



Addressing climate change impacts



Preface

“Addressing climate change impacts” is an MIT Technology Review Insights report sponsored by the Michigan Economic Development Corporation (MEDC). To produce this report, MIT Technology Review Insights conducted a survey of senior business executives in the United States. The report also draws on in-depth interviews conducted with executives, government officials, and experts.

Denis McCauley was the author of the report, Teresa Elsey was the editor, and Nicola Crepaldi was the producer. The research is editorially independent, and the views expressed are those of MIT Technology Review Insights.

We would like to thank the following experts for their time and insights:

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Kara Cook, Chief Climate & Energy Strategist, State of Michigan

Scott Thomsen, Chairman & Chief Executive Officer, LuxWall

Virginia Wilkinson, Program Manager, Sustainability Clinic,
University of Michigan School for Environment and Sustainability

About the survey

The survey forming the basis of this report was conducted by MIT Technology Review Insights in June and July 2024. The survey sample consists of 300 executives from businesses across the major regions of the United States: the Northeast (22%), Midwest (19%), South (21%), West (24%), and Northwest (17%). The respondents all hold senior roles in their organizations: 36% are founders, presidents, board members or C-level executives, and 64% are vice presidents, directors, or function heads.

Fourteen industries are represented in the sample, including consumer goods and retail, financial services and insurance, manufacturing, high tech, automotive, and telecommunications. The organizations surveyed range in size: 32% of respondents come from companies employing more than 500 people, 28% come from companies employing between 101 and 500, and the balance come from companies employing fewer than 100.

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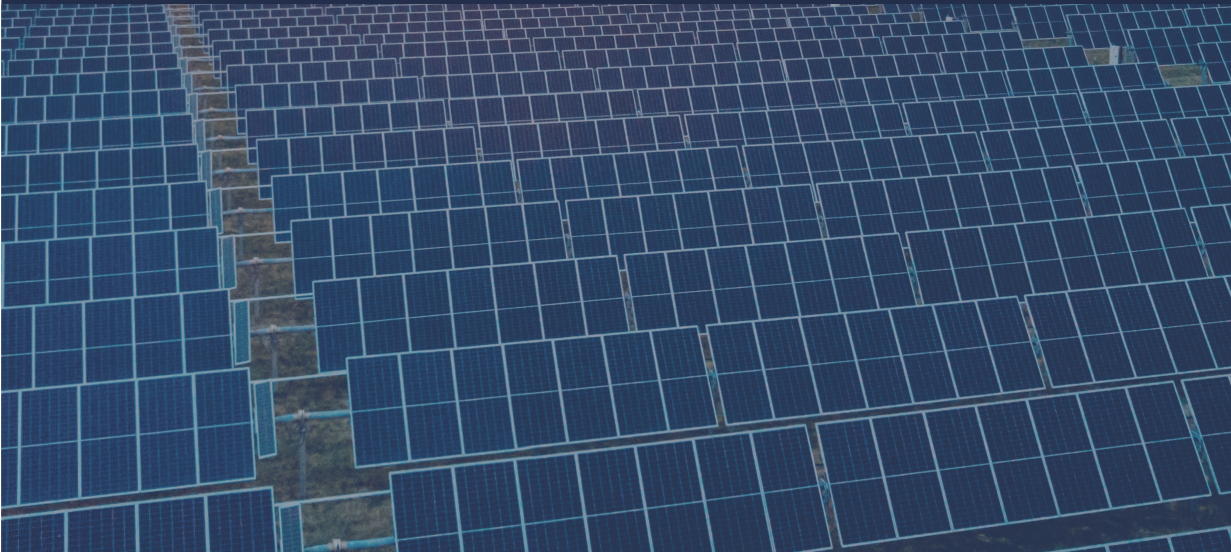
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01

Executive
summary

The reality of climate change has spurred enormous public and private investment worldwide, funding initiatives to mitigate its effects and to adapt to its impacts. That investment has spawned entire industries and countless new businesses, resulting in the creation of new green jobs and contributions to economic growth. In the United States, this includes the single largest climate-related investment in the country's history, made in 2022 as part of the Inflation Reduction Act.

For most US businesses, however, the costs imposed by climate change and the future risks it poses will outweigh growth opportunities afforded by the green sector. In a survey of 300 senior US executives conducted by MIT Technology Review, every respondent agrees that climate change is either harming the economy today or will do so in the future. Most expect their organizations to contend with extreme weather, such as severe storms, flooding, and extreme heat, in the near term. Respondents also report their businesses are already incurring costs related to climate change.

This research examines how US businesses view their climate change risk and the steps they are taking to adapt to climate change's impacts. The results make clear that climate considerations, such as frequency of extreme weather and access to natural resources, are now a prime factor in businesses' site location decisions. As climate change accelerates, such considerations are certain to grow in importance.

Key findings include the following:

- **Businesses are weighing relocation due to climate risks.** Most executives in the survey (62%) deem their physical infrastructure (some or all of it) exposed to the impacts of climate change, with 20% reporting it is "very exposed." A full 75% of respondents report their organization has considered relocating due to climate risk, with 6% indicating they have concrete plans to relocate facilities within the next five years due to climate factors. And 24% report they have already relocated physical infrastructure to prepare for climate change impacts.



