

# WORKING PAPER CLIMATE CHANGE INVESTMENT FRAMEWORK

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AIIB Asia Climate Bond Portfolio Case Study



  
CLIMATE CHANGE  
INVESTMENT FRAMEWORK

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 ASIAN INFRASTRUCTURE  
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## **ABSTRACT**

This paper presents a simple holistic approach to build climate risk-resilient investment portfolios based on the three key objectives of the Paris Agreement: climate change mitigation, climate change adaptation, alignment of financial flows with a low-carbon, climate resilient pathway. We explain the financial rationale to adopt such an approach and identify the appropriate investment metrics for portfolio construction, as well as building an innovative investment framework that can be applied across geographies and asset classes. We illustrate how this framework can be implemented to construct a bond portfolio across Asian Infrastructure Investment Bank (AIIB) member geographies and propose a governance mechanism to support positive externalities in the building of sustainable capital markets.

**Keywords:** Climate Risk, Paris Agreement, Portfolio Construction, Free Option on Carbon

**JEL Classification:** Q55

## I. INTRODUCTION

The Intergovernmental Panel on Climate Change's (IPCC) report on "Global Warming of 1.5°C", published in October 2018, emphasized a renewed call for urgent action to limit global temperature increases. Human-generated emissions are estimated to have already resulted in 1°C of global warming above pre-industrial levels. The consequences are apparent. The IPCC report highlighted that total losses from natural catastrophes and synthetic disasters in 2018 was about USD 165 billion. The insurance industry covered around USD 85 billion of those losses, the fourth-highest one-year aggregate industry payout to date.<sup>1</sup>

In the face of a growing global mobilization to fight climate change, policy makers and regulators have started to take action. The Paris Agreement (2015) stands as a reference point with 186 ratifications. The Agreement demands a dramatic global response in support of three key objectives: 1) climate change mitigation, 2) adapting to the adverse impacts of climate change, and 3) aligning financial flows to make them consistent with a pathway towards low greenhouse gas emissions (GHG) and climate resilient development.

Building on this, groups of leading institutional investors responded positively by integrating climate change into investment processes. Their work has focused on two sets of actions. First, investors looked to reduce their exposures to the financial risks of climate change. Analyzing climate change risks at the portfolio level upholds their mandates to achieve long-term stable returns. For example, the Portfolio Decarbonization Coalition consisting of 32 investors, with over USD 800 billion of assets under management, aims to reduce their exposure to greenhouse gas emissions.<sup>2</sup> In November 2019, Sweden's central bank sold its bond holdings in Western Australia and Queensland citing worrying levels of GHG emissions.<sup>3</sup> Second, investors looked to allocate investments towards dedicated sustainable finance instruments. For example, according to the Global Sustainable Investment Alliance, global "sustainable investing assets" grew 126 % from 2010 to USD 30.7 trillion by 2018, with public equities and fixed income accounting for 51 % and 36 % of the respective growth. Investing in green bonds further supports the capital expenditure needed from private and public institutions to meet the financing needs of global climate change goals.

Despite encouraging steps towards addressing climate change in the capital markets, such mobilization lacks a holistic approach at the market and institutional levels. At the market level, there is a lack of appropriate standardization. Sustainable investment instruments proliferated and diversified since the first green bond issuance in 2007, followed by sustainability and social bonds. However, as such labeled bonds are use-of-proceeds instruments, the current standards make it difficult for investors to easily select issuers who actively consider achieving Paris Agreement objectives through their business activities. At the institutional level, most initiatives such as the Climate Action 100+, focus on selecting issuers that work towards addressing individual objectives of the Paris Agreement, instead of selecting issuers that do this for all three objectives. The latter is an essential approach that investors should consider in order to help them spot companies that are adequately prepared, or on a good transition path towards mitigating risk and capturing opportunities in a climate-changed world.

This Climate Change Investment Framework (henceforth "the Framework") aims to provide investors with a benchmark tool for assessing an investment, at the issuer-level, in relation to climate change-related financial risks and opportunities. The approach translates the three objectives of the Paris Agreement into fundamental metrics that investors can use to assess an investment's level of progress towards achieving climate change mitigation, adaptation, and low-carbon transition objectives.

This paper showcases a first implementation case study in the context of the AIB Asia Climate Bond Portfolio, which is executed in partnership with Amundi Asset Management and focuses on emerging market corporate bonds. The Framework and its analytical tools can be applied across a global range of issuer types and asset classes. While the authors are cognizant that the data referenced in the case-study application may evolve in a fast-changing environment, they hope that the Framework's principles and the guidance provided in this paper will make a modest contribution in helping investors and market practitioners to integrate more systematically and holistically climate-related issues in their investment decisions.

1. Swiss Re Institute, 2019

2. Please see the Portfolio Decarbonization Coalition here: <https://unepfi.org/pdc/>

3. Guardian, "Sweden's central bank dumps Australian bonds over high emissions". 14 Nov 2019

## II. RATIONALE FOR THE FRAMEWORK

According to the IPCC Special Report (2018) global climate financing still has to bridge a gap of between USD 1.6 trillion to USD 3.8 trillion annually between 2016 and 2050, for supply-side energy systems investment alone. Besides encouraging increased investments beyond renewable energy generation projects, the Climate Policy Initiative highlighted in their 2019 Global Landscape of Climate Finance report, that building sustainable capital markets is a key requirement in meeting the

climate finance levels associated with achieving the objectives of the Paris Agreement. Across asset classes, financial innovation resulted in a multiplication of investment solutions aiming to contribute to climate financing. As an exemplary case study and for the purposes of this paper, fixed income products stand as a key example. However, such instruments face challenges around additionality and the general investment thesis, placing bottlenecks on additional capital flows.

### 2.1 Sustainable Fixed Income

Fixed income instruments outstanding represent a majority of global capital markets today. Bond markets hold significant importance in developing local financial systems and also stand as a potential imperative for economic growth and development. With that in mind, integrating sustainability into fixed income markets offers the potential to mobilize capital at scale and align economic growth trajectories towards achieving the objectives of the Paris Agreement.

In 2019, total debt securities outstanding stood at approximately USD 120 trillion, including both domestic and international debt securities.<sup>4</sup> Developed countries accounted

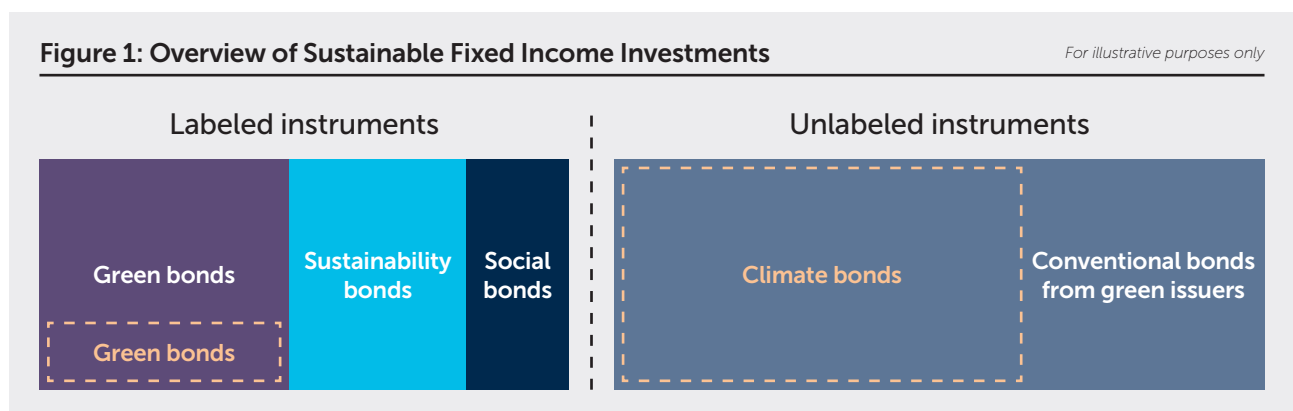
for around 80% while emerging markets picked up around 20%.<sup>5</sup> For comparison, the estimated value of global listed equities ranges between USD 70 to USD 90 trillion.<sup>6</sup>

The rationale for developing debt capital markets is well-known. For issuers, debt instruments such as bonds provide competitive pricing and longer maturities along with the potential to access a larger investor base. This tends to support the funding of riskier innovation-related projects that are commonly left underserved by the banking sector. For investors, this results in a competitive investment opportunity offering potential long-term stable returns and liquidity.

### 2.2 Innovative Instruments Offering Solutions

Under the fixed income umbrella, growing climate change awareness among investors has resulted in the growth of sustainable fixed income instruments. The market for

sustainable debt securities covers labeled and unlabeled instruments, of which climate-positive instruments form a subset of both categories (Figure 1).



4. BIS Quarterly Review, March 2020.

5. Remaining contributions from offshore centers (2.7%) and international organizations (1.5%)

6. World Bank, 2018

An unlabeled instrument refers to a bond for which the use of proceeds are not explicitly defined and ultimately support an issuer’s balance sheet activities. Otherwise, commonly known as a conventional bond. Some issuers of conventional bonds may have a balance sheet which is predominantly made up of green activities. In this case, the bond is considered as a “conventional bond from green issuers”. Such issuances can be classified as an unlabeled climate bond if the issuer is also taking steps towards reducing its emissions and/or safeguarding their operations from the impacts of climate change. For example, an infrastructure developer adopting the use of higher temperature-resistant materials to make their end-products more climate resilient and/or actively increasing the proportion of its energy obtained from renewable sources.

Labeled instruments are like traditional fixed income instruments but with proceeds earmarked to financing projects or assets on an issuer’s balance sheet that have a positive impact. Such instruments follow international best practices defining project selection, proceeds management, and impact reporting standards. For example, green, sustainable and social bonds commonly undergo external reviews to receive a certification of compliance with the International Capital Market Association’s (ICMA) relevant principles such as the Green Bond Principles (GPB). Labeled climate bonds are a subset of green bonds with proceeds earmarked to financing projects or assets on an issuer’s balance sheet that have a positive impact on reducing climate change.

