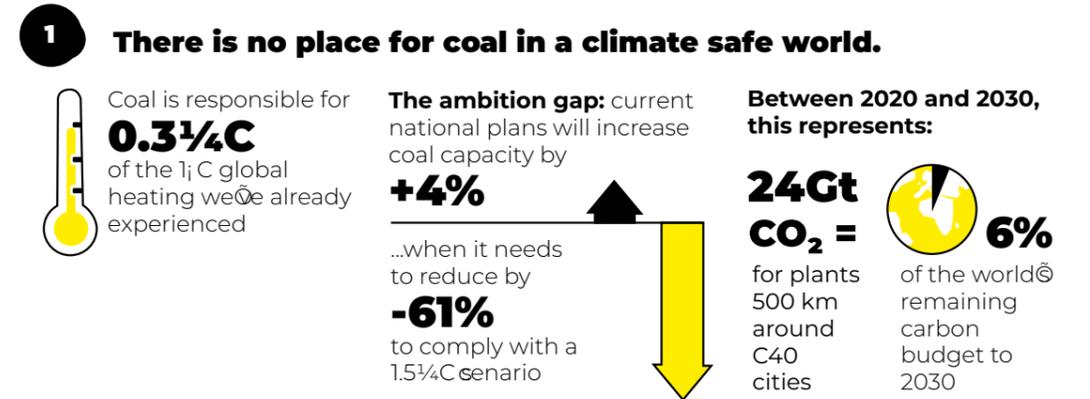
Urban action on coal can provide an essential contribution to achieving 1.5°C. A rapid phase out of coal from C40 city's electricity could prevent around 1.3 GtCO<sub>2</sub>e of GHG emissions. If C40 cities collaborate with other stakeholders to phase-out all coal-generated electricity across their surrounding energy region, the avoided emissions increase to a cumulative total of 24 GtCO<sub>2</sub>e, equivalent to 6% of the world's total remaining carbon budget.

### RESOURCES :

**Call to action:** Discover the full report story: [Coal-free cities: the health and economic case for an energy revolution.](#)

**Data explorer:** Explore our concentration and health figures on the interactive [Knowledge hub data explorer.](#)

**City reports:** 60 Reports with city specific data are available on demand: Amman Amsterdam Athens Austin Bangkok Beijing Bengaluru Berlin Bogota Boston Chengdu Chennai Chicago Ciudad de Mexico Dalian Delhi NCT Dhaka Ekurhuleni Fuzhou Guadalajara Guangzhou Hangzhou Hanoi Heidelberg Ho Chi Minh City Hong Kong Houston Istanbul Jakarta Johannesburg Karachi Kolkata Kuala Lumpur Medellin Melbourne Miami Moscow Mumbai Nanjing New Orleans New York City Philadelphia Qingdao Quezon City Rome Rotterdam Seoul Shanghai Shenzhen Singapore Sydney Tel Aviv Tokyo Tshwane Venice Warsaw Washington DC Wuhan Yokohama Zhenjiang



## >>>> THE MULTIPLE BENEFITS OF BUILDING RETROFITS

Buildings are typically the biggest source of GHG emissions in a C40 city and contribute, on average, more than 60% of emissions. Buildings are also where urban residents spend 90% of their time and thus indoor environments have a significant impact on people's health and economic savings.

**Case Studies:** Milan, New York City and Copenhagen have used the methodology to assess the impact of some of their building retrofits policies. Read more here: Case Studies, 2019. Available in [English](#) and [Chinese](#).

Deep building retrofits can therefore be used as a policy measure to simultaneously deliver on multiple urban goals. Improving the energy efficiency of the building stock provides city governments with an opportunity to cut emissions, as well as reduce healthcare costs, tackle energy poverty and improve the productivity and educational attainment of urban residents.

To support cities in this process, C40 introduces a methodology and toolkit to enable cities to quantify the benefits from deep retrofit projects, and presents results from three cities. The tool was developed by C40 Cities with technical input from BuroHappold and University College London. The tool calculates benefits and data including:

-  > **Reduced greenhouse gas emissions**
- > **Job creation**
-  > **Time needed to earn back the investment through operational costs savings**
- > **For office buildings, it also estimates increased employee productivity**
-  > **For residential buildings it calculates the reduction in energy poverty and improvement in health.**

**RESOURCES :**

The **tool and learning material** are available online in [English](#) and [Chinese](#).

