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Adapting to climate change: Investing in the resiliency imperative

KEY POINTS

- Climate change is accelerating, and society is underprepared for the rising human, environmental, and economic toll.
- We believe demand for climate adaptation solutions will increase significantly.
- By investing in adaptation, investors can help address the climate challenge, gain exposure to a growing and inefficient market segment, and hedge portfolio exposure to climate risk.

Combating climate change is fast becoming an economic necessity. Swiss Re estimates global GDP could shrink 18% by 2050 if global temperatures are allowed to rise by 3°C.[1] To date, most efforts have focused on mitigating climate change through regulation or carbon pricing, while spending on innovations to help society adapt to physical climate threats has lagged. Our work with Woodwell Climate Research Center gives us conviction that physical climate risks will rise significantly over the next 10 to 30 years, driving demand and expanding markets for adaptation solutions. This thesis is corroborated by the United Nations Intergovernmental Panel on Climate Change's (UN IPCC's) recent report, which calls for an increase in adaptation investment across public and private sectors to build resilience to climate extremes and climate variability.[2]

In this paper, we share why we believe market growth for climate adaptation has been slow and how a growing need for climate resiliency will accelerate investment. We also share how we translate insights we have gained from Woodwell's climate research into our investment process. Finally, we discuss why we believe investors need to think differently about climate adaptation, adopting longer time horizons and accepting uneven growth in a segment we believe can outpace broader markets over time.

Society is unprepared for climate-related costs

Climate change is inevitable. Most greenhouse gases (GHGs) remain in the earth's atmosphere long after they are released. Because their warming effects linger for decades or centuries, future warming of 1.5°C is already "baked in" and unlikely to reverse, regardless of mitigation pathways taken.[3] Woodwell projects increasing frequency and intensity in heat waves, droughts, wildfires, flooding, and hurricanes. At the same time, water shortages and rising sea levels threaten livability in many regions.

[1] "World economy set to lose up to 18% GDP from climate change if no action taken, reveals Swiss Re Institute's stress-test analysis," SwissRe, 22 April 2021.

[2] "Climate Change 2021: The Physical Science Basics," UN IPCC, August 2021.

[3] Woodwell Climate Research Center.

Overall, society remains underprepared for the potentially devastating human, environmental, and financial toll of climate change. In just the past few years, the numbers have been staggering:

- In 2020, global losses from natural disasters totaled US$210 billion; the cost of climate-related disasters across Asia reached US$67 billion.[4] The US suffered 22 separate billion-dollar weather disasters in 2020.[5]
- 2020 was the most active hurricane season in 170 years, when reliable record keeping began. The cost of 2020 Atlantic storms was nearly US$47 billion.[6]
- 2020 was also the second-warmest year on record; global land and ocean surface temperatures departed from averages by +0.98°C (+1.76°F), the largest margin ever.[7]
- During the 2019 – 2020 bushfire season, a record 18 million hectares burned across Australia. The costs to industry and tourism approach US$2.9 billion. Entire species of animals may be at risk of extinction from this one devastating period.[8]
- California's 2020 wildfires destroyed over 10,000 structures and cost over US$12 billion in damages (US$10 billion in property damage and US$2 billion in fire suppression costs).[9]
- During the 2020 monsoon season, China experienced massive river overflow, with approximately 40 major waterways reaching the highest levels ever recorded. In May 2021 — prior to this year's monsoon season — 97 rivers across China exceeded high-water warning levels.[10]
- Negative trends have continued in 2021. Northwestern US and Canada have experienced record heatwaves. Wildfires have created smokey haze over cities on the US eastern seaboard, 3000 miles away. Significant floods in Europe have killed hundreds and washed away entire towns. A drought-driven water shortage in Taiwan has affected daily life and disrupted the global technology supply chain.

Why the slow uptake on climate adaptation?

Amid scientific evidence of accelerating climate change and the massive costs of climate-related damage, why has the investment community been relatively slow to focus on adaptation? We believe there are two main reasons: reliance on pattern recognition and market short-termism.