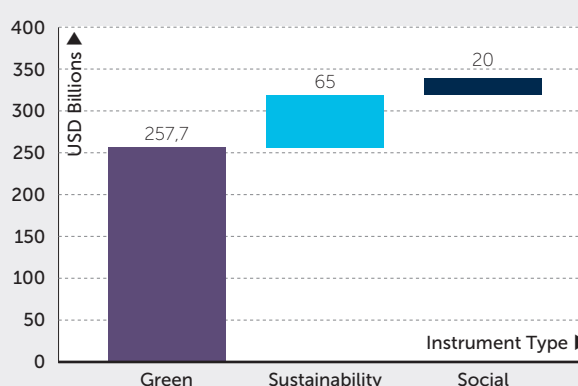
Under the GBP, the positive environmental impact that proceeds go towards often aims to comply with, or at least not damage, the objective of the Paris Agreement of capping global emissions below 2°C. The same could potentially be said for sustainability bonds which are instruments where the proceeds are exclusively applied to finance or re-finance a combination of green and social projects. However, standards for both instruments often lack specific project taxonomies in relation to climate change. Complementary certifications provide more specific project definitions as seen in certifications under the Climate Bonds Initiative’s (CBI) Climate Bonds Standards or the European Union’s (EU) Green Bond Standard. In practice, CBI certification will result in “Certified Climate Bonds” which are a subset of the labeled green bond universe.

Today, labeled green bonds are a cornerstone initiative to building sustainable fixed income markets and a debt investor’s preferred choice to increase their exposure to solutions seeking to address climate change. On the one hand, an issuance benefits an issuer by providing a source of financing for green projects. On the other hand, investors benefit from project-level impact without a risk exposure to

the project’s direct cash flows. Instead, investors comfortably take counterparty risk to the issuer’s entire balance sheet with stable and predictable returns.

Since the inception of the first green bond issued by the European Investment Bank in 2007, the global green bond market has continued to fulfill the promise of leveraging capital at scale towards green projects. From 2007 to 2018, green bond issuance had a cumulative issuance volume of USD 521 billion. In 2018 alone, CBI estimates that the total green bond issuance amounted to USD 167 billion which rose to USD 257.7 billion for the year of 2019 (Figure 2).<sup>7</sup>

**Figure 2: 2019 Issuance of Sustainable Fixed Income Labeled Instruments**



Source: Climate Bonds, 2019

The market saw an annual increase in issuances with a growing diversification in geography, issuers, and projects types. In 2013, issuances only originated from the developed markets of France, Germany, Norway, Sweden, and the United States. Development banks accounted for over 60% of issuances and use of proceeds were predominantly focused on renewable energy and energy efficiency projects. By 2019, the number of countries with green bond issuances stood at around 60. Issuer types had diversified to include sovereigns, local governments, financial institutions, and non-financial corporates just to name a few. Types of projects diversified to include (but not limited to) green buildings and sustainable water management but they remained largely focused on climate change mitigation.<sup>7</sup>

7. Climate Bonds Initiative, 2020

## 2.3 Outstanding Challenges of Labeled Instruments

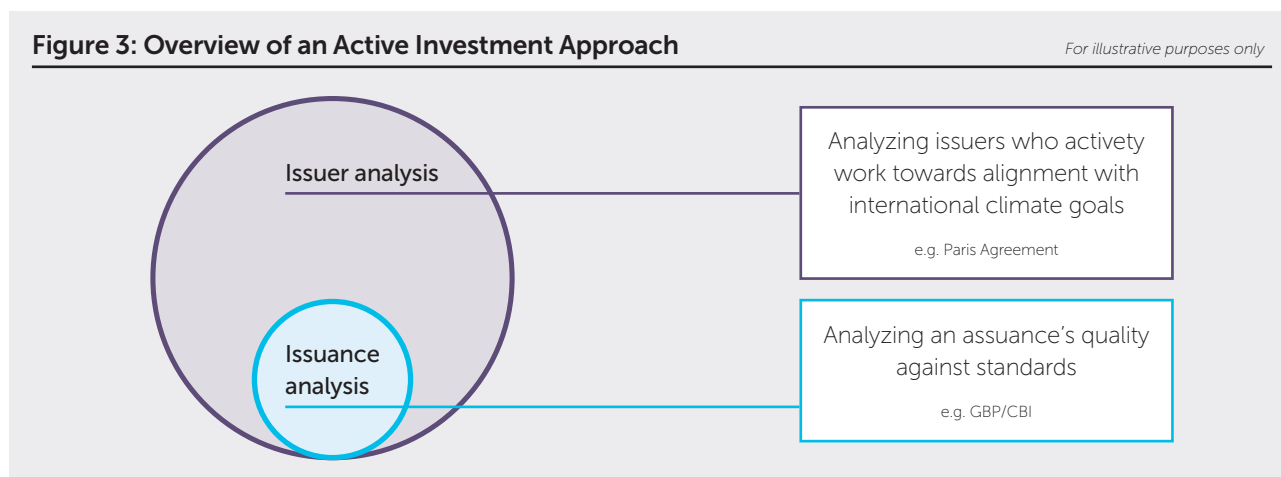
Despite ever-increasing issuance volumes, challenges remain for labeled sustainable fixed income instruments.

- **Additionality:** Firstly, current industry standards for labeled instruments are based on ringfenced financing through balance sheet bonds but this does not necessarily necessitate a commitment by the issuer to implement new climate-aligned investments. Secondly, impact analysis is only encouraged at the project level even though an investor is exposed to the risk on an issuer’s entire balance sheet.<sup>8</sup> Thus, there is a general need for a stronger connection to an issuer’s wider balance sheet activities and exposure to climate change risk and opportunities.

- **Investment Thesis:** Although there has been a number of innovative sustainability-linked bonds whose financing costs can vary depending on the performance of predefined climate or green objectives, the market is still dominated by green “use-of-proceeds” bonds where the risk profile is the consequence of the issuer’s overall credit risk. This prohibits labeled instruments from offering investors a more competitive risk/return profile compared to an issuer’s conventional bonds. Although premiums for green bond issuers have been recorded, they remain limited more towards Europe-based issuances and have not been generalized to the general primary and secondary markets.<sup>9</sup>

## 2.4 An Active Investment Approach as a Potential Solution

A potential solution to the challenges in the labeled market segment is for investors to implement an active investment approach comprised of issuance and issuer level analysis (Figure 3).



At the issuance-level, investors must apply the integrity of the best practices as outlined in guidelines such as the GBP, CBI or other best practice market initiatives. Ideally, these should put project requirements into the context of wider sustainability challenges such as climate change mitigation and adaptation. However, even then, the investments still face the problems identified in section 2.3 whereby a labeled green bond could be issued by a company without a clear strategy in regard to climate change risks and opportunities.

Therefore, at the issuer-level, investors must analyze an issuer’s entire balance sheet. Only then, can an investor manage their exposure to sustainability risks and opportunities related to climate change. Adding the additional level of analysis at the issuer level allows investors to also expand the investment universe beyond labeled instruments, such as green bonds, to unlabeled instruments, such as conventional bonds from green issuers as detailed in Figure 1.

Furthermore, investors must remain engaged with the issuer to ensure the green bond is part of a wider plan of transforming the issuer’s overall balance sheet towards sustainable practices. The effect of taking such an approach is twofold. Firstly, it positions the investor to contribute and potentially guide an issuer to implement new sustainable projects. Secondly, it positions the investor to potentially benefit from any *halo effect*<sup>10</sup> across the issuer’s yield curve as the market prices in sustainability and climate change-related risks. Together, the challenges outlined in Section 2.3 could potentially be alleviated to uphold sustainable fixed income as a climate finance solution.

Thus, implementing an active approach relies on analyzing an issuer’s level of alignment with global sustainability goals. As of today, there is no market standard for doing so in a holistic manner with regards to international policy agendas, specifically in regard to climate change.

8. Please see <https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp/>

9. Results on green bond pricing are mixed. Some studies find lower yields for green bonds (Zerbib, 2019), while others find higher yields (Bachelete et al., 2019); CBI, Green Bond Treasurer Survey (2020); CBI, Green Bond Pricing in the Primary Market: H2 (Q3-Q4) 2019 (2020).

10. It has been documented that green bonds could benefit from a “halo effect” whereby issuing a green bond can put downward pressure on the company’s entire yield curve.



## III. BUILDING A HOLISTIC FRAMEWORK

Modern investment analysis is unified under the capital asset pricing model (CAPM), which assesses the risk of an investment versus the risk compensation against the risk-free rate. CAPM theory is a risk-reward framework which allows an investor to not only assess each individual investment (by analyzing the risks of the individual investment) as well as performing a comparable investment analysis (of that one individual investment versus other investments). Under such traditional pricing models, climate change risks and opportunities remain potentially underpriced by the market.

With that in mind, AIB and Amundi developed an innovative investment framework that aims to integrate pricing of climate change risks and opportunities in investment management processes. The Framework aims to help tailor a portfolio that

actively considers alignment with the three key objectives of the Paris Agreement. In this framework, each Paris Agreement objective is translated into a variable relevant to investment decision making, with consideration of current state-of-the-market data availability and its future developments. With the appropriate metrics, investors can integrate such variables into the relative value analysis of multiple investment opportunities with regards to climate change. Guiding investments with the Framework's variables in mind aims to support a global investor mobilization to address the vital financing issues related to climate change. For example, the Framework enables investors from developed markets to channel capital towards emerging markets where the challenge of the low-carbon, climate resilient transition is greatest.

### 3.1 Objectives of the Paris Agreement

The Paris Agreement was a call for action to strengthen the global response to the threat of climate change. There is a clear focus placed on the three objectives outlined in Article 2.1:

- **Climate Change Mitigation:** "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels";
- **Climate Change Adaptation:** "adapt to adverse impacts of climate change and foster climate resilience"; and
- **Contribution to the Transition:** "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development".

These three objectives guide the global effort against climate change and represents the recipe for success to build a sustainable economic growth trajectory with a stable climate. When translated into investment-relevant variables, these objectives should also reflect common but differentiated responsibilities, capabilities, and objectives, in the light of different national circumstances<sup>11</sup> in order to promote Paris Alignment in a robust but equitable manner across geographies (Section 3.3a provides more details on how this may be implemented).

### 3.2 Translating the Objectives into Investment Risks and Opportunities

Translating the objectives of the Paris Agreement requires identifying factors material to economic actors such as corporates and investors. Each objective can in turn be

#### a) Climate Change Mitigation

Mitigating climate change requires decarbonizing the global economy with extensive changes and this represents a transition risk to investor portfolios. Depending on the speed of such changes, corporates may suddenly become exposed to demand or supply side shocks from regulatory, market and/or technological shifts. For example, subject to a carbon tax, a

translated into an investment risk or opportunity at the issuer-level with potential to impact portfolio-level returns.

carbon-intensive issuer may see a reduction in profit margins, potentially reducing their debt servicing capabilities (along with operational and capital expenditure). Thus, investors need to analyze an issuer's exposure to the transition risk of climate change (Figure 4).

