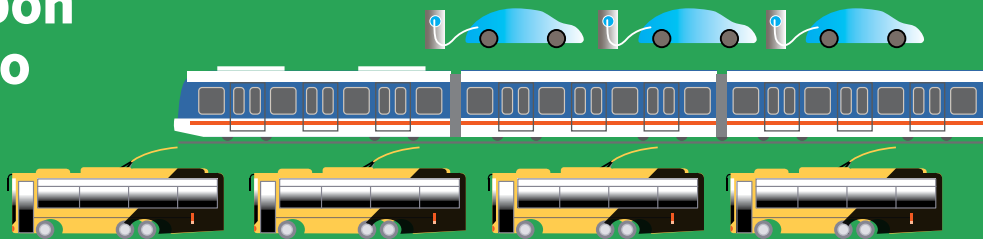
Special Report Developed for the project "Building a foundation for a sustainable and scalable low-carbon future in Mexico – from Green Bonds to a Greener Ecosystem" under UK PACT Mexico

Financing low-carbon transport in Mexico



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Mexico is a key player in reducing emissions in Latin America. The aim of this briefing is to provide a guide to the opportunities in the country to leverage green and sustainable bonds to finance low-carbon transport. Globally, energy, buildings, and transportation projects attracted the largest proportion of funding from green bonds in 2020.[1] Investment in adaptation and resilience of transport infrastructure presents further opportunities for Mexico.

Introduction to the transport sector

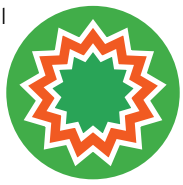
The awareness related to climate change and environmental protection has been growing in the last decades. The pressure is being increasingly placed on governments, the private sector, and organizations worldwide to prioritize decisions that reduce GHG emissions and impacts on natural ecosystems. The Paris Agreement is a landmark for the globe to take ambitious efforts to keep the global temperature rise below 1.5 degrees Celsius. To achieve this goal, it is imperative that there are globally- accepted definitions of what is considered green or sustainable. In the financial market, one beneficial outcome of the growth of the green bond market is that it has started this global conversation around definitions and has helped investors to identify projects aligned with mitigation and resilience principles.

The imperative:

Almost 48% of the energy consumed in Mexico is used to move goods and people, and the combustion of gasoline in transport makes this sector the second source of greenhouse gas emissions (GHG) in the country.[2] It is therefore urgent to reduce emissions generated by transportation activities. Doing so can substantially improve air quality, especially in urban centers, reduce pulmonary diseases and deaths related to atmospheric pollution, and lower Mexico's contribution to global climate change.[3] Action points in this direction must consider diversifying urban mobility options, improving transportation systems through the use of new technologies for heavy and light-duty vehicles, and public transportation fleets.

Mexico sees the transport sector as a critical sector for a transition to a low carbon economy, and, therefore, it has proposed reducing black carbon emissions by 51% by 2030, the only country to set a black carbon commitment.[4] In Mexico, 38% of black carbon emissions, are derived from the transport sector.[5]

The opportunity: To meet the imperative, substantial investment will be needed in low-carbon transportation (LCT) options. Green bonds can help to increase the visibility of LCT assets in capital markets and meet investors' growing demand for transparency in operations, subnational infrastructure development, and vehicular technologies for carbon emissions reduction. A key characteristic of the transport sector is that the investment costs for emission mitigation can be compensated if the co-benefits of an integrated transport system are considered.



Due to the percentage of greenhouse gases emissions coming from transportation, action taken in the sector can have a big impact on reducing overall emissions. Moreover, a better transport system can help to achieve climate goals since it takes more time to switch people to drive something cleaner than establishing a well-functioning transportation system which encourages people to drive less. Mitigation actions such as promoting efficient public transport, could be among those that contribute the most to meeting climate goals.