- **Companies must lock in the costs of climate change adaptation.** Nearly all US businesses have already suffered from the effects of climate change, judging by the survey. Weighing most heavily thus far, and likely in the future, are increases in operational costs (affecting 64%) and insurance premiums (63%), as well as disruption to operations (61%) and damage to infrastructure (55%).

- **Executives know climate change is here, and many are planning for it.** Four-fifths (81%) of survey respondents deem climate planning and preparedness important to their business, and one-third describe it as very important. There is a seeming lag at some companies, however, at translating this perceived importance into actual planning: only 62% have developed a climate change adaptation plan, and 52% have conducted a climate risk assessment.

- **Climate-planning resources are a key criterion in site location.** When judging a potential new business site on its climate mitigation features, 71% of executives highlight the availability of climate-planning resources as among their top criteria. Nearly two-thirds (64%) also cite

the importance of a location's access to critical natural resources.

- **Though climate change will affect everyone, its risks and impacts vary by region.** No US region is immune to climate change: a majority of surveyed businesses in every region have experienced at least some negative climate change impacts. However, respondents believe the risks are lowest in the Midwest, with nearly half of respondents (47%) naming that region as least exposed to climate change risk.

02

No more time for denial

There was a time when hard-nosed US business leaders questioned the reality of climate change. That time has passed, judging from our research. “The evidence of climate change is growing like a crescendo,” says Scott Thomsen, chairman and CEO of LuxWall, a manufacturer of energy-efficient windows. “We’re certainly seeing it in our industry.”

This certainty was also observed in the survey results. Every executive included in the survey believes that climate change is harming the US economy now or will harm it in the future. A resounding four-fifths (81%) say climate planning and preparedness is important to safeguard their organization’s operations; one-third (33%) deem it very important.

When respondents are asked which climate events are most likely to impact their businesses, “long-term climate shifts” – in other words, climate change writ large – is the most common response, cited by 68% (see Figure 1). More than half of respondents also cite potential damage from individual manifestations of climate change as concerns – severe storms (67%), flooding (55%), and extreme heat (51%).

“People are finally acknowledging that extreme weather events are induced by climate change, and it is raising risks for business,” says Kara Cook, the State of Michigan’s chief climate and energy strategist. Extreme weather, she adds, “has led to companies losing power for days, for example, hurting their workers, their profits, and their ability to expand.”



“People are finally acknowledging that extreme weather events are induced by climate change, and it is raising risks for business.”

Kara Cook, Chief Climate & Energy Strategist, State of Michigan



Figure 1: Anticipated impacts of climate change

In the future, which of the following are likely to impact your business as a result of climate change?



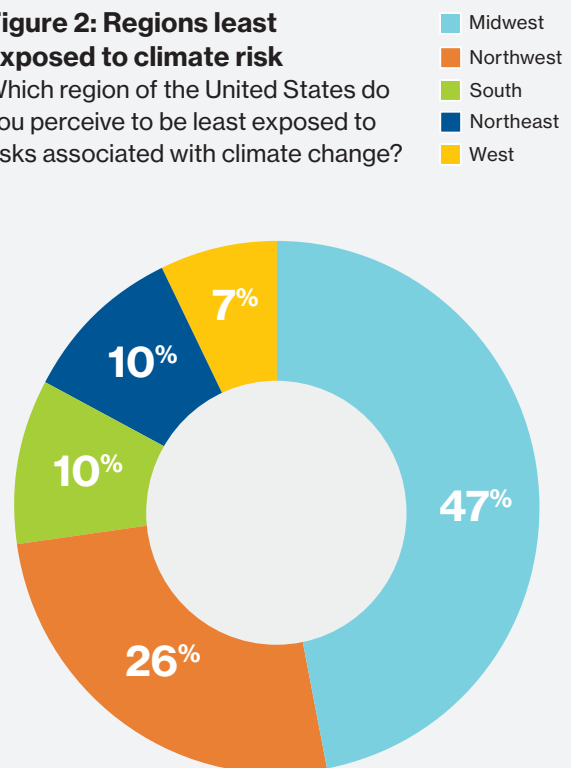
Source: MIT Technology Review Insights survey, 2024

“We’re looking at a massive escalation of climate change in the next few years,” says Shanta Barley, chief climate scientist at Fortescue, an Australia-based green technology, energy, and metals company that aims to eliminate fossil fuels from its main operations in that country by 2030. In recent years, Fortescue has established green hydrogen facilities in several US states, including Michigan. “We understand that decarbonization isn’t a choice but an inevitability, and we want to be ahead of the curve,” she says. “It’s hard work and expensive, but we know that five years from now the world is going to look very different. By 2030, we want to have changed, and chosen how we change, rather than being forced to change by inevitable regulation.”