**Call to action:** How many lives will an individual climate action save? How many new jobs will a building retrofit project result in? How will an improved building standard affect urban residents' health, well-being and productivity?

Discover the full report story: The Multiple Benefits of Deep Building retrofits, C40, 2019. Available in [English](#) and [Chinese](#).



# NEW YORK USA

## DRIVERS OF ACTION

New York City contains just over 1 million buildings (Metcalf, 2013), which collectively account for 67% of the city's emissions (NYC Sustainability, 2017). Many of these buildings will still exist come 2050. As such, it is imperative that the city's existing building stock be retrofitted in order to meet its ambitious emissions reduction targets. Meeting the new building targets will require climate action from all actors, public and private, and the municipality is setting an example and leading the way, with initiatives that affect their 4,000+ buildings and facilities.

To date, DCAS has mostly implemented "low-hanging fruit" energy conservation measures, such as lighting- and heating-system upgrades, but the department recognises that delivering the objectives set out by Mayor De Blasio and the City of New York necessitates further bold and ambitious climate action. Deep energy retrofits could deliver these goals.

These municipal properties are managed by more than 25 city agencies and span a wide range of building types, including schools, hospitals, firehouses, wastewater treatment plants, libraries and other facilities. Within the city, the Department of Citywide Administrative Services' (DCAS) Division of Energy Management is tasked with serving as a hub for energy management. DCAS is responsible for achieving the city government's GHG emissions reduction targets, including a 40% reduction for city-owned buildings by 2025, a 50% reduction by 2030, and a city-wide reduction of 80% by 2050.

To achieve the targets set out in its 1.5°C compliant climate action plan (NYC Sustainability, 2017) and the Climate Mobilization Act, New York has highlighted the need to rapidly educate agencies and contractors on the meaning and necessity of deep energy retrofits.

The outcomes of this pilot programme will support DCAS and other city agencies in their efforts to make the case for a holistic approach to deep energy retrofits. In addition, the city is in the process of developing guidelines for deep energy retrofits. Peer-review by the C40 network will ensure that the findings of the pilot study inform the guideline development.

## TAKING ACTION

For this pilot, New York focused on 23 public schools with particularly high emissions. Energy audits are currently being conducted and the city is considering the following retrofit elements: glazing, insulation, heating, ventilation and air-conditioning (HVAC), lighting, controls, solar photovoltaic (PV) and building management systems.

## PILOT PROJECT BENEFITS: 23 SCHOOLS



## >>>> BENEFITS OF ACTIVE MOBILITY

Most of the world's population live in countries where overweight and obesity kills more people than underweight. 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. Overweight is a major risk factor for noncommunicable diseases, increasing the prevalence of cardiovascular diseases, type 2 diabetes and cancer.

Due to increasing wealth and consumption, in addition to more sedentary lifestyles and unequal access to healthcare, urban living presents a major challenge to both human health and climate. Yet this also presents an opportunity for policymakers to make a huge positive impact on citizen's health.

The Benefits of Walking and Cycling research is built upon three years of forward-thinking work and provides a tool for cities to estimate the wider benefits of walking and cycling. The tool has supported 18 C40 cities to uncover the health and associated economic benefits of increasing walking and cycling in their city, due to the increase in physical activity. The tool calculates benefits and data including:

-  > Improved active mobility.
-  > Reduced mortality.
-  > Reduced incidences of cardiovascular diseases, stroke, diabetes, colon and breast cancer, dementia, depression.
-  > Value of lives lost.
-  > Avoided greenhouse gas emissions and pollutants.

### RESOURCES :

The **tool and learning material** are available online in [English](#).

**Deep dive case study:** Cycling prevents an estimated 10 deaths in Mexico City per year due to the protective benefits of increased physical activity.

See the full story [here](#).

