GARI

2019 Investor Briefing:
Physical Climate Risk and Resilience

Investor Briefing from:

Global Adaptation & Resilience Investment Working Group

December 2019

Acknowledgements & Disclaimer

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Acknowledgements:

The authors would like to thank the members of the Global Adaptation & Resilience Investment Working Group (GARI) for their valuable input and feedback. GARI is a private sector, private investor-led initiative announced at Paris COP21 in 2015. It is a partner of the UN Secretary General's A2R Climate Resilience Initiative. The working group has brought together over 300 private and public investors, bankers, leaders and other stakeholders to discuss critical issues at the intersection of climate adaptation and resilience and investment with the objective of helping to assess, mobilize and catalyze action and investment. For more information, please visit www.garigroup.com.

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Foreword

The Global Adaptation & Resilience Investment Working Group (GARI) was conceived in the run up to the Paris COP21 conference. Launched at COP21 in conjunction with the UN Secretary General's A2R Climate Resilience Initiative (and now a partner of A2R), GARI was designed to bring together private investors and a range of other stakeholders to focus on investment in climate adaptation and resilience. The idea was to bring together interested investors, climate experts, and other stakeholders to focus on how to practically invest in the face of adaptation and climate resilience needs, and the associated benefits.

Since its launch in 2015, GARI has met 21 times and engaged over 300 private investors and other stakeholders. GARI has now been institutionalized as a non-profit and will continue to pursue its mission of engaging investors and others in discussions at the intersection of climate resilience and adaptation and investment.

2019 was a pivotal year in terms of the growing need to build resilience to the effects of climate change. Around the world – from the devastating cyclones across southern Africa, India, and Bangladesh, to the floods and landslides in Bolivia, to the California wildfires that continue to ravage the US – the need for action and investment is increasingly palpable. Climate change continues to increase risks and impacts to lives and livelihoods, as well as to physical assets, infrastructure, and business operations, around the world. Investors not only have an important role in helping to build resilience in the face of a changing climate, but also have an opportunity to consider such a changing environment in their own investment decisions.

Reflecting the substantial developments in evaluating physical climate risk and the opportunity for climate resilience investment, GARI participants in 2019 agreed to develop an update for investors – an Investor Briefing – focusing on a "plain language" approach to brief investors and others key stakeholders on the now increasingly rapid developments in physical climate risk and resilience. This Investor Briefing reflects the discussions and feedback from members of the GARI working group and is intended to provide a peer-driven perspective to private investors on climate risks and resilience, rather than a comprehensive analysis.

GARI and this Investor Briefing would not be possible without the support of GARI participants and the volunteer, pro-bono leadership, expertise, and efforts of the lead authors and contributing authors. We applaud their continued engagement and support. We also welcome interested private investors and other stakeholders to engage with and participate in GARI.

We hope you find this Investor Briefing useful. Comments or questions can be sent to chair@garigroup.com.

Sincerely,

Jay L. Koh
Founder & Chair
GARI

Executive Summary

Purpose of this Briefing

The purpose of this Investor Briefing is to educate investors on how to think about physical climate impacts in their investment and portfolio management decisions, as well as to help investors identify burgeoning opportunities to proactively invest in adaptation and resilience. This briefing seeks to foster climate adaptation and resilience as a mainstream consideration in financial management for asset owners, investors, insurers, and lenders.

In December 2017, GARI published its first investor guide *An Investor Guide to Physical Climate Risk & Resilience: An Introduction*. This briefing provides a practical update to that guide for private investors on recent developments in physical climate risk and climate resilience, focusing on three areas:

- climate risk disclosure;
- climate risk management for investment portfolios; and
- opportunities for climate resilience investment.

Though this briefing is not exhaustive of all existing literature relevant to adaptation and resilience, it was created to provide investors and other stakeholders with a baseline set of basic knowledge for considering adaptation and resilience in investment and portfolio management decisions.

Introduction to GARI

The Global Adaptation & Resilience Investment Working Group (GARI) is a 501(c)(3) private sector, private investor-led initiative that was convoked at Paris COP21 in December 2015 in conjunction with the UN Secretary General's Climate Resilience Initiative. The working group brings together private and public sector investors, bankers, lenders, asset managers and other stakeholders to discuss critical issues at the intersection of climate adaptation and resilience and investment, with the objective of catalyzing action and investment to build resilience and adaptation to a changing environment.

