Green Finance: A bottom-up approach to track existing flows

Climate Business Department

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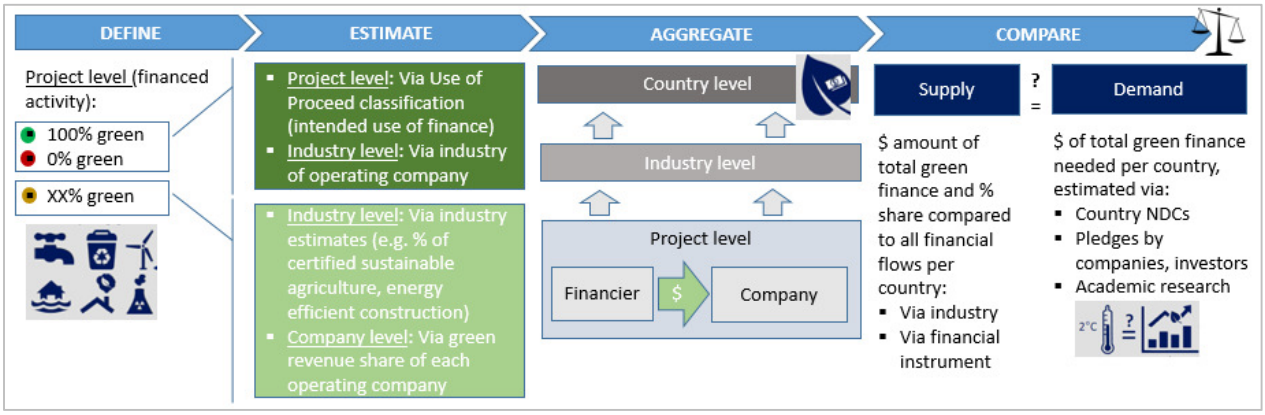
Executive Summary

For the transition to a net-zero emissions world and sustainable global economy, we need to scale up green finance – the financial sector needs to be leveraged to shift investments into green projects. **Green finance is defined as financing of investments that provide environmental benefits**. A comparison of the current supply of green finance provided by the private sector with the global demand by country would allow for the development of clear action points to close any gaps.

The development of green finance activities, their definitions and tracking is gaining momentum. Various financial institutions, international initiatives, standard setters and regulatory bodies have developed their own approaches to green finance. This diversity of approaches, with definitions being tailored to each organization's own purpose and not providing a harmonized and consistent approach applied across the financial sector, makes it difficult to assess overall progress on green finance. This is further constrained by current data availability which limits the rigor of the analysis of existing green finance flows.

Building on the work of the 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, in order to understand the current status of green lending and provide recommendations on how to better align different green finance measuring approaches to allow for analysis at a broader scale that can result in better policies to mobilize additional green finance.

This bottom-up methodology first defines what is 'green' at a project level via 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 per industry and on a country level. These results can finally 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 use of a green typology and other relevant data points such as sector classifications across available data sets.

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' in financial datasets. However, this classification can only identify green in some cases, and even so, its definition is often imprecisely applied, e.g. 'Project Finance' is chosen instead of 'Clean Energy'. This leads to missing information where the definition could be clear.

- **Sector level data**: If the 'Use of Proceed' is not insightful, the industry of each operating company can serve as an estimate for the green share per project. Publicly available studies indicate each industry's share that yield environmental benefits, e.g. certified green buildings for the Real Estate sector. But, the industry classifications used vary across different data sets. 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 data point only exists in a consistent format for a limited number of listed companies.

Challenge 2: Aggregating the data

- **Via borrower's location**: As each project's location is not available in a consistent format, it needs to be assumed that it is equal to the operating company's location. This introduces inaccuracies given the cross-border activities of many companies, e.g. the location listed in data sets 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.
- **Via financier location**: If data should be aggregated per financing institution, information is often limited regarding how much of the project was financed by a particular financier (e.g. per bank) and their location. This lack of information leads to limitations in the analysis.
- **Combining data sets**: For a meaningful analysis of green finance per financial instrument, project location (countries), project operators (companies) and project financiers (lending banks, bond issuers, investors), different datasets need to be combined. Therefore, connecting factors must be found across datasets. This can be unique identifiers per financed project (e.g. project ID), operating company or financing institution. Yet, many different identifiers are used across data sets and geographies. The lack of consistency complicates linking different sources to aggregate the data on different levels.

