Green Finance

A Bottom-up Approach to Track Existing Flows

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Executive Summary

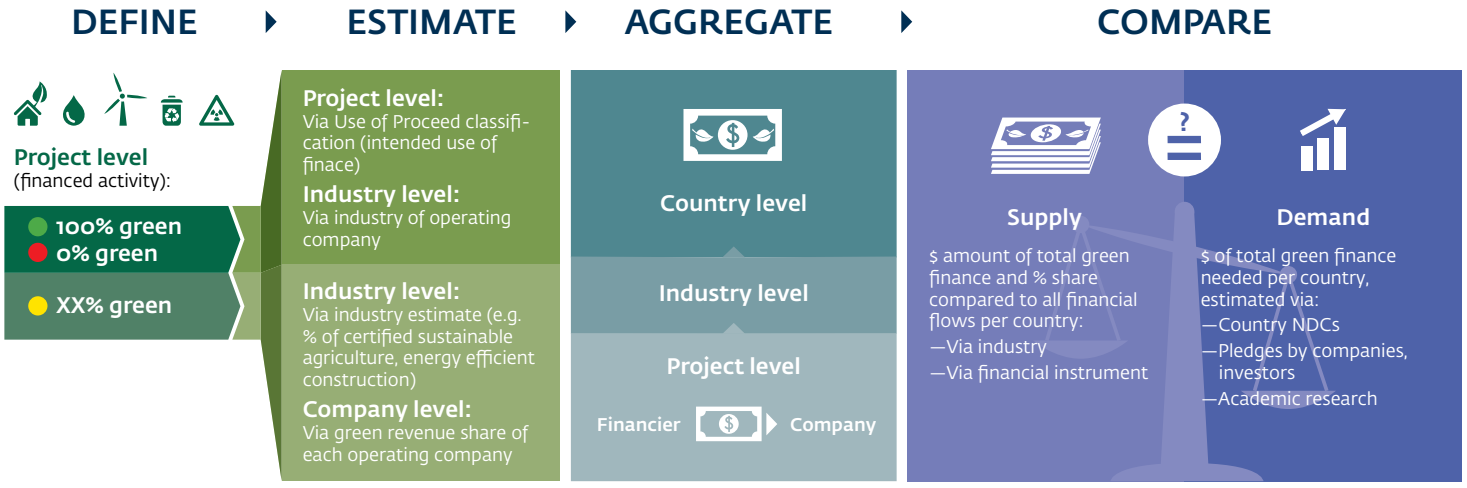
If we are to transition to a sustainable global economy, we need to scale up the financing of investments that provide environmental benefits, known as "green finance."

Various financial institutions, international initiatives, standard setters, and regulatory bodies have developed their own approaches to green finance. The diversity of approaches and definitions across the financial sector makes it difficult to assess overall progress. This is further constrained by data availability, which limits the rigor of the analysis of existing green finance flows.

A comparison of the current supply of private sector green finance and the global demand by country would allow for the development of clear action points to close any gaps. Building on the work of the Group of 20 (G20) Green Finance Study Group, the IFC Climate Policy team has developed a new approach to assess and track green finance, focusing on the banking sector, to understand the current status of green lending and provide recommendations on how to better align different approaches to measuring green finance. This will allow for analysis on a broader scale, which could result in better policies to mobilize additional green finance.

This bottom-up methodology first defines what is "green" at a project level, based on the intended use of the investment in the real economy, through the application of estimates for the respective green share per project. It then aggregates the numbers at an industry and country level. These results can be compared to green finance needs to identify gaps and action points.

There are many challenges to implementing this approach, including the lack of consistency in the definition of green and other relevant data points, such as sector classifications across available datasets.



CHALLENGE 1: DEFINING GREEN AND FINDING SUITABLE ESTIMATES

- **Project-level data:** The share of green finance can best be identified by examining the actual project activity, classified as "use of proceed"[a] in financial datasets. However, this classification can identify green only in some cases, and its definition is often imprecisely applied. For example, "project finance" may be chosen instead of "clean energy." These unclear definitions lead to information gaps.
- **Sector-level data:** If the use-of-proceed classification does not provide useful information, the industry of each operating company can serve as an estimate for the green share of every project. Publicly available studies indicate each industry's share that yields environmental benefits, such as certified green buildings in the real estate sector. But, the industry classifications used vary across different datasets. This lack of consistency complicates the approach when combining data sources.
- **Company-level data:** The share of green revenues per operating company can provide a more sophisticated estimate than sector-level data. However, this information exists in a consistent format only for a few listed companies.

[a]The "use of proceed" is a classification for an investment that indicates the intended use of that investment.

CHALLENGE 2: AGGREGATING THE DATA

- **Borrower's location:** As each project's location is not available in a consistent format, the operating company's location is used. This introduces inaccuracies given the cross-border activities of many companies. For example, the location listed in datasets refers to the place of legal incorporation of the borrower or head offices and not the physical location where the proceeds of the loan will be applied.
- **Financier's location:** If data is aggregated per financing institution, there is often limited information on how much of the project was financed by a particular financier and their location. This lack of information leads to limitations in the analysis.
- **Combining datasets:** For a meaningful analysis of green finance per financial instrument, project location (countries), project operator (companies), and project financier (lending banks, bond issuers, investors), different datasets need to be combined. This means that connecting factors must be found across datasets. This can be a unique identifier per financed project (a project ID), operating company, or financing institution. However, many different identifiers are used across datasets and geographies. The lack of consistency complicates the linking of different sources to aggregate the data at different levels.

CHALLENGE 3: COMPARING SUPPLY WITH DEMAND

- **Supply:** Findings remain limited to rough estimates given the challenges described above.
- **Demand:** Existing policy targets still need to be translated into indicators for how different sectors in the real economy have to change in each country to achieve the Paris Agreement targets and the Sustainable Development Goals. For such sector indicators, a breakdown of the need for finance per financial instrument is needed to conduct a rigorous analysis.

Banking:
Application of the methodology to the loan market reveals some initial estimates

Define

The methodology is applied to a dataset on syndicated loans by Thomson Reuters. Green project finance is defined based on the industry of the borrower.

Estimate

The green percentage of projects is applied to industry classifications using existing research figures:

- **100 percent green:** Clean energy
- **0 percent green:** Oil and gas, petrochemicals, pipelines, coal power
- **17 percent green:** Real estate
- **13 percent green:** Food and beverages, paper and forest products, agriculture
- **10 percent green:** Infrastructure and transport

Aggregate

The results are aggregated per industry and the country of the borrower.

Compare

Supply has not been compared with demand yet, due to the topic's complexity.

Results:

82 percent of all syndicated loans in 2014 financed projects in sectors with some green activities.	Considering the dollar value of all loans in 2014, almost **15 percent** was green financing.	Of all lending to projects with some green share, **41 percent** of loans were for green real estate and **21 percent** for infrastructure and transport (potentially because other industries use less project finance through loans).	The United States has the largest share, with **35 percent** of the total amount, followed by the United Kingdom with **8 percent.** China and India have the biggest share among emerging markets, both with **4 percent.**

Bonds:
Green bond labels allow for consistent tracking, but improvements are needed

- The Green Bond Principles[b] allow for consistent tracking across markets, datasets, and geographies
- The size of the global bond market has been estimated as a total of $90 trillion, with $694 billion climate-aligned bonds, of which $118 billion are labeled as green bonds (17 percent)

Institutional investors:
While awareness seems to be widespread, implementation is weak

- Despite many investor initiatives, a lack of clear definitions limits the actual application and tracking of environmental, social, and governance investing criteria (ESG)
- 1,072 investors currently report on their ESG investment activities to the Principles for Responsible Investment (PRI)
- Very few integrate ESG criteria into fundamental decision making

[b]The Green Bond Principles are voluntary guidelines that recommend transparency and disclosure in the green bond market, and promote integrity by clarifying the approach for issuance of a green bond. http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/

CONCLUSIONS AND RECOMMENDATIONS

The development and tracking of green finance activities is gaining momentum. However, current data availability limits the rigor of the analysis of existing green finance flows. Definitions and tracking are most advanced in the bond market and could serve as an example for other areas. For banking, loan tracking processes need to be improved and institutional investors need to implement clear decision-making criteria. To get a full picture of green finance, we need to track "green" at the level of each project. Cooperation between market players on the following action points is crucial:

	Multinational organizations	National regulators	Private financial sector	Data providers and standard setters
Short term	• Analyze clients' demand for green finance • Convene efforts at national and international levels to establish green finance typologies and standards consistent with policy targets	• Understand market players' current practice of green finance tracking • Understand and articulate national needs for green finance • Promote transparency and consistency in financial datasets	• Improve application of use-of-proceed classifications, where already used, for better identification of project purpose • Integrate existing ESG criteria into investing decisions	• Increase awareness of the need to integrate green finance into existing datasets • Engage with peers to set a consistent green finance typology, and harmonize unique company identifiers and industry classifications
Medium term	• Pilot analysis comparing supply and demand for selected countries with clear policy plans • Implement recommendations emerging from international groups to put in place green finance typologies and standards • Link bottom-up approach on green finance with top-down research	• Develop new regulations for banking, bonds, and institutional investors • Build on lessons learned from peers, such as China's green banking regulations and Nigeria's sustainable banking principles	• Build on the green bonds experience: Develop clear definitions/tracking mechanisms per financial instrument • Integrate data on green revenue share per company into decision making	• Advocate for better data on green activities at company level, by building green revenue share data into corporate reporting procedures, for example • Develop new services for clients supplying or demanding green finance data

Introduction

The transition to a sustainable, carbon-neutral global economy requires change across the financial sector, based on two pillars:

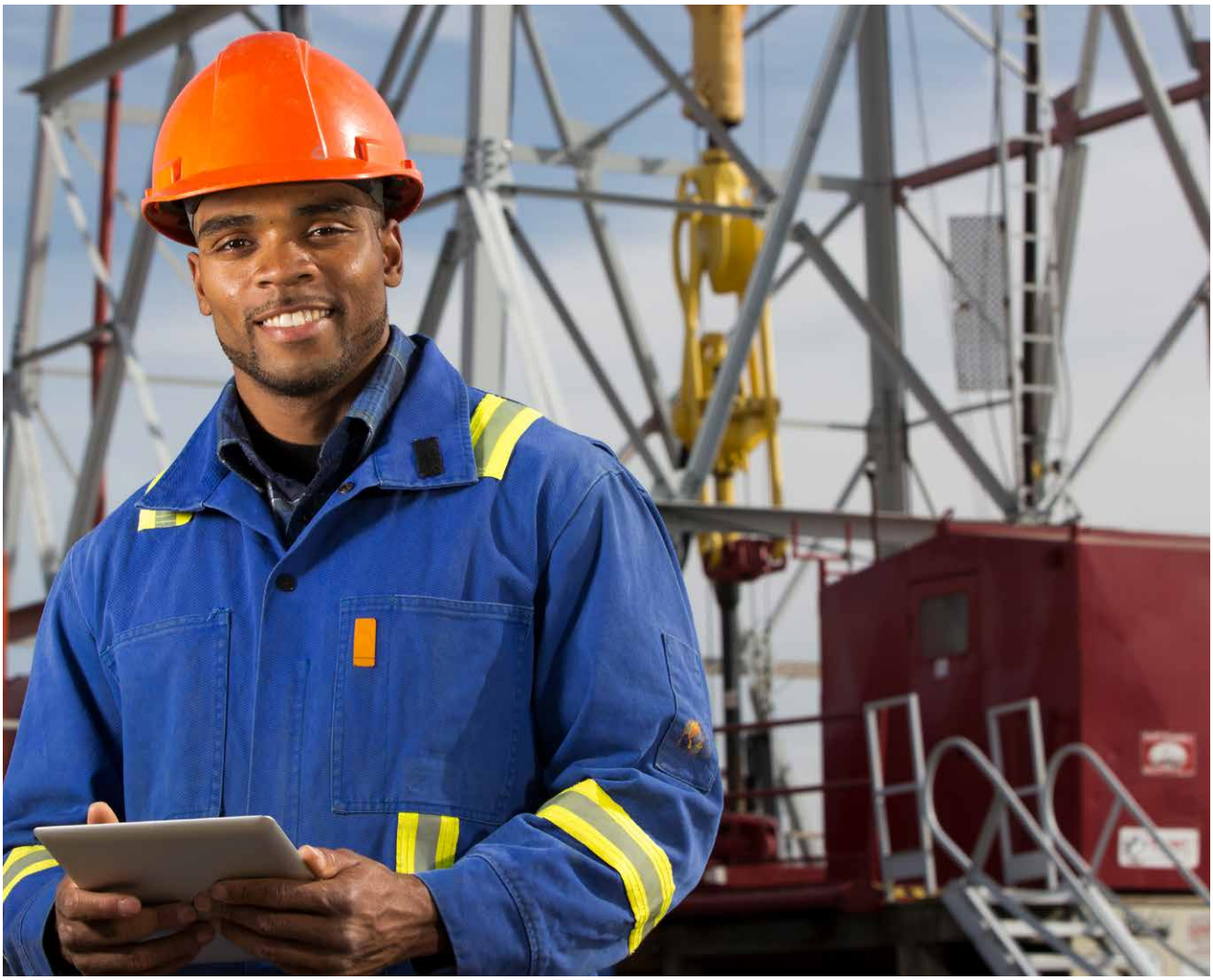
- Acknowledgment and transparency of finance flows that deliver environmental benefits
- Empowerment of financial actors championing investments in projects or companies that deliver environmental benefits and support sustainable development.

Momentum around the role of the financial sector in supporting sustainable development and addressing climate change has been generated by the G20, and further strengthened by the Financial Stability Board and the Paris Agreement and the associated nationally determined contributions. Similarly, 479 global investors, alongside companies, cities, subnational authorities, regions, and civil society organizations, have pledged their commitment to climate action through the global platform NAZCA (Non-State Actor Zone for Climate Action).[1] While some progress has been made in green finance, only a small percentage of bank lending is explicitly classified as green according to countries' own definitions. In the current landscape of limited metrics and transparency, less than 1 percent of global bonds are labeled green and less than 1 percent of global institutional investors' holdings are classified as green infrastructure assets.[2] These financial flows must increase substantially to meet the massive investment financing needs associated with global development and climate targets.

As countries begin to implement their green growth plans and nationally determined contributions on climate change, the ability to compare the current supply of private sector green finance with investment needs globally and per country would help identify gaps and what needs to be done to close them. However, there is no systematic approach to assessing progress on these challenges in the global financial system. For example, while there are estimates for some countries on the proportion of banking assets that are green (10 percent in China), there is no clear global approximation available of stocks or flows. To be able to address gaps and sequence appropriate interventions, it is important to have a solid understanding and dataset on practices, policies, and monitoring approaches.

The G20 Green Finance Study Group, established in early 2016 under the Chinese G20 presidency, focused on identifying and addressing the institutional and market barriers to scaling up green finance. Its findings, published in June 2016, revealed a lack of consistency in market terms and standards of green finance. While there is broad consensus on the sectors that can provide opportunities for green finance, the tracking of such financial flows is inconsistent or nonexistent. Improving ways of measuring progress across the financial system, and not just in specific silos, is critical. A better understanding of the current supply of green finance will provide policy makers, regulators, international institutions, development banks, and the private sector with insights into the location and type of additional incentives needed to increase green finance.

This report focuses on the Green Finance Study Group's suggestion to improve the indicators for measuring green finance activities and their impact. Building on a review of existing guidelines and definitions, it develops



a bottom-up methodology to estimate green finance flows. Based on available data, it then applies this approach to the banking sector. Its findings for the banking sector, the bond market, and institutional investors provide insights into the most effective methods of tracking green finance currently available. The report provides recommendations for different stakeholders, including financial institutions, data providers, standard setters, international organizations, and governments, on how to improve green finance indicators.

