



ACCESSING INTERNATIONAL MARKETS

ADAPTING TO AN UNCERTAIN CLIMATE: A WORLD OF COMMERCIAL OPPORTUNITIES



About this report

Adapting to an uncertain climate: A world of commercial opportunities is a UK Trade & Investment (UKTI) report commissioned from the Economist Intelligence Unit. The report seeks to examine the potential business opportunities, and risks, involved in adapting to anticipated changes in the global climate, such as changing rainfall patterns, rising numbers of extreme weather events and so on. In particular, it examines four key sectors: financial services; infrastructure and construction; professional services and consulting; and agriculture and life sciences. It does not consider business opportunities relating to efforts to stop change occurring in the climate (that is, efforts to mitigate the severity of climate change by reducing greenhouse gas emissions), but rather examines new emerging markets for goods and services as businesses seek to adapt to the realities of an uncertain climate.

To quantify this, the Economist Intelligence Unit conducted a survey of 705 companies globally, representing a range of business sectors, during January and February 2011. The survey attempts to afford even representation to the following regions: Middle East and Africa; Western Europe; Asia Pacific; North America; and Latin America. In line with the specific sectoral focus outlined above, nearly half (46 per cent) of the survey sample was focused on these key sectors; the balance covered a range of other industries. All company sizes were represented: 41 per cent of firms polled had annual revenue of less than US\$500 million, while 44 per cent had revenue of at least US\$1 billion. All respondents held management positions, with just over half (53 per cent) representing the C-suite or board.

All graphs and tables in this report are sourced from the Economist Intelligence Unit's global survey.

To complement the survey findings, the Economist Intelligence Unit also conducted wide-ranging desk research and in-depth interviews with a range of organisations. Our thanks are due to the following for their time and insight (listed alphabetically, by organisation):

- Andrew Brown, climate change and environmental performance manager, Anglian Water
- Denise Dewar, executive director for plant biotechnology, CropLife International
- Paul Jayson, head of sustainability, DLA Piper
- Fernando Moreiro, CEO, HSBC Insurance Brazil
- Michael Riley, deputy portfolio manager for the Energy and Climate Funds, SAM
- Noel Morrin, senior vice-president for sustainability and green support, Skanska
- David Symons, director, WSP Environment & Energy

EXECUTIVE SUMMARY

Climate uncertainty is likely to increase in the decade ahead. In the past few months alone, images of flooding across Australia, Brazil, Sri Lanka, Pakistan and South Africa have filled news channels. Organisations such as the UN suggest that tens of billions of dollars will be needed annually in the coming decades to help countries adapt to the realities of a changing climate. Accordingly, this is an apt time to consider the business risks, as well as the commercial opportunities in adapting to a more unpredictable climate.

This UK Trade & Investment report, commissioned from the Economist Intelligence Unit, seeks to outline these emerging opportunities for business. In particular, it considers four key sectors in detail: financial services; infrastructure and construction; consulting and professional services; and agriculture and life sciences. Its key findings include the following:

Around nine in every ten firms have suffered climate impacts in the past three years

- **Although most businesses are aware of the need to respond to climate change, few are yet actively adjusting.** Only three in ten firms are already actively planning and making changes within their businesses and one in ten firms still thinks that no changes are required at all. Nearly all others recognize the importance of the issue, but say it is not yet a pressing concern. Urgency is greatest in Asia, perhaps reflecting the high climate risks faced there. In contrast, concern is lowest in North America, most likely reflecting divided opinion over climate risks.
- **Around nine in every ten firms have suffered climate impacts in the past three years.** More than half (55 per cent) of firms polled have reported an increase in weather-related impacts over the past three years; just 9 per cent say their companies have not been affected. Impacts have been varied: most are simply disrupted by staff not being able to make it into work, but many have had supply chains disrupted, or have lost revenue. Nearly one in five (17 per cent) have suffered damage to buildings or equipment. Accordingly, a number of businesses plan to invest in measures to cope with such impacts over the next few years. For example, around one in four plans to protect some of their assets through weather-proofing (27 per cent) or upgrading their insurance policies (26 per cent). Most efforts will be handled in-house, but a significant proportion will turn to external consultants or vendors, driving new demand.

- **While risks abound, executives see greater opportunity.** Adaptation involves both risk management (protecting offices and operations, or bolstering supply chains) and opportunity (developing new crop insurance products, or helping to design more resilient structures). Slightly more firms (64 per cent) see opportunity here, rather than risk (53 per cent), although one in three overall thinks it encompasses both. Around one in five (19 per cent) firms has already generated new revenue from such opportunities. Of the four sectors profiled in greater depth in this report, professional services and consulting stands out: 24 per cent of firms in this sector say they have already generated revenue from such work, compared with 19 per cent in infrastructure and construction and 15 per cent in financial services. Far more see growth ahead, some in the short term (25 per cent), but more in the longer-term (36 per cent).
- **Much work is already underway in terms of developing relevant new products and services.** Although adaptation remains a relatively niche area today, a growing market is expected to emerge over the coming decade. Nearly four in ten (39 per cent) of respondents say players in their industry are grabbing competitive advantage from helping clients adapt to climate change. And close to half of firms polled (46 per cent), are conducting related research already. Given the sometimes blurred line between mitigation and adaptation, there are clear synergies and crossovers that will be reflected in this report.
- **Emerging markets are viewed as the primary business growth opportunity, especially within Asia.** The unfortunate reality is that many of today's less developed markets are also most likely to shoulder some of the largest forecast climate impacts. Accordingly, 60 per cent of executives polled point to emerging markets as the number one source of business growth relating to adaptation, ahead of those who look to developed markets (43 per cent). Asia in particular is singled out, with North America and then Europe the next contenders.
- **Limited awareness about adaptation and a shortage of skills are the main obstacles hindering further development.** Several executives interviewed for this report noted the limited awareness from clients when pitching adaptation-related products and services. Furthermore, the subject of climate change itself remains contentious in many markets. In general, a lack of awareness of the opportunities is the primary barrier cited for slow development in this area, along with a shortage of related skills. Seed biotechnologists, engineers, climate modellers, and flood planners are just some of the jobs that will likely be in demand in the decade ahead.

Emerging markets are viewed as the
primary business growth opportunity

REGIONAL VARIANCES

Given that climate impacts vary widely across different regions and countries, the urgency of responses to the issue vary widely too.