Challenge 3: Comparing supply with demand

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

***Banking*: Application of the methodology to the loan market reveals some first estimates**
Methodology: ▪ 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 percent of projects is applied to industry classifications via existing research figures: ● 100 percent green: Clean Energy ● 0 percent green: Oil & Gas, Petrochemicals, Pipelines, Coal Power ● 17 percent green: Real Estate ● 13 percent green: Food & Beverage, Paper & Forest, Agriculture ● 10 percent green: Infrastructure & Transport ● 0.1 percent green: Automobiles ▪ AGGREGATE: The results are aggregated per industry and the country of the borrower. ▪ COMPARE: No comparison with the demand side has been done 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 $mil amount of all loans in 2014, almost 15 percent went into green finance. ▪ Of all projects with some green share, nearly 38 percent go into green Real Estate and 31 percent into Clean Energy (potentially because other industries use less project finance via loans). ▪ The US shows 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 all emerging markets, both with 4 percent.

***Bonds*: green bond label allows for consistent tracking, though improvements needed**	***Institutional Investors*: while awareness seems to be widespread, implementation looks poor**
▪ The Green Bond Principles (GBP) allow for consistent tracking across markets, data sets 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).	▪ Despite many investor initiatives, a lack of clear definitions limits the actual application of environmental, social and governance investing criteria (ESG) and its tracking. ▪ 1,072 investors currently report on their activities to the Principles of Responsible Investment (PRI). ▪ Only very few integrate ESG criteria into fundamental decision making.

Conclusions and recommendations:

The development of green finance activities and their tracking 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, existing tracking processes on loans should be improved; while institutional investors need to implement clear decision criteria. To get a full 360° picture of green finance, we need to track 'green' at the level of each project. Therefore, **cooperation between market players on the following action points is crucial**:

	Multinational Organizations	National Regulators	Private Financial Sector	Data Providers & Standard Setters
Short term	▪ Analyze clients' demand for green finance. ▪ Convene efforts at national and international levels to establish green finance typologies and standards coherent with policy targets.	▪ Understand market players' current practice of green finance tracking. ▪ Understand and articulate national needs for green finance. ▪ Promote transparency and standardization in financial datasets.	▪ Improve application of 'Use of Proceeds' classifications where already used, for better identification of project purpose. ▪ Integrate existing ESG criteria more resolutely 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 company unique identifiers and industry classifications.
Medium term	▪ Pilot analysis comparing supply and demand for selected countries with clear policy plans. ▪ Implement recommendations emerging from international convenings 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: China's green banking regulation.	▪ Build on the green bonds experience: Develop clear definitions / tracking mechanisms per financial instrument. ▪ Integrate 'green revenue share per company' data point into decision making.	▪ Advocate for better data on green activities at company level, e.g. build 'green revenue share' data points into corporate reporting procedures. ▪ Development of new services for clients supplying or demanding green finance data.

1) Introduction

Financial market actors' lending and investment practices have a great impact on the real economy. As such, the transition to a net-zero emissions world and sustainable global economy, will require change across the financial sector based on two pillars: (i) acknowledgement and transparency of finance flows that deliver environmental benefits, and (ii) a metrics-based 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 NDCs. [1] While some progress has already been made in green finance, only a small fraction of bank lending is explicitly classified as green according to national definitions, with an unknown volume of finance remaining undetected under the green lens. 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 the holdings by global institutional investors are classified as green infrastructure assets.[2] Significant efforts are needed to further scale up these financial flows to meet the massive investment financing needs associated with the development and climate targets.

As countries begin to implement their green growth plans and their Nationally Determined Contributions (NDCs) on climate change, being able to compare the current supply of green finance provided by the private sector with the investment needs globally and per country would allow for the development of clear action points to close any gaps. However, there is currently no systematic approach to assessing progress on these challenges within the global financial system. For example, while there are estimates for some countries such as China on the proportion of banking assets that are 'green' (10 percent), there is no clear global approximation available of stocks or flows. In order to be able to address gaps and sequence appropriate interventions it is important to have a solid understanding and data set on practices, policies and monitoring approaches.

The G20 Green Finance Study Group (GFSG), 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 very diverse or non-existent. Advancing ways to measure progress in greening across the financial system and not just in specific silos will be critical for overall progress on this agenda. A better understanding of the current supply of green finance is essential to providing policy makers, regulators, international institutions, development banks and the private sector with insights into where and what type of additional incentives are needed to scale up green finance.

This report therefore focusses on the synthesis report's suggestion to improve the indictors 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 currently available data, it then applies this approach to the banking sector. Its findings for the banking sector, as well as the bond market and institutional investors provide insights into current best practice for green finance tracking. The

[1] IFC (2016) Climate Investment Opportunities in Emerging Markets: An IFC Analysis
[2] G20 Green Finance Study Group (2016), *G20 Green Finance Synthesis Report*, access at http://g20.org/English/Documents/Current/201608/P020160815359441639994.pdf.

report provides recommendations for different stakeholders on how to improve green finance indicators, especially at the intersection of financial institutions, data providers, standard setters, and international organizations and governments.

