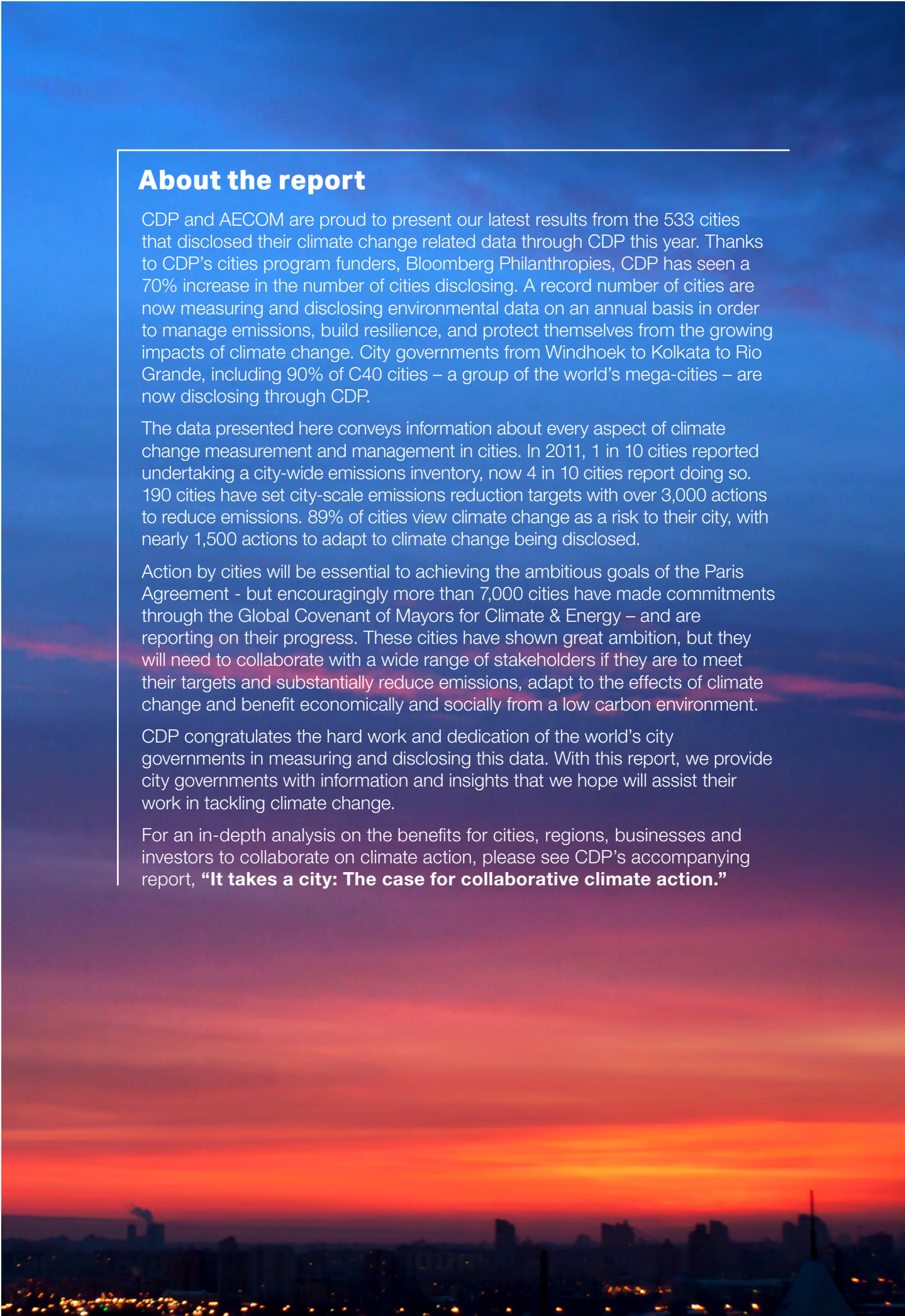


## **CDP Cities 2016**

Climate action from 533 global cities







# About the report

CDP and AECOM are proud to present our latest results from the 533 cities that disclosed their climate change related data through CDP this year. Thanks to CDP’s cities program funders, Bloomberg Philanthropies, CDP has seen a 70% increase in the number of cities disclosing. A record number of cities are now measuring and disclosing environmental data on an annual basis in order to manage emissions, build resilience, and protect themselves from the growing impacts of climate change. City governments from Windhoek to Kolkata to Rio Grande, including 90% of C40 cities – a group of the world’s mega-cities – are now disclosing through CDP.

The data presented here conveys information about every aspect of climate change measurement and management in cities. In 2011, 1 in 10 cities reported undertaking a city-wide emissions inventory, now 4 in 10 cities report doing so. 190 cities have set city-scale emissions reduction targets with over 3,000 actions to reduce emissions. 89% of cities view climate change as a risk to their city, with nearly 1,500 actions to adapt to climate change being disclosed.

Action by cities will be essential to achieving the ambitious goals of the Paris Agreement - but encouragingly more than 7,000 cities have made commitments through the Global Covenant of Mayors for Climate & Energy – and are reporting on their progress. These cities have shown great ambition, but they will need to collaborate with a wide range of stakeholders if they are to meet their targets and substantially reduce emissions, adapt to the effects of climate change and benefit economically and socially from a low carbon environment.

CDP congratulates the hard work and dedication of the world’s city governments in measuring and disclosing this data. With this report, we provide city governments with information and insights that we hope will assist their work in tackling climate change.

For an in-depth analysis on the benefits for cities, regions, businesses and investors to collaborate on climate action, please see CDP’s accompanying report, **“It takes a city: The case for collaborative climate action.”**

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# Global

## 533 disclosing cities in 89 countries

**Africa** › Burkina Faso › Bakata › Burundi › La mairie de Bujumbura › **Cameroon** › Bangangté › Foumban › Yaoundé 6 › **Cote d Ivoire** › Abidjan › Grand-Bassam › **Democratic Republic of Congo** › Kananga › Kinshasa › **Egypt** › Cairo › **Ethiopia** › Addis Ababa › **Ghana** › Accra › **Kenya** › Kisumu › Nairobi › Nakuru › **Madagascar** › Antananarivo › **Malawi** › Blantyre › Lilongwe › **Morocco** › Rabat › **Mozambique** › Cidade de Maputo › Nacala › **Namibia** › Windhoek › **Nigeria** › Abuja › Ibadan › Lagos › **Senegal** › Dioudoubou › Ziguinchor › **South Africa** › Cape Town › Durban › Ekurhuleni › Emfuleni › Johannesburg › Nelson Mandela Bay › Pietermaritzburg › Pretoria › Tshwane › Sekhukhune › Ugu › Vhembe › **Tunisia** › Commune Ain Drahem › **Uganda** › Jinja › **United Republic of Tanzania** › Arusha › Dar es Salaam › Morogoro › Mwanza › **Zambia** › Mazabuka › **Zimbabwe** › Harare **Asia and Oceania** › Australia › Adelaide › Byron Shire › Cairns › Canberra › Melbourne › Perth › Sydney › **China** › Guangzhou › Shenzhen › Wuhan › Hong Kong › **India** › Bangalore › Jaipur › Kolkata › **Indonesia** › Bogor › Jakarta › Yogyakarta › **Israel** › Tel Aviv-Yafo › **Japan** › Hiroshima › Nagoya › Okayama › Tokyo › Yokohama › **Jordan** › Amman › **Malaysia** › Iskandar › Kuala Lumpur › Petaling Jaya › **New Zealand** › Auckland › Kapiti Coast › Napier › Wellington › **Pakistan** › Karachi › **Philippines** › Angeles › Antipolo › Batangas › Makati › Quezon › **Singapore** › Singapore › **South Korea** › Ansan › Boseong › Changwon › Cheongsong › Daejeon › Damyang › Geoje › Geumsan › Goheung › Gokseong › Gunpo › Gurye › Gwangju › Gwangyang › Haenam › Hoengseong › Hongcheon › Hwacheon › Imsil › Incheon › Inje › Jangheung › Jangseong › Jecheon › Jeju › Jeongseon › Jeonju › Mokpo › Muan › Naju › Nonsan › Pyeongtaek › Samcheok › Sejong › Seocheon › Seogwipo › Seoul › Shinan › Sunchang › Suwon › Tongyeong › Ulsan › Wonju › Yeonggwang › **Taiwan** › Hsinchu › Kaohsiung › New Taipei › Pingtung › Tainan › Taipei City › Taoyuan › Yilan › **Thailand** › Bangkok › **UAE** › Dubai › **Vietnam** › Hanoi › Ho Chi Minh **Europe** › **Albania** › Tirana › **Bulgaria** › Sofia Municipality › Stara Zagora › **Croatia** › Zagreb › **Czech Republic** › Brno › **Denmark** › Aarhus Kommune › Allerød Minicipality › City of Årskøbing › Copenhagen › Egedal Municipality › Frederikshavn › Kommune › Gladsaxe Kommune › Hjørring › Hoeje-Taastrup Kommune › Hørsholm Kommune › Hvidovre › Jammerbugt Kommune › Middelfart Kommune › Odder Kommune › Skive Kommune › Sønderborg Kommune › **Estonia** › Johvi › **Finland** › Helsinki › Lahti › Turku › **France** › Amiens Métropole › Communauté urbaine du Grand Nancy › Nice Côte d’Azur › Paris › Villeurbanne › **Georgia** › Tbilisi › **Germany** › Berlin › Hamburg › Landeshauptstadt Magdeburg › Stadt Heidelberg › **Gibraltar** › Gibraltar › **Greece** › Athens › Thessaloniki › **Iceland** › Akureyri › Reykjavík › **Ireland** › Dublin › **Italy** › Bologna › Bolzano › Cagliari › Ferrara › Firenze › Genova › Lucca › Milano › Monza › Napoli › Olbia › Oristano › Padova › Piacenza › Ravenna › Reggio Emilia › Rimini › Roma › Torino › Udine › Venezia › **Kosovo** › Pristina › **Lithuania** › Šiauliai › Vilnius › **Monaco** › Monaco › **Montenegro** › Podgorica › **Netherlands** › Amsterdam › Groningen › Nijmegen › Rotterdam › The Hague › **Norway** › Bærum Kommune › Oslo › Tromsø › Trondheim › **Poland** › City of Wrocław › Gdańsk › Gdynia › Tarnów › Warsaw › **Portugal** › Águeda › Barreiro › Braga › Cascais › Fafe › Faro › Funchal › Lamego › Lisbon › Matosinhos › Moita › Ovar › Porto › Santarém › Torres Vedras › Vila Nova de Famalicão › Viseu › **Romania** › Alba-Iulia › Tulcea › **Russia** › Moscow › **Serbia** › Subotica › **Slovenia** › Ljubljana › **Spain** › Barcelona › Madrid › Murcia › Zaragoza › **Sweden** › Stockholm › Trelleborg › **Switzerland** › Basel-Stadt › Lausanne › Nyon › Stadt Zürich › **Turkey** › Bornova › Eskişehir › Istanbul › Kadiovacik › Seferihisar › **United Kingdom** › Birmingham › Bournemouth › Cambridge › Cardiff › Glasgow › Leicester › London › Manchester **Latin America** › **Argentina** › Buenos Aires › Córdoba › Mendoza › Río Grande › San Isidro › Santa Fé Ciudad › Vicente López › **Bolivia** › Gobierno Autónomo Municipal de Tarija › La Paz › **Brazil** › Aparecida › Aparecida de Goiânia › Aracaju › Assis › Barueri › Bauru › Belém › Belo Horizonte › Betim › Birigui › Blumenau › Brasília › Brotas › Cabreúva › Caieiras › Campinas › Campo Grande › Campos de Goytacazes › Canoas › Capivari › Catalão › Caxias do Sul › Cerquilha › Cosmópolis › Cotia › Cubatão › Cuiabá › Curitiba › Duque de Caxias › Estância Climática de São Bento do Sapucaí › Estância Hidromineral de Águas de São Pedro › Estância Turística de Guaratinguetá › Estância Turística de Itu › Estância Turística de Olímpia › Feira de Santana › Florianópolis › Fortaleza › Franco da Rocha › Goiânia › Guarulhos › Jaboatão dos Guararapes › Jahu › Jundiá › Limeira › Lorena › Macapá › Mairiporã › Manaus › Mauá › Montes Claros › Natal › Nova Odessa › Palmas › Piracicaba › Porto Alegre › Porto Feliz › Porto Velho › Recife › Rio Branco › Rio de Janeiro › Rio Verde › Salvador › Santos › São Bernardo do Campo › São Caetano › São Gonçalo › São João da Boa Vista › São José do Rio Preto › São Luís › São Paulo › Sertãozinho › Sorocaba › Tatuf › Tupã › Uberlândia › Vinhedo › Vitória › **Chile** › Colina › Copiapó › Independencia › La Pintada › La Serena › Peñalolén › Providencia › Región Metropolitana de Santiago › San Fernando › Santiago › Temuco › **Colombia** › Alcaldía de Pasto › Alcaldía de Pereira › Alcaldía de Tunja › Alcaldía Distrital de Santa Marta › Alcaldía Municipal de Armenia › Alcaldía de Sincelejo › Bogotá › Cartagena › Medellín › Santiago de Cali › **Costa Rica** › Belén › **Dominican Republic** › Santo Domingo de Guzmán › **Ecuador** › Quito › Santiago de Guayaquil › **Guatemala** › Guatemala › **Honduras** › Alcaldía de Tegucigalpa › **Mexico** › Cuernavaca › Guadalajara › León de los Aldamas › Luáñez › Mexicali › Mexico City › Monclova › Monterrey › Morelia › Municipio de Mérida › Naucalpan de Juárez › San José de Gracia › San Luis Potosí › Tampico › Torreón › Zaragoza › **Panama** › Alcaldía de Panamá › **Peru** › Arequipa › Lima › Miraflores › Punta Hermosa › **Uruguay** › Montevideo › **Venezuela** › Alcaldía Metropolitana de Caracas **North America** › **Canada** › Ajax, ON › Brandon, MB › Calgary › City of Winnipeg › Edmonton › Halifax › Hamilton › London, ON › Montreal › North Vancouver › Peterborough › Prince George, BC › Regional Municipality of Durham › Salaberry-de-Valleyfield › Saskatoon › Sudbury › Toronto › Vancouver › Victoria › Windsor › **USA** › Abington › Albany › Alton, IL › Ann Arbor › Arlington, VA › Asheville › Aspen and Pitkin County › Atlanta › Aurora, CO › Austin › Baltimore › Bellingham, WA › Benicia › Blacksburg › Boston › Boulder › Brisbane, CA › Brownsville › Buffalo › Burlington › Cambridge › Carmel, IN › Chapel Hill, NC › Charlotte › Charlottesville, VA › Chicago › Cincinnati › Cleveland › Columbia, SC › Columbus › Dallas › Davis, CA › Denver › Des Moines › Detroit › District of Columbia › Durham › Easton, PA › El Paso › Elgin, IL › Emeryville, CA › Eugene › Flagstaff › Fort Wayne Fort Worth › Greenbelt, MD › Hayward › Hermosa Beach, CA › Hollywood › Houston › Huntington Beach › Indianapolis › Iowa › Jackson, MS › Knoxville › Lake Forest, IL › Lakewood › Lancaster › Lancaster, PA › Las Vegas › Long Beach › Los Altos Hills › Los Angeles › Louisville, KY › Medford › Miami › Milwaukee › Minneapolis › Nashville and Davidson › New Bedford, MA › New Orleans › New York City › Northampton, MA › Oakland › Oklahoma › Orlando › Palo Alto › Park City, UT › Philadelphia › Phoenix › Piedmont, CA › Pittsburgh › Portland, ME › Portland, OR › Providence › Raleigh › Reno › Richmond, CA › Richmond, VA › Roanoke › Rochester › Sacramento › Salt Lake City › San Antonio › San Diego › San Francisco › San José › Santa Monica › Savannah › Seattle › Somerville, MA › St Louis › Takoma Park, MD › Tucson › University City, MO › Vail, CO › West Hollywood › Westport, CT › Winston-Salem › Wisconsin Rapids › Yonkers

