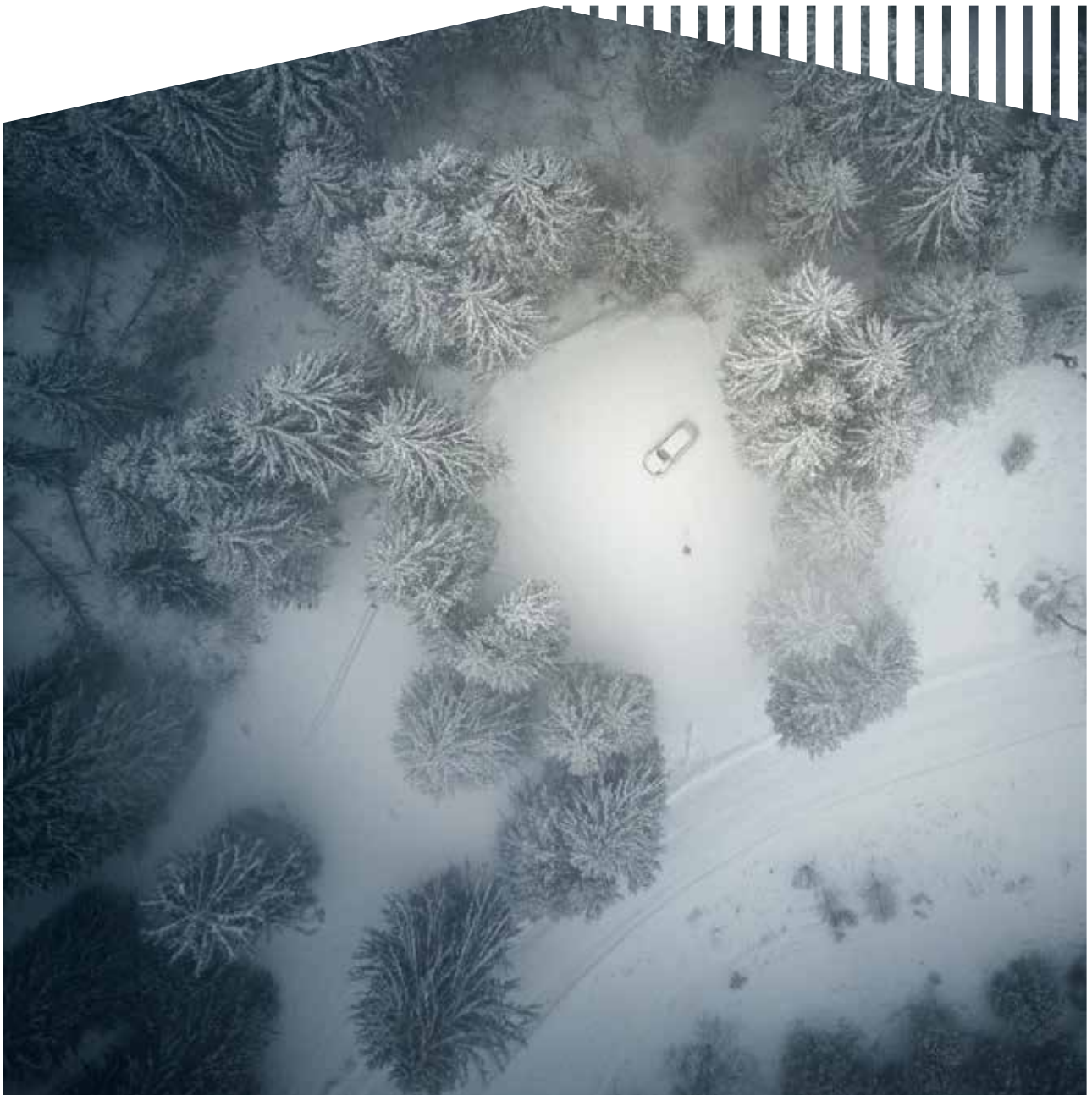


FINANCING FOR CLIMATE RESILIENCE



FOREWORD

This year's G20 Summit in Germany concluded green finance is key to addressing a range of global challenges with strong, sustainable and resilient economic growth. As we cross the two-year mark since the signing of the 2015 Paris Climate Agreement, the ability to finance climate resilience and sustainable growth has become an urgent mandate for organizations and governments. With global sustainable investment growing at a double-digit rate, investors are grappling with the urgency of the situation and the attractiveness of the opportunities, as green financing creates new markets to penetrate and consumer bases to attract.

It is clear however, that financing climate resilience will require significantly more capital investment, greater collaboration between the public and private sectors, sound policy, and innovations in finance and risk management practices, both at an enterprise and economy level.

We are pleased to provide this collection of insights from across our organization on how to address the factors inhibiting climate resilience financing. A companion report with further insights on strategies for climate resilience and climate risk management will be released in January 2018.



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A STRESSING CLIMATE?

KEY CHALLENGES FOR BANKS
IN ASSESSING AND DISCLOSING
CLIMATE CHANGE RISK

JANE AMBACHTSHEER, JOHN COLAS, ILYA KHAYKIN AND ALBAN PYANET

NEW RECOMMENDATIONS FOR FINANCIAL DISCLOSURE

Companies in all sectors, including those in the financial-services industry, are being asked the same question: What are the implications of climate change risks and opportunities for your organization's financial performance? Investors, regulators, consumers, suppliers, and employees are looking for greater clarity and transparency on this issue. At this stage, however, there's no established best practice for assessing the impact of climate change on bank performance. This topic has not escaped the focus of central bankers, specifically Financial Stability Board (FSB) Chair and Bank of England Governor Mark Carney, who has written and spoken extensively on climate change risk. The recent release of a disclosure framework aims to facilitate the process; yet companies—particularly financial institutions—face a number of challenges in implementing the recommendations.

The FSB Task Force on Climate-related Financial Disclosures (TCFD), issued a set of recommendations in June 2017, providing a framework and approach for all companies to report on climate impacts in their mainstream financial filings.¹ The disclosures, which are meant to be voluntary, consistent, comparable, reliable, and clear, should aim to provide material information to lenders, insurers, investors, and other stakeholders. This disclosure of the financial impact of climate-related risks will push institutions to enhance how these risks are assessed, priced, and managed. To that end, banks and financial institutions are particularly encouraged to adopt the recommendations.

SCENARIO ANALYSIS TO ASSESS CLIMATE RISKS AND OPPORTUNITIES

In adopting the TCFD recommendations, financial institutions will need to embed the impact of climate change into their strategy, risk, and opportunity analyses. These analyses should consider the physical risks stemming from climate change in the physical environment, the transition risks associated with the economic costs of moving to a lower-carbon economy, and the opportunities for developing new products and services in response to climate change. The TCFD recommends using scenario analysis to support this exercise – including the consideration of a 2 degree Celsius (or lower) global temperature-warming scenario aligned with the 2015 Paris Climate Agreement.

Scenario analysis is a well-established method to inform strategic plans and ensure resiliency to a range of future states. The use of scenario analysis to assess the implications of climate-related risks and opportunities for companies, however, is recent.²

Organizations need to consider a range of scenarios relevant to their businesses. Alongside the Paris Agreement scenario (where a rise in global temperatures is limited to 2-degree Celsius by 2100 but significant transition risks arise from the economic adjustment needed to limit the temperature increase), scenarios with higher degrees of warming are typically considered to further stress the physical risks of climate change (such as a 3-degree Celsius scenario, which is broadly aligned with the current Paris commitments, and a 4-degree Celsius or warmer scenario that reflects the current temperature pathway if countries do not follow through on their commitments).

1 In late 2015, at the request of G20 leaders, finance ministers, and central bank governors, the Financial Stability Board (FSB) established an industry-led task force under the leadership of Michael Bloomberg. The task force was charged with developing voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders. To learn more, see: <https://www.fsb-tcfd.org>.

2 Mercer first introduced this approach with its 2011 report, *Climate Change Scenarios – Implications and Strategic Asset Allocation*, followed by its 2015 study, *Investing in a Time of Climate Change*.

Each scenario must include a set of coherent variables and a narrative explaining the underlying rationale for the values and trends of the variables, as well as the interdependency between them. These variables can include assumptions on policies and regulatory developments (regionally, domestically, and internationally), the pace of technological change, the sea level rise, and how these disruptions may positively or negatively impact industry sectors and supply chains. Along with this, organizations need to develop a methodology capable of translating scenario variables into a financial impact. A fine balance is needed to thread the complexity of the processes and analyses so as to ensure realistic implementations and executions of scenario planning and assessment.

CHALLENGES IN DEVELOPING EFFECTIVE CLIMATE SCENARIOS

There are a number of challenges in developing effective climate scenario analyses to support management in reaching actionable decisions. For example, the banking sector faces four key challenges in developing climate scenario analyses for their wholesale exposures.

1. **Time horizon** – The disconnect between the typical time horizon of risk analyses and the longer-term climate forecast horizon.

Time horizon is a key challenge when modeling the impact of climate change on bank performance, as the impacts will materialize over a longer time frame than banks typically consider in their processes and tools:

- If retaining a short-term view of the climate scenario (such as three-to-five years, which is similar to stress-testing or planning horizons), there will be a limited impact, as the biggest impacts are expected in the medium to long term (15 years). Importantly, this information set will not help banks drive strategic changes until conditions materially worsen.