The first section of the report provides the rationale for tracking green finance, by delving into the background and context for this work; complemented by a brief stocktaking of existing definitions of green finance, actors and their approaches. This report goes on to focus on the banking sector in section two, developing 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 further challenges. Section three summarizes current knowledge of green finance in the context of the bond market and institutional investors, before the last section concludes with recommendations for next steps for different stakeholder groups in the short and medium term. While the quantification of demand for green finance is considered in this document, it is not the main focus of this analysis.

Section 1: Context and Objectives

2) Background and rationale

The G20 Green Finance Study Group initiated by the Chinese G20 Presidency, and being taken forward by the current German G20 Presidency, established its mandate to "identify institutional and market barriers to green finance, and based on country experiences, develop options on how to enhance the ability of the financial system to mobilize private capital for green investment"; where "green finance" is defined as financing of investments that provide environmental benefits[3] in the broader context of sustainable development. Its initial findings developed in close collaboration with other initiatives and organizations, were published in a synthesis report, and focused on banking, the bond market, and institutional investors, as well as two cross-cutting topics, risk analysis and measuring progress[4]. They identified the following key recommendations:

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

While there is huge potential for scaling up green finance, there exist 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. The latter in particular, leads to inadequate analysis because of inaccuracies in measuring current green finance flows and their impact. This report therefore focuses on the final recommendation and builds on the World Bank Group's input paper to the G20 GFSG on measuring progress on green finance[5]. This 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. Indicators are needed to mobilize finance towards green activities as well as mainstream financial risk management related to environmental, social and governance (ESG) issues. According to a survey conducted by the World Bank Group among public and private financial institutions, the definition of what is covered by green finance being applied by both is broadly consistent, but the tracking of it is still very sporadic and diverse in approach.

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

[3] See G20 Green Finance Synthesis Report, p.3: These environmental benefits include, for example, reductions in air, water and land pollution, improved energy efficiency as well as mitigation of and adaption to climate change. Green finance involves efforts to internalize externalities and adjust risk tolerance in order to boost environmental friendly investments and reduce environmentally damaging ones.

[4] The synthesis report and all input papers can be found here: http://unepinquiry.org/g20greenfinancerepositoryeng/

[5] http://unepinquiry.org/wp-content/uploads/2016/09/5_Outline_Framework_for_Measuring_Progress_on_Green_Finance.pdf

3) Objective: 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 a low-carbon economy to prevent disastrous consequences of climate change and the urgency for economic development to be sustainable, **financial markets play an integral role to drive investments to climate-friendly and green projects**.

Greening the financial system goes beyond lending and investment standards by considering both the impact of 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 and build on their **mutual impactful relationship with sustainability**: investments are directly or indirectly affected by climate change and other negative environmental externalities of industrial processing (such as air, water and land pollution) and should account for these in their risk assessments[6]. 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, 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[7].

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 and how these could be framed. Many financial institutions do not yet offer robust products promoting green investments, and for those who do, labeled products differ in their definition of 'green'. Consequently, to achieve the Sustainable Development Goals and bring 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.**

4) Definitions of green finance in use

Recent analysis by the World Bank Group on measuring green finance[8] identifies current initiatives that include green finance tracking; reviews schemes for defining and measuring green finance mobilization and ESG risk management integration.[9] 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, bio-system adaptation etc.), carbon capture & storage, energy efficiency (cogeneration, smart grid etc.), environmental protection (pollution control, prevention and treatment etc.), green buildings, green products & materials, renewable energy (solar, wind, hydro etc.), sustainable land management, (sustainable agriculture, forestry etc.) transport (urban rail/metro, electric, hybrid etc.), waste management (recycling, waste management etc.) and water

[6] Boston Common Asset Management 2015
[7] Input paper 3, p.10ff., quoting a study from Deutsche Asset & Wealth Management and the University of Hamburg, 2016, http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf; as well as Sustainable Accounting Standards Board (SASB) quoting Morningstar data https://www.sec.gov/comments/s7-06-16/s70616-25.pdf; and BlackRock Investment Institute: a simulated low-carbon portfolio outperforms the Russell 3000 benchmark by seven percentage points over the period 2012 till August 2016 https://www.blackrock.com/investing/literature/whitepaper/bii-climate-change-2016-us.pdf
[8] http://unepinquiry.org/wp-content/uploads/2016/09/5_Outline_Framework_for_Measuring_Progress_on_Green_Finance.pdf
[9] http://unepinquiry.org/wp-content/uploads/2016/09/5_Outline_Framework_for_Measuring_Progress_on_Green_Finance.pdf

(water efficiency, waste-water treatment etc.). Based on that survey, the report concludes that **green finance definitions being applied can be quite granular, but broadly feature many similarities** including obvious sectors such as renewable energy, green buildings etc., **as well as differences** regarding specific sectors such as nuclear power, noise abatement and carbon capture and storage, reflecting the localized, country-specific nature of definitions. **Data is currently captured at various levels, mostly via 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 GHG emission reductions, number of jobs created, air and water quality, energy savings in GWh, ESG indicators and their materiality etc. There appears to be little information on the actual amounts of the share of green investments being monitored and collected[10].