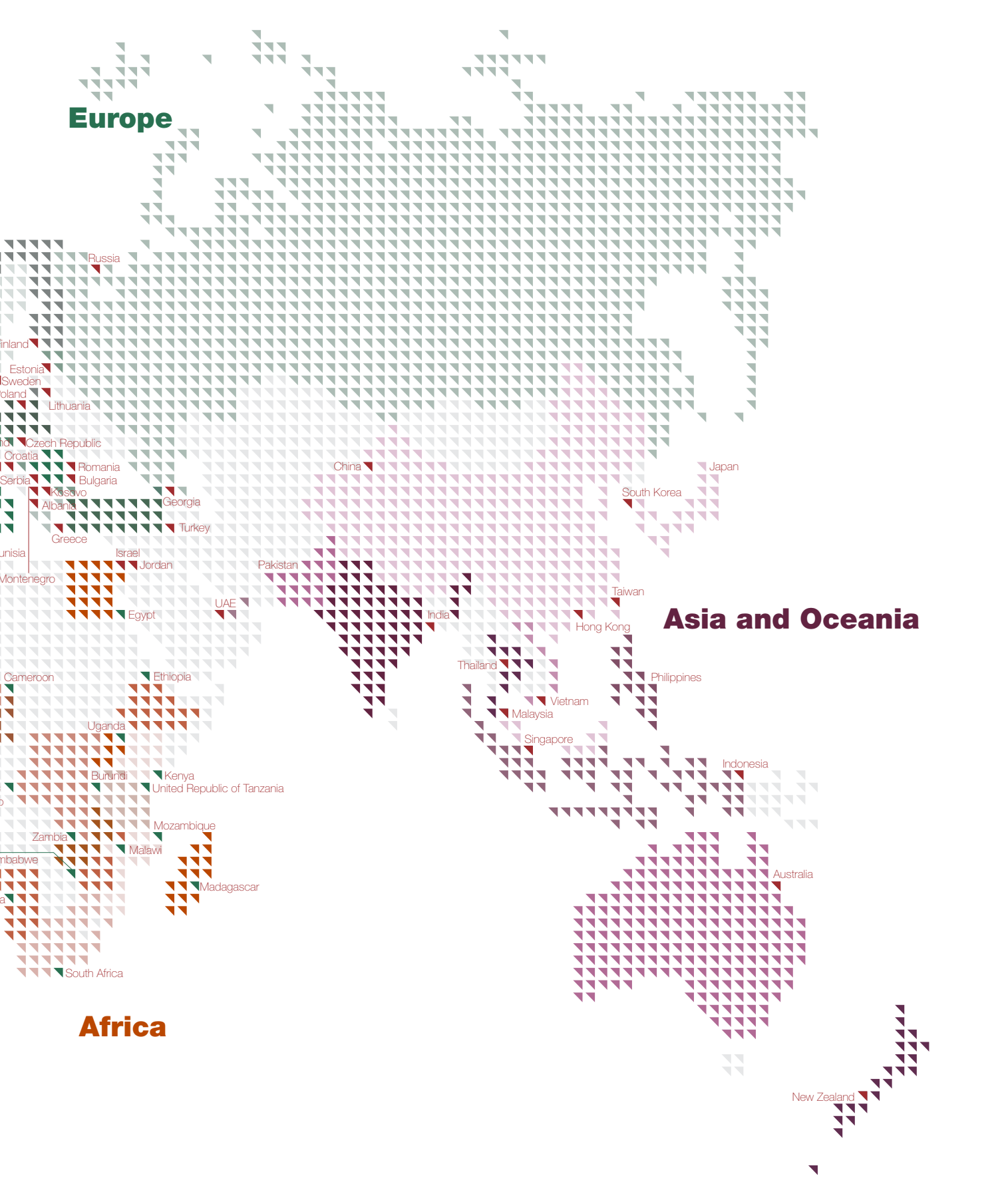
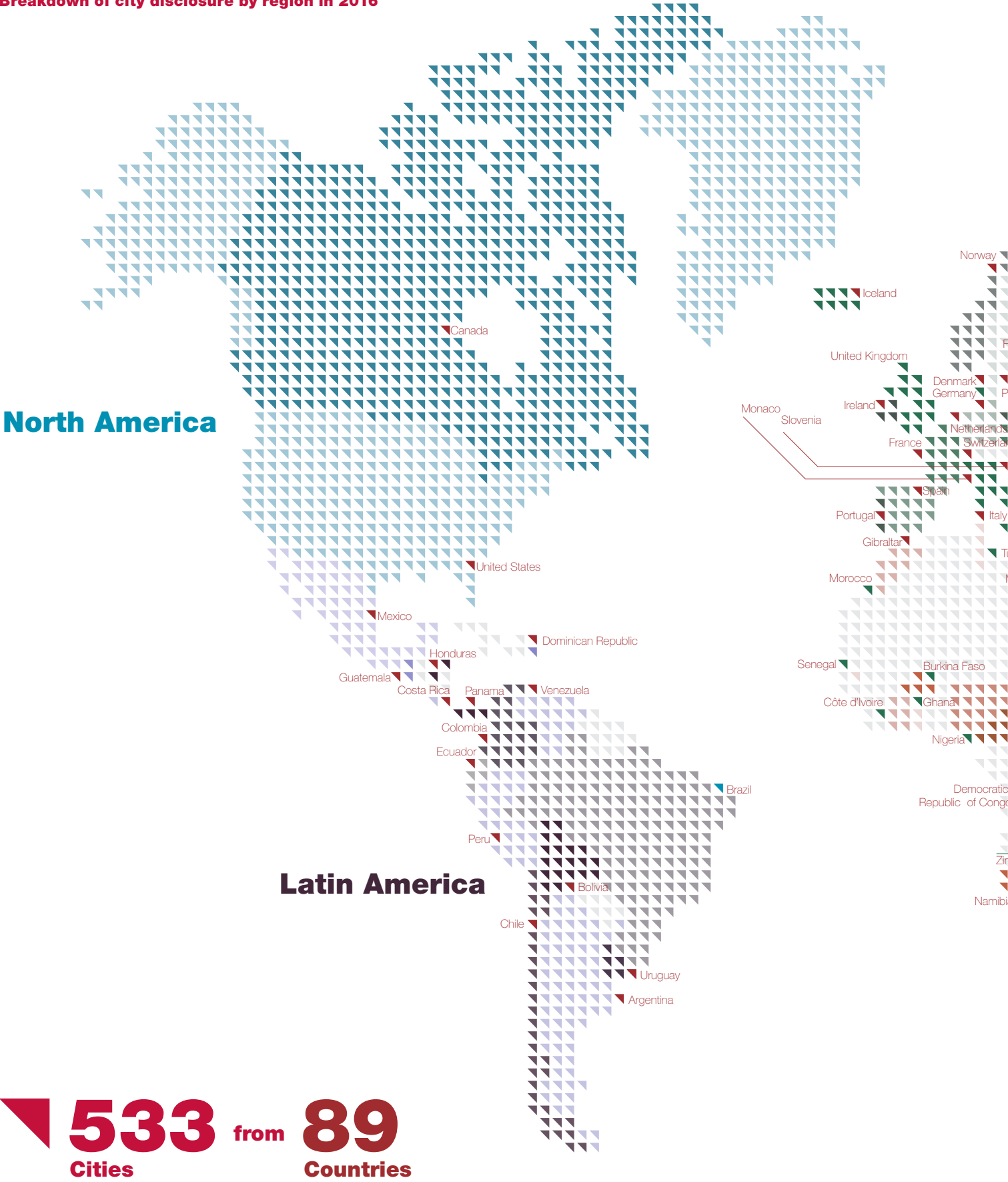
Please note that not all cities choose to disclose their information publicly. Please visit [www.cdp.net/en/cities](http://www.cdp.net/en/cities) for more information.



# Cities



Breakdown of city disclosure by region in 2016







Mitigation

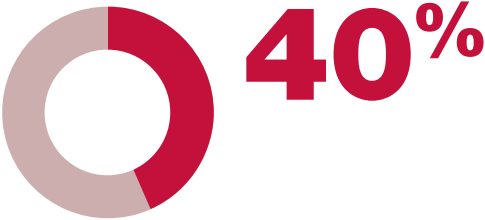
190

Number of cities with a city-wide emissions reduction target

246

Number of CDP cities committed to the Compact of Mayors, which in June 2016, merged into the Global Covenant of Mayors for Climate & Energy.

Percentage of cities with a city-wide emissions inventory



Percentage of cities with a climate action plan



Percentage of cities incorporating sustainability goals into the master planning for the city



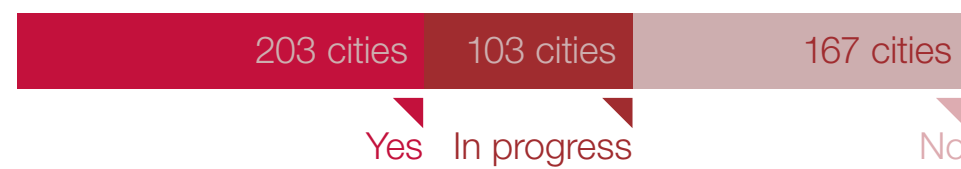
Top 5 emissions reduction activities		Anticipated emissions reduction (metric tonnes CO <sub>2</sub> e)
Number of cities		
298	Energy efficiency/ retrofit measures	13,775,821
221	Infrastructure for non motorized transport	10,006,843
159	Low or zero carbon energy supply generation	10,004,901
184	Waste prevention policies and programs	6,427,637
143	Improve fuel economy and reduce CO <sub>2</sub> from non motorized vehicles	5,644,729

## Climate hazards

Percentage of cities that view climate change as a significant risk to their city



Number of cities that have completed a climate change risk or vulnerability assessment



**2,022**  
Total number of climate hazards across 533 cities

Top climate hazards disclosed by cities

Extreme temperature

**319** cities



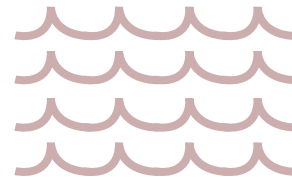
Water scarcity

**199** cities



Storm/Precipitation

**305** cities



Insects and micro-organisms

**119** cities

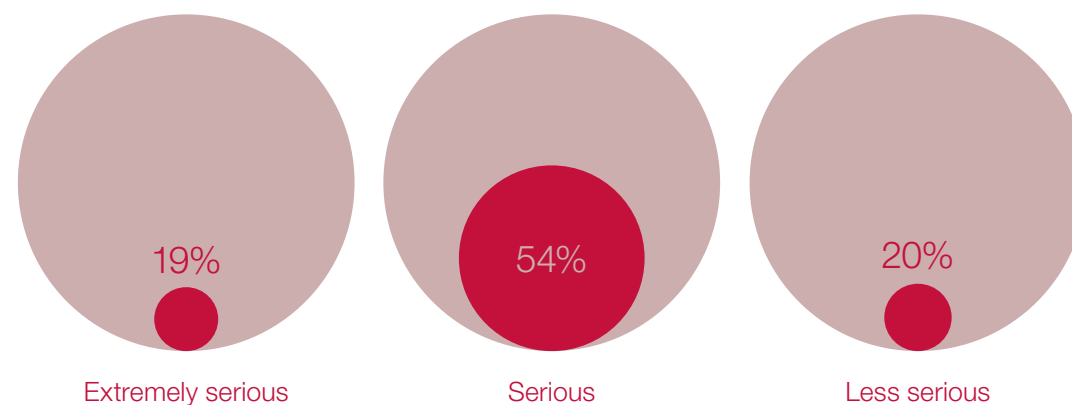


Flood

**258** cities



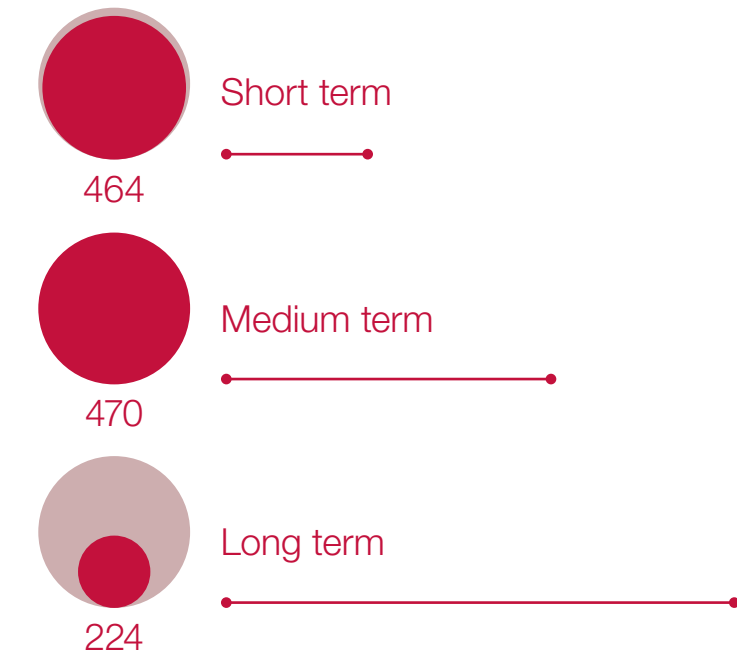
Magnitude of climate hazards



## Climate hazards cont'd

**705**  
Number of currently occurring climate hazards disclosed by cities

Number of climate hazards disclosed by cities by timescale



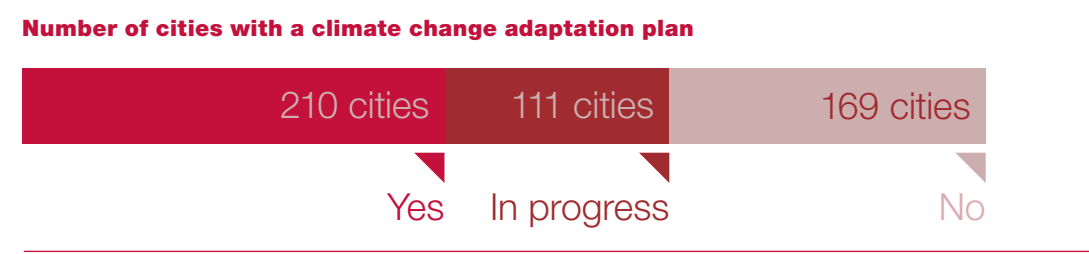
Number of social risks disclosed by cities