Since 2016, GARI has convened in-person and remotely-accessible meetings in New York, Washington DC, San Francisco, and London, bringing together over 300 private sector investors and other stakeholders – from pension funds, endowments and foundations, insurance companies, banks and investment managers to corporations, start-ups, think tanks, advisory firms and development finance institutions – to discuss and create opportunities for investment in adaptation and resilience.

GARI continues to engage with stakeholders to build and harmonize the knowledge base around climate-related risks and opportunities. As a knowledge hub for the emerging tools and methodologies to track, measure, and assess physical climate risk on financial assets, GARI hopes to continue to help investors identify ways to engage in climate resilience investment opportunities, so that private investment in climate adaptation can scale to the degree needed in order to build a more resilient future.

All interested parties are invited to participate in GARI working group meetings and to reach out with any questions or comments at www.garigroup.com.

Previous GARI Publications

To date, GARI has released the following additional white papers to public on adaptation and resilience topics:

- GARI (2017). *An Investor Guide to Physical Climate Risk & Resilience: An Introduction*, December 2017.
- GARI (2016). *Bridging the Adaptation Gap: Approaches to Measurement of Physical Climate Risk and Examples of Investment in Climate Adaptation and Resilience*, November 2016.

This investor briefing represents the third in a series of white papers that the GARI working group seeks to publish on a regular basis in order to build a shared knowledge base for investors and other stakeholders around adaptation investment.

Physical Climate Risk & Resilience: Three Things Investors Need to Know Now

Global mean temperatures have already risen by approximately 1.0°C above pre-industrial levels[1] and other changes in the climate system are underway. These changes are causing more frequent and extreme weather and climate events, as well as gradual shifts in rainfall patterns, sea levels, sea ice, and glacial retreat. A certain amount of man-made climate change is locked into the earth's climate system over coming decades and centuries, regardless of the success and rate at which global greenhouse gas (GHG) emissions are controlled (or mitigated). The physical climate risks of natural disasters and long-term temperature and precipitation changes are impacting the operations, markets, infrastructure, raw materials, and financial assets of businesses and governments and consequently impacting their respective financial partners as well. As such, investors will need to consider physical climate risks, adaptation, and resilience, alongside both transition risks (e.g., risks due to policy, legal, technology, market, and reputation impacts from the shift to a low-carbon economy)[2] and actions to mitigate GHG emissions across their portfolios.

This Investor Briefing provides a practical update for private investors on recent developments in ***physical climate risk and climate resilience***, focusing on three primary recommendations around climate disclosure, climate risk in investment portfolios, and climate resilience investment, as well as one bonus recommendation on climate action.

1. Pay Attention to Climate Risk Disclosure: It's Coming!

The first recommendation is to pay attention to climate risk analysis and disclosure, because it is coming (if not already here). A growing number of companies and investors are voluntarily committing to analyze and disclose their climate-related financial risks, and there is an increasing likelihood that this type of disclosure will become mandatory in the near term. While climate risk analysis and disclosures initially focused on measuring carbon intensity and transition risks (e.g., stranded assets), shareholders and regulators are now also asking companies and investors to analyze and determine the climate-based physical risks to assets and operations.

In particular, a key development in climate risk analysis and disclosure has been the increased adoption of the recommendations of the Task Force on Climate-Related Financial Disclosure (TCFD) which was established in 2015 by the Financial Stability Board, an international body that monitors and makes recommendations about the global financial system. Launched by the Bank of England Chair Mark Carney in 2015 and led by former New York City Mayor Michael Bloomberg, TCFD produced a set of voluntary recommendations in 2017 for companies on how to establish and implement a process for evaluating and disclosing the transition risk and physical risk to their assets and operations from climate change, through stress tests and scenario analysis.[3]

In June 2019, the EU Technical Expert Group on Sustainable Finance released the EU Taxonomy for Sustainable Finance (the "Taxonomy"), a tool to help investors understand whether an economic activity is environmentally sustainable.[4] The Taxonomy includes a framework for determining whether an economic activity significantly contributes to climate change mitigation and adaptation, among other sustainable activities, and thereby can be used by investors to comply with disclosure requirements such as those contemplated by the TCFD recommendations.