Various approaches to defining green finance have been developed for different needs[11]. The approaches adopted by a range of different institutions are detailed below in Table 1. Financial institutions, governments and international organizations have started defining green finance according to their underlying motivations. *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 non-financial aspects of finance. The underlying criteria for a project's eligibility for green finance are sometimes but not always publicly available.

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

Actor	Example	Approach	Motivation
Financial institutions	Index providers: FTSE4Good Index Series[12], Dow Jones Sustainability Index (DJSI)[13]; Stock Exchanges: Johannesburg Stock Exchange (JSE) Socially Responsible Investment (SRI) Index[14]	**FTSE4Good** and **DJSI**: companies demonstrating strong Environmental, Social and Governance (ESG) practices based on a best-in-class approach defined internally (not publicly available); **JSE**: SRI 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 Environmental, Social and Governance (ESG) practices
Banking associations	Sustainable Banking Network (SBN)[15]	**SBN**: Knowledge sharing and the development of regulatory guidance	Encourage local banks to adopt sustainable banking practices
International initiatives/ Reporting Frameworks	Principles for Responsible Investing (PRI)[16], Principles for Sustainable Insurance	**PRI**: largest global reporting project on responsible investment, signatories sign up to six principles, annually report on progress and receive feedback **PSI**: global framework for the insurance industry to address environmental, social	Better understand, prevent and reduce ESG risks and better manage and leverage opportunities; promote knowledge sharing and

[10] See the results of a survey among financial institutions by the IFC in June 2016
[11] A lack of definitions and standards and inadequate data on companies to invest in is also pointed out by the PRI input paper to the G20 GFSG, p.14: http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf
[12] http://www.ftse.com/products/indices/FTSE4Good
[13] http://www.djindexes.com/sustainability/
[14] https://www.jse.co.za/services/market-data/indices/socially-responsible-investment-index
[15] http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Partnerships/Sustainable+Banking+Network/
[16] https://www.unpri.org/

	(PSI)[17], CDP (Carbon Disclosure Project)[18]	and governance 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	improvements via transparency
Standard setters	Sustainable Accounting Standards Board (SASB)[19], International Integrated Reporting Council (IIRC)[20], CDSB (Climate Disclosure Standards Board)[21], IFC Performance Standards[22], Equator Principles[23]	**SASB**: disclosure guidance and accounting standards on sustainability topics for use by U.S. and foreign public companies in their annual filings; **IIRC**: corporate reporting framework with a focus on conciseness, strategic relevance and future orientation, including ESG into mainstream financial reports; **CDSB**: framework and guidance for reporting environmental information & 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 investment by IFC; **Equator Principles**: risk management framework for projects, adopted by financial institutions, for determining, assessing and managing environmental and social risk	Mainstream the accountability of environmental externalities and provide a holistic view on businesses' value creation by improving the availability of such data
Regulatory bodies	China Banking Regulatory Commission (CBRC)[24], Bangladesh[25]; France[26], EU Directive[27]	**China[28]**: ▪ Clear KPIs to strengthen and monitor green banking, with twelve concrete categories and guidelines to track green lending products and services. ▪ For the 21 largest banks, it is mandatory to report on their green loans on a regular basis according to the set categories. ▪ CBRC Green Credit Statistics: general numbers (seldom details) get published on an annual basis (~10 percent green loans). **Bangladesh:**	Enhance understanding of green finance, improve data quality, and increase green finance investments

[17] http://www.unepfi.org/psi/
[18] www.cdp.net
[19] http://www.sasb.org/sectors/financials/
[20] http://integratedreporting.org/
[21] http://www.cdsb.net/
[22] http://www.ifc.org/wps/wcm/connect/115482804a0255db96fbffd1a5d13d27/PS_English_2012_Full-Document.pdf?MOD=AJPERES
[23] http://www.equator-principles.com/
[24] http://www.cbrc.gov.cn/EngdocView.do?docID=3CE646AB629B46B9B533B1D8D9FF8C4A
[25] http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/IFC+Sustainability/Partnerships/Sustainable+Banking+Network/SB+Guidance+from+SBN+Members/
[26] https://www.ipe.com/countries/france/france-aims-high-with-first-ever-investor-climate-reporting-law/10011722.fullarticle, and https://www.legifrance.gouv.fr/affichTexteArticle.do?idArticle=JORFARTI000031045547&cidTexte=LEGITEXT000031047847&categorieLien=id
[27] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013L0034
[28] http://unepinquiry.org/wp-content/uploads/2016/09/4_Greening_the_Banking_System.pdf