Because humans tend to rely on pattern recognition for decision making, it can be difficult to acknowledge or accept paradigms that deviate from past experience. Familiar patterns or datasets give us mental comfort on which to base decisions and take risks. Climate change does not offer such comfort. According to Woodwell, we should not rely on historical data and patterns to project climate conditions. Their projections show that the climate will be more volatile over the next three decades than the last three. Heat will threaten the health of vulnerable populations. The probability of hurricanes, floods, and wildfires is rising. Seasonal precipitation will oscillate between dearth and deluge. And water scarcity will disrupt industries from agriculture to energy to semiconductors.

Short-termism, exacerbated by a misreading of future climate risk, is likely compounding inaction on adaptation. Investors are typically evaluated (and incentivized) on one-, three- and five-year performance. Many investors assume that the consequences of climate change — and, therefore, the need to adapt — are far in the future, and hence they need not be factored into current investment decisions.

[4] "Record hurricane season and major wildfires: The natural disaster figures for 2020," Munich RE, January 2021.

[5] "Billion-Dollar Weather and Climate Disasters: Overview," NOAA Centers for Environmental Information, 2021.

[6] "2020 Atlantic hurricane season," Center for Disaster Philanthropy, 1 December 2020.

[7] US National Oceanographic and Atmospheric Administration (NOAA).

[8] Center for Disaster Philanthropy.

[9] "Billion-Dollar Weather and Climate Disasters: Overview," NOAA Centers for Environmental Information, 2021.

[10] "China swings into flood defenses as 97 rivers exceed warning levels," Global Times, 27 May 2021.

"Short-termism, exacerbated by a misreading of future climate risk, is likely compounding inaction on adaptation."

In our view, the rising frequency and cost of climate events disprove that assumption: Climate change is both a near-term and a longer-term risk. While the market impacts of climate change may not appear material in diversified portfolios today, we believe the risks are rising. A tipping point that results in rapid, widespread asset repricing could expose higher risk levels and thus a greater need for climate hedges than otherwise expected.

Rising tide of spending on climate adaptation

The growing realization that lives and assets are increasingly exposed to climate risk is beginning to shift capital flows toward adaptation. We believe this trend will accelerate, creating a range of attractive investment opportunities.

- Bank of America projects a doubling of the climate adaptation market to US$2 trillion per year within the next five years.[11]
- For its 2022 budget, the US Department of Defense has requested US$26.1 billion "to replace, restore and modernize enduring facilities to enhance their resilience to climate events."[12]
- The European Commission has proposed spending at least 25% of the total EU budget on climate action for the next six years.[13]
- In 2022, California plans to spend US$4.1 billion on climate-resilient infrastructure; New York State will spend US$29 billion.[14]
- The state of Florida has announced a US$1 billion bond program aimed at adapting infrastructure, with US$60 million more allocated to address shoreline erosion, sea-level rise, and coral reef protection.[15]

For investors, the opportunities created by waves of spending on adaptation are manifold (**Figure 1**).

- Engineering firms help municipalities redesign infrastructure to prepare for flooding, storm surges, or sea-level rise.
- Water desalination services help recycle water in regions impacted by water shortages.
- Air conditioning manufacturers can help people survive extreme heat.
- Backup power companies help homeowners and businesses maintain utilities during wildfires or hurricanes.

[11] "Climate Change Solutions: 5 Areas that are Making a Difference," Bank of America/Merrill Lynch, August 2020.

[12] "Official Testifies on DOD Budget Request for Construction, Energy, Environmental Programs," US Department of Defense, 15 July 2021.

[13] "Supporting climate action through the EU budget," ec.europa.eu.

[14] "Governor Cuomo Announces Highlights of FY 2022 Budget to Reimagine, Rebuild and Renew New York," press release, 6 April 2021. "Here's How Newsom's Proposing to Spend $4.1 billion on the Climate and Environment," kqued.com, 8 January 2021.