In North America, which faces lower risks than some other countries, active responses from business lag other regions: 22 per cent of those polled are making an active response in terms of planning or adapting—below the global average of 31 per cent. In contrast, Asia, which faces clearer climate risks, is well above average, at 37 per cent. In particular, Australia's regular climate extremes are reflected in its responses: 45 per cent of Australian firms polled are actively working on the issue. Europe, meanwhile, sits close to the average, at 33 per cent.

Businesses in the Middle East and across Africa fall right on the global average, although 39 per cent of respondents from the UAE in particular are actively engaged. There, concerns centre largely on water issues. This is perhaps not surprising; in January 2010 the UAE issued a three-volume report detailing the likely impacts of climate change among its member Emirates and the need for adaptation. Work has long been underway on a range of projects, from desalination plants to the huge Masdar City project.

Latin American firms are slightly above the average, at 34 per cent, with Mexico, fresh from hosting the latest UN Climate Change Summit, at 36 per cent, ahead of the US, at 25 per cent. During the Summit, Mexico, along with the UN Development Programme (UNDP), announced a medium-term adaptation plan for the country, which it billed as a world first.

Given that climate impacts vary widely across different regions and countries, the urgency of responses to the issue vary widely too

INTRODUCTION: THE NEED FOR ADAPTATION

During the past decade, a huge global industry catering to rising concerns about energy and climate change has emerged. The most obvious aspect of this has been the boom in production of renewable energies, but related businesses span sectors as diverse as consulting, education, construction and manufacturing. Much of this activity relates to mitigation – efforts to cut the amount of emissions produced by power stations, buildings, vehicles, agriculture, and other sources. Accordingly, there have been many studies looking at what role business can play here. Rather fewer have considered how industries will cope with the consequences of unavoidable changes in the climate through adaptation or how they will best take advantage of related commercial opportunities.

In the years ahead, greater emphasis will need to be placed on adaptation. Regardless of personal opinion about the causes and severity of global climate change, the broad scientific consensus is that it is happening. The fourth assessment report from the UN's Intergovernmental Panel on Climate Change (IPCC)¹ details a wide range of impacts that have already been observed. These include more frequent hot days and heat waves, an increase in hurricane intensity in the North Atlantic, and increases of both drought and heavy rainfall events. Such trends are forecast to continue, with dry regions getting drier, wet regions getting wetter, more droughts and floods, and coastlines exposed to increased erosion. Impacts vary widely between regions, although many poorer countries are expected to be at greater risk.

Accordingly, regardless of what efforts are taken to mitigate the severity of climate change, some adaptation will also be necessary to cope with that change which is already unavoidable. Such efforts are not always carried out in isolation, however: for example, when building new structures, engineers are increasingly considering not only how to reduce the climate impact of such work (mitigation), but also how to make it more resilient against an adverse climate (adaptation).

For businesses, climate change raises clear risks, both directly and indirectly. This is especially so for those operating in areas that could be affected, whether from increased exposure to flooding, disruptions to supply chains, or direct impact on their core business. Accordingly, increased attention to business resilience and risk management will be important here. But adaptation also creates new opportunities, as industries respond to such changes by creating new products and services that help individuals, businesses, cities and governments cope.

For businesses, climate change raises clear risks, but also new opportunities

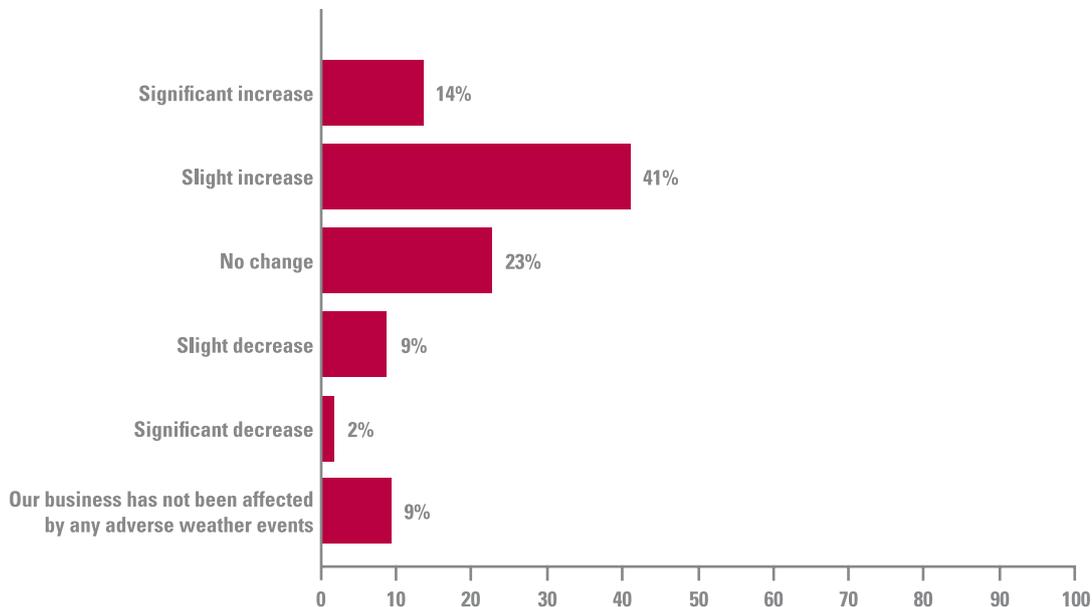
CLIMATE IMPACTS: ADVERSITY AND OPPORTUNITY

Over the past few years, climate-related impacts have rarely been out of the headlines. Record heat waves blighted Russia last summer, while severe drought has parched China more recently. The resulting crop losses in both countries have raised concerns about global food supply, adding to already rapid price inflation. Australia's farming community was similarly affected, shortly before the country experienced its worst flooding in decades, during December and January 2010. In Brazil, the worst floods and mudslides in several decades inflicted great damage upon large swathes of the country. Less damaging, but still significant blizzards and other inclement weather in North America and Europe during November and December have been blamed for disrupting commerce and stalling economic growth.

Businesses have also felt the impact of all this. Executives polled for this report say they have been battling with a higher incidence of adverse weather over the past three years. More than half report an increase in weather-related impacts, while just one in ten say that they have been unaffected (see Table 1). Much of the impact, especially in developed markets, has been in the form of staff being unable to work. But around one in three (31 per cent) has had goods stranded in their supply chains, or lost revenue as a result. And one in five have suffered damage or loss of stock, while 17 per cent have had damage to buildings or equipment. Asian and Latin American firms have felt this most, especially in terms of supply chain disruptions and lost revenue.