- If retaining a longer-term view (roughly 25 years), forecasting income statement and balance-sheet views requires modeling anticipated changes in the portfolio composition, business models, and financial structure of the institutions. Results will be subject to multiple assumptions (scenario, portfolio evolution, and sector evolution), complicating their interpretation, significantly increasing uncertainty, and decreasing comparability between banks.

There are two main implications:

- Comprehensive sensitivity testing of potential credit losses is more relevant and appropriate at this stage than a full-blown, firm-wide, holistic stress-testing exercise that would cover losses, revenues, and capital. Such sensitivity testing can help banks assess the exposure under alternative portfolio constructs and business strategies and therefore drive decision making. While holistic stress testing may someday be useful, at the moment, it introduces greater uncertainty into forecasts and complicates an interpretation of the results.
- Existing models will require adjustment and/or new models will be necessary to accommodate the longer-term time horizon.

2. **Data availability** – Data gaps for assessing climate impacts on credit risk.

Banks currently do not have comprehensive, deal-by-deal climate-risk assessments across the portfolio and often have only very limited relevant climate attributes of their borrowers. Moreover, in contrast to traditional macroeconomic stress testing where a model can be calibrated and back-tested against previous crises or economic environments, climate modeling lacks the necessary historical empirical data since the most critical and material effects of climate change have yet to be observed (although this is changing, with the increase in extreme weather events, as well as a series of bankruptcies in the coal sector).

There are two main consequences:

- Given the limited availability of borrower-level climate attributes, a sector-level analysis is – at this early stage – a more efficient way to capture the main sensitivities of the organizations to transitional risks. Supplementing the sector-level methodology with select borrower-level analyses helps to calibrate the approach and increase conceptual soundness.
- Given the lack of empirical loss data related to climate change, banks must make use of expert judgments, which are subjective.

3. Coordination and organization – Integrating cross-functional capabilities and expertise across the bank.

Climate-related analysis and disclosure calls for integrating expertise and capabilities from various departments within a bank, such as:

- Sustainability leaders, who are often subject-matter experts on climate change and understand the potential impact and nuances of different scenarios.
- Credit-risk experts with an understanding of the drivers of borrower credit losses and the bank's credit portfolio.
- Stress-testing teams, who understand different approaches to sensitivity analysis and stress testing and can build and/or run the stress-testing machinery.
- Strategic planning units, which can incorporate information on climate risks, sensitivities, and opportunities into planning processes and strategic decision making (this may include decisions that limit the financing of certain types of activity, such as coal-fired power generation and the launch of "green" products and services).
- Finance and/or investor communication leaders who can frame and detail disclosures, with support from management and the board.

Achieving the coordination needed across these teams to create a collective output will challenge the existing organization, governance, and processes but is necessary for delivering a robust climate strategy for the years ahead.

4. Modeling uncertainty – Implications of significant uncertainty in modeling on scope of climate disclosure.

As the challenges highlight, there are significant limits to anticipating the financial impact of climate change accurately. Given those bounds, companies and financial institutions will need to carefully determine the extent of their disclosures. Insufficient information may not provide investors with a transparent view of the risks and could fail to meet expectations of the TCFD, as well as regulators. However, disclosure of uncertain information may also mislead stakeholders and be inconsistent with the TCFD's articulated principle of reliable disclosure.

MOVING AHEAD WITH MANAGED EXPECTATIONS

Organizations are expected to show prudence in framing and detailing disclosures to ensure the information provided is properly understood by the market. Initial discussions with leading banks suggest that the robustness of disclosures will evolve over time as financial institutions refine their climate-related underwriting and risk-assessment practices while corporates, in parallel, enhance their disclosures to reflect climate risks and resiliency strategies.

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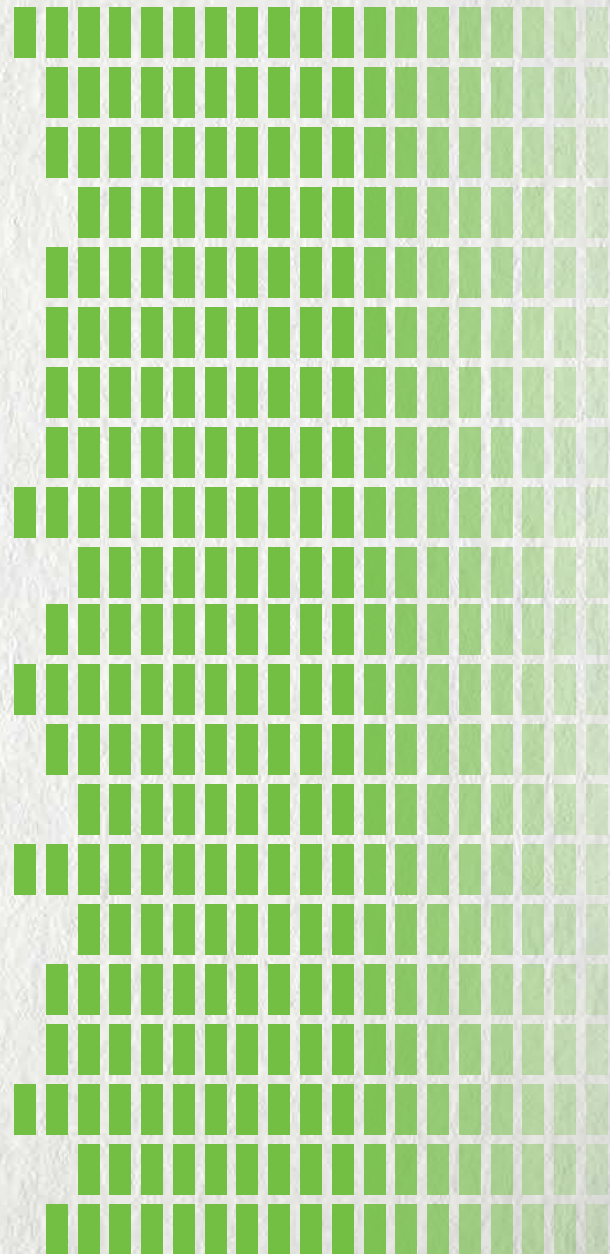
<http://www.brinknews.com>

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FINANCING CLIMATE RESILIENCE

PRACTICAL CONSIDERATIONS
TO ENHANCE STRUCTURES IN
PLACE TODAY

PETER REYNOLDS AND GAURAV KWATRA



Research suggests there is a material gap between the demand for, and supply of, funding for green investment. For example, the Development Bank of Singapore (DBS) estimates that annual demand of US\$200 billion in Southeast Asia over the next 30 years will massively outstrip annual supply of US\$40 billion.

However, polling at the November 2017 G20 Green Finance Conference¹ in Singapore indicated otherwise. During the conference, the audience – composed of finance professionals in the green space – responded to a live polling question: "What is the biggest challenge to scaling up financing for green projects?"

Almost half (44 percent) answered "lack of environmental data," while 39 percent selected "lack of investible projects", and the remaining 17 percent chose "inconsistent standards." Neither "investor demand" nor "maturity mismatch" were picked. This phenomenon points to a paradox at the core of green finance: Top-down estimates suggest a huge need without being matched by sufficient bottom-up funding. Yet when investors were asked the same question, they focused on matters of

data, project invisibility, or standards – clearly indicating that the issue for investors is a shortage of demand, rather than supply!

Simply put, the market at present isn't working, and needs fixing.

BOND MARKET AT PRESENT

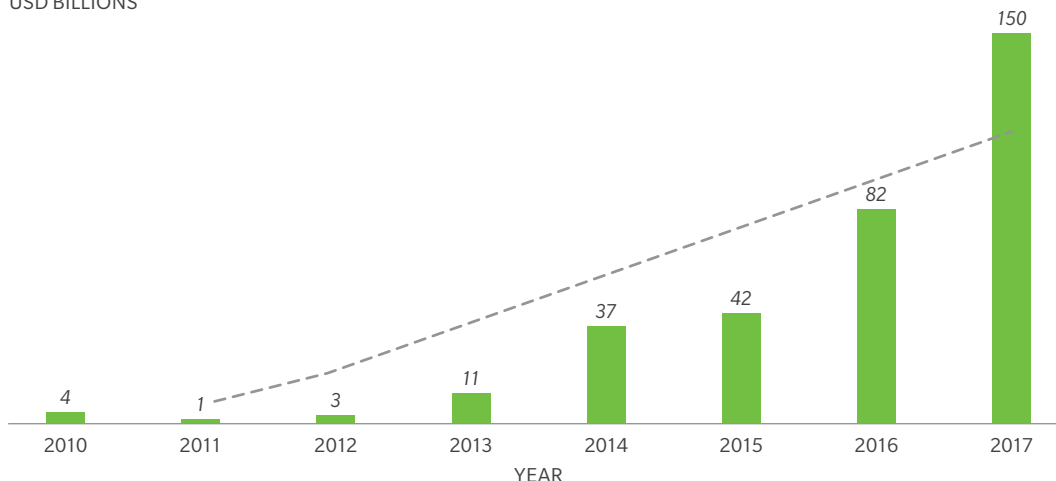
With the significant mismatch between the top-down growing demand for the green finance and the insufficient bottom-up funding of green projects, a transformational shift is required to address the challenge of climate change. Green bonds are currently the most mature form of debt instruments dedicated to financing eco-friendly projects, and there has been a sharp growth in issuance in recent years. (See Exhibit 1).