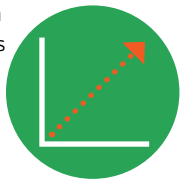
Reducing emissions directly improves air quality and respiratory health problems. Studies have found a relationship between poor air quality, chronic health problems and even premature deaths.[6]

Mexico City is one of the most affected cities in the country and the world, with sustained high levels of pollution. Even at times of low traffic during the COVID-19 pandemic, the concentration of fine particles PM2.5 and PM10 remains high. This has put a high percentage of the population at risk, and to a greater extent, informal workers with high exposure to polluted air or long travel times.[7]

Improvements to the transport sector offers the potential to improve quality of life, reduce the burden on the health sector as well as promote urban economies.[8] Low carbon transport systems also reduce household's dependency on private transport, saving them time and income.[9] Investments in the sector provide an opportunity to stimulate job growth, become safer and more socially inclusive.

Within cargo transit, there is a particular opportunity to migrate towards more efficient and cleaner units in the next couple of decades given that there are over 980 thousand cargo vehicles in Mexico each with an average life span of 18 years, which need to be renewed.[10] Furthermore, the vehicle fleet is expected to be expanded.

Size of the building green bond market:



Investments in LCT have followed a stable upward trend for the last few years. In the green bond market, issuers have allocated proceeds to fund the sector by employing various green bond structures and initiating a green securitization market. According to CBI data, USD191bn has been allocated to low-carbon transport projects and assets globally as of December 2020.

Sector overview

A competitive transport and infrastructure system is crucial for the economic development of the country. However, transport is the largest and the fastest-growing sector in Mexico when it comes to energy consumption and GHG emissions with around 90% of emissions generated by road transportation. The country's vehicle fleet nearly tripled in 10 years between 1996 and 2006 increasing from 8 to 21 million vehicles. The numbers have been boosted by a huge increase in the importation of used cars from the US, a factor that has increased the average age of the vehicle fleet, which raised, in turn, has raised concerns about low gas mileage and increased GHG emissions.

In Mexico, 55.5% of products transported are shipped in freight trucks, with which the transport sector represents 3.34% of GDP in Mexico, according to data reported by the National Institute of Statistic and Geography (INEGI).[11] The economic relevance of the transport sector in the production and distribution of merchandise is shown by its monetary value. Promoting more efficient means of transportation such as railways, highways, airports, and ports will substantially decrease both costs and emissions.

According to the National Institute of Ecology and Climate Change (INECC) in Mexico, emissions from the transport sector directly account for 25.1% of the total national emissions, the largest of any sector.[12] The private sector will also play an important role in reducing emissions, particularly those relating to the transport of goods and merchandise, of which 157Mt are emissions from the freight transport sector.[13]

There are solutions to reduce emissions in the sector. In the short term, efficiency improvements and regulations can help to drive immediate emissions reductions but longer-term, efficiency improvements will not be enough and a shift to a low carbon economy, investment in new technology vehicles and public transport systems will be required.

In 2016, Mexico registered a 13% reduction in fuel consumption from cars and light trucks in respect to 2011, thanks to adopting filter-based, best-in-class transport standards at the national level, according to the International Council on Clean Transportation.

The standardization of the environmental norms and regulations for existing and new vehicles was one of the government's goals for the transport sector established on the NDCs. Other goals centered on promoting multi-modal freight and passenger transport and modernizing the vehicle pool, while reducing imports of used automobiles. Increasing access to clean fuel, natural gas vehicles, and ultra-low sulphur gasoline and diesel options was another set of goals that has been established.[14]

To meet these goals and to address carbon emissions, the Ministry of the Environment and Natural Resources (SEMARNAT) has recently updated the norms for all new on-road vehicles and engines to feature advanced technologies for pollution control, under U.S. and European standards. These regulations mainly include restrictions for heavy-duty trucks and buses' machinery to be soot-free, which is essential for achieving Mexico's NDC pledge to reduce black carbon emissions by 51% by 2030.[15]

Progress towards carbon emissions reduction has also been made at a municipality level, for example in Mexico City, which established the Euro VI standard for all new buses in the publicly-owned fleet, signaling to the market what technology it wants to operate with.[16] These are not the best current practices worldwide but the regulation update in Mexico represents a significant step forward in the sector's public policies, where the country has a lot of potential for improvement.