The first section of the report provides the rationale for tracking green finance, delving into the background and context for this work, and briefly reviewing existing definitions of green finance, the actors involved, and their approaches. Section 2 focuses on the banking sector, using a four-step methodology (*define, estimate, aggregate*, and *compare*) to assess the supply of green finance. The application of this approach to the syndicated loans market yields some initial results and highlights challenges. While the quantification of demand for green finance is considered in this document, it is not the main focus of the report's analysis. The third section summarizes current knowledge of green finance in the context of the bond market and institutional investors, followed by a conclusion and recommendations for next steps for different stakeholder groups in the short and medium term. The Annexes

Section 1: Context and Objectives

BACKGROUND AND RATIONALE

The G20 Green Finance Study Group aims to identify institutional and market barriers to green finance, and, based on the experiences of countries, develop ways to enhance the ability of the financial system to mobilize private capital for green investment. The group defines green finance as the financing of investments that provide environmental benefits[c] in the broader context of sustainable development. It published its initial findings in a synthesis report, which focused on banking, the bond market, and institutional investors, as well as two crosscutting topics: risk analysis and measuring progress.[3] The group made the following recommendations:

- Provide strategic policy signals and frameworks
- Promote voluntary principles for green finance
- Expand learning networks for capacity building
- Support the development of local green bond markets
- Promote international collaboration to facilitate cross-border investment in green bonds
- Develop a forum to facilitate knowledge sharing on environmental and financial risk
- Improve the definitions for measuring green finance activities and their impact.

[c]These environmental benefits include, for example, reductions in air, water, and land pollution; improved energy efficiency; and mitigation of and adaption to climate change. Green finance involves efforts to internalize externalities and adjust risk tolerance in order to boost environmentally friendly investments and reduce environmentally damaging ones.

While there is huge potential for scaling up green finance, there are also several challenges for financiers, ranging from difficulties in accounting for environmental externalities in financial decision making, to maturity mismatches for long-term projects as many investors seek short-term returns, and information asymmetries caused by a lack of consistency in market terms and standards. Information asymmetries in particular lead to inadequate analysis as a result of inaccuracies in measuring current green finance flows and their impact.

This report focuses on the final recommendation and builds on the World Bank Group's input paper to the G20 Green Finance Study Group on measuring progress on green finance.[4] The paper suggests that the greening of the global financial system will rely strongly on indicators that track the connectivity and permeability of the whole financial system. These indicators will enable the measurement of the transparency, efficacy, resilience, and efficiency of greening efforts, which in turn will help mobilize finance for green activities, as well as mainstream financial risk management related to ESG issues. According to a survey conducted by the World Bank Group among public and private financial institutions, their definition of green finance is broadly consistent, but the tracking of it is still sporadic and diverse in approach.

This paper reviews a limited number of existing guidelines and definitions, and builds on that analysis to outline an approach on how to measure green finance flows with available data.

APPROXIMATING GREEN FINANCE FLOWS THROUGH PRIVATE FINANCIAL INSTITUTIONS

Financial markets have tremendous power to shift developments in the real economy through their investment decisions. Given the global need for an urgent transition to a low-carbon economy and sustainable economic development, financial markets play an integral role in driving investments in climate-friendly and green projects.

Greening the financial system goes beyond lending and investment standards—it considers the impact of both environmental and social risks on the financial system, and the impact of the financial system on environmental and social risks. As private financial institutions are tied to all economic sectors through their lending and investment practices, they need to recognize their relationship with sustainability. Investments are directly or indirectly affected by climate change and the negative environmental effects of industrial processing (such as air, water, and land pollution), and should account for these in their risk assessments.[5] At the same time, financial instruments can leverage sustainable growth, enabling investments in energy efficiency, renewable energy, clean technology, and smart solutions for waste and water treatment, particularly in the transport and infrastructure sectors. Furthermore, several studies indicate that in most cases there is a positive correlation between investments managed according to sustainability criteria and their financial performance.[6]

Consistently and coherently measuring and tracking green finance will improve our understanding of the effectiveness of policies and incentives being developed to drive green finance, and provide insights into where additional incentives are needed. Many financial institutions do not yet offer robust products promoting green investments, and for those that do, labeled products differ in their definition of green.

Achieving the Sustainable Development Goals and bringing Article 2.1c of the Paris Agreement to life—aligning financial flows with climate targets—requires not only the efforts of financial institutions themselves, but also the engagement of standard setters, international organizations, and data providers.

DEFINITIONS OF GREEN FINANCE

The World Bank Group's recent analysis on measuring green finance identifies current initiatives that include green finance tracking, and reviews plans for defining and measuring green finance mobilization and ESG risk management integration.[7] The analysis was informed by a survey across financial institutions on the sectors/activities they include in their definition of green finance. The following broad categories were among those prioritized by the respondents:

- Adaptation (conservation, biosystem adaptation)
- Carbon capture and storage
- Energy efficiency (cogeneration, smart grid)
- Environmental protection (pollution control, prevention, and treatment)
- Green buildings
- Green products and materials
- Renewable energy (solar, wind, hydro)
- Sustainable land management, (sustainable agriculture, forestry)
- Transport (urban rail/metro, electric, hybrid)
- Waste management (recycling, waste management)
- Water (water efficiency, wastewater treatment).

Based on that survey, the report concludes that green finance definitions feature many similarities, including obvious sectors such as renewable energy and green buildings, as well as differences regarding specific sectors such as nuclear power, noise abatement, and carbon capture and storage, reflecting the country-specific nature

of definitions. Data is captured at various levels, mostly through capital markets, financial sector associations, and private banks in compliance with existing regulations and practices. The information being tracked is primarily the financial instrument used, the user itself, and any relevant impact indicators such as greenhouse gas emission reductions, the number of jobs created, air and water quality, energy savings in gigawatt hours, ESG indicators and their materiality, and so on. There appears to be little information on the actual amounts of the share of green investments being monitored and collected.

Financial institutions, governments, and international organizations tend to define green finance according to their underlying motivations (see Table 1). Financial institutions established their own green criteria for sustainability indices, banking associations defined guidelines for green lending and bonds, and international initiatives did so for sustainable investing. Standard setters and regulatory bodies established voluntary or mandatory directives and requirements on nonfinancial aspects of finance. The underlying criteria for a project's eligibility for green finance are not always publicly available.

While these different definitions focus on the underlying financed activity, there is little evidence of how such data is then tracked on a broader scale. In many cases, the institution either does not intend to track green finance flows or stocks in the first place, or the complexity of the topic hinders any measurement attempts. In addition, a broad assessment requires widely applied green finance definitions (for example, out of 1,553 PRI members, only 342 report details on how they integrate ESG data in their investment approaches).[8] As most definitions are narrowly used by specific groups of companies, investors, or other market players, they are usually not available in existing datasets offered by financial data providers for large-scale analysis. China is, to date, the only country to have introduced standardized mandatory

Table 1: A selection of different actors and their approaches to definitions and measuring green finance

Actor	Example	Approach	Motivation
Financial institutions	Index providers: FTSE4Good Index Series,[9] Dow Jones Sustainability Index[10] Stock exchanges: Johannesburg Stock Exchange Socially Responsible Investment Index[11]	**FTSE4Good** and **Dow Jones Sustainability Index:** Companies demonstrating strong ESG practices based on a best-in-class approach defined internally (not publicly available) **Johannesburg Stock Exchange:** Socially Responsible Investment Index for South African companies with green criteria including climate change, air and water pollution, waste, and water consumption	Measure the financial performance of ESG leaders and highlight companies demonstrating strong ESG practices
Banking associations	Sustainable Banking Network,[12] Institute of International Finance[13]	**Sustainable Banking Network:** Knowledge sharing and the development of regulatory guidance **Institute of International Finance:** The Green Finance Working Group has recently been established, and focuses on developing a common vocabulary for green finance	Encourage local banks to adopt sustainable banking practices

(*continued*)

Table 1: *Continued*

Actor	Example	Approach	Motivation
International initiatives/ reporting frameworks	PRI,[14] Principles for Sustainable Insurance,[15] Carbon Disclosure Project (CDP)[16]	**PRI:** Largest global reporting project on responsible investment. Signatories sign up to six principles, and annually report on progress and receive feedback **Principles for Sustainable Insurance:** Global framework for the insurance industry to address ESG risks and opportunities (no reporting) **CDP:** Largest reporting framework for companies on climate, water, and forest-related activities and externalities, providing scores and data to institutional investors	Better understand, prevent and reduce ESG risks, and better manage and leverage opportunities; promote knowledge sharing and improvements through transparency
Standard setters	Sustainable Accounting Standards Board,[17] International Integrated Reporting Council,[18] Climate Disclosure Standards Board,[19] IFC Performance Standards,[20] Equator Principles[21]	**Sustainable Accounting Standards Board:** Disclosure guidance and accounting standards on sustainability topics for use by the United States and foreign public companies in their annual filings **International Integrated Reporting Council:** Corporate reporting framework with a focus on conciseness, strategic relevance, and future orientation, including ESG, into mainstream financial reports **Climate Disclosure Standards Board:** Framework and guidance for reporting environmental information and natural capital in mainstream financial reports **IFC Performance Standards:** Eight standards around environmental and social sustainability that the client is to meet throughout the life of an IFC investment **Equator Principles:** Risk management framework for projects, adopted by financial institutions, for determining, assessing, and managing environmental and social risk	Mainstream accounting for environmental externalities and provide a holistic view on businesses' value creation by improving the availability of such data

Actor	Example	Approach	Motivation
Regulatory bodies	Bangladesh,[22] China Banking Regulatory Commission,[23] EU Directive,[24] France,[25] Nigeria[26]	**Bangladesh:** • Environmental risk management guidelines, policy guidelines for green banking • Banks develop their own green banking policy that introduces green finance, and report on website and to supervision body (no defined format) **China:**[27] • Clear performance indicators to strengthen and monitor green banking, with 12 concrete categories and guidelines to track green lending products and services • For the 21 largest banks, it is mandatory to regularly report on their green loans according to set categories • China Banking Regulatory Commission Green Credit Statistics: general numbers (seldom details) are published annually (~10 percent green loans) **EU:** • Large companies have to report on their environmental matters, company policies, risks, and their management thereof (Directive 2013/34/EU) • European organizations can apply to EU LIFE grants, supporting environmental, nature conservation, and climate action projects[28] **France:** • Institutional investors have to disclose climate-related risks, climate risk management, and contributions to the energy transition (Article 173)	Enhance understanding of green finance, improve data quality, and increase green finance investments

(*continued*)

Table 1: *Continued*

Actor	Example	Approach	Motivation
		Nigeria: • Sustainable banking guidelines were adopted in 2012, covering nine principles, including the implementation of robust and transparent ESG practices. Banks report annually on the percentage of their total portfolio screened/assessed for environmental and social risk, and the number of client engagements on environmental and social issues that result in positive outcomes for the client and the bank[29] • Sector guidelines already exist for agriculture, oil and gas, and power, and are under development for mining, and manufacturing	
International organizations	United Nations (UN) Framework Convention for Climate Change,[30] Organisation for Economic Co-operation & Development (OECD),[31] International Development Finance Club,[32] multilateral development banks[33]	**UN Framework Convention for Climate Change:** The Green Climate Fund finances projects that contribute to low-emissions sustainable development and increase climate-resilient sustainable development **OECD:** Formalized its work on green finance by launching the OECD Centre for Green Finance and Investments, focusing its research on the rapid scaling up of green investment and finance flows, and related policy needs **International Development Finance Club:** Members agreed on a list of categories for green finance covering climate mitigation and adaptation, and other environmental objectives **Multilateral development banks**: Jointly report on climate finance on an annual basis (no green finance tracking as yet)	Develop approaches to tracking green finance that can be replicated by other actors

reporting on green loans for its largest banks. Lessons learned from this regulation's implementation could serve as an example for other regulators.

A range of institutions and initiatives have started working on new bottom-up tracking approaches. While there are no designated higher authorities tracking the application of green finance criteria in actual financial decision making, many institutions and initiatives are making progress in integrating climate and green measures into the assessment of financial products. Table 2 provides an overview of such initiatives. They are grouped into those developing bottom-up tracking and reporting mechanisms for different actors (companies, asset owners, banks, and portfolio and fund managers) and those that aim to combine bottom-up data with top-down information on policy targets for different sectors.

Table 2: Current initiatives developing new bottom-up tracking approaches for climate or green finance

New bottom-up tracking approaches

Organization/initiative	New tracking approaches
FTSE LCE ICS green revenue model[34]	Assigns each company a revenue share for: • Goods, products, and services that enable society to adapt to, mitigate, or remediate the impact of climate change, resource depletion, and environmental erosion (according to 60 chosen subsectors) • Available for >13,000 companies
Financial Stability Board Task Force on Climate-related Financial Disclosures[35]	The task force, established in 2015, consists of representatives from the private sector. It focuses on company disclosure: • Aims to develop voluntary, consistent climate-related financial risk disclosures for use by companies providing information to shareholders (climate risk typology) • Builds on existing corporate reporting frameworks mentioned in Table 1. • Plans to suggest which businesses will be required to report
Portfolio Carbon Initiative (World Resources Institute, UN Environment Programme Finance Initiative)[36]	Climate metrics for asset owners and banks to disclose: • Carbon emissions of financed projects • Green vs. brown (carbon intensive) indicators for investments/lending • Carbon risk for asset owners and banks
Portfolio Decarbonization Coalition (CDP, UN Environment Programme Finance Initiative)[37]	Pledge by investors, including working groups, to: • Commit to measures and disclose portfolio carbon footprint (according to the Montreal Pledge) • Take action to decarbonize portfolios
Climpax (CDP, South Pole Group)[38]	Ratings developed for fund managers: • Ranks portfolios according to their climate impact • Creates transparency about the climate impact across funds • Enables fund investors to take strong climate action (engage/divest)

(*continued*)

Table 2: *Continued*

New bottom-up tracking approaches

Organization/initiative	New tracking approaches
UN Environment Programme[39]	Green tagging for energy efficiency to scale up green finance: • Tag each loan to the underlying asset's energy performance, fuel efficiency, or existing environmental standards (for example, for buildings or white goods such as refrigerators and washing machines) • This would add transparency and allow the packaging of energy-efficient loans as asset-backed securities into green bonds • It could provide a basis for comparing financial performance of different loans
World Energy Investment Review by International Energy Agency[40]	Detailed, comprehensive analysis of investment across the global energy system: • New annual report since 2015 • Current investment landscape across fuels, technologies, and countries
Bloomberg New Energy Finance, New Energy Outlook[41]	Annual long-term view of how the world's power markets will evolve in the future: • Focused on the electricity system • Combines the expertise of over 65 country and technology specialists in 11 countries

New tracking approaches combining bottom-up data with top-down information

Organization/initiative	New tracking approaches
2 Degrees Investing Initiative (2DII): Sustainable Energy Investment Metrics Project[42]	Develop a portfolio optimization tool to measure the exposure to any energy transition scenario for investors (assessing sustainability and policy-related risks in assets): • For listed equity and corporate bonds • Per asset class, region, and technology
2DII: Transition Capital Monitor[43]	Aims to develop a global database to align policy targets with actual economic developments, including: • Metrics at the physical asset level to capture the exposure to green/brown finance per sector and financial instrument • Information on ownership of assets and securities, as well as policy targets

Broadly speaking, these bottom-up tracking approaches are all led by industry participants themselves or by non-profit or research organizations, rather than by regulatory bodies. Many of them build on existing definitions and corporate reporting initiatives (as shown in Table 1), and interpret the available data in a meaningful way for financial market participants. Once these tracking approaches have been developed further, regulators may choose to apply them to reporting requirements for financial market participants themselves in order to consistently measure green finance based on the underlying assets. Where possible, new regulations should build on existing standards and approaches. For example, in France, where institutional investors have had to report on the climate exposure of their portfolios since 2015, there are no requirements as yet on how investors should do that—potentially due to a lack of knowledge or agreement on an approach.