However, green bonds are not appropriate for all climate change financing. There are other pools of funding available to finance green projects from various sources, including:

- **Government and State grants** – directly designed to encourage development in green investments, including subsidies, tax relief, and other benefits.

Exhibit 1: Volume of green bonds issued since 2010

USD BILLIONS



Source: Climate Bond Initiative

¹ In collaboration with the Monetary Authority of Singapore and the United Nations Environment Program, the G20 Green Finance Conference was jointly organized by the Asia Securities Industry and Financial Markets Association (ASIFMA) and the Global Financial Markets Association (GFMA), and was held in Singapore on 15 Nov 2017.

- **Multilateral Development Banks (MDBs)** – either specifically designed to operate in this field (for example, Global Environmental Facility and Green Climate Fund) or those increasing their “green” mandate (such as the World Bank, AIIB, among others).
- **Private-sector quasi-MDBs** – such as large foundations and other charitable funds.
- **Private-sector funding providers** – including those looking to diversify their investment portfolios (for example insurance companies looking to match long-dated liabilities), as well as more traditional financing mechanisms (such as banks, green private equity, and venture-capital funds).

Such funds are designed to specifically address green projects that would not receive stand-alone private sector funding. Each participant in these funding pools has different modalities (broadly, a mix of grants, debt, equity, and guarantees) available to finance such projects.

such funds is often frustrating for those looking to finance and develop climate resilience. Often, funding comes with onerous ongoing monitoring and reporting requirements that represent a hidden cost to the recipients.

While much of the discussion had been focused on the mismatch between the supply of funds and the global need, even where potential supply of funding exists to meet the demand, the mechanism for matching projects with funds is not working efficiently. We believe the resolution of this issue – enabling efficient transmission of funds to the appropriate green projects – is key to meeting the challenges of climate change.

To ensure transformative and efficient change, the various pools of funding will need to be combined in more creative ways. This will require the effective functioning of a complete “ecosystem” of participants in the market, ranging from public to private and often crossing international boundaries.

MATCHING AVAILABLE RESOURCES EFFECTIVELY

In our experience, access to and use of such funding pools has been relatively slow. Furthermore, the process to gain access to

BREAKING DOWN THE BARRIERS

First and foremost, to strengthen green policies and catalyze green projects, the various challenges and barriers to entry must be recognized. (See Exhibit 2).

Exhibit 2: Illustration of root challenges to financing climate resilience today

	RECIPIENTS	FUNDING PROVIDERS
1	LANGUAGE <ul style="list-style-type: none"> • Lack financial jargon and terminologies to clearly articulate their needs • Lack financial understanding to assess the different options available in the market 	<ul style="list-style-type: none"> • Lack investment strategy to clearly articulate their risk appetite, especially how to balance financial returns with a “second bottom line” • Lack of common definition of “green” (for example, carbon storage and capture is both seen as good and damaging to different groups)
2	OPERATIONS <ul style="list-style-type: none"> • Dealing with many options and multiple funding providers, all with: <ul style="list-style-type: none"> – Different recipient assessment criteria (often manual and slow) – Inefficiency in managing funding platforms • No ex-ante view on whom to approach first 	<ul style="list-style-type: none"> • Processes not adapted to financing green projects; often a very formulaic financing perspective on a relatively subjective topic • Scarce resources available that combine climate science and financial expertise
3	PROCESSES <ul style="list-style-type: none"> • Material – and costly – ongoing reporting requirements on climate impact, with different requirements for each funding source 	<ul style="list-style-type: none"> • Slow and bureaucratic processing of funding requests (for example, board-level approval with little standardization) • Unclear regulatory framework and volatile inter-governmental support

Source: Marsh & McLennan Companies

Many green finance recipients find it difficult to articulate their needs and the green benefits of their projects, as they are not familiar with the highly specific financial terminology and/or may come from an engineering or infrastructure background.

The relatively early stage of green finance is also challenging for recipients as they lack the historical track records to quantify positive outcomes for potentially transformative ideas, often resulting in higher risks. Moreover, because the investments are often in unproven early-stage startups, R&D funding carries a much higher risk premium, given the higher degree of uncertainty and longer-term potential payout, hampering the initial catalysis phase.

On the other hand, funding providers also face a number of additional challenges besides the shortcomings in language, operations, and processes. There is no efficient secondary market for green investments, leading to longer-term exposure required to be held on the balance sheet (both national and private), making the need for careful consideration of such investments all the more important. Plus, the global benefits for the public sector and MDBs are hard to align with potentially high local costs. Given the wide breadth of potential projects, there is no “common currency” used to compare across the various projects.

WHAT CAN BE DONE?

There are tangible ideas that should be considered now to improve the functioning of the market today. These can be categorized broadly into three types of initiatives, with examples of each included below:

1. Make funding recipients better counterparties.
 - Develop a set of detailed online education resources designed to equip those seeking funding with the skills needed to communicate with potential funding providers, and carefully assess funding offers once those are made.

| C A S E S T U D Y |

FUNDING A CLIMATE-RESILIENT PORT IN NAURU

The Pacific island state of Nauru approached the Green Climate Fund (GCF) for funding assistance with the development of a climate resilient port, a project that was discussed at the 18th meeting of the GCF Board. The GCF agreed to grant financing of \$26.9 million, with the project co-financed by the Asian Development Bank, and the Governments of Australia and Nauru. Though successfully funded, the project highlights key challenges faced in green financing:

- Identifying the green portion of the project: Like most infrastructure, the port requires regular redevelopment. However the frequency of such redevelopment needs has increased due to more adverse weather, caused by climate change. Clearly identifying how much of this change is caused by climate impact is subjective.
- Parsing between the development and climate portions of the cost: The proposal as presented in the public discussion at the GCF outlined the incremental cost of building a “climate resilient” port over a more standard port. Again, the precise calculation of the incremental costs is clearly somewhat subjective, and open to interpretation.
- Quantifying the benefits: The benefit stream outlined in the proposal is estimated to extend for 50 years. While the port is a critical infrastructure requirement for the 11,300 inhabitants of Nauru, placing a precise value on the benefits is clearly impossible.
- Accessing multiple funding sources: The project is funded by four different parties, all of whom have different processes and requirements to access the funds.
- Determining appropriate funding concessionality: The port is a commercial venture, and hence will be able to repay some of the funding cost over time from future revenue streams. As such, funders needed to determine the correct level of concessionality in funding so as to not distort the private market – and ideally “crowd-in” the availability of such funding.

- Market participants come together to develop more standardized funding mechanisms, in addition to green bonds, that can then be traded. Such approaches may include newer digital funding tools, such as “initial coin offerings” or crowd-funding.

2. Make funding providers better partners for those requiring funds.

- Develop a common application process and an online platform for projects to be presented. This will allow the interested parties to view the range of possible projects without needing to complete multiple applications.
- Wherever possible digitize the application process and consider using the newer tools of 21st-century finance such as blockchain, initial coin offerings, and digital contracts.
- Produce a set of operational target standards for each of the funding providers, and track and compare each to the benchmarks to allow for learning.

3. Improve the information flow between the two sides.

- Set up a platform for sharing market data on green projects, on which external ratings can be developed. This would need to include an agreed-upon approach to quantification of second bottom-line risk – that is, the volatility in potential project success – to carefully manage this new form of risk.
- Build new digital solutions to simplify and track project impact efficiently, so as to provide the data in a timely fashion for the performance-monitoring needs of providers, while not over-burdening recipients.

Addressing climate change is clearly an era-defining global challenge. Effective financing of such projects by multiple parties is essential to overcoming the challenge. As such, careful development and growth of effective transfer mechanisms is critical.

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HOW BONDS CAN CLOSE THE CLIMATE ADAPTATION FINANCING DEFICIT

ALEX BERNHARDT

A GROWING NEED FOR ADAPTATION

To date, green bonds have dominated the conversation among debt investors as the primary means of achieving environmental or social impact in fixed-income mandates. Green bond issuance has grown significantly since the market was initiated in 2007 with offerings by the European Investment Bank (EIB) and the World Bank. In 2017, total labeled green-bond issuances – those explicitly marketed by issuers as green and many receiving third-party verification of their “greenness” – amount to \$221 billion in debt outstanding. An additional \$674 billion has been identified as “climate-aligned” by the Climate Bonds Initiative, bringing the total market for such debt to nearly \$900 billion.¹

The vast majority of the projects financed by green bonds have been focused on achieving climate change mitigation goals via low carbon-energy installations or public-transport initiatives to reduce greenhouse gas emissions. While investment in such green projects faces challenges in reaching the necessary scale, a less often considered (but arguably just as critical) element of the climate change investing equation is the need for climate adaptation. That is to say, initiatives that anticipate, plan for, and adapt to the changing climate and its impacts. Examples include altering coastal infrastructure for anticipated sea level rise or implementing green roofs and permeable pavements to reduce heat island effects in cities.