No parts of the US are immune to the effects of climate change. Some, however, are substantially less exposed to risk than others, according to survey respondents. Nearly half of all respondents (47%) choose the Midwest as the least exposed region of the country (see Figure 2). At the other end of the spectrum is the West (which only 7% choose as least exposed), where extreme heat, drought, and wildfires have been serious challenges in recent years.

Figure 2: Regions least exposed to climate risk

Which region of the United States do you perceive to be least exposed to risks associated with climate change?



Source: MIT Technology Review Insights survey, 2024



“We know that five years from now the world is going to look very different. By 2030, we want to have changed, and chosen how we change, rather than being forced to change by inevitable regulation.”

Shanta Barley, Chief Climate Scientist, Fortescue

Virginia Wilkinson, program manager of the Sustainability Clinic at the University of Michigan's School for Environment and Sustainability, acknowledges that the Midwest may suffer less than other states from extreme weather events. “The number of days disrupted by adverse weather events and natural disasters,” she says, “are broadly less of an issue in Michigan than they are in a lot of geographies.”

She adds, however, that “extreme heat waves, hurricanes, and other unexpected weather events are becoming part of the climate change discussion” across the country. Survey respondents share this view: though there are geographic differences, a large share of respondents, regardless of region, believe that their businesses will be impacted by severe storms, flooding, and extreme heat in the future (see Figure 1).

Weighing the damage

According to the National Climate Assessment, a report produced by the federal government every five years, extreme weather events cost the US almost \$150 billion annually in infrastructure damage, disruptions in labor and public services, and property value losses.¹ Events causing more than \$1 billion in losses are occurring much more frequently, the report notes. In the 1980s, such events (adjusted for inflation) occurred once every four months on average. Today, they occur every three weeks.

The businesses in our survey have certainly felt such impacts (see Figure 3). This has most frequently been through increasing operational costs and rising insurance premiums, cited by almost two-thirds of respondents (64% and 63%, respectively). More than half report their organizations have experienced



Figure 3: The business costs of climate change, past and future

Which of the following impacts of climate change have negatively affected your organization to date, and what future impacts are you most concerned about? (Overall and by region)

Up to today	Overall	Northeast	Midwest	South	West	Northwest
Increased operational costs	64%	72%	62%	60%	58%	71%
Rising insurance costs/ premiums	63%	63%	74%	54%	59%	65%
Disruption to business operations	61%	62%	52%	65%	70%	62%
Damage to physical infrastructure	55%	49%	57%	59%	53%	52%
Negative impacts on the organization's bottom line	39%	51%	41%	30%	41%	35%
Loss of employee productivity	39%	42%	41%	43%	41%	27%
Scarcity of necessary natural resources	37%	37%	38%	29%	41%	40%
Difficulty recruiting or retaining talent	29%	28%	21%	33%	27%	42%
In the future	Overall	Northeast	Midwest	South	West	Northwest
Increased operational costs	66%	57%	67%	78%	56%	73%
Rising insurance costs/ premiums	60%	60%	64%	52%	67%	52%
Disruption to business operations	64%	71%	62%	67%	64%	56%
Damage to physical infrastructure	48%	48%	52%	48%	47%	50%
Negative impacts on the organization's bottom line	46%	51%	55%	41%	47%	37%
Loss of employee productivity	37%	37%	33%	43%	34%	35%
Scarcity of necessary natural resources	42%	40%	41%	32%	41%	58%
Difficulty recruiting or retaining talent	36%	34%	34%	40%	25%	46%

Source: MIT Technology Review Insights survey, 2024

disruption to operations (61%), such as power outages, and damage to physical infrastructure (55%). When asked about future climate change–related impacts on their businesses, business leaders cite the same impacts, with similar levels of concern.

When it comes to operational costs, Thomsen says businesses like LuxWall are feeling the impacts of rising utility bills, including electricity, natural gas, water, and sewage. Rising insurance costs are another consequence of climate change. “We had to get special insurance for a plant we’re building near a river,” says Thomsen. “That’s because there’s a high probability of water level rise during our 20-year lease.”



“Companies can adapt up to a point to the extreme conditions climate change is creating, but ultimately, if we allow emissions to keep rising, we will hit an upper limit of adaptation and productivity will be impacted.”

Shanta Barley, Chief Climate Scientist, Fortescue

Climate’s impact on talent and the workforce

In a 2022 survey, Forbes asked 2000 Americans, “If you were to move in the next year, what would motivate it?” Nearly one-third answered “climate change.”² This suggests that extreme weather and climate shifts will increasingly become a factor in companies’ ability to hire the talent they need. Indeed, many business leaders in the survey are deeply worried about this.

Approximately half (49%) of survey respondents are very concerned about how climate change will impact their ability to recruit talent. Virginia Wilkinson agrees they should be. “Particularly with the escalation of heat events, we are going to see some significant changes in businesses’ ability to attract talent in geographies that are exposed to those types of hazards,” she says. “It will increasingly become a question of whether workers will be able to physically perform construction, agriculture, maintenance, and any number of other roles.”