11. Paris Agreement and United Nations Framework Convention on Climate Change. Available here: <https://unfccc.int/resource/docs/convkp/conveng.pdf>

**Figure 4: Example of Transition Risk Materialization****Emission Regulations *Chemicals Sector (China)***

China's 13<sup>th</sup> Five-Year Plan (2016-2020) places environmental protection as a major driver for economic growth and sustainable development.<sup>12</sup> The National Action Plan on Climate Change (2014-2020) stands as the main legislative framework integrating climate change into the Environmental Protection Law.<sup>13</sup>

The chemical sector has been affected by the forced reallocation of plants away from urban areas along with a reduction in the number of plants. There has also been considerable pressure to reduce energy consumption and emission levels. For example, new emission taxes and limits for pollutants restrict air and water pollution from production processes.<sup>14</sup>

Many chemical producers have been faced with restricted operating rates. The government monitors the compliance of plants on such mandatory standards and sanctions those in breach. Overall, in 2017, 80,000 chemical factories were found to be in breach of emission levels. Chinese producers of caustic soda are reported to have faced operating rates of 50-70% over 2017 and 2018.<sup>15</sup>

**b) Climate Change Adaptation**

All scenarios of climate change action include increased acute weather events and/or chronic shifts in climate patterns. Such forces may have financial implications for corporates, such as direct damage to assets on the balance sheet and indirect impacts from supply chain disruptions increasing production

costs as well as costs of goods sold. This is the physical risk of climate change that investor portfolios would be exposed to. Thus, investors need to analyze an issuer's exposure to the physical risks as a result of climate change (Figure 5).

**Figure 5: Example of Physical Risk Materialization****Droughts *Utilities Sector (India)***

In the IPCC's special report on climate change and land, lower rainfall and longer periods of high temperatures are projected to increase drought frequency and intensity around the world.<sup>16</sup> Already, droughts have caused extreme water shortages, paralyzing business operations of energy producers.

In recent years, India faced acute rainfall deficiency. From 2011 to 2018, only 2013 had monsoons with an average rainfall that was above expectations.<sup>17</sup> A lack of appropriate regulation and distribution has increased the risk of water scarcity in the country.<sup>17</sup>

As a result, energy companies have seen an impact on their bottom lines. The World Resources Institute found that water scarcity forced 14 of India's 20 thermal utilities stations to go out of operation at least once between 2013 and 2016.<sup>18</sup> This resulted in significant financial loss for energy producers. For example, in one quarter a large power producer lost 17% of its earnings due to water shortages.<sup>19</sup>

12. Available here: [https://en.ndrc.gov.cn/policyrelease\\_8233/201612/P020191101482242850325.pdf](https://en.ndrc.gov.cn/policyrelease_8233/201612/P020191101482242850325.pdf)

13. IEA, 2013. Original text is available (in Mandarin) here: <https://policy.asiapacificenergy.org/sites/default/files/%E5%9B%BD%E5%AE%B6%E5%BA%94%E5%AF%B9%E6%B0%94%E5%80%99%E5%8F%98%E5%8C%96%E8%A7%84%E5%88%92%E5%BC%882014-2020%E5%B9%B4.pdf>

14. Pfiug, 2018

15. Independent Commodity Intelligence Service Report (2018). Available here: <https://www.icis.com/explore/resources/news/2018/%2001/11/10182191/china-chemical-closures-send-ripples-around-the-world/>

16. Available at <https://www.ipcc.ch/report/srcc1/>

17. Financial Times, 2019

18. The World Resources Institute, 2018

19. The World Resources Institute, 2019

### c) Contribution to the Transition

Aligning financial flows with climate change not only relates to risk management but also to capturing new investment opportunities associated with the low-carbon economy. Related technologies, such as renewable energy are decreasing in cost and replacing traditional technology systems, such as coal. Investors have the opportunity to

finance issuers benefiting from these technological shifts, and contribute to the transition to a low-carbon economy while driving further climate change mitigation and adaptation.

Below (Figure 6) is an example of business opportunities arising from the transition to a low-carbon economy.

**Figure 6: Example of Business Opportunities Arising from the Low-Carbon Transition**

#### Renewable Energy Sector (Asia)

The commercialization of low-carbon and clean energy solutions embodies vast opportunities. Already today, old technology systems are being replaced by more efficient climate friendly substitutes. Renewable energy production stands as a reference point.

Asian economies face increasing electricity demands from growing populations. Existing coal plants have utilization rates up to 2050 for electricity and power generation.<sup>20</sup> However, renewables continue to penetrate the generation mix at accelerating rates. 2018 saw a global addition of 171 gigawatts (GW) of renewable energy capacity. According to the International Renewable Energy Agency (IRENA, 2019), renewable energy now accounts for a third of global power capacity. Behind Oceania, Asia accounted for the most growth in renewable energy capacity with 11.4% in 2018. China alone accounted for 40% with a focus on capacity expansions for solar, wind, and ethanol.

The story goes beyond China. The production of electricity from renewables is 130% higher than 2007 levels for Indonesia, Thailand, Vietnam, Malaysia and the Philippines.<sup>21</sup> This is expected to triple by 2025. The source of growth varies by country. Indonesia and the Philippines expect to capitalize on geothermal resources originating from their 100 or so active volcanoes. On the other hand, with a long coastline Vietnam differentiates its energy mix with growing wind capacity. Finally, Thailand and Malaysia have seen most growth from solar and biomass. (IRENA, 2019)

To summarize, the objectives of the Paris Agreement represent risks and opportunities to economic actors. Firstly, climate change mitigation creates transition risks. Secondly, climate

change adaptation produces physical risks. Finally, aligning the financial flows with a low-carbon economy creates the opportunity for investors to contribute to the transition.

### 3.3 Identifying the Appropriate Investment Metrics

Taking the factors mentioned in section 3.2. into account requires translating them into appropriate metrics for an investment analysis. As a first step, investors can utilize general metrics regarding an issuer's overall recognition and integration of climate change into their corporate strategy.

Thereafter, investors need to scrutinize an issuer's performance on specific metrics linked to the individual economic risks and opportunities of climate change mitigation, adaptation, and contribution to the transition.

#### a) General Investment Metrics on Assessing an Issuer's Climate Change Strategy

Issuers that are actively working towards achieving the objectives of the Paris Agreement usually demonstrate corporate intentionality towards aligning their business practices with respect to climate-related considerations. Some of these practices at the company-level are listed below:

- Clearly articulated climate change strategy that is integrated into its core business approach.
- Executive responsibility to execute climate change strategies.
- Contribution to a climate change offsetting program.
- Subscription to international industry reporting standards [(e.g. Task Force on Climate-Related Financial Disclosures (TCFD)).

- Non-involvement in any climate-related incidents that could result in reputational damage.

With regards to the abovementioned metrics, an investor should pay attention to evaluating the issuer's climate change efforts within the context of the country or countries of its operation. This is to take into consideration the adequacy of the company's efforts in making a positive contribution to the Paris Agreement goals within the context of country-specific climate strategies, capabilities and responsibilities (see Section 3.1). One point of reference are documents such as a country's Nationally Determined Contributions (NDCs). These are in turn,

20. Bloomberg New Energy Finance, 2019  
21. Nikkei Asian Review, 2019

recognized as commitments that communicate a country's efforts (which ideally should embody sufficient ambition levels) in view of achieving the Paris Agreement objectives.

In addition to the general metrics, specific metrics that indicate if an issuer is actively working towards institutionalizing the objectives of the Paris Agreement in its operational activities can be found in Figure 7.

## b) Specific Investment Metrics to assess an Issuer's commitment in Considering and Institutionalizing Paris Agreement Objectives

Figure 7: Investment Metrics per Paris Agreement Objective

Paris Agreement Objective	Economic Risk / Opportunity	Investment Metric
Climate change mitigation	Transition risk	<p><b>Main Metric:</b></p> <ul style="list-style-type: none"> <li><b>Risk exposure assessment metric:</b> What are the company's direct (Scope 1<sup>22</sup>) and indirect (Scope 2 &amp; 3<sup>23</sup>) carbon emissions?</li> <li><b>Risk management metric:</b> Is the company showing efforts aimed at reducing its Scope 1, 2 and 3 emissions?</li> </ul> <p><b>Key considerations:</b></p> <ul style="list-style-type: none"> <li>Has the company set emission targets and/or have climate-related incentives for management?</li> <li>Is the company pricing-in the cost of emissions in their current and future operations by using an appropriate shadow carbon price?</li> <li>Are the company's current and future operations consistent with the pace recommended by climate change scientists to limit the impact of climate change in line with the Paris Agreement mitigation target to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels?</li> </ul> <p><i>Note: Mitigation efforts from issuers differ by sector and can be assessed per sector by methodologies such as the Science-Based Target Initiative. CBI's Climate Bonds Standard and the EU Taxonomy for Sustainable Activities (EU Taxonomy) also provide guidelines on the taxonomy of activities that can be considered as positively contributing to climate mitigation. Investors may use these guidelines as a starting point to quantify reductions in Scope 1 to 3 emissions.</i></p>
Climate change adaptation	Physical risk	<p><b>Main Metrics:</b></p> <ul style="list-style-type: none"> <li><b>Risk exposure assessment metric:</b> What proportion of the company's operations are located in geographies that have high climate change risk? What is the probability of occurrence of a climate hazard in the company's geography of domicile in the next years?</li> <li><b>Risk management metric:</b> Despite a certain level of exposure to physical risks, is the company taking steps to increase the resilience of its assets to climate change appropriately?</li> </ul> <p><b>Key considerations:</b></p> <ul style="list-style-type: none"> <li>Does the company take physical or soft infrastructure (e.g. capacity building) steps to make its operations more resilient to the impacts of climate change?</li> <li>How dependent is the company on raw materials which face a risk of shortages in the case of climate hazards?</li> <li>What is the financial impact of climate-related disruptions to the company?</li> </ul> <p><i>Note: Quantifying the exposure of a company and the steps it has taken to adapt to the effects of climate change related physical risks varies largely by sector and location. Commodity-dependent companies are more vulnerable to climate-related disruptions on their supply chains. For example, a solar panel company can be exposed to physical risks through the scarcity of raw materials needed in their production process.</i></p>
Contribution to the transition	Low-carbon and climate resilient technologies/ activities	<p><b>Main Metric:</b></p> <ul style="list-style-type: none"> <li><b>Risk exposure assessment metric:</b> What percentage of a company's revenue stream originates from products and services identified as climate change solutions?</li> <li><b>Risk management metric:</b> Is the company taking steps to increase the proportion of its green revenue that corresponds to products and services designed for a low-carbon and climate resilient economy?</li> </ul> <p><b>Key considerations:</b></p> <ul style="list-style-type: none"> <li>Is the company limiting its exposure to carbon-intensive activities and assets?</li> </ul> <p><i>Note: To date, there is no global consensus on technologies and activities needed to build a low-carbon, climate resilient economy. For example, some activities may not be considered as contributing activities even though they contribute to reducing carbon emissions (e.g. replacing coal power generation with less carbon-intensive fossil fuels like natural gas). Guidance from leading International bodies on climate change attempt to provide enough common features to trace vital technological developments. For example, the IPCC recognizes the development of renewable energy sources as a need for the transition of the energy sector. It also considers biofuels as a potential solution for the transition of the aviation industry. To this effect, the CBI Climate Bonds Standard and EU Taxonomy attempts to standardize technical criteria with a list of economic activities that are identified to make substantial contribution for climate change mitigation and adaptation. However, it is worth bearing in mind that some regional divergences exist, and some definitions of green may not be applicable to the current state of economies in developing countries. The forthcoming Taxonomy harmonization work by Chinese and EU regulators has the potential to set a globally recognized standard.</i></p>

