Executive summary

The growing green bond market

In the Paris Agreement, Parties agreed to hold the increase in the global average temperature to well below 2°C and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, and to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development. Recent estimates suggest that approximately USD 93 trillion in infrastructure investment will be needed in the next 15 years in a "low-carbon" scenario.

Debt currently finances the majority of infrastructure investment. In particular, bond finance is a natural fit for low-carbon and climate-resilient infrastructure assets such as renewable energy infrastructure, which is characterised by high upfront capital costs and long-dated and frequently inflation-linked income streams.

Since 2007-08 a market for bonds specifically "labelled" or designated as "green" ("green bonds") has emerged. A green bond is differentiated from a regular bond by its commitment to use the funds raised to finance or refinance "green" projects, assets or business activities. With growing market appetite for such bonds, annual issuance of labelled "green bonds" rose from just USD 3 billion in 2011 to USD 95 billion in 2016.

There are a number of international and national taxonomies addressing green bond project definitions, including the Green Bond Principles and the Climate Bonds Standard. However, the lack of universal rules and standardisation is a shared and enduring source of concern cited by participants in the market. Convergence towards commonly accepted definitions will be essential to maximise the effectiveness, efficiency and integrity of the market. At the same time, striking a balance between securing market confidence and reducing green transaction costs will be critical.

Green bonds can offer several important benefits for green investment including: 1) providing an additional source of green financing; 2) enabling more long-term green financing by addressing maturity mismatches; 3) enhancing issuers' reputation and clarifying environmental strategy; 4) offering potential cost advantages; 5) facilitating the "greening" of traditionally brown sectors; and 6) making new green financial products available to responsible and long-term investors.

Barriers, policy actions and options for green bond market development and growth

The evolving green bond market faces a range of specific challenges and barriers including: 1) general challenges to bond market development; 2) lack of awareness of the benefits of green bonds and existing international guidelines and standards; 3) lack of local green bond guidelines; 4) costs of meeting green bond requirements; 5) lack of green bond ratings, indices and listings; 6) lack of supply of labelled green bonds;

7) difficulties for international investors to access local markets; and 8) lack of domestic green investors.

There are various options and policy considerations for addressing these barriers that are already being used by the official sector in different jurisdictions globally:

- establishing enabling, "investment-grade" policy environment as preconditions
- careful design and calibration of regulatory frameworks
- market building, such as identifying project pipelines and developing green guidelines and standards; in particular, defining international rules could help overcome many of the barriers identified
- demand-side measures, such as giving public institutions mandates for green bond investment
- supply-side measures, such as public sector demonstration issuance and reducing costs of green bond issuance and reporting
- public intervention, such as risk mitigation.

A quantitative framework for analysing potential bond contributions in a low-carbon transition

This report proposes a framework for understanding possible directions of bond market evolution and for analysing the potential contribution that the bond markets can make to a low-carbon transition. The analysis studies: 1) how much debt finance is needed to meet the IEA's 2°C energy investment scenarios (2DS) between 2015 and 2035 in the four markets studied (the People's Republic of China, the European Union, Japan and the United States); 2) how the bond market might evolve in the same period to account for part of these debt finance needs; and 3) the implications for institutional investors that have driven the growth of the green bond market to date.

This analysis focuses on bond financing for the renewable energy, energy efficiency and low-emission vehicle sectors which account for 80-90% of the low-carbon assets included in the 2DS. Two main scenarios were modelled on a 2DS pathway: 1) a base-case scenario that uses conservative asset securitisation assumptions; and 2) a scenario with a 10% increase in asset securitisation rate across all sectors. Both main scenarios assume that policy makers adopt supportive policies to overcome various challenges.

The results of the analysis suggest that by 2035 in a 2DS, bonds financing and refinancing the three sectors in the four markets studied have the potential to scale to USD 4.7-5.6 trillion in outstanding securities globally and USD 620-720 billion in annual issuance. While these figures may seem large on an absolute basis, they are small (approximately 4%) relative to the scale of debt securities markets, generally with USD 19 trillion of gross issuance in the four markets in 2014.

The 2020s have the potential to be the start of the "golden years" for bond issuance in the low-carbon sectors. As low-carbon technologies mature and become more familiar to bond markets, and as the risks of assets fall as policy stabilises, the role played by bonds could expand rapidly. This analysis examines the potential for different types of bond to finance a range of sectors and sub-sectors of low-carbon investments studied. It displays a picture of the volume of outstanding securities through to 2035 and the speed at which they could potentially scale up.

Bond finance has the potential to play a significant role in mobilising additional institutional investors to support the low-carbon investment necessary to meet a 2DS by mid-century. Institutional investors in the OECD have the potential to absorb the increased supply of such bonds, through shifting asset allocations in response to the increased percentage of low-carbon bonds as a share of the broader bond markets. This conclusion is based on two assumptions: 1) institutional investors' appetite for low-carbon bonds may be expected to grow in light of increasing attention to climate risks and opportunities in investment portfolios; and 2) institutional investors will shift allocations to reflect the increasing share of low-carbon bonds in the market as a whole.