

BUSINESS UNUSUAL:

Why the climate
is changing the rules
for our cities
and SMEs



In collaboration with:



PSI
Principles
for Sustainable
Insurance

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HENRI DE CASTRIES, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, AXA GROUP



With Governments about to gather under the auspices of the United Nations for the Paris Climate Conference (COP21), it is encouraging to see civil society and the business world working together towards an ambitious international agreement on global warming.

Yet, even the +2°C scenario that was reaffirmed this year by the United Nations and Group of Seven as the objective would not be without consequences. It would mean a rise in sea levels and an increase in the rate and intensity of extreme climate events such as heat waves, floods and droughts.

These disasters would be magnified by the fact that populations and assets have never been so concentrated in disaster-prone areas. Half of the world's population now resides in cities, often along coastlines, and this proportion is due to rise to nearly two-thirds by the middle of the century, representing some 6.4 billion people. It comes as little surprise, then, that 80% of the climate change adaptation costs for 2010-2050 would be borne by urban areas.

Cities will be at the core of the climate conundrum. They house the small- and medium-sized enterprises (SMEs) that compose the economic backbone of our society, but are also the most vulnerable to natural disasters. They are also the best placed to map the risks likely to materialize locally as well as design adaptation strategies to curtail their exposure to the changing climate.

We have conducted this research with urban leaders and owners of small businesses in over a dozen countries spanning all continents, in order to understand the extent to which local stakeholders are conscious of the scale of the challenges ahead. We have inquired as to the adaptation strategies they are developing to strengthen the world's economic and social fabric, so as to

understand how public and private action can coordinate in the face of climate change.

This report shows that certain cities have made great strides: they've put in place comprehensive resilience plans, invested in new infrastructure and helped residents and businesses alike adapt to the new reality of global warming. They've developed international networks to share experiences and expertise on how to reduce the impact of disasters, and both repair and rebuild –but better—after disaster has struck.

But much remains to be done. Although 78% of SMEs believe that climate change poses a long term risk to their business, only a quarter have implemented adaptation actions. And a lack of funding and political engagement prevents a move towards a more proactive stance on resilience.

Climate change, though, is as much an opportunity as a risk. If cities can adjust, become smarter, they will drive future prosperity. Equally, businesses can use the challenge to open up to innovation and embrace technological progress. Either way, the decisions they take will affect the lives of billions.

We hope the findings outlined in this report will provide useful insights for public authorities and businesses alike to better plan for the consequences of global warming. And it is our conviction that thanks to its expertise in risk modeling and prevention, crisis management and better repair, the insurance industry of which AXA is one of the driving forces will become a decisive partner in this global effort to develop resilience to climate change.

There is an old saying that goes: "*We do not inherit the earth from our ancestors; we borrow it from our children.*" The time to act on climate is not 2100, it is not 2050, it is not even 2020. It is now.



BUTCH BACANI, PROGRAMME LEADER THE UNEP FI PRINCIPLES FOR SUSTAINABLE INSURANCE INITIATIVE



The importance of cities and SMEs in promoting economic, social and environmental sustainability is highlighted in the UN Sustainable Development Goals (SDGs) that were adopted by world leaders last September. This is embodied by SDGs such as “make cities inclusive, safe, resilient and sustainable”, “build resilient infrastructure, promote sustainable industrialization and foster innovation”, and “promote inclusive and sustainable economic growth, employment and decent work for all.” It is also clear in the SDGs that the world needs to “take urgent action to combat climate change and its impacts”.

Therefore, this pioneering report, capturing the views of city leaders and SMEs from across the globe on climate risks, could not have come at a better time. It also shows how the insurance industry can work together with cities and SMEs in helping build resilient and sustainable communities and economies.

The vision of the UNEP FI Principles for Sustainable Insurance (PSI) Initiative is of a risk aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society.

This is why, for example, the PSI produced the “United for Disaster Resilience Statement”, a global commitment by the insurance industry to work with governments and other key stakeholders in implementing the Sendai Framework for Disaster Risk Reduction, which was produced by the 3rd UN World Conference on Disaster Risk Reduction in Japan last March. The Statement underscores the value of disaster risk reduction, especially in the context of climate change adaptation, and the need for climate change mitigation.

By leading the international survey on how cities and SMEs are adapting to and building resilience to climate risks, AXA – a founding PSI member – is setting an example on how the PSI’s vision can be achieved.

As we approach the 2015 UN Climate Change Conference in Paris, the insurance industry has another exceptional opportunity to demonstrate leadership in supporting the SDGs. In this context, the insurance industry can lead the way in placing sustainable development at the heart of risk management, and in placing risk management at the heart of sustainable development.





Executive Summary

As our cities have grown, so has their vulnerability to climate change and natural disasters. The growth of cities has resulted in a concentration of risk for people and assets alike. Catastrophes such as the 2004 Indian Ocean tsunami and Cyclone Nargis, which struck Myanmar just four years later, have led to the loss of hundreds of thousands of lives. These disasters also brought economic catastrophe: millions lost their homes and livelihoods; cities were reduced to rubble; economic growth and development were set back by years, or even decades in some cases. Left unchecked, the cost of climate change could account for some 20% of global GDP by the end of this century¹. And, much of that bill will have to be paid by cities and businesses.

As we head towards COP21, research from Penn Schoen Berland (PSB) shows that “Urban Leaders” believe we have already come too far to fully mitigate the threat of climate change. Where once the fight focused predominately on preventing further damage, communities across the globe are now forced to confront the fact that resilience and adaptation will have to complement mitigation efforts as part of future responses to the problem of climate change.

As this new reality has increasingly been acknowledged, cities around the world have continued to develop and build on adaptation strategies to make their city's infrastructure and population more resilient to the challenges they will increasingly face. A key factor for a city's resilience is a strong local economy. With this in mind, Urban Leaders

stress the need for businesses of all sizes to focus on how they intend to meet the challenge of long term climate change.

Research shows, however, that many SMEs are severely under-prepared to deal with the effects of climate change: only 26% say that they have a strategy or plan in place to deal with potential climate-related risk. As a result, SMEs feel vulnerable – only a quarter believe that their business is well prepared to withstand the impact of climate change – and 65% are worried about climate change in relation to their business, with this figure rising to 75% among SMEs from emerging markets, where communities have been most affected to date.

The insurance industry, recognized as a leader in risk assessment, has a major opportunity to step forward to advise SMEs on how to assess climate risks and support them in the development of resilience plans. Sixty-two percent of SMEs believe that insurance companies are a credible source of information on climate change and 74% believe that insurance companies can help reduce climate-related risks. Urban Leaders also recognize the power of the insurance industry to drive change and the importance of having an ongoing dialogue with insurers to better understand the evolving nature of the risks they face. The industry has the opportunity to instigate behavioral change among businesses at the local level through education and awareness-raising and through the pricing and design of products and services that incentivize resilience measures.

1. Stern Review on the Economics of Climate Change (2006)

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METHODOLOGY

PSB conducted 1,104 online interviews with senior decision makers at SMEs in 11 key markets, as well as 41 interviews with Urban Leaders across 18 markets. Fieldwork was conducted between July 30, 2015 and September 9, 2015.

For the purpose of this report, markets are grouped as either “developed” or “emerging.” The markets that comprise each group are detailed below:

	SME markets	Urban Leader markets
Developed	Belgium, France, Italy, UK, US	Australia, Belgium, Canada, France, Italy, Japan, New Zealand, UK, US
Emerging	Brazil, China, India, Indonesia, Mexico, Thailand	Brazil, China, India, Indonesia, Jamaica, Mexico, Philippines, South Africa, Thailand

The **Urban Leaders** cited in this report are senior decision makers in local governments or city administrations who have extensive influence over planning and policy on climate change, and specifically manage the risks associated with it, for that area. For the purpose of this research, we targeted those decision makers who have **direct responsibility for the coordination and implementation of resilience activities** within their department and administration more broadly. All of the Urban Leaders work in cities with a population of over 100,000 people.

Distribution of SMEs surveyed by sector

Agriculture	3%
Food manufacturing/drink manufacturing	7%
Healthcare	9%
Leisure	3%
Manufacturing	16%
Natural resources	4%
Professionals/Financial institutions	12%
Property (including building materials and construction)	11%
Retail/wholesale	14%
TMT (technology, media and telecommunications)	12%
Transportation franchises	4%
Other service activities	18%

SME markets and Urban Leader markets



● SME markets
★ Urban Leader markets



The majority of cities have a **specific person, team or department responsible for city resilience**, and indeed many of the Urban Leaders fall into this category. Titles of those interviewed include: *Chief Resilience Officer, Resilience Officer, Resilience Manager, Director of Recovery & Resiliency, Climate Resilience Group Manager*.

In addition the Urban Leader audience includes actors with **broader responsibility for the city overall – for example Mayors and their Deputies, or for sustainability and the environment** in the city. Titles of those interviewed include: *Mayor, Deputy Mayor, Principal Officer of Climate Change, Head of Environmental Planning and Climate Protection, Chief Sustainability Officer, Head of Sustainability, Senior Sustainability Officer, Sustainable Development Officer, Environmental Steward, Environmental Director*.

The third type of Urban Leader included are those who work **within departments with a direct impact on a city's resilience** – for instance Energy and Utilities, Emergency Services and Public Health. Titles of those interviewed include: *Emergency Manager, Head of Energy Services, Director, Department of Public Health, Director, Office of Energy*.