22. Scope 1 emissions are direct emissions from owned or controlled sources. Please refer to the GHG protocol for more information: [https://ghgprotocol.org/sites/default/files/standards\\_supporting/FAQ.pdf](https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf)

23. Scope 2 emissions are indirect emissions from the generation of purchased energy. Scope 3 emissions are all indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream. Please refer to the GHG protocol for more information: [https://ghgprotocol.org/sites/default/files/standards\\_supporting/FAQ.pdf](https://ghgprotocol.org/sites/default/files/standards_supporting/FAQ.pdf)

## IV. IMPLEMENTING THE FRAMEWORK

This chapter represents the first implementation of the Framework to a concrete investment universe. It outlines the practical steps to operationalizing the investment metrics listed in section 3.3 and is broken down into two main steps: 1) identifying criteria for data providers that enable quantification of the metrics outlined in section 3.3 for the purpose of selecting high-performing climate-aligned issuers, and 2) designing an appropriate investment strategy to uphold a dual objective of financial return and impact.

### 4.1 Identifying Appropriate Data Providers

A wide array of data providers covering the environmental, social, and governance (ESG) performance of issuers were screened to select appropriate data source(s) for each of the Framework's metrics underlined in section 3.3. With regards to the data providers considered, climate change variables outlined in Section 3.3. were part of the suite of data covered as a component of their ESG analysis. The following considerations were applied in the selection process:

Evaluating data providers involved analyzing the quality of their methodology, the applicability and relevance of their output to the investment metrics, and the coverage of their data set when applied to a given investment universe. For example, a data provider's methodology needs to cover not only the core operations of a company but also wider activities in relation to their entire value-chain. Such activities are outside the scope of a company's main operations and sometimes result in hidden risks. For example, a corporate's exposure to transition risk will relate to both direct and indirect emission scopes. Additionally, the threat of physical risk goes beyond a corporate's main assets in operation. The sourcing locations and production sensitivity of raw materials used by a corporate can result in an indirect exposure to climate change-related weather events previously unconsidered.

For all the data sources selected, investors should consider whether the metrics and scoring systems enable them to consider a relative or an absolute approach to quantifying such risks. A relative scoring approach encourages investors looking to reward best-in-class issuers within specific sectors or geographies, thereby enlarging the investment universe. On the other hand, an absolute approach would allow investors to select an issuer based on their outright performance against well-defined objectives. Such an approach usually implies to exclude some sectors and/or geographies with inherently bad scores on average, thereby potentially reducing the investment universe.

These two approaches also necessitate different engagement strategies. In the case of a relative approach, investors would focus on investing in and engaging with a group of "best-in-class" issuers. Engagement would focus on encouraging corporates to catch up with the current best-standards within their sector and geography.

However, sector best-standards may not necessarily meet the requirements of absolute objectives, such as the Paris Agreement. For example, an investor could select an issuer because they have a good score, when in fact, it is only because they are relatively a good performer in an inherently bad performing sector or geography that investors want to avoid altogether. Therefore, the difference in engagement with the use of an absolute approach would center around encouraging issuers across the portfolio to actively work towards meeting the objectives of the Paris Agreement. With regards to the Framework's use-case in emerging economies, the framework encourages the use of a combination of both an absolute and relative data approach. An absolute data approach is applied in regard to data sources selected in order to ensure adequately ambitious performance thresholds. Thereafter, a relative approach is applied as an additional selection threshold, which would benefit the contextualization of the framework to specific sectors and geographies.

Furthermore, vendors must keep assumptions as simple as possible and rely on trusted third-party models when assessing climate scenarios. Finally, the output variable has to be clear and easy to use in order to provide a sound foundation for raising investor awareness.

Regarding a data provider's coverage, data availability needs to be assessed for each specific contemplated universe (equity or debt, emerging countries or developed markets, etc.). In the particular case of AIB Asia Climate Bond portfolio implementation, the authors have focused on coverage from corporate (both non-financial and financial) issuers active in AIB Members, with specific attention to issuers active in Regional Members.<sup>24</sup> A representative universe was constructed by aggregating three benchmarks: ICE BofAML Emerging Markets Corporate Plus; ICE BofAML Global Large Cap Corporate Hedged; and ICE BofAML Global High Yield Index Hedged.<sup>25</sup> Immediately, this represents a challenge as up until now data providers based their issuer coverage on global equity indices in which emerging markets, specifically Asian non-listed debt issuers, are less represented.

Below is the analysis for each variable.

24. AIB Regional Members: Afghanistan, Australia, Azerbaijan, Bahrain, Bangladesh, Brunei Darussalam, Cambodia, China, Cyprus, Fiji, Georgia, Hong Kong, China, India, Indonesia, Iran, Israel, Jordan, Kazakhstan, Korea, Kyrgyz Republic, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Oman, Pakistan, Philippines, Qatar, Russia, Samoa, Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Turkey, United Arab Emirates, Uzbekistan, Vanuatu, Vietnam. AIB Non-Regional Members: Austria, Belarus, Belgium, Canada, Denmark, Egypt, Ethiopia, Finland, France, Germany, Greece, Guinea, Hungary, Iceland, Ireland, Italy, Luxembourg, Madagascar, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Spain, Sudan, Sweden, Switzerland, United Kingdom.

25. In aggregate, these benchmarks cover more than 1,500 issuers with more than 13,000 issuances representing about USD 11 trillion in outstanding amount. It excludes notably sovereign and privately placed debt.

## a) Climate Change Mitigation

### Methodology

Most data providers concentrate on analyzing the carbon intensity of an issuer. Large companies usually report their carbon emissions and for those that do not, data providers estimate the level of emissions by using modelling techniques based on the sector of the company, its assets and its geography. Thereafter, there are two main approaches to measure an issuer’s overall exposure to transition risk.

- **2 degrees approach:** This approach consists of comparing a corporate’s carbon emissions trajectory with sectorial carbon thresholds as calculated by data providers, that are meant to be consistent with *limit global warming to 2°C or below 2°C*.
- **Comprehensive transition risk approach:** This approach evaluates the current level of carbon emissions of a company across its entire value-chain and derives the transition risk exposure of the company. It then assesses the company’s level of commitment to reduce its footprint in order to potentially correct the level of transition risk exposure.

For the application of the Framework, the comprehensive transition risk approach was selected due to comprehensive coverage of an issuer’s business activities. The carbon emission calculations include scope 1, 2, and 3, along with commitments, targets, and/or communications of the issuer on the transition to a low-carbon economy (translated into a score).

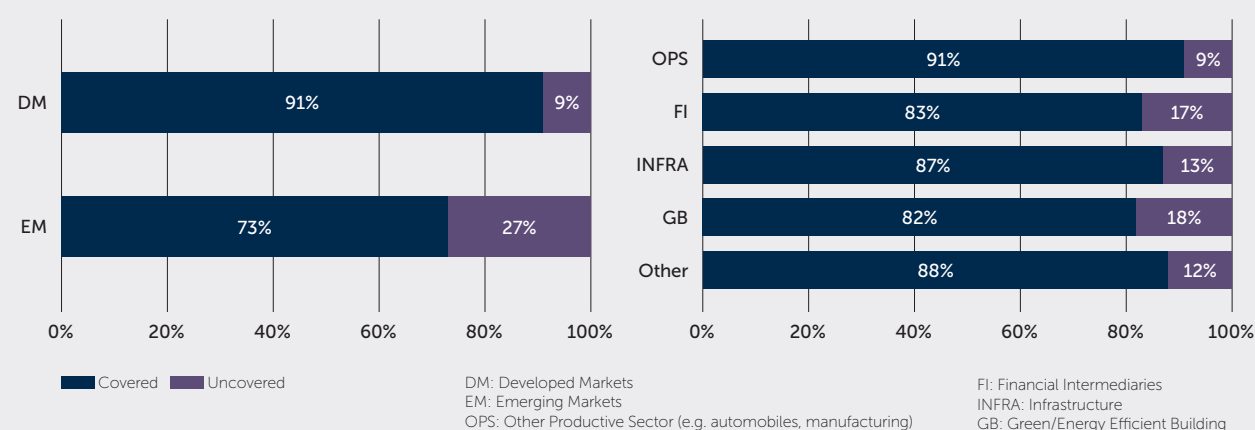
A 2°C degrees approach could also provide an appropriate alternative metric to evaluate the alignment of an issuer with respect to the carbon thresholds that correspond to temperature goals under a Paris Agreement scenario. This is identified as a key need in section 3.3. However, prediction-based approaches, naturally need to consider uncertainties over a long-time horizon (past 2030), often causing a lack of precision due to the higher number of assumptions needed.

### Coverage

Coverage of the investment universe provided by data providers using the 2 degrees and comprehensive transition risk approach is very heterogeneous. Coverage varied from around 1,000 issuers to more than 8,000 issuers across providers. One important thing to consider is the sectorial bias. Naturally, such databases focus on sectors that have a higher potential for having low-carbon and climate resilient activities. Additionally, some sectors may inherently have better carbon emission measurements. The absence or poor quality of scope 3 emission recording and reporting is problematic in sectors where this Scope is critical to properly assess transition risk (the Automobiles sector being the typical example of the limitation of carbon intensity measures not taking into account scope 3 downstream emissions). A slight bias toward developed markets was also observed because of higher availability and quality of carbon data published by issuers, which is illustrated in Figure 8 below.

**Figure 8: Climate Mitigation Data Coverage**

(% of issuers in general investment universe covered by a provider)



## b) Climate Change Adaptation

### Methodology

Most data vendors evaluate physical risk using asset-level data (asset location, type of asset, production, etc.). According to the location of a company’s assets, a level of exposure to each type of chronic and acute climate-related weather

event is identifiable. Through this, the exposure of each asset to a specific event is computed. This relies on recognized climate models used by the scientific community.<sup>26</sup> Finally, the aggregation of all asset exposures, by region and probability of

26. Most vendors use climate models from the Coupled model intercomparison project (CMIP) 5 which provided the scientific foundations for the IPCC’s Fifth Assessment Report.

climate-related risk exposure gives an adaptation risk score at the company level. Across all data vendors, this approach has two main points of divergence.