According to the US Environmental Protection Agency (EPA), the key threats that climate change pose to workers’ health are heat illnesses, such as heat stroke and exhaustion; respiratory illnesses, caused by smoke from wildfires, excess dust during droughts, and longer pollen seasons; insect-related diseases, as warmer temperatures and greater rainfall bring more mosquitos; effects from greater pesticide use in agriculture as pest populations and distribution change; and the physical and mental health effects of dealing with extreme weather events.³

Fortescue, based in Western Australia, knows something about the effects of extreme weather on labor. “Extreme heat events are becoming more frequent where we operate,” says Shanta Barley. “Companies can adapt up to a point to the extreme conditions climate change is creating, but ultimately, if we allow emissions to keep rising, we will hit an upper limit of adaptation and productivity will be impacted.” She notes average nighttime temperatures are actually rising faster than daytime temperatures. Compounded by rising humidity, this is creating a major risk for workers across the tropics and sub-tropics. “If people can’t recover at night from daytime stress,” she says, “we have a major problem. The only solution is for the world to stop burning fossil fuels as soon as possible.”



A disconnect on climate change's economic fallout

As noted earlier, 100% of survey respondents believe that climate change will harm the US economy in the future, if it's not already doing so now. Their views diverge sharply, however, regarding when they think the impact will start to be felt. It seems many are not yet connecting climate-related damage to their own businesses with damage to the wider economy.

Just over one-quarter of survey respondents (26%) believe climate change is harming the national economy today (see Figure 4). The remainder expect that harm to occur on much longer timeframes – 34% think it will happen in 10 years, 29% in 25 years, and 11% in 50 years. Business leaders from the South are more likely than their peers to see economy-wide harm occurring now (33%). By contrast, more than half (55%) of the respondents from the Midwest expect to see economic harm in 25 years or longer, whereas 24% see it occurring now.

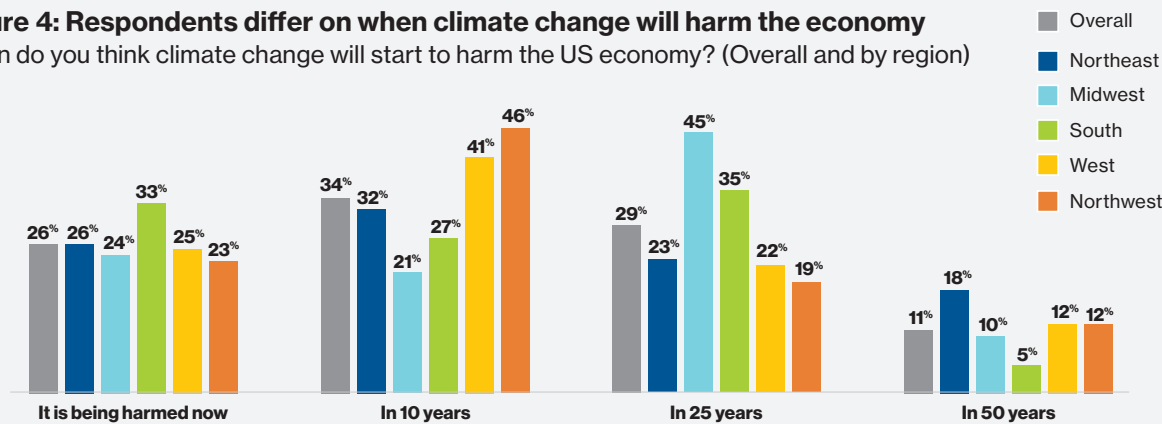
When asked about their own organizations' experiences, however, 100% of respondents identify ways their businesses have already been negatively impacted by climate change. The majority have suffered business disruption (61%) and damage to physical infrastructure (55%). Many also report their operational costs (64%) and insurance premiums (63%) are rising.

For now, it seems respondents are not connecting their personal experiences to current economic impacts from climate change. Though business

leaders are able to report on their own experiences, they may be unaware or less likely to call to mind similar impacts to other organizations in their industry or region, or nationally.

Asked about this discrepancy, Virginia Wilkinson, of the University of Michigan's School for Environment and Sustainability, says, "I would take the side that we're seeing economic harm now, but we're not acknowledging it now because the quantification of that is folded into a lot of operational averages. So, you may be seeing a specific event's impact on a short operational timeframe, but then you average that over the course of a year of operations and you're not seeing those costs as clearly."

Figure 4: Respondents differ on when climate change will harm the economy
When do you think climate change will start to harm the US economy? (Overall and by region)



Source: MIT Technology Review Insights survey, 2024

03

Climate decision-making and adaptation

As recognition of the risks and costs of climate change becomes nearly universal, executives are stepping up to create greater organizational resilience. They are formally assessing their businesses' climate risk and creating climate change adaptation plans.