SME decision makers are defined as those with decision-making authority for their entire organization, or for multiple departments or divisions within it, in companies with 10 to 250 employees. Quotas were set to ensure a range of sectors were included.



KEY SME STATS

59%

have been affected by climate change.

27%

are well prepared for the consequences of climate change.

27%

are focusing on adapting their businesses to be more resilient.

53%

believe climate change represents an opportunity for their business.

26%

currently have a resilience plan in place. In the UK and US, more than 40% have no plans to develop one at any point in the future.

74%

believe that large corporations are ahead of their business in adapting to climate change.

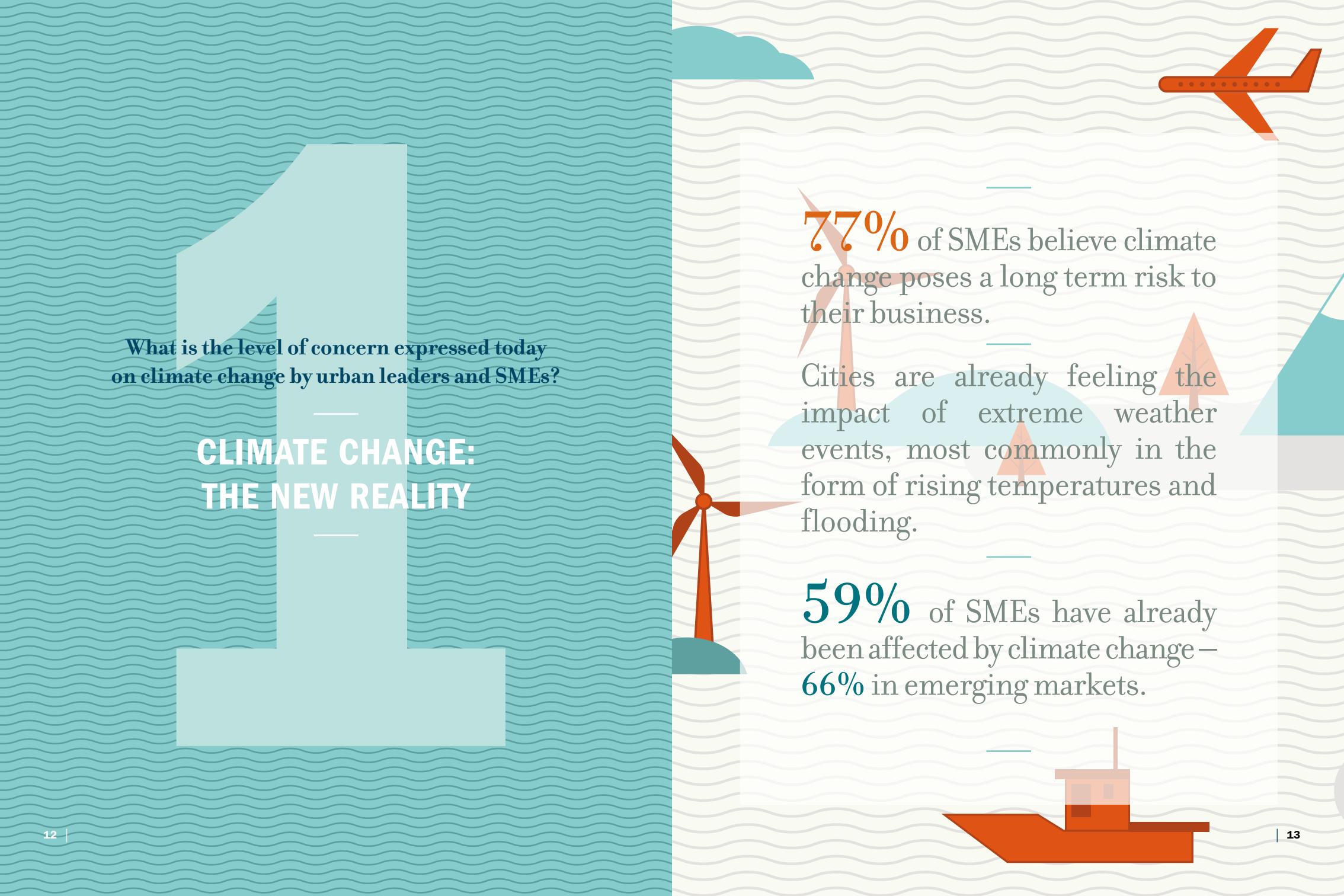
19%

currently interact with government on the issue of climate change.

79%

think insurance companies should be doing more to help businesses adapt to the consequences of climate change.





What is the level of concern expressed today on climate change by urban leaders and SMEs?

CLIMATE CHANGE: THE NEW REALITY

77% of SMEs believe climate change poses a long term risk to their business.

Cities are already feeling the impact of extreme weather events, most commonly in the form of rising temperatures and flooding.

59% of SMEs have already been affected by climate change – 66% in emerging markets.

Climate change, recognized as a major threat by Urban Leaders, poses a variety of risks to cities and the wider region.

The danger of climate change lies both in its capacity to create short-term emergencies through extreme weather events, and in its ability to cause new social and economic problems, or compound existing ones. While the greatest focus on climate change is seen in cities that have already been affected by serious climate events, all Urban Leaders believe that climate change is a threat they will face sooner or later.

Urban Leaders in emerging markets feel most exposed; many have already experienced climate-related events and emphasize that the challenges they face will only increase over time.

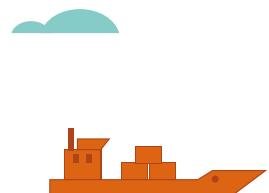
In comparison to their counterparts in developed markets, they also tend to feel less well equipped to deal with the effects of climate change. Many point to a lack of national government attention, as well as inadequate funding for adaptation and resilience planning.

Extreme weather events create significant new risks to a city's population and infrastructure.

Across markets, Urban Leaders point to extreme weather events, excessive heat, precipitation and flooding as the key threats to their communities. For a majority of them, the most immediate perils are threats of flooding (through sea-level rise near the coast or river runoff flooding in inland areas) and extreme heat. "Urban heat islands" are cited by Urban Leaders as a severe threat, as infrastructure – particularly housing that is inadequately prepared to withstand extreme high and low temperatures – puts inhabitants at risk. Again, Urban Leaders in emerging markets feel particularly

"All these problems caused by climate change generate economic and social impacts in the State. We have less water for farming irrigation, so the areas for crops are reduced, meaning we have fewer employment opportunities. We then produce less, leading to a lack of fodder for livestock and thus a shortage of cattle. This all generates migration."

URBAN LEADER, MEXICO



"From a scale of one to ten, how significant is climate change for our city? Twenty."

URBAN LEADER, ITALY

vulnerable, stressing that they have less capacity to rebuild following severe weather events in the short term or to adapt in the longer term.

These weather events in turn have extensive knock-on effects for communities, creating or exacerbating social and economic issues.

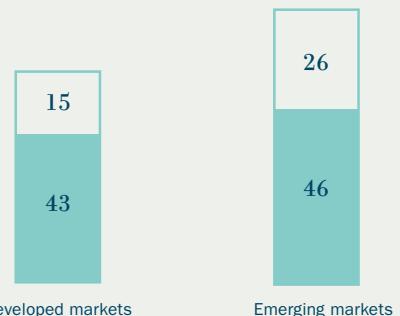
Urban Leaders unanimously point to the most vulnerable members of their communities (those on low incomes or unemployed, the elderly and the young, as well as women) as most at risk from the wider impact of climate change in public health emergencies, food shortages, drought and migration.

Like Urban Leaders, SMEs are worried about climate change: 65% are concerned about climate change in relation to their business.

SMEs in emerging markets are most concerned, with those in Indonesia and Thailand perceiving the greatest short-term risks from climate change (83% in Indonesia and 80% in Thailand). In comparison, SMEs in developed markets tend to see climate change as a long term issue rather than a short-term risk: 70% believe that climate change poses a long term risk.

In relation to your own business, how worried are you overall about climate change? (showing "very worried" and "somewhat worried")

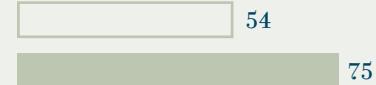
□ Very worried
■ Somewhat worried



To what extent do you agree or disagree with the following statements?

■ Developed
■ Emerging

The consequences of climate change pose a growing risk to my business in the short term



The consequences of climate pose a growing risk to my business in the long term



59% of SMEs globally have already been affected by climate change.

Explaining their higher levels of concern, SMEs in emerging markets have so far felt the greatest impacts, with 66% reporting that they have been affected by climate change, and 11% “extremely affected” (vs. only 4% in developed markets).

The most significant impact climate change has had on SMEs has been on costs and the price of inputs (cited by 37% of those surveyed). This is even more prevalent in emerging markets (46%), and is understandably of highest concern to those operating in manufacturing sectors. SMEs in developed markets give equal weight, in this respect, to the impact on costs and input prices as to the cost of insurance and protection against risk.

“For agricultural enterprises like mine, rising temperatures are likely to have a fatal impact on my business. I can’t grow the crops I need.”

SME, CHINA



Like Urban Leaders, SMEs are most concerned about extreme weather events and heat, along with knock-on effects such as damage to infrastructure, pollution and social or economic upheaval.