However, *improving* the energy efficiency of transport technologies and moving towards cleaner fuels will not be enough and it is clear that Mexico must show much greater ambition to achieve climate goals. For this reason, the international classifications, including the Climate Bonds Standard (see page 5) do not regard gas as green fuel, and there is a move around the world towards full electrification of transport systems. There is also still a lot of debate around biofuel's sustainability, which is excluded, except for maritime transport, under the Climate Bonds Standard (CBS), but can be considered for the aviation industry.

The SLOCAT (Partnership on Sustainable, Low Carbon Transport) framework explores the concepts of: (i) avoid, and (ii) shift, at the same time as (iii) improve, which can allow developing more comprehensive investment plans for low carbon transportation.[17] Utilizing land use planning efficiently can *avoid* unnecessary travel and reduce travel lengths. This is being achieved by cities and municipalities working on urban planning projects. On the other hand, *shifting* towards public transport, or sustainable transport modes can complement the development towards LCT, which is being achieved through increasing lanes for urban public transport. As a third consideration, *improving* the quality of fuels, especially transitioning towards non-fossil fuels will be necessary, such as is being demanded for Mexico City's buses' technology. These three concepts are already being considered under the Climate Bonds Criteria and can be financed through green bonds.

It is also essential to understand the impact of the automotive industry on the Mexican economy. The automotive industry in Mexico generates around 3.6% of the national GDP. The assembly and manufacturing companies have invested in Mexico due to its privileged geographical location and its affordable and qualified labor force, which is characterized by its competitive levels and quality. However, local labor will require a new skillset given that electric vehicles will be the priority for Mexico's main trade partners.[18]

Worldwide, sales of hybrid and electric cars have increased steadily. According to the Mexican Association of the Automotive Industry (AMIA), between January and July 2020, 12,408 new vehicles with environmental technology were sold, representing 1.66% of the total sales of light vehicles made during that period in Mexico, a percentage that, although still low, continues to increase.[19]

The transition toward a circular economy will also be an important environmental objective to meet. Manufacturing largely accounts for

The EURO standard

The Euro Standard regulates the acceptable limits for internal combustion gas emissions for most petrol and diesel vehicle types sold in the European Union. There are seven norms in total, where EURO VII will be the stringiest and will be followed by a phase-out of fossil fuel vehicles.

Euro I	Euro II	Euro III	Euro IV	Euro V	Euro VI	Euro VII
1992	1996	2000	2005	2009	2014	2025

This standard is continually evolving, as it aims at zero emissions to improve air quality, prompting manufacturers to implement and adjust to new technologies that increasingly clean vehicles' exhaust gases.

the total environmental impact generated by vehicles, but an automobile is one of the most recycled consumer products. Everything from aluminum and steel to tires and oil can be recycled. Due to the need to make current cars more efficient and renew the circulating units, there is the scrap process underway. Remanufacturing entails rebuilding products to meet the original finished product specifications using repaired, reused, and new features. The shift to a circular economy entails a challenge and represents a tremendous opportunity to ensure efficiency through waste reduction and to maintain the materials in the loop, making them greener.

Stimulus packages supporting the vehicle fleet's decarbonization as well as the European Green Deal to support green economic recovery are generating additional pressure on the industry. Volkswagen, Ford, and BMW Group are some of the manufacturers that are beginning to work with automobiles' assembly with electrical technology in Mexico. But none of the current production plans are ambitious enough to be fully aligned with the goals of the Paris Agreement.[20]

Low-carbon transport bonds in Mexico

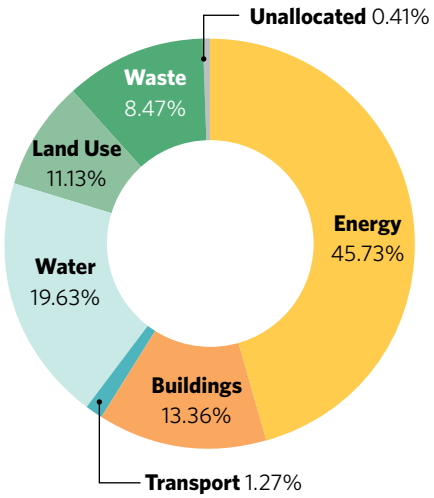
Large amounts of investment for green and resilient transportation infrastructure can be financed by green or sustainable bonds. We have identified the following examples from Climate Bonds public data sources.[21]