Top-down approaches usually attempt to measure the investment needed for sustainable development for different sectors or countries, with none focusing solely on green finance. Organizations such as the Food and Agriculture Organization, the World Health Organization, the International Energy Agency, G20, and the International Panel on Climate Change have published estimates on the total investment amounts required to reach certain Sustainable Development Goals,[44] and other research exists for specific sectors (for example, a McKinsey study on sustainable infrastructure).[45] Top-down information can also be provided by regulators announcing specific country or sector targets, including an estimate on the status quo based on extrapolations (using renewable energy targets and the current share of electricity supply, for example).

There has been little progress in bridging the gap between top-down and bottom-up approaches. However, there are two initiatives listed in Table 2 that show promise in this regard: the Sustainable Energy Investment Metrics Project, which is trying to factor policy targets into the assessment of financial risk exposure of portfolios, and

2DII, which is attempting to combine information on physical assets held and their owners with current policy targets. These projects will shed light on the effect policy targets may have on financial markets' behavior, and clarify where the stocks of currently financed physical assets are still removed from green policy goals.

The following section develops an approach to tracking green finance in the banking sector that uses both bottom-up financial data and broader sectoral data to identify the existing shares of green lending. This approach aims to overcome some of the challenges in applying existing green finance definitions to larger financial datasets. It suggests how existing indicators in financial datasets can be combined with some of the definitions mentioned in Table 1, and thereby contributes to the development of a new model (see Table 2). It also proposes a practical approach to estimating the green finance share of an economic activity in a particular sector. The analysis informs recommendations on how to better integrate green measures into existing financial data.

Section 2: Tracking Green Finance in the Banking Sector

METHODOLOGY FOR TRACKING GREEN FINANCE FLOWS

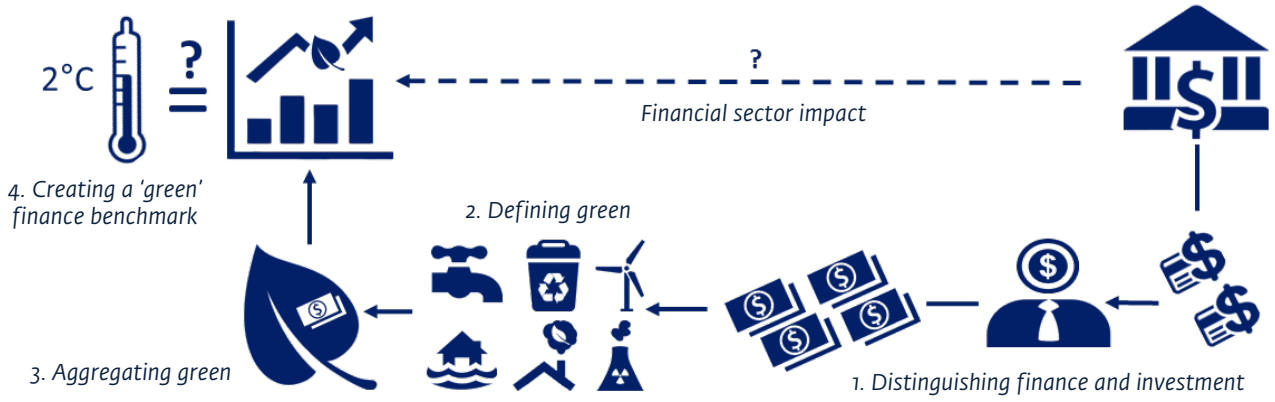
The following bottom-up approach is an initial attempt to map green financial flows in the context of the existing demand for green finance.

First, it defines what is "green" at a project level based on the intended use of each investment, considering the activity that is actually financed in the real economy. To do this, the green share of a project is estimated based on available information about the company or the sector in which it operates. The numbers per industry and at a country level are then aggregated. These results can be compared to green finance needs based on policy targets to identify gaps and action points.

Challenges lie in definitions, data aggregation, and interpretation. Depending on the financial instrument under consideration, pure amounts invested need to be distinguished from the activities that are actually financed in the real economy. In this context, "green activities" need to be defined, often through finding suitable proxies, because definitions are either not available or inconsistently applied. The data needs to be aggregated across sectors and financial instruments, connecting different datasets. And finally, a valid benchmark needs to be applied (the demand for green investment, in this case) to derive a "sufficient" level of green finance. The 2DII has mapped these challenges in Figure 2.[46]

Figure 1: Steps to approximate the amount of green financial flows and put it into perspective

Figure 2: Challenges to measuring green finance



Source: 2DII, Measuring progress for greening financial markets

THE DEMAND FOR GREEN FINANCE

Any figures on the existing supply of green finance need to be put into perspective in terms of the demand for this type of finance. This will enable better decision making. An estimated "sufficient amount of green finance" needs to be established, ideally for each financial instrument, because linking green finance needs with the best suited disbursement channel is important for its success.[47] This estimated demand can be backed by information from countries' national regulations and development plans, national research institutes, and business associations or companies' strategy announcements. Many countries have set general political targets for environmental action, including climate change, and businesses are following with their own pledges, but only a few countries and companies have announced clear targets on how to involve the private sector in achieving the greening of the economy. Estimated green finance needs in the real economy still remain rather abstract, especially when it comes to a breakdown of specific financial instruments.

The OECD published various papers related to the demand for green finance. A 2011 paper summarizes and analyzes some of the existing initiatives to encourage and support pension funds to help finance green growth projects.[48] Another publication from 2015 addresses publicly capitalized green investment banks, examining the reasons why they are being created and how they mobilize investment.[49] In its input paper to the G20 Green Finance Study Group in 2016, the OECD published a quantitative framework for analyzing potential bond contributions to meet low-carbon financing needs on a 2°C compatible emissions pathway.[d] Focusing on China, the European Union, Japan, and the United States, it suggests that the more mature low-carbon technologies become, the more accessible bond markets get, which means they could contribute significantly to new built assets in future.[50]

A study by Bloomberg New Energy Finance and Ceres published in 2016 concludes that to reach the goals of the Paris Agreement, $12.1 trillion will be needed over the next 25 years. This is $5.2 trillion above current business-as-usual projections, or an extra $208 billion a year.[51] IFC analysis published in 2016 estimated that the nationally determined contributions of 21 emerging market countries present an investment opportunity of $23 trillion between 2016 and 2030.[52] Considering the broader context of modeling future investment and finance needs, the Intergovernmental Panel on Climate Change's 5th Assessment Report, published in 2014, included a chapter on estimates for investment and finance needs.[53] The panel also published estimates on the total required amounts of money to achieve the Sustainable Development Goals, as did the Food and Agriculture Organization, the World Health Organization, the International Energy Agency, and G20.[54]

Finally, the 2DII's suggestion of a climate capital monitor provides an interesting outline of how to analyze policy targets and the corresponding financing requirement by linking physical asset-level data with information on ownership of securities (see Table 2). Such work needs further development to achieve a supply-demand comparison that can ultimately provide policy makers and private market participants with meaningful and comparable information.

THE SUPPLY OF GREEN FINANCE BY BANKS

In alignment with the G20 Green Finance Study Group, this report considers banking, bonds, and institutional investors in turn. This section provides an overview of green finance tracking for banks by applying the methodology outlined above. The analysis prioritizes this sector because relatively little work has been done to measure green banking flows to date. The focus is further narrowed to the loan market because loans represent the largest share of banks' activities.[55] The challenges identified in doing this analysis are contextualized and described on the following pages.

[d]Based on the Paris Agreement target of limiting the increase in global average temperatures to below 2°C above preindustrial temperatures.

DEFINE: STOCKTAKING OF AVAILABLE DATA AND DEFINITIONS OF GREEN

To date, a meaningful and comprehensive review of green finance for lending does not exist.[56] Different datasets for the banking sector are accessible via international data providers such as BIS, Bloomberg, Bureau van Dijk, IFC, the International Monetary Fund, and Thomson Reuters. At a country level, aggregated data is available on total loans issued, the share of nonperforming loans, outstanding debt, returns on assets, and so on. At the bank level, information on ownership structures of individual banks, mergers and acquisitions, and total loans is provided. The most relevant datasets for our purpose contain the following data:

- Project-level information, which refers to the use of proceed or physical activity being financed (a wind park, for example), including information about financial amount, time frame, and sometimes explicit details on that activity (production of x tons of steel, for example), and selected impacts (carbon and water footprint, jobs provided, and so on).
- Company-level information regarding the creditor and borrower for each loan, including their sector and location.

Figure 3 shows the different levels of available datasets and their respective financial indicators, as well as data providers offering such information. It maps out how the approximation of green finance needs to happen at project levels, capturing what is effectively financed in the real economy. The categorization into green and conventional finance per project can then be summarized according to the lender's (or borrower's) country of headquarter, and sector. This aggregated data can then be integrated into datasets at country or financial institution level

Figure 3: Data providers for the loan market, their data levels, and indicators

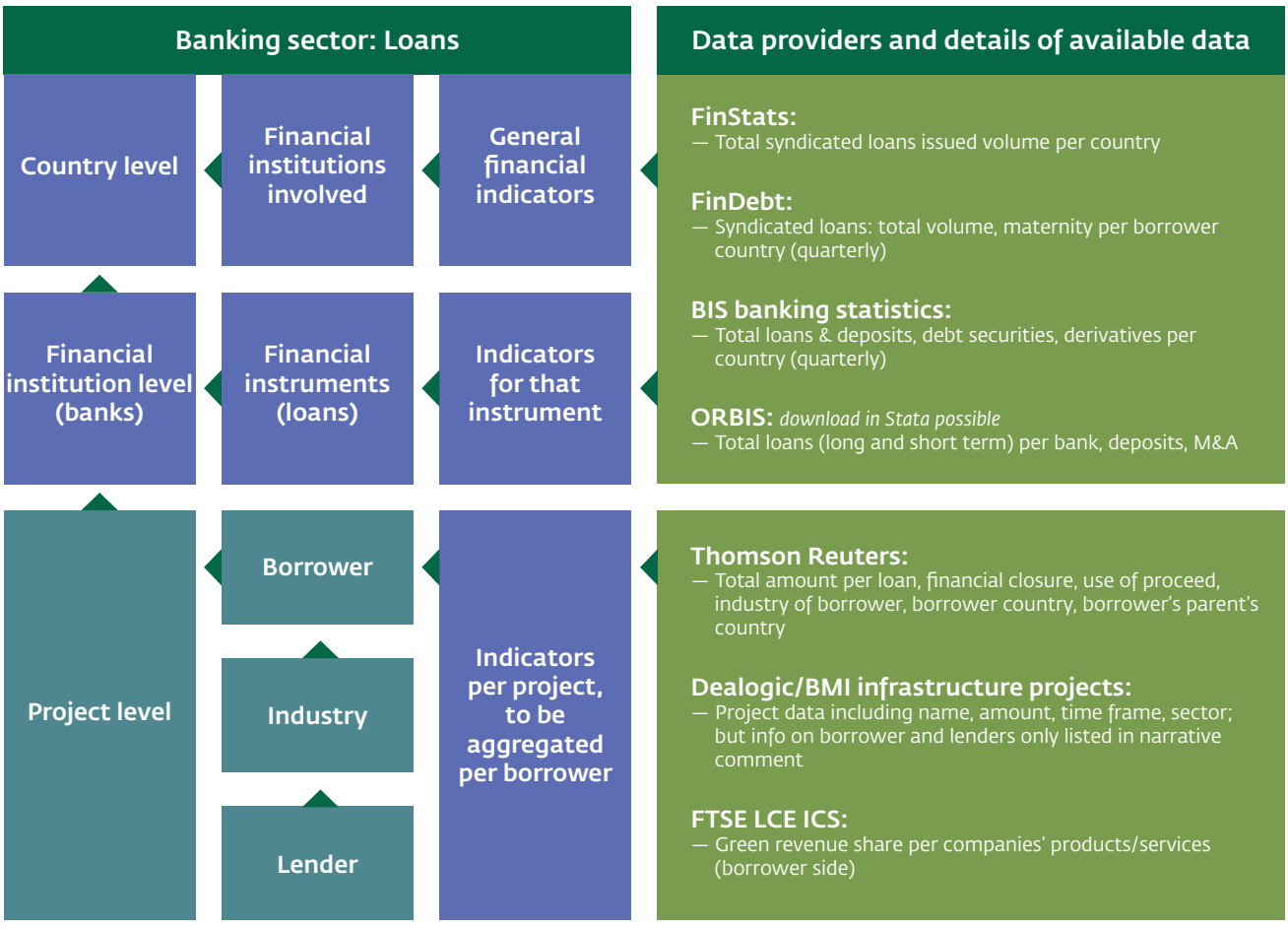


Table 3: Available metrics defining green finance activities and related challenges

Define green:
What data are used and what are the criteria for a green project

Metric	Availability	Data provider	Challenges
Dataset on loans containing project-level data	Private via partnership	Thomson Reuters, Bloomberg	Various datasets exist on loans. However, few provide a global picture with detailed information at a project level
Sectors included in the definition of green finance: • Adaptation • Carbon capture & storage • Energy & energy efficiency • Environment protection • Green buildings • Green products & materials • Renewable energy • Sustainable land management • Transport • Waste management • Water	Public	IFC approach	Different institutions have developed their own criteria to determine whether a project is green. Given the broad consensus on sectors that can be considered green as per the IFC survey, we used the listed sectors as a preselection to then apply estimates per sector where needed The FTSE Russell green revenues model maps companies' revenue against 60 green industrial subsectors.[57] However, this list is not publicly available

to, for example, analyze the performance of (partly) green loans compared to conventional loans issued by financial institutions in a specific country.

As a starting point, this analysis uses the Thomson Reuters data on syndicated loans. We narrow this down to all reported syndicated loans with a financial closure date within the 2014 calendar year.[e] This dataset includes 4,412 loans in total, amounting to $1.1 trillion. Data on non-syndicated loans is not available in a comparable format, including project-level information. Nevertheless, as bilateral loans are usually much smaller in size, the available dataset is still considered as a valuable representation of the loan market.

In addition, we applied the sectors identified as green, through the IFC survey of financial institutions for the G20, to preselect sectors that can be included in the definition of green finance.

BankTrack published an analysis on syndicated loans of 75 selected financial institutions for selected companies engaged in fossil fuels, renewable energy input equipment manufacturers, renewable energy projects, and utility companies from 2004 to 2014. However, as we aim to analyze a broader dataset covering all sectors, we do not directly use their data.[58]

[e]The financial closure date is defined as when the credit agreement/facility is funded and available for withdrawal.

Table 4: Applied use-of-proceed categories in the Thomson Reuters dataset

Category	Sublevel	Category	Sublevel
Acquisition related	Acquisition financing	Other	Other
Acquisition related	Future acquisitions	Other	Restructuring
Acquisition related	Infrastructure leveraged buyout	Other	Working capital
Acquisition related	Leveraged buyout	Project finance	Aircraft financing
Acquisition related	Sponsored buyout	Project finance	Project finance
General corporate purposes	General corporate purposes	Project finance	Ship financing
Green bonds	Renewable energy	Project finance	Water infrastructure
Investments	Investment/loan	Real estate	Construction
Other	Capital expenditures	Real estate	Property acquisition
Other	Export/import finance	Refinancing	Refinance bank debt
Other	Finance-linked trade	Refinancing	Refinancing
Other	Operating fund/cash reserve	Security related	Standby/CP support

ESTIMATE: CALCULATING GREEN FINANCE SHARES

For each project, either the entire amount invested can be categorized as green or a certain share must be estimated, depending on the financed activity. There are three ways of estimating the green finance share of a project.

Project level

Whenever a project's use of proceed clearly falls into the green category (such as renewable energy), 100 percent of this loan is considered green. This approach takes into account green projects that are being undertaken by companies whose underlying sectors of operation are not entirely green, such as energy, which can also include fossil-fuel-related investments.