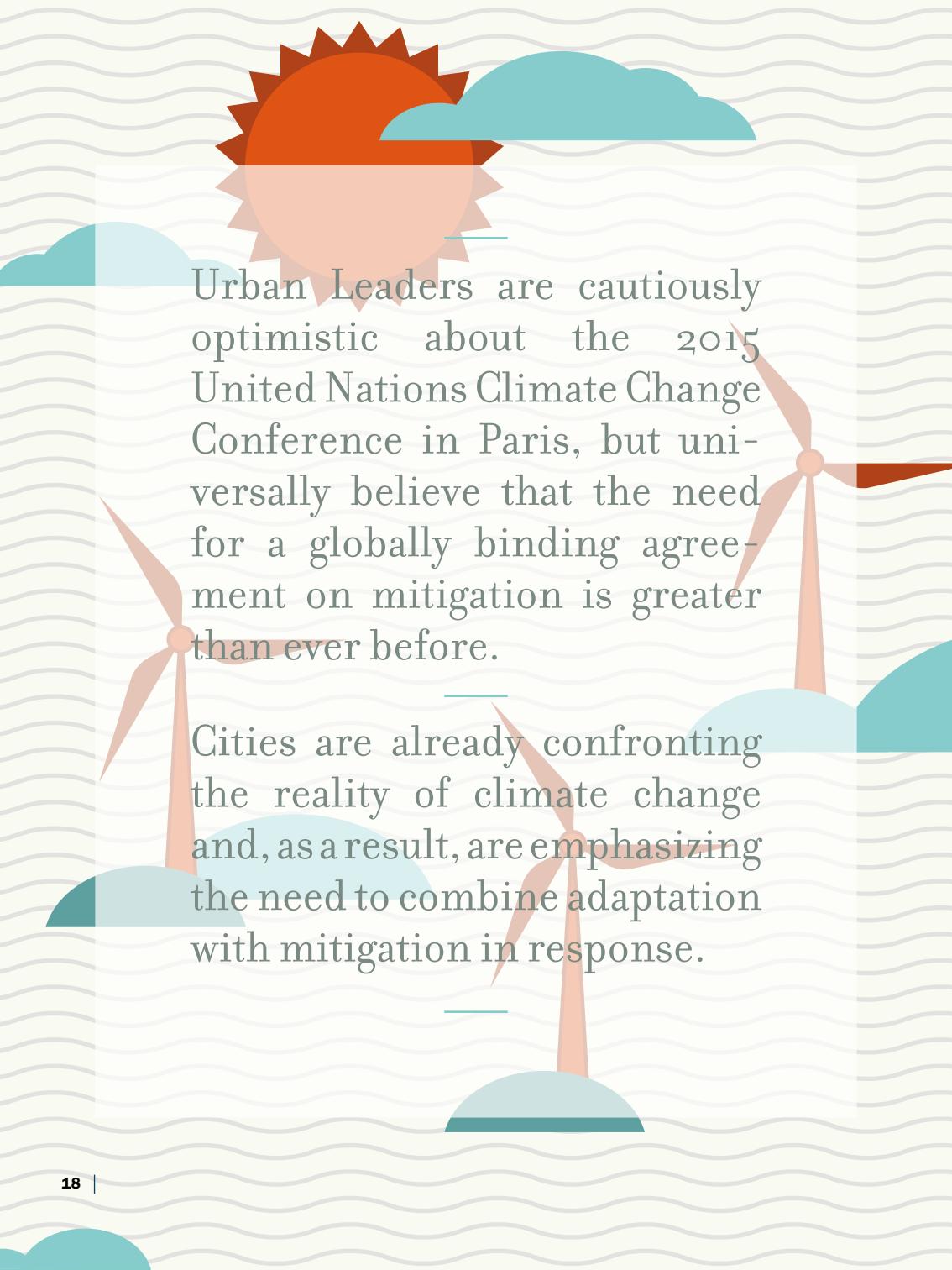
Seventy-six percent of SMEs in developed markets and 90% of SMEs in emerging markets are concerned about the impact of extreme weather events on their businesses, while 71% and 89% in developed and emerging markets, respectively, are concerned about rising temperatures and extreme heat. These are also the issues that SMEs are most likely to have experienced already, with emerging markets again the most affected.



Which of the following aspects of your business have already been affected by the consequences of climate change?



	Developed	Emerging
Costs and pricing of inputs	26%	46%
Health and/or well-being of your employees	20%	37%
Sourcing and inputs and other raw materials	16%	32%
Production processes	16%	29%
Demand for your business’s products and services	15%	28%
Cost of insurance and protection against risk	26%	28%
Distribution, transport and access to markets	16%	26%
Business competitiveness and productivity	19%	26%
Buildings and other infrastructure	16%	21%
Reputation, brand or image	12%	13%



Urban Leaders are cautiously optimistic about the 2015 United Nations Climate Change Conference in Paris, but universally believe that the need for a globally binding agreement on mitigation is greater than ever before.

Cities are already confronting the reality of climate change and, as a result, are emphasizing the need to combine adaptation with mitigation in response.



What is their message for COP21?

MITIGATION AND ADAPTATION: TWO SIDES OF THE SAME COIN

CLIMATE CHANGE POLICIES, A FEW DEFINITIONS

To rise to the challenge of climate change, the United Nations Framework Convention on Climate Change (UNFCCC) highlights the importance of two main policy channels: mitigation and adaptation.

MITIGATION involves reducing the scale of global warming through a reduction in greenhouse gas emissions *ex ante*. The aim here is to deal with the causes of the changing climate.

ADAPTATION involves reducing societal exposure to the consequences of climate change, without necessarily dealing with the underlying cause of those impacts. Examples of adaptation measures include: using scarce water resources more efficiently; adapting building codes to future climate conditions and extreme weather events; building flood defenses and raising the levels of dykes; developing drought-tolerant crops, etc².

In addition to the two strategies mentioned above, another avenue is **GEO-ENGINEERING**, a deliberate, large-scale intervention in the Earth's natural systems to counteract the effects of climate change *ex post*. There are currently two main types of geo-engineering: Solar Radiation Management (SRM) techniques, which aim to reflect a small proportion of the Sun's energy back into space; and Carbon Dioxide Removal (CDR) techniques, which aim to remove carbon dioxide from the atmosphere. However, geo-engineering techniques could trigger unintended and possibly irreversible consequences and should usually be presented as a "last resort" solution to the climate change problem.

². Source: European Commission, Climate Change Factsheet (2014)

"When you are on a cliff's edge, something has to change."

URBAN LEADER, MEXICO

"I'm not saying it's game over. Never, until methane starts getting released from the permafrost. Then all bets are off, and chances are that it's too late. But I think it's critical for us to develop a concrete plan now, with commitments and legal obligations."

URBAN LEADER, CANADA



"I don't think we can just mitigate our way out of this; we already bought some degree of change. I suppose if we figured out a way to suck CO₂ out of the air, maybe that would do it."

URBAN LEADER, US

"Adaptation and resilience, that's exactly where the yardstick has to move, in terms of action. Much of the focus has been traditionally, obviously, on mitigation."

URBAN LEADER, CANADA

Looking toward the 2015 United Nations Climate Change Conference in Paris (COP21), Urban Leaders express cautious hope that a legally binding, universal agreement on climate change will be achieved.

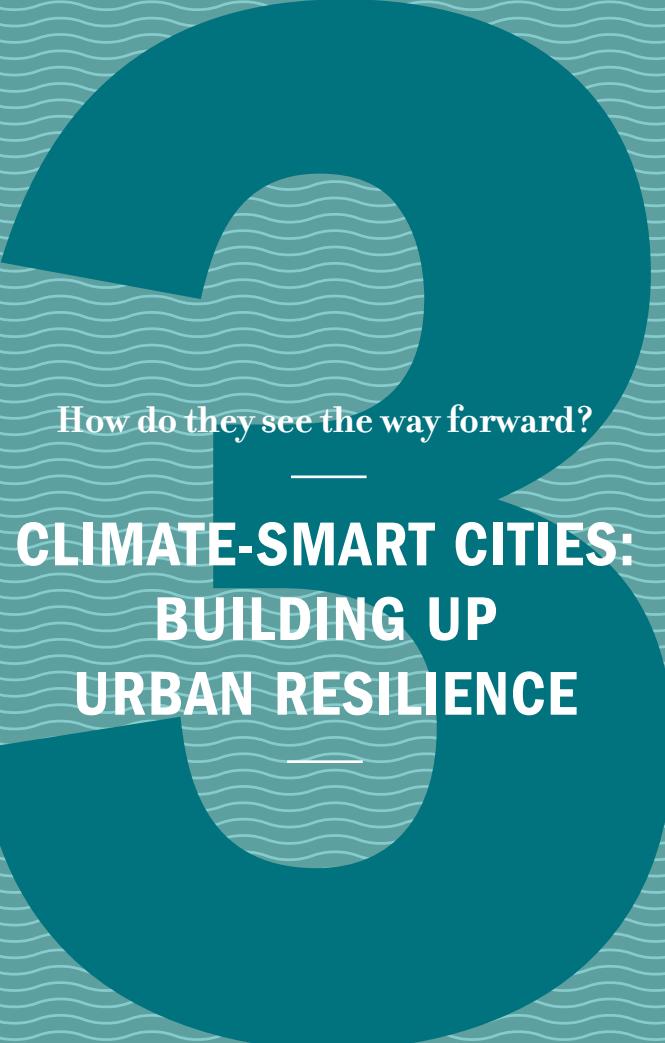
For many, their hopes are based on the fact that they see the need for international agreement and collective action as greater than ever before. However, the failure to reach a global, binding agreement on mitigation at previous UN Climate Change summits (notably Kyoto 1997 and Copenhagen 2009) limits the level of optimism Urban Leaders are prepared to express.

