



**Re|imagining**  
resilience in a post  
pandemic world

NOT IF, BUT HOW

Munich RE 

# Climate change represents one of the greatest long-term risks in the insurance industry.

According to the World Economic Forum's 2020 Global Risks Report<sup>1</sup> – **climate action failure is the highest global risk in terms of impact**. Two of the three top risks in terms of likelihood are extreme weather and natural disasters.

A fundamental question is facing our society. How can we avoid disastrous consequences with respect to climate change risk? The early warnings are here right now for climate change – recent catastrophes such as severe flooding events and the devastating California wildfires are just two examples. The COVID-19 pandemic has illustrated that the best course of action is on an ex-ante basis rather than an ex-post one. Our society needs to act immediately to mitigate and adapt to the effects of climate change and strengthen our resilience.

Munich Re Group (“Munich Re”) first began tackling the emerging issue of climate change risk in the 1970s. Since then we have been analyzing long-term data on meteorology and losses in order to better understand the risks of change in a warmer climate. As a leader in the climate risk space, Munich Re has been carbon neutral since 2015 and employs subject matter experts from a variety of fields including meteorology, climatology, seismology, hydrology, geoinformatics, data analytics, and engineering. These scientists combine our deep institutional knowledge with cutting-edge expertise to help clients identify the most important and relevant climate change risks that could adversely impact them.

There is strong evidence that climate change has already had a significant influence on the frequency and severity of some types of natural disasters and extreme weather events in regions across the world. Incidents such as hurricanes,

wildfires, and floods might widen the protection gap that already exists between economic and insured losses if successful counter measures are not taken to reduce the vulnerability of property and business interruption risks to these perils. Education is another vital aspect in climate change mitigation, and Munich Re is enhancing general risk awareness by initiating a wide range of prevention and adaptation measures to help protect people and make vulnerable communities more resilient.

Understanding the size and ramifications of the protection gap and the scope of potential losses due to climate change is critical for many in our society – insurers, brokers, regulators, members of the public sector, and financial institutions. The insurance industry has a tremendous opportunity to help close this protection gap. Effective methods include the offering of innovative risk transfer solutions for weather perils and the development of risk transfer products and services that incentivize resilience and risk mitigation. Another way is through supporting people and communities as they manage the impact of climate change.

Traditionally, Munich Re has focused coverage on peak risks associated with increased frequency and severity of natural disasters. The company is increasingly working on initiatives to address both loss mitigation and prevention, as well as developing innovative solutions to measure and transfer climate risk. This approach will facilitate adaptation to climate change, foster climate-friendly technologies, and help communities become more resilient.

## Introduction

COVID-19 led to vast societal and economic disruption on a global scale, and per analogy, climate change could also result in far-reaching and detrimental societal and economic impacts. As history shows, we are in a critical period where powerful steps can be taken to help make society resilient against future catastrophes and mitigate the impacts of global warming.

There are several parallels between pandemics and the future catastrophes that climate change could bring. First, they are both systemic by nature. Despite decades of warning and the recent lessons of SARS, Swine Flu and Zika, the world was caught relatively flat-footed by COVID-19. Economies ground to a halt. Entire patterns of work, commerce, and social interaction were altered, at least for an extended period. This event was unprecedented in that its disruption was simultaneously felt in almost every corner of the world.

Recent natural disasters, such as the Australian wildfires in 2019/2020 and catastrophic flood events suffered by southeastern Texas over the past 5 years, including Hurricane Harvey and Tropical Storm Imelda, serve as a similar bellwether. The need for longer-term prevention strategies in these areas was identified long before; yet, these were sidelined in favor of short-term priorities. If vulnerable regions continue to deprioritize long-term strategies, the risk of unexpected and severe global disruption due to extreme weather events and knock-on effects, from supply chain disruption to food and water shortage and migration pressure, will grow.