[15] "DeSantis calls for $1 billion to brace for climate change," Tampa Bay Times, 28 January 2021.

Figure 1
Range of adaptation solutions across climate variables

Physical risk	Heat	Hurricanes	Flooding	Water scarcity
Opportunities	Air conditioning	Disaster recovery	Drainage systems	Desalination
	Swimming pools	Impact-resistant glass	Stormwater management	Wastewater treatment
	Pest control	Coastal dredging	Flood defenses	Rainwater harvesting/ water storage
	Electrical grid and transmission line upgrades	Infrastructure design	Pumps/pumping stations	Smart meters
	Resilient road and rail materials	Resilient construction materials		Hydropower-facility reinforcement
		Backup power		
Physical risk	**Sea-level rise**	**Wildfires**	**Drought**	
Opportunities	Seawalls	Fire-resistant building materials	Irrigation technology	
	Beach nourishment	Backup power	Heat/drought-resistant crops	
	Floodgates		Controlled agriculture	
	Coastal protection			
	Erosion control			

For illustrative purposes only. Source: Wellington Management

Exposure to climate adaptation investments can also provide what we call climate-resiliency beta. We believe most investors are "short" climate risk; in other words, a large-scale climate event is likely to detract from portfolio returns rather than increase them. Investments in adaptation can serve as a hedge against this exposure, as we expect future demand and thus market returns to be correlated with the structural trend of climate change. In this white paper,[16] we offer suggestions for building climate resilience into broader strategic asset allocation plans.

For all our conviction, we are realistic about the pace of broad-based adoption of this theme. Markets are only just beginning to see climate-related tailwinds. It will take time for an opportunity set of climate-adaptation securities to mature — which simply means investors have an opportunity to gain first-mover advantage.

Figure 2 illustrates how we think about time diversification in this market segment. We invest in solutions across all climate variables because we think the growth potential is substantial, driven by the secular trend of adaptation spending. We also expect different segments to mature at different rates, as certain climate events catalyze investor interest sooner than others. For example, while the market began to reprice backup-power-generation companies following recent active wildfire and hurricane seasons, valuations for water metering companies, which play an important role in addressing climate-related water scarcity issues, have yet to appreciate.

[16] "Building climate resilience within a strategic asset allocation framework," wellington.com/en/insights/climate-resilience-strategic-asset-allocation-us/

About the authors

Chris spearheads a collaborative initiative between Wellington Management and Woodwell Climate Research Center to integrate climate science and asset management. This alliance, launched in 2018, focuses on creating investor tools to help analyze and better understand how and where climate change may impact global capital markets.

Erika partners with our Climate Research Team and advises clients on both transition and physical climate risks and opportunities across traditional and alternative asset classes. She contributes to climate-focused strategic client engagements and product development efforts across our Climate Product Platform.

FIGURE 2

Adaptation opportunities will evolve over time

SEED	SPROUT	SAPLING	TREE
Water metering	Air conditioning	Swimming pools	Infrastructure engineering
Pest control	Dredging	Weather resistant building materials	Backup power generation

For illustrative purposes only. The specific securities identified are not representative of all the securities purchased, sold, or recommended for clients. It should not be assumed that an investment in the securities identified has been or will be profitable. Source: Wellington Management.

Investors must think differently

We must adapt to climate change. There's simply no alternative. We have high conviction in this accelerating theme; climate science shows that the world will face more frequent and more severe climate events, and society will need more adaptation ideas that protect lives and assets.

Climate change will require investors to think differently about the future. Because climate change is a secular trend with no mean reversion, investing in adaptation may require longer time horizons, as well as tolerance for high tracking risk and concentration risk. Investors also need to accept that companies developing adaptation solutions may experience uneven ("lumpy") growth as climate events unfold.

In the long run, however, we believe growth paths will smooth out and that investors who remain invested in climate adaptation will be rewarded in two ways. Over time, we believe the adaptation segment may deliver returns that outpace the market. And by investing in this theme, investors can support companies providing products and services that may safeguard lives and economies from accelerating climate threats.

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