Urban Leaders emphasize that today's reality means that any efforts to combat climate change must combine adaptation with mitigation.

Given that Urban Leaders are already dealing with the impacts of climate change, resilience is still something cities will need to develop in the future, whether COP21 is a success or not. Over the last ten years, many cities in both developed and emerging markets have begun to plan and implement climate change strategies – including adaptation and mitigation – in order to protect their city's infrastructure, resources and population from both the short- and long term risks of climate change.

Only 16% of SMEs are "very" optimistic about the potential of COP21, with SMEs in Europe particularly pessimistic that an agreement might solve the issues they are currently dealing with.



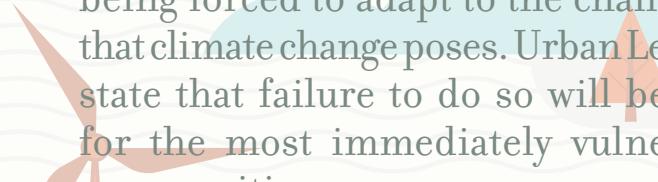


CLIMATE-SMART CITIES: BUILDING UP URBAN RESILIENCE

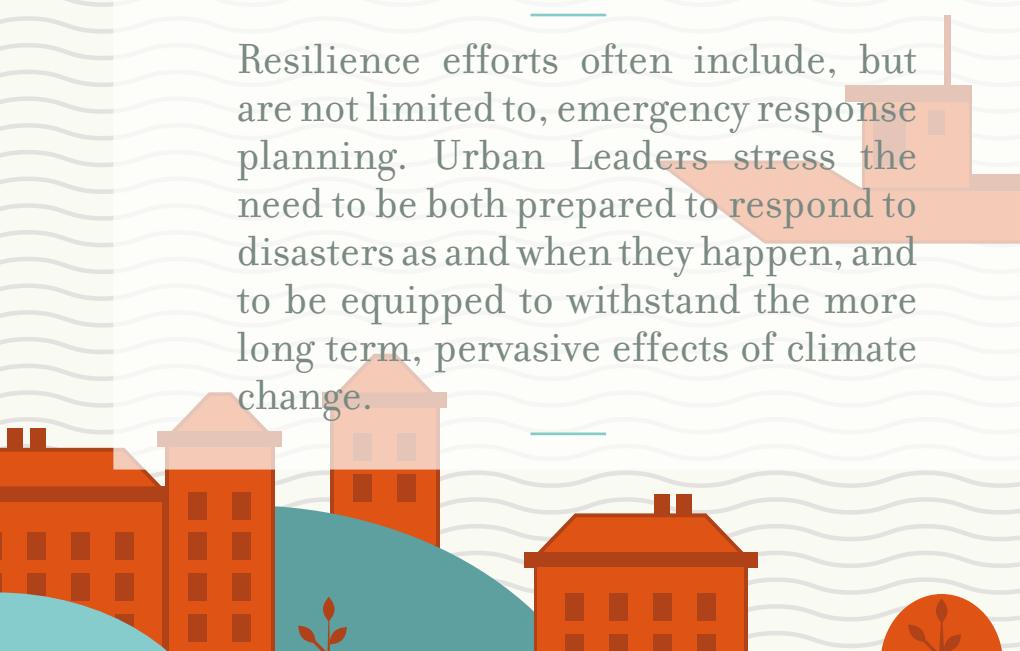
How do they see the way forward?



Cities around the world are already being forced to adapt to the challenges that climate change poses. Urban Leaders state that failure to do so will be fatal for the most immediately vulnerable communities.



While levels of resilience vary from city to city, there is a unified aim among Urban Leaders to ensure that their cities are better prepared to withstand the impact of climate change.



Resilience efforts often include, but are not limited to, emergency response planning. Urban Leaders stress the need to be both prepared to respond to disasters as and when they happen, and to be equipped to withstand the more long term, pervasive effects of climate change.

BIG-CITY LIFE

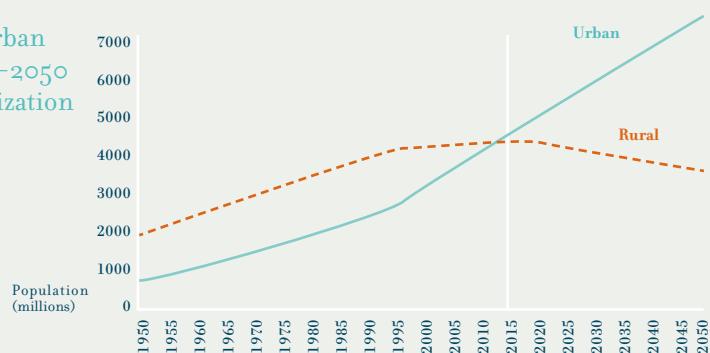


Megacities –those with populations of more than 10 million – are a relatively new phenomenon. In 1990, there were just 10 in total. Today, there are 28, home to more than 450 million people³. They include Tokyo –still the world's largest city– as well as New Delhi, Shanghai, Sao Paulo, Mexico City, Osaka, etc. The list is growing. By 2030, according to the UN, there will be more than 40 megacities, with Africa representing a growing share.

Although megacities are impressive, they account for only a small part of the expected growth in urban populations. Smaller cities are also expanding. By 2030, for example, "large cities" –those with populations of between five and 10 million, including cities such Santiago and Madrid– will account for roughly 9% of the world's urban population, more than 400 million people.

3. United Nations, World Urbanization Prospects, 2014

Rural and Urban divide: 1950–2050 world urbanization trends



United Nations Department of Economics and Social Affairs (UNDESA), World Urbanization Report 2014

With the right governance in place, cities can play a pivotal role in the climate conundrum

INTERVIEW WITH MAGALI DREYFUS,
RESEARCH SCIENTIST, FRENCH NATIONAL CENTER
FOR SCIENTIFIC RESEARCH (CNRS)



Given the global scale of the climate challenge, what makes action at city level relevant?

Urbanization and climate change are two significant trends in today's world, and they have crossover effects on each other. By 2050, 66% of the world's population is projected to be urban. At the same time, depending on the assessment method (production- or consumption-based), cities are responsible for 40 to 70% of greenhouse gas emissions¹. Conversely, the concentration of people, infrastructures, and economic activities makes urban areas more vulnerable to the consequences of global warming, such as floods and storms of increased frequency and intensity. Action at city level is therefore strategic for both the mitigation and adaptation dimensions of climate action.

Urbanization rates are particularly high in Asia and Africa where more than 2 billion new urban residents are expected by 2050². Yet cities in emerging countries have to face a lack of adapted infrastructure, budgetary constraints as well as higher losses, notably due to the absence of loss mitigation mechanisms. Strengthening the local economic and social fabric can therefore be the cornerstone of longer term sustainability and climate resilience.

What types of adaptation actions can be rolled out at municipal level to bolster urban resilience?

City resilience requires a holistic and transversal approach, with the coordination of many actors who sometimes have different priorities and time-scales. The first building block is risk-planning, through the mapping of potential vulnerabilities and the design of appropriate responses across sector-specific policies (land-use, housing, transport, energy supply and so forth).

Our cities will also need to find innovative solutions to lessen their dependence on fossil fuels and play a role on the mitigation front. In 2010, in Tokyo, the metropolitan government set up the first city cap-and-trade system to regulate greenhouse gas emissions of the heaviest emitters of the industrial and commercial sectors.

One of the major hurdles remains the length of local political mandates, often around 5 years, when climate policy requires a long term focus. Political considerations enter into play and budgets are often unlocked only in the wake of the disaster when preventive action would have been more effective and less costly.

How can we ensure an efficient coordination between local governments and other actors to face these perils?

The recognition of the role of local public authorities within the international climate regime is a prerequisite. This process has started with the adoption of the Lima-Paris Action Agenda (LPAAG) in 2014 at COP-20. Now the future regime needs to urge national governments to acknowledge and collaborate with their sub-national authorities in order to meet the global and national targets of emissions reductions. They can do so by involving them in the definition of national climate strategies or through the creation of mixed public bodies, which gather all relevant stakeholders.

Partnerships are also part of the solution. In emerging countries, development agencies can help on the infrastructure challenges: the construction of New Delhi's underground was coordinated by a Japanese development agency, contributing to reduce carbon emissions from car traffic. For cities in developed countries, public-private partnerships can be a good fit. Copenhagen for example worked with Veolia to develop early warning systems for floods, and to build evacuation plans based on models and maps prepared by the company.

Finally, networks of cities at national and international level have gained traction. The International Council for Local Environment Initiatives (ICLEI), C40 Large Cities Climate Leadership Group, the European Covenant of Mayors are initiatives from cities based mostly in OECD countries and focusing on mitigation. However their scope is now broadening and new networks tackle specifically the issue of climate adaptation as for instance the Asian Cities Climate Change Resilience Network (ACCCRN).

1. United Nations, *World Urbanization Prospects, 2014 Revision* (New York, United Nations, 2014); UN-Habitat, *Cities and Climate Change: Policy Directions* (Nairobi, UN-Habitat 2011)

2. United Nations, *World Urbanization Prospects, 2014 Revision* (New York, United Nations, 2014)



Resilience planning is a complex issue that falls under the responsibility of multiple areas of government.

While some cities have set up plans that centralize multiple aspects, others have integrated adaptation and resilience across departments and areas. Cities are implementing both long term adaptation measures as well as more immediate response activities.

Given the nature of the challenges that cities will face, long term planning and adaptation to the changing environment will be crucial for surviving the worst impacts of climate change.