Although the pandemic revealed vulnerability to such catastrophes, the collective response of governments, business entities, and individuals has demonstrated society's ability to learn from and adapt to the situation. Ideas that were previously thought to be impossible – like entirely remote workforces – suddenly became possible. The world has found new ways to carry on. However, as discussed before, the benefits of preparedness to these catastrophes far outweigh (with compounding impacts) the response after the event.

As nations move from response to recovery, they will think more about how to prevent future pandemics. Given the comparative severity and urgency, any exploration of resilience must also involve the impacts of climate change. Like pandemic response, the work to promote resilience against climate change must be collective. The insurance industry will have an important role to play. Better risk

transfer solutions mean a faster recovery. Education and expertise in risk assessment will guide governments and businesses towards making meaningful policy shifts. And a new generation of technologies, practices, and standards will help reshape the way we mitigate – and manage – the risks of climate change.

## How pandemics can reshape the thinking around climate risk

History shows that few things spur meaningful, long-lasting change as catastrophes. Throughout Munich Re's nearly fifty year legacy in climate risk and natural disasters, we've seen that the greatest leaps are made in the wake of destructive events.

1992's Hurricane Andrew exemplifies this. The unprecedented scale and severity of the damage, in part reportedly caused by lax building code enforcement, compelled the state of Florida to make broad changes that would help protect its citizens against future hurricanes. Building codes were toughened, codes were locally enforced, and planning was modernized. Since these codes went into effect, Florida has endured several new hurricane events, and post-event surveys and claims analysis show that strict building codes significantly reduce the damage to homes and businesses as compared to pre-code structures. Similarly, Andrew also forced the insurance industry to change, as the storm rendered 11 insurers insolvent in a span of six hours. In response, the insurance industry developed and leveraged new technologies and risk models to improve their understanding of hurricane risk on their portfolios, an action that has led to far fewer insolvencies due to natural catastrophes since then.



Today, there is a similarly valuable opportunity to refashion the way we as a society, think, behave, and act, so that we become resilient against future disasters

### Acknowledging 'gray rhino' risk

To make meaningful change, it's important for society to embrace the idea that these events are not anomalies or 'black swans', but more like 'gray rhinos.' A term popularized by the American policy analyst Michele Wucker, 'gray rhino' events are those which are highly probable, highly impactful, and often neglected.<sup>2</sup> Extreme events like a pandemic or natural catastrophe may seem like they are once-in-a-lifetime. But, because of globalization and the practices associated with it – urbanization, deforestation, consumption, and mass travel – these events are likely to become more common, especially if our collective behavior remains unchanged.<sup>3</sup>



The importance of embracing 'gray rhino' events was evident in the initial response to COVID-19. During the first and second quarters of 2020, those countries that better understood the risks associated with a global pandemic were the most prepared, suffered less disruption, and were able to return to everyday life more quickly.

Likewise, a greater acceptance of climate change and the risk of 'gray rhino' events opens the door for governments, enterprises and others to build resilience. It's important for these stakeholders to understand that just because climate

change will impact different locations at various rates does not mean that it is not a global risk. Catastrophic wildfires, destructive storms, and record floods in Australia, America, and Southeast Asia signal what's ahead if climate change remains unchecked.

### Learning from the pandemic response

Climate change calls for better coordinated action and information sharing than we've seen in the pandemic response. It's widely understood, for example, that vaccine development will progress slowly without an exchange of scientific information among virologists, scientists, and labs. Likewise, the lessons from countries, states, and cities which have made the greatest leaps towards disaster prevention will help other places become more resilient.

Insurance companies, governments, businesses, and individuals all play an important role in developing resiliency. Working together, these stakeholders can make substantial progress in ensuring the world becomes better prepared for what lies ahead.

Like pandemics, building resilience towards climate change requires immediate and longer-term strategies. Because reducing the world's carbon emissions requires technological, behavioral, and structural shifts in the way businesses are run and the way goods are manufactured and people move around, there is a tendency to believe that remedial steps will take years or decades.