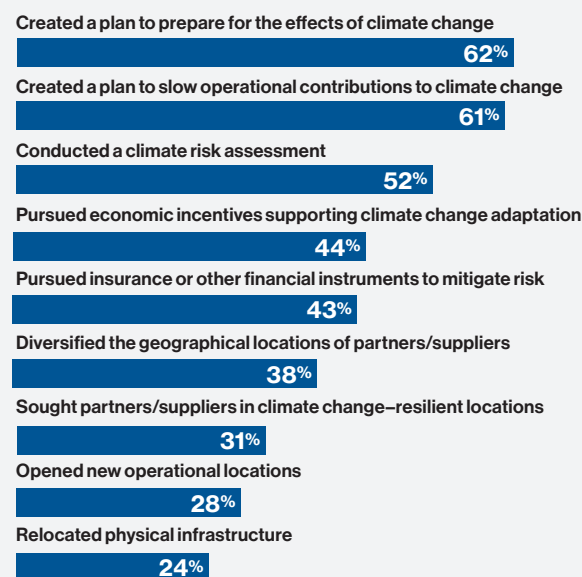
The majority report they are working to lessen their businesses' emissions and climate impacts. Some are even reconsidering the locations of their operations and infrastructure as a strategy for adaptation.

Most executives in our survey (62%) say their organizations have created a plan to prepare for climate change effects (see Figure 5). Just over half (52%) have conducted a climate risk assessment. Cook observes that many companies have developed climate mitigation plans. "Particularly as they develop new sites, they're starting to think about what those resiliency steps are," she says.

Wilkinson agrees that climate adaptation planning is widespread, although it may be labeled differently across companies. "It is a fundamental part of emergency preparedness today," she says. "Not all

Figure 5: Measures taken to address climate risk

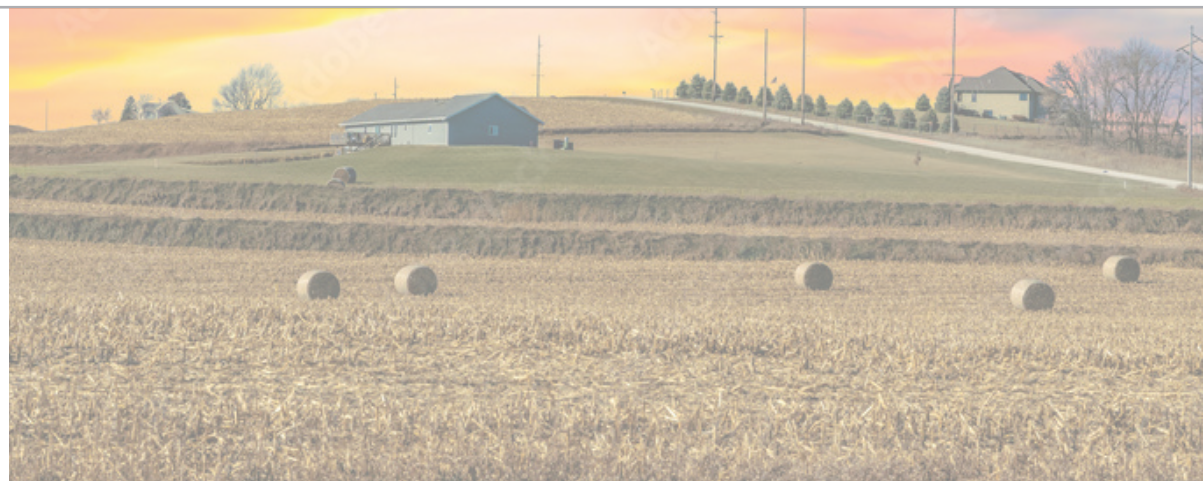
What actions has your business taken to prepare for the potential impacts of climate change?



Source: MIT Technology Review Insights survey, 2024

“Climate adaptation planning is a fundamental part of emergency preparedness today.”

Virginia Wilkinson, Program Manager, Sustainability Clinic, University of Michigan School for Environment and Sustainability



companies may refer to it as climate adaptation, but they'll look at it as they would any effort to add resiliency to their business."

At the same time, there is a noticeable gap between the 62% of businesses that have begun planning for climate change effects and the 81% of executives who deem climate planning as important to their business. This discrepancy suggests a lag in translating senior management's awareness of climate change into actual plans at some organizations.

Insurance is another common step to reduce climate risk: 43% of respondents' companies have sought insurance or other financial instruments for this purpose. This is notwithstanding the rising premiums many report having to pay. Several have also taken steps to reduce their supply chain's exposure to climate risk: 38% have diversified the locations of their suppliers, and 31% have prioritized climate-resilient locations when choosing new suppliers.

Finally, many businesses recognize the importance of reducing their own environmental footprint, or climate change mitigation. Among the respondents, 61% say their planning includes slowing their organization's contributions to climate change. Such measures are likely to include limiting or cutting carbon emissions, reducing material waste, or recycling water on site.