Companies and investors are increasingly committing to evaluate and disclose climate risks aligned with the TCFD recommendations. As of June 2019, "more than 340 investors with nearly $34 trillion in assets under management have committed to engage the world's largest corporate greenhouse gas emitters to strengthen their climate-related disclosures by implementing the TCFD recommendations as part of Climate Action 100+."[5]

Developments in Climate Risk Disclosure Practices

Although presented as voluntary, the TCFD recommendations and general climate risk-related disclosure practices are likely to become a mandatory standard in many jurisdictions, as evidenced by the following developments over recent years:

- In 2015, France became the first nation to pass a law mandating climate risk reporting for listed companies and financial institutions. Under Article 173 of the Energy Transition Law, French companies are required to disclose financial risks related to climate change, potential consequences, and measures to address them.[6] Article 173 went into force in 2016 and has raised awareness of the measurement and evaluation of climate risks, although is still in early stages of implementation.[7]
- The European Union's (EU) non-binding Non-Financial Reporting Directive went into effect in 2018 across the EU, and each of the 28 member countries is now adapting it into law.[8] In June 2019, the EU published guidelines for climate-related reporting that incorporated TCFD requirements and set out the minimum level of climate and environmental information that over 6,000 European companies must include in their annual reports.[9]
- The UK Government's 2019 Green Finance Strategy announced that, "the Government expects all listed companies and large asset owners to be disclosing in line with the TCFD recommendations by 2022", and it plans to establish a taskforce to explore the appropriateness of mandatory reporting.[10]
- In 2019, the Principles for Responsible Investing (PRI), with over 2,250 signatories representing $83 trillion of assets under management (as of February 2019), announced that TCFD-based analysis and disclosure would become mandatory for PRI signatories in 2020.[11]
- In April 2019, the Network for Greening the Financial System (NGFS), a group of 42 central banks and supervisors and eight observers, "encourage[d] all companies issuing public debt or equity as well as financial sector institutions to disclose in line with the TCFD recommendations."[12]
- On 15 April 2019, the Bank of England's Prudential Regulation Authority (PRA) issued a policy statement on enhancing banks' and insurers' approaches to managing the financial risks from climate change and set a deadline of 15 October 2019 for companies to submit their plans for managing such risks.[13]
- In July 2019, the United States House Financial Services Committee passed the Climate Risk Disclosure Act of 2019, which was introduced by Illinois Representative Sean Casten in 2018.[14] The bill required the Securities and Exchange Commission (SEC) to develop and implement guidelines for companies on disclosing climate-related risks and to make the information available to the public on the SEC website. Although the bill did not pass the full House or Senate, it represents an important policy signal in the U.S. of the growing awareness around climate risk disclosure.

Many investors have already effectively signed up for TCFD disclosure as a result of other commitments. For example, PRI reports that 480 investors representing $42 trillion in assets submitted responses with climate indicators in 2018.[15] BlackRock[16], Vanguard[17], and State Street[18], among others, have engaged their own portfolio companies on the importance of climate risk disclosures.

There is evidence that under such pressure from shareholders and regulators, companies themselves are increasingly citing climate-related impacts as potential risks to their business operations. For example, a CNBC analysis in 2019 found that the number of S&P 500 firms indicating "wildfire" as a potential risk factor in their annual reports has risen from 9 in 2010 to 37 in 2019 (through November 2019).[19] In 2019 alone, at least 14 companies across various sectors in the S&P 500 have added wildfire risk to the 10-K filings with the SEC.[20] Also, nearly 7,000 companies reported their business' climate-related information to the Carbon Disclosure Project (CDP) in 2018, the data of which was used to publish CDP's *Global Climate Change Analysis 2018*, in which many large firms indicated that they are bracing for the physical impacts of climate change – from manufacturing companies noting that increased rainfall and flooding in Southeast Asia could knock out suppliers, to regional banks indicating that severe drought could affect their borrowers' creditworthiness, to tech companies highlighting that the rising temperatures could impact the cost of cooling its data centers.[21]