Even if temperature warming is limited to 2° Celcius by the end of this century, some significant level of change to historical weather patterns and sea levels is expected over this time frame. Indeed, leading research – and recent events in California and the Caribbean/US Gulf Coast – indicates that these impacts are already materializing. And while such impacts are notoriously difficult to quantify, the United

Nations Environment Program (UNEP) pegs the annual requirement for investments in climate adaptation at \$56 billion to \$76 billion per annum in 2015, increasing to anywhere from \$140 billion to \$300 billion per annum in 2030². This equates roughly to an aggregate requirement of between \$1.5 trillion to \$3 trillion over the 15-year time period³.

LEVERAGING BONDS TO CLOSE THE GAP

To date, actual and future committed public finance for climate adaptation has fallen woefully short of the estimated need. And while data is limited, it appears as though private finance is not being mobilized adequately to fill the remaining gap. Evidence of such limited commitment to adaptation can be found in the green bond universe where only 3 percent to 5 percent of issuances have been tied to an adaptation-related project, all in the water sector⁴. This despite the fact that the Green Bond Principles acknowledge the application of bond proceeds to support “climate change adaptation (including information support systems, such as climate observation and early-warning systems)”⁵ and the Climate Bonds Initiative includes in its taxonomy an adaptation section (albeit unfinished)⁶.

The reasons for the adaptation-financing deficit are manifold, and the solutions will not come easily. In the meantime, there exist a number of promising sub-segments in the global bond market for investors looking to diversify their sustainable investment portfolios with climate change adaptation solutions:

- **Catastrophe Bonds:** Insurance-linked securities (ILS), in particular public-traded catastrophe bonds, represent a compelling opportunity for investors to support financial resilience in the face of the multiplying physical impacts of climate change. While most issuers of ILS today are commercial

1 https://www.climatebonds.net/files/files/CBI-SotM_2017-Bonds&ClimateChange.pdf

2 UNEP Adaptation Gap Report, 2016 <http://drustage.unep.org/adaptationgapreport/sites/unep.org.adaptationgapreport/files/documents/agr2016.pdf>

3 Author calculations.

4 https://www.climatebonds.net/files/files/CBI-SotM_2017-Bonds&ClimateChange.pdf - Page 18

5 <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/GreenBondsBrochure-JUNE2017.pdf>

6 <https://www.climatebonds.net/standards/taxonomy>

insurers, a growing number of such transactions are originating from public-sector insurers, non-financial corporations, and public entities, many of which have at their core a social mission⁷. The ILS market today is small – 30 times smaller than the climate-aligned bond market at just \$30 billion in debt outstanding⁸ – but the capacity of the global capital markets to assume more weather and catastrophe risk is immense. This capacity could be put to use plugging the widening catastrophe insurance gap⁹, though a broader array of corporate and public-sector issuers will first need to recognize the merits of ILS in helping them manage their contingent weather/catastrophe liabilities.

- **Environmental Impact Bonds:** Social impact bonds are not all structured as bonds per se, and so defy simple aggregation, but by most estimates they represent a very small investable market (less than \$1 billion in total issuance outstanding). These bonds follow a “pay for success” model whereby investors receive a higher rate of return if a certain predetermined social objective is met. Recently, the DC Water and Sewer Authority issued what is believed to be the first Environmental Impact Bond globally, the proceeds of which will be used to support green infrastructure improvements (such as permeable pavement). If storm water runoff reduces by a certain amount in the years post-issuance, then investors will receive a onetime additional payout when the bond reaches maturity¹⁰.

- **Resilience Bonds:** While resilience bonds are still just a concept, the elegance of the solution has distinct appeal, and several pilot programs are rumored to be in the works¹¹. In short, a resilience bond would act like a catastrophe bond for a municipality but with a built-in contingent premium discount for the issuer based on the completion of an infrastructure improvement which would make the covered location(s) less susceptible to damage from the covered peril(s)¹². Using premium discounts to incentivize long-term decision making for individual policyholders is a time-worn concept in the personal insurance industry, though it has yet to be applied effectively in the catastrophe bond market¹³.

While the above investment categories are all currently small in size (or as yet non-existent), the building blocks for global investing in climate change adaptation are in place. Scaling these opportunity sets will be essential, as the need to move more dollars rapidly into climate finance to support adaptation is clear. This need will only increase as global temperatures continue to rise.

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7 <https://insurancelinked.com/insurance-linked-securities-and-responsible-investment/>

8 As at 2017: http://www.artemis.bm/deal_directory/cat_bonds_ils_issued_outstanding.html accessed November, 2017.

9 http://www.swissre.com/media/news_releases/The_USD_13_trillion_disaster_protection_gap.html

10 <http://www.goldmansachs.com/media-relations/press-releases/current/dc-water-environmental-impact-bond-fact-sheet.pdf>

11 <http://www.bbc.com/future/story/20170515-resilience-bonds-a-secret-weapon-against-catastrophe>

12 <http://www.refocuspartners.com/wp-content/uploads/pdf/RE.bound-Program-Report-September-2017.pdf>

13 <https://hbr.org/2017/08/how-the-insurance-industry-can-push-us-to-prepare-for-climate-change>

RISK FINANCING

CLOSING THE GAP IN
FLOOD PROTECTION

CHARLES WHITMORE



A GROWING PROTECTION GAP

On a global scale, approximately 70 percent of economic losses due to natural catastrophe events are not covered by insurance. This protection gap – the cost of uninsured events – frequently falls on governments in the form of disaster relief, welfare payments, and infrastructure repair and rebuilding. The ultimate cost of these responses places a strain on public balance sheets and increases public debt, hurting taxpayers.

Globally, economic losses from natural catastrophes such as floods and hurricanes have increased dramatically. This is no different in Europe, where weather-related uninsured losses have remained high since 2010. The trend may be attributed to the steady increase in urbanization and projected increases in rainfall. Along with this, Europe has experienced a corresponding increase in the concentration of both insured and uninsured flood risks.

Geographically, the European continent is made up of countries with small land masses and comparatively large rivers. A single flood event can affect more than one country and produce damages that overwhelm the public funds available to address them. Severe and prolonged flood disasters may yield insurance claims that far exceed the funds available to pay for even insured losses.

Organizations throughout Europe have thus significantly promoted public sector initiatives to close this gap and improve their societies' ability to respond to the impacts of natural catastrophes. For example, in the United Kingdom, the British Insurance Brokers' Association flood scheme provides flood cover for businesses and many commercial premises located in flood risk areas. As part of the Italian Catastrophe scheme, risks from all natural perils to which the country is exposed – earthquakes, floods, flash floods, landslides, mudslides, and tsunamis – have been modelled and quantified so as to enhance the private-public partnership (PPP) between the country's insurance industry and its governmental bodies.

FOUR WAYS TO CLOSE THE PROTECTION GAP

To supplement such initiatives, there exist additional actions the private sector can take to support broader product offerings, ensure greater market stability, and close the protection gap.

1. HARNESS THE GLOBAL INSURANCE INDUSTRY'S CAPABILITY TO IMPLEMENT RISK TRANSFER SOLUTIONS AND PROMOTE RISK MITIGATION MEASURES

A successful public/private approach to managing disaster risk and the potential impact of climate change requires meaningful engagement among a wide spectrum of stakeholders to ensure a focused and sustainable solution over the medium term. The insurance industry has a critical role to play given its data capabilities in quantifying, pricing, and underwriting risk using cutting-edge modeling software – providing the mechanism to effectively spread and diversify risk worldwide.

The United Nations has recognized the importance of the insurance industry's role in educating and incentivizing its policyholder base on climate-related risk. In April 2016, the United Nations Secretary General hosted a high-level meeting to address the topic of resilience. Subsequently, the Insurance Development Forum (IDF) was formed¹. The IDF is an industry-wide body that will engage international entities to work together to achieve a “better understanding and utilization of risk information that could help governments in better deployment of their resources to build resilience to protect people and their property.”

¹ Dan Glaser, President & CEO of Marsh & McLennan Companies sits on this Forum.

2. ENHANCE PUBLIC/ PRIVATE PARTNERSHIPS

A coordinated approach between the insurance industry and governments is increasingly being recognized as the most effective means of creating sustainable and effective risk transfer mechanisms. Greater strategic dialogue is needed between governmental departments, non-governmental organizations, the scientific and academic communities and, of course, the insurance industries. It will promote the development of multifaceted approaches to disaster risk management and the implementation of insurance solutions. A joint collaboration should involve sharing complimentary expertise that enables communities to: better assess and understand risk; put in place ex-ante prevention and resilience measures; combine resources to create effective risk transfer solutions; and enable societies and communities to dramatically speed their recovery, post-loss (See Case study: Flood Re – A Public Sector Initiative).

3. IMPROVE DATA COLLECTION FOR MODELING EFFORTS

One of the main challenges in modeling evolving flood risks is the requirement for high quality data. The computational demands for hydraulic modeling is high, especially as the size of modeled areas expands with increasing urbanization, and given that preventative measures can directly influence flood threats through the construction of defense structures.