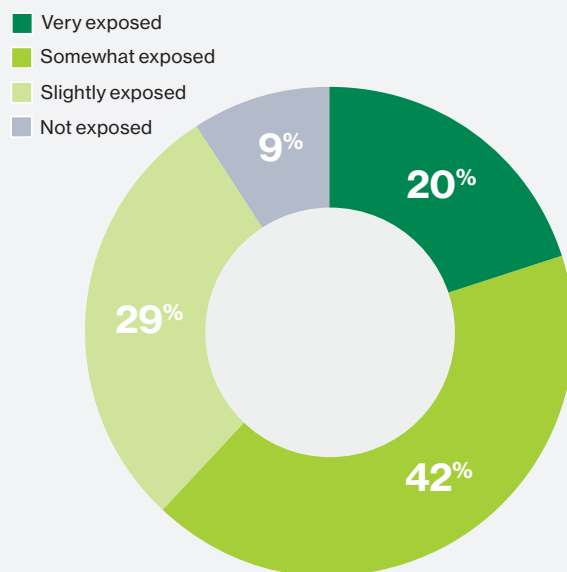
Infrastructure at risk

Many organizations find that a large share of their climate risk is tied to their physical infrastructure,

which could be damaged by extreme weather, rendered inoperative by utility outages or resource shortages, or otherwise harmed by climate change effects. Most executives surveyed (62%) consider their organizations' physical infrastructure to be at least somewhat exposed to the impacts of climate change (see Figure 6). One-fifth (20%) deem it to be very exposed. Those in the West (67%) are the most likely to say their facilities are somewhat or very exposed; those in the Northwest

Figure 6: Infrastructure exposure to climate change risk

To what extent is the physical infrastructure of your business exposed to the impacts of climate change?



Source: MIT Technology Review Insights survey, 2024

“We looked at the probability of tornadoes, hurricanes, and other extreme storms. We looked at water availability. And we looked at grid resilience.”

Scott Thomsen, Chairman & Chief Executive Officer, LuxWall

(54%) and Midwest (60%) are the least likely to, although a majority still express concern.

What are businesses doing to address their infrastructure's exposure to climate change effects? Anecdotal evidence points, for example, to utilities relocating substations away from areas exposed to wildfires or floods; to businesses strengthening their facilities to better protect against hurricanes and other extreme storms; and to manufacturers building water treatment and recycling facilities in areas where water sufficiency cannot always be guaranteed.⁴

Location, location, location

Another way to build business resilience is to relocate or build new infrastructure in a region less exposed to risks of particular concern. Many organizations (28% of those surveyed) have opened new locations for their facilities with climate considerations firmly in mind.

Climate risk has featured prominently in Fortescue's decision-making on new locations in the US, according to Barley. “It's not the only factor, and not necessarily the dominant one, because there are other factors at play [such as commercial viability]. But it's come in for a lot of attention in our different projects,” she says.

Founded and based in Ypsilanti, Michigan, LuxWall considered six Midwestern states for a new glass-making facility. According to Thomsen, it compared the different locations on R&D tax credits and other financial incentives. Weather and resource availability were also key factors.

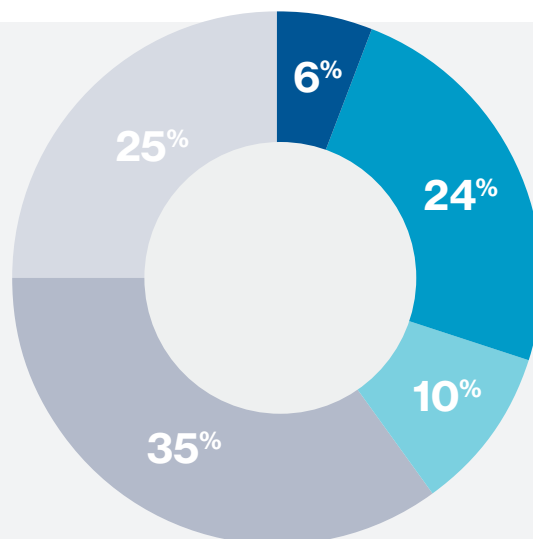
“We looked at the probability of tornadoes, hurricanes, and other extreme storms,” says Thomsen. “We looked at water availability, because we use quite a bit of water for our process, and we try to re-use water. But some places didn't have the infrastructure to handle the daily discharge. And we looked at grid resilience, because we need power to run our glass ovens.” In the end, grid resilience was the decisive factor. “If you don't have power, you can't run a plant,” says Thomsen. The company ultimately settled on Detroit for the new site.

Another 24% of respondents say their companies have gone as far as relocating physical infrastructure due to climate change risks. Asked about the future, 6% report concrete plans to relocate facilities within the next five years due to climate factors, and another 10% are considering doing so in that time frame. Another 59% are planning, or at least considering, a relocation in the longer term (see Figure 7).

Figure 7: Relocating to address climate risk

Has your organization considered relocating its physical infrastructure due to climate change risks?

- Planning to relocate (in < 5 years)
- Planning to relocate (in 5+ years)
- Considering relocating (in < 5 years)
- Considering relocating (in 5+ years)
- Not considering relocating



Source: MIT Technology Review Insights survey, 2024

As some regions begin to experience climate change-related drought, Cook sees some companies looking to secure sufficient water supply through relocation. “Semiconductor fabrication facilities, for example, consume large amounts of water,” she says. “We see fabs in the Southwest, for example, looking at new sites in the Midwest and South.”