Fortunately, there are a growing number of practical guides and advisory services related to TCFD analysis and implementation, such as for investors[22] and banks[23], and from a variety of other sources, such as the Sustainable Accounting Standards Board (SASB).[24]

2. Assess and Address Climate Risk in Your Portfolio

Beyond fulfilling disclosure requirements, investors should put plans in place to address the increasingly identifiable financial risks from the physical effects of climate change in their own portfolios. Acute physical climate risks include event-driven extreme weather impacts such as hurricanes, wildfires, and flooding; and chronic physical climate risks represent longer-term shifts in climate patterns, such as extended droughts, sea level rise, and chronic heat waves. Such risks can severely impair the value of investment portfolios if left unaddressed.

The financial impacts to municipalities and companies caused by, for example, damage to production facilities or infrastructure, crop losses, increased prices of raw materials, or declines in real estate values, can have severe follow-on impacts to all types of investment asset classes. As an illustrative example (see Table 1 below), physical climate impacts can lead to the loss of tax revenue for governments, thereby impacting their creditworthiness, and ultimately resulting in fluctuations to municipal bond values, which could further lead to divestment and/or reduced investment in public infrastructure. Similar lines of logic can be followed to understand how physical climate risk can impact the value of corporate bonds, private debt, asset-backed securities, public and private equity.

Table 1. Examples of physical climate risk and financial impacts on corporate and municipal bonds

	Physical Climate Risks	Impacts: Corporate/Govt	Credit Institution	Investors
Acute	Increased severity and volatility of extreme weather events (e.g., hurricanes, wildfires, floods)	Damage to production facilities or infrastructure; Loss from tax revenue from businesses to pay debt service on bonds	Deterioration and increased difficulty of assessing corporate and municipal borrower economic and financial creditworthiness	Reduced and/or more volatile yields on corporate and municipal bonds
Chronic	Longer-term shifts in climate patterns, causing e.g., chronic droughts, sea level rise, heat waves	Reduced availability of and changes in price of raw materials; Loss of property value and related tax revenue		

As the effects of climate change continue to unfold, the real, financial implications of such increased risks and impact are finally becoming clearer to all stakeholders across the investment value chain. For example, a January 2019 headline in The Wall Street Journal described the recent bankruptcy of Pacific Gas & Electric (PG&E), the 10th largest utility in the United States, due to wildfire liability as "The First Climate-Change Bankruptcy, Probably Not the Last".[25] Investors citing climate change as important to the municipal bond market tripled between 2018 and 2019, from 6 percent to 19 percent, yet only 1% of analysts believe municipal issuers are "very prepared," or "prepared" from the impact of climate change.[26] It is becoming evident that climate change is beginning to carry weight outside of the traditional sustainability discussion. The consideration of climate-related risks is now an imperative for businesses and investors alike.

Credit risk rating agencies are responding accordingly. In July 2019, Moody's Investor Service announced the majority acquisition of business intelligence firm Four Twenty Seven, a leading expert in climate risk.[27] Moody's stated goal of the acquisition is to "advance global standards for assessing environmental and climate risk factors", in recognition of the fact that more work needs to be done in the assessment of climate-related risks.[28] Four Twenty Seven tracks data on a range of physical climate risks including heat stress, intense rainfall or flooding, wildfires and rising sea levels and analyzes how those risks affect companies, REITs, governments. Other rating agencies, such as Fitch and S&P, have also issued reports warning state and local governments that their exposure to climate risk could affect their credit ratings.[29] Investors should pay attention to how rating agencies view and analyze such risks in order to understand the potential impacts that climate change could have on their own investment portfolios.