Unfortunately, detailed data on the presence, construction standards, and operational regimes of flood defenses is not universally available. Modelers will thus have to expend considerable effort to quantify this aspect. Finally, as flood damage occurs in a fairly binary manner – property being either submerged in water or not – highly accurate information on the location of risks is essential, especially in changing urban environments.

Despite such challenges, the first flood risk models for Europe began appearing in 2004. While commercial vendors have

been slow to address the gap so far, others, including brokers, have been steadily producing models. At Guy Carpenter, we have produced a range of flood models for key countries and a pan-European hailstorm model based on detailed claims data. Such efforts are part of the push to broadly quantify risk so as to enable insurers to price and assume previously uninsured risks – risks that, in the event of natural disaster, ultimately burdened public-sector balance sheets.

4. PRODUCT TRANSPARENCY AND INNOVATION

The factors that contribute most to the protection gap – low insurance penetration and lack of insurability – must be addressed at their source. Some insurance products may be too complex for promotion of increased uptake, with confusing language or myriad clauses and exclusions making them difficult to understand. As a result, there exists significant room for policyholder misinterpretation, potentially leading to voided and non-responding policies. The distribution of insurance products also needs to become more streamlined, more cost-effective, and more user friendly from the customer's perspective. The use of emerging technology will be critical in creating a cheaper and more customer-friendly insurance purchase experience.

| C A S E S T U D Y |

UK'S FLOOD RE A PUBLIC SECTOR INITIATIVE

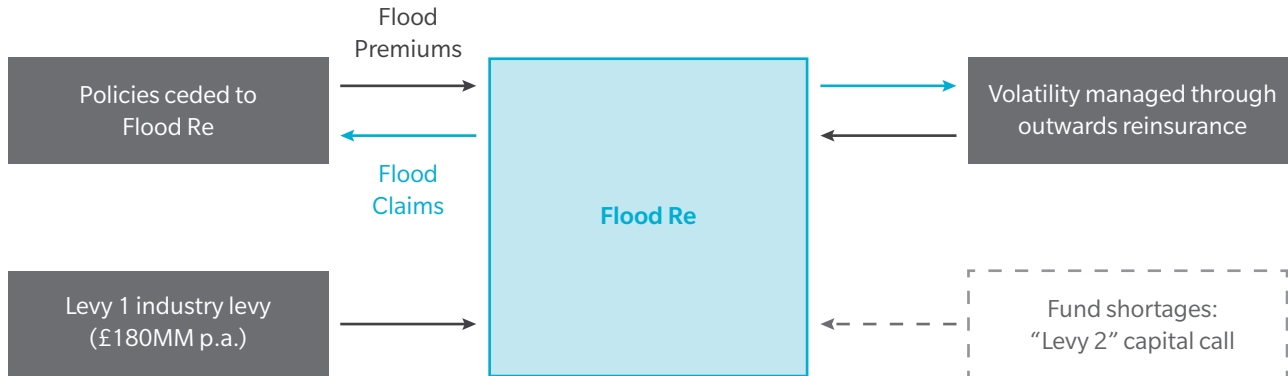
Following years of planning by the insurance industry and negotiations with a wide group of stakeholders including the United Kingdom government, the Prudential Regulatory Authority, the Financial Conduct Authority, and others, Flood Re was launched in April 2016. The overarching aim of this market-based scheme is to ensure better access to more affordable household insurance for people in high flood risk areas.

Flood Re brings long-sought stability to a marketplace that has been beset by major flood events in recent years. This 25-year initiative possesses value beyond simply providing a framework for the provision of insurance. All stakeholders are committed to working in unison with the government to deliver on its objective of boosting public confidence and understanding; re-establishing a functioning flood

insurance market that supports the customer; and strengthening the overall national understanding of the peril to ensure that robust risk management strategies exist at all levels.

Here's how it works: the household customer continues to purchase home insurance from an insurer in the usual way. Flood Re enables the insurers to reinsure (transfer) the flood risk element of a household policy to Flood Re at a pre-set (fixed) more affordable reinsurance premium based on the property's local tax rates, with no variation for hazard level. The premium base has been fixed sufficiently low to be affordable for high-risk homeowners and therefore, the income for Flood Re is bolstered by "Levy 1;" a GBP 180 million annual levy on all UK household insurers calculated according to market share. In extreme circumstances, Flood Re can also call upon "Levy 2" from household insurers to bolster the position of the company (Exhibit 1).

Exhibit 1: The construct of Flood Re



Source: Guy Carpenter

Benefits to UK Homeowners: An estimated 350,000 homeowners in the UK are expected to benefit from Flood Re and stimulate a more competitive insurance market. Early figures for Flood Re take-up and “on-boarding” by insurers and customers are very positive, with all major insurers participating. At this early stage, customers are seeing direct benefits from the scheme with flood-exposed households experiencing reductions in premiums that can be measured in the thousands of pounds.

Guy Carpenter collaborated extensively on the launch of Flood Re. Working together, the two teams developed key parts of the business plan submission to the PRA; the expected portfolio composition and build-up analysis; catastrophe modeling and realistic disaster scenario testing; and the design and testing of operational systems.

A GBP 2.1 billion multi-year reinsurance program was placed to ensure that the scheme could be operationalized. Flood Re also broke new ground in that the placement was the first known reinsurance program procured under the European Union (EU) and UK public procurement regulation, requiring the design of a bespoke reinsurance strategy to meet the regulatory requirements.

CONCLUSION

The protection gap is widening in both emerging and advanced economies where investment in critical infrastructure does not always keep pace with asset growth and accumulation. As such, the (re)insurance industry will play a crucial role in establishing efficient risk transfer strategies on behalf of public sector entities as part of their plans to manage rising flood risks.

The financial management of flood risks continues to present significant policy challenges in Europe, as well as in many other parts of the world. Careful consideration of the relative effectiveness of various risk management strategies will be necessary – from prevention investments to the use of risk transfer schemes against significant post-disaster costs. Equally important will be private-public collaboration to create a public private partnership (PPP) that unites the efficiency of private organizations with the effectiveness of state guarantees.

Charles Whitmore is a Managing Director with Guy Carpenter and is based in London, United Kingdom.



FINANCING A GREEN FUTURE

WHO IS DRIVING IT PAST
THE TIPPING POINT?

JACLYN YEO

GOING MAINSTREAM

The transition to a lower-carbon economy has already begun and will require a great deal of financing. Collectively known as green finance, these efforts are understood to be instrumental in carbon reduction strategies, achieving sustainable development goals, and building a climate-resilient future.

The question is: Who will drive green investment into the financial mainstream – investors or regulators?

Because the transition to a lower-carbon economy will involve various, far-reaching changes, no one single definition for green finance holds across all countries and regions. Nonetheless, the common theme of green finance is investment that promotes a sustainable, lower-carbon, and climate-resilient economy.

WIDE-RANGING SPECTRUM OF GREEN FINANCING TOOLS

More measures related to green finance were introduced between June 2016 and June 2017 than in any one-year period since 2000. These included implementing strategic policy signals and frameworks, supporting the development of local green-bond markets, and promoting international collaboration to facilitate cross-border green bonds investments. The result has been increased flows of green finance, most notably in the issuance of green bonds, which doubled to US\$81 billion in 2016.

Though green bonds are the most common instruments, green financing principals can be applied across various financing and de-risking instruments. This includes traditional debt and equity and other tools along that continuum, such as credit enhancements. (See Exhibit 1.)

While green bonds are most commonly associated with green infrastructure financing, they may appear unattractive due to the common misconception that green infrastructure projects are less “bankable.” This is one of the factors

leading to the so-called “green financing gap,” estimated to range from a minimum \$2.5 trillion, to as high as \$4.8 trillion. The gap is largely attributable to inadequate risk-adjusted returns, one of the key barriers facing private-sector financing of sustainable infrastructure, described in recent reports by Mercer Mercer and the Inter-American Development Bank.¹

This gap can be bridged via credit enhancements from de-risking instruments such as insurance and derivatives, which remove some of the inherent risks that otherwise make an investment unbankable. With adequate credit wraps, green investments can be treated as de-risked products with higher returns and longer-term financial stability, with the eligibility for longer tenure.

As such, green financing instruments should be sufficiently broad so as to capture all the objectives of the respective green finance provisions. At the same time, however, the designation of green finance needs to be defined more narrowly so as to make the emerging discipline credible and actionable. Unifying criteria and standards will be required to specify the scope and degree of “green” for investors and regulators, given the various initiatives across regions and countries to define environmentally friendly financial instruments and investment principles.

GREEN FINANCE AND INVESTORS: WHO'S DRIVING WHOM?

As it concerns both the direct and indirect risks of the transition to a lower-carbon economy – as well as the various opportunities associated therewith – green finance has lately become the talk of the town. Investors are recognizing the increasing number of green investment opportunities, along with new markets to penetrate and consumer bases to attract. Indeed, global sustainable investment stood at \$23 trillion in 2016, a 25 percent increase from 2014 with a compounded annualized growth rate of 12 percent.