		Number of cities
Increased risk to already vulnerable populations		234
Increased demand for public services (including health)		198
Increased incidence and prevalence of disease		173
Increased resource demand		114
Fluctuating socio-economic conditions		111



## Adaptation

**1,445**  
Total number of adaptation  
actions disclosed

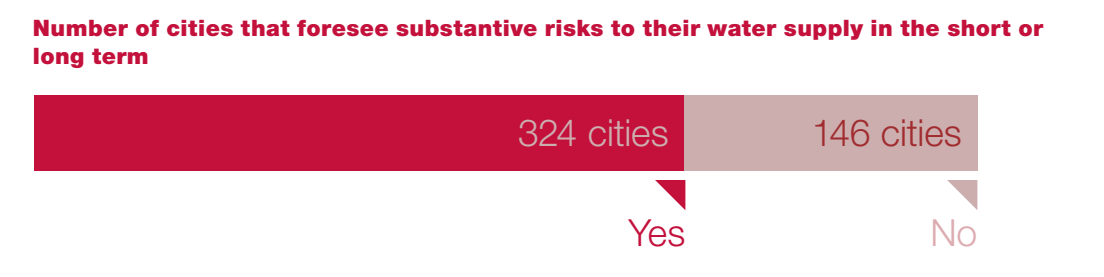







Top 5 adaptation actions taken for the top climate hazards		
		Number of cities
	Community engagement/education	147
	Crisis management including warning and evacuation systems	129
	Flood mapping	123
	Tree planting and/or creation of green space	101
	Projects and policies targeted at those most vulnerable	86








## Water

**686**  
Total number of water  
supply risks disclosed



Top 5 water supply risks disclosed		
		Number of cities
	Increased water stress or scarcity	248
	Declining water quality	137
	Flooding	114
	Inadequate or aging infrastructure	97
	Higher water prices	54

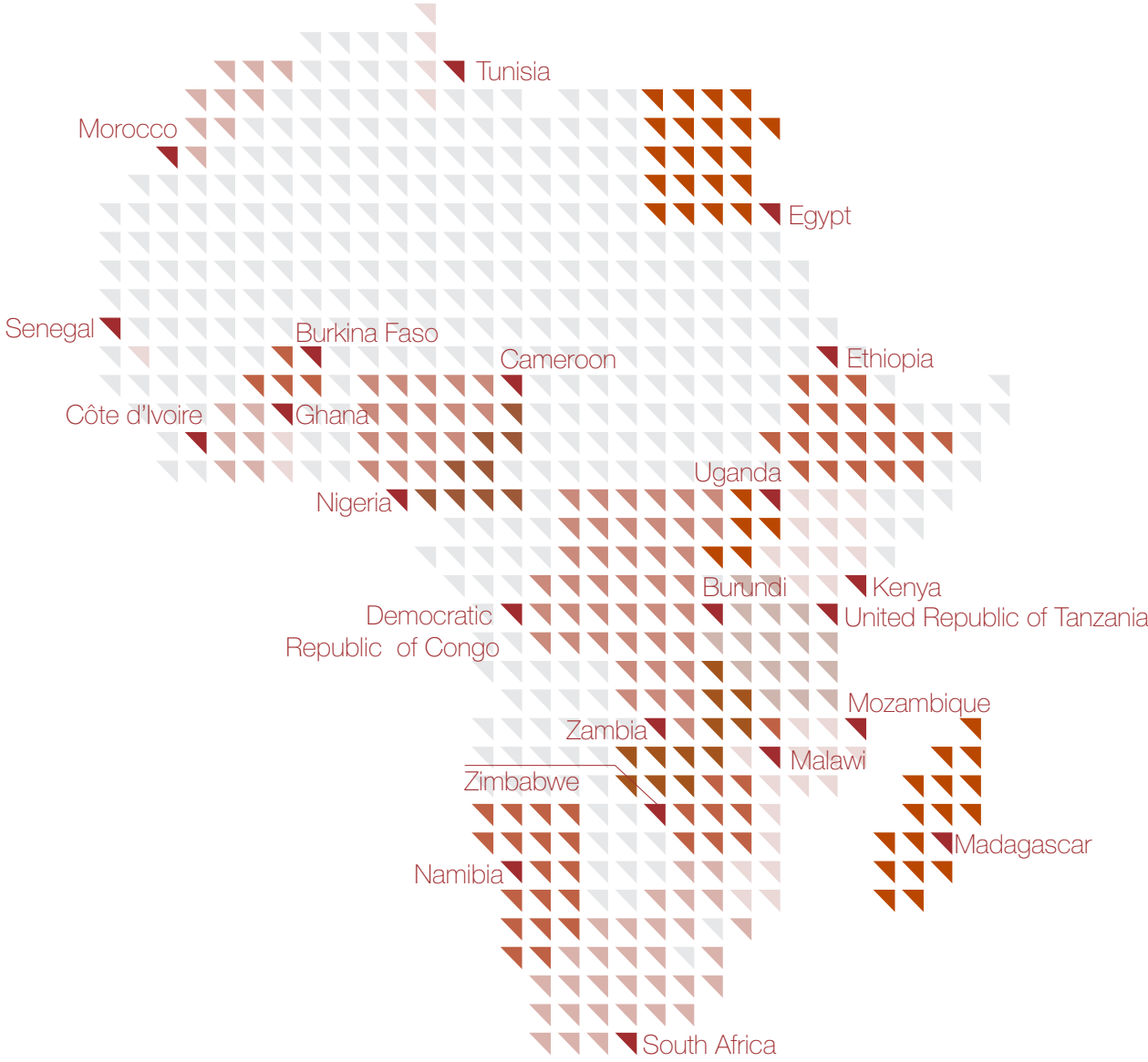
**681**  
Total number of water  
adaptation actions disclosed

Top 5 water adaptation actions disclosed		
		Number of cities
	Conservation awareness and education	138
	Investment in existing water supply infrastructure	128
	Stormwater management (natural or man-made infrastructure)	80
	Watershed preservation	47
	Diversifying water supply (including new sources)	41





# Africa



46 from 22  
Cities Countries

**Africa** › Burkina Faso › Bakata › Burundi › La mairie de Bujumbura › Cameroon › Bangangté › Foumban › Yaoundé 6 › Cote d Ivoire › Abidjan › Grand-Bassam › Democratic Republic of Congo › Kananga › Kinshasa › Egypt › Cairo › Ethiopia › Addis Ababa › Ghana › Accra › Kenya › Kisumu › Nairobi › Nakuru › Madagascar › Antananarivo › Malawi › Blantyre › Lilongwe › Morocco › Rabat › Mozambique › Cidade de Maputo › Nacala › Namibia › Windhoek › Nigeria › Abuja › Ibadan › Lagos › Senegal › Dioudoubou › Ziguinchor › South Africa › Cape Town › Durban › Ekurhuleni › Emfuleni › Johannesburg › Nelson Mandela Bay › Pietermaritzburg › Pretoria › Tshwane › Sekhukhune › Ugu › Vhembe › Tunisia › Commune Ain Drahem › Uganda › Jinja › United Republic of Tanzania › Arusha › Dar es Salaam › Morogoro › Mwanza › Zambia › Mazabuka › Zimbabwe › Harare



## Mitigation

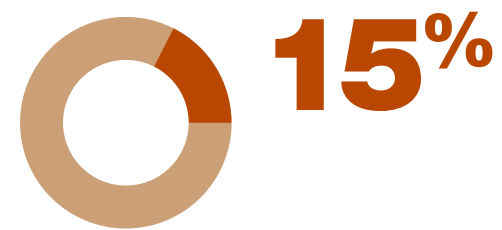
3

Number of cities with a city-wide emissions reduction target

Total community-scale emissions reported by cities in Africa

118,328,891 metric tonnes of CO<sub>2</sub>e

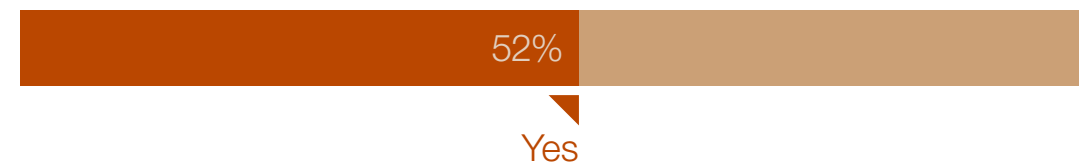
Percentage of cities with a city-wide emissions inventory in Africa






Percentage of cities with a climate action plan



Percentage of cities incorporating sustainability goals into the master planning for the city



Top 3 city-wide emissions reduction activities

	Number of cities
 Green space and/or biodiversity preservation and expansion	7
 Improve bus infrastructure, services, and operations	6
 Recycling or composting collections and/or facilities	4

## Climate hazards

Percentage of cities that view climate change as a significant risk to their city



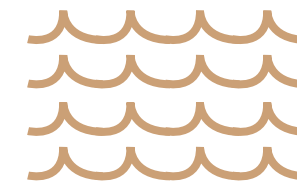
Number of cities that have completed a climate change risk or vulnerability assessment



Top 3 climate hazards as disclosed by cities

Flood

27 cities



Insects and micro-organisms

17 cities



Extreme temperature

17 cities



169

Total number of climate hazards across 46 cities



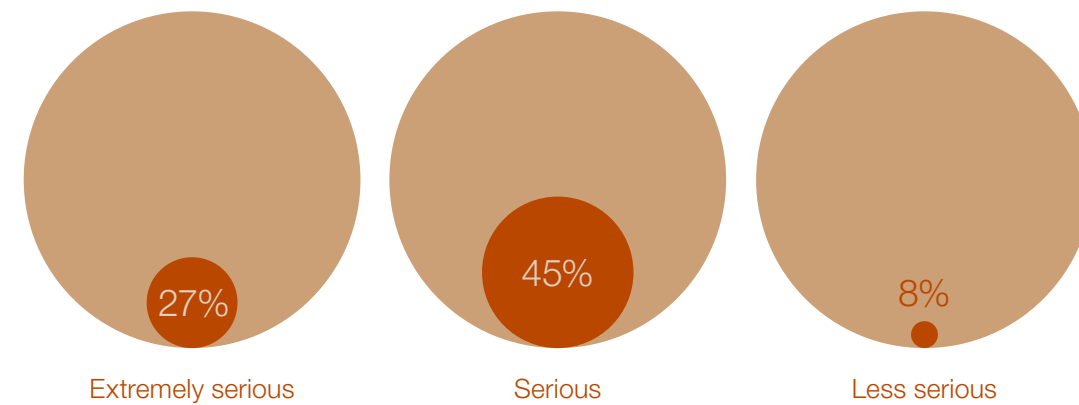
Lagos | Nigeria

Lagos with a population of 21 million people has a vast coastline but a relatively small land area. This makes it one of the most vulnerable cities in the world to the impact of climate change.