About 2.4 percent of all loans under consideration are classified as financing for renewable energy projects and are identified as 100 percent green. Comparing this with Bloomberg loan data indicates that the numbers can be considered reliable. According to Bloomberg loan data, 2.0 percent are green bonds/loans.[f]

Unfortunately, out of the 127 use-of-proceed sublevel classifications available (amounting to 11 main categories), only 24 are actually applied (listed in Table 4).[g] Moreover, most of them do not provide any indication of the environmental benefits associated with the project, but instead use broad labels such as project finance.

The UN Environment Programme's suggestion (see Table 2) of tagging loans that finance energy-efficient projects to increase transparency on green finance could be combined with the application of use-of-proceed classifications. Where a product or service is delivered that already complies with an established efficiency standard (for example, buildings or white products such as air conditioning and refrigerators), this could be classified accordingly.

[f] Retrieved from Bloomberg terminal on August 13, 2016.
[g] A full list of all available use of proceeds can be found in the annex.

Table 5: Challenges using project-level information (use of proceed) when estimating green loans

Estimate green:
Project-level information

Metric	Availability	Data provider	Challenges
Use-of-proceed classification per project to tag green loans	Allows for most detailed allocation of green investment per project, but only some can be attributed to green finance	Thomson Reuters, Bloomberg	Only a fraction of the available use-of-proceed classifications is used. Even obvious classifications such as renewable energy are not always applied. With a more thorough and consistent classification of the intended use of each investment, this data would be much more valuable An ideal scenario would be the establishment of an additional sublevel, indicating or tagging green (or not) per use of proceed A challenge remains for general purpose bonds and corporate loans. Not limited to green finance, lenders and bond buyers are often less interested in the use of proceeds as long as creditworthiness is ensured

Table 5 summarizes the challenges with project-level information when estimating green loans.

As we cannot rely solely on the use-of-proceed classification to define what is green at a project level, we have to find estimates for the share of green projects in the borrowing companies' industries.

Sector level

For projects in sectors that are considered only partly green, approximations can be derived from existing research. These estimates can be applied to define the green share per sector. For example, the share of green buildings in the real estate sector, the share of electric vehicles in the auto manufacturing sector, the share of renewables in the power/electricity sector, and so on. Such estimates can be found through industry associations, certifying organizations, and international research and analysis.

Table 6 provides an overview of the different metrics available to classify borrowing companies into industries, and then define if and to what extent their activities can be considered green. The more granular the classification, the better the definition for green will be.

Company level

If information on the project and sector is not insightful, a more accurate green estimate could be derived from the activities of the borrowing company itself. A company's share of green investments, projects, products, and services can be estimated using the different sources outlined in Table 7.

Table 6: Available metrics for borrower's sector-level information and related challenges

Estimate green:
Sector-level information

Metric	Availability	Data provider	Challenges
Global Industry Classification Standard,[59] Industry Classification Benchmark[60]	Only for listed companies (used at stock markets) Less granularity/number of subsectors (>100)	Bloomberg	No industry classification is used consistently across different datasets. The International Standard Industrial Classification is referenced in every Securities and Exchange Commission filing, but it is quite antiquated. For example, PayPal falls under the category of "other." The North American Industry Classification System is more up to date (with e-commerce as an industry) but its granularity might be too detailed to apply to green estimates. Thomson Reuters offers financial macro and mid codes, which combine the International Standard Industrial Classification and the North American Industry Classification System
International Standard Industrial Classification,[61] North American Industry Classification System,[62] European classification,[63] Australian and New Zealand Standard Industrial Classification[64]	Available for a broader range of companies. Sometimes a company is classified into several categories according to revenue share (used by financial and ESG data providers to segment companies into industries or activities) More granularity (>1,000)	Thomson Reuters (International Standard Industrial Classification and North American Industry Classification System of borrower and parent company, Thomson Reuters' own aggregation of those)	

Table 7: Available metrics for estimating the green share of loans using company-level information and related challenges

Estimate green:
Company-level information

Metric	Availability	Data provider	Challenges
FTSE LCE ICS green revenues model[65] (green revenue share per company)	Indicates the portion of corporate activities in green sectors according to their own methodology, covering 13,400 listed companies	FTSE Russell	Only available for listed companies and data access might be costly

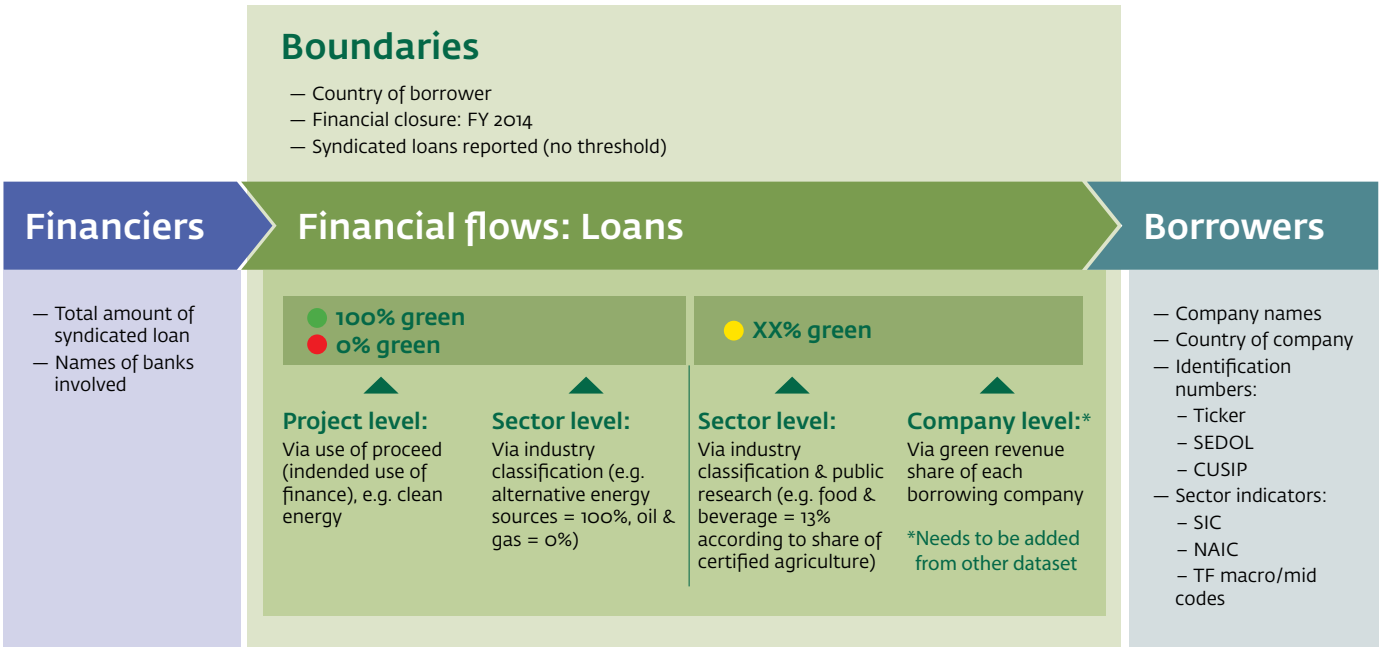
(*continued*)

Table 7: *Continued*

Estimate green:
Company-level information

Metric	Availability	Data provider	Challenges
MSCI ESG research[66] (carbon and clean-tech tools)	MSCI ESG carbon metrics and clean tech metrics provide investors with data on carbon reserves and emissions, low-carbon indexes and clean-tech involvement, covering about 8,500 companies	MSCI	Only available for listed companies, still relatively small coverage, data access might be costly
Individual announcements in annual statements	If not available from the FTSE LCE data, a portion of corporate activities in green sectors can be estimated using publicly available data	Companies' annual financial statements, websites	Information is not available in a standardized way and may require manual research. Its application is questionable on a larger scale
Inclusion in sustainability rankings	Rankings usually look at indicators such as risk management practices, sustainability targets (reduction in carbon emissions, deforestation, water usage), an external verification of environmental data, and so on. It remains to be investigated if rankings estimate the share of green products/services as an underlying indicator Companies responding to CDP provide a data point on percentage of revenue from low-carbon products[67]	CDP Climate A List, CDP Water A List, CDP Forest Leaders;[68] Oekom Research company rating[69] (not public); Global Reporting Initiative: data on who reports[70]	As rankings are mostly relative sector benchmarks, they do not necessarily match the definition of green projects, and might not be useful in this context
Inclusion in sustainability indices	This poses the same questions on selection criteria as with rankings	FTSE4Good Index Series,[71] Dow Jones Sustainability Index[72]	Even if underlying information exists, it is unlikely that index providers will share such granular information

Figure 4: Options to estimate the green share of finance for loans



AGGREGATE: PROJECT, SECTOR, AND COUNTRY DATA

Depending on the data available and the compatibility of datasets, the application of green shares per loan can be aggregated for each country of borrowing companies and their respective sectors, or per financing institution. Table 8 outlines the two options for data aggregation and the corresponding challenges.

Different datasets need to be combined for meaningful analysis of green finance per financial instrument, project location (countries), project operator (companies), and project financier (lending banks, bond issuers, investors). This means that connecting factors must be found across datasets. These factors could be the unique identifiers per financed project (the project ID), the operating company, or the financing institution. In a forthcoming paper, 2DII finds that less than half of climate-relevant asset-level data providers provide financial IDs that are usable across different sources (in other words, classification codes not specific to the data provider).[73]

RESULTS: A FIRST ESTIMATE OF GREEN LOANS SUPPLIED

Based on available information, the methodology outlined above has been applied to the Thomson Reuters dataset in the following way:

Step 1: Stocktaking of available data and definitions

This analysis uses Thomson Reuters loans data with financial closure in calendar year 2014, and has pre-selected green sectors in alignment with the IFC Survey conducted for the G20 Green Finance Study Group (see Table 3).

Step 2: Identifying data and proxies to estimate green finance shares

Due to the inconsistent application of the use-of-proceed classifications, we defined green based on the industry of the borrowing company. We took a proxy for each industry (see Table 6) that can be considered green based on available industry studies (see below). The

Table 8: Options for aggregation of green finance data for banking and related challenges

Aggregate data:
Borrower or financier

Aggregation approach	Challenges
Financing institution	Due to the availability of data, it remains challenging to attribute loans to certain financial institutions and their locations. The amount contributed per bank is often not displayed—only the total amount per syndicated loan and the names of all banks that contribute
Borrowing company	The database on borrowers includes data on their headquarter location. Some inaccuracies remain, because it is unlikely that a company's headquarter country is always the same as the project location
Linking different datasets	• Many different identifiers are used across datasets and geographies, which complicates the linking of different sources of information. For example, Ticker and International Security Identification Numbers are used only for public companies. Committee on Uniform Securities Identification Procedures numbers are mostly used for products issued in the United States and Canada, but cover private companies. Stock Exchange Daily Official List identifiers are assigned to securities by the London Stock Exchange • An upcoming paper by the 2DII finds that less than half of data providers with climate-relevant asset-level data provide usable financial IDs that are not specific to the data provider • Some promising developments are happening regarding open data: The Financial Instrument Global Identifier (Figi) is a 12 character, alphanumeric, randomly generated ID that clearly describes a financial instrument. It acts as a uniform resource identifier that is linked to a set of metadata. Figi, available through the OpenFigi website, also exists for asset classes that do not usually have a global identifier, including loans, futures, and options[74] • Similarly, OpenCorporates provides a URL for every company in the world, covering 110 million companies[75]

identified industries were grouped using Thomson Reuters' own industry classification—Thomson Financial (TF) descriptions—prior to applying our proxies. These classifications have a broad category, TF macro descriptions, and a more detailed level, TF mid descriptions. The TF macro and mid descriptions both combine two widely used industry classification schemes, the broader International Standard Industrial Classification and the more granular North American Industry Classification System.[h] The proxies applied to these groups for the share of green activity per industry are not broken down by country or geographic region due to the limited availability of data. The derived green share is then applied to each loan issued in the respective industry, assuming that, on average, individual non-green and green projects will even out to finally match that proxy.

100 percent green: Clean energy

- Applied to loans with industrial classifications of alternative energy sources, water and waste management, power, and other energy and power. A manual check of the business description of each

[h]For further clarification see Table 6.

loan is conducted to make sure it captures green projects (for example, to rule out projects including coal-powered plants).

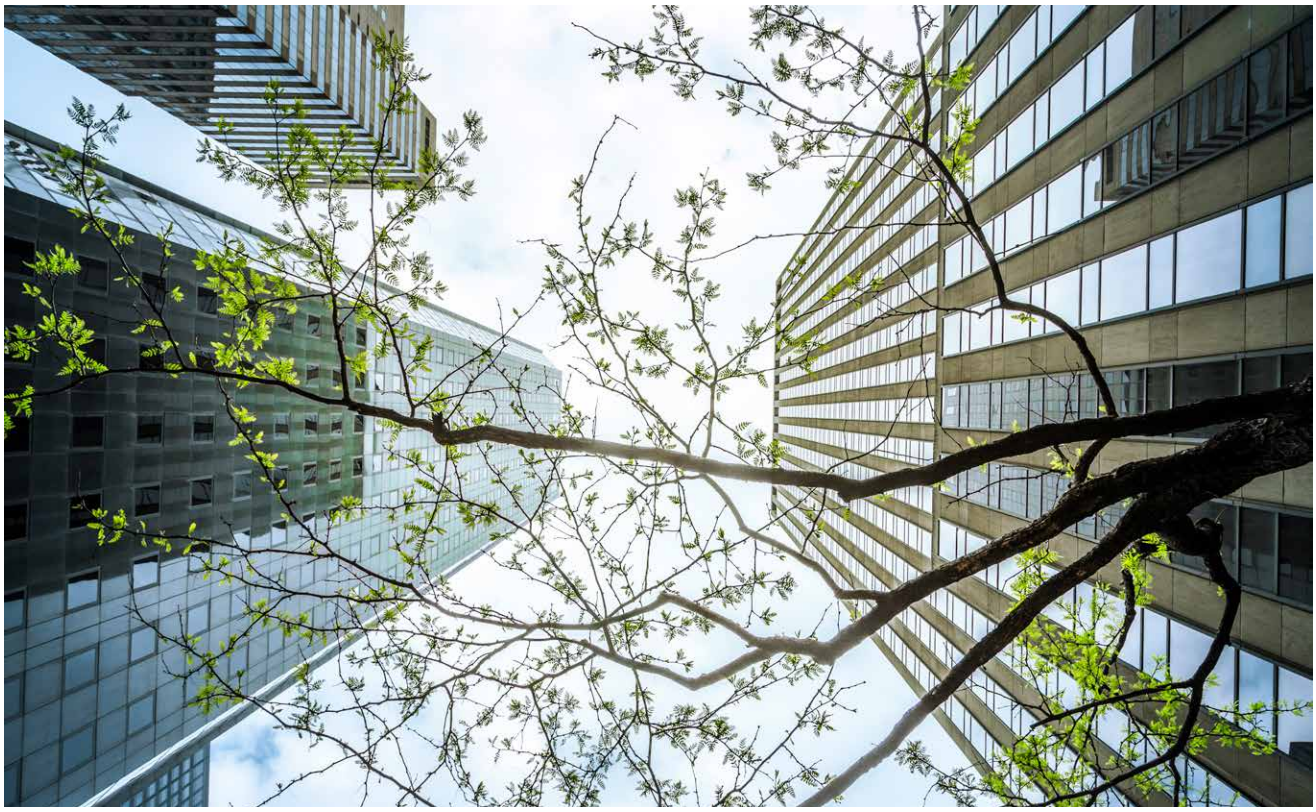
- Similarly, loans with a power industry classification can be further broken down using the business description. Those containing hydro or wind are 100 percent green as well (this category does not contain solar).

0 percent green: Oil and gas, petrochemicals, pipelines, coal power

- Applied to loans with industrial classifications of oil and gas, petrochemicals, and pipelines.
- The business descriptions of these loans were also manually checked to see if hydro or wind are mentioned.