Table 1

Q *Over the past 2-3 years, what change has there been to the levels of extreme and unexpected weather events that have had a direct impact on your business?*



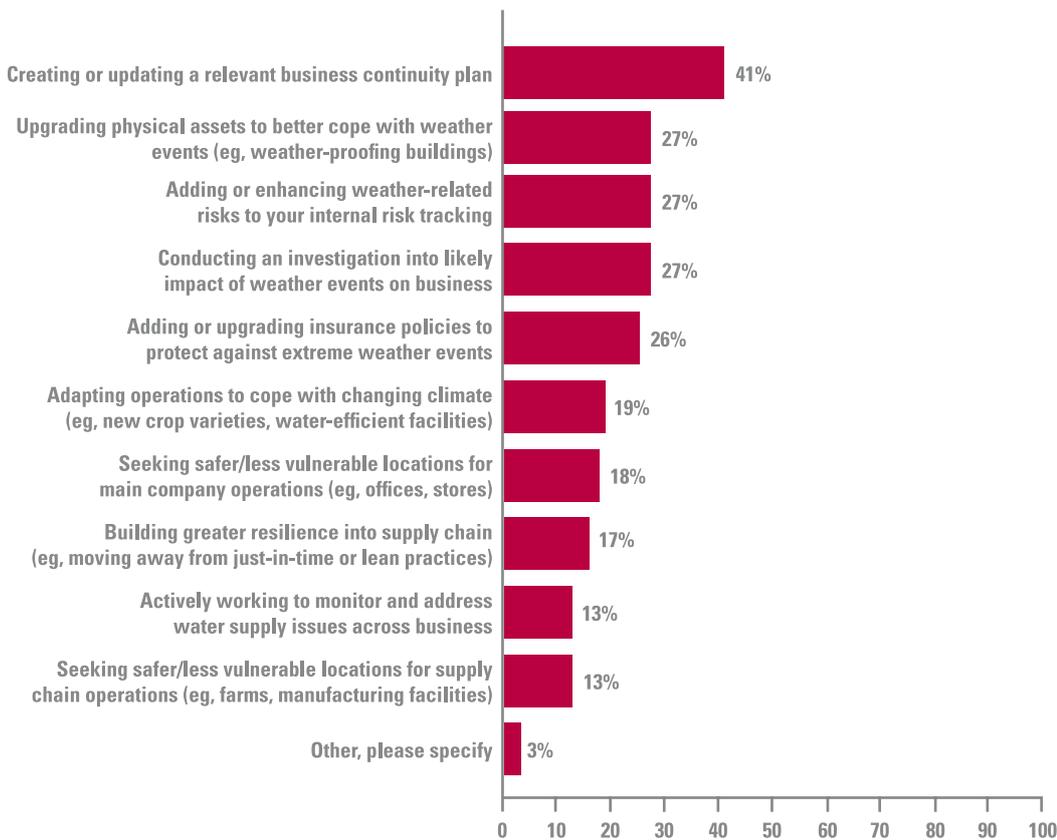


Investing in new protection

In response, many firms are investing better to protect themselves. Much of this takes the form of dusting off business continuity plans, or upgrading risk trackers (see Table 2). But around one in four firms is either upgrading their existing physical assets, for example by weather-proofing buildings, or are taking out new insurance policies. Around one in five plans to adapt their operations better to deal with such changes, such as adopting new crop varieties or more water-efficient facilities.

Table 2

Q Which of the following actions will be pursued within your organisation over the coming 2-3 years (including any that already apply), as a proactive defence against changing weather and extreme weather events?

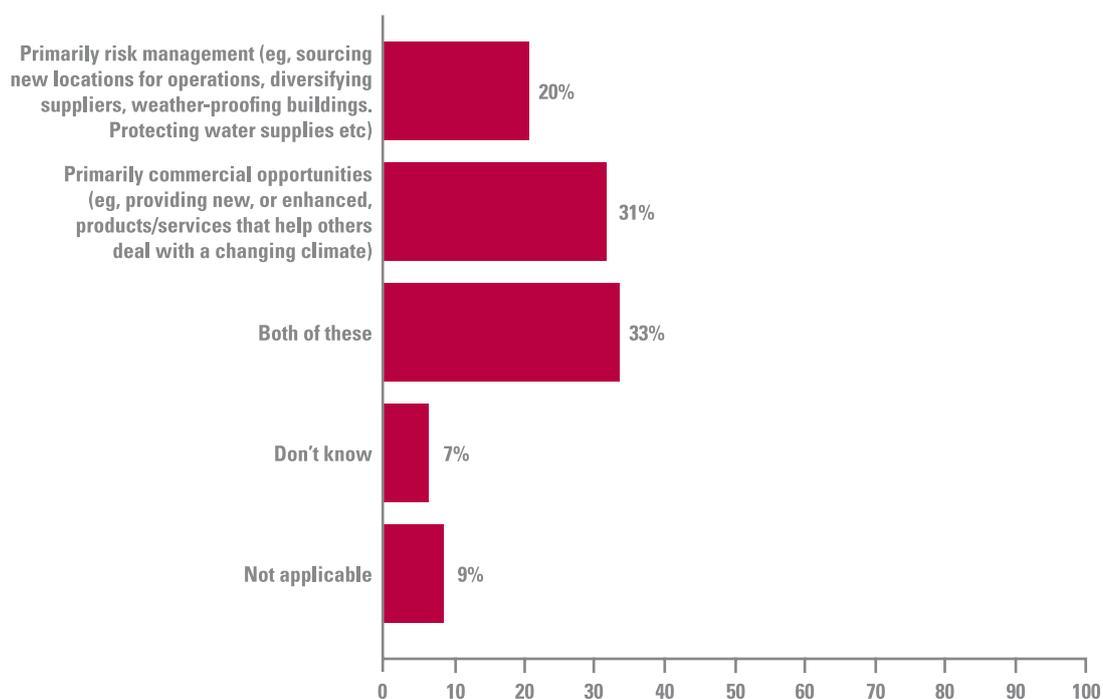


In turn, new products and services are emerging. Executives cite examples ranging from climate-proofing technologies to consulting and risk management services (see Box: Adaptation: A world of emerging opportunities). Four in ten respondents agreed that firms in their sector are already creating competitive advantage by helping others deal with a changing climate, while just 23 per cent disagreed.