Not surprisingly, greater exposure to climate risk appears to be related to motivation to relocate. Businesses that deem themselves as very exposed to climate risk are more than twice as likely as those in the overall sample (14% vs 6%) to be planning for relocation in the medium term (five years). The “very exposed” group is also much more likely to be planning a longer-term relocation of facilities (more than five years; 39% vs 22%).

“Semiconductor fabrication facilities, for example, consume large amounts of water. We see fabs in the Southwest, for example, looking at new sites in the Midwest and South.”

Kara Cook, Chief Climate & Energy Strategist, State of Michigan

Climate change mitigation and adaptation

Climate change mitigation refers to efforts to stop or slow contributions to climate change, generally by reducing greenhouse gas emissions. Carbon-neutrality goals set by businesses and localities are mitigation efforts. These can include shifts to clean energy, reductions in energy consumption, or attempts to capture greenhouse gases via initiatives like reforestation.

Climate change adaptation refers to initiatives to prepare for and adapt to the changes caused by climate change. These actions increase resilience to impacts of

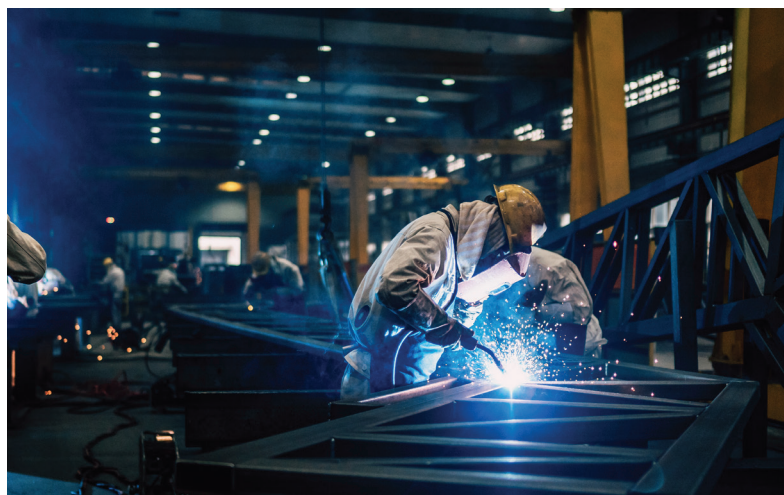
climate change, ranging from nations strengthening their coastal infrastructure against extreme weather to individual organizations developing business continuity strategies for disaster scenarios.

Although this report is primarily focused on adaptation, businesses surveyed for this report seem to be pursuing mitigation and adaptation strategies in tandem: 61% have a plan to slow their operational contributions to climate change, whereas 62% have a plan to prepare for the effects of climate change. Similarly, they value a mixture of

mitigation and adaptation resources when assessing possible business locations, expressing interest in regions that offer climate-planning resources (71%), disaster-preparedness or climate-adaptation plans (52%), clean energy infrastructure (49%), and carbon-neutrality goals (37%).



04

Natural partners
for resilience

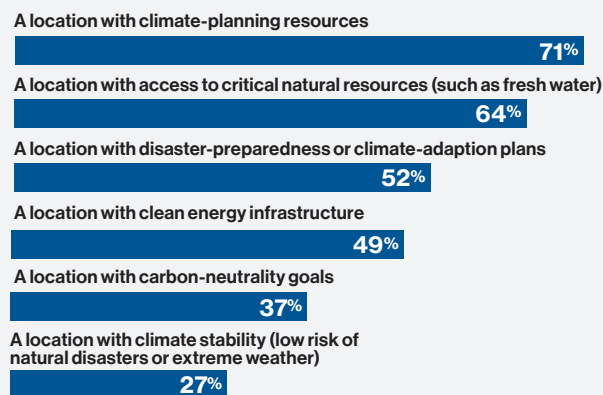
Business and government have not always seen eye-to-eye on how to mitigate and adapt to climate change, particularly when government-mandated steps impose costs on companies. But business leaders are now well aware of the risks climate change poses to their operations, and they are seeking government help to mitigate those risks.

Companies look to government for public infrastructure – electricity grids, roads, ports, and dams, for example. Now, that infrastructure needs improved resilience due to extreme weather and other climate change-related disruptions.

“It’s the main thing businesses here tell us they need,” says Cook. “It’s roads and other transport, so employees can get due to work and goods can be shipped. And it’s the reliability of the power grid, particularly as we have old distribution infrastructure.”

Figure 8: What states and localities can offer to business

When assessing a potential new business location’s ability to mitigate climate change risks, which of the following features are most attractive to you? (Percentage of respondents ranking feature in their top three)



Source: MIT Technology Review Insights survey, 2024

LuxWall builds its own resilience

“You’ve got to do more for the climate within your own four walls,” says LuxWall CEO Scott Thomsen.

A producer of energy-efficient windows, his Ypsilanti, Michigan-based company recently selected Detroit as the site of its second glass-manufacturing facility.

With this brand-new project, for which the company has received \$32 million from the US Department of Energy, LuxWall can build climate resilience into the factory from the start. Thomsen says the opportunity is not being wasted. In addition to addressing climate risk, he says, the company’s resilience initiatives should also have cost benefits and assist the local community.