## Climate hazards cont'd

### Magnitude of climate hazards



### Top 3 assets or services impacted by the effects of climate change

Health and community



Food and agriculture



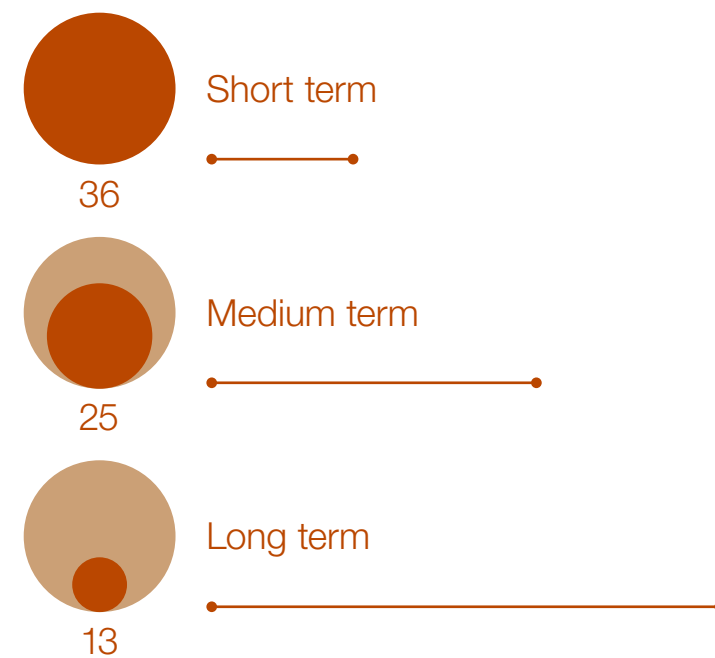
Residential



# 74

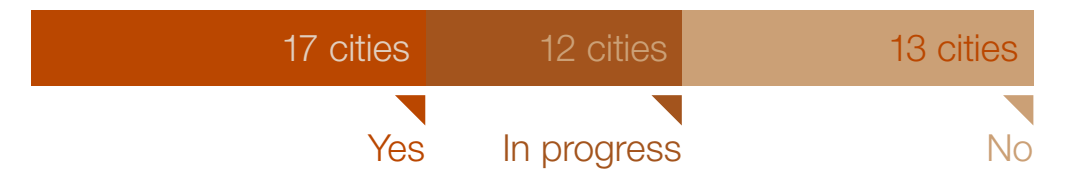
Number of currently occurring climate hazards disclosed by cities

### Number of climate hazards disclosed by cities, by timescale



## Adaptation

### Number of cities with a climate change adaptation plan



### Top adaptation actions taken for the top climate hazards

Flood	<ul style="list-style-type: none"> <li>Flood mapping</li> <li>Restrict development in at risk areas</li> </ul>
Insects and micro-organisms	<ul style="list-style-type: none"> <li>Disease prevention measures</li> <li>Improve water supply distribution method</li> </ul>
Extreme temperature - hot	<ul style="list-style-type: none"> <li>Heat mapping and thermal imaging</li> <li>Community engagement/education</li> </ul>
Water scarcity	<ul style="list-style-type: none"> <li>Water use restrictions and standards</li> <li>Tree planting and/or creation of green space</li> </ul>



### Pietermaritzburg | South Africa

Pietermaritzburg is currently experiencing a devastating drought with impacts being severely felt in the agricultural sector. The drought has reportedly affected almost 10,000 provincial farmers and stock losses were mounting with more than 30,000 cattle having been lost.



# Water

Number of cities that foresee substantive risks to their water supply in the short or long term



## Top 3 water risks disclosed by cities

		Number of cities
	Increased water stress or scarcity	22
	Inadequate or aging infrastructure	14
	Declining water quality	9

## Top 3 water adaptation actions disclosed by cities

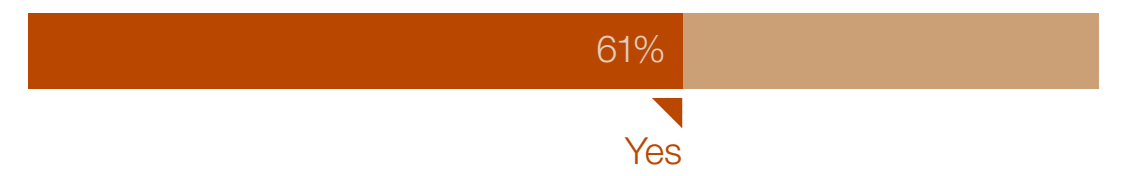
		Number of cities
	Investment in existing water supply infrastructure	18
	Conservation awareness and education	10
	Stormwater management (natural or man-made infrastructure)	7

# Economic opportunities

Percentage of cities reporting that climate change could threaten the ability of businesses to operate successfully in their city



## Percentage of cities that see an economic opportunity from climate change



## Foumban | Cameroon

In partnership with a local women's association, Foumban has financed a project to roll-out improved cooking stoves. These stoves are sold at a reasonable price and do not require as much firewood to function as normal cooking stoves. As many families use firewood to cook and as a source of energy, forests are in danger of over and un-managed exploitation.





# Asia and Oceania



**Asia and Oceania** › Australia › Adelaide › Byron Shire › Cairns › Canberra › Melbourne › Perth › Sydney › China › Guangzhou › Shenzhen › Wuhan › Hong Kong › Hong Kong › India › Bangalore › Jaipur › Kolkata › Indonesia › Bogor › Jakarta › Yogyakarta › Israel › Tel Aviv-Yafo › Japan › Hiroshima › Nagoya › Okayama › Tokyo › Yokohama › Jordan › Amman › Malaysia › Iskandar › Kuala Lumpur › Petaling Jaya › New Zealand › Auckland › Kapiti Coast › Napier › Wellington › Pakistan › Karachi › Philippines › Angeles › Antipolo › Batangas › Makati › Quezon › Singapore › Singapore › South Korea › Ansan › Boseong › Changwon › Cheongsong › Daejeon › Damyang › Geoje › Geumsan › Goheung › Gokseong › Gunpo › Gurye › Gwangju › Gwangyang › Haenam › Hoengseong › Hongcheon › Hwacheon › Imsil › Incheon › Inje › Jangheung › Jangseong › Jecheon › Jeju › Jeongseon › Jeonju › Mokpo › Muan › Naju › Nonsan › Pyeongtaek › Samcheok › Sejong › Seochon › Seogwipo › Seoul › Shinan › Sunchang › Suwon › Tongyeong › Ulsan › Wonju › Yeonggwang › Taiwan › Hsinchu › Kaohsiung › New Taipei › Pingtung › Tainan › Taipei City › Taoyuan › Yilan › Thailand › Bangkok › UAE › Dubai › Vietnam › Hanoi › Ho Chi Minh



## Mitigation

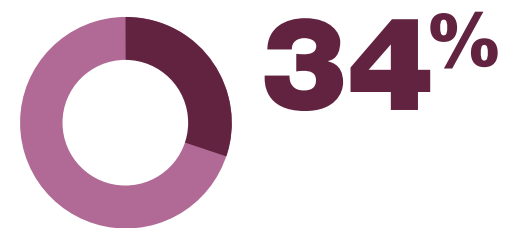
31

Number of cities with a city-wide emissions reduction target

Total community-scale emissions reported by cities in Asia and Oceania

591,499,151 metric tonnes of CO<sub>2</sub>e

Percentage of cities with a city-wide emissions inventory



Percentage of cities with a climate action plan



Percentage of cities incorporating sustainability goals into the master planning for the city



Top 3 emissions reduction activities

Number of cities		Anticipated emissions reduction (metric tonnes CO <sub>2</sub> e)
10	Low or zero carbon energy supply generation	4,273,000
6	Waste prevention policies and programs	3,615,500
14	Energy efficiency/retrofit measures	2,493,685

## Climate hazards

Percentage of cities that view climate change as a significant risk to their city



Number of cities that have completed a climate change risk or vulnerability assessment



Top 3 climate hazards as reported by cities

Extreme temperature

66 cities



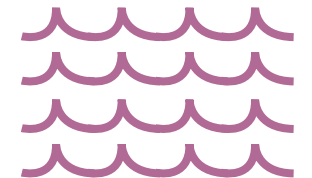
Storm/Precipitation

44 cities



Flood

53 cities



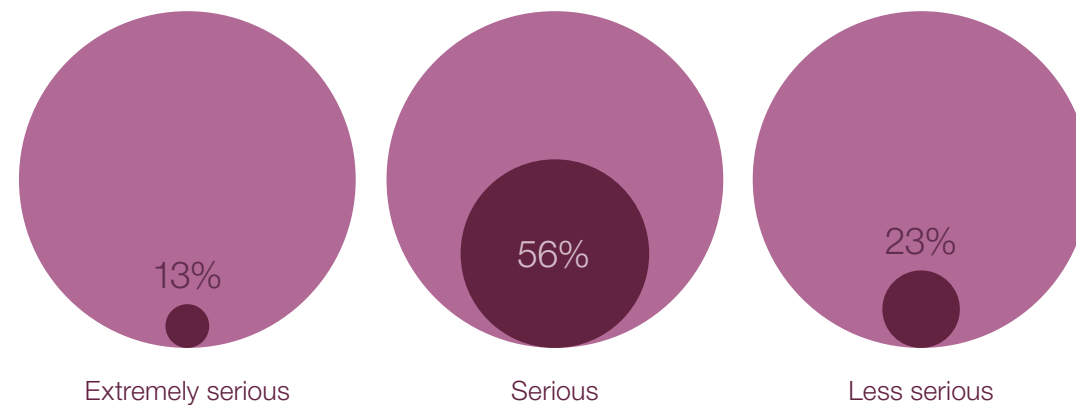
Hong Kong | China

Hong Kong aims to eliminate 40% of food waste disposal at landfills by 2022. They are planning to develop Organic Waste Treatment Facilities (OWTF) in phases to recycle food waste into compost and bio gas as renewable energy.



## Climate hazards cont'd

### Magnitude of climate hazard



### Top 3 assets or services impacted by the effects of climate change

Health and community



Food and agriculture



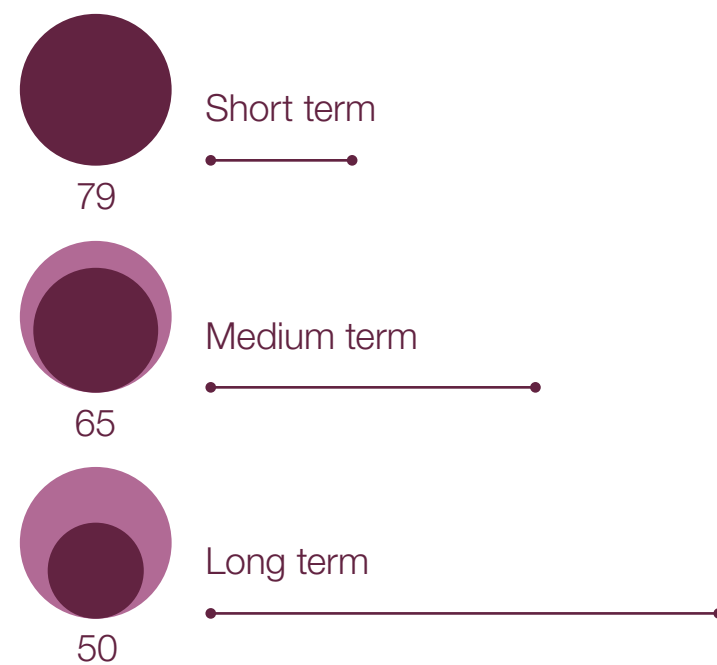
Residential



# 123

Number of currently occurring climate hazards disclosed by cities

### Number of climate risks disclosed by cities by timescale



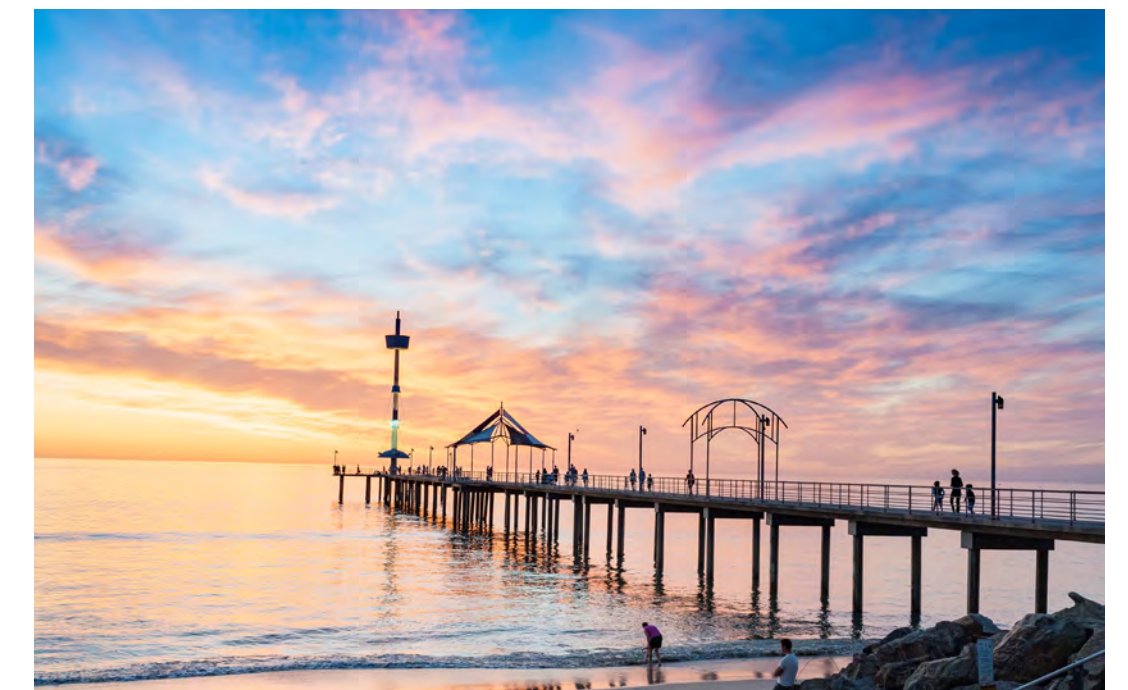
## Adaptation

### Number of cities with a climate change adaptation plan



### Top adaptation actions taken for the top climate hazards

Extreme temperature - hot	Tree planting and/or creation of green space
	Community engagement/education
Flood	Flood mapping
	Flood defences – development and operation & storage
Precipitation	Crisis management including warning and evacuation systems
	Storm water capture systems
Water scarcity	Diversification of water supply
	Storm water capture systems