		▪ Environmental Risk Management Guidelines, Policy Guidelines for Green Banking. ▪ Banks shall develop their Green Banking policy that introduces green finance, and report on website and to Supervision body (no defined format). **France**: ▪ Institutional investors have to disclosure GHG emissions of their portfolios as well as corresponding climate risk management (Article 173). **EU**: ▪ Large companies have to report on their environmental matters, company policies, risks and their management of those (Directive 2013/34/EU). ▪ European organizations can apply to EU LIFE grants, supporting environmental, nature conservation and climate action projects.[29]	
International Organizations	UNFCCC (United Nation Framework Convention for Climate Change[30], OECD (Organization of Economic Cooperation & Development)[31], IDFC (International Development Finance Club)[32], MDB (Multilateral Development Banks)[33]	▪ **UNFCCC**: the Green Climate Fund (GCF) finances projects that contribute to shifting to low-emissions sustainable development pathways and increasing 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 financing flows and related policy needs. ▪ **IDFC**: members agreed on a list of categories for green finance covering climate mitigation and adaptation and other environmental objectives. ▪ MDBs: jointly report on climate finance on an annual basis (no green finance tracking as yet).	

While these different definitions focus on the underlying financed activity, there is little evidence for how such data is then tracked at a broader scale. It is often either not the explicit intention of the institution to track green finance flows or stocks in the first place, or the complexity of the topic precludes any attempts to place green categorizations into precise measures. Additionally, green finance definitions must be widely applied in order to base a broader assessment on them (e.g. out of 1,553 PRI members only

[29] http://ec.europa.eu/environment/life/
[30] http://www.greenclimate.fund/funding/proposal-approval
[31] http://www.oecd.org/cgfi/about/
[32] https://www.kfw-entwicklungsbank.de/PDF/Entwicklungsfinanzierung/Umwelt-und-Klima/Zahlen-Daten-Studien/MAPPING-OF-GREEN-FINANCE-DELIVERED-BY-IDFC-MEMBERS-IN-2012.pdf
[33] http://pubdocs.worldbank.org/en/740431470757468260/MDB-joint-report-climate-finance-2015.pdf

342 report details on how they integrate ESG data in their investment approaches[34]). Furthermore, 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 a large-scale analysis. China is, to date, the only country to have introduced standardized mandatory 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 currently gaining momentum in their attempts to integrate 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 such 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[35]	Assigns each company a revenue share for: ▪ Goods, products and services which enable society to adapt to, mitigate or remediate the impact of climate change, resource depletion and environmental erosion (according to 60 chosen subsectors) ▪ Currently available for >13,000 companies
FSB (Financial Stability Board) Task Force on Climate-related Financial Disclosures[36]	Established in 2015, it consists of representatives from the private sector, is chaired by Michael Bloomberg, focusses on company disclosure: ▪ Aims to develop voluntary, consistent climate-related financial risk disclosures for use by companies providing information to shareholders (climate risk typology) ▪ Such disclosure could build on existing corporate reporting frameworks mentioned in Table 1. ▪ Plans to suggest which businesses will be required to report.
Portfolio Carbon Initiative (WRI, UNEP-FI)[37]	Climate Metrics for Asset Owners and Banks to disclose: ▪ Carbon emissions of financed projects ▪ Green vs. brown indicators for investments/ lending ▪ Carbon risk for asset owner and banks
Portfolio Decarbonization Coalition (CDP, UNEP-FI)[38]	Pledge by investors including working groups to take action: ▪ Investors commit to measure and disclose portfolio carbon footprint (according to the Montreal pledge), and ▪ Take action to decarbonize portfolios
Climpax (CDP, South Pole Group)[39]	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 (e.g. engage/ divest)

[34] http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf , p.20
[35] http://www.ftserussell.com/files/press-releases/new-green-revenues-model-ftse-russell-tracks-global-transition-green-economy
[36] https://www.fsb-tcfd.org/
[37] http://www.ghgprotocol.org/Portfolio_Carbon_Initiative
[38] http://unepfi.org/pdc/
[39] http://www.climpax.org/

New tracking approaches combining bottom-up data with top-down information	
Organization/ Initiative	New tracking approaches
SEI Metrics Project (Sustainable Energy Investment)[40]	Develop a portfolio optimization tools to reduce the exposure to the 2-degree economy for investors (assessing sustainability and policy related risks in assets): ▪ For listed equity and corporate bonds ▪ Per asset class, region and technology
2DII[41]	Climate Capital Monitor: 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 schemes on sustainability issues (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. 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 the 'how' .