It is therefore necessary to move beyond plans that simply identify the potential for disaster and outline emergency responses.

In particular, increasing heat is a pressing concern, with many cities noting rising numbers of heat-related deaths during the summer. To counter this, many cities are embarking on cooling strategies. These include increasing green spaces and looking at how to adapt existing housing to better withstand hotter summers and colder winters.

While the measures cities implement are unique to the challenges they face, there are common elements of resilience planning across geographies:

• Risk assessments to identify key vulnerabilities

In most cases, risk assessment is the first stage of the adaptation process. The data used to map risks and identify priorities come from a range of sources, with academic research playing an important role in both developed and emerging markets. In many cities, local universities have been at the forefront of strategy planning, providing historical data and measuring change in the local area, as well as predicting future events and pinpointing vulnerabilities.

"We have started to prepare an action plan that covers up to 70 different areas such as energy, agriculture and livestock, housing and transportation."

URBAN LEADER, MEXICO

"This past Spring, the city issued a new document that really takes a broader look at resilience, not focusing exclusively on coastal flooding issues but also looking at socio-economic conditions, to bring forward the idea of social resilience."

URBAN LEADER, US



"We are developing new neighborhoods, focused on plants, green spaces and the construction of new buildings. For example, we have created walls of trees in the direction of the wind, so when it is windy in the summer, the wind is channeled through the trees and we create a cooler environment."

URBAN LEADER, FRANCE

In emerging markets, the lack of access to specific data and information on risk is a challenge. Many rely on assistance from international networks or partners in developed markets. Risk mapping is seen as a core strength of the insurance industry and is an area in which the industry could be playing a more active role.

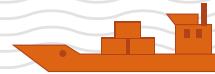
• Adaptation of essential infrastructure to withstand changes to the environment

Urban Leaders stress the need to adapt essential infrastructure, such as sewer and drainage systems, housing, energy, food supplies, water supplies and transport networks. Having robust infrastructure is crucial to the resilience of urban areas and the safety of their inhabitants. The immediate risks to key infrastructure posed by extreme weather events highlight the need to develop responses such as improved drainage systems for roads or back-up power systems. However, city planners also point to the need to adapt to longer term changes to the climate, namely more extreme temperatures and increased precipitation.

• Development of flood defenses to protect inhabited areas from flooding caused by extreme weather events and increased rainfall.

Cities face a number of flooding challenges including coastal flooding, rising river levels, flash rainfall and groundwater run-off (both coastal and inland cities face this challenge). In order to minimize the damage flooding can cause, municipalities are responding by looking at a range of different ways to identify and protect the areas that are most vulnerable and densely populated, important economic zones, and areas that hold essential infrastructure.

Methods of flood defense can include the development of "natural" barriers (for example mangroves, coral reefs or more green space to absorb rainfall), as well as the development of flood barriers.



• Urban planning and relocation of buildings, including adapting to future developments that allow greater resilience to the consequences of climate change

Many of the current challenges that cities face due to climate change are exacerbated by urban planning decisions of the past. Urban heat islands and buildings located in flood-risk areas are consistent challenges, as is a lack of urban green space, which is important for the run-off of heavy rainfall and for providing cooler areas for respite. Resilience experts point out that some of the most vulnerable areas are those that are the most developed and densely populated, with the fewest open spaces and green areas. In many cities it is not uncommon that these areas are inhabited by those with the lowest incomes.

In the longer term, many cities acknowledge that the sacrifice of certain areas of land is inevitable, particularly in the face of rising sea levels. Urban Leaders therefore emphasize the need for smarter planning regulations to avoid building in vulnerable areas and to ensure that the most at-risk areas are relocated (or at a minimum are adequately prepared and protected).

A significant challenge is that urban planning and the development of large-scale flood defenses tend to require substantial investment as well as stricter regulations, leading to increased construction costs. Given that most are currently struggling to build the housing required for their growing populations, cities are often forced to make a trade-off between long term resilience and the development of the housing needed to cope with expanding populations in the short term.

• Development of emergency warning and response plans

Emergency response planning is a core pillar of resilience strategies, especially in the most immediately vulnerable areas, including those that have already experienced extreme weather events and disasters.

"We basically developed the flood plan ourselves. We do regular aerial photography and satellite imagery and we've got a big database. For all of our urban area, we've got a very detailed flood map that feeds our management plan for those events."

URBAN LEADER, AUSTRALIA



"We also know that the areas with more concrete are the poorer areas of town. There's an alignment between lower-income areas and higher temperatures as a result of urban heat islands. So we are trying greening strategies to help cool those areas."

URBAN LEADER, CANADA

"We have a project to move back houses and community activities that are by the sea, because of coastal erosion."

URBAN LEADER, FRANCE

SOME CITIES ARE AHEAD OF THE GAME

With respect to climate change, some cities have already grasped the nettle. Recent natural catastrophes – particularly Hurricane Sandy and Hurricane Katrina in the US – gave a real impetus to the issue of cities and climate resilience. Certain cities have made great strides; they've put in place comprehensive resilience plans, invested in new infrastructure and helped residents and businesses adapt to the new reality of climate change. In Copenhagen, for example, the city is planning new "cycle super highways"; in Johannesburg, the government recently used the proceeds from a green bond to fund a new, greener rapid-transport bus system, copying similar systems in Bogotá in Colombia and Curitiba in southern Brazil.

Importantly, they've made cities easier places to live – and more pleasant, too – often with the help of online data, which, by mapping traffic patterns and tracking demand for public services, can pinpoint potential problems or bottlenecks. In New York, a year after Hurricane Sandy, the city released *"A stronger, more resilient New York,"* setting out its resilience and rebuilding plans, sector by sector, district by district.

The development of an emergency response plan is often the starting point for many. This is firstly because – compared to some other elements of resilience planning – it can be simpler to demonstrate the immediate short-term value of being prepared to cope with an emergency. Secondly, in contrast to (for instance) infrastructure adaptation or the relocation of housing, emergency response plans often require a smaller economic investment. In addition, many cities already have emergency plans in place, even if climate change was a less significant threat at the time the plans were developed. These plans can be adapted to cover the new risks posed by severe weather events and flooding.

• Community engagement and awareness-raising activities

Urban Leaders understand that a resilient city requires a resilient business community and general public. Therefore, engaging the public to understand, and in some cases participate in resilience planning is central to the creation of a fully integrated plan. Urban Leaders stress the need for members of the community as well as local businesses to make individual adaptation efforts to complement the wider efforts of government. Government can lead, but individuals themselves will need to work on adapting their homes and businesses to the long term impacts of climate change.

In addition, the public is a resource that can be engaged, especially in times of emergency. Recruiting and training members of the public as volunteers who can assist in the implementation of emergency response plans is cited by many Urban Leaders both as a cost-effective and efficient means of equipping urban areas to respond to disasters and emergencies.

The role of the Chief Resilience Officer (CRO) as a centralizing, coordinating force

As mentioned above, resilience plans often consist of many different standalone elements, and engage a mix of individual government departments and budget resources. In this context, Chief Resilience Officers are the central coordinators and leading advocates for resilience in cities.

It is notable that, while most cities have a single person or department responsible for resilience, this position is not always specifically labeled "CRO". For many, this position has been a relatively recent creation. These cities cite the benefit of assigning responsibility for resilience strategies to a central individual or team. Specific benefits include more visibility for the city's top management, additional funding and the opportunity to specifically allocate more time to adaptation and city resilience.

"We have a warning system that we set up in the municipalities, in case we have flooding or major disasters."

URBAN LEADER, JAMAICA



"We have had a plan for years, even before we started to speak about climate change to this extent. We've had many hurricanes on both coasts, so years ago, we started to introduce this national civil protection system. This plan covers earthquakes, hurricanes, droughts."

URBAN LEADER, MEXICO

"Without ICLEI, we would not have had the means or the technical capacity to carry out our climate analysis."

URBAN LEADER, PHILIPPINES

"Our team went to Australia to visit an area that is similar to ours geographically and that faces many of the same challenges. That city showed us what they've done to protect that area."

URBAN LEADER, JAMAICA

Working together: international cooperation and sharing best practices

International networks, along with local and regional networks, have become integral to resilience planning and adaptation strategy implementation in both developed and emerging markets.

Such collaborative efforts have proven essential in assisting the cities most vulnerable to climate change to access resources, expertise and knowledge.

For many cities in emerging markets, international assistance from developed markets and networks is vital; many Urban Leaders point to the support they receive from developed nation partners and international networks as being fundamental to their adaptation efforts.

COOPERATION AMONG CITIES

Increasingly, cities are working together on climate resilience. Several forums have sprung up in recent years, including the ICLEI alliance of local governments for sustainability and the Rockefeller Foundation's 100 Resilience Cities Initiative.

There is also the C40 Cities Climate Group, currently led by the Mayor of Rio, Eduardo Paes, and the Cities Alliance, which is focused on reducing urban poverty. The UN is also pushing the resilience agenda – notably through UN Offices for Disaster Risk Reduction (UNISDR) and UN Habitat.

The UN Principles for Sustainable Insurance have also spearheaded a three-year project on global resilience, led by the Insurance Australia Group.



Urban Leaders emphasize that a resilient economy is key to the overall resilience of a city and stress the need for local businesses to develop strategies that enable them to withstand the consequences of climate change.

Currently, however, SME activity on climate change is primarily focused on mitigation - only **27%** say they feel well prepared to deal with the impact climate change will have.