As a result, business leans towards an optimistic viewpoint on adaptation. While clearly climate change holds great risks – around half (53 per cent) cite this as a prime concern – an even greater proportion (64 per cent) see it as an opportunity. Of these, one in three see it as an equal risk and opportunity (see Table 3).

Table 3

Q *Regarding any potential changes your firm might make with regards to planning for and/or adapting to an uncertain or changing climate, would these be focussed primarily on risk management or exploiting new commercial opportunities?*



ADAPTATION: A WORLD OF EMERGING OPPORTUNITIES

A selection of responses from executives polled for this report, regarding the opportunities emerging from climate adaptation.

- Seeds and crops: *“New crop varieties, or selling existing varieties in new geographical markets.”*
- More effective water treatment facilities, and a range of other water-related efforts, including recycling and technologies to reduce use.
- City and town planning, from revising existing designs to planning wholly new cities.
- Various climate-proofing products, such as improved roofing and insulation.
- Software applications: *“Consumer software applications and enterprise software applications on mobile devices concerning climate-related services.”*
- Flood and other disaster-response services, from replacement of damaged equipment to clearing up affected areas.
- Flood mitigation and relocation, including adapting coastal defences, levees and other infrastructure for sea-level rises.
- New construction materials, technologies and processes, as well as new approaches to design and planning.
- Climate-related insurance offerings, from building damage to crop losses, and cover for perishable goods.
- Other financial products, from simple loans to help others pay for adaptation work, to climate derivatives and investment funds.
- Advisory, legal and consulting services.
- Risk management services.
- Weather and other information services.
- Public relations and lobbying: *“Offering media and public relations management services to deal with the situations presented by changing climate.”*
- Training and education.
- Medicines and healthcare: *“Change in the demand driven by new geography for diseases that are tropical or sub-tropical, such as dengue in South America.”*
- Supplying alternative raw materials for those that are at risk from climate change.

A major global market emerging

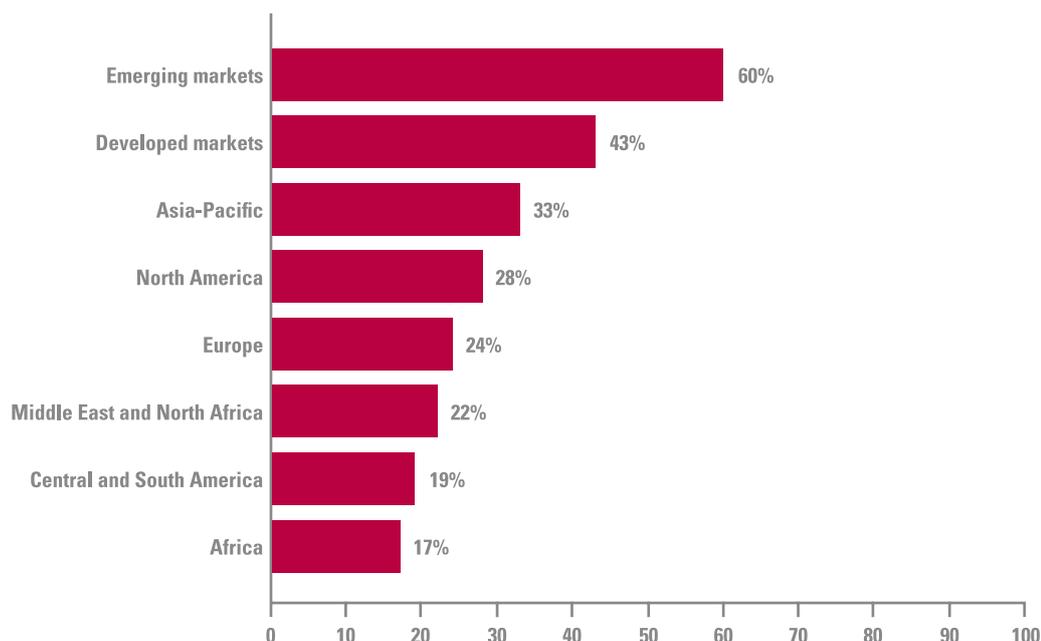
Although climate adaptation is viewed by most as a longer-term opportunity, it is clear that the scale of investment will need to grow substantially. In the coming decades, homes, offices, cities, coastlines, water systems, agriculture and all manner of physical infrastructure and industries will need to be upgraded and adapted. A study from the UN Framework Convention on Climate Change (UNFCCC)² forecasts that US\$49-171 billion will be required annually by 2030, spanning both developed and emerging markets. All this is far less than the total projected spending required for mitigation, which is US\$355 billion by 2030, but is nonetheless significant.

Moreover, these figures may well be understated, especially within poorer countries. A 2010 World Bank consultation report³ estimates the cost of adapting to climate change at US\$75-100 billion annually between 2010 and 2050, for developing countries alone. (Other earlier studies forecast annual costs ranging from as little as US\$4 billion to US\$109 billion per year, over the period 2010-15, indicating the wide degree of variance in this field⁴). Within this, infrastructure (urban drainage, paved roads, public buildings, and so on) accounts for the largest proportion of costs.

Given this, it is hardly surprising that six in every ten firms see emerging markets as the largest single source of growth, ahead of those focusing on developed markets (see Table 4). When it comes to assessing where business opportunities lie, businesses are largely focused on their own region. Globally, though, Asia is the top region of interest overall.

Table 4

Q Which of the following regions and/or types of markets present the greatest opportunity for your industry, if any?



But challenges remain

Who, though, will pay? Emerging markets' access to capital varies widely: across Asia, countries such as Japan, China, South Korea and Singapore are all able to invest heavily. Others will struggle, although they may be aided by a new "green climate fund", agreed at the UN's climate change meeting in Cancún, which promises around US\$100 billion annually by 2020 to assist poorer countries in both mitigation and adaptation.