17 percent green: Real estate

- Applied to loans with the industrial classification of real estate.
- According to the most recent World Green Building Trends report by Dodge Data & Analytics, green buildings account for 24 percent of the total share of construction activities among all 1,026 survey participants in 69 countries.[76] However, this estimate might be too high given a likely bias among the participants towards those that already focus on green buildings.
- In the United States, the share of new homes certified with an energy star yields a more realistic picture. Out of all homes completed in 2015, 9.7 percent received an energy star.[77]
- Other regional estimates could be derived, but have not been included here due to limited data availability. The following certification schemes need to be investigated further: Europe's energy performance certificate, China's three-star rating, and the Indian Green Building Council.
- For now, the average of the World Green Building Trends report and the energy star market share in the United States has been taken as a proxy, resulting in a share of 17 percent.



13 percent green: Food and beverages, paper and forest products, agriculture

- Applied to loans with industrial classifications of food and beverages, food and beverage retailing, paper and forest products, and agriculture and livestock.
- It is difficult to set a green share for these industries due to the wide variety of companies' activities, ranging from using certified raw materials such as sugarcane, palm oil, or coffee, to avoiding deforestation and pesticides, to improving working conditions, and using new harvesting techniques to increase yields.
- While 83 percent of 24 global agriculture companies are involved in at least one sustainable agriculture stakeholder group, only 16 percent have corporate procurement policies in place that refer to good agricultural practices for soil management, water management, animal production, health and welfare, working conditions, health and safety, public health, and biodiversity.[78] In 2012, 40 percent of coffee production complied with global standards, as did 22 percent of cocoa production, 15 percent of palm oil production, and 9 percent of forestland.[79] Taking the average of these shares as a rough indicator, the global green share of agriculture can roughly be estimated at 13 percent. However, progress is slow. For example, half of the companies with commitments to source certified soy are yet to use any in their supply chains.[80]

10 percent green: Infrastructure and transport

- Applied to loans with the industrial classification of infrastructure and transportation.
- Several studies exist on this industry, but no clear estimate of a green share for loans could be found. A share of 10 percent has been used as an estimate for now, based on the 2016 Prequin Global Infrastructure Report for institutional investors. This report estimates an aggregated deal value of $349 billion for 661 infrastructure deals completed globally in 2015, out of which 295 have been reported in the renewable energy sector with an aggregate value of $33 billion (9.5 percent). However, the authors estimate a much higher value of $103 billion.[81]
- Fitch Group BMI Research provides general data about the infrastructure sector, but not specifically on green infrastructure investments.[82] Similarly, IJ Global (Infrastructure Journal) published league tables on infrastructure investments per company, sector, and value, but did not identify green projects.[83]
- According to a 2016 McKinsey report, current infrastructure spending of between $2.5 trillion and $3 trillion a year is only half the amount needed to meet the estimated $6 trillion of average annual demand from 2015 to 2030, if we aim for sustainable infrastructure.[84] The study looked at energy, transport, water and waste, and telecommunications, with energy and transport making up two-thirds of the needs. Barriers identified included the lack of transparency of bankable project pipelines and viable funding models, inadequate risk-adjusted returns and unfavorable policies.
- The Institute for Sustainable Infrastructure recently developed a sustainable infrastructure rating system using 60 different criteria, available for a project verification process (Envision). So far, 350 projects are using Envision as a guideline and only five projects completed the verification process. This development may lead to more sophisticated data in the future.[85] The OECD publishes research on each transportation area,[86] and various other organizations promote sustainable infrastructure (such as the Sustainable Shipping Initiative), but data is rarely available.
- Another upcoming initiative is the Global Real Estate Sustainability Benchmark (GRESB), an industry-driven organization committed to assessing the ESG performance of real assets globally, including real estate portfolios and infrastructure assets. The final scoring methodology was in its pilot phase in 2016.[87]
- The Global Infrastructure Basel Foundation is a Swiss foundation working to promote sustainable and resilient infrastructure. Several standards are being developed to assess the sustainability of infrastructure projects around the world and to make the added value accessible for investors.[88]

Step 3: Aggregating green finance data—findings

The application of the sector estimates mentioned above allows for an analysis of the total green share of loans (both as a share of the number of loans issued and their dollar value), in terms of the country and sector of operation of the borrowing companies.

The total number of loans with financial closure in 2014 is 4,412, with a total amount of $1.1 trillion. By applying the estimates for the green share per sector, quite a few of the syndicated loans go to sectors where some green activity is happening. However, the volume of these loans is still very small.

Of the syndicated loans that closed in 2014, 3,610, or 82 percent, financed projects in sectors with some green activities, while the remaining 18 percent financed activities in sectors that cannot be considered green at all (see Figure 5).

Considering the total monetary value of all syndicated loans in 2014, we estimate that almost 15 percent went into green finance. The green share of the volume of all loans is $164.7 billion out of the total $1.1 trillion (see Figure 6).

Figure 7 shows the distribution of partly green loans issued across sectors. The corresponding share of the monetary value of loans attributed to green activities shows that the majority of these finance flows go into clean energy projects, $62.4 billion (38 percent) and green real estate projects, $51 billion (31 percent).

Looking at the distribution of the monetary value of green loans per country (Figure 8), the largest share of

Figure 5: Share of green loans per total loans, displayed per number of loans

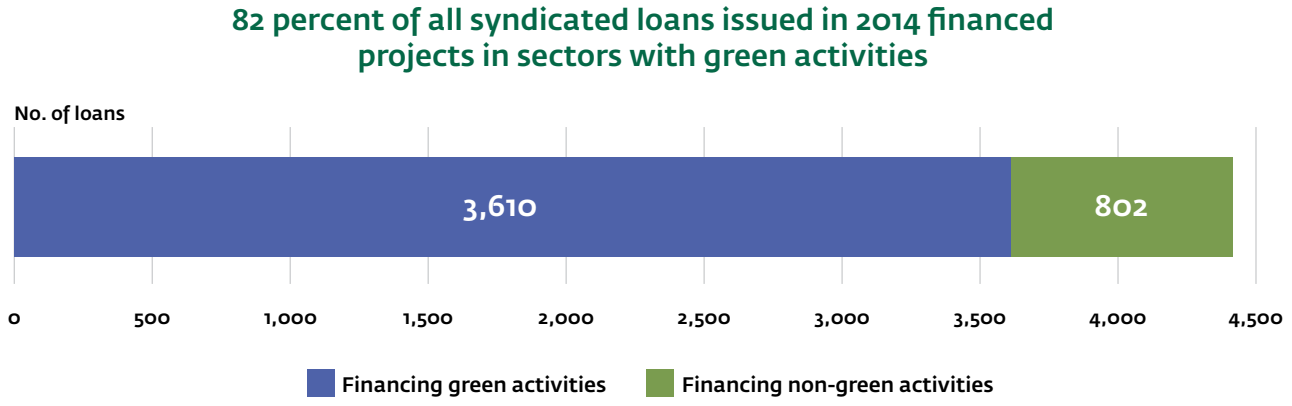


Figure 6: Share of green loans per total loans, displayed per dollar value

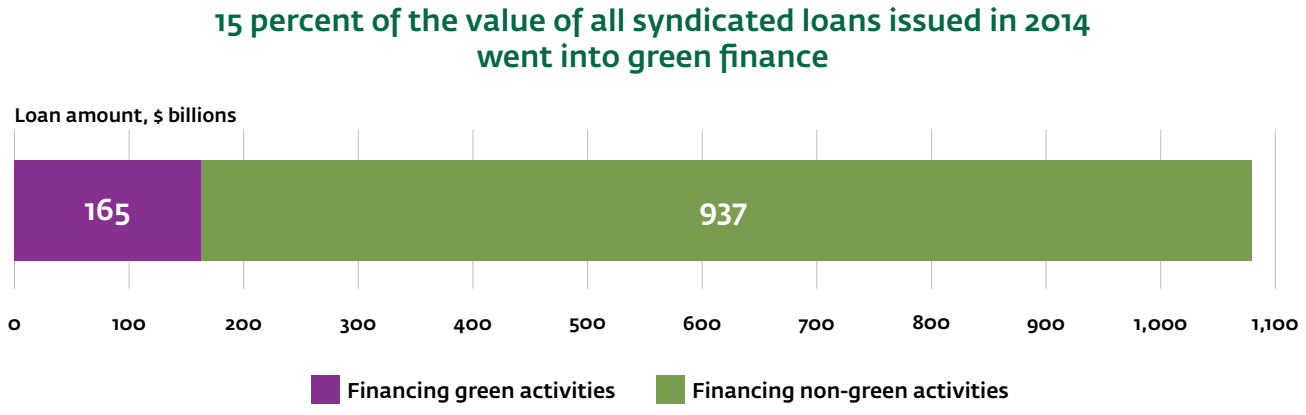


Figure 7: Distribution of green loans across sectors

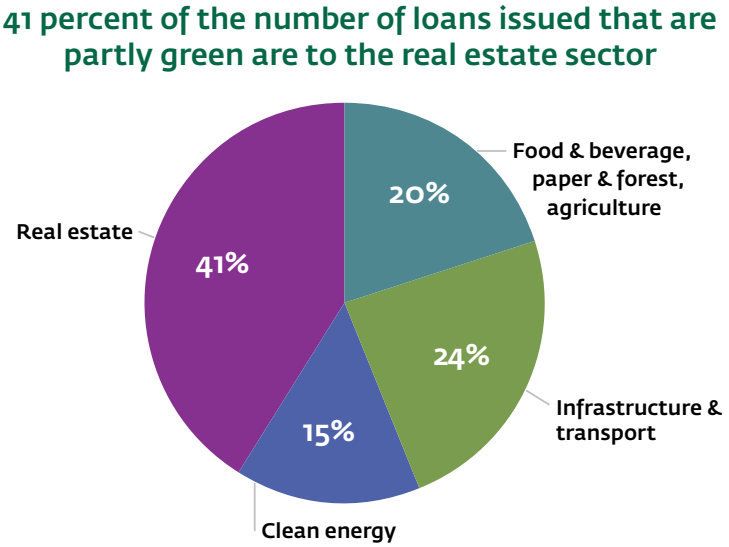


Figure 8: Distribution of green loans (as a monetary share of total loans) across countries of borrowers and across emerging markets

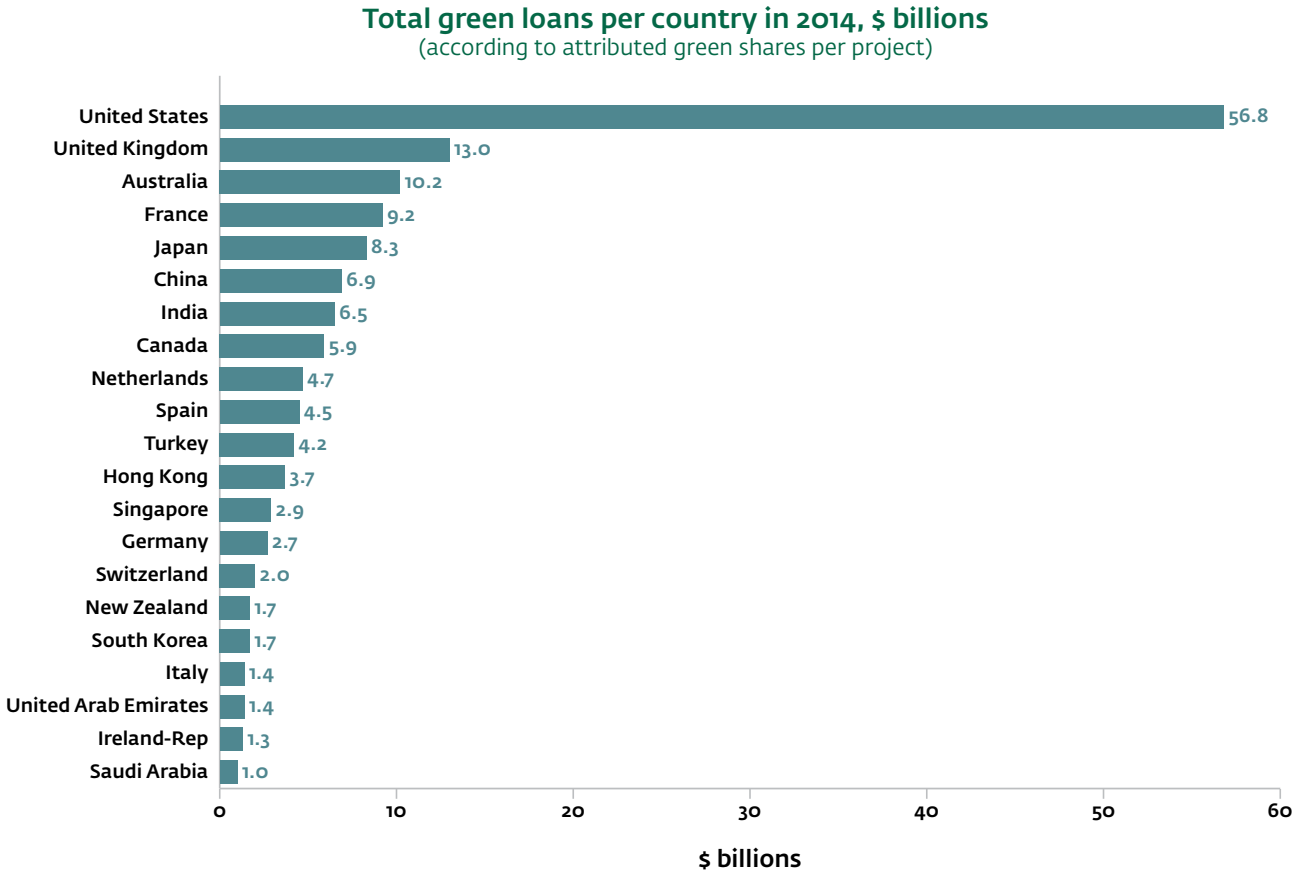
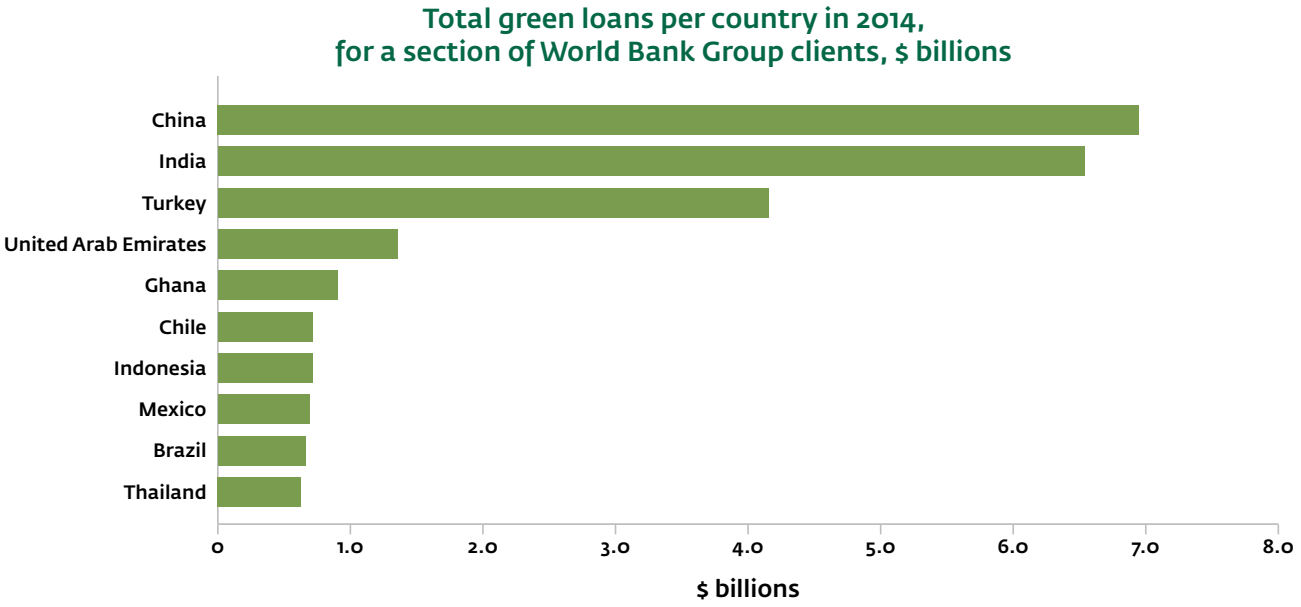