Yet, in addition to necessary longer-term changes, there are immediate actions that all stakeholders can take towards developing resilience. Many of these offer significant economic benefits and better quality of life. More importantly, they have a compounding effect – the more people act, the more impactful their collective efforts become towards a climate resilient future.

### To improve recovery, close the insurance gap

Resilience is an essential factor in determining the speed of a community's recovery post-event. The less damage that is inflicted by an event, the faster a community can bounce back to normal life.

Another factor that plays a critical role in recovery is the take-up rate of insurance across a community and its residents. Insurance companies play a vital recovery role through risk transfer, providing funds needed for

policyholders to repair and rebuild their homes, which in turn stimulates the local economy. However, if not enough residents purchase insurance (or adequate levels of insurance), an ‘insurance gap’ – the difference between overall and insured losses – occurs. This gap in coverage ultimately hinders the ability of the community to recover quickly after an event.

Risk transfer mechanisms are key financial instruments for both a community’s economic growth and post-disaster stability. Without it, families and communities struggle to recover from a natural disaster, as they lack the savings of capital needed to rebuild. Yet, many people and businesses don’t have the appropriate level of coverage for their level of risk. Closing the insurance gap increases economic stability, for individuals, businesses, communities, and governments alike.

Insurance gaps already exist in the United States. There are significant gaps in flood coverage nationwide, especially in non-coastal states and counties. Another insurance gap exists regarding the insuring of public entities, whom often work within very tight financial budgets. And there is the risk of new insurance gaps opening up, like in forested regions prone to severe wildfires. To close these gaps (or prevent them from growing), the industry must ramp up its efforts to educate individuals, businesses and communities about the risks they face, even more so in light of climate change, and the economic buffers and resilience that insurance provides.

More importantly, insurance companies will continue developing products and policies that address the ‘gray rhino’ events that we know climate change will likely bring. Of course, these products are only useful if people utilize them. The more that the industry can help citizens and communities embrace the risks and encourage the use of innovative risk transfer solutions, the less that communities will be caught off guard when a disaster strikes.

## The key to prevention: Know more, build better

As the world moves to protect itself from future pandemics, public and private organizations will be far more inclined to share information, coordinate action, and take more preventative measures.

The same approach will be important for mitigating the risks of climate change. Insurance companies play an important part – they have the ability to heighten awareness of the risks and help shift standards, policies, and practices in a way that strengthens resilience.

**The expertise that insurance companies hold is a valuable resource to governments, communities, businesses, and individuals alike. This knowledge – and the actions it inspires – is important in two ways:**



**Educating stakeholders** on the importance, benefits and means of prevention.



**Promoting coordination and much-needed change** to building standards and land-use practices.

## The role of education

The insurance industry has an advanced understanding of climate risk and extreme events. Its modelling, analyzing, and forecasting capabilities offers vital insights to other participants in the resilience ecosystem, helping them better comprehend the risks, identify potential weaknesses, and plot a course towards prevention. Thus, it’s important that the industry deepens its links with governmental bodies, non-government organizations, and businesses that would especially benefit.

The importance of knowledge sharing across the players engaged for resiliency goes beyond hazard data. Insurance companies have helped drive efforts to better understand how to build resiliently. This is evident through the work of the Insurance Institute for Business & Home Safety (IBHS), which is wholly funded by the insurance industry, where extensive full-scale building testing has brought about valuable insights on how to improve the physical resistance of buildings against wind, wind-driven rain, hail, and wildfire.

This knowledge is important for educating construction companies and property owners on better building practices. As with insurance, many people are unaware of the significant improvements to life safety and overall economic benefits that resilience brings.

It is estimated that every \$1 invested in disaster mitigation saves \$6 in future damages.<sup>4</sup>

The cost of damages and disruption far outweigh the costs of prevention. In some cases, materials that could significantly enhance a structure's ability to withstand hail, severe storms or fires can be relatively inexpensive, particularly if done at the time of construction. Furthermore, a home that isn't destroyed by a natural disaster is also eco-friendly, as rebuilding homes requires new natural resources to be consumed.