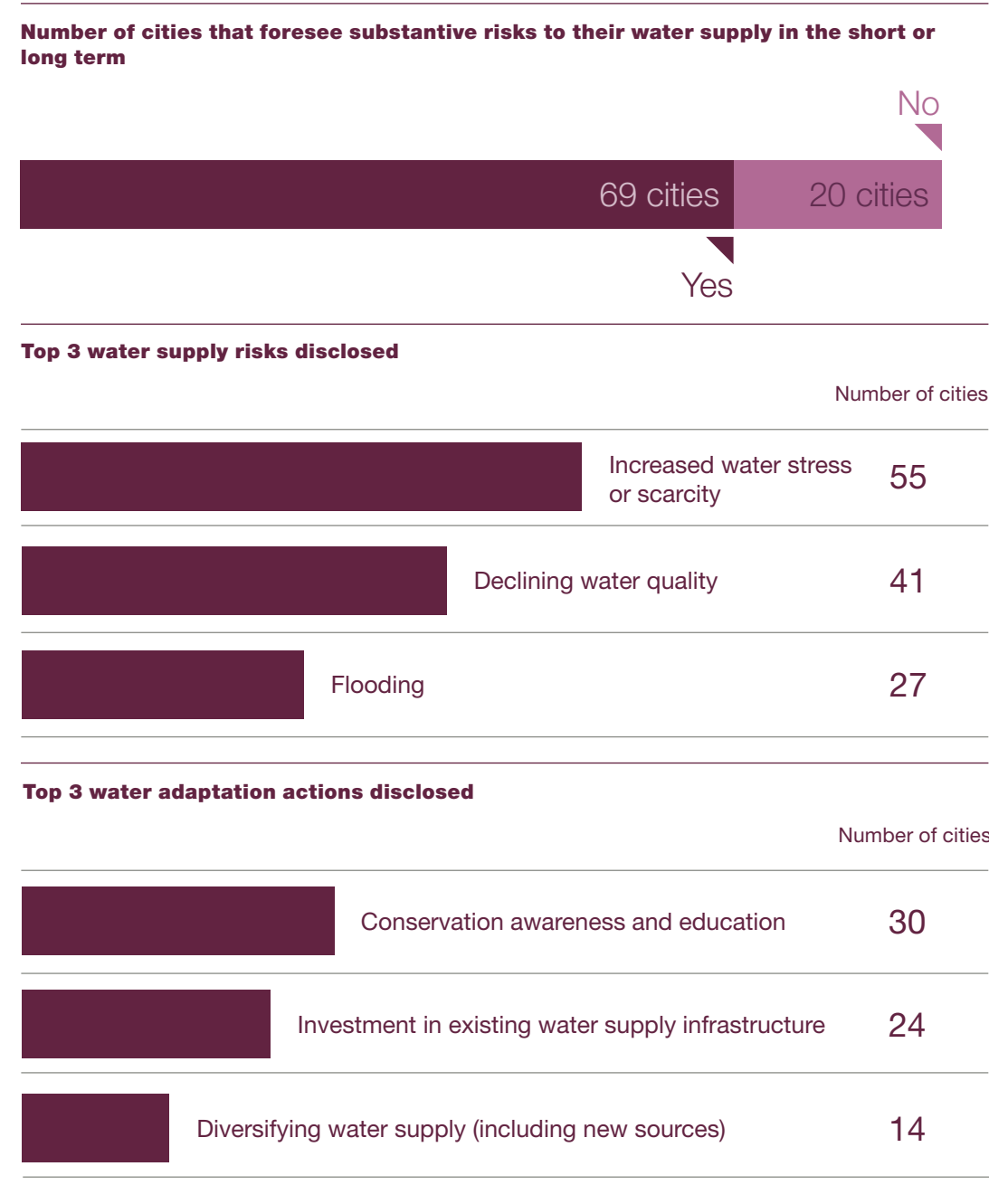


### Adelaide | Australia

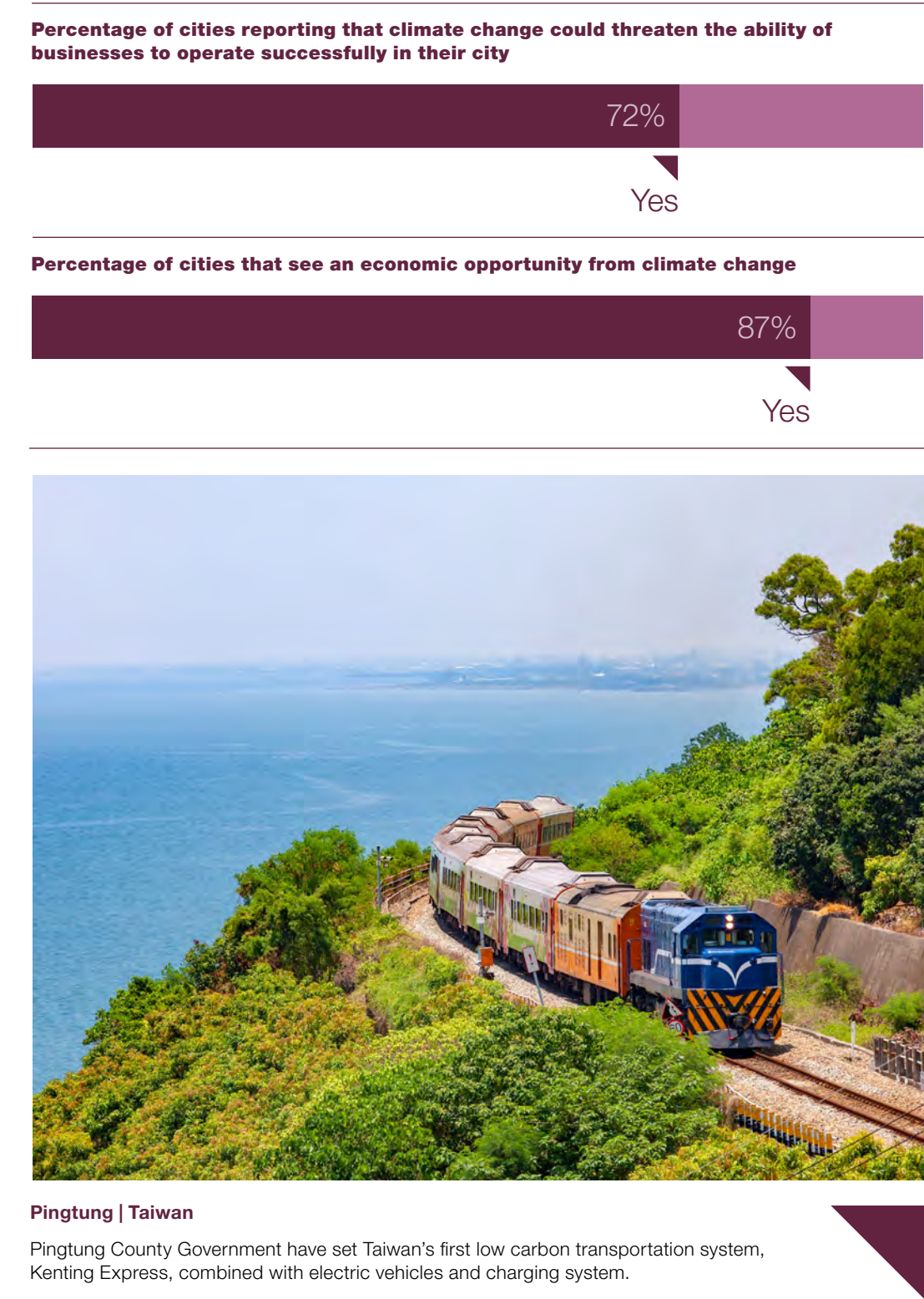
Adelaide and South Australia have formally endorsed their shared aspiration for Adelaide to be the world's first carbon neutral city through the formation of the Carbon Neutral Adelaide Partnership.



# Water



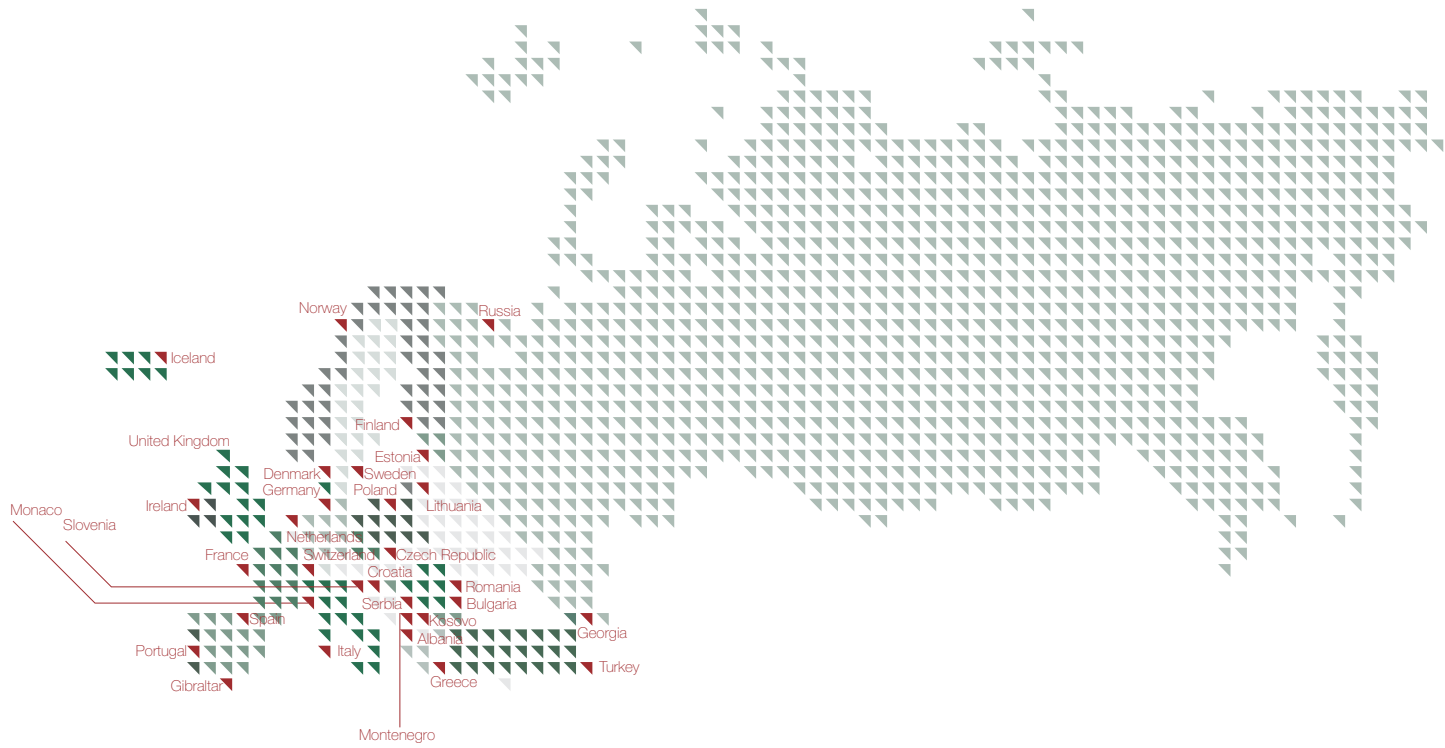
# Economic opportunities







# Europe



**126** from **32**  
Cities Countries

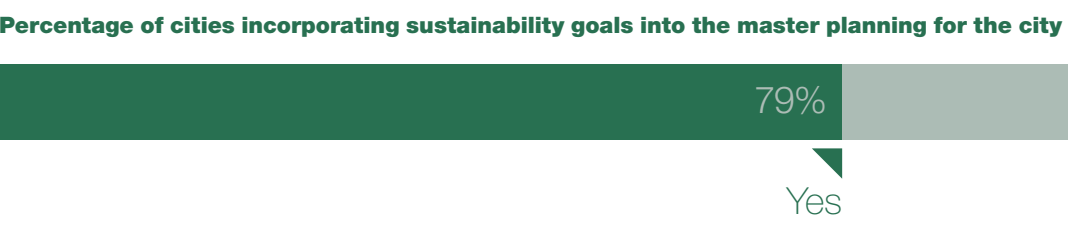
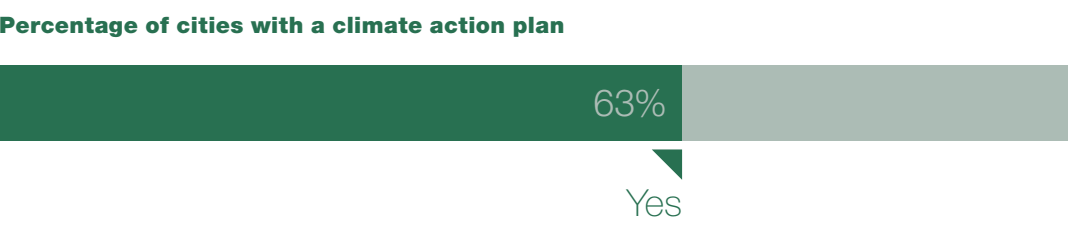
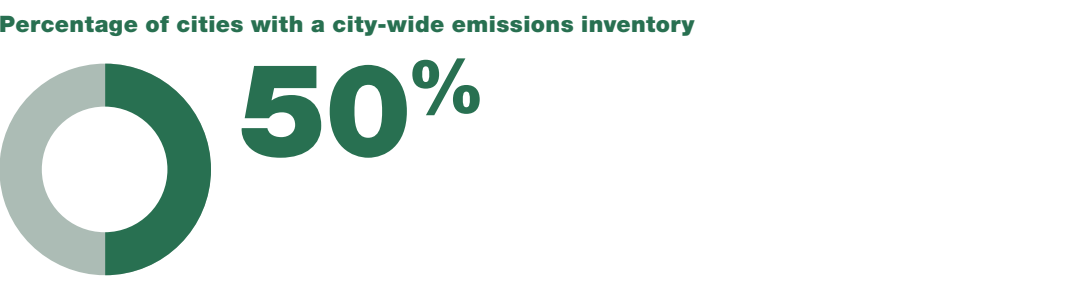
**Europe** › **Albania** › Tirana › **Bulgaria** › Sofia Municipality › Stara Zagora › **Croatia** › Zagreb › **Czech Republic** › Brno › **Denmark** › Aarhus Kommune › Allerød Municipality › City of Århus › Copenhagen › Egedal Municipality › Frederikshavn › Kommune › Gladsaxe Kommune › Hjørring › Høje-Taastrup Kommune › Hørsholm Kommune › Hvidovre › Jammerbugt Kommune › Middelfart Kommune › Odder Kommune › Skive Kommune › Sønderborg Kommune › **Estonia** › Johvi › **Finland** › Helsinki › Lahti › Turku › **France** › Amiens Métropole › Communauté urbaine du Grand Nancy › Nice Côte d'Azur › Paris › Villeurbanne › **Georgia** › Tbilisi › **Germany** › Berlin › Hamburg › Landeshauptstadt Magdeburg › Stadt Heidelberg › **Gibraltar** › Gibraltar › **Greece** › Athens › Thessaloniki › **Iceland** › Akureyri › Reykjavik › **Ireland** › Dublin › **Italy** › Bologna › Bolzano › Cagliari › Ferrara › Firenze › Genova › Lucca › Milano › Monza › Napoli › Olbia › Oristano › Padova › Piacenza › Ravenna › Reggio Emilia › Rimini › Roma › Torino › Udine › Venezia › **Kosovo** › Pristina › **Lithuania** › Šiauliai › Vilnius › **Monaco** › Monaco › **Montenegro** › Podgorica › **Netherlands** › Amsterdam › Groningen › Nijmegen › Rotterdam › The Hague › **Norway** › Bærum Kommune › Oslo › Tromsø › Trondheim › **Poland** › City of Wrocław › Gdańsk › Gdynia › Tarnów › Warsaw › **Portugal** › Águeda › Barreiro › Braga › Cascais › Fafe › Faro › Funchal › Lamego › Lisbon › Matosinhos › Moita › Ovar › Porto › Santarém › Torres Vedras › Vila Nova de Famalicão › Viseu › **Romania** › Alba-Iulia › Tulcea › **Russia** › Moscow › **Serbia** › Subotica › **Slovenia** › Ljubljana › **Spain** › Barcelona › Madrid › Murcia › Zaragoza › **Sweden** › Stockholm › Trelleborg › **Switzerland** › Basel-Stadt › Lausanne › Nyon › Stadt Zürich › **Turkey** › Bornova › Eskişehir › Istanbul › Kızılcaköy › Seferihisar › **United Kingdom** › Birmingham › Bournemouth › Cambridge › Cardiff › Glasgow › Leicester › London › Manchester