### Case Studies

- Lima 2020 - Pedestrianisation of the Historic Center Case Study ([English](#) / [Spanish](#))
- Mexico City 2019 - [Massive Bike Parking Facilities](#)
- Bengaluru 2018 - [Tender Sure Case Study](#)
- Rotterdam 2019 - [Superblock Oude Westen Case Study](#)
- Houston 2018 - [Summary Results](#) and [Full Report](#)

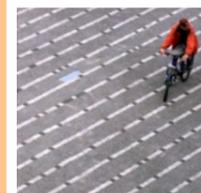
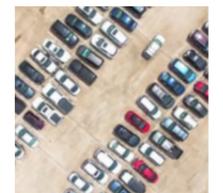
Switching from driving to an active commute (walking at a brisk pace or cycling 30 minutes per day, 5 days a week) can deliver the following health benefits for citizens:

- 23% reduced risk of heart disease,
- 23% reduced risk of stroke,
- 15% reduced risk of type 2 diabetes,
- 14% reduced risk of depression,
- 12% reduced risk of breast cancer
- 11% reduced risk of dementia, and
- 8% reduced risk of colon cancer



**65 MILLION**

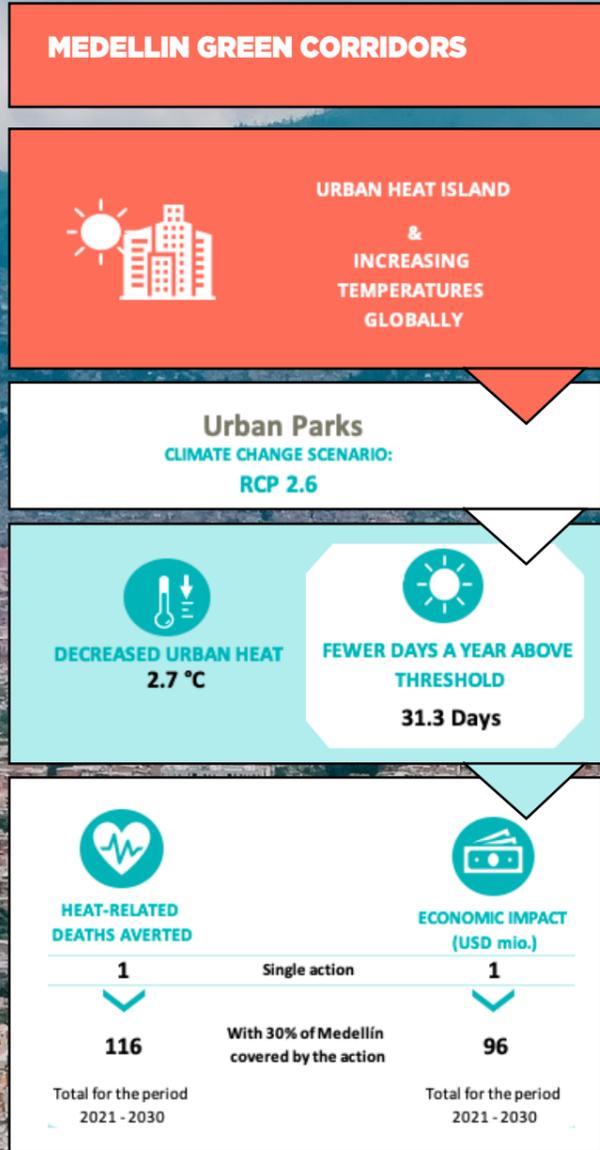
THE POTENTIAL NET PRESENT BENEFITS OF MEXICO CITY'S BIKE LANES TOTALS MORE THAN US \$65 MILLION, ALMOST 6 TIMES MORE THAN THE COSTS



**TEN DEATHS PREVENTED**

CYCLING PREVENTS AN ESTIMATED 10 DEATHS IN MEXICO CITY PER YEAR DUE TO THE PROTECTIVE BENEFITS OF INCREASED PHYSICAL ACTIVITY

*Benefits of ECOBICI and the pedestrianisation of Madeiro Street in Mexico City. Read the full story [here](#).*



PROBLEM  
ACTION  
OUTPUT  
OUTCOME

## >>>> HEAT RESILIENT CITIES: MEASURING BENEFITS OF URBAN HEAT ADAPTATION

The impact of extreme temperatures on health and wellbeing is rising up policy agendas in many cities. The Excel-based Heat Resilient Cities benefits tool has been designed to help city planners and decision-makers to quantify the health, economic and environmental benefits of common urban heat adaptation actions. Cities can use this information to make the case for urban heat adaptation investments, and to prioritise the actions that are likely to have the most positive impact locally.