Mexico City's local government has issued two green bonds. The 2018 bond allocated part of its MXN1.1bn issuance to sustainable public transport projects. Their 2016 green bond allocated 58% of its MXN1bn to its transport sector projects, specifically to the public transport system's construction, the Metrobus line 5, the repair and maintenance of the metro- Metrobus network, and the refinancing of the acquisition of light rail units.[22]

Additionally, **BANOBRAS**, a development bank in Mexico offering financial solutions for infrastructure development and public service projects issued five sustainability bonds until December 2020. Some of the proceeds collected from these bonds have been channeled to affordable basic infrastructure, utility infrastructure, disaster recovery, and sustainable transportation.[23]

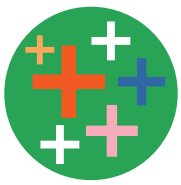
Green funds could finance new efficient low-carbon transport systems. Although the green and sustainable bond market in Mexico was at USD3.07bn of issuance as of the end of December 2020, it is growing. In September 2020, Mexico issued the first Sovereign Sustainability Bond linked to the Sustainable Development Goals (SDG) promoted by the United Nations for EUR750m. The country will use the proceeds for the public financing of the budget aligned with the 2030 Agenda and the SDGs, according to the SDG Sovereign Bond Framework.[24]

Only 1.27% of green bond proceeds raised by Mexican issuers go to low-carbon transport.



31 January 2021

Low-carbon transport opportunities in Mexico



Green and sustainable bonds can finance underlying projects, assets, or receivables related to low-carbon emissions, circular economy or resilient infrastructure.

The opportunities to invest in low-carbon transport in Mexico are numerous, as the country possesses a huge potential in terms of skills base and technological ability to make improvements in energy efficiency and climate-smart measures. The following section briefly describes some of the most iconic projects being developed.

The "**New bus corridor for electric buses on Eje 8 Sur in Mexico City**" project aims to be the first Mexico City's Zero Emissions Corridor. The construction will be divided into two phases, where a cost of USD115m is estimated for Phase 1 and USD90m for Phase 2. More than 50 electric buses will be delivered to operate along the 22km corridor, where 185,000 daily trips are expected, thus reducing cumulative GHG emissions by 875,809t.[25]

Mexico City has already delivered the first ten fully **electric buses** for Line 3 of the Metrobus, with nine additional buses to be provided in the following months. Each unit's cost is about USD750,000, reducing the operating costs by 30% compared to diesel-fueled buses.[26] The plan is to enlarge the zero-emissions fleet in the next years upon evaluating the acquired electric buses' performance.[27]

Another project is **The Jalisco Line 3 of the Guadalajara Light Rail**, an electric system that cost MXN32bn (approximately USD1.5bn) and expanded the network transport system by 86% to cover 233,000 trips daily. The federal government financed it fully, and it has been the most significant investment ever in Jalisco for low-carbon transportation.[28]

The Mexico-Toluca Train is another federal government initiative project under construction that has been identified as LCT.[29] With the capacity of 230,000 trips per day, the project will integrate into other public transportation systems, including Mexico City's Subway Network. It will also connect to Toluca's Airport. The Mexico-Toluca Train will provide seven new stations, across six different municipalities, and reduce 90 minutes of commute time between Zinacantepec and Observatorio. The system will be supplied with electric and automatic trains, aerodynamic design, and regenerative brakes that minimize energy consumption. The total investment is approximately MXN90bn (USD4bn). More than 27,000 tons of pollutants are expected to be avoided, considering that 13,000 vehicles won't be used on a daily basis.[30]

The Mexican multinational company Bimbo currently has 400 electric vehicles. It will invest around USD146m dollars through its subsidiary company Moldex to manufacture a total of 4,000 units in the next four years to expand its electrified delivery fleet. Part of this production may be sold to other companies that have similar requirements. The energy that feeds them is generated by Piedra Larga's Group wind farm in Oaxaca, backed by rows of solar panels and wind turbines, which provides the necessary storage for hours in the absence of sun and wind. The company is also working towards energy efficiency and clean energy consumption to meet their goal, set for 2025, of becoming 100% renewable. When it comes to electric trucks, Bimbo is not the only company taking the initiative to become builders and buyers of their vehicles. Companies such as UPS and Amazon in the U.S., Deutsche Post in Germany are also gradually introducing these vehicles into their companies' fleet.[31]