Any top-down approaches usually attempt to measure the needed investment amounts for sustainable development for different sectors or countries; with none focusing solely on on green finance. Organizations such as the FAO, WHO, IEA, G20, and IPCC have published estimates on the total amounts of investment required to reach certain Sustainable Development Goals[42], and other research exists for specific sectors (e.g. a McKinsey study on sustainable infrastructure[43]). 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 (e.g. renewable energy targets and current share of electricity supply).

There has been little progress on bridging the gap between the top-down and bottom-up approaches. The two listed approaches trying to factor in policy targets into the assessment of financial risk exposure of portfolios (SEI Metrics Project), and attempting to combine information on physical assets held and their owners with current policy targets (2DII) are promising in this regard. These independent 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 far away from green policy goals.

Section 2, 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, and has been developed to try to get beyond some of these **challenges in applying existing green finance definitions to larger financial datasets.** The approach 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 estimate the green finance share based

[40] http://cordis.europa.eu/project/rcn/194638_de.html
[41] Measuring Progress on Greening Financial Markets, Briefing Note for Policymakers, 2DII
[42] UNEP Inquiry, The Financial System We Need, Aligning the financial system with sustainable development, 2015
[43] http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/next-generation-of-infrastructure

on the sectors where an economic activity is financed to inform recommendations on how to better integrate green measures into existing financial data.

Section 2: Tracking Green Finance in the Banking Sector

5) Methodology for tracking green finance flows

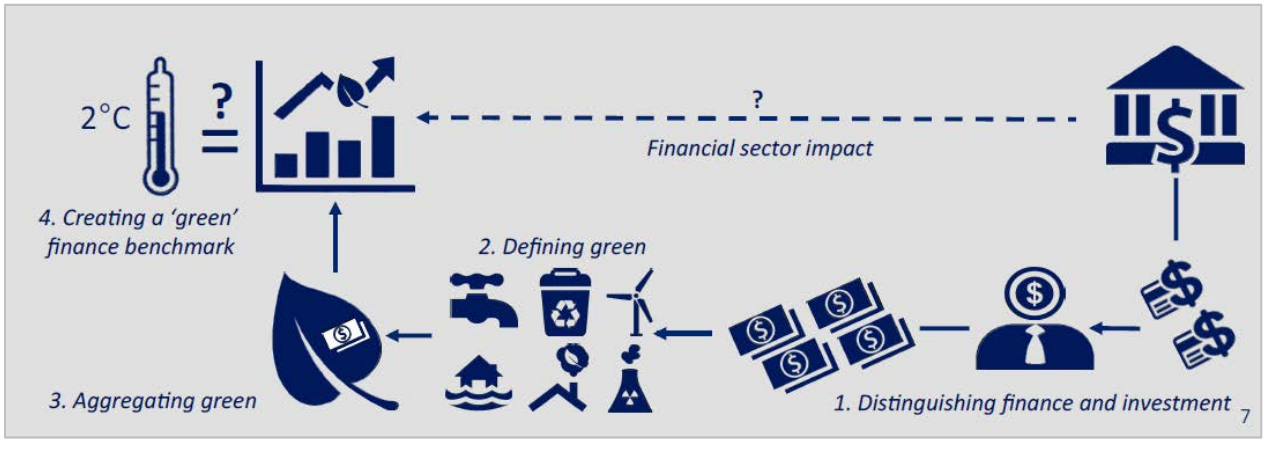
The following bottom-up approach is an initial attempt to generate a mapping of current green financial flows from the financial sector and place them in perspective with the existing demand for green finance.

First, it defines what is 'green' at a project level via the intended use of each investment, considering the activity that actually gets finance in the real economy**.** To do this, estimates are applied for the respective green share per project, based on available information about the company realizing the project or the sector it is operating in. It then aggregates the numbers per industry and on a country level. These results can finally be compared to green finance needs defined via policy targets to identify gaps and action points.