In regard to the asset-level assessment, two main approaches exist. Some vendors choose to compute exposure from asset-level data and then take into account additional variables such as the exposure at the supply-chain and at the products & services level. Others include an additional layer by evaluating the extent of financial impact of climate change-related weather events on each asset. To do so they evaluate varying economic consequences of the impact ranging from complete destruction (writing off an asset) to a decrease in productivity.

Currently no data provider translates a company’s intent increasing the resilience of their assets in areas of exposure into a quantitative score for physical risk. However, data providers are recognizing the importance of integrating quantitative and qualitative scoring in tracking both exposure reduction to physical climate vulnerabilities, and intent to promote climate resilience in their operations. For example, some data providers have begun to integrate analysis from TCFD disclosures which also includes corporate strategy analysis as applicable to increasing climate resilience. In the meantime, investors should ensure that the selected data provider should provide back-testing capability where quantifying the change in physical risk score could be reflective of a company taking the right effort to minimize exposure and vulnerability to climate change risks.

This framework considers focusing only on the exposure of a corporate’s core operations. This satisfies the demand for having an exhaustive assessment as well as the desire to rely on as few assumptions as possible. Standardizing adaptation assessment at the issuer’s operations level could be better for standardizing adaptation risks faced by companies from

very different sectors. For example, between infrastructure companies directly exposed to physical impacts across a variety of geographies and financial institutions that hold portfolios across multiple industries.

The level of information available regarding the financial impact of physical risk is still limited. Hence, vendors rely on assumptions driven by scientific literacy on the topic, which may not always be standardized across sectors and regions. All in all, such an approach leaves more room for potential miscalculations. This approach could perhaps be more suitable to an assessment at the asset-class level as data providers usually translate the financial impact of weather events into equity valuation or a bond’s default risk. This means that it is hardly applicable to issuer-level analysis as per the Framework.

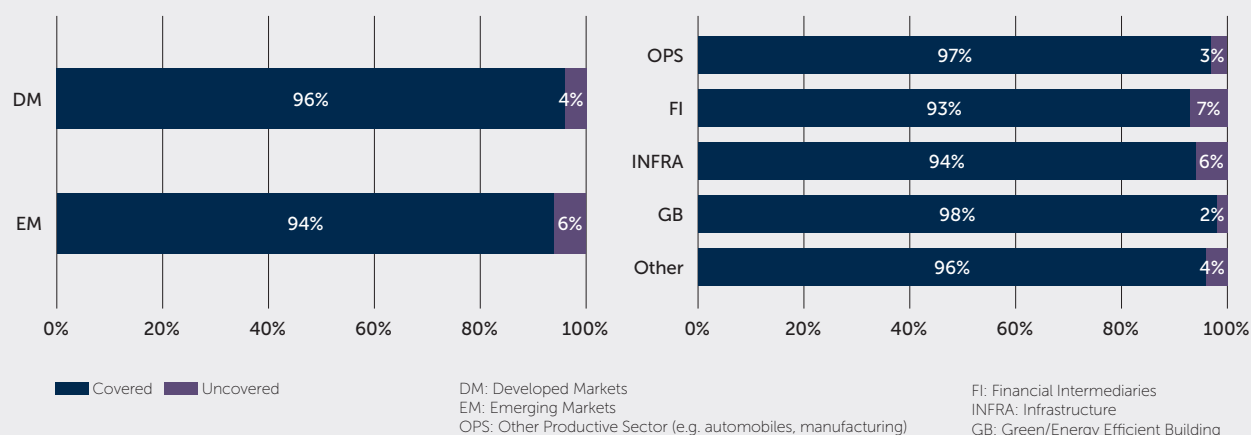
**Coverage**

Data providers evaluated have disparate coverage for climate change adaptation risk related data. Coverage ranged from 2,000 issuers to more than 15,000 issuers between various providers. The availability of asset-level data is crucial to the assessment of a corporate’s exposure to extreme weather events. However, such granular data on asset locations is currently not supported by standard corporate disclosure practices.

Similar to the analysis for data coverage on climate change mitigation, some data providers have a slight coverage bias toward developed markets. On average, data sets for physical risk only cover 67% of emerging market issuers in the investment universe, versus 71% on average for the developed market issuers. However, individual data sets show a very unbiased coverage for a general investment universe as seen in Figure 9.

**Figure 9: Climate Adaptation Data Coverage**

(% of issuers in general investment universe covered by a provider)



### d) Contribution to the Transition

#### Methodology

The share of revenue coming from a company’s green activities is a common way to measure an issuer’s contribution to the transition. Sourcing the information on an issuer’s revenue stream relies on corporate disclosures complemented by proprietary modelling techniques to evaluate a share of green revenues when such data is not disclosed.

The methodologies used for estimating green revenue break down an issuer’s revenue at the most granular level (“business activity” level) and then sum the revenues coming from the business activities deemed as green by the data provider. Corporate reporting in regard to revenue information is not standardized and not always very easily accessible. Thus, data providers complement such databases by estimating green revenue percentages with maximum and minimum possibilities when a corporate does not disclose.

Qualifying green revenues would rely on a taxonomy of business activities considered as in line with a low-carbon and climate resilient economy. Any taxonomy used to define green activities should be as granular as possible but, for global approaches, leave sufficient flexibility to take a regional or even a country by country approach. Indeed, at the time of writing, and despite one universal climate agreement, there is no universal green taxonomy. That said, several interesting initiatives have emerged.

Set to be finalized in late 2020, the EU Taxonomy aims to set the standard for defining what business activities define eligible climate change mitigation and adaptation solutions. However, some areas of the EU’s taxonomy would need adapting to be relevant for emerging markets. For buildings for instance, the ownership and acquisition principle of “top 15%”

energy or emissions performance in any national or regional market can be applied globally, but new buildings must meet the energy performance thresholds in the EU-specific “Nearly Zero Energy Building” requirements. This regulation-linked metric would not map easily to emerging markets.

While Bloomberg and Refinitiv have announced forthcoming data services that address EU Taxonomy requirements, most data providers have yet to integrate such best practice green taxonomies into their green revenue product offerings.<sup>27</sup> In fact, the classifications of green activities used by data providers are heterogenous and still evolving. Currently, taxonomies used present broad categories of green revenue activities rather than deep breakdowns. Until regulatory measures to enforce Taxonomy application become the norm, it might be useful for investors to use several providers to have an unbiased set of green activities taken into account and enlarge the coverage. This supports investors to analyze discrepancies between data sources with the potential to apply their own taxonomies.

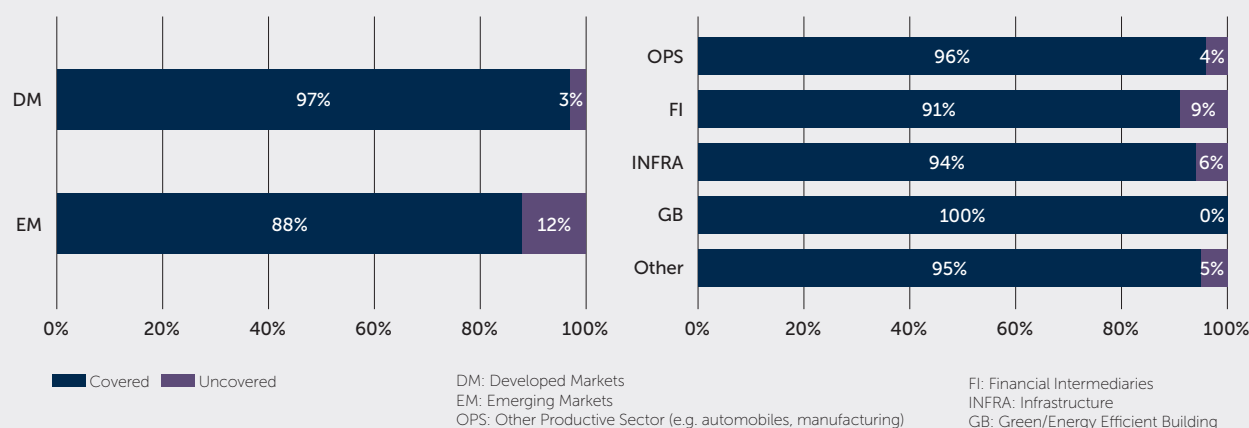
#### Coverage

The product space for evaluating an issuer’s green revenue is mature and has been used for several years now by investors. Data providers use the same metric for measuring contribution to the transition (percentage of revenue in green activities), which allows for a direct comparison between the providers and for the aggregation of data.

On the providers assessed, coverage varies between 6,000 issuers to more than 15,000. Sectorial biases are observed, because some sectors are more heavily involved in green activities than others (e.g. green buildings). Coverage against a general investment universe for a combination of two data providers can be found in Figure 10.

**Figure 10: Contribution to the Transition Data Coverage**

(% of issuers in general investment universe covered by a combination of two providers)



27. The EU has already placed strategic importance for data providers to create taxonomy profiles for companies as suggested by the TEG. Data providers will need to invest time, money, and human resources to be able to disclose meaningful, comparable and quality information that allows investors and asset managers to carry out a due diligence exercise against the taxonomy’s requirements. Ultimately, data providers’ response will be influenced by market demand from investors.



## 4.2 Building a Tailored Investment Strategy

The investment strategy aims to mobilize issuers in regards to their performance of climate mitigation, adaptation and contribution to the low-carbon, climate resilient transition. Meeting this objective relies on selecting issuers who rate high on the three dimensions under the Framework and/ or who are at least on a positive trajectory.

The issuer selection process must target the inclusion of as many players as possible who are vital to the low-carbon, climate resilient transition across all sectors of the economy. The application of the Framework is aimed to reach all types of issuers and sectors of an economy. The point is not to only select issuers who are performing well on the Framework's but to focus on issuers who are challenged by climate change and support them. For example, the Framework does not mandate that any sector or country should be excluded. Instead, sector exclusion may be applied on a case-by-case basis according to the investors' views on climate

change economic impact on exposed sectors, and, if any, ethical constraints.

For climate change mitigation, each issuer is assigned a score based on its carbon impact, including both operational carbon intensity and product carbon intensity. The score also accounts for the issuer's management of transition risks and opportunities. For climate change adaptation, each issuer is assigned a score based on its exposure to the physical risks of climate change. For the contribution to the transition variable, each issuer is scored on the percentage of green revenues derived from the products and services identified as solutions to climate change mitigation and/ or adaptation. Regarding issuers on a positive trajectory, a concrete engagement strategy needs to be put in place to support an issuer to take action in predetermined areas for improvement. This can either relate to the decarbonization of their products and services, or an improvement in their climate change risk management systems.