SMEs acknowledge their vulnerability - **65%** are worried about the impact of climate change and **72%** believe they need to start focusing on adaptation. Helping them to move from intent to action will be key.

From intentions to action,
where do they place the emphasis?

RISKY BUSINESS: THE CALL FOR A MORE RESILIENT ECONOMY

Urban Leaders stress that in failing to prepare for the consequences of climate change, SMEs pose a serious threat to local economies.

Ensuring that SMEs and the private sector more broadly are equipped to withstand the impacts of climate change is a key component of their city's overall resilience.

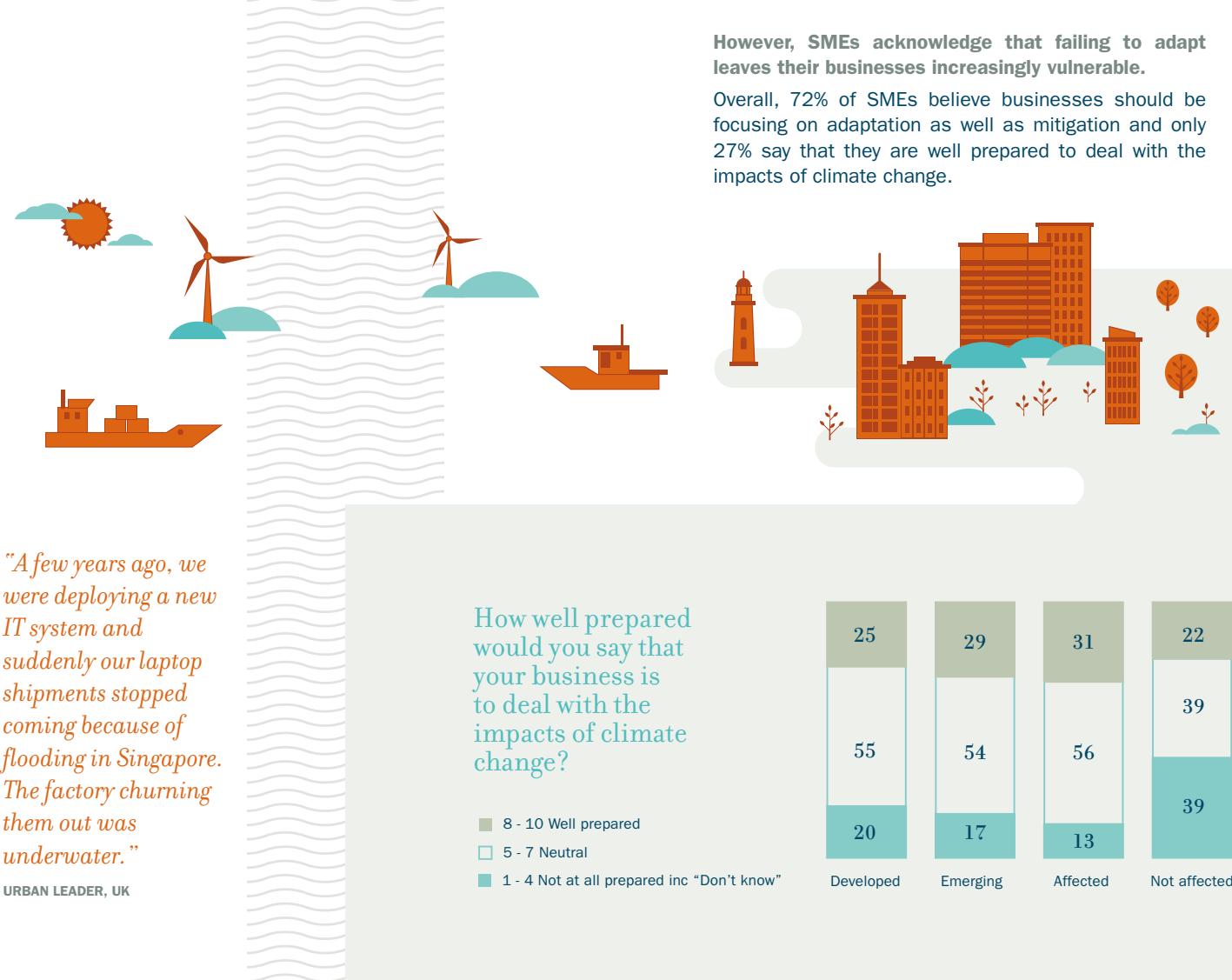
Failing to do so can have an impact on supply chains, as climate-related disasters on the other side of the world could have a detrimental impact on the functioning of their city.

In contrast to city administrations, SMEs are currently far less focused on planning for and adapting to the consequences of climate change, despite their concern that they will be affected by it in the future.

Across markets, SMEs' climate change-related activities are predominately focused on mitigation rather than on adaptation measures to protect their businesses.

Basic mitigation measures such as recycling and energy saving are the most common environmental actions currently being undertaken by SMEs in both developed and emerging markets. Sixty-five percent of emerging-market SMEs and 47% of developed-market SMEs have implemented measures to save energy and reduce their impact on the climate; 61% of emerging-market SMEs and 57% of developed-market SMEs recycle.

There is a significant drop when these figures are compared with the proportion that has undertaken adaptation and resilience measures. Only 25% of SMEs in developed markets and 28% in emerging markets have paid for insurance to cover climate-related risks and fewer than 25% currently undertake regular risk assessments or planning for natural disasters.



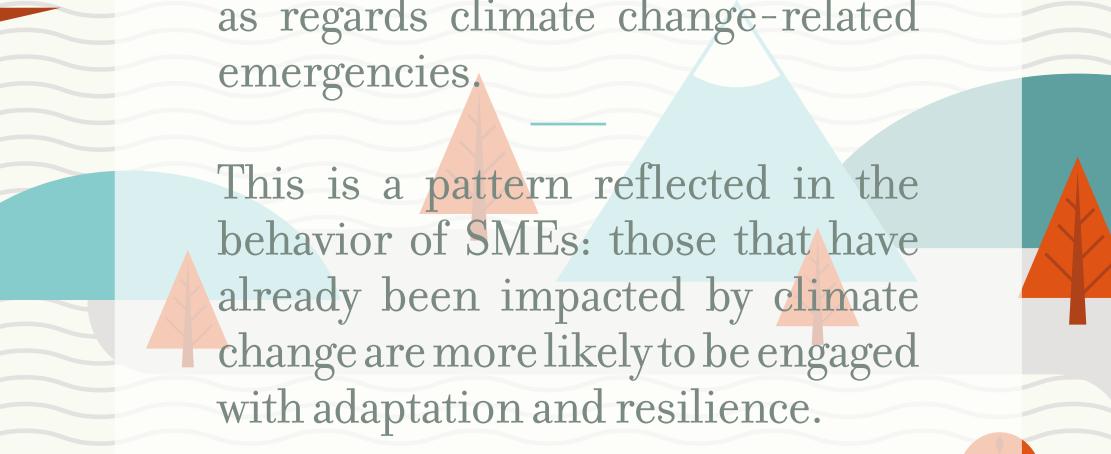


SO WHAT'S HOLDING US BACK? CHALLENGES AND OBSTACLES

Climat change is clearly seen
as an immediate and not a future problem



Urban Leaders say that resilience and adaptation strategies are often reactive rather than proactive as regards climate change-related emergencies.



This is a pattern reflected in the behavior of SMEs: those that have already been impacted by climate change are more likely to be engaged with adaptation and resilience.



A key challenge facing Urban Leaders is to engage the private sector locally and demonstrate to them the mutual economic and social benefits of integrating resilience into their business strategies.

Lack of political will and financial support are the two biggest barriers to resilience strategies and planning.

Even though most of our Urban Leaders cite climate change as possibly the most significant issue facing their city – an opinion SMEs share – it can take a back seat to more pressing issues on local and national political agendas.

In recent years, budgetary constraints at the local and national governments level in developed markets have restricted the funding available for a range of activities, including climate adaptation and resilience efforts.

As one might expect, access to funding is an even bigger challenge in emerging markets, where the related issues of lack of political will and lack of resources are compounded by and contribute to an inability to access the necessary technology and expertise to accurately predict and therefore adequately plan for risk.

Conversely, the presence of strong political will is seen as one of the most important factors underlying the most successful plans and strategies. The cities that feel most prepared and well equipped to implement adaptation plans are those where climate resilience has been emphasized as a priority at either the local or national level. Urban Leaders point to the correlation between strong political will and increased support for resilience efforts, along with increased funding and publicity.

Natural disasters often act as a catalyst for the implementation of resilience strategies.

For many Urban Leaders, it has taken a major climate change-related emergency for local and national governments to prioritize and implement an extensive resilience strategy.

"We have been severely hit by cuts in government funding. We're very much about survival at the moment and trying to cope with demand for services and trying to regenerate the city. So, [climate change] is not very high on the agenda - it's not on the agenda at all, really, for my leaders, at the moment."

URBAN LEADER, UK



Another hurdle very present in emerging countries – particularly in parts of Africa and Asia – is the fact that cities have grown so quickly that coordinated action becomes more difficult. One issue is the expansion of informal housing and townships, which often lack official recognition and lie outside the influence of city or national government.

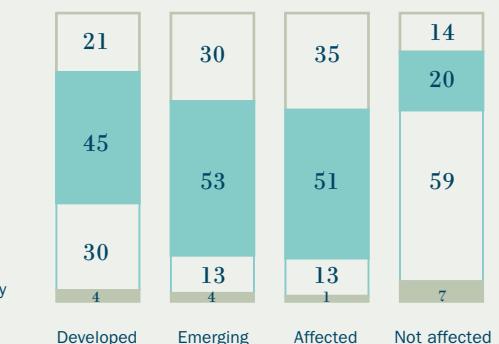
For SMEs, as with cities, those who have experienced the impact of climate change are far more likely to have introduced long term resilience measures.