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

Challenges lie in definitions, data aggregation and interpretation. *First*, depending on the financial instrument under consideration, pure amounts invested need to be distinguished from what activities actually get financed in the real economy. *Second*, in that context it needs to be defined what activities are 'green', often through finding suitable proxies. *Third*, the data needs to get aggregated across sectors and financial instruments, connecting different data sets. And *finally*, a valid benchmark needs to be applied, namely the demand side, to derive a 'sufficient' level of green finance. The 2DII has mapped these challenges as follows[44]:

Figure 2: Challenges to measuring green finance



(Source: 2DII, Measuring progress for greening financial markets)

[44] http://2degrees-investing.org/IMG/pdf/2ii_measuringprogress_v11.pdf

6) The demand for green finance

Any figures on the existing supply of green finance need to be put into perspective vis-a-vis the demands to enable better decision making. **A proxy for a 'sufficient amount' of green finance needs to be established, ideally per financial instrument**, as linking green finance needs with the best-suited disbursement channel is important for its success.[45] This 'demand side' can be backed by information from countries' national regulations and development plans, national research institutes, and business associations or companies' strategy announcements. Even though general political targets for environmental action including climate change are set in many countries, and businesses are following with their own pledges, only a few countries and companies have announced any clear targets on how to involve the private sector in achieving the greening of the economy. Approaches on modelling finance needs in the real economy for the implementation of a zero-net carbon and green economy still remain rather abstract, especially when it comes to a breakdown for specific financial instruments. The Two Degree Investing Initiative's (2DII) suggestion of a 'Climate Capital Monitor' provides an interesting outline of how to analyze policy targets for that purpose through the linkage of 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 conclusions for required action.

7) The supply of green finance by banks

In alignment with the G20 GFSG this report considers banking, bonds and institutional investors in turn. This chapter provides an overview of green finance tracking for banks by applying the methodology outlined above. **The analysis prioritizes banking as relatively little work has been done so far to measure green banking flows.** The focus is further narrowed to the loan market as loans represent the largest share of banks' activities[46]. The challenges identified in doing this analysis are contextualized and described below, in a manner consistent with those outlined in Figure 2. The first challenge identified there, distinguishing between pure investments and actual projects financed, does not apply to loans, as they can directly finance real economy activities.

a. *Define*: Stocktaking of available data and definitions of green

To date, a meaningful and comprehensive review of green finance for lending does not exist[47]. Different data sets for the banking sector are accessible via international data providers such as BIS, Bloomberg, Bureau van Dijk, IFC, IMF and Thomson Reuters[48]. At a **country level**, aggregated data is available on total loans issued, the share of non-performing loans, outstanding debt, return on assets, etc. At the **bank level**, information on ownership structures of individual banks, mergers & acquisitions and total loans is provided. The most relevant data sets for our purpose contain the following data: **Project level** information that refers to the Use of Proceed[49] or physical activity being financed (e.g. wind park), including information about

[45] In 2014, the importance of this linkage was stressed in a study by KfW and CPI on green energy finance: https://www.kfw-entwicklungsbank.de/PDF/Entwicklungsfinanzierung/Sektoren/Finanzsystementwicklung/Veranstaltungen/2014_Symposium_Landscape-Study-Final-Version.pdf

[46] An example of is given in DNB 2016 – Time for Transition, p.73: https://www.dnb.nl/en/binaries/TimeforTransition_tcm47-338545.pdf

[47] Measuring progress for greening financial markets, Briefing Note for Policy Makers, 2DII, 2016

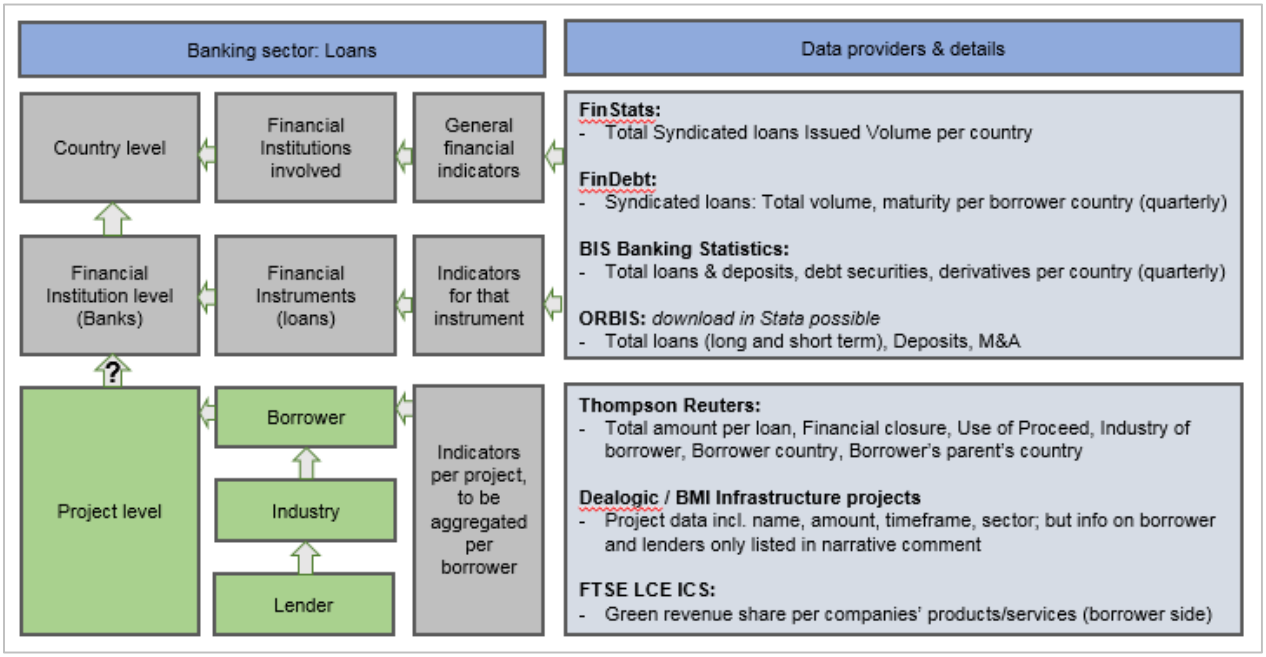
[48] An overview of data providers and their respective information can be found in the annex.