### a) Engaging Issuers for Improvement

The AIB Asia Climate Bond Portfolio has an objective to encourage the transition to a low-carbon and climate resilient economy, and to thus be well positioned to source any potential returns from the future repricing of climate change-related risks in capital markets. With that in mind, the investment strategy focuses on investing in the future leaders in regard to climate change.

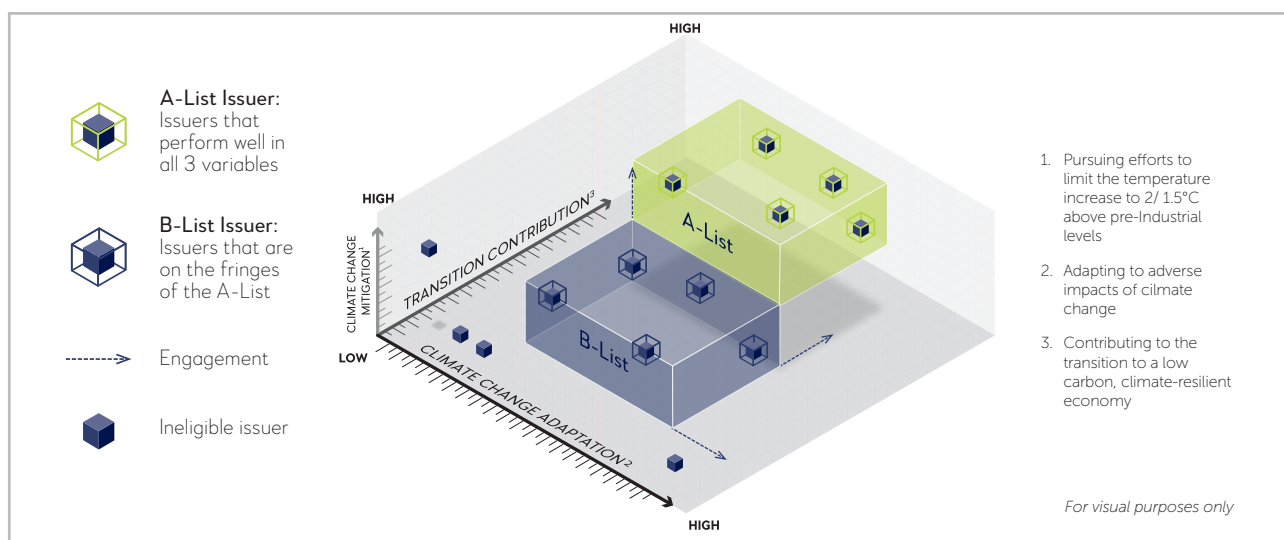
Over the past decade, a growing recognition of climate change and low-carbon technologies pushed some corporates towards aligning business with a climate-positive strategy. However, for most, climate change mitigation and adaptation are new concepts. This has created a continuum of issuers differing in the level of progress in integrating climate change risks and opportunities. Below is a potential breakdown of issuers into three distinct categories:

- **A-List:** Issuers who are fully aligned with, and who rate highly on the Framework's three variables.

- **B-List:** Issuers who are partially aligned with, and rate moderately highly on the Framework's three variables, i.e. companies who are on a trajectory to enter the A-List and currently transitioning to a low-carbon and climate resilient business model.

- **Ineligible Issuer:** Issuers who are not aligned with, and rate poorly on the Framework's three variables.

By applying the Framework, investors can select, invest into and engage B-List companies to transition towards the A-List by way of balance sheet greening and selection of issuers who are on a positive trajectory in working towards achieving the objectives set out within the Paris Agreement. For investors, this offers the opportunities listed in Section 5.2. Notably, the chance to target higher additionality and the potential green halo effect.



### b) Taking Issuer Specificities into Account

There are multiple types of issuers who currently contribute to the global effort to tackle climate change. For instance, a small company generating electricity with renewable energy sources and large industrial conglomerates manufacturing turbines for wind farms are both key contributors to the transition even though they have very different business models. In order to account for these specificities, identifying A-List and B-List issuers warrants a tailored approach. This requires differentiating issuers depending on a multitude of factors such as size, sector or even geographic location, just to name a few.

As a first step, the Framework distinguishes issuers based on the different business models between Pure Players and Diversified Leaders.

- Pure Players have a revenue stream focused on a limited set of products and services. They aim at obtaining a strong market share in their activities of interest.

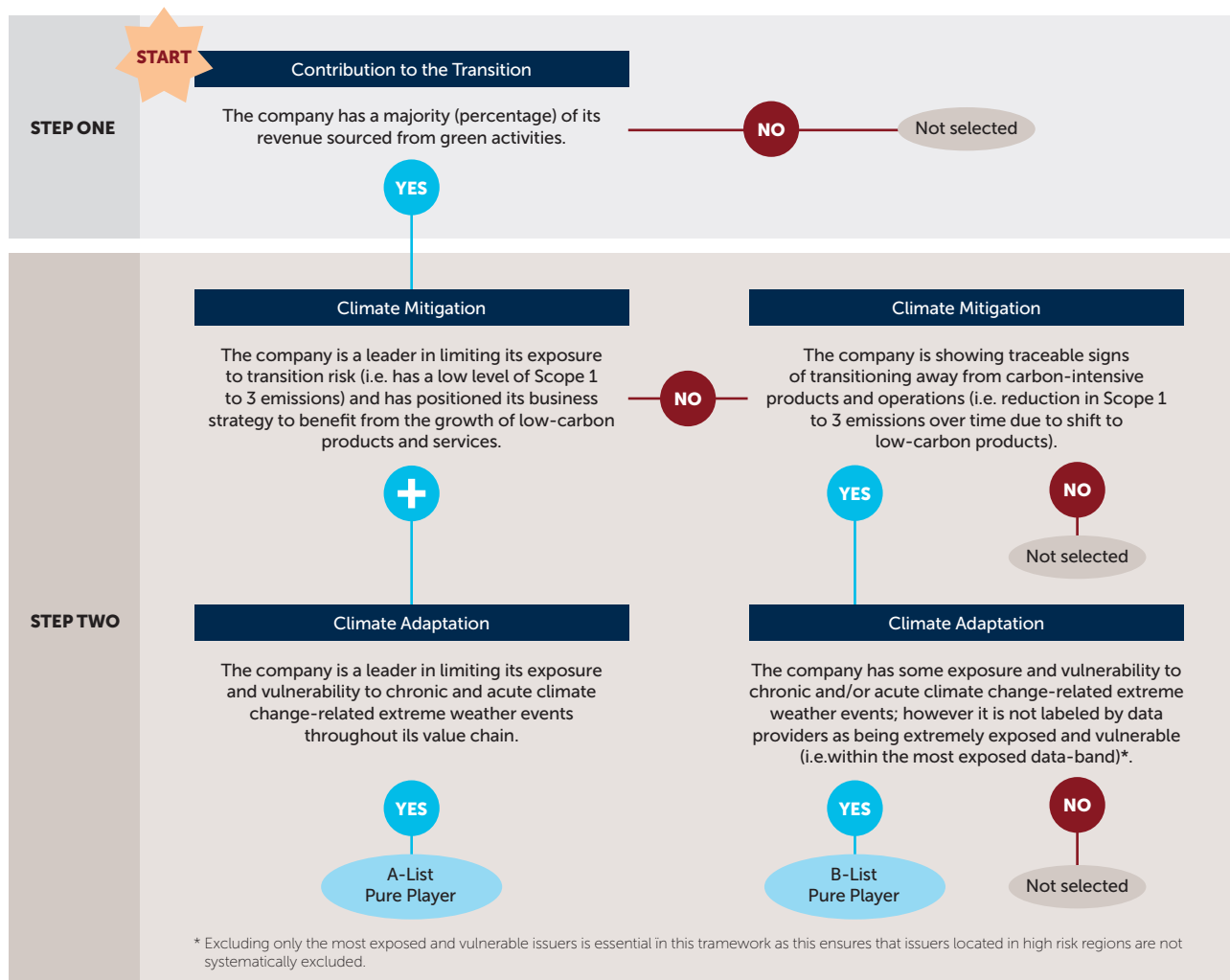
- Diversified Leaders have a highly diversified revenue stream, such as conglomerates. They usually intervene in a wide range of activities and have a high level of integration.

In both cases, the application of the Framework merits a dedicated selection and engagement approach.

#### Pure Players

Eligible Pure Players are defined as companies with their main business activity already contributing to the transition (i.e. companies that already have majority of its revenue classified as green revenue). However, Pure Players can differ in relation to their level of exposure to physical and transition risk. For this reason, the Framework encourages engaging Pure Players who already contribute significantly to the transition but need to improve their climate change risk management. With that in mind, the following definitions and recommended screening thresholds were set for A-List and B-List Pure Players (Figure 11).

Figure 11: Defining a Pure Player under the Framework



Selecting A-List Pure Players relies on implementing strict performance requirements across all three of the Framework's variables. By definition, A-List issuers need to stand as an exemplar of climate change alignment under the framework.

Selecting B-List Pure Players relies on taking a more dynamic approach. Firstly, as pure players, issuers need to meet the same level of predefined green revenue threshold. Secondly, issuers can have some level of exposure to physical and transition risk with promising signs for improvement. This is the key focus of Pure Player engagement practices where the Framework will exclude all issuers with a high exposure to climate risks and engage issuers with some level of exposure (as defined in Figure 11) for improvement.

An example of a B-List Pure Player that would be shortlisted for engagement is a Chinese lithium-battery manufacturer. This company would potentially have a strong involvement in activities contributing to the transition. On the other hand, manufacturing batteries is a resource-demanding process which exposes the company to acute and chronic climate change-related weather events under the climate adaptation pillar. The manufacturing process may also induce serious GHG emissions, causing a high exposure under the climate mitigation pillar. However, such companies are still strategic agents in meeting global climate change goals. Thus, Amundi, as the asset manager of the AIB Asia Climate Bond Portfolio, will engage with B-List issuers on their climate change risk management practices to enter the A-List.

For the AIB Asia Climate Bond Portfolio, portfolio exposure to climate mitigation and adaptation risks differ significantly by market. For example, Pure Players in AIB Regional Members<sup>28</sup> (predominantly emerging markets) were found to have around 1.7 times the exposure to physical risks compared to issuers in AIB Non-Regional Members (predominantly developed markets).<sup>29</sup> In these circumstances, rather than excluding issuers based on a strict maximum exposure level, it may be more appropriate to engage with the company to find out more about the steps it is taking to mitigate the risks before excluding them. For instance, it is more important to increase the awareness of a renewable energy company with offshore wind turbines in an area exposed to severe weather events than to exclude it under the Framework.