The first conversation about the transport sector in Mexico

In September 2020, the *Instituto Tecnológico Autónomo de México* (ITAM) and the Climate Bonds Initiative, with the support of the UK PACT programme of the British Government, hosted a RoundTable discussion on green and sustainable transport in Mexico.[32]

Experts highlighted the need for the transport sector's standards to achieve the country's goals to decrease GHG emissions, pollution in the main cities and attract higher and cheaper capital flows.

The sector's sustainability was also primarily discussed; for instance, new public transportation projects should be electric and carbon-free. However, high acquisition prices are always the main argument against this solution. Having an operation cost efficiency and other cost-benefit analysis could change these views.

As one of the solutions, the experts explained that Mexico needs to evaluate the efficiency of transporting certain goods and simultaneously switch to electromobility. This perception comes from experts who affirm that Mexico could allocate investment towards electric vehicles in accordance with global trends instead of adapting more efficient engines in a fleet of old units.

It was also brought up that improving aspects such as energy efficiency, operations, and maintenance (also referred to as telematics) are as important as new technologies. Finance for greener transport should focus on building capacities for vehicles' correct use, reducing emissions, especially for small and medium companies, instead of inefficient and unnecessary freight trips.

There must be improvements in engines and renovations in clean technology, but energy efficiency changes are also essential.

Defining green public transport is vital for the sustainable mobility of all people. This is particularly important when planning green smart cities as transport is an important component of the urban system. All experts agreed that it is necessary to create financial incentives and match the capital flows with the investment needs, ideally, during the early stage of the projects.

Endnotes

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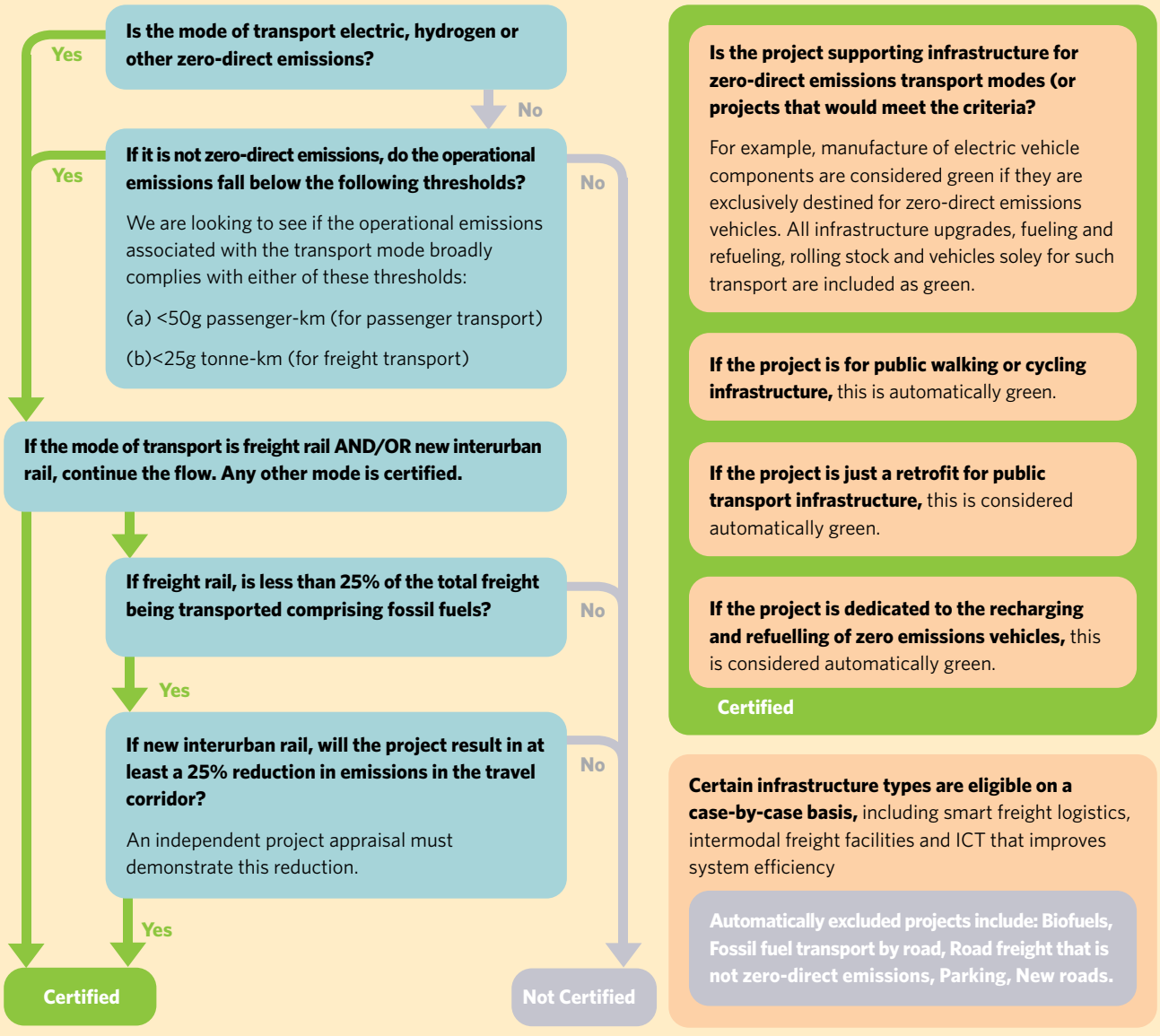
Low-carbon transport certifications accepted by the Climate Bonds Standard