Users can calculate the benefits brought by specific parks and green infrastructure, water bodies such as rivers and lakes, and cool and vegetative surfaces. The tool can also extrapolate results from these specific investments to calculate the benefits of scaling-up across the whole of the city. The tool models the impact of heat adaptation actions on surface temperatures, and in turn the lower heat-related hospital admissions and economic cost savings that lower temperatures generate. The results of the tool are indicative, not definitive, due to the range of necessary and generalising assumptions which underpin the tool.

-  > Decreased urban heat
- > Fewer days a year above the threshold
-  > Reduced mortality
- > Reduced hospital admissions
- > Reduced healthcare costs

The tool was developed with guidance from cities which participate in the C40 Cool Cities Network, and from urban heat and health impact specialists. It has been piloted with the cities of Medellín and São Paulo.

### RESOURCES :

The **tool and learning material** are available online in [English](#).

### Deep dive case study:

- The health and economic benefits of Medellín's green corridors. Available in [English](#) and [Spanish](#).
- The health and economic benefits of São Paulo's Ipiranga Stream Revitalisation. Available in [English](#) and [Portuguese](#).

## >>>> BENEFITS OF WASTE COLLECTION AND SEGREGATION

Waste management aims to reduce waste upstream, repurposing as much as possible and recovering materials for reuse. It includes managing waste disposal to minimise emissions from degrading material. Waste segregation or separation means dividing waste by category, typically dry for recycling and wet for composting or anaerobic digestion. A waste collection and segregation action refers to a policy or initiative that the city implements to increase waste collection and separation at or close to the source.

The tool has been developed by C40's inclusive climate action (ICA) team and Dalberg, and calculates benefits and data including:

- > **Job Creation**

The **tool and learning material** are available online on the [Resource Center](#).

## >>>> AFFORDABILITY OF COOL ROOFS

Cool roofs are roofing surfaces (often coatings, membranes, or tiles) that are more reflective to sunlight than conventional roofs, keeping the roof surface and the building area beneath it cooler. Buildings with cool roofs require less energy to cool, saving building owners and residents money on their electricity bills.

The tool has been developed by C40's inclusive climate action (ICA) team and Dalberg, and calculates benefits and data including:

- > **Net financial savings**

The **tool and learning material** are available online on the [Resource Center](#).

## >>>> BENEFITS OF BUS RAPID TRANSIT

Bus rapid transit (BRT) is a bus-based transit system that delivers fast and cost-effective services at metro-level capacities. BRT systems typically have faster average speeds than conventional bus systems through the provision of dedicated lanes, off-board fare collection, and faster and more frequent operations

The tool has been developed by C40's inclusive climate action (ICA) team and Dalberg, and calculates benefits and data including:

- > **Job creation**
- > **Time travel savings**

The **tool and learning material** are available online on the [Resource Center](#).

## >>>> BENEFITS OF CONGESTION PRICING

Congestion pricing involves charging drivers for operating vehicles on limited road space at congested times and locations. It promotes more balanced road usage by all transport modes (instead of prioritizing private vehicles) and helps to reduce travel times, improve air quality, and decrease greenhouse gas emissions

The tool has been developed by C40's inclusive climate action (ICA) team and Dalberg, and calculates benefits and data including:

- > **Time travel savings**

The **tool and learning material** are available online on the [Resource Center](#).

## >>>> METHODS TO BUILD INCLUSIVE CLIMATE ACTION

Cities are made up of dynamic and complex social, political, economic and natural systems. Pursuing inclusive climate action in cities is critical, but not always easy or straightforward. C40 Cities, in collaboration with our partners, has developed a set of comprehensive resources to support cities in their efforts to advance climate action through an inclusive engagement and planning process that results in more equitable outcomes for all.

Our research has demonstrated that to deliver inclusive climate action, cities must ensure that principles of equity and inclusion are embedded in processes, policies and impacts:

- **Processes** are rooted in genuine engagement with a broad and diverse set of stakeholders, particularly those suffering from inequality and the impacts of climate change;
- **Policies** are actively designed with people, fairness and justice at the centre of decision-making; and
- **Clear mechanisms** exist -or can be put in place- for measuring, monitoring and evaluating both the direct impacts and the distribution of impacts of climate actions across the population.