SMEs that have been affected are more than twice as likely as those who have not to have implemented measures to cope with the impact of climate change: 35% have a plan in place and 51% intend to develop one in the future.

The most prepared market is China, where 41% of SMEs say they have a plan in place, followed by Thailand, where 38% have developed a plan.

Does your company have a strategy or plan in place to deal with potential climate related risks?

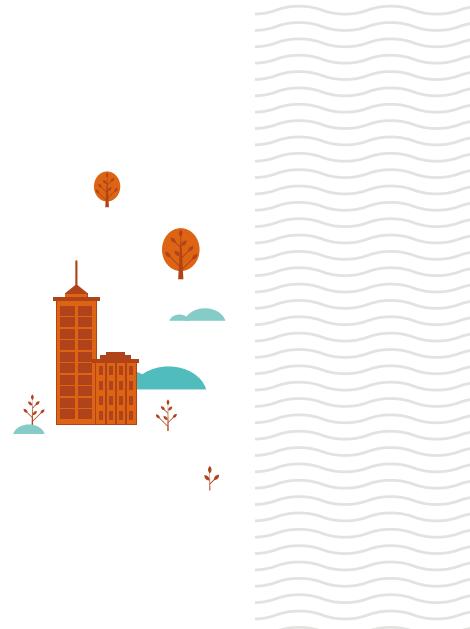
- Yes
- No, but we plan to develop one
- No, and we have no plans currently to develop one
- Don't know



In contrast, among those SMEs that have not yet been affected by climate change, only 14% have a plan in place to deal with potential climate risk and 59% currently have no intention of developing one. The least prepared markets are the US and UK, where more than 40% currently have no intention of developing a plan at any point in the future.

The relative lack of resilience activity among SMEs is partly explained by the fact that currently, climate change sits below the perceived “top-tier” threats to their business, which include financial instability, data privacy and work-related diseases. Currently, only 14% of developed-market SMEs and 20% of emerging-market SMEs perceive climate change as one of the biggest risks to their business.

Compounding this is the fact that many SMEs feel that they lack the capacity, knowledge and necessary support to plan and adapt to the consequences of climate change.

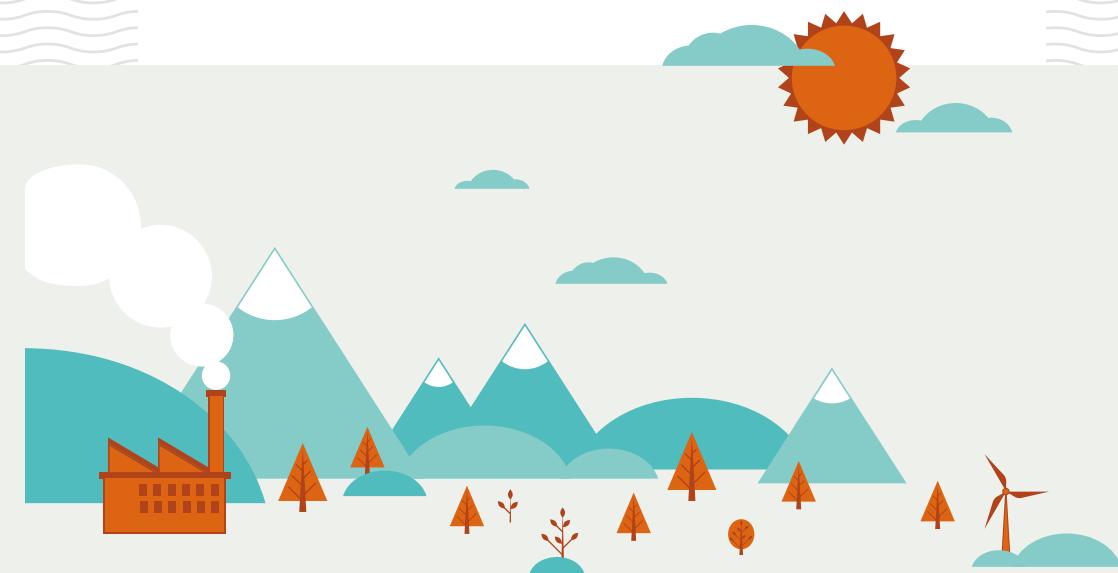


"We've got some strong leadership. The mayor set a goal to become a top-tier city for sustainability and with that kind of leadership, you're going to get a lot more pull."

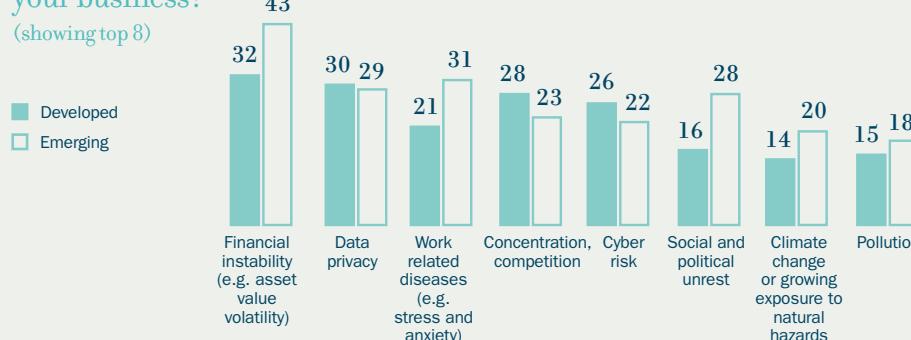
URBAN LEADER, US

"After Hurricane Sandy there was an influx of federal funding. We were able to do a whole lot, more quickly... Having suffered the consequences, we see that we don't want to experience that again."

URBAN LEADER, US



What are the 5 risks and trends that are currently the most impactful for your business?
(showing top 8)





Adapting to the consequences of climate change offers opportunities beyond resilience.

Urban Leaders point to quality of life improvements for the inhabitants of resilient cities as well as economic benefits and opportunities.

SMEs recognize that they can play a significant role in the fight against climate change and **53%** believe that climate change offers an opportunity to their business. Capitalizing on this sentiment offers an opportunity to increase and develop new links between the public and private sectors.

What potential tangible benefits can be expected?

ADAPTATION AS AN OPPORTUNITY: BUILDING RESILIENT COMMUNITIES



Many Urban Leaders recognize the value of focusing climate change policy on adaptation, as resilience offers tangible benefits for cities and communities.

Resilience measures offer empowerment: cities can implement measures that have a direct and visible impact on the community, and results are far less dependent on what happens elsewhere in the world. It offers a way to overcome the “free-rider” challenge of climate change mitigation (in which everyone has an interest in seeing emissions diminish, while continuing to emit on an individual basis).

Quality of life for the city's inhabitants is one of the most important benefits identified by Urban Leaders of resilience initiatives.

As potential outcomes for more resilient cities, Urban Leaders cite better transportation and infrastructure; greater priority given to local needs; lower levels of pollution; and town planning that is better thought-out and more sensitive to local requirements.

Urban Leaders also foresee economic benefits in resilience.

First and foremost, cities with resilient local economies have better local employment opportunities.

In addition, many Urban Leaders, especially in developed markets, recognize the potential of “resilience” as a new industry, which could be central to a city's future growth. The development of technology that can aid resilience is seen as a particular opportunity.

More resilient cities also tend to be more efficient cities, both in the way they use their energy and in the way they do business. In improving the functioning of industries, such as water and energy, resilience has the potential to drive employment prospects and attract talented workers.

The good thing about the resilience strategy is that it's irrelevant what's happening in other places... No matter what, you're building resilience within your community and you're going to get the benefit of that. The local benefits are there.

URBAN LEADER, CANADA



I think [SME resilience] would increase the resilience of our economy, which would be good for the city and for our population. It's good for our businesses, too, which will be more likely to survive, and that will help generate, retain and protect employment.

URBAN LEADER, UK

I compare it to Silicon Valley: we could work in a “Climate Valley” which would be the place where we would anticipate the issues and challenges of global warming, and develop specific technologies and protection measures.

URBAN LEADER, FRANCE

Public-Private Partnerships

Both SMEs and Urban Leasers see climate change as an opportunity for increased partnership between government and business.

Urban Leaders believe more can be done to engage with the private sector – in particular SMEs – given the localized nature of city adaptation and resilience efforts.

Increased partnerships offer great potential in addressing the threats posed by climate change, and Urban Leaders are keen to engage local businesses as part of their resilience efforts.

SMEs believe that the business community shares responsibility with governments for tackling climate change and has the potential to make a meaningful contribution on the issue.

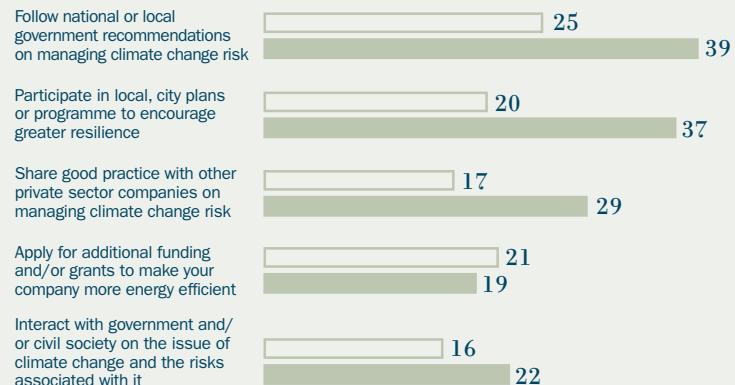
Eighty-four percent of SMEs in emerging markets and 76% of SMEs in developed markets believe that businesses share an equal responsibility with government for tackling climate change. Seventy-five percent of SMEs believe that businesses like theirs can make a real contribution to the fight against climate change.