Insurance companies can do more to educate stakeholders, from property owners to local governments, about making better choices around where and how to build resiliently. The industry's knowledge can shift the thinking around prevention, turning the focus towards the economic benefits.

### Policy change – and why public-private partnerships matter

As the world considers how to improve policies to diminish the impact of pandemics, public and private organizations can similarly examine how to update rules and regulations that can promote resiliency.

Building codes and land-use planning are areas in which more work needs to be done nationally. Since building codes are a state, not federal issue, a patchwork of inconsistent regulations exists that makes some areas far more vulnerable to natural disasters than others. Proper land-use planning will equally become more important in a warmer climate as some regions might be exposed to more frequent flash floods or river flooding whilst others will become uninhabitable due to sea level rise.

For example, in spite of Florida's success with its stringent building requirements, some hurricane-prone U.S. states have not acted to implement more resilient building codes. Additionally, in most non-coastal states, most buildings are only required to withstand 90 mph winds – the equivalent of an EF1 tornado (on the 0-5 Enhanced Fujita scale) leaving them vulnerable to relatively weak tornadoes, let alone stronger tornadic events. As a result, many places are already at risk of being damaged by today's severe storms, never mind the stronger events that are expected in a warmer climate.

Additionally, as a society we continue to build in increasingly vulnerable areas – as of 2020, it's estimated that over 7.3 million buildings in America are in coastal regions vulnerable to storm surge and sea level risk, with a total reconstruction cost value of over \$1.7 trillion.<sup>5</sup>

The sheer volume and value of assets vulnerable to rising seas and coastal flooding is a major economic risk to the nation, and only gets worse with each passing year. This makes the need for proper land usage and harmonizing and strengthening building codes, even more urgent in light of our climate future.

Deeper relationships between the insurance industry, private organizations, and public entities can foster the policy changes necessary to ensure resilient communities. An improved exchange of information and coordinated action can level out gaps in preparedness.

Once more, action on resiliency starts with education. Risk modeling can help public bodies understand the probability of a major disaster and identify areas most at risk. These insights can inform communities how to grow resiliently and should help determine appropriate land zoning to create natural buffer zones that can both diminish catastrophe impacts and reduce community flood risk. This work can toughen standards and create consistency across vulnerable regions.

Public-private partnerships are also essential for the recovery phase, closing the insurance gap and providing greater economic stability. This relationship is mutually beneficial, as cities and towns may be unable to shoulder all of the economic burden of a catastrophe while tax revenue dwindles and the local economy grinds to a halt. This collaboration can range from insurers providing guidance for public entities on setting capital buffers for catastrophes to insurers or economic development banks, like the World Bank, teaming up to cover higher-than-average exposures that might otherwise be uninsurable.

### Paving the way for long-lasting progress

Prescriptive action is just part of the story. As we look to transform the way we live and work in a post-pandemic world, what kind of broader changes can we make in order to make substantial progress towards ameliorating climate change? And how can we better integrate resilience into the way businesses and governments function?

## Global carbon emissions temporarily decreased by an estimated 17% during the first wave of the pandemic in the first quarter of 2020, aided by the mass elimination of commutes as the workforce moved to home offices and industries came to a halt.<sup>6</sup>

Now that it's understood that many people can work efficiently while remote and that a lot of business travel may be unnecessary, companies have an opportunity to incorporate new practices – such as regular work-from-home policies - that can collectively reduce their carbon footprint in the “next normal” in a meaningful manner.

In terms of manufacturing, businesses can reexamine the costs and benefits of using clean energy. Historically, companies and governments have been discouraged by the higher initial costs of implementing clean technologies versus conventional methods. Yet, the fixed costs of wind or solar energy continue to decrease and can end up being a more favorable option as compared to the volatility of oil, natural gas or coal prices, which fluctuate daily in commodity markets. While it can seem hard to let go of fossil fuels, especially as prices currently remain deflated, the lower long-term total cost of ownership becomes vastly more appealing if one looks past the short term.