¹ Mercer and IDB, Building a Bridge to Sustainable Infrastructure (2016) and Crossing the Bridge to Sustainable Infrastructure. 2017. Both reports can be accessed at Mercer.com

Some argue that investors are spearheading green finance. Mandated climate disclosures – compulsory reporting of how companies manage climate-related risks – represent a major step toward mainstreaming green finance. This will promote transparency and help investors identify climate-related risks and opportunities.

For example, in March 2017, global investment institution BlackRock listed climate risk disclosure as one of their key engagement themes in their investment priorities.² Specifically, the firm will be asking companies to demonstrate how climate risks might affect their business and what their managements’ approach will be to adapting and mitigating these risks.

Shareholders increasingly want to know what companies are doing to transform their operations and products and remain competitive during the transition to a lower-carbon economy.

In 2017, a leading energy company was pressured by investors to report climate-related impacts on its business under a two-degree scenario. The move was a strong signal to the market that climate change is now counted a significant financial risk.

GETTING PAST THE TIPPING POINT

Investors may be driving the green finance initiative, but they cannot succeed without the support of other key stakeholders. Besides institutional investors, there are markets where regulators and policy makers appear to be more aggressive in leading the transition:

- **Regulators**
To better facilitate the development of green finance, the Luxembourg Green Exchange in September 2016 opened a segment dedicated to Sustainable and Social (S&S) projects bonds, a sector valued at over

Exhibit 1: Spectrum of selected green financing products available

SPECTRUM OF GREEN FINANCING PRODUCTS

FINANCING INSTRUMENTS		DE-RISKING INSTRUMENTS	
Asset Category	Definitions	Credit Enhancement	Definitions
FIXED INCOME (DEBT) <ul style="list-style-type: none"> • Bonds • Loans 	Lending or debt instruments provide borrowers with upfront funding in exchange for repayment of funding <i>Example: Green bonds</i>	THIRD-PARTY GUARANTEE <ul style="list-style-type: none"> • Credit-rating agencies 	Provides overall credit rating to help investors manage investment risks and offers visibility into the perceived risk-reward profile of an investment <i>Example: Moody's and S&P started to assess climate change impacts on credit ratings in 2016</i>
EQUITY <ul style="list-style-type: none"> • Listed • Unlisted 	Equity investments provide critical capital base for company or project to grow its operations, access other sources of finance, and reduce investment risks faced by other investors <i>Example: PPP, REITs, direct corporate stocks</i>	INSURANCE <ul style="list-style-type: none"> • Political risk • Credit risk 	Insurance protects investors from a borrower's failure to repay as a result of pre-specified events, such as political situations that include governmental expropriation of assets <i>Example: Political Risk Insurance</i>
FUNDS AND STRUCTURED PRODUCTS <ul style="list-style-type: none"> • Debt/Equity funds • Securitized products 	These instruments allow investors to diversify investments and reduce investment transaction costs, and improve borrowers' access to finance smaller "green" projects <i>Examples: Sustainable Global Equity Funds</i>	DERIVATIVES <ul style="list-style-type: none"> • Weather-indexed 	Financial agreements to manage various risks faced by investors/borrowers, such as risks associated with adverse weather conditions <i>Examples: Weather parametric</i>

Source: Marsh & McLennan Companies

² BlackRock, 2017. BlackRock Investment Stewardship Engagement Priorities for 2017-2018.

US\$23 trillion. It had increased the visibility of S&S projects and expedited their financing.

Meanwhile, the Securities and Exchange Board of India in June 2017 finalized the disclosure requirements for the issuance and listing of green debt securities, which will raise funds from capital markets for green investments in climate change adaptation, and more specifically renewables and clean transportation.

- **Legislations**

The French Energy Transition for Green Growth Act was enacted in January 2016, mandating that institutional investors and fund managers disclose in their annual reports how climate change considerations have been incorporated into their investment and risk management policies.

China has also been ambitious in launching pilot zones to focus on different aspects of green financing in the provinces of Guangdong, Guizhou, Jiangxi, Zhejiang, and Xinjiang. In the program, banks are encouraged to explore new financing mechanisms; the program also incentivises the financial sector to accelerate the advancements of green insurance and credit enhancement instruments in these regions.

Undoubtedly, *investors are the key driving forces*, but to drive further demand at this nascent stage, *government intervention may be necessary*. Regulators and/or policy makers might need to step in with subsidies, risk-mitigation mechanisms, and guarantee mechanisms for green investments.

WHERE NEXT?

This year's G20 Summit in Germany concluded that green finance will be key in addressing a host of global challenges. This echoes the call at the previous year's Summit to scale-up green financing for driving environmentally sustainable growth.

2017 has since seen significant progress by world leaders, national initiatives, and investors alike in fostering sustainable global growth through green finance. Looking forward, the G20, the UN Environment Programme, and the Monetary Authority of Singapore will continue to maintain this momentum when the G20 Green Finance Conference is held in Singapore earlier in November.

Such conferences promote the development of a green financial system, workable from a capital markets perspective and aligned with the national and international commitments of the Paris Agreement.

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<http://www.brinknews.com/asia>

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INCREASING CLIMATE RESILIENCE THROUGH RISK FINANCING

CASE STUDY MOZAMBIQUE

THOMAS LONDON AND ROBERT WYKOFF

INCREASING IMPACTS

2017 marks one of the worst years in recent history for global natural catastrophes. Staggering losses stemming from a series of devastating floods, hurricanes, and earthquakes have brought the topic of disaster risk financing back to center stage as governments, the public, and insurance companies work to recover and rebuild. By October 2017, global insured catastrophe losses for the year were in excess of US\$100 billion, only the third time such a threshold was breached.¹ Extreme weather events that destroy homes, businesses, infrastructure, and agricultural assets have high opportunity costs, particularly in emerging economies, where scarce resources must be reallocated to reconstruction efforts.

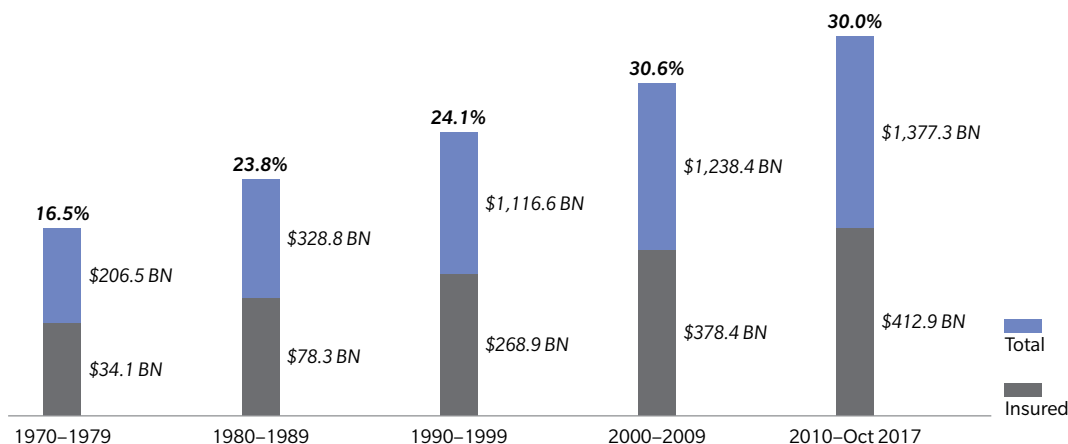
Scientific consensus suggests that climate change will exacerbate the intensity of tropical cyclones, severe storms, and droughts. While many of these losses are privately insurable, governments are often responsible for filling the gap when the private sector is unable or unwilling to. Although insurance is currently providing a greater portion of relief from natural catastrophe losses, the industry's growth is being eclipsed as trends such as urbanization drive total dollar losses higher. (See Exhibit 1.)

Private insurance can be quite important in supporting economies in resilience and disaster recovery. For example, research indicates that a 1 percent rise in insurance penetration translates to a 13 percent reduction in total uninsured losses and a 22 percent reduction in taxpayers' contribution following a disaster. Further, insurance improves the sustainability of an economy and leads to greater rates of growth – a 1 percent rise in insurance penetration leads to increased investment equivalent to 2 percent of national GDP.²

With insurance covering an estimated 40 percent of catastrophic losses, developed countries generally have the fiscal resources and political stability to address catastrophe risk. However, in developing countries it is estimated that only 5 percent of catastrophe losses are insured.³ Those assets with insurance are often foreign investments, such as oil and gas exploration efforts, located far from urban centers, built to international construction standards, and insured with large international insurers. These facilities suffer relatively little loss during catastrophes and offer few premium benefits to local insurers.

Exhibit 1: Natural catastrophes

INSURED LOSS (% OF TOTAL LOSS, USD) BY DECADE



Source: Swiss Re, Sigma 1/2016

¹ <http://www.gccapitalideas.com/2017/10/31/asia-pacific-catastrophe-report-2017-executive-summary/>

² Lloyd's City Risk Index 2015-2015 – <https://www.lloyds.com/cityriskindex/>

³ Cummins, Mahul. Catastrophe Risk Financing in Developing Countries: Principles for Public Intervention. The World Bank.