For more information, explore our [resources](#) on inclusive community engagement, inclusive planning and equitable impacts.

### Community engagement

Inclusive climate action starts with a process where everyone's voice is represented. Inclusive community engagement underpins the delivery of equitable climate policies and should help to ensure that impacts are fairly distributed across the city's population. C40 Cities encourages cities to engage a wide range of communities and stakeholders, with a particular focus on increasing involvement of populations adversely affected by climate change and suffering from inequality. For this reason, we have developed guidance, case studies, techniques and exercises on participatory processes in cities to support them in delivering and improving stakeholder and citizen engagement strategies while planning or delivering climate policies.

Read more: [here](#).

### Inclusive Planning

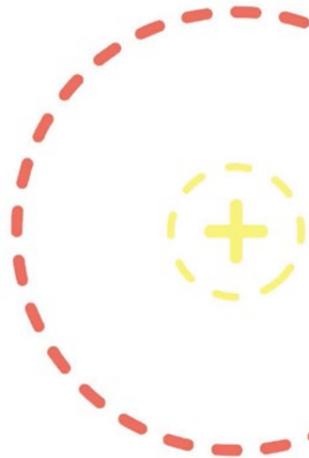
Inclusive climate action must be underpinned by fair and equitable policies. C40 Cities encourages cities to design and plan their climate actions in a way that avoids unintended inequities and increases access of programmes and services for the majority of the population. The Roadmap for Inclusive Planning provides overarching guidance for cities to assess equity throughout their climate action planning process. Cities will be able to use this roadmap to influence equitable, fair and accessible climate mitigation and adaptation policies and actions. Specifically, this includes: guidance on conducting a needs assessment of the city (the "city selfie"); guidance for analysing the equity and inclusivity considerations of several climate actions; policy recommendations; and finally, example indicators and targets for equitable outcomes.

Read more: [here](#).

### Equitable Impacts

Cities need to ensure that the climate transition has a positive impact on people's lives, from decent jobs to improved health. It is critical that cities can quantify and communicate these wider benefits of climate action, and that they design climate action that ensures the equitable distribution of these benefits to their residents. The Toolkit for Equitable Impacts builds on C40's existing research to provide city officials with a global approach for evaluating the non-GHG emissions impacts of climate action, based on the tools on benefits assessments.

Read more: [here](#).