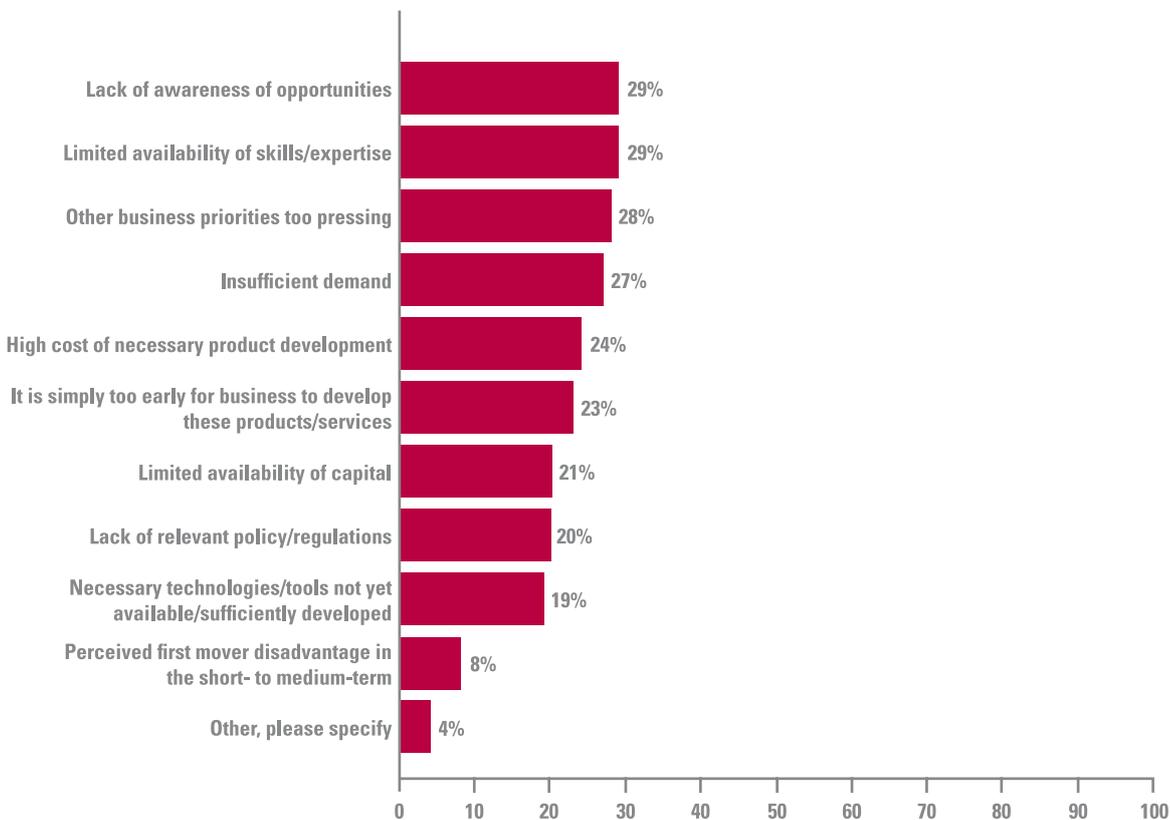
There are other challenges beyond funding. The largest relates to awareness, especially in terms of seeing the opportunities (see Table 5). Several executives interviewed for this report note the lack of awareness of clients when discussing adaptation issues. And in some markets, such as the US, climate change remains a controversial topic; in our survey,

North American firms were least likely to consider this issue a priority (see Box: Regional variances on page 4). A shortage of skills is the second key concern, a point highlighted by a recent UK report on climate change adaptation by the Royal Academy of Engineering⁵, which flags the need to develop relevant skills and awareness.

Naturally, both the scale of the challenges and the opportunities vary widely from industry to industry. Some may feel little of either, while others will face greater risks, as well as greater potential opportunities. The next four chapters of this report review key sectors that are likely to be at the forefront of adaptation to climate change.

Table 5

Q What are the primary barriers to exploiting potential commercial opportunities within your industry?



SECTOR PROFILE: FINANCIAL SERVICES

In major economic development, the financial services sector is usually a crucial component. Climate adaptation is no different, whether in terms of direct lending to finance projects, funds that invest in the sector and provide crucial capital, or insurance products that help individuals and businesses manage their exposure to climate risk.

A small, but significant, minority (15 per cent) of firms in the financial services sector are already marketing adaptation-related products and services to their clients. This is roughly the same size as the group that see short-term opportunities for their business, while far more – one in four – sees longer-term opportunities. Much of this comes from existing markets: more financial services firms see growth opportunities within their current markets than by entering new ones, unlike the other three sectors profiled in this report (see Chart: New growth; sector comparisons). Executives polled for this report offered a wide array of examples of work in which they are involved, from financing relevant projects to running funds that invest in such areas, to specific insurance products. Some are specifically opportunistic, such as efforts that focus on acquiring distressed assets and debts.

According to insurance firm Swiss Re, insured losses alone from weather-related disasters have jumped from US\$5.1 billion annually in 1970-89, to US\$27 billion annually over the last two decades. In 2005 Hurricane Katrina pushed the annual cost to over US\$100 billion in that year. Allianz, a German insurance and financial services group, in 2007 forecasted US\$80-120 billion of annual damage globally from weather-related disasters over the period 2010-19. It has also noted that the number and size of catastrophe bonds has increased sharply in recent years. It is already providing a range of insurance offerings, such as a crop insurance product in Brazil, launched in 2009 in partnership with HSBC, which offers farmers protection against extreme weather events, including strong winds, hail, frost and excessive rain. It is now following this up with other targeted insurance products (see Case Study on page 13).

New growth; sector comparisons (per cent of those polled)

	Professional services & consulting	Financial services	Agriculture and life sciences	Infrastructure and construction
We see potential for new growth/revenue within our existing market	39	42	38	43
We see potential for new growth/revenue within new product/service markets	40	37	41	49

Investing in adaptation

Other parts of the financial services sector are interested in climate adaptation too. SAM, a Swiss investment group that focuses on sustainability-related investments, already allocates nearly 15 per cent of its €118 million (US\$164 million) climate fund to adaptation-related equities, and expects this proportion to grow quickly. “Strategically, adaptation and response should be around 35 per cent of the fund, with adaptation taking most of that share,” says Michael Riley, deputy portfolio manager for the firm’s energy and climate funds. He is specifically interested in areas such as water and coastal infrastructure, building infrastructure, agricultural systems, and knowledge and warning systems. One example is Aecom Technologies, a US firm that specialises in coastal and water infrastructure.

Funds such as SAM’s are attracting interest from institutional investors that are seeking to access the kind of long-term investment opportunities that adaptation can provide. “We see increasing demand in terms of assets under management and also from an increasing number of institutional investors searching for a way to incorporate climate change into their investment strategies,” says Mr Riley. One investment challenge in this sector is that there are few firms focusing solely on adaptation; instead, much of the activity comes from established firms that are moving into this market, especially within infrastructure.

But the global opportunity is clear: “Climate change impacts essentially every geography, so adaptation investment will need to occur on a global basis,” notes Mr Riley. This spans both developed markets, which have massive assets to protect, and developing markets, which are often more at risk. Accordingly, many finance executives polled for this report highlight emerging markets as key targets, in particular the Middle East.