Mitigation

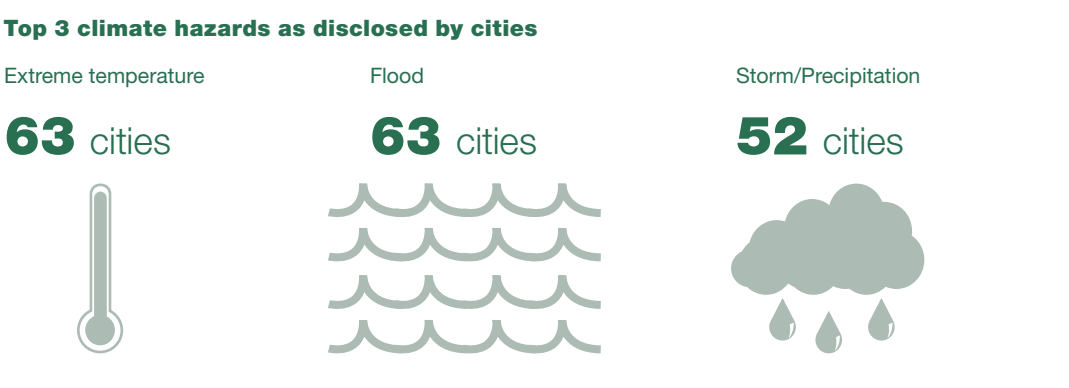
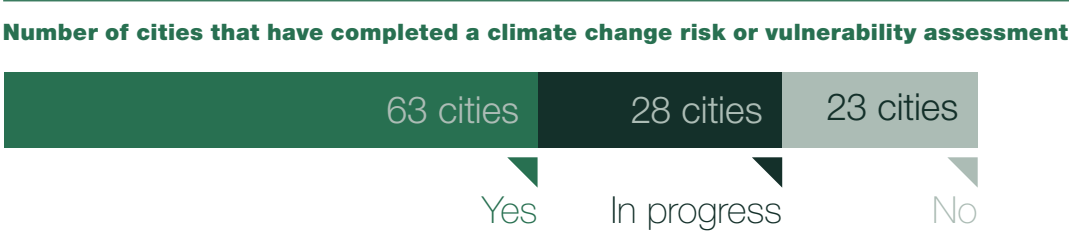
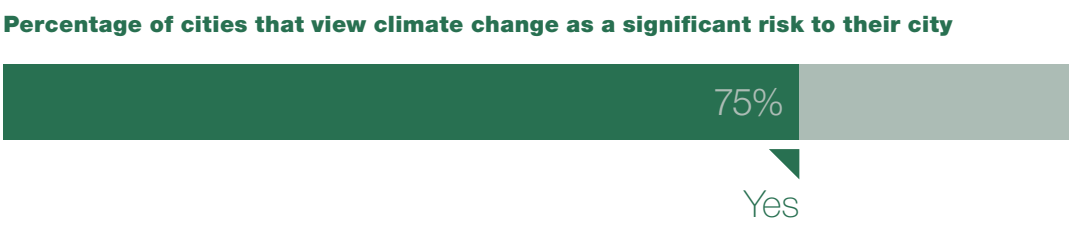
73  
Number of cities with a city-wide emissions reduction target

Total community-scale emissions reported by cities in Europe  
217,633,573 metric tonnes of CO<sub>2</sub>e



Top 3 emissions reduction activities		
Number of cities		Anticipated emissions reduction (metric tonnes CO <sub>2</sub> e)
23	On-site renewable energy generation	3,633,017
28	Infrastructure for non motorized transport	2,458,373
29	Low or zero carbon energy supply generation	1,968,649

Climate hazards



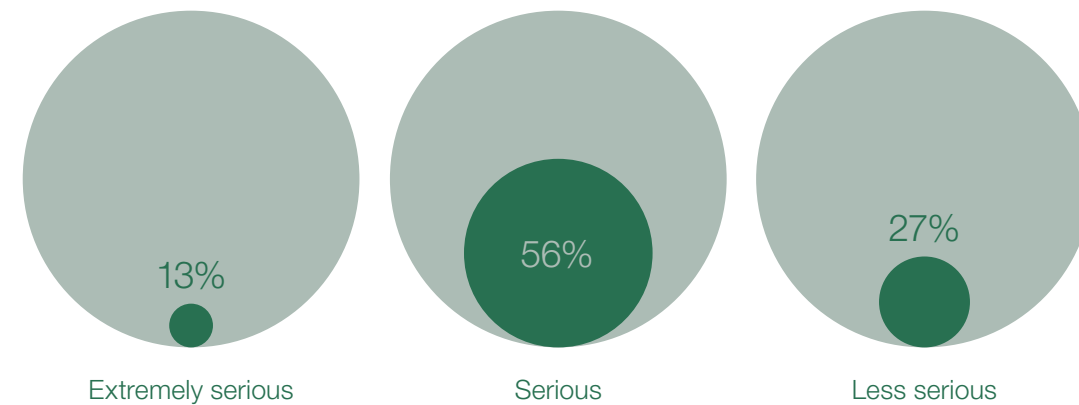
**Bologna | Italy**

Bologna's transportation hub is vulnerable to a severe weather even as there is no alternative supply chain plans in place. If severe weather events occur, disruptions to the city's supply chain will incur costs and losses in revenue to private businesses.



## Climate hazards cont'd

### Magnitude of climate hazard



### Assets or services impacted by the effects of climate change

Health and community



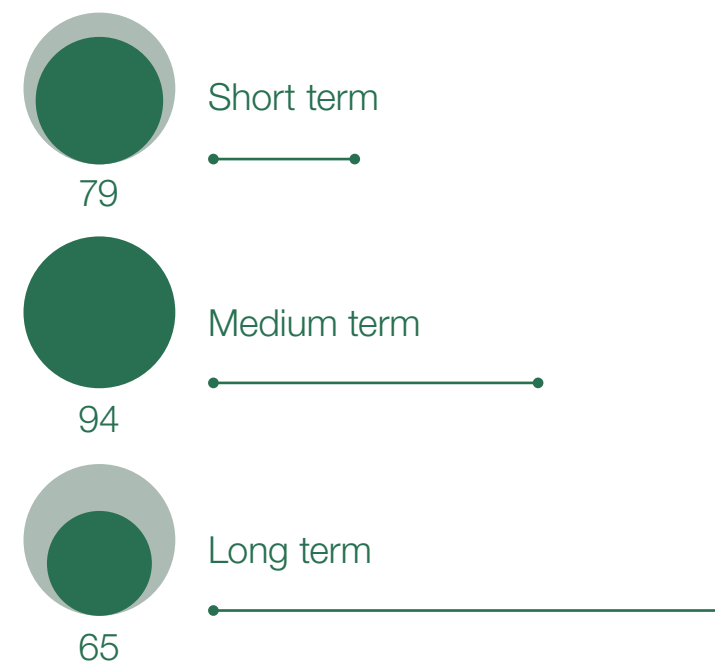
Residential



Transport



### Number of climate hazards disclosed by cities by timescale



97

Number of currently occurring climate hazards disclosed by cities

## Adaptation

### Number of cities with a climate change adaptation plan



### Top adaptation actions taken for the top climate hazards

Flood	Flood mapping
	Flood defences – development and operation & storage
Extreme temperature - hot	Heat mapping and thermal imaging
	Incorporating climate change into long term planning documents
Precipitation	Flood mapping
	Incorporating climate change into long term planning documents
Water scarcity	Diversification of water supply
	Community engagement/education



### Hørsholm Kommune | Denmark

A new waste-to-energy plant is under construction and will be put into operation in Hørsholm Kommune by 2017. The new combined heat and power plant will supersede the old plant and has higher heating and electricity efficiencies, thereby reducing GHG emissions from other sources.



# Water

Number of cities that foresee substantive risks to their water supply in the short or long term



Top 3 water supply risks disclosed

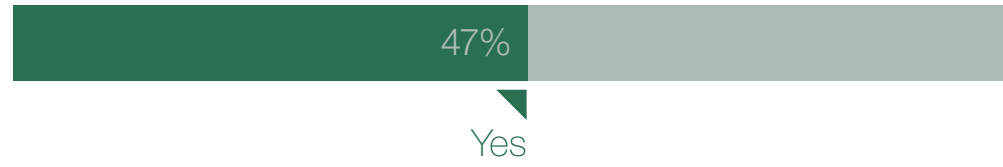
	Number of cities
Increased water stress or scarcity	28
Declining water quality	19
Flooding	15

Top 3 water adaptation actions disclosed

	Number of cities
Investment in existing water supply infrastructure	19
Conservation awareness and education	10
Stormwater management (natural or man-made infrastructure)	9

# Economic opportunities

Percentage of cities reporting that climate change could threaten the ability of businesses to operate successfully in their city



Percentage of cities that see an economic opportunity from climate change



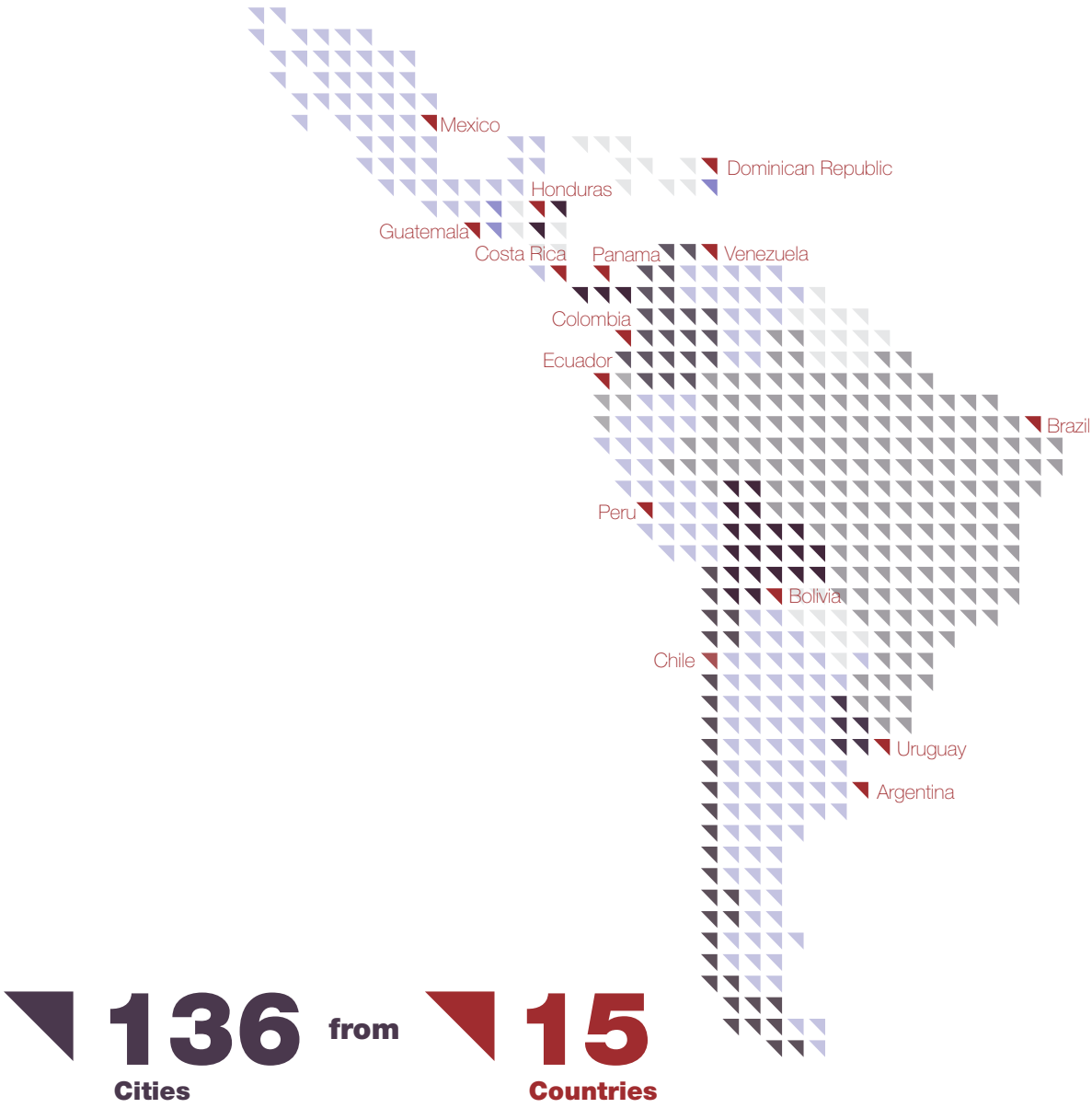
## Manchester | United Kingdom

Manchester is deploying a smart distribution system (DMS) with a dedicated communication network for the whole Electricity North West by 2018. This will deliver a US\$65 million program of smart network changes and integrated storage pilots to promote connection of decentralised energy, and deploy smart meters for gas and electricity.