Businesses may find it easier to mentally and conceptually make the leap towards climate-friendly technologies. Manufacturing practices can be revamped, moving away from heavy pollutants. Advancements in mobility can bring about the widespread adoption of zero emissions vehicles. Businesses may discover that working towards climate-friendly technologies and operating models could significantly contribute to their business models' long-term relevance and viability.

Governments can propel these changes by attaching green incentives into their post-pandemic economic stimulus packages. This can range from carbon-reduction targets to the creation and support of jobs in innovative clean energy initiatives. This would follow a strategy deployed in the wake of the 2008 financial crisis, where governments prioritized investment in clean energy as part of the recovery effort. These investments proved to be a boon for the adoption of clean energy.<sup>7</sup>

For governments and businesses alike, studying the impact of pandemics and other recent catastrophes on supply chains will help limit interruptions in future events. Inventive solutions can be created to prevent economic disruption and ensure access to capital.

Insurance companies must also evolve. Risk assessment and transfer are only one part of the resilience equation. To prepare society for the risks of climate change, insurance companies need to develop new solutions in risk mitigation and transfer. This involves a shift to look beyond the industry's traditional strengths, client base, and policy forms with the same level of inventive, coordinated thinking that businesses and governments are applying in their responses to the current pandemic.

Indeed, Munich Re went through such a shift in the wake of the pandemic, moving quickly to develop multiple initiatives to improve the availability of critical equipment and ensure supply-chain stability within our own ecosystem. Now, we find ourselves thinking about how to do the same to improve society's resilience to catastrophes. We see this as an important consideration for the insurance industry. The groundwork that the industry has made in measuring and transferring climate risk has been seminal in advancing the climate change conversation over the last five decades. We believe that the industry is nearing a critical juncture where it must play an even more active role in ensuring that people, businesses and governments build resiliency against catastrophes to come.



# Can we seize the moment?

**Seeing is believing.** The world has known about the disruptions climate change may cause for decades. But it took a virus only a few months to give us our first global experience in better understanding widespread societal and economic disruption.

If disruptive impacts of pandemics invoke the potential severity of climate change, our current situation will also provide guidance on how to fight it. As a society, we've witnessed an unprecedented mobilization, coordination, and collaboration between parties, public and private, to address the pandemic, even if it might have been far from perfect. Likewise, we've quickly adapted to a new way of working and living, which has boosted our confidence in making large-scale paradigm shifts.

We are open to more possibilities than ever before. We have the opportunity to reimagine how businesses function, redesign standards and practices, and strengthen the

relationships and knowledge sharing between the multitude of parties that have a stake in climate change and resilience.

We stand to only lose if we revert to our previous ways of thinking. And the temptation to return to a state of business as usual pre-pandemic will be strong. But if we can keep our minds attuned to the possibilities, we have the opportunity to create a more vibrant, safer, and resilient future.

Climate change feels daunting at times. One person or entity seems like no match for a global phenomenon. But, as we have learned, there is power in partnerships and numbers. The actions we take today will have a compounding effect, giving us the strength to stand up to disasters if and when they do arrive – or maybe even better yet, our work today may mean that we never have to face them.



## Contributors

**Anthony Kuczinski**  
President and CEO  
akuczinski@munichre.com

**Mark Bove**  
Meteorologist and Natural Catastrophe Solutions Manager  
mbove@munichre.com

**Dr. Eberhard Faust**  
Leading Expert-Climate Change  
efaust@munichre.com

**Dr. Gunther Kraut, MBR**  
Head of Epidemic Risk Solutions  
gkraut@munichre.com

**Ingo Pischetsrieder**  
Strategic Innovation Leader  
ipischetsrieder@munichre.com

**Michael Quigley**  
Head of Property Underwriting  
mquigley@munichre.com

**Ernst Rauch**  
Chief Climate and Geo Scientist  
erauch@munichre.com

**Dr. Raghuvveer Vinukollu**  
Natural Catastrophe Solutions Lead  
rvinukollu@munichre.com

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