Within the Climate Bonds Standard and associated Sector Criteria, low-carbon transport definitions are divided by subsectors for eligible projects and assets aligned with the Paris Agreement 2-degree limit. Please see below the diagram and transport criteria eligible for certification under the Climate Bonds Standard.

CBI has more information about the Transport Criteria and the various subcategories available for certification on the Climate Bonds website.

Transport core eligibility



How to issue a green bond/loan

Who can issue green bonds?

Any entity which has suitable green assets can issue green bonds and/or obtain green loans. Suitable green assets include renewable energy, low carbon transport, low carbon buildings, sustainable water, agriculture, shipping, waste management, sustainable land use as well as climate change adaptation measures such as flood defences.

1 Develop a green bond framework

- Define eligibility criteria for projects/assets
- Create selection process
- Set up tracking & reporting

Available guidelines & standards:

International: EU Taxonomy, Green Bond Principles (GBP), Green Loan Principles, Climate Bonds Taxonomy and Climate Bonds Standard

Country-specific: Brazil, Chile, Mexico, Dominican Republic, Panama, Colombia, Ecuador, Paraguay (SDG), Argentina, Peru, and Costa Rica

2 Best practice: Arrange an external review

Assurance report: an external party confirmation of compliance with GBP/GLP

Second Party Opinion: an external assessment of the issuer's green bond framework, confirming GBP compliance and analysing the eligible asset categories

Green rating: an evaluation of the green bond and framework against a third-party rating methodology, which considers the environmental aspects of the investments. In LAC, these mainly include products developed by international rating agencies such as S&P and Moody's.

Verification report for Certified Climate Bond: third party verification, pre- and post-issuance, which confirms that the use of proceeds adheres to the Climate Bonds Standard and Sector Criteria and the Paris agreement to keep global warming to 2°C and achieve full decarbonisation by 2050

3 Check for support mechanisms:

In some LAC countries, it is mainly stock exchanges that provide some support services for green bond issuers. Although financial support is rare (only Costa Rica's BNV seems to offer reduced fees for green bonds issuers, as well as helping them in organising roadshows), it is worth checking this locally, especially since green finance policy is changing rapidly. Other local organisations, such as Brazil's CEBDS and Mexico's CCFV also be able to provide support.

4 Issue the bond / loan

5 Post-issuance reporting

Report annually to confirm that the funds are allocated to green projects / assets

Best practice: Disclose environmental impacts of financed projects in absolute terms and relative to an appropriate benchmark

www.climatebonds.net

Design: Godfrey Design

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