Figure 9: Distribution of green loans (as a monetary share of total loans) across selected World Bank Group clients



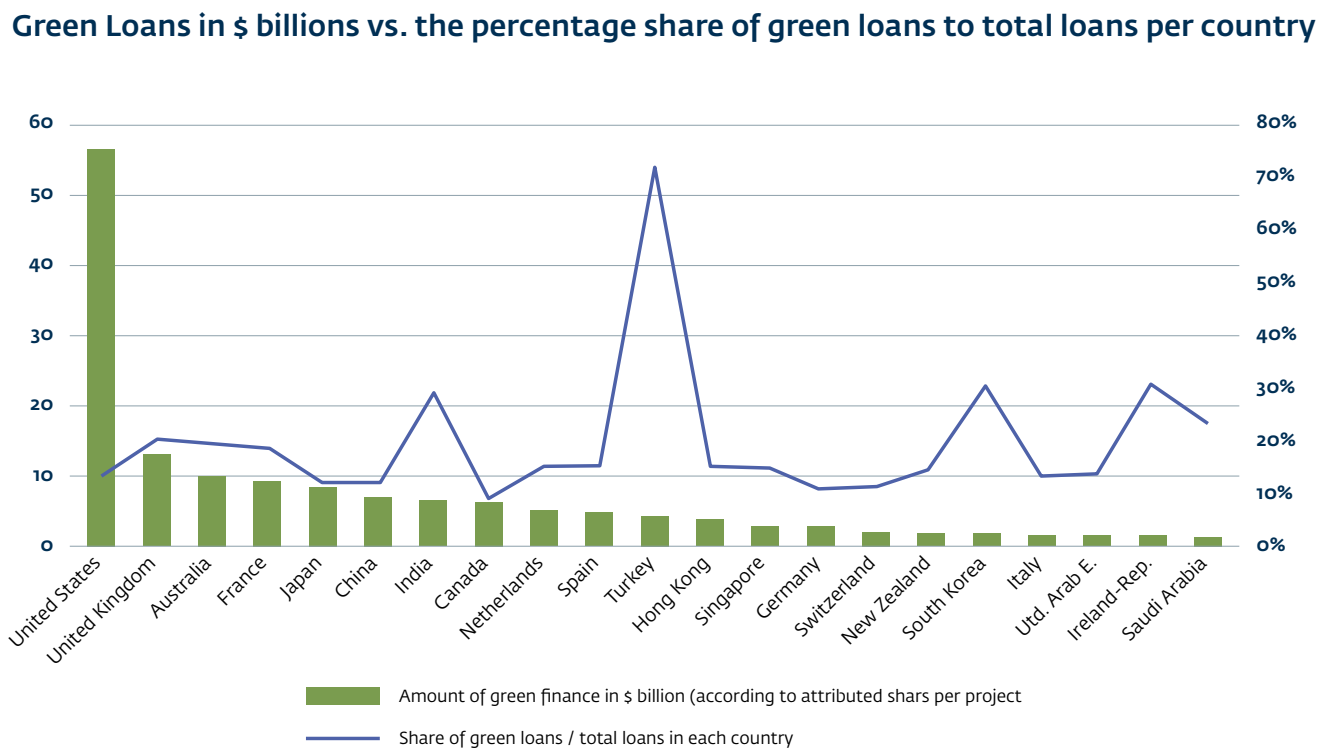
the global total goes to the United States, accounting for 35 percent, followed by the United Kingdom with 8 percent, Australia and France with 6 percent, and Japan with 5 percent. Among emerging markets, China and India have the largest green loan amounts, both with about 4 percent of the total global loans value. These differences might be due to the large size of the United States loan market; a potential bias in the dataset containing more information about the United States and other developed markets than other areas where data is less accessible; or the level of development of financial markets (lower self-financing and higher shares of securities/syndicated loans versus private loans in the United States).

Considering emerging markets independently, borrowers in the following World Bank Group client countries received the most financing through green loans from private financial institutions in 2014:[89]

- Borrowers in China and India received more than $6 billion, in Turkey more than $4 billion, and in the United Arab Emirates more than $1 billion.
- Borrowers in Ghana, Chile, Indonesia, Mexico, and Brazil received more than $600 million.
- About 40 percent of the remaining emerging market countries received between $100 million and $500 million, and the remaining 60 percent received less than $100 million.

Individual countries' domestic share of green loans as a proportion of total loans issued nationally varies significantly across nations. While the average across all countries is 15 percent, there are clear outliers, with the most striking being Turkey with a share of green loans of 72 percent. This is due to the fact that, in our dataset, all loans to borrowers in Turkey are for alternative energies or transportation systems.

Figure 10: Green loans in $ billion compared to the percent share of green loans out of total loans per country



The proportion of green loans to total loans in the United States is 14 percent, in the United Kingdom it is 20 percent, in Australia and France it is 19 percent, in Japan and China 12 percent, and in India 30 percent.

Plausibility check and limitations of the analysis

To put these results into perspective, we have identified two different sources that provide information for comparison.

As a result of the regulation on green bank lending in China, there is data available for the Chinese banking sector. According to the China Banking Regulatory Commission, the share of green loans issued by Chinese banks was 10 percent in 2015.

A survey of IFC's financial institution clients in 2016 revealed that 70 percent of the responding institutions provided climate-related or green financing, with the majority providing renewable energy, energy efficiency, waste and water-related financing. The average climate/green financing portfolio cited is 6 percent of the total outstanding loan portfolio—providing about $4.5 billion in finance issued primarily through commercial banks and specialized finance companies. The vast majority of clients who provide climate/green finance do not have tools for impact measures such as carbon emissions or energy savings, making it difficult for them to track or account for green investments.

This report's estimate of about 15 percent in green loans out of the total value of syndicated loans with financial closure in 2014 is significantly higher than the two figures from Chinese bank lending and IFC clients' portfolios, more than doubling the latter. This may be due to the shortcomings of the dataset used for this analysis and the proxies applied for green shares per sector.

The Thomson Reuters global dataset on syndicated loans has a potential bias towards the United States, where most loans are reported. This could be due to easier data access and a higher share of syndicated loans versus private loans resulting from a more developed financial market. Additional datasets focusing on the emerging markets should be considered for a more holistic view of the loan market, especially as the analyzed dataset does not contain enough loans for some emerging-market countries to draw representative conclusions. In that context, it could be interesting to compare the distribution of green loans per sectors (Figure 7) across different countries.

In addition, the dataset does not contain syndicated loans in the automotive industry. While the share of electric or hybrid vehicles is still quite small and would not alter the results much, this needs to be investigated for future analysis. According to Bloomberg New Energy Finance, although some 1.3 million electric vehicles have now been sold worldwide and 2015 saw strong growth, they still represent less than 1 percent of light-duty vehicle sales that year.[90] Hybrid cars held an estimated 3 percent of the market share in 2015.[91]

The applied estimates for the shares of green activities per sector reflect insights from current public research, and remain broad in many cases. Assuming that both Chinese banks and IFC clients selected their green portfolios based on detailed information per financed project, the methodology itself may be the main reason for the differences in the numbers for the green share of loans. A global comparison of green finance tracking at the most granular level is currently not possible given the lack of detailed data for each financed project. As a compromise, country-specific estimates should be developed and applied for more representative results, especially for a more detailed country analysis. Unfortunately, such estimates are rarely available.

The results of this analysis should be viewed critically. However, they do provide indicative insights and suggestions for where and how to improve existing data on green loans (see Section 4 for specific recommendations).

Section 3: Bond Market and Institutional Investors

GREEN FINANCE IN THE BOND MARKET

STOCKTAKING OF DEFINITIONS FOR THE GREEN BOND MARKET

The green bond market is the most evolved financial instrument in terms of green finance definitions and tracking. In 2014, the Green Bond Principles were issued by a group of international banks, investors, and issuers, in collaboration with the International Capital Market Association. They provide voluntary process guidelines to issuers on the key components involved in launching a credible green bond, ensure the availability of sufficient information to evaluate the environmental impact of a green bond investment, and help underwriters facilitate transactions through standard disclosure processes.[92] Several guidelines and regulations issued since then have built on the framework of the Green Bond Principles. The G20 Green Finance Study Group input paper 6 provides an overview of green bond guidelines, challenges, and recommendations on how to grow the market further.[93]

Table 9: Green bond guidelines, standards, and regulations

Guideline/standard/ regulation	Voluntary/ mandatory	Details
International Capital Markets Association: Green Bond Principles[94]	Voluntary	• Launched in 2014 under the International Capital Markets Association's coordination • As of August 2016: 122 members, 75 observer organizations, 24 executive committee members • Green bond principles: 1. Use of proceed (exclusively green) 2. Process for project evaluation and selection 3. Management of proceeds 4. Reporting • Certification recommended through third parties • Eligible categories include renewable energy; energy efficiency; pollution; prevention and control; sustainable management of living natural resources; terrestrial and aquatic biodiversity conservation; clean transportation; sustainable water management; climate change adaptation; and eco-efficient products, production technologies and processes

(*continued*)

Table 9: Continued

Guideline/standard/ regulation	Voluntary/ mandatory	Details
Climate Bonds Initiative: Climate Bond Standard (including the Climate Bond Taxonomy)[95]	Voluntary	• Standard developed by the Climate Bonds Initiative on third-party verification, functions as a screening tool for investors and governments • Fully incorporates the Green Bond Principles, with more specific criteria • Eligible projects: Wind; solar; geothermal; low-carbon buildings; bus rapid transit systems; low-carbon transport; bioenergy; water/ hydro; agriculture, forestry & other land use; and soon: industrial energy efficiency; fisheries and marine investments, cogeneration, infrastructure adaptation and resilience
China: Green Financial Bond Guidelines; Green Bond Endorsed Project Catalogue[96]	Mandatory for green bond issuers	• Published by People's Bank of China and China Society of Banking and Finance • Aligned with Green Bond Principles and Climate Bonds Initiative's standard • Quarterly reporting is mandatory, including details on use of proceed • Most issuers obtain third-party verification
India: Green bond requirements[97]		• Published by Securities and Exchange Board of India • Follows Green Bond Principles, turning some recommendations into requirements, seen as a tool to meet India's nationally determined contribution to the Paris Agreement • Definition of green is case-by-case evaluation • Management of proceeds needs to be verified • Use of proceed (projects) needs to be disclosed in annual report
France: Transition Energetique Climat label[98]	Mandatory	• The label was inspired mainly by Green Bond Principles and Climate Bonds Initiative taxonomy • Fixed income/credit funds that want to be labeled should be significantly invested in green bonds issued in accordance with the Green Bond Principles, for more than 83 percent of their net asset value
Sweden: Aggregation of single green loans into a portfolio[99]	Voluntary	• The Swedish local government debt office combines single green loans into an aggregated portfolio of green loans, empowering smaller municipalities with green financing opportunities • Green bonds are issued with a commitment to allocate bond proceeds to the portfolio of eligible loans
Stock exchanges[100]	Mandatory	• Stock exchanges in London, Luxembourg, Mexico, Shanghai, and Shenzhen are developing minimum requirements for listing of green bonds

Guideline/standard/ regulation	Voluntary/ mandatory	Details
KfW: Minimum requirements based on Green Bond Principles[101]	Mandatory	• Public-law institution based in Germany, providing loans to mega trends • Defined minimum criteria based on Green Bond Principles
Paris Green Bonds Statement[102]	Voluntary	• 27 global investors representing more than $11.2 trillion of total assets under management issued the Paris Green Bonds Statement in December 2015 • Its signatories have committed to support policies that drive the development of long-term, sustainable global markets in green bonds as part of climate finance solutions

AVAILABLE DATA ON GREEN BONDS

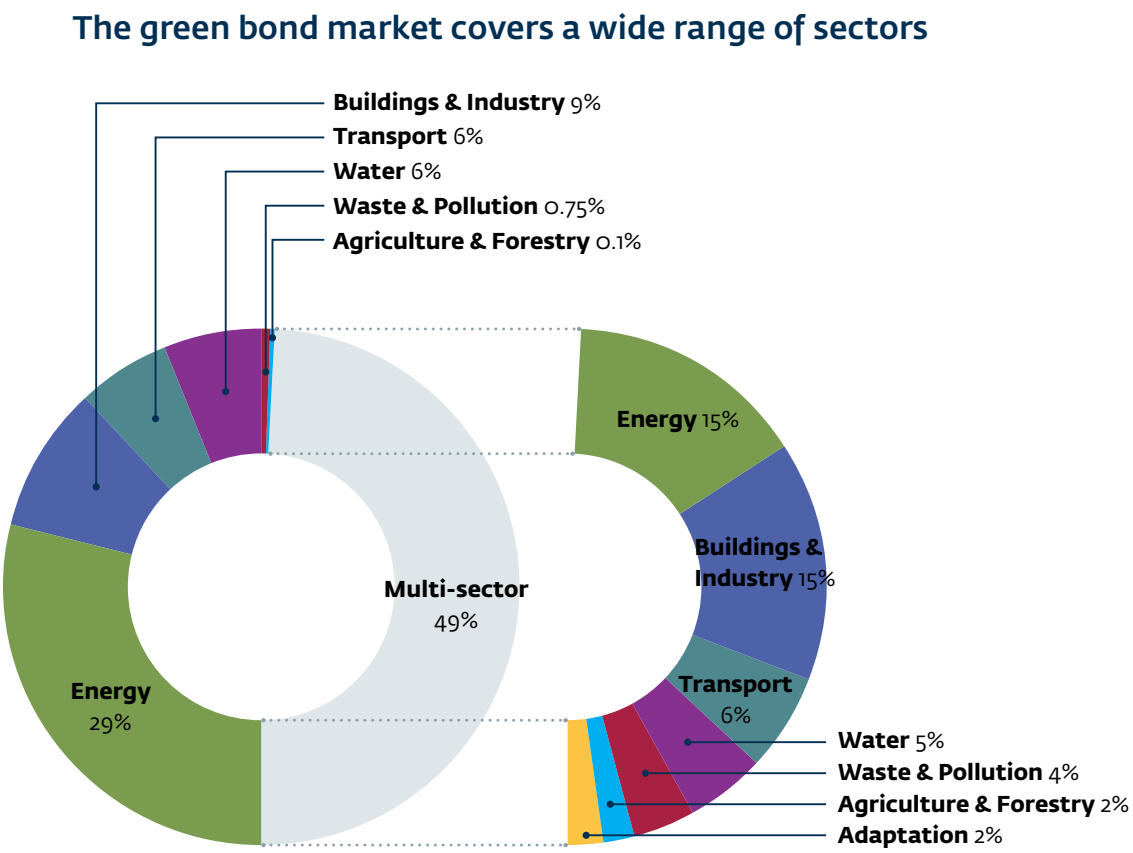
For the past five years, the Climate Bonds Initiative and HSBC have published an annual report on the state of the green bond market.[103] In their 2016 report, the size of the global bond market was an estimated $90 trillion, with $694 billion in climate-aligned bonds, of which $118 billion were labeled as green bonds (17 percent). There are six main categories for climate-aligned bonds: Transport, energy, buildings and industry, water, waste and pollution control, and agriculture and forestry.