Glass production, for example, requires enormous quantities of water. To enable a sufficient supply, while also using natural resources responsibly, the new LuxWall plant will feature water recirculation capabilities. “We’re putting in recirculation to meet

our production needs, but also to help soften future increases in city water charges,” says Thomsen.

The company is also building an electricity substation to ensure that the plant can continue to operate even through local power disruptions. “It’s going to cost us \$3 million of capital,” says Thomsen, “and we’ll need to sign up to a load-sharing contract, but we can’t take the risk of not having power.” Solar panels on the roof may also help ensure energy resilience. “We’re trying to become more utility-independent,” explains Thomsen. “Otherwise, manufacturing costs can get out of your control, and you can’t always pass on the cost increases.”

LuxWall will also install emissions abatement technology in the Detroit plant. “Local communities are so much more climate-aware today,” says Thomsen, “and we have to be sure that as little emissions as possible get out of the factory.”

Many of the executives surveyed also want help with climate planning. When respondents were asked to rank climate change–related features of prospective new business locations, climate-planning resources came out on top, with 71% of respondents including that choice in their top three (see Figure 8). A majority of respondents also prioritize a location’s access to critical natural resources, such as water (64%), and the existence of disaster preparedness or climate adaptation plans (52%).

An example of this type of climate-planning resource, says Cook, is the development advice that Michigan state agencies can provide businesses, such as helping them understand the value of existing wetlands in preventing site flooding. “We also encourage companies to look at innovative technologies that enhance resilience – for example, microgrids or on-site renewable energy storage,” she adds. These technologies build companies’ own resilience, but they may also enable the business to profit and the community to benefit from surplus energy fed back into the public grid.

Cook also finds that businesses not only seek government help in climate planning, but also many are looking to return the favor, becoming a partner in the state’s planning. “Many have said they want to help us with our climate mitigation plan,” she says, referring to the MI Healthy Climate Plan. “They know the more we can do on mitigation, the better the chance they will avoid worse impacts in the future.”

This is a relatively recent phenomenon, however, says Cook, and she has yet to see substantial manifestations of it. One place she would like to see more business participation in is public advocacy for state climate-resilience initiatives. The governor of Michigan recently managed to secure budget funding from the state legislature for infrastructure initiatives that will improve flood resilience, she notes: “In the future, we’d like businesses to be part of those conversations with our legislature to say, ‘This is something that we want to get done.’”

05

Conclusion

When it comes to business readiness for climate change in the US, this research offers both sobering news and grounds for reassurance. All survey respondents agree that the effects of climate change will eventually harm the US economy – there is no evidence of lingering climate change denial in executive suites. As well, respondents consistently report that climate change has already had negative impacts on their own businesses.

Organizations appear ready to adjust to this reality, understanding that adapting to climate change is a business necessity. But while business planning for climate change risk is widespread, it does not yet appear to be universal. There is a considerable gap between organizations claiming that such planning is important to their business and those that have actually developed their own plan. Additionally, though all businesses represented in our survey have already incurred climate-related costs themselves, only a minority of executives acknowledge that climate change is currently affecting the wider economy.

For executives cognizant of the risks of climate change but unsure of how to prepare their companies for it, this research offers a few key takeaways:

- **Invest in climate resilience now.** Regardless of when economic impacts become fully apparent, now is the time to begin adapting. Relatively low-stakes investments, such as commissioning a climate risk assessment, or purchasing insurance to help cover the financial risks of extreme weather, can be a good start. Companies should also review the climate risk faced by their suppliers and partners; diversifying sources of key inputs could mean avoiding production stoppages in the future. More

substantial investments, such as building new facilities, will also benefit from longer lead time.

- **Emphasize climate criteria when evaluating business locations.** Local operating costs and access to talent are critical, but the sufficiency of natural resources such as water are no longer a given everywhere. The types and likelihood of extreme weather should also figure in site selection. Climate risk assessments that accompany site selection processes should consider more than the adequacy of utilities and the risk of business downtime; they must also gauge the impact of extreme weather, especially heat, on the workforce.

- **Assess and use local climate planning resources.** Some state and local authorities have been more proactive than others in offering advice for climate risk mitigation to businesses. Jurisdictions that have climate adaptation plans of their own, for example, are more likely to have resources for businesses, including those businesses that are scouting future sites for facilities.

- **Collaborate with state and local government.** Everyone has a vital stake in limiting the impacts of climate change and adapting to its effects, and the scope of the necessary changes will require teamwork. Businesses may not agree with every climate decision by government, but they should seek to have a voice in public climate planning. By understanding the issues at stake, for their business and for the community at large, and by participating in the conversation, they can work toward mutually beneficial ends, transforming shared challenges into shared opportunities.

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About Michigan Economic Development Corporation

The Michigan Economic Development Corporation, in collaboration with more than 100 economic development partners, markets Michigan as the place to do business, assists businesses in their growth strategies, and fosters the growth of vibrant communities across the state.



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Endnotes

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