# Latin America



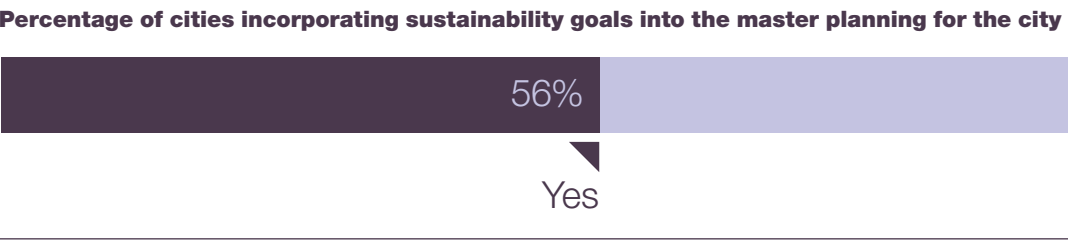
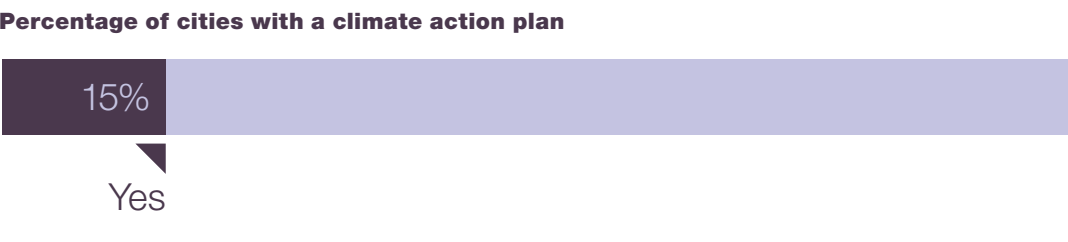
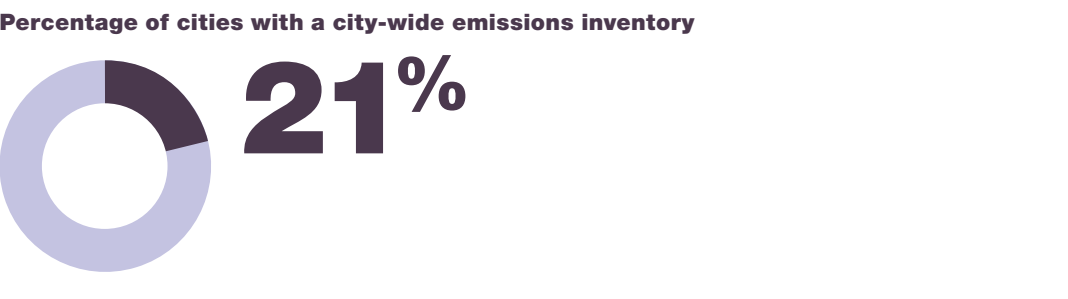
**Latin America** › **Argentina** › Buenos Aires › Córdoba › Mendoza › Rio Grande › San Isidro (Argentina) › Santa Fé Ciudad › Vicente López › **Bolivia** › Gobierno Autónomo Municipal de Tarija › La Paz › **Brazil** › Aparecida › Aparecida de Goiânia › Aracaju › Assis › Barueri › Bauru › Belém › Belo Horizonte › Betim › Birigui › Blumenau › Brasília › Brotas › Cabreúva › Caieiras › Campinas › Campo Grande › Campos de Goytacazes › Canoas › Capivari › Catalão › Caxias do Sul › Cerquilha › Cosmópolis › Cotia › Cubatão › Cuiabá › Curitiba › Duque de Caxias › Estância Climática de São Bento do Sapucaí › Estância Hidromineral de Águas de São Pedro › Estância Turística de Guaratinguetá › Estância Turística de ITU › Estância Turística de Olímpia › Feira de Santana › Florianópolis › Fortaleza › Franco da Rocha › Goiânia › Guarulhos › Jabotão dos Guararapes › Jahu › Jundiaí › Limeira › Lorena › Macapá › Mairiporã › Manaus › Mauá › Montes Claros › Natal › Nova Odessa › Palmas › Piracicaba › Porto Alegre › Porto Feliz › Porto Velho › Recife › Rio Branco › Rio de Janeiro › Rio Verde › Salvador › Santos › São Bernardo do Campo › São Caetano › São Gonçalo › São João da Boa Vista › São José do Rio Preto › São Luis › São Paulo › Sertãozinho › Sorocaba › Tatuí › Tupã › Uberlândia › Vinhedo › Vitória › **Chile** › Colina › Copiapó › Independencia › La Pintada › La Serena › Peñalolén › Providencia › Región Metropolitana de › Santiago › San Fernando › Santiago › Temuco › **Colombia** › Alcadia de Pasto › Alcadia de Pereira › Alcadia de Tunja › Alcadia Distrital de Santa Marta › Alcadia Municipal de Armenia › Alcadia de Sincelejo › Bogotá › Cartagena › Medellín › Santiago de Cali › **Costa Rica** › Belén › **Dominican Republic** › Santo Domingo de Guzmán › **Ecuador** › Quito › Santiago de Guayaquil › **Guatemala** › Guatemala › **Honduras** › Alcadia de Tegucigalpa › **Mexico** › Cuernavaca › Guadalajara › León de los Aldamas › Luárez › Mexicali › Mexico City › Monclova › Monterrey › Morelia › Municipio de › Mérida › Naucalpan de Juárez › San José de Gracia › San Luis Potosi › Tampico › Torreón › Zaragoza › **Panama** › Alcadia de Panamá › **Peru** › Arequipa › Lima › Miraflores › Punta Hermosa › **Uruguay** › Montevideo › **Venezuela** › Alcadia Metropolitana de Caracas



Mitigation

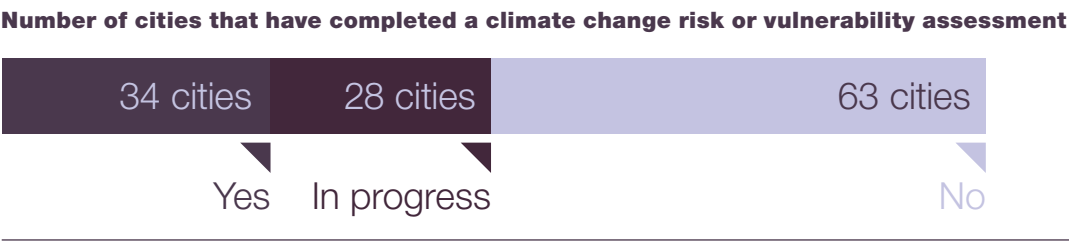
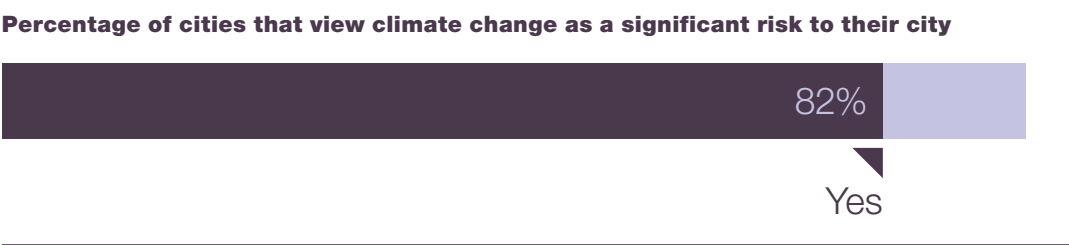
8  
Number of cities with a city-wide emissions reduction target

Total community-scale emissions reported by cities in Latin America  
202,054,752 metric tonnes of CO<sub>2</sub>e

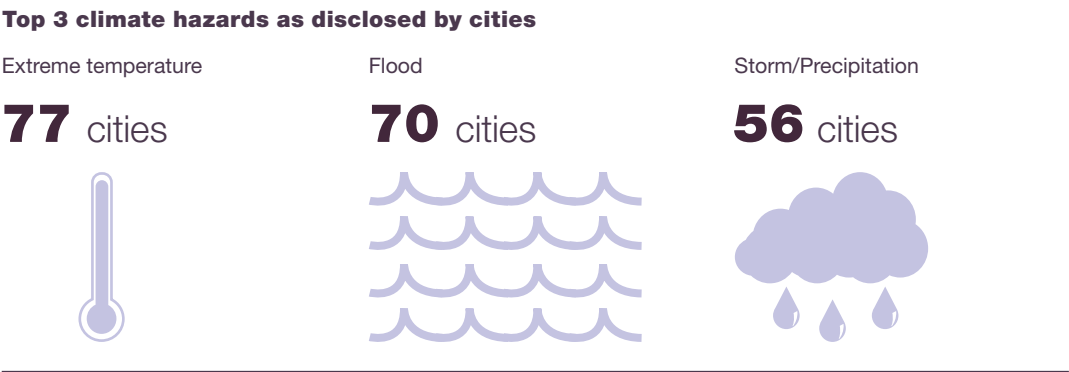


Top 3 emissions reduction activities		
Number of cities		Anticipated emissions reduction (metric tonnes CO <sub>2</sub> e)
14	Infrastructure for non motorized transport	6,863,740
7	Improve fuel economy and reduce CO <sub>2</sub> from motorized vehicles	3,610,987
13	Awareness and education for non motorized transport	2,764,850

Climate hazards



482  
Total number of climate hazards across 136 cities



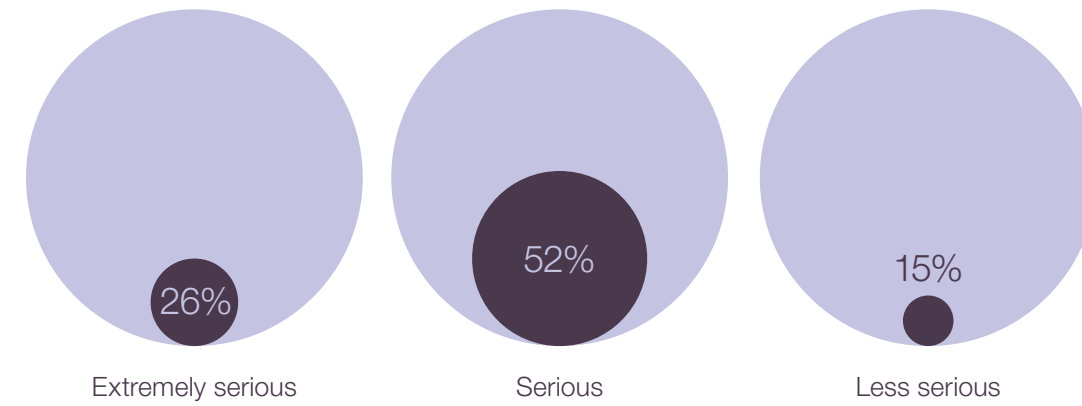
São Paulo | Brazil

São Paulo has seen an increase in floods and storms which impacts the energy supply system, causing blackouts, and affecting the communications system. As demonstrated by the recent drought in 2014 and 2015, the city is vulnerability to water scarcity and the spread of diseases such as, dengue, zika and chikunguya.



## Climate hazards cont'd

### Magnitude of climate hazard

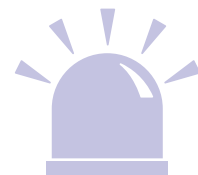


### Top 3 assets or services impacted by the effects of climate change

Health and community



Emergency services



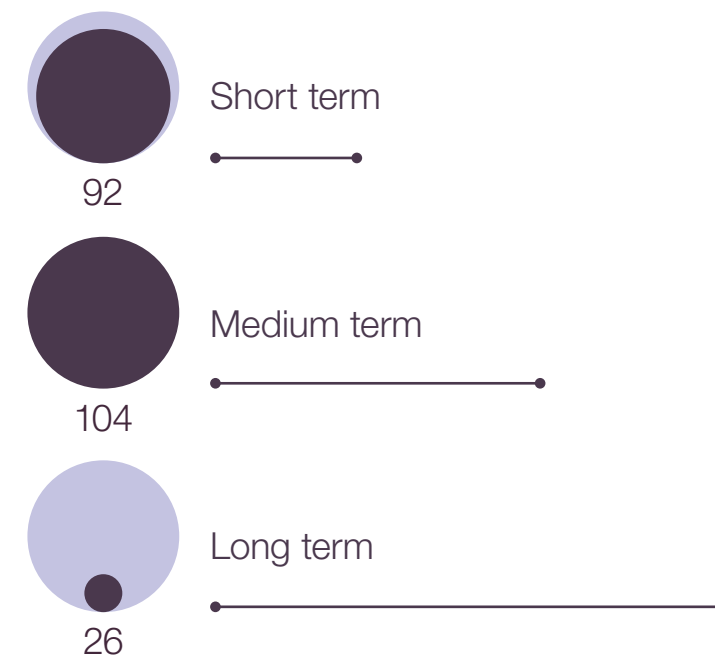
Water



# 177

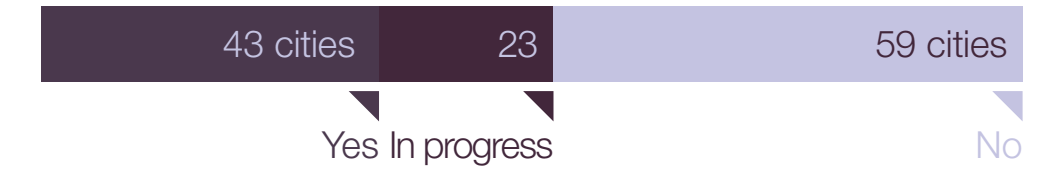
Number of currently occurring climate hazards disclosed by cities