According to the G20 Green Finance Study Group input paper on bonds, the annual issuance of labeled green bonds rose from just $3 billion in 2012 to $47.8 billion in 2015 (slightly higher than the Climate Bonds Initiative figure) with issuance occurring in 14 of the G20 markets.[105]

Table 10: Key features of the climate-aligned and labeled green bonds, July 2016

Climate-aligned bonds ($694 billion)	Subset: Labeled green bonds ($118 billion)
• Transport (mostly rail) is the largest category, making up a third of the universe (67 percent) • The majority of issuance is from government entities • The majority of issuance has tenors (bond time to maturity) longer than 10 years, and amounts larger than $100 million • The dominating currency is Chinese renminbi (RMB) with 35 percent of bonds, followed by dollars (23 percent) and euros (16 percent)	• Buildings and industry, and energy dominate with 68 percent, while transport is low (12 percent) as specific bonds for that sector are relatively new (see Figure 11) • Development banks are still among the most important issuers, while corporate and commercial bank bond issuances continue to grow • The average tenor is between five and 10 years • The dominating currencies among labeled green bonds are dollars and euros (together 80 percent), followed by RMB • Similar to recent years, about 60 percent of the labeled green bonds have received an external review, reconfirming the labels' credibility • The Chinese government has announced it will issue $46 billion (RMB300 billion) of labeled green bonds in 2016 alone. Between January and July, China was already the largest issuing country in 2016[104]

Figure 11: Labeled green bonds and sector coverage



Source: Climate Bonds Initiative and HSBC, Bonds and Climate Change State of the Market, 2016

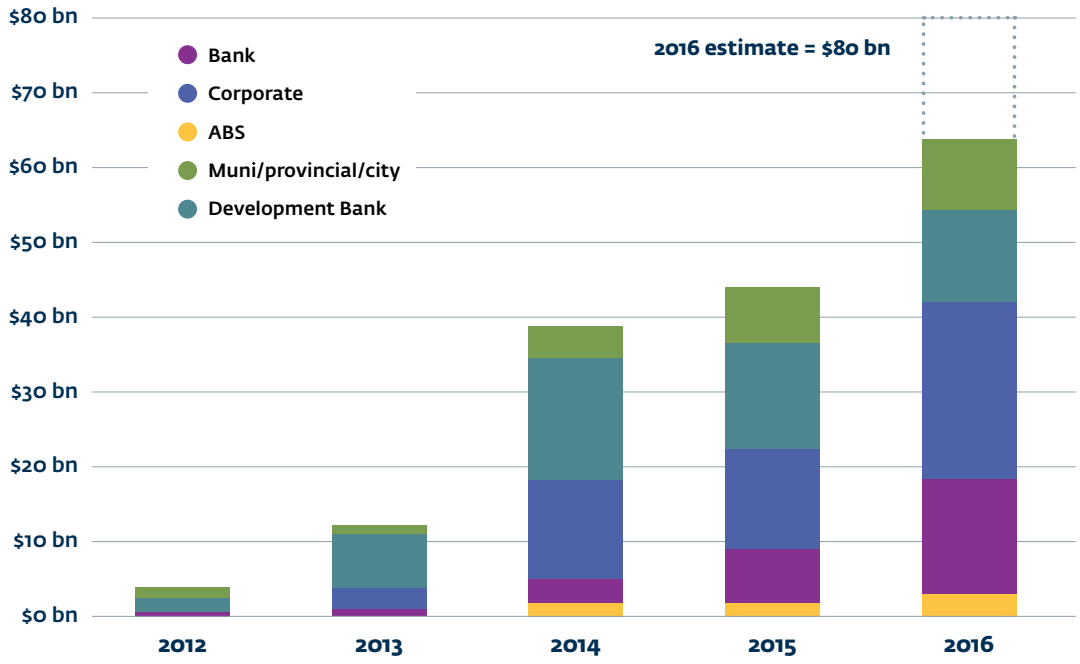
Annual issuance of green bonds has quadrupled between 2013 and 2015. As of October 31, total 2016 issuance was already 50 percent higher than the 2015 total. Moody's has estimated that total issuance of green bonds in 2016 will be $80 billion.[106]

Of the largest 10 green bond issuers in 2016, three are banks (Shanghai Pudong Development Bank with $7.6 billion, European Investment Bank with $4.1 billion, and Bank of China with $3 billion), and the remaining seven are private corporations with issuances ranging between $1.4 billion and $2 billion each (Mexico City Airport Trust, Électricité de France, Iberdrola, TenneT Holdings, Toyota, Apple Inc, and New York MTA).

The fact that labeled green bonds represent only 17 percent of all identified climate-aligned bonds indicates the large potential for growth. According to Bloomberg data, the labeled green bond market had about $130 billion in outstanding debt as of July 2016, or just 0.15 percent of the total global fixed-income market,[107] consistent with an estimate of below 0.2 percent by the Climate Bonds Initiative.[108] Non-labeled climate-aligned bonds are captured if bond issuers derive 95 percent of their revenue from climate-aligned assets. There are many more bonds that could be identified as green if the respective project details were known. However, information at project level is not consistently available to analyze bonds more thoroughly than the revenue-share approach taken here.

Progress is visible. Standard & Poor's sees environmental disclosure platforms such as the Global Reporting Initiative or the CDP as significant drivers for large

Figure 12: Labeled green bond issuance and market composition, 2012–2016



Source: Climate Bonds Initiative, Green Finance: Green Bond Directions, COP22, November 2016

corporations to tap the green bond market, because they enable companies to demonstrate the credibility of their activities through labeled green bonds.[i] [109] Given that standards are available and both governments and investors are pushing for broader application and disclosure, green finance tracking on bonds is expected to develop quickly.

GREEN FINANCE AMONG INSTITUTIONAL INVESTORS

This section provides an overview of green finance tracking for institutional investors and equity investments.

STOCKTAKING OF GREEN FINANCE INITIATIVES AMONG INSTITUTIONAL INVESTORS

The Investor Platform for Climate Actions provides an overview of existing initiatives led by institutional investors that promote low-carbon and green investments among investors, policy makers, and companies.[110] It has identified 19 initiatives, with more than 400 investors participating from 40 countries and a total of $25 trillion in assets under management. The initiatives are classified in four categories: Measure, engage, reallocate, and reinforce (Table 11).

The initiative considered the most relevant for green finance tracking is the Portfolio Decarbonization Coalition, which focuses on finding ways to measure and disclose the carbon footprint of portfolios (according to the Montreal Pledge), and taking action to decarbonize them. Another critical initiative to increase transparency around green finance is the Climate Disclosure Standards Board Fiduciary Duty Statement. The statement encourages companies in all industries to publish information on climate-related corporate performance, risks, and opportunities alongside mainstream corporate reports, stressing that the economic effects are tangible and

[i] The percentage of companies reporting to CDP who have active emissions-reduction initiatives increased from 47 percent in 2010 to 89 percent in 2015.

Table 11: Investor initiatives and actions to promote a low-carbon green economy

Measure	• PRI Montreal Pledge
Engage	• Aiming for A • Carbon asset risk • CDP carbon action • Ceres Shareholder Initiative on Climate & Sustainability • Global Engagement Services carbon risk engagement • Institutional Investors Group on Climate Change Initiative on European Union company climate lobbying • Investor expectations on corporate climate risk management • PRI investor working group on corporate climate lobbying • Regnan climate change resilience engagement
Reallocate	• Portfolio Decarbonization Coalition • Low-carbon investment registry
Reinforce	• Global Investor Statement on Climate Change • Climate Disclosure Standards Board Fiduciary Duty Statement • Climate Bonds Initiative • European Union and G20 governments to enable more investment in energy efficiency • Investor expectations for oil and gas companies • Investor expectations on corporate climate lobbying • Statement of investor expectations for the green bond market • Other actions

have implications for the relevant prospects of firms, industries, and investment portfolios.[111] The Climate Disclosure Standards Board framework for reporting is designed to help organizations prepare and present environmental information in mainstream reports for the benefit of investors.

The NAZCA platform, initiated by COP20 in 2014, lists individual commitments and actions taken by investors around the world.[112]

Civil society organizations' efforts have also gained attention recently. The campaign Go-fossil-free[113] calls on institutional leaders to "immediately freeze any new investment in fossil fuel companies, and divest from direct ownership and any commingled funds that include fossil fuel public equities and corporate bonds within five years." A global climate movement, 350.org,[114] is petitioning for carbon emission regulations, holding "our leaders accountable to the realities of science and the principles of justice." DivestInvest Philanthropy[115]

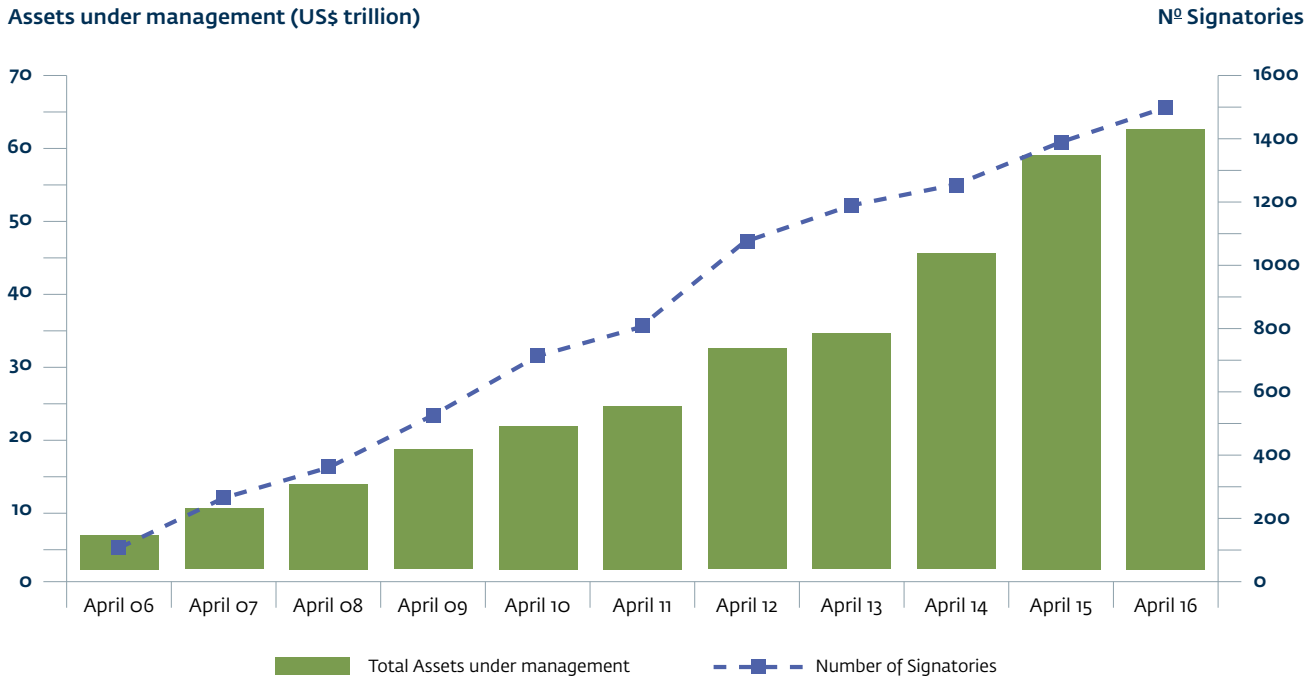
connects institutions that follow the lead of student and community-driven movements to call for fossil fuel divestment and clean energy investment. *The Guardian* started the campaign Keep-it-in-the-ground[116] in March 2015, informing people about climate change, the carbon bubble, divestments, and renewable energy.

Investors themselves report to the PRI if they are members. PRI is an investor initiative in partnership with the UN Environment Programme Finance Initiative and the UN Global Compact, advocating for responsible investments. It works to understand the investment implications of ESG factors and to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions.[117] Signatories agree to:

- Incorporate ESG issues into investment analysis and decision-making processes
- Be active owners and incorporate ESG issues into ownership policies and practices
- Seek appropriate disclosure on ESG issues by the entities in which they invest
- Promote acceptance and implementation of the principles within the investment industry
- Work together to enhance their effectiveness in implementing the principles
- Report on their activities and progress towards implementing the principles.

Since its founding in 2006, the number of signatories has grown from 63 signatories representing $6.5 trillion in assets under management to 1,501 members in April 2016 with $62 trillion in assets under management. A total of 1,072 signatories representing $56.4 trillion in assets under management have submitted their responses to the reporting framework in 2016 on their activities on ESG investing in 2015. Although individual responses are not public, member organizations can access some of the data. Of those that reported, the largest number of signatories are in the European Union (696) and the United States (256), followed by Australia (118),

Figure 13: PRI signatories and assets under management



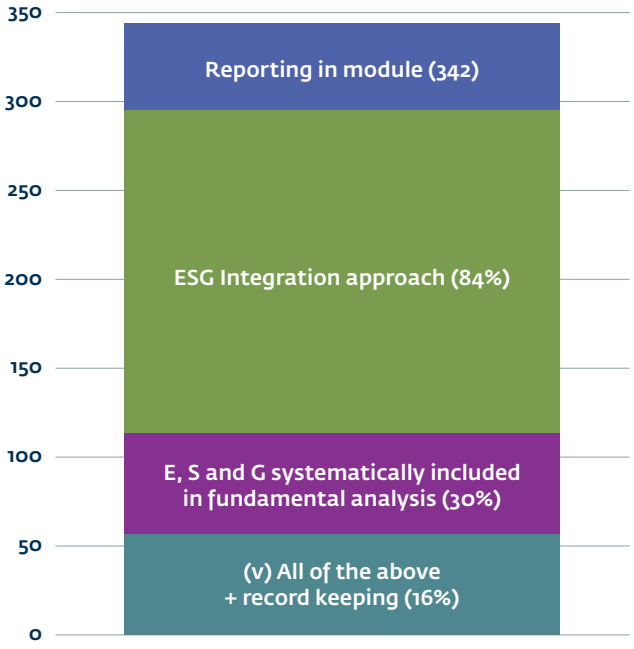
Source: PRI website[119]

Canada (76), Brazil (57), South Africa (52), Japan (39), and China (17).[118]

Each member receives feedback on their reporting. PRI recently announced that it will be more vocal about members' performance in the future, naming leaders and laggards, and more transparent regarding their scoring and data availability.[120]

Several challenges need to be addressed to increase actual green investments. Broadly accepted definitions of green (the E in ESG criteria for asset allocation) at the company disclosure level will improve the assessment of potential investments; clear policy frameworks will increase market predictability; and capacity building will improve investor expertise. A legal review recently undertaken in seven G20 countries found that, in all cases, failure to consider material green issues is a breach of fiduciary duty.[121] Consequently, due diligence material such as green funds and credit ratings need to improve to decrease investment risk. Finally, investment opportunities

Figure 14: PRI managers' ESG integration methods in listed equity



Source: PRI Report on Progress 2015

must become more accessible, both in terms of where and when green investments are needed and how small amounts or short-term needs can be met, given that investors are usually interested in larger investments.

AVAILABLE DATA ON GREEN INVESTMENTS

Although green investments are being mainstreamed into the global investment industry, information on how institutional investors integrate environmental factors into their decision making and what share of their investments finance green activities is often available only in anecdotal form. While awareness seems to be widespread, implementation appears poor.

Climate-related data is captured more widely: Bloomberg New Energy Finance provides the most comprehensive dataset in that area. The Global Investor Coalition on Climate Change created a low-carbon investment registry in 2014, the first public, online database showing examples of global low-carbon investments made by institutional investors.[122] In addition, several large institutional investors have announced how much they will invest in clean energy, sustainable investing, and green bonds. The G20 Green Finance Study Group input paper 3 gives a good overview of leaders in this area.

PRI provides some comprehensive figures on sustainable investments: As at 2015, about 63 percent of professionally managed assets globally were held by PRI signatory investment managers ($46.3 trillion out of $74 trillion), or 56 percent without double counting.[123] Of the 1,072 signatories that reported both publically and privately on ESG, 455 (42 percent) held a total of $1.3 trillion in assets under management in ESG investments, or $1.2 trillion without double counting. This means that only 2.1 percent of total reported assets under management held by PRI signatories are ESG investments.