Despite this, only a limited number of SMEs currently engage with national or local government specifically on adaptation.

Fewer than half the SMEs surveyed say that they follow national or local government recommendations on managing climate change risk and a similar proportion say they participate in local or city planning efforts on resilience. Fewer than one in three share good practices with peers, and fewer than one in four apply for funding or interact with the government or wider society on climate change.

Which, if any,
of the following
do you and
your business
currently do?
(showing top 5)

Developed
Emerging



Currently, public-private partnerships are more likely to exist between governments and larger businesses and corporations.

To date, interaction between government and the private sector on resilience has specifically tended to center on larger companies, including utilities and large construction firms. As a consequence, a substantial majority of SMEs feel they are lagging behind larger corporations when it comes to adaptation, with 67% in developed markets and 79% in emerging markets believing this to be the case.

Urban Leaders foresee an important role for local government in engaging and integrating SMEs into their resilience framework in the future.

Urban Leaders point to positive examples of collaboration with local companies on mitigation, and many have developed partnerships on the issue over time. In many countries – particularly developing ones – governments have also provided incentives to SMEs for working toward mitigation goals.



"We've got a housing-supply crisis at the moment. Finding ways to build more houses more cheaply and make them sustainable for the future is a huge challenge and that means the construction sector should come up with innovative solutions for that."

URBAN LEADER, UK

SMEs themselves widely acknowledge the benefits of mitigation efforts.

This is evidenced by the fact that 57% take measures to save energy and reduce their company's impact on the climate, and 59% recycle and attempt to reduce their waste. Eighty-three percent believe that "efforts by business to mitigate the effects of climate change will not only support sustainable development but will also promote business viability, profitability and competitiveness," and 79% say that this fact makes them consider changing the way in which they conduct business.

Many Urban Leaders feel that currently there is less impetus for private companies to engage on the issue of resilience, particularly if the local or national government is unable to demonstrate there is an immediate threat, either to the business itself or local community. Learning from the successes of public-private partnerships on mitigation will be key for increased collaboration on resilience in the future.



How can the insurance experts accompany the transition?

THE ROLE OF THE INSURANCE INDUSTRY: INCENTIVIZING BEHAVIOURAL CHANGE



Across markets, both Urban Leaders and SMEs are looking for more engagement from the insurance industry in relation to climate change adaptation and resilience.

Urban Leaders point to the potential impact the industry could have, instigating change in behavior by linking insurance premiums to resilience efforts, and by supporting and educating businesses and communities to identify and adapt to risk.

The insurance industry is seen as a highly credible voice on the issue of climate change, but this reputation risks being undermined if insurers are not seen to recognize resilience efforts when developing and costing insurance policies.



SMEs believe the insurance industry has an important role to play in helping them to adapt to the consequences of climate change.

This view is most prevalent among SMEs in emerging markets (77%). However, SMEs also believe that the insurance industry could be doing more. While overall 59% of SMEs say that insurance companies are already playing an important role in helping businesses like theirs adapt to the consequences of climate change, 74% in developed markets and 84% in emerging markets say that insurance companies should be doing more to support businesses and communities.

"The government's bureaucracy usually takes a long time. If the insurance industry could be involved, the process would be quicker and there would be faster compensation for people. The insurance industry should cooperate with the government to provide adequate coverage and compensation."

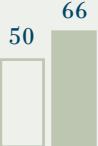
URBAN LEADER, THAILAND



To what extent do you agree or disagree with the following?
(showing % strongly/somewhat agree)

Developed
Emerging

Insurance companies are already playing an important role in helping businesses like mine adapt to the consequences of climate change



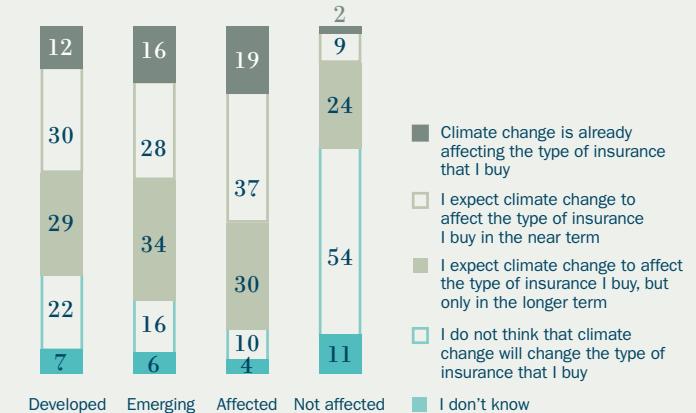
Insurance companies should be doing more to help businesses and communities adapt to the consequences of climate change



"They can be really helpful in encouraging the world's businesses and public-sector organizations to think about their exposure to climate risk and what they can do to become more resilient."

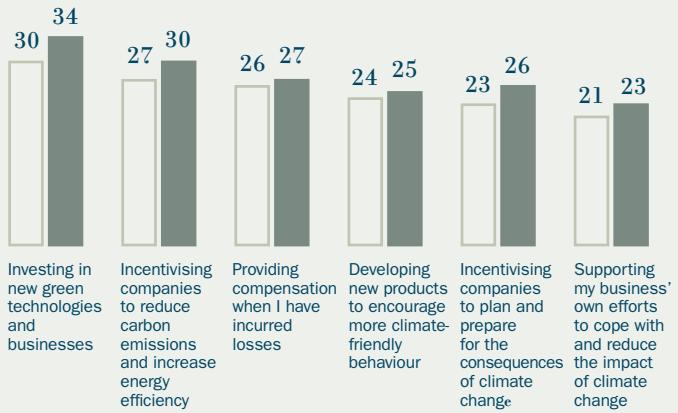
URBAN LEADER, UK

Thinking about the consequences of climate change in relation to the insurance that you buy for your business, which of the following is closer to your view?



Which of the following do you think are the three main priorities an insurance company should have in supporting your business in the context of climate change? (showing top 6)

□ Developed
■ Emerging



For most SMEs, tackling climate change is not yet a factor in their choice of insurance.

Only 12% of those in developed markets and 16% of those in emerging markets are currently taking climate change into account when choosing their level of insurance provision. However, the majority of SMEs expect climate change to affect their choice of insurance at some point in the future. Only SMEs in the UK and the US buck the trend, and are more likely to say that their choice will not be affected. SMEs are far more likely to consider how their insurance needs may change after being affected by climate change. Firsthand experience of the impact of climate change has a significant effect on changing SME expectations of their insurance needs.

"Our government does not have access to accurate risk data because of a lack of resources, but it is very important for decision-making. Insurance companies could help us with this."

URBAN LEADER, BRAZIL

"They can provide incentive for action, because money is the bottom line in so many things. If insurance companies refuse to insure businesses or the Council, or they increase premiums because of a lack of adaptation, then that is a really strong incentive."

URBAN LEADER, UK

Currently, Urban Leaders in emerging markets have a limited view of the role of the insurance industry.

Urban Leaders report that cities typically rely on nationally mandated funds to repair and rebuild after national catastrophes. The insurance sector has an opportunity to take a more active role in the future. Some Urban Leaders believe that insurance companies are able to respond faster and more efficiently to climate-related disasters than governments, specifically in the provision of compensation and cash-relief systems that enable businesses to continue to function in the wake of a disaster or emergency.

For many, the industry's specialist knowledge and expertise in terms of modeling and forecasting climate risk can be better utilized in helping cities plan their resilience strategies.

Urban Leaders are very open to greater involvement from the insurance industry in assessing the risks cities face. Urban Leaders, particularly in emerging markets, emphasize the challenges they face in accessing an up-to-date, accurate risk analysis for their area. City administrations would warmly welcome assistance in calculating the most effective and efficient way to spend their very limited resources. The industry could provide this assistance through risk-modeling and the sharing of data.



The ability of the insurance industry to engage with government officials, the business community and individuals is recognized across markets, as is the potential scope of that engagement. Urban Leaders see the insurance industry as playing a key role in raising awareness.

Insurers need to turn words into actions. Currently, when companies or SMEs take measures to make themselves more resilient, even in developed economies, this tends to have little or no effect on their premiums.

Even so, insurers can help drive behavioral change, by incentivizing action in favor of resilience, and by promoting and rewarding positive behavior.

According to Urban Leaders, the insurance industry has a key role to play in helping educate SMEs about their vulnerabilities to climate risk, and in encouraging behavioral change. Urban Leaders point to the calculation of insurance premiums as a useful way to force SMEs to recognize the benefit of planning and adapting their businesses to ensure they can withstand the impact of climate change. Insurers can assist businesses with the assessment of risk, and suggest tangible and practical measures they can implement to increase the resilience of their organization. Positive behavior on adaptation can then be reinforced through the recognition of resilience efforts in the pricing and designing of insurance policies.



As an insurer, I have had the opportunity to witness time and time again the resilience of our societies. This gives me hope that we will learn from the errors of the past, give ourselves the means to solve the climate conundrum and set ourselves on a path towards a more sustainable future. In any case, we have no choice: a +2°C world might be insurable, a +4°C world would certainly not be."

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