DEVELOPING A MARKET

Mozambique offers a case study of the challenges developing economies face as limited resources hamstring competing efforts to grow the economy, build resilient infrastructure, and prepare for disasters.⁴ The country is Africa's third most susceptible to weather-related perils, the result of its proximity to the Indian Ocean, 2,400 km of coastline, and downstream location on numerous major African rivers. Approximately 41 percent of Mozambique's coastal areas are exposed to catastrophe events, while economic activity in these areas constitutes 52 percent of the country's gross domestic product.⁵ Weather-related events account for 94 percent of the country's economic losses, and climate change is expected to increase both the frequency and severity of weather events.⁶ When disasters occur in Mozambique, vital resources must be redirected to relief efforts.

To help the country tackle these challenges, international donor agencies are exploring ways to build capacity and proactively finance catastrophe losses by tapping into local and international insurance markets. USAID's Coastal City Adaptation Project aims to enhance Mozambique's capacity to respond to climate change by decreasing the country's exposure to rising sea levels and weather events. The Project involves mitigation efforts and training local communities on best practices to prepare for, respond to, and recover from disasters. For the first time, USAID is exploring the viability of engaging the private insurance market to support foreign risk financing initiatives in developing economies.

“INSURANCE IS A VITAL TOOL IN THE CAPACITY BUILDING ARSENAL.”

Effective risk transfer programs spread risk among many parties through a process called layering. For example, insurance can directly cover government assets, reinsurance can provide a backstop for government insurance schemes, and insurance linked securities can fund infrequent but severe events by transferring risks to global financial markets. In the most extreme circumstances, international donor support can serve as a backstop for devastating losses.⁷ (See Exhibit 2.)

Research and analysis suggests that greater private sector participation will support the development of a national catastrophe insurance program. Should efforts in Mozambique prove successful, programs developed there could serve as a template for ones in other countries. USAID's pilot program simultaneously addresses several critical components to maximize the odds of success: at risk populations are being educated about relevant prevention and response techniques; buy-in is being achieved at all levels of government; appropriate tools, data, and analytics are being explored to identify and quantify risks; and training and guidance are being tailored to a wide audience ranging from rural populations to the CEOs of large insurance companies.

4 Cummins, J. David., and Olivier Mahul. *Catastrophe Risk Financing in Developing Countries: Principles for Public Intervention*. Washington, D.C.: World Bank, 2009. Print.

5 "Risk calculators and dashboards". Verisk Maplecroft. https://maplecroft.com/about/news/economic_losses.html. Accessed: February 2017.

6 "Basic Country Statistics and Indicators (2014)". *PreventionWeb*. <http://www.preventionweb.net/countries/moz/data>. Accessed: February 2017.

7 World Bank; Policy Research Paper *Disaster Risk Financing and Contingent Credit: A Dynamic Analysis*; Daniel Clarke and Olivier Mahul; June, 2011.

TRANSFERRING PUBLIC RISK TO THE PRIVATE SECTOR

Privatizing risk typically begins with a low limit pilot program. As data are gathered and familiarity with the process grows, a program's limits, coverages, and geographic territories may be expanded. The following are examples of governments that have successfully transferred public risk to the private sector:



MEXICO

The Mexican government pioneered government risk transfer strategies with the world's first sovereign catastrophe bond in 2005. This provided coverage for US\$160 million across three regions, supplemented by an additional parametric reinsurance program. Four years later, Mexico made history again by issuing the first ever multi-peril catastrophe bond for hurricane and earthquake losses.¹ The coverage continues today, funding the reconstruction of public assets, key infrastructure, and low-income properties damaged by natural disasters.² In 2017, a series of earthquakes triggered coverage, obligating the entire earthquake tranche of the bond.



TURKEY

In one of the most seismically active countries, the government established the Turkish Catastrophe Insurance Pool and issued a US\$400 million catastrophe bond in 2013. The bond covers parametric earthquake risk and is triggered by seismometer measurements taken by the country's Early Warning and Rapid Response System. As of 2015, the pool increased its total coverage to US\$500 million.³



CARIBBEAN CATASTROPHE RISK INSURANCE FACILITY

CCRIF is a regional catastrophe fund for Caribbean governments to limit the financial impact of hurricanes and earthquakes. It is the first multi-country risk pool and represents a cost-effective way to pre-finance short-term liquidity for recovery efforts following a catastrophe, filling the gap between immediate response aid and long-term redevelopment. Parametric triggers enable rapid payouts by eliminating delays due to loss adjustment processes and providing an objective basis for payouts and pricing. Since its inception, over US\$100 million in payouts have been issued, all within 14 days of the given disaster event.⁴ In 2017, Hurricane Irma resulted in US\$31.2 million in payouts and Hurricane Maria triggered a US\$19.3 million payout to Dominica, marking over US\$50 million in payouts for 2017.

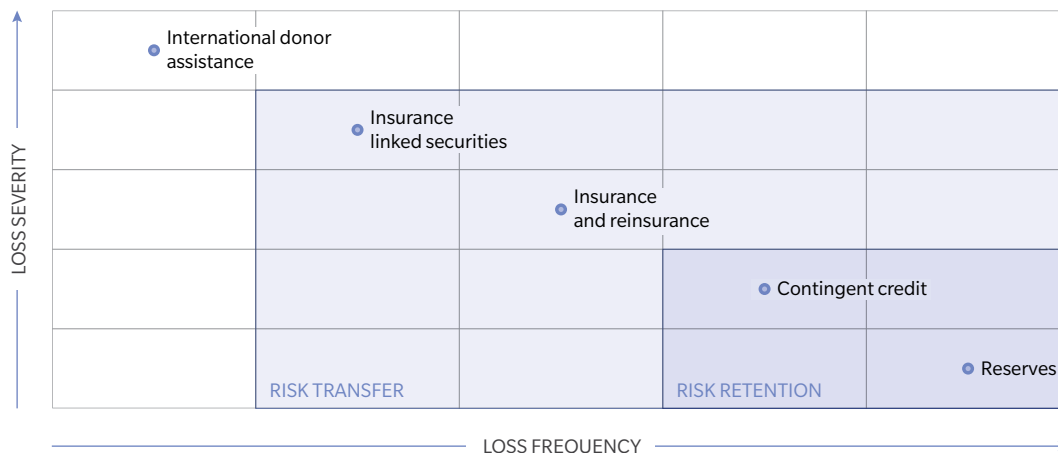
*1: Dana Julie and Sebastian von Dahlen. *An Overview of Potential Pathways to Appraising Impact of Sovereign DRFI: Where Should We be Looking to Assess Benefits?*. WBG, DFID, GFDRR, March 2014.

*2: Bussolera, Paolo. "Indemnity based Nat Cat insurance covers for sovereign risks – Example: FONDEN, Mexico". *Munich Re. Presentation*, April 23, 2013.

3: "GC Securities Completes Catastrophe Bond Bosphorus Ltd. Series 2015-1 Notes Benefiting the Turkish Catastrophe Insurance Pool". GC Capital Ideas. August 26 2015. http://www.guycarp.com/content/dam/guycarp/en/documents/PressRelease/2015/GC%20Securities_%20Completes%20Catastrophe%20Bond%20Bosphorus%20Ltd.%20Series%202015-1%20Notes%20Benefiting%20the%20Turkish%20Catastrophe%20Insurance%20Pool.pdf. Accessed: February 2017.

*4: *Informe Anual del CCRIF SPC 2015 – 2016*. The Caribbean Catastrophe Risk Insurance Facility, 2016.

Exhibit 2: Layering in action



Source: World Bank

CHALLENGES REMAIN

While progress is being made in Mozambique, capacity building efforts are not without their challenges. Examples include:

- At-risk populations are often unwilling to relocate given the disruptive effects it has on communities.
- In-country technical ability is scarce, necessitating external resources be brought in.
- Financial tools such as risk financing can be a tough sell in regions where even food is not reliably available.
- Data to support the identification and analysis of at risk regions are often incomplete or non-existent.
- Assessing losses in devastated areas proves difficult when critical infrastructure has been destroyed by disaster.

The negative impacts of climate change are a global problem, and international efforts are underway to help populations likely to be most impacted. Capacity building for disaster resiliency is a crucial step in preparation and insurance is a vital tool in the capacity building arsenal. By shifting the financial burden of loss from taxpayers to the insurance sector, governments, businesses, and communities can focus limited resources on vital projects that will continue growing and developing their economies.

Chemonics International and Guy Carpenter partnered with the United States Agency for International Development (USAID) to evaluate risk financing options in emerging economies and pilot the Coastal City Adaptation Project program in Mozambique.

Thomas London and **Robert Wykoff** are assistant vice presidents at Guy Carpenter, based in New York and Philadelphia, respectively.

PATH TO SUSTAINABLE INFRASTRUCTURE

AMAL-LEE AMIN AND JANE AMBACHTSHEER



The world needs more infrastructure, particularly in developing countries. But not just any infrastructure. To achieve the economic, social, and environmental objectives embodied by the Paris Agreement and the Sustainable Development Goals (SDGs), this infrastructure must be sustainable, low-carbon and climate-resilient. The New Climate Economy's 2014 report, *Better Growth Better Climate*, estimates that from 2015 to 2030, the global requirement for new infrastructure assets will be \$90 trillion, more than the value of the world's existing infrastructure stock.