A joint study by PRI and Accenture found that 76 percent of investors see sustainability as a differentiator in determining industry leaders.[124] PRI statistics provide further insights about listed equity being the most commonly held asset class for their signatories.[125]

Within listed equity, the proportion of investment managers incorporating ESG into decision making grew to 95 percent in 2015, up from 93 percent the year before. Further details were provided by 342 investors:

- The most commonly reported ESG incorporation strategy remains the integration of ESG factors into buy-sell-hold decisions (84 percent [286] of respondents). Only 30 percent (103) do so as part of fundamental analysis. Only 16 percent (56) keep systematic records on how ESG integration influences actual decision making.
- About 76 percent (259) positively or negatively screen stocks based on ESG considerations.
- About 36 percent (108) manage ESG-themed funds.

Section 4: Conclusions and Recommendations

A lot of work has been done by different actors to support and measure green finance. The analysis presented in this report proves that it is possible to roughly estimate green finance flows through private financial institutions. However, it also highlights that additional work is needed to make green finance more accountable and visible.

Definitions and tracking are most advanced in the bond market and could serve as an example for other areas. In the banking sector, existing tracking of loans should be improved, while institutional investors need to develop clear approaches in their decision making to move from awareness to implementation.

A better understanding of the current status of green finance will allow for a thorough analysis against policy targets, with implications for multinational organizations, national governments and regulators, the private financial sector, data providers, and standard setters. The next steps outlined below set out specific action points for each stakeholder group to improve the tracking, and thereby the shaping, of green finance.

SHORT-TERM STEPS: RAISE AWARENESS, AND UNDERSTAND AND IMPROVE CURRENT PRACTICE

Multinational organizations

- **Analyze clients' demand for green finance:**
  For multinational development banks in particular, it is important to understand their clients' needs for green finance in developing their services. Insights should be gathered from policy makers, but also from industry specialists and researchers.
- **Convene efforts between organizations to establish green finance typologies:**
  To develop tracking standards that are coherent and comparable with the formulation of policy targets, different research, actions, and interests should be aligned. This can be facilitated at future Sustainable Banking Network meetings, COP side events, or working groups at organizations such as the UN Environment Programme Finance Initiative, World Resources Institute, World Economic Forum, 2DII, CDP, Global Reporting Initiative, International Integrated Reporting Council, and standard setters (SEC, Climate Disclosure Standards Board, and the new ISO standard on climate finance).

(*continued*)

National regulators

- **Understand market players' current tracking of green finance:**
  To develop explicit regulations and guidelines for green finance in the medium term, policy makers need to gain insights into local market players' green finance tracking, both broadly and in detail (who tracks what).
- **Understand and articulate national needs for green finance:**
  For the implementation of policy targets to reach the Paris Agreement and Sustainable Development Goals, national plans need to be translated into clear indicators per sector, and ideally the different financing instruments needed for the planned transitions should be identified.
- **Promote transparency and consistency in financial datasets:**
  Regulators should urge data providers, financial sector participants, and companies to agree on existing best practice regarding green finance tracking and jointly develop new indicators.

Private financial sector

- **Bank lending—improve application of existing use-of-proceed classifications:**
  One easy way to improve the quality of existing data is to ensure the consistent application of the use-of-proceed classification indicating the use of project finance, especially for renewable energy. Classifying general purpose bonds and corporate loans may be a challenge because the use of proceeds can be diverse.
- **Institutional investors—integrate existing ESG criteria more resolutely into decisions:**
  To track green finance flows as well as their performance, ESG criteria and existing company data on sustainability measures should be applied more thoroughly into standard decision-making processes, in a quantitative format.

Data providers & standard setters

- **Increase awareness of the need to integrate green finance into existing datasets:**
  When collecting information and computing datasets, data providers should put more emphasis on sustainability, climate, and green indicators.
- **Engage with peers to increase consistency in indicators across datasets:**
  Company unique identifiers and industry classifications should be harmonized, and a joint typology around green finance should be developed.

MEDIUM-TERM STEPS: DEVELOP A COMPREHENSIVE SYSTEM TO TRACK GREEN FINANCE

Multinational organizations

- **Pilot analysis comparing supply and demand for selected countries with clear policy plans:**
  For countries with advanced development plans on how to reach the Paris Agreement and Sustainable Development Goals, an early comparison of the existing green finance supply could yield further insights into the types of policies needed to close any financing gaps.

- **Implement green finance typologies and standards:**
  Following the alignment of various actors' interests and existing approaches to green finance, recommendations need to be put into action and consistent green tracking standards that align with policy targets need to be developed. Organizations such as IFC, Sustainable Banking Network, UN Environment Programme Finance Initiative, World Resources Institute, World Economic Forum, 2DII, CDP, International Integrated Reporting Council, Climate Disclosure Standards Board, and Global Reporting Initiative are well placed to facilitate such processes.
- **Link bottom-up approach on green finance with top-down research:**
  Organizations such as the Food and Agriculture Organization, World Health Organization, International Energy Agency, G20, and Intergovernmental Panel on Climate Change published estimates on the total required amounts of money to reach the respective Sustainable Development Goals. Methodologies for these estimates on a macro level should be aligned with a bottom-up approach.

National regulators

- **Develop new regulations for banking, bonds, and institutional investors:**
  Without regulations, consistency is rare or takes a long time to develop. Policy makers should cooperate with the insights gained by multinational organizations and the private financial sector to establish clear guidelines.
- **Build on lessons learned from peers, such as China's green banking regulation:**
  China regulates the tracking of green bonds and green lending. Other countries should consider this example when developing their own regulations.

Private financial sector

- **Bank lending—build on the green bonds experience**:
  The Green Bond Principles provide clear definitions and tracking mechanisms for bonds. Similar processes should start for the loan market, and possibly also for equity investments. The tracking could be integrated into existing measures, such as use-of-proceed categories. For certain industries, a new green tag can build on existing energy-efficiency standards.
- **Institutional investors—integrate green revenue into decision making:**
  The recently launched FTSE LCE green revenue data point could serve as an additional factor in investors' decision-making processes, saving a lot of time and effort.

Data providers & standard setters

- **Advocate for better data on green activities at company levels:**
  A green revenue share data point could be integrated into existing reporting procedures, such as CDP, Global Reporting Initiative, or integrated annual reports (International Integrated Reporting Council), and thereby into Bloomberg terminals and other financial datasets provided such as Thomson Reuters and Bureau van Dijk.
- **Develop new services for clients supplying or demanding green finance data:**
  Given the increasing demand for green finance information from investors, multinational development banks, researchers, and policy makers, new products (datasets) and services (research) could provide a business model for data providers.

Annex

USE-OF-PROCEED CATEGORIES AND THEIR USE IN THE THOMSON REUTERS DATASET

Category	Sublevel	In use?
Acquisition related	Acquisition financing	Used in TR data for 2014
Acquisition related	Acquisition of securities	
Acquisition related	Future acquisitions	Used in TR data for 2014
Acquisition related	Infrastructure LBO	Used in TR data for 2014
Acquisition related	Leveraged buy-out	Used in TR data for 2014
Acquisition related	Demerger	
Acquisition related	Sponsored buy-out	Used in TR data for 2014
Acquisition related	Management buy-in	
Acquisition related	Management buy-out	
Acquisition related	Spinoff	
General corporate purposes	General corporate purposes	Used in TR data for 2014
General corporate purposes	Improve balance sheet	
General corporate purposes	Marketing & sales	
General corporate purposes	Pay on LT borrowings	
General corporate purposes	Reduce indebtedness	
General corporate purposes	Relending	
General corporate purposes	Tax payment	
Green bonds	Energy efficiency	
Green bonds	Environmental protection projects	
Green bonds	Renewable energy	Used in TR data for 2014
Green bonds	Green bond purposes	
Green bonds	Green construction	
Green bonds	Waste and pollution control	
Green bonds	Water efficiency and sustainability	
Investments	Bridging loan	
Investments	Investment/loan	Used in TR data for 2014
Investments	Investment in liquid assets	
Investments	Investment in other companies	
Investments	Investment/loan to affiliate	
Other	Balance of payments finance	
Other	Bank deposit	
Other	Coal mining	
Other	Communications	
Other	Divestments	
Other	Down payment	
Other	Economic development	

(*continued*)

Category	Sublevel	In use?
Other	Evaluation of prospects	
Other	Exit financing	
Other	Foreign exchange stability fund	
Other	Capital expenditures	Used in TR data for 2014
Other	Export/import finance	Used in TR data for 2014
Other	Joint venture	
Other	Land transport	
Other	Finance-linked trade	Used in TR data for 2014
Other	Medical	
Other	Metal products	
Other	Military	
Other	Municipal services	
Other	Natural reserve/agriculture	
Other	Operating fund/cash reserve	Used in TR data for 2014
Other	Other	Used in TR data for 2014
Other	Overdraft	
Other	Pay fees & expenses	
Other	Payment for borrowings	
Other	Petrochemicals	
Other	Place funds on deposit	
Other	Pre-del ship fin	
Other	Product development	
Other	Restructuring	Used in TR data for 2014
Other	Working capital	Used in TR data for 2014
Other	Railways	
Other	Rescheduling	
Other	Sale and leaseback	
Other	Sanitation/recycling	
Other	Sewage	
Other	Social	
Other	Unknown/not applicable	
Other	Working fund	
Project finance	Airports	
Project finance	Combined utilities	
Project finance	Dams	
Project finance	Education	
Project finance	Electricity	
Project finance	Energy	
Project finance	Gas	
Project finance	Harbors	
Project finance	Highways/roads	
Project finance	Hydroelectricity	
Project finance	Industrial development	
Project finance	Land infrastructure	
Project finance	Limited recourse project finance	
Project finance	Metal ore mining	
Project finance	Mining exploration	
Project finance	Non-recourse project finance	

Category	Sublevel	In use?
Project finance	Nuclear	
Project finance	Oil financing	
Project finance	Pipelines	
Project finance	Public-private partnership	
Project finance	Recourse project finance	
Project finance	Aircraft financing	Used in TR data for 2014
Project finance	Project finance	Used in TR data for 2014
Project finance	Ship financing	Used in TR data for 2014
Project finance	Water infrastructure	Used in TR data for 2014
Project finance	Telecommunications	
Project finance	Transport finance	
Real estate	Assisted living	
Real estate	Buildings	
Real estate	Build-operate-transfer facility	
Real estate	Cont care ret comm	
Real estate	Housing stk transfer	
Real estate	Leases	
Real estate	Mortgage financing	
Real estate	Property development	
Real estate	Construction	Used in TR data for 2014
Real estate	Property acquisition	Used in TR data for 2014
Refinancing	Add-on	
Refinancing	Debtor-in-possession	
Refinancing	Ref eq-linked bonds	
Refinancing	Refinance acquisition debt	
Refinancing	Refinance comm paper	
Refinancing	Refinance eurobonds	
Refinancing	Refinance fixed-income debt	
Refinancing	Repricing	
Refinancing	Refinance bank debt	Used in TR data for 2014
Refinancing	Refinancing	Used in TR data for 2014
Security related	Backup facility	
Security related	Common stock repurchase	
Security related	Dividend recapitalization	
Security related	Issue/placing paper	
Security related	Preferred stock repurchase	
Security related	Proceed to shareholders	
Security related	Recapitalization	
Security related	Redeem class A shares	
Security related	Redeem class B shares	
Security related	Redeem shares	
Security related	Secondary	
Security related	Standby/CP support	Used in TR data for 2014

TOTAL GREEN SYNDICATED LOAN AMOUNTS PER COUNTRY

Amount of green loans per country in $ billion, and the respective shares as a proportion of the total global green loan amount (Thomson Reuters dataset on global syndicated loans, financial closure data in 2014).

Amount of green loans per country in $ billion

		Total sum = 164.7	
Nation (Headquarters)	**Domicile nation code**	**Amount of green loans (according to attributed shares per project)**	**Share of total green loans in Thomson Reuter dataset (per $)**
United States	US	56.8	34.5%
United Kingdom	UK	13.0	7.9%
Australia	AU	10.2	6.2%
France	FR	9.2	5.6%
Japan	JP	8.3	5.1%
China	CH	6.9	4.2%
India	IN	6.5	4.0%
Canada	CA	5.9	3.6%
Netherlands	NT	4.7	2.9%
Spain	SP	4.5	2.7%
Turkey	TK	4.2	2.5%
Hong Kong SAR	HK	3.7	2.3%
Singapore	SG	2.9	1.8%
Germany	WG	2.7	1.7%
Switzerland	SZ	2.0	1.2%
New Zealand	NZ	1.7	1.0%
South Korea	SK	1.7	1.0%
Italy	IT	1.4	0.8%
Utd Arab Em	UA	1.4	0.8%
Republic of Ireland	IR	1.3	0.8%
Saudi Arabia	SD	1.0	0.6%
Ghana	GH	0.9	0.6%
Norway	NO	0.9	0.5%
Chile	CE	0.7	0.4%
Indonesia	ID	0.7	0.4%
Mexico	MX	0.7	0.4%
Brazil	BR	0.7	0.4%
Thailand	TH	0.6	0.4%
Denmark	DN	0.6	0.3%
Nigeria	NI	0.6	0.3%
Romania	RO	0.5	0.3%
Qatar	QA	0.5	0.3%
Finland	FN	0.5	0.3%
Sweden	SW	0.4	0.3%
Bermuda	BE	0.4	0.3%
Greece	GR	0.4	0.2%
Austria	AS	0.4	0.2%
Russian Federation	RU	0.4	0.2%
Philippines	PH	0.4	0.2%

Nation (Headquarters)	Domicile nation code	Amount of green loans (according to attributed shares per project)	Share of total green loans in Thomson Reuter dataset (per $)
Malaysia	MA	0.4	0.2%
Belgium	BL	0.3	0.2%
Luxembourg	LX	0.3	0.2%
Jordan	JO	0.2	0.2%
Poland	PL	0.2	0.1%
Portugal	PO	0.2	0.1%
Taiwan	TW	0.2	0.1%
South Africa	SA	0.2	0.1%
Croatia	CT	0.2	0.1%
Hungary	HU	0.2	0.1%
Uganda	UG	0.2	0.1%
Monaco	MO	0.2	0.1%
Ethiopia	ET	0.1	0.1%
Macau SAR	MC	0.1	0.1%
Colombia	CO	0.1	0.1%
Vietnam	VT	0.1	0.1%
Barbados	BS	0.1	0.1%
Morocco	MR	0.1	0.1%
Peru	PE	0.1	0.0%
Georgia	GE	0.1	0.0%
Czech Republic	CC	0.1	0.0%
Kuwait	KU	0.1	0.0%
Egypt	EG	0.1	0.0%
Liberia	LB	0.1	0.0%
Guernsey	GG	0.1	0.0%
Chad	CD	0.0	0.0%
Marshall Islands	MS	0.0	0.0%
Panama	PA	0.0	0.0%
Ivory Coast	IV	0.0	0.0%
Serbia	QS	0.0	0.0%
Ukraine	UE	0.0	0.0%
Sri Lanka	SL	0.0	0.0%
Pakistan	PK	0.0	0.0%
Cyprus	CY	0.0	0.0%
Argentina	AR	0.0	0.0%
Honduras	HN	0.0	0.0%
Jersey	JE	0.0	0.0%
Myanmar (Burma)	BM	0.0	0.0%
Namibia	NM	0.0	0.0%
Bangladesh	BG	0.0	0.0%
Israel	IS	0.0	0.0%
Dominican Republic	DR	0.0	0.0%
Ecuador	EC	0.0	0.0%
Kenya	KE	0.0	0.0%
Lithuania	LT	0.0	0.0%
Slovak Republic	SV	0.0	0.0%

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