## >>>> READ CITY STORIES

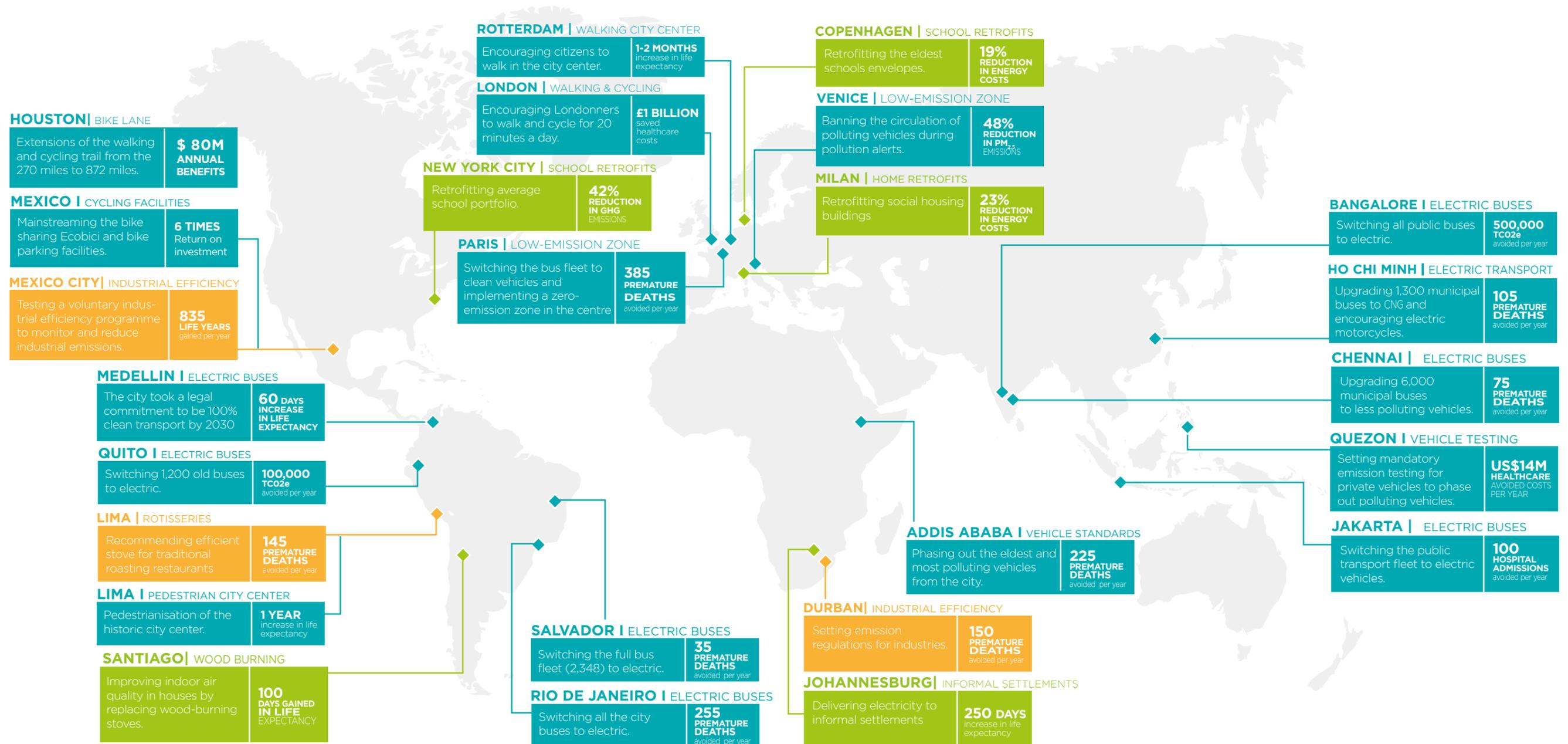
Over 40 cities have undertaken benefits analysis to study the impact of their climate actions. Discover their stories by clicking on their boxes.

SECTOR

■ TRANSPORT

■ BUILDINGS

■ INDUSTRY & ENERGY



## >>>> PRESS COVERAGE

### RECENT ARTICLES

#### **La bicicleta es un muy buen negocio y aquí le explicamos por qué, El Tiempo, July 2020, Colombia.**

Cycling can bring multiple benefits, boosting local shops, enhancing people's wellbeing and health and reducing premature deaths. This article summarises the findings of both Tfl Economic Benefits summary, as well as C40 Benefits work with Mexico City, to introduce Bogota new cycling lanes.

> <https://www.eltiempo.com/bogota/bicicleta-y-sus-beneficios-economicos-por-que-es-buena-inversion-para-las-ciudades-519696>

#### **Solutions to climate change and obesity can be found in our cities, Telegraph, January 14th 2020, UK.**

As citizens and activists rally to engage governments to fight the twin challenges of climate change and health, it's worth noting they share an important commonality: they can – and should – be tackled in cities. Decisions taken today about food, energy, green spaces and transport in our cities will be pivotal in determining the state of the climate and public health for future for generations.

> <https://www.telegraph.co.uk/global-health/climate-and-people/solutions-climate-change-obesity-could-found-cities/>

#### **A common language can unite energy saving efforts, Foresight, 11th October 2019, Denmark.**

City decision makers often need to argue the case for energy efficiency across multiple administrative and budgetary departments, but there is frequently a significant gap between the priorities of each department. Four major metropolises have tested a tool aimed at creating a common language among all department managers to enable much needed deep retrofits in public buildings and greater reductions in greenhouse gas emissions

> <https://foresightdk.com/a-common-language-can-unite-energy-saving-efforts/>

#### **Learning by example, Foresight, 13th September 2019, Denmark.**

The need to walk the talk is at the heart of the energy transition. Cities aiming to lead on carbon neutrality have the perfect opportunity to do just that by renovating their own building stock. Actions to reduce energy use in hospitals,

schools and offices owned by local government authorities mean fewer greenhouse gas emissions and are a good way for cities to showcase the benefits of the energy transition for people's wallet, health and comfort. The World Green Buildings 2018 report cites a "lack of public awareness" as one of the main barriers to energy efficient construction and retrofits worldwide. By renovating public buildings and shouting loudly to citizens about the gains, ignorance is a problem that can be overcome.