Overall, however, it is clear that climate adaptation remains a niche area of interest. Opinions are about evenly divided as to whether adaptation holds scope for competitive advantage for the financial services sector, or whether it is simply too small at present. The clear reason is that there is simply insufficient demand, as well as a general lack of awareness. It remains to be seen how quickly interest will accelerate.

CASE STUDY

HSBC – risk and return

HSBC, a global financial services firm headquartered in the UK, has developed a range of responses relating to climate adaptation, from both a risk perspective and in terms of opportunity. On the risk front, it released a report in 2009, focused on the G20, which assesses the risk to different countries from expected climate impacts, in terms of food losses, water stress, and rising healthcare costs. This assessment is intended to advise both the bank and its clients on looming risks, but can also help to shape future products. One clear example is the bank’s entry into the crop insurance market, developing, together with Allianz, a German insurance and financial services group, an offering for Brazilian farmers, to help them deal with climate-related losses.

Later this year, HSBC’s Brazilian insurance arm will introduce a new climate offering: an insurance product for individuals that will provide cover to clean and repair homes and cars that are affected by weather events. The product also provides warnings and information to consumers, says Fernando Moreiro, the CEO of HSBC Insurance Brazil. “It’s basically a 24-hour service that gives information about climate and risks of flooding. And if you’ve been flooded, then we would clean your home or car.” Mr Moreiro plans to sell this in conjunction with finance products offered by the bank and believes it will create a huge new market. “If you asked me about the biggest impact, it’s more about homes and businesses; the real impact in terms of changing consumer culture, it’s much more on the people side. What we are planning will really go to the next level.”

SECTOR PROFILE: INFRASTRUCTURE AND CONSTRUCTION

All elements of infrastructure are built to withstand a certain amount of variance in the weather, from cold and wet winters to hot and dry summers. As weather patterns start to change, however, infrastructure and construction firms need to start adapting their projections and build with greater sensitivity to likely impacts down the line.

Such changes in climate need not be major to alter businesses' planning assumptions. Take Anglian Water, a British utility firm, for example. By fiscal year 2006/07 (April-March), it noted that more than 85 per cent of the incidents managed by its wastewater incident team were weather-related, far more than in previous years. It is now actively investing in order to start adapting its infrastructure (see Case Study on page 16). More broadly, such changes are prompting all kinds of utility firms to invest in increased capacity and improved distribution. Fortum, an electricity utility operating in the Nordic countries, has identified not only risks to its power generating ability, but also fines it may incur as a result of lengthy power outages relating to climate impacts. As such, it is investing to increase the capacity and resilience of both its generating assets and transmission network.

Such considerations go well beyond utility firms. Cities, especially coastal ones, face considerable climate-related risks. In the US, New Orleans may be the most visible example of such risks, but others, such as New York, are actively considering how rises in sea level and more frequent storms will impact it. The city plans to become the first major US city comprehensively to assess the risks, costs and potential solutions for adapting to climate change, along with updating its 100-year floodplain maps and amending its building code. In California, city planners at Newport Beach are expecting to raise seawalls, while foundations of new homes are being built substantially higher than in the past to protect against flooding. In some markets, such as the UAE and China, wholly new cities such as Masdar and Tianjin Eco-City are being built that incorporate detailed consideration of future climate impacts.

In practice, however, it is difficult to segregate mitigation and adaptation in infrastructure. When constructing a new office tower, firms consider how to improve overall energy efficiency – a mitigation-related measure – but also think about how robust the structure will need to be to endure future climate impacts – an adaptation-related measure. This even goes down to a materials level: Cemex, a Mexican cement maker, does extensive research into how to reduce the energy required to manufacture its cement, but also looks at how its cement can be used to help make structures more resilient to extreme weather.

In practice, it is difficult to segregate mitigation and adaptation in infrastructure

Infrastructure opportunity

But what is a risk for city planners, utility firms, businesses and homes, is in turn an opportunity for those who build and maintain such assets. From flood defences and more robust office building, to reservoirs needing reinforcement. Accordingly, 38 per cent of infrastructure and construction companies polled see only opportunity resulting from an uncertain climate – slightly more than professional services firms (see Chart: Risk versus opportunity, by sector) and the highest of the four sectors profiled. Another 32 per cent see risk and opportunity in equal measure, making a total of seven in ten firms that see scope to profit. One in three believes it holds immediate short-term potential, again the highest of the four sectors profiled, with a further 43 per cent that see long-term opportunity.

Skanska, a Swedish development and construction company that operates internationally, sees both short- and longer-term opportunity. Noel Morrin, the firm's senior vice-president for sustainability and green support, says the firm is pinning its long-term future on becoming a "deep green" developer and construction partner, which it believes will bolster its competitive advantage over time.

He argues that infrastructure investments that do not factor in future climate impacts – and future regulatory demands in terms of the energy efficiency and carbon impact of structures – will find themselves facing increased risks, both with regard to climate and finance, over the lifecycle of that structure. "The future has to be deep green, future-proof buildings and infrastructure," argues Mr Morrin. "You have to ask how do we future-proof these assets, because, if you don't, then the value of the asset declines."

Skanska goes as far as it can in terms of advising its clients on how to plan for such future changes. Its standard lifecycle analysis looks at climate impacts, including what temperatures might be expected in 15-20 years time, which are now included as default in its private finance initiative (PFI) projects. This encompasses everything from the energy efficiency of a building and its ability to capture rainwater, to how robust it is in the face of changing weather patterns. One example is a school development it is involved with in Bristol in the UK. "Part of the initiative looks at the usability and access of classrooms, so we have had to model the climate impact of classrooms and ensure that classes are neither too hot nor too cold," says Mr Morrin.

Risk versus opportunity, by sector (per cent of those polled)

	Professional services	Financial services	Agriculture and life sciences	Infrastructure and construction
Primarily risk management	21	23	28	17
Primarily commercial opportunities	34	26	20	38
Both of these	31	29	35	32

This is despite the often-bemused looks from clients that greet its engineers when raising climate adaptation issues. As with other sectors, awareness could certainly be higher: “There’s a big need for education in some of our markets,” notes Mr Morrin. This is reflected more widely: around one in three (34 per cent) of firms polled note that limited awareness is a key barrier to exploiting potential commercial opportunity.