### Number of climate hazards disclosed by cities by timescale



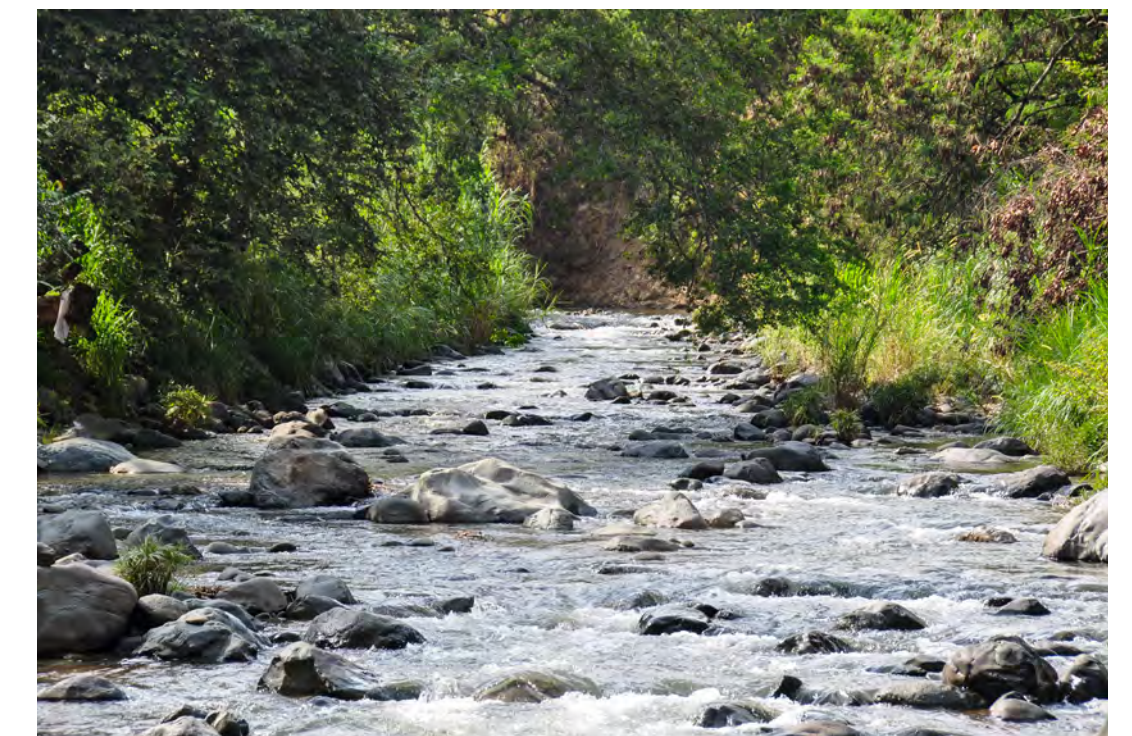
## Adaptation

### Number of cities with a climate change adaptation plan



### Top adaptation actions taken for the top climate hazards

Extreme temperature - hot	Tree planting and/or creation of green space
	Community engagement/education
Flood	Crisis management including warning and evacuation systems
	Flood mapping
Insects and micro-organisms	Disease prevention measures
	Community engagement/education
Water scarcity	Community engagement/education
	Water butts/rainwater capture



### Cali | Colombia

Cali developed the "Jarillon del Cauca River and Complementary Works Plan – PJAOC", which aims to reduce flood risk associated with the Cauca River Interceptor Canal Sur, the Cali river and the drainage system in eastern Cali. This will protect the life and assets of 900,000 inhabitants in the east of the capital of Valle del Cauca.



## Water

Number of cities that foresee substantive risks to their water supply in the short or long term



Top 3 water supply risks disclosed

Number of cities		
	Increased water stress or scarcity	76
	Declining water quality	37
	Inadequate or aging infrastructure	27

Top 3 water adaptation actions disclosed

Number of cities		
	Conservation awareness and education	45
	Investment in existing water supply infrastructure	35
	Conservation incentives	15

## Economic opportunities

Percentage of cities reporting that climate change could threaten the ability of businesses to operate successfully in their city



Percentage of cities that see an economic opportunity from climate change



Belo Horizonte | Brazil

The main physical impact of climate change in Belo Horizonte is flooding. If this situation persists or gets worse, it may alienate potential entrepreneurs. Moreover, this problem causes an obvious impact on the traffic, decreasing the availability of workforce, and the disruption in the business chain.





# North America



**131** Cities from **2** Countries

**North America** › **Canada** › Ajax, ON › Brandon, MB › Calgary › City of › Winnipeg › Edmonton › Halifax › Hamilton › London, ON › Montreal › North Vancouver › Peterborough › Prince George, BC › Regional Municipality of Durham › Salaberry-de-Valleyfield › Saskatoon › Sudbury › Toronto › Vancouver › Victoria › Windsor › **USA** › Abington › Albany › Alton, IL › Ann Arbor › Arlington, VA › Asheville › Aspen and Pitkin County › Atlanta › Aurora, CO › Austin › Baltimore › Bellingham, WA › Benicia › Blacksburg › Boston › Boulder › Brisbane, CA › Brownsville › Buffalo › Burlington › Cambridge › Carmel, IN › Chapel Hill, NC › Charlotte › Charlottesville, VA › Chicago › Cincinnati › Cleveland › Columbia, SC › Columbus › Dallas › Davis, CA › Denver › Des Moines › Detroit › District of Columbia › Durham › Easton, PA › El Paso › Elgin, IL › Emeryville, CA › Eugene › Flagstaff › Fort Wayne Fort Worth › Greenbelt, MD › Hayward › Hermosa Beach, CA › Hollywood › Houston › Huntington Beach › Indianapolis › Iowa › Jackson, MS › Knoxville › Lake Forest, IL › Lakewood › Lancaster › Lancaster, PA › Las Vegas › Long Beach › Los Altos Hills › Los Angeles › Louisville, KY › Medford › Miami › Milwaukee › Minneapolis › Nashville and Davidson › New Bedford, MA › New Orleans › New York City › Northampton, MA › Oakland › Oklahoma › Orlando › Palo Alto › Park City, UT › Philadelphia › Phoenix › Piedmont, CA › Pittsburgh › Portland, ME › Portland, OR › Providence › Raleigh › Reno › Richmond, CA › Richmond, VA › Roanoke › Rochester › Sacramento › Salt Lake City › San Antonio › San Diego › San Francisco › San José › Santa Monica › Savannah › Seattle › Somerville, MA › St Louis › Takoma Park, MD › Tucson › University City, MO › Vail, CO › West Hollywood › Westport, CT › Winston-Salem › Wisconsin Rapids › Yonkers



## Mitigation

75

Number of cities with a city-wide emissions reduction target

### Total community-scale emissions reported by cities in North America

552,937,022 metric tonnes of CO<sub>2</sub>e

### Percentage of cities with a city-wide emissions inventory



### Percentage of cities with a climate action plan



### Percentage of cities incorporating sustainability goals into the master planning for the city



### Top 3 emissions reduction activities

Number of cities		Anticipated emissions reduction (metric tonnes CO <sub>2</sub> e)
68	Energy efficiency/retrofit measures	9,318,734
38	Low or zero carbon energy supply generation	3,763,252
28	Waste prevention policies and programs	1,580,933

## Climate hazards

### Percentage of cities that view climate change as a significant risk to their city



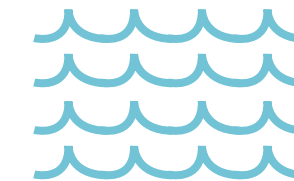
### Number of cities that have completed a climate change risk or vulnerability assessment



### Top 3 climate hazards as disclosed by cities

Flood

101 cities



Extreme temperature

96 cities



Storm/Precipitation

81 cities



677

Total number of climate hazards across 131 cities



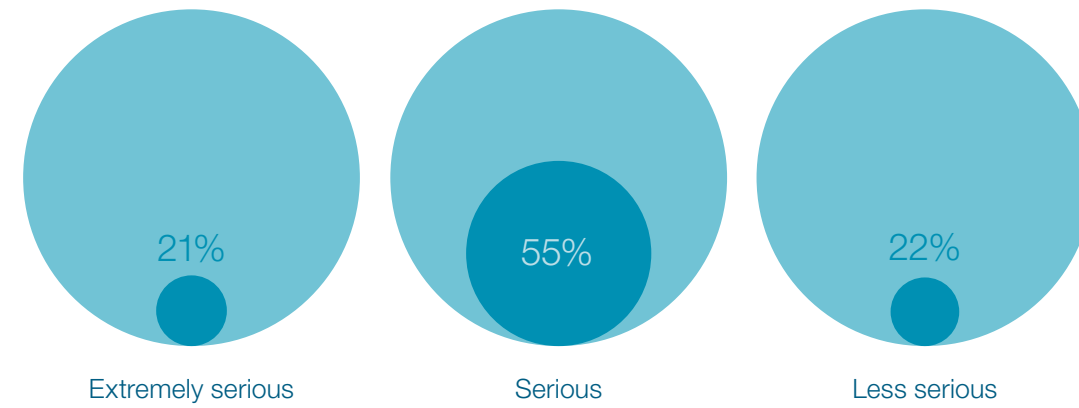
### Toronto | Canada

Toronto's climate is getting warmer – it is expected that by 2040, the number of hot days exceeding 30 degrees Celsius will increase threefold, from 20 to 66 days. To mitigate the risks associated with extreme heat and increased heat waves, the City has developed a Climate Change and Health Strategy for Toronto.



## Climate hazards cont'd

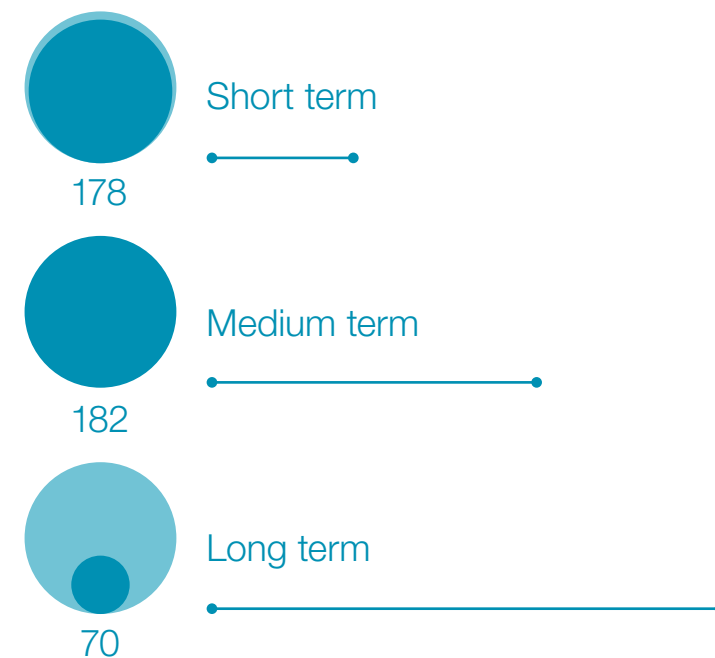
### Magnitude of climate hazard



### Top 3 assets or services impacted by the effects of climate change



### Number of climate hazards disclosed by cities by timescale



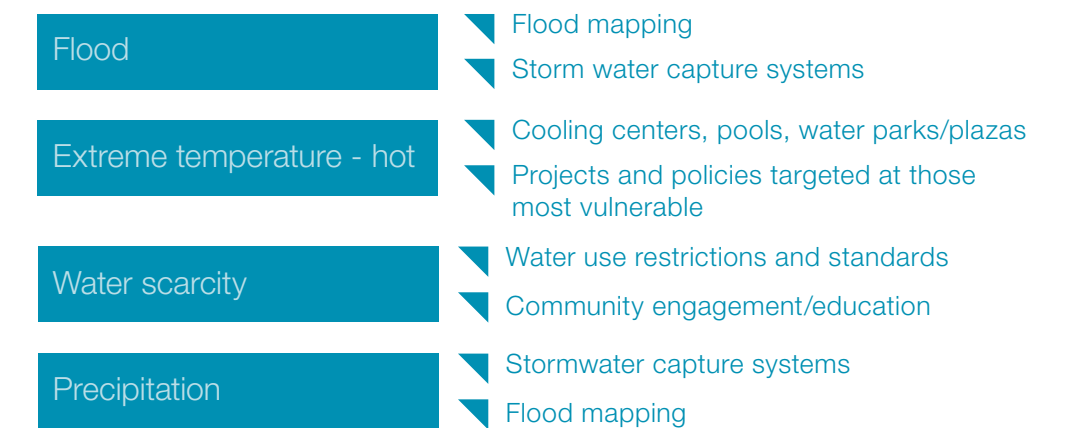
**234**  
Number of currently occurring climate hazards disclosed by cities

## Adaptation

### Number of cities with a climate change adaptation plan



### Top adaptation actions taken for the top climate hazards



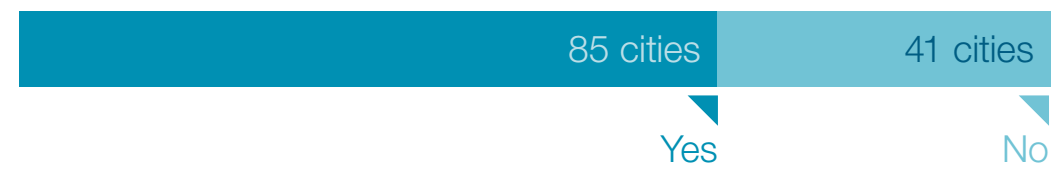
### Las Vegas | USA

Las Vegas has set a Renewable Energy Agreement for the City and its operations. To achieve this Las Vegas is partnering with the state's investor-owned utility NV Energy and they have an Energy Advisory Committee that is looking at renewable energy for the community.



# Water

Number of cities that foresee substantive risks to their water supply in the short or long term



## Top 3 water supply risks disclosed

Number of cities		
	Increased water stress or scarcity	67
	Flooding	40
	Inadequate or aging infrastructure	34

## Top 3 water adaptation actions disclosed

Number of cities		
	Conservation awareness and education	43
	Stormwater management (natural or man-made infrastructure)	39
	Investment in existing water supply infrastructure	32

# Economic opportunities

Percentage of cities reporting that climate change could threaten the ability of businesses to operate successfully in their city



## Percentage of cities that see an economic opportunity from climate change



### Baltimore | USA

Baltimore is currently implementing a 3 year, \$52 million energy efficient and retrofit program for residential and commercial property owners and renters in the City. This program has multiple components that address increasing energy efficiency in multiple building sectors city-wide.







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NOTE: This report has been updated in 2020 to replace some erroneous usage of imagery on pgs. 14, 21 and 45.