Resources for Investors on Assessing Climate Risks and Opportunities

In recent years, institutional investors and research analysts have started to evaluate and quantify the impacts of physical climate risk on certain types of financial assets or have provided frameworks for how investors can begin to think about assessing these types of risks on their own assets. The following resources contain helpful guidance for investors looking to assess climate risks and opportunities in their own investment portfolios:

- In 2019, BlackRock released a report on physical climate risk analysis, evaluating coastal real estate, the $3.8 trillion U.S. municipal bond market, and 269 listed utilities, concluding that climate-related risks are currently underpriced across all three of these asset classes.[30]
- Mercer published a 2019 *Investing in a Time of Climate Change* report, which provides an update on the latest research and methodologies around climate scenario modeling for institutional investors with diversified portfolios for assessing climate impacts on investment return.[31]
- In September 2019, the Government of the United Kingdom, the Government of Jamaica, Willis Towers Watson, the Global Commission on Adaptation and the World Economic Forum launched the private sector-led Coalition for Climate Resilient investment (CCRI). The Coalition brings together over 30 organizations across the investment value chain to develop a common approach to integrating climate risks into infrastructure investment decision-making.[32]
- In its 2015 report titled *Risks and Opportunities From the Changing Climate: Playbook for the Truly Long-Term Investor*, Cambridge Associates discussed the implications of climate risks across various sectors and asset classes, and also provided strategies for defending against such risks.[33]
- The Institutional Investors Group on Climate Change (IIGCC) is developing a high-level guidance document on physical climate risk analysis for investors in partnership with Acclimatise and Chronos Sustainability, due in November 2019.[34]
- Further guidance is also evolving in specific asset classes, such as hydropower[35] and real estate[36].
- Increasingly, Environmental Social & Governance (ESG) and climate-related screening tools and filters are also being employed to assess the risks associated with climate change and to improve portfolio performance. The number of analysts using Bloomberg Terminal ESG data more than tripled from 2012 to 2018.[37]
- To help facilitate broader and more consistent access to climate risk data, the emerging non-profit OS-Climate is establishing an open source collaboration community. OS-Climate aims to aggregate climate risk data, modeling, and computing worldwide to enable new applications for climate-integrated investing and to "boost global capital flows into climate change mitigation and resilience".[38]

While many of these standards are still in their early stages, the hope is that ultimately investors, companies, and other relevant stakeholders can converge on a set of harmonized approaches to assessing climate risk. This way, physical climate risk assessment can be mainstreamed into all kinds of investment decision-making at scale.

3. Look for Resilience Investment Opportunities

While the term "risk" is often interpreted as downside-only, investors should consider shifting their framing to view the increase in climate *risks* as a real opportunity to invest in climate *resilience*. There are a growing number

of opportunities to invest in resilience, whether in assets that are screened for their resilience to climate impacts or in assets that help to build resilience or adapt to the effects of climate change. For example, Bank of America has committed a total of $445 billion through 2030 to investments in sustainable energy and transportation, climate resiliency, clean water and sanitation.[39] Investment advisors such as Cambridge Associates[40] and Mercer[41] have long advocated for the consideration of investment opportunities created by the need for climate resilience. Recent analysis from TCFD indicates that companies are increasingly identifying potential investments from climate change, with the Carbon Disclosure Project (CDP) reporting that companies face $1 trillion in climate change risks, and $2.1 trillion in climate business opportunities.[42]

Below are a number of emerging opportunities for investors to invest in climate resilience:

- **Green bonds.** The market for green bonds has gone from almost non-existent a decade ago to over $155 billion across the world today.[43] These bonds generate financing for renewable energy, energy efficiency, sustainable housing and other environmentally friendly initiatives. The Climate Bonds Initiative, an international non-profit working to develop a one trillion dollar market for green bonds, published a set of Climate Resilience Principles (CRP), which provides guidance for investors, bond issuers and banks to determine when projects are assets are compatible with a climate resilience economy.[44] The CRP provides a framework for screening green bonds to ensure that proceeds are funding assets and activities that assess and address climate risks and build climate resilience. Immediately following publication, EBRD issued a $700 million climate resilience green bond that was in accordance with the CRP.[45]
- **Private equity and growth equity.** Climate resilience and adaptation to climate change are increasingly becoming discussion topics for private equity investors, both institutional investors and impact investors. In 2019, The Lightsmith Group completed an analysis of the potential investment opportunities, interested investors, and potential structure of a Climate Resilience and Adaptation Finance and Technology Transfer Facility (CRAFT), the first private investment strategy focused on climate resilience and adaptation. The final report assessing the investment concept detailed the identification of over 800 potential target companies across 20 sectors of the economy, discussions with over 200 private and public sector investors, and the legal, accounting, regulatory, and operating structure for launching such a strategy.[46] Some examples of adaptation- and resilience-related sectors are agricultural analytics, weather forecasting/analytics, mapping and geospatial imagery, water efficiency/management, grid reliability/battery storage, supply chain analytics, drip irrigation, and insurance.
- **Resilient infrastructure**. The Coalition for Climate Resilient Investment (CCRI) group focuses on strengthening the market for private and public-sector investment in climate resilient infrastructure, reducing climate risk by shifting the flow of investment toward climate resilient infrastructure, and supporting climate vulnerable geographies to attract investment and prevent capital flight as climate risks intensify. Ultimately, CCRI hopes to provide analytical tools for infrastructure investors to include resilience cost and benefit considerations into investment decision-making.[47]
- **Public equities.** A growing number of mutual funds and exchange-traded funds are creating portfolios focused on technologies and assets most likely to benefit from climate change, such as businesses in agriculture, fishing, waste management, transportation and water.[48]

Climate resilience and adaptation have become topics for discussion at investment conferences hosted by Cambridge Associates, the Global Impact Investment Network (GIIN), and the Green Climate Fund. Investors will increasingly be presented with investment opportunities in assets that are screened and designed for climate resilience, as well as assets that generate resilience to climate change.

Next Steps: Proactively Managing Climate Risk

Interested investors can develop an understanding of the policy implications around climate resilience and adaptation. Globally, as well as locally, adaptation and resilience are gaining increased emphasis and focus:

- The Global Commission on Adaptation (GCA) released its final report in September 2019, including an analysis of the need for investment in adaptation and climate resilience.[49] The GCA calls for a 2019-2020 Year of Action, which will include new investment initiatives and a major investment conference. The GCA's analysis also found that $1.8 trillion in resilience investment can deliver more than $7 trillion in economic benefits over the next 10 years.[50]
- The UN Secretary General hosted the Climate Action Summit in New York in September 2019, calling for greater ambition on climate finance, particularly around adaptation and resilience to climate change.
- The UK's Financial Conduct Authority (FCA) and PRA are continuing to facilitate the Climate Financial Risk Forum (CFRF) which has working groups on scenario analysis and disclosure. A number of guidance documents will be produced in early 2020.
- The FCA released a new Feedback Statement on October 16, 2019 which sets out its response to a 2018 consultation paper on climate change and green finance. The Feedback Statement also sets out FCA's actions and next steps relating to climate risk disclosures, including considerations of new rules on the horizon.

Policy developments around climate change will likely impact investment in the medium term (1) as new risk analysis, disclosure, and regulations are developed and (2) as new investment opportunities are generated as a result of companies, governments, and communities taking action to assess and address the growing risks and impacts increased by climate change. Both short- and long-term investors can begin to anticipate and invest in alignment with these trends, both protecting against greater downside and capitalizing on potential upside from these risks and opportunities.

Beyond financial risk and return, investors should also take social responsibility into consideration in the context of adaptation- and resilience-related investment. While the risks of climate adaptation-informed investor decisions shifting capital in ways that adversely impact certain economies and communities warrants further discussion, informed investors can take initial steps by (1) assessing these longer-term potential societal impacts in their investment decisions, and (2) seeking opportunities to build social value by, for example, investing in the resilience of vulnerable populations, thereby reducing the potential for such adverse impacts.

As an investor, lender, asset-owner or insurer you can:

- Follow trends and discussion on financial climate risk management;
- Be aware of emerging tools for climate risk analysis;
- Watch for emerging risk management metrics and strategies; and
- Consider longer-term social value creation in your capital allocation.

Annex A: Suggestions for further reading

- GARI (2017). *An Investor Guide to Physical Climate Risk & Resilience: An Introduction*, December 2017.
- GARI (2016). *Bridging the Adaptation Gap: Approaches to Measurement of Physical Climate Risk and Examples of Investment in Climate Adaptation and Resilience*, November 2016.
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End Notes

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