Of course, awareness will increase as adaptation-related projects start to proliferate. The EU has conducted a detailed study into the European environment and what will need to be adapted, while a number of countries have started to review the changes that will be required. As a result, awareness is slowly spreading. “In engineering, there’s a growing awareness of how climate impacts on day-to-day design work that engineers are doing,” says David Symons, a director at the environment and energy division of WSP a British engineering consultancy. “As an industry, we’re on a journey with this, with lots of talk and work, but certainly more that needs to be done.”

CASE STUDY

Anglian Water – adapting to new realities

In 2005 the penny dropped for Anglian Water in terms of the need properly to assess looming climate impacts. Its CEO instigated a full review of the implications, which are wide-ranging, especially as much of its business is low-lying and operates along an extensive coastline. “The implications cover almost every element of our business,” says Andrew Brown, the firm’s climate change and environmental performance manager. The company’s latest strategic direction statement outlines climate change as one of the two key challenges faced.

To better understand this, the firm worked with the UK Climate Impacts Programme, and the Tyndall Centre, a UK climate change research agency, to map out the specific impacts faced. It expects wetter winters and drier summers to reduce the availability and quality of water resources, while more intense rainstorms will increase the risk of flooded drains, sewers and treatment works. Longer-term, many of its pumping stations and major coastal infrastructure assets face a threat from rising sea levels.

To deal with these, it has set out three adaptation priorities: immediate (managing risk of flooding and weather-related incidents); imminent (dealing with seasonal changes, for example by increasing winter storage); and “on the horizon” (designing resilient infrastructure for the long term). It has identified 20 water treatment sites for priority flood prevention work and is investing “tens of millions” in enhancing the resilience of its water supply network, as part of its ongoing capital investment. This spending is a small fraction of its overall annual spending of several hundred million pounds, but represents an important shift in planning focus for the longer-term.

SECTOR PROFILE: PROFESSIONAL SERVICES AND CONSULTING

As with any major transition faced by business, governments or individuals, help and advice will be sought: from engineering, planning and design to architecture, legal and management consulting. For many, this will be in terms of risk assessments and considering how to enhance business resilience. For some, it could be in terms of helping to develop new products and services.

Take PricewaterhouseCoopers (PWC), a UK-headquartered professional services firm. It works with its clients on a wide range of sustainability-related services, including specific consultation on adaptation. In the private sector, this is largely focused on risk management: helping firms to identify vulnerabilities, priority risks and cost implications across their business and supply chains, as well as mapping climate risks for investors. A wider range of services is aimed at the public sector, from risk assessments to the development of adaptation plans.

In December 2010 it issued a report advising the private sector to act on adaptation, not only to climate-proof their operations, but also to access new business opportunities. Dr Celine Herweijer, the director of PWC's sustainability and climate change practice, noted at the time that adaptation is not simply a defensive play, but is about "capitalising on new opportunities, innovations and markets. That's the often forgotten story".

In general, consultants and professional services firms will help other businesses both to understand the risks and to capitalise on the opportunities. Work is already underway: around one in four companies in the sector (24 per cent) has already generated revenue relating to climate uncertainty – the highest of the four sectors profiled in this report (see Chart: Firms that have already generated growth/revenue from such opportunities; sector comparison). And nearly one in three (30 per cent) overall sees short-term potential for their business. A high proportion of firms here say they are already creating competitive advantage through new services (39 per cent).

Firms that have already generated growth/revenue from such opportunities; sector comparison (per cent of those polled)

Professional services	24
Infrastructure and construction	19
Financial services	15
Agriculture and life sciences	14

Emerging services

Much of this opportunity lies in straightforward consulting services: advising businesses on how to adapt their operating, financial and strategic practices. A lot of effort will go into sharpening risk management practices and devising business continuity plans. But there is also a wide range of more specific consulting and services, such as developing software to help analyse the impact of natural disasters and other specialised climate services (see Box: Emerging climate services).

Much attention within the consulting industry is given to how to deal with the impacts of weather on physical assets, such as offices, cities, factories and farms. WSP Group has developed a wide-ranging business on the back of climate-change-related services. In terms of adaptation specifically, this involves “quite a lot of hard engineering,” says Mr Symons of the firm’s environment and energy division. “Designing flood defences, re-engineering gas pipelines, and so on. It’s not necessarily sexy, but these are the biggest opportunities for the engineering business resulting from climate change.” Such work in turn requires collaboration with architects, cost consultants, programme managers and management consultancies, among others. For example, WSP Group worked with Foster + Partners, a UK-based architecture firm, to help develop sustainable infrastructure strategies for Masdar City, a new city being created in Abu Dhabi, UAE, that aims to be the world’s first operationally zero-carbon and zero-waste development.

The legal sector is also finding new demand from adaptation. DLA Piper, a global law firm with offices in 29 countries, is advising private sector clients on issues ranging from real estate portfolio management to compliance, while also working with public sector clients on adaptation-related policy creation and implementation. One example relates to flood risk, to help assess the risk and ensure that appropriate measures have been taken in a given situation. “We often get situations, such as big public procurement projects, where the idea is to back up the risk that underpins the deal,” explains Paul Jayson, the firm’s head of sustainability. “We look at who can bear that risk, and then deal with insurers to get insurance, or reinsurance, to back it up.”

To deal with such challenges, DLA Piper taps into its expertise across the globe in order to bring it to bear on all kinds of climate scenarios. “It’s a question of how one innovates and applies that to similar, but different situations,” says Mr Jayson. “For example, our offices in the Gulf of Mexico may deal with issues of flooding, but then in the Middle East they’re handling issues of drought, but using the same principles.”

As DLA Piper's example suggests, being able to source and tap into appropriate skills is a key challenge for consultants and professional services firms. To cope, firms will need to invest in training: helping their engineers, risk managers and consultants develop appropriate experience relating to climate issues. Along with this, demand for new and more specialist skills will also rise.

One example comes from Willis Research Network, a subsidiary of Willis Group, a global insurance and reinsurance broker, which already collaborates with various universities to deepen its research efforts into climate modelling. It ensures a supply of appropriate skills and applies them to its business; it specifically funds PhD students and postdoctoral research fellowships.

EMERGING CLIMATE SERVICES

A range of new services is emerging in response to new, or expected, demands relating to climate services. In the US, Earth Networks, a company that specialises in providing weather data, announced in January that it would invest US\$25 million in new equipment in order to monitor and sell data on greenhouse gases, such as carbon dioxide and methane, to governments and business, the first commercial venture of its kind.