### *Diversified Leaders*

Diversified Leaders have a diverse range of business activities, some of which can actively contribute to the

transition. Given their market power, their innovative capabilities and their ability to generate economies of scale, such players are very important to developing low-carbon technologies. As they have highly diversified businesses, their level of green activities as a share of overall revenue is significant but lower than for Pure Players, where Pure Players are required to have majority of their revenue defined as green. This defines an A-List Diversified Leader along with a low exposure to both transition and physical risk reflecting the same leading standards for climate change mitigation and adaptation as A-List Pure Players.

When it comes to defining a B-List Diversified Leader, the equation remains largely the same as with B-List Pure Players. The issuer is expected to have a similar level of green revenue to their A-List counterparts, with a slightly higher exposure to transition and/or physical risk. However, given current data constraints, identifying a B-List Diversified Leader is less straightforward which is why there are two approaches for investors to consider.

A first approach ("B-List Type 1 Diversified Leader" in Figure 12) reflects an issuer that has a green revenue proportion recorded similar to their A-List Diversified Leader peers and also has some level of exposure and vulnerability to physical and transition risks. Such issuers commonly do not have an extremely high exposure to transition risk because their activities do not induce high Scope 1, 2, or 3 GHG emissions. For example, a B-List Type 1 Diversified Leader company could refer to a telecommunications company which could have a relatively moderate exposure to transition risk, because some of its activities are considered green (telecommunication activities needed for the implementation of smart grids). However, due to the vast network of telecommunication infrastructure, a certain level of physical risk exposure would be expected, especially for emerging markets. Diversified Leaders in AIB Regional Members (predominantly emerging markets) were found to have around 1.6 times the exposure to physical risks compared to issuers in AIB Non-Regional Members (predominantly developed markets).

A second approach ("B-List Type 2 Diversified Leader" in Figure 12) exists whereby although the issuer has the same level green revenue and exposure to physical and transition risk, current data sources available to investors might misidentify them. For example, a B-List Type 2 Diversified Leader has a similar exposure level to physical risk as their Type 1 counterparts but are recorded to have less green revenue and a lower exposure to transition risk. The lack of green revenue may not negate the issuer's lack of contribution to the transition. For example, a company in the auto parts sector could fall under this category.

28. AIB Regional Members: Afghanistan, Australia, Azerbaijan, Bahrain, Bangladesh, Brunei Darussalam, Cambodia, China, Cyprus, Fiji, Georgia, Hong Kong, China, India, Indonesia, Iran, Israel, Jordan, Kazakhstan, Korea, Kyrgyz Republic, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, New Zealand, Oman, Pakistan, Philippines, Qatar, Russia, Samoa, Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Timor-Leste, Turkey, United Arab Emirates, Uzbekistan, Vanuatu, Vietnam.

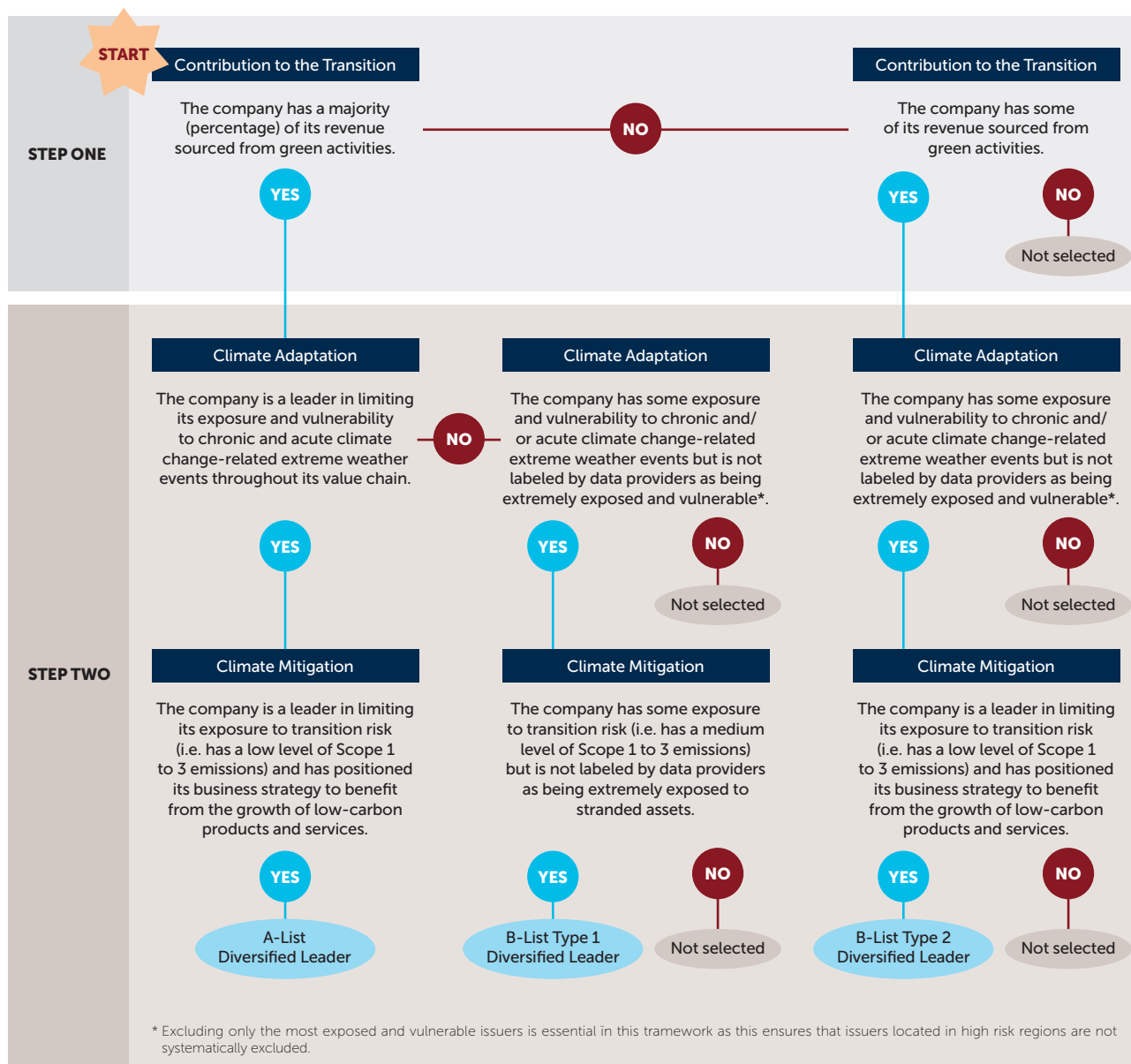
29. AIB Non Regional Members: Austria, Belarus, Belgium, Canada, Denmark, Egypt, Ethiopia, Finland, France, Germany, Greece, Guinea, Hungary, Iceland, Ireland, Italy, Luxembourg, Madagascar, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Spain, Sudan, Sweden, Switzerland, United Kingdom.

In this case, the company might be employing energy efficient solutions across their manufacturing operations but not have these GHG emissions 'savings' count towards green revenue generation. This results from the fact that activities with low Scope 1 – 3 emissions may not always overlap with the definition of green revenue generating activities used by data providers in relation to the contribution to the transition pillar. Thus, the B-List Diversified Leaders Type 2's lack of green revenue may

come from a lack of disclosure or coverage in the green taxonomy used by data providers. With that in mind, for these B-List Type 2 Diversified Leaders, the presence of a sound climate change mitigation strategy should be given equal consideration, rather than adherence to a strict definition of having a fixed proportion of green revenues.

The figure below shows a decision-tree for defining and selecting A-List, and two types of B-list Diversified Leaders.

**Figure 12: Defining a Diversified Leader under the Framework**



When using the Framework to select B-List Type 2 Diversified Leaders, though high performance in the climate mitigation variable would ensure that an issuer is limiting its exposure to transition risk across its key business functions, eligible issuers should also be committed to consistently drive change across their business activities (i.e. exhibiting a commitment to achieving organization-wide transition milestones over time, including increasing the proportion of their green revenues) in order to comprehensively address risks and maximize opportunities brought about by climate change.

In applying the selection thresholds, it was found that there was usually a positive correlation between the scores of an issuer on the pillars of climate change mitigation and contribution to the transition (i.e. companies that get a significant share of their revenues from activities contributing to the transition tend to score about 5 – 10% higher on the climate mitigation pillar, thus granting them a lower exposure to transition risk, compared to companies without any contributing activities).

## V. REPORTING ON THE FRAMEWORK

The Framework aims to stand as a first reference point for investors and issuers adopting best practices in relation to climate change-related investing, monitoring, and reporting. To that purpose, the Framework is positioned as a complementary tool to other important industry-wide initiatives. It will be kept as up to date as possible, and report on its impact annually.

### 5.1 Alignment with Other Market Initiatives

#### *The Framework's contribution to issuer disclosure of climate-related information*

The Task Force on Climate-related Financial Disclosure's (TCFD) recommendations make up the main disclosure platform to integrate climate change considerations into business disclosure practices. It is relevant to all sectors and covers an institution's governance, strategy, risk management and reporting. The Framework supports an institution looking to use the TCFD's recommendations and vice versa.

The TCFD recommends both investors and issuers to disclose the metrics and processes used to assess climate-related risks and opportunities. Adjacently, the Framework expands upon on the most relevant and available metrics. Together, the two create a common language for climate investing and reporting activities. For example, the TCFD calls for the disclosure of Scope 1, 2, and 3 of GHG emissions along with any targets set by the company.<sup>30</sup> This reflects the necessary inputs to calculate an issuer's score under the Framework's metric for transition risk as detailed in section 3.3a and 4.1a.

#### *The Framework's contribution to investor mobilization*

The Framework represents an opportunity for investors to report on concrete steps in regard to any global commitments taken. For example, under the One Planet

Summit's Sovereign Wealth Fund (SWF) Framework (OPSSWFF), "SWFs should consider investment opportunities that arise from the global effort to address climate change". Furthermore, principles 1.1 and 1.2 state "SWF's recognize that climate change will have an impact on financial markets", and "Due to the long-term investment horizon and diverse investment portfolios, SWF's recognize that climate change presents financial risks and opportunities which should be incorporated in the investment framework". Endorsing the Framework stands as a potential first step to materialize the commitments taken.