To meet these needs, annual investment in infrastructure will need to increase from current levels, about \$3 trillion, to \$6 trillion. At the same time, data from the Organisation for Economic Co-operation and Development and alternative assets researcher Preqin shows investors' allocations to infrastructure are gradually increasing, driven by a combination of factors (such as low yields in traditional asset classes and inflation protection).

Together, these should be positively reinforcing developments. But are they? The Inter-American Development Bank (IDB) commissioned Mercer to assess the extent to which infrastructure investors – and other stakeholders, including governments, multilateral development banks (MDBs) and infrastructure industry initiatives – are focusing and collaborating on sustainable infrastructure. Our findings are somewhat mixed: the positive momentum of new initiatives focused on sustainable infrastructure is countered by the fact that sustainability concerns struggle to enter the core allocation strategies of mainstream investors.

Our initial report, published in November 2016, *Building a Bridge to Sustainable Infrastructure*, outlined the effort underway to raise awareness of sustainable infrastructure investment opportunities and develop tools to foster related investment analysis and monitoring. However, as outlined in the companion paper, *Crossing the Bridge to Sustainable Infrastructure*, we find that the level of investor awareness and engagement with these developments seems relatively limited. In addition, current allocations

to infrastructure fall short of the levels required to support economic development, *The New Climate Economy* found in 2016. To overcome these barriers, we set out a call to action for investors, governments, MDBs and industry initiatives (see Exhibit 1).

WHAT IS SUSTAINABLE INFRASTRUCTURE?

In a broad sense, sustainable infrastructure is socially, economically and environmentally sustainable. The specific application of this concept will depend on the relevant geographical and sector contexts. But ultimately, sustainable infrastructure is that which will enable the world collectively to meet the SDGs and the Paris Agreement.

Some investors have the misconception that sustainable infrastructure simply means more renewable energy infrastructure. Indeed, investment flows into renewable energy have been increasing; for example, in 2016, more than 40 percent of new infrastructure investment went into renewables, data from Preqin shows. Although this is positive, sustainable infrastructure needs are broader. The New Climate Economy's *Better Growth Better Climate* outlines in detail the change that is required across three critical economic systems: cities, land use and energy.

In addition, infrastructure needs to be resilient in the face of a changing climate. A 2016 study of public-private partnerships (PPPs) by Acclimatise found that "among the sample of 16 national PPP policy frameworks examined, not a single one was found to mention a changing climate, climate resilience, or adaptation."

"ULTIMATELY, SUSTAINABLE INFRASTRUCTURE IS THAT WHICH WILL ENABLE THE WORLD COLLECTIVELY TO MEET THE SDGS AND THE PARIS AGREEMENT."

BRIDGING THE DIVIDE

A CALL TO ACTION

Three sets of complementary actions are outlined below. The first relates to industry initiatives focused on infrastructure investment. The second two address multilateral development banks (MDBs), governments, investors and industry initiatives.

ACTION ONE: CONVENE THE CONEVENORS

Investors identified a number of opportunities for industry initiatives to influence the investor mindset on sustainable infrastructure (SI), and to accelerate the development and standardization of frameworks and tools. Action one is about delivering on the five "C"s outlined in this illustration.



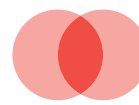
CLARIFY
the principles for
SI investment



COMMIT
to SI



COORDINATE
the convenors



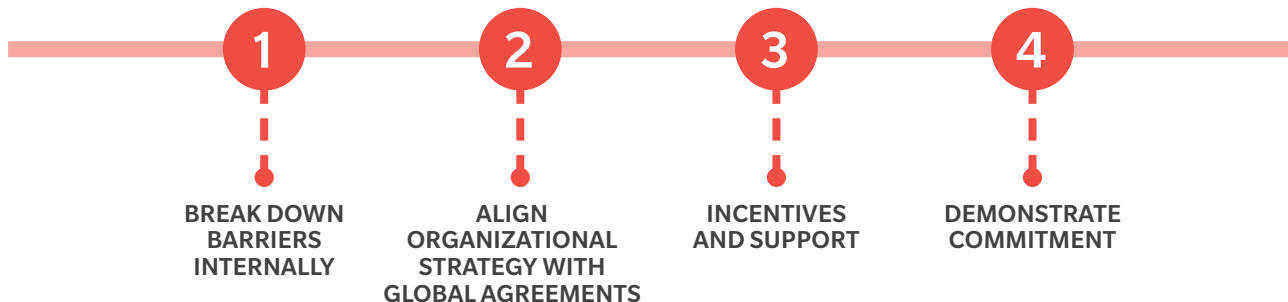
COLLABORATE
with mobilizers



COMMUNICATE
for systemic change

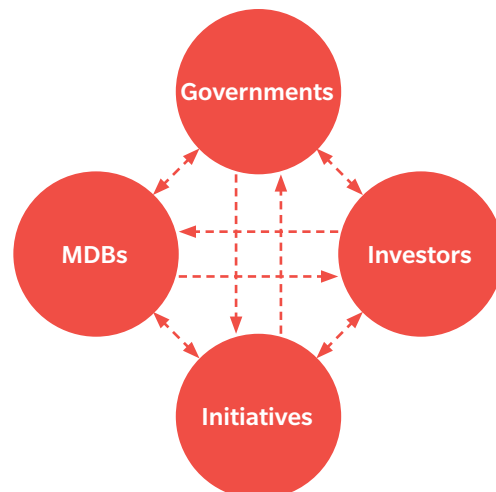
ACTION TWO: INTERNAL ALIGNMENT

Key steps for success: addressing internal barriers to prioritizing SI and implementing required changes; aligning organizational strategies with interantional agreements and commitments; and structuring of incentives to deliver on those commitments.



ACTION THREE: EXTERNAL COLLABORATION

There are collaborations that must takeplace between stakeholder groups to cross the bridge towards sustainable infrastructure. These leverage key links across the development and financing process, from project planning, to investment due diligence and reporting. To advance the ecosystem towards effective sustainable infrastructure, each group must play a role. A key focus is on building new relationships and shifting the discussion so that infrastructure investment and development naturally consider alignment with commitments aimed at achieving the 2 degree, or lower, target.



INVESTOR INTERVIEWS SHOW LACK OF PROGRESS

As part of our research, we spoke with a number of infrastructure investors about the extent to which they consider sustainability in their decision-making. Despite growing attention to environmental, social, and governance considerations within investment organisations, we found that many infrastructure teams are just now developing a formal approach to sustainability in investment and, further, that such considerations are generally applied at the deal level. There is little top-down thinking about the transformational change and investment pathways that must accompany successful implementation of the Paris Agreement and the SDGs, and the opportunities that they offer to investors. We identified the following factors contributing to this lack of progress:

- Lack of familiarity with the sustainable infrastructure business case and a related lack of experience in considering what might qualify;
- Limited standardization of tools and approaches, with barriers to entry for investors;
- Lack of coordinated policy commitments across regions and sectors consistent with the Paris Agreement and the SDGs, which dampens investors' focus on energy transition risk (that is, the risk associated with swift action to mitigate climate change);
- Lack of tools and focus on climate resilience (that is, adaptation), which has seen little prioritization to date.

Investors noted an interest in learning more about the merits of a sustainable infrastructure approach and in gaining the know-how to achieve it. To date, industry initiatives have not been successful in providing such knowledge and would benefit from greater clarity about what constitutes sustainable infrastructure and its business case.

CALL TO ACTION

Despite some high-level commitments to sustainable development by policymakers, and the significant efforts underway to leverage private-sector finance, there is still a lack of engagement from many infrastructure investors. Thus, a call to action is essential. We highlight three key initiatives, as outlined in Exhibit 1.

If you invest in infrastructure, we encourage you to review *Crossing the Bridge to Sustainable Infrastructure* and develop an approach that enables your organization to optimize risk and return considerations for the long term, while being cognizant of the role your investments play in the transition to a low-carbon and sustainable economy.

This article was first published on www.Top1000Funds.com on June 2, 2017.

Amal-Lee Amin is Chief of the Climate Change and Sustainability Division at the Inter-American Development Bank. **Jane Ambachtsheer** is Paris-based partner at Mercer Investments and a member of the Financial Stability Board Task Force on Climate-related Financial Disclosures.

ABOUT THE GLOBAL RISK CENTER

Marsh & McLennan Companies' Global Risk Center addresses the most critical challenges facing enterprise and societies around the world. The center draws on the resources of Marsh, Guy Carpenter, Mercer, and Oliver Wyman – and independent research partners worldwide – to provide the best consolidated thinking on these transcendent threats. We bring together leaders from industry, government, non-governmental organizations, and the academic sphere to explore new approaches to problems that require shared solutions across businesses and borders. Our Asia Pacific Risk Center in Singapore studies issues endemic to the region and applies an Asian lens to global risks. Our digital news services, BRINK and BRINK Asia, aggregate timely perspectives on risk and resilience by and for thought leaders worldwide.

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