Other firms already provide specialist climate-modelling services, especially for insurers and reinsurance firms, to support risk or catastrophe modelling. For example, AIR Worldwide, a US-based provider of risk modelling and consulting services, helps insurers calculate the likely impacts of floods, storms and other weather events. In 2009 it collaborated with the UK's Meteorological Office to produce a report detailing the financial risks of climate change, from flooding in the UK to typhoons in China.

Much attention within the consulting industry is given to how to deal with the impacts of weather on physical assets, such as offices, cities, factories and farms

SECTOR PROFILE: AGRICULTURE AND LIFE SCIENCES

Although adapting to an uncertain climate is a relatively new concept for many industries, it has essentially been a reality for farmers since farming first existed. “Agriculture has always been adapting to climate change, that’s the nature of farming,” says Denise Dewar, executive director of plant biotechnology at CropLife International, an industry association headquartered in Brussels, Belgium. “We’ve been constantly adapting and increasing yields.”

Now, in addition to that the need to feed a rapidly expanding global population, there is a recognition of the need to overcome greater and more frequent climate shocks. “Things are going to become more unpredictable in future. We’re trying to find ways to find a food supply that is more stable, yields that are more stable, so that we can survive more shocks in the system,” says Ms Dewar.

In turn, such efforts are feeding a wide range of R&D efforts to help the sector. One prime consideration is dealing with rising patterns of water stress and associated rises in soil saline content. Firms such as Pioneer (a technology subsidiary of US-based DuPont) and Syngenta, a Swiss agricultural biotechnology firm, have been working for years to create new products that cater to such concerns. Both firms have recently announced new seeds for drought-tolerant corn, as part of a rising level of competition in the industry for such products.

A recently released plant biotechnology pipeline from CropLife shows a range of crops, encompassing corn, cotton, rice, eggplant and tomato, which have new water stress-tolerant traits currently in development. “More of these traits are coming, with a greater variety of crops coming to the market,” says Ms Dewar. Other efforts in the sector cover related processes: Jain Irrigation, an Indian firm specialising in irrigation systems, has developed various products that reduce water wastage, from drip systems to water filtration.

Given the seriousness of the issue, along with rising pressures on world food supply, both governments and academia are closely involved. Last August, a team of UK researchers released the first sequence coverage of the wheat genome, as part of efforts to deepen understanding of wheat genes and to help develop new varieties that are better able to cope with drought, salinity, or to deliver higher yields. Similarly, the Scottish Crop Research Institute has partnered with Ribena, a UK beverage company, to develop new varieties of blackcurrants that are more resilient and resistant to climate change.

One prime agricultural consideration is dealing with rising patterns of water stress

Healthy business?

Another area that will face new pressures and potential opportunities, relates to healthcare and life sciences. Research from HSBC⁶ suggests that climate change is currently the cause of less than one per cent of the global disease burden, less than half of which is felt within the G20 countries, but that health-related productivity losses could double by 2020, with healthcare costs owing to flooding increasing by 500 per cent. The World Health Organisation (WHO) notes that diseases such as malaria and dengue could spread as rainfall and temperature patterns change. In 2007 Italy reported an outbreak of chikungunya, a tropical virus spread by mosquitoes, the first incidence of the disease noted in Europe, which was blamed on unusually warm weather. More starkly, increased incidences of drought and flooding will lead to more malnutrition and diarrhoea, resulting from reduced sanitation and dirty water.

Accordingly, developing new healthcare approaches or drugs to cater for changing risks will be another area of increased attention. As one healthcare executive polled for this report puts it “Pathogens and diseases are affecting different areas as a result of climate change. Areas previously arid or temperate are becoming wet or tropical, resulting in different insects and diseases. These are opportunities and threats regarding the provision of healthcare and pharmaceutical services.”

Challenges ahead

Across the life sciences and agriculture sector as a whole, nearly half (46 per cent) of firms polled are currently conducting R&D to develop new products, or enhance existing ones (see Chart: Companies currently conducting research and development; sector comparison). For example Nestlé, a Swiss food group, has opened an R&D centre in the Ivory Coast to help improve cocoa production in extreme weather conditions.

But given the complexities of much of the work, especially that related to drug development, one of the top challenges identified by respondents is that of the high cost of product development – second only to the challenging business environment and on a par with insufficient demand. Another issue for drug companies is on the demand side; as many of the impacts, such as malaria, will likely be felt disproportionately within poorer countries, pharmaceutical firms may need carefully to consider how they approach this. GlaxoSmithKline, a UK-based drug company, has already agreed to cut prices on its patented medicines in 50 of the least developed countries, to a maximum of one-quarter of prices in developed countries, in response.

Overall, this was the only sector of the four profiled in this report where more respondents see risks to their business than opportunities: 28 per cent saw only risks, versus 20 per cent who saw only opportunity (a further 35 per cent saw both risk and opportunity in roughly equal measure).

Companies currently conducting research and development; sector comparison (per cent of those polled)

Agree or disagree: we are currently conducting R&D to create/enhance related products/services	Professional services and consulting	Financial services	Agriculture and life sciences	Infrastructure and construction
Agree	47	44	46	39
Neutral	33	33	27	40
Disagree	20	19	24	18

CONCLUSION: TAKING THE NEXT STEPS

As new issues gain prominence, new markets spring up in response. This process is getting underway in terms of adapting to uncertain future climate impacts, although it remains at an early stage – especially in terms of awareness. Many of the forecast effects of climate change will be long-term considerations, so it is understandably currently low on many firms’ radars. Nevertheless, rising climate unpredictability, coupled with increasingly globalised businesses and supply chains sensitive to such changes, means firms would be well advised to put climate risks, and related adaptation opportunities, on their agenda.

Some of the key steps businesses should consider are listed below.

- Get buy-in from senior management. Anglian Water, for example, only got moving on the issue of adaptation once its chief executive got involved in the issue.
- Assess the potential risks and vulnerabilities relating to climate impacts. This should encompass both direct impacts (flood risks, storm exposure, etc) and indirect ones (supply chain disruptions, insurance costs, etc).
- Keep alert as to new opportunities that might be emerging. As awareness of the need to adapt grows, both new government regulations and increased business and consumer demands will stimulate the emergence of new markets.
- Tap into external information. Firms can use related research, such as country-level assessments of likely impacts, to aid internal efforts. Many insurers, for example, are tapping into a range of agencies and academic institutions to help develop risk models.
- Where applicable, develop and refine an adaptation strategy. Set out shorter-term priorities, as well as longer-term aspirations.

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