#### *The Framework's contribution to financial supervisory*

The Central Banks and Supervisors Network for Greening the Financial System (NGFS) aims to integrate climate-related risks into prudential supervision. This includes engaging financial firms to ensure the risks are understood and integrated in investment decisions. The Framework stands as a potential tool to evaluate the performance of an issuer in regard to the physical and transition risks related to climate change. Therefore, supervisors could use the Framework as a guidance tool for a regulated firm's appropriate risk management practices.

30. Task Force on Climate-related Financial Disclosures, 2017

## 5.2 Expected Impact

The impact of the Framework is at two levels. As previously noted, taking an issuer level approach to climate change alignment analysis can position an investor to:

- 1) Encourage the integration of climate change risks and opportunities into business practices. By helping B-List issuers transition into the A-List by active engagement, issuers will potentially improve their management of climate change transition risk, physical risk, but also their contribution to the low-carbon transition.
- 2) Benefit from any future repricing of climate change risks and opportunities in the capital market.

With that in mind, an investor implementing the Framework can expect a potential financial and extra-financial impact.

### a) Extra-Financial Impact

Implementing the Framework is a first step to aligning portfolios with climate change and making effort towards achieving the three objectives of the Paris Agreement. Monitoring and reporting on the progress of the Framework's implementation rests on the success of B-List issuer engagement.

By helping B-List issuers transition into the A-List by active engagement, an investor encourages the improvement of an issuer's management of physical and/or transition risks, along with a reorientation of their business strategy to focus on low-carbon, climate resilient products and services. With that in mind, the cumulative number of B-List issuers engaged to enter the A-List stands as the main proxy for measuring the Framework's success and annual impact. Such mobilization will be tracked through the change in the variables measured by the Framework over time (i.e. over the investment holding period).

Additional impact indicators depend on the financial instruments in a strategy's investment universe. For example, the AIB Asia Climate Bond Portfolio partially invests in labeled green bonds. The GBP ensures green bond issuers provide investors with appropriate impact reporting. A best practice metric is the tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) emissions avoided per year. However, investors may also choose to track a variety of other impact metrics at the use-of-proceeds level in accordance to ICMA's Harmonized Framework for Impact Reporting, such as annual energy savings in MWh/GWh.<sup>31</sup> Furthermore KPIs that are contextualized to track improvement while bearing in mind alignment with national contexts (e.g. NDCs) such as tons of coal equivalent (TCE) avoided, or progress in adopting EU Green Bond Standards for corporates in emerging markets may also be tracked.

The AIB Asia Climate Bond Portfolio will issue an annual impact report covering both these levels of impact.

### b) Financial Impact

As the impacts of climate change increase and the general awareness from market participants grows, climate change-related risks and opportunities will become more material to capital market pricing mechanisms. By using the Framework, investors have the ability to position investments to potentially benefit from relevant future repricing of assets and/or avoid negative impacts.

Today, there is a general understanding that climate change risks and opportunities are not fully priced by the market due to the Tragedy of the Horizon.<sup>32</sup> This potentially leaves current investment portfolios exposed to risks unaccounted for. In "Credit Risk Sensitivity to Carbon Price" (Bouchet & Le Guenedal, 2020), the author's found that the impact of the foreseeable scenarios of carbon prices on corporate EBITDA and credit default possibilities has limited materiality in the medium term (by 2023), increasing to high severity in the long term (by 2060). Indeed, the impact are most notable on the sectors of Utilities, followed by Energy and

Materials. By 2023, between 30% to 50% of companies in the Utilities sector could experience a reduction in EBITDA by more than 2%. By 2060, this rises to 60% to 80% of the companies in the Utilities sector experiencing a EBITDA reduction by more than 20%. This also reflects the distribution of the probability of default, as by 2023, 6% of the companies in the Utilities sector have a default probability of at least 10%. By 2060, 40% to 80% of the companies have a default probability of 99%.

However, some recent research at the instrument level evidences asset price exposure to a company's performance on environmental topics. Research at the portfolio level is yet to be fully explored beyond forward looking scenario analysis (See case study below).

Issuing a green bond can create a halo effect by putting downward pressure on an issuer's entire yield curve. Issuers with green bonds have been found to trade with a tighter spreads of nearly 6bps on average, when compared to peers in the same sector without green bond issuance.<sup>33</sup>

31. Please see <https://www.icmagroup.org/assets/documents/Regulatory/Green-Bonds/June-2019/Handbook-Harmonized-Framework-for-Impact-Reporting-WEB-100619.pdf>

32. Carney, 2019. The traditional horizon of most banks and investors are shorter than the expected time for the materialization of climate change risk. Additionally, financial risks are often priced on historical distributions. However, there are no historical precedents for the materialization of climate change risks.

33. S&P Global, 2018

Furthermore, a corporate with a strong ESG profile tends to have lower credit risk, reflected in their cost of debt. Amundi's most recent research focuses on analyzing the relationship between ESG and credits ratings in Euro investment grade fixed income. Initial findings noted ESG has a positive impact on the cost of debt function. For instance, the cost of capital difference is equal to 31 bps between an ESG best-in-class and worst-in-class corporates, controlling for individual issuer characteristics.<sup>34</sup> This is partially expected as credit rating models already include considerations for extra-financial risks. The results

were also more pronounced for some sectors than others, such as banking and utilities and energy.

With these initial findings in mind, a B-List issuer could enter the A-List and experience an increase in credit quality and decrease in its cost of debt. The Framework enables an investor to identify B-List issuers before entering the A-List and thereby potentially benefit from trading the issuer's debt at a premium. Evidence of such return impacts are yet to be studied and the AIB Climate Bonds Portfolio is only planned for launch in 2020.

## Case Study - Overview of Climate Change Risks Impacting Portfolio Returns

### Summarizing Mercer's 2019 Main Findings

The impact of climate change risks at the portfolio level is yet to be recorded at scale. A contribution might be the unwillingness of investors to publicize any significant related losses. However, thanks to scenario analysis and stress testing, there is evidence that investment portfolios face impacts in years to come.

As a best effort, Mercer updated a sequel to their report answering how climate scenario modeling can help investors. Mercer exposed a conventional growth portfolio<sup>35</sup> and a sustainable growth portfolio<sup>36</sup> to stress tests under a 2°C, 3°C, and 4°C warming scenario above pre-industrial levels. The timeframe ranged up to 2030 and 2050. The underlining conclusion was that a portfolio more closely aligned to a 2°C scenario has positive return implications for long-term investors.

In a 3°C and 4°C warming scenarios the potential impact of physical risks is most material. In a 4°C scenario the portfolios tested faced a return impact of -0.07% per annum to 2030. To 2100, a 4°C scenario results in the portfolios being down more than 0.10% per annum compared to a 2°C scenario.<sup>37</sup>

In a 2°C warming scenario, portfolios are more exposed to transition risks. However, investors have the opportunity to avoid return impairments from transition risk, and benefit from targeting mitigation and adaptation solution sectors. For example, the sustainability growth portfolio recorded nearly 0.20% per annum more to 2030. Additionally, a strategic sector approach enables investors to benefit from solution driven sectors such as renewables, as illustrated below.<sup>37</sup>

### Expected Annual Return Impacts Under a 2°C Global Warming Scenario

Example industry sectors	% p.a. to 2030 in 2°C scenario	% p.a. to 2050 in 2°C scenario	% cumulative impact to 2030 in 2°C scenario	% cumulative impact to 2050 in 2°C scenario
Coal	-7.1	-8.9	-58.9	-100*
Oil and gas	-4.5	-8.9	42.1	-95.1
Renewables	+6.2	+3.3	+105.9	+177.9
Electric utilities	-4.1	-3.3	-39.2	-65.7

Although this data is foretelling, it is clear that there are limitations in data availability and methodologies for modeling climate change risk damages. The resulting levels of impact are only indicative and potentially underestimated.

\* Effective absolute loss of value is expected to occur in 2041 under a scenario in which global warming is limited to 2°C by 2100.<sup>37</sup>

34. Amundi, 2019

35. Developed market equity (17.5%), emerging market equity (10%), low-volatility equity (7.5%), small-cap equity (2.5%), private equity (5.0%), real estate (10%), infrastructure (5%), timberland (2.5%), agriculture (2.5%), hedge funds (5%), private debt (5%), developed market sovereign debt (10%), emerging market sovereign debt (2.5%), multi-asset credit (10%), investment-grade credit (5%).

36. Developed market equity (7.5%), emerging market equity (10%), low-volatility equity (7.5%), small-cap equity (2.5%), sustainable equity (10%), private equity (4%), sustainable private equity (1%), real estate (10%), infrastructure (4%), sustainable infrastructure (1%), timberland (2.5%), agriculture (2.5%), hedge funds (5%), private debt (5%), developed market sovereign debt (10%), emerging market sovereign debt (2.5%), multi-asset credit (10%), investment-grade credit (5%).

37. Mercer, 2019

### 5.3 Governance

An annual review of the Framework will be run by a Steering Committee initially comprised of AIB and Amundi. Other representatives are expected to join, potentially including institutional investors implementing the Framework and/or relevant experts from the global climate finance ecosystem.

The annual review shall analyze the past years performance on the Framework based on the impact of AIB Asia Climate Bond Portfolio as defined in Section 5.2. The Framework will also face an annual update if necessary according to any innovation in regards to Climate and ESG related metrics or newly available data. Additional updates could include adjusting the implementation of the Framework according to new issuer, sector, and/or country approaches.

## VI. CONCLUSION

Avoiding the catastrophic impacts of climate change requires a significant reduction in global GHG emissions and a deep transformation in the economy. The Paris Agreement, adopted at the COP21, unleashed new momentum to mobilize international capital markets to support climate change mitigation and adaptation. Consequently, investors have assumed their responsibility to start integrating climate change risks and opportunities into investment practices.

The Climate Change Investment Framework is a lens for investors to align investments with the Paris Agreement in a holistic manner covering all three objectives: climate change mitigation, climate change adaptation, and contribution to the transition. Implementing the Framework allows investors to engage issuers to increase climate change alignment and potentially benefit from the future repricing of climate change risk in capital markets in the long-run.

The AIB Asia Climate Bond Portfolio, managed by Amundi and launched in 2020, is the first implementation of the Framework. The implementation of the Framework demonstrates its successful application in light of the challenges faced by investors in emerging markets (high risk) and fixed income (under-represented by ESG providers) and this stands as an example for investors to no longer look to climate change investing as a satellite strategy. Instead, the Framework has the potential to be applied across asset classes and geographies to core asset allocations. This could potentially encourage the tipping point to mobilize the trillions needed to finance global climate change mitigation and adaptation efforts.



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# CLIMATE CHANGE INVESTMENT FRAMEWORK

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Endorsed by the Climate Bonds Initiative