> <https://foresightdk.com/learning-by-example/>

#### **Plant trees in city parking spaces, The Times, London, 12th June 2019, UK.**

Millions of parking spaces should be removed and replaced with trees and cycle lanes to reduce air pollution and tackle climate change, according to a body advising mayors of the world's biggest cities.

> <https://www.thetimes.co.uk/article/plant-trees-in-city-parking-spaces-jctxvnsz8>

### PAST REFERENCES

#### **Mayor of Medellín Federico Gutiérrez calls for Latin American cities to embrace zero emission transport and lead the world on climate action, C40 Media, July 2019, Global.**

> [https://www.c40.org/press\\_releases/world-cities-summit-medellin](https://www.c40.org/press_releases/world-cities-summit-medellin)

#### **Mayor Crivella Commits to Make the Streets of Rio Free from Fossil Fuels by 2030, C40 Media, June 2019, Global.**

> [https://www.c40.org/press\\_releases/fossil-fuel-free-rio](https://www.c40.org/press_releases/fossil-fuel-free-rio)

#### **The Benefits Research Programme - Enabling action through research , Cities changing Diabetes, May 2019, Global.**

> <http://www.citieschangingdiabetes.com/content/Global/AFFILIATE/cities-changing-diabetes/english/actions/action-cases-places.html>

#### **CM launches public bicycle sharing system in Bengaluru,**

#### **Times of India, March 2019, India.**

> <https://timesofindia.indiatimes.com/city/bengaluru/cm-launches-public-bicycle-sharing-system-in-bengaluru/articleshow/68260585.cms>

#### **Major cities can fight climate change and make billions: researchers, Reuters, December 2018, UK.**

Syndicated in: Daily Star (Bangladesh); New Age Bangladesh; Reuters India; Irrawaddy (Myanmar); Eco-Business; Mail Online (UK); Oman Observer; Yeni Şafak (Turkey)

> <https://uk.reuters.com/article/cities-emissions-research/major-cities-can-fight-climate-change-and-make-billions-researchers-idUKL8N1YA1E4>

#### **Curbing Climate Change Would Reap Huge Health Benefits-UN, Asharq Al-Awsat, December 2018, Saudi Arabia.**

> <https://aawsat.com/english/home/article/1492386/curbing-climate-change-would-reap-huge-health-benefits-un>

#### **New research reveals cities can tackle climate concerns simultaneously, December 2018, Infrastructure News (SA).**

> <https://infrastructurenews.co.za/2018/12/04/new-research-reveals-cities-can-tackle-climate-concerns-simultaneously/>

#### **Cities, on front lines of climate change, can make outsized difference, Curbed, December 2018, USA.**

> <https://www.curbed.com/2018/12/4/18125677/cities-climate-change-urban-planning-pollution>

#### **Bolder climate action in cities could yield \$583bn economic boost, BusinessGreen, December 2018, UK.**

> <https://www.businessgreen.com/bg/news/3067488/bolder-climate-action-in-cities-could-lead-to-583bn-boost-research-finds>

#### **Cities can tackle GHG & air pollution simultaneously, GreenWatch, December 2018, Bangladesh.**

> <http://greenwatchbd.com/cities-can-tackle-ghg-air-pollution-simultaneously-study/>

#### **Bike Plan First Anniversary, Houston City, March 2018, USA.**

> <http://www.houstontx.gov/mayor/press/bike-plan-first-anniversary.html>

#### **Climate Action Adds 3 Weeks to Average Life Expectancy of Every Citizen of Paris and Could Prevent 45,000 Premature Deaths Globally Each Year, C40 Media, December 2017, Global.**

> [https://www.c40.org/press\\_releases/climate-action-green-healthy-streets-paris](https://www.c40.org/press_releases/climate-action-green-healthy-streets-paris)