[49] The 'Use of Proceed' is a classification per investment that indicated the intended use of that investment.

financial amount, timeframe, and sometimes explicit details on that activity (e.g. production of x tons of steel) and selected impacts (carbon and water footprint, jobs provided, etc.); and **Company level** information regarding the creditor and borrower for each loan including their sector and location.

Figure 3 visualizes 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 on the *project level*, capturing what is effectively financed in the real economy. The categorization into green and conventional finance per project can then be summarized per country of headquarter of the lender (or borrower), and via different sectors. This aggregated data could finally be integrated into country or financial institution level datasets to, for example, analyze the performance of (partly) green loans compared to conventional loans issued by financial institutions in a specific country.

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



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 close date within the calendar year 2014[50]. This dataset includes 4,412 loans in total, summing up 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 pre-select sectors that can be included in the definition of "Green Finance".

[50] Meaning that the credit agreement/ facility is funded and available for withdraw.

Table 3: Available metrics defining what financed activities are green and challenges

Define green: what data is used and what are the criteria for a green project			
Metric	**Availability**	**Data provider**	**Challenges**
Data set on loans containing project level data	Private via partnership	Thomson Reuters, Bloomberg	Various data sets exist on loans. However, few provide a global picture with detailed information on 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	As outlined in chapter 4, different institutions have developed their own criteria for when they consider a project green (if they even call it green). Given the broad consensus for sectors that can be considered green as per the IFC survey, we used the listed sectors as a pre-selection to then apply estimates per sector where needed. The FTSE Russell Green Revenues model maps companies' revenue against 60 green industrial subsectors[51]. However, this list is not publicly available.

b. Estimate: Identification of proxies to calculate 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 each project.

Project level:

Whenever a Use of Proceed per project clearly falls into the green category (e.g. renewable energy), we take 100 percent of this loan as green. That way, we can account for 100 percent green projects of companies that do not fall into an entirely 'green' sector with all their activities, e.g. energy.

2.4 percent of all loans under consideration are classified with a Use of Proceed 'Renewable Energy' and can be identified as 100 percent green. Comparing this with Bloomberg loan data indicates that the numbers are reliable: According to Bloomberg loan data, 2.0 percent are classified with a 'green bond/loan' Use of Proceed[52]. This is only slightly less than the 2.4 percent in the Thomson Reuters database.

Unfortunately, out of the 127 Use of Proceed sub-level classifications available (summing up to 11 main categories)[53], only 24 are actually applied (listed in Table 4). Moreover, most of them do not provide any indication of the environmental benefits associated with the project e.g. project finance, but could be more useful in this context if they included details on the specific sector to which the financing is being directed, as this would then allow for green share estimates to be calculated for each project. Table 5 summarizes the challenges with project level information when estimating green loans.

[51] https://www.ftserussell.com/files/press-releases/new-green-revenues-model-ftse-russell-tracks-global-transition-green-economy
[52] Retrieved from Bloomberg terminal on August 13 2016
[53] A full list of all available Use of Proceeds can be found in the annex, as well as a classification of applied Use of Proceeds into 100% green, partially green, and not green at all.

Table 4: Applied Use of Proceed categories in the Thomson Reuters dataset

Category	Sub-level
Acquisition Related	Acquisition Financing
Acquisition Related	Future Acquisitions
Acquisition Related	Infrastructure LBO
Acquisition Related	Leveraged Buyout
Acquisition Related	Sponsored Buyout
General Corporate Purposes	General Corporate Purposes
Green Bonds	Renewable Energy
Investments	Investment/Loan
Other	Capital Expenditures
Other	Export/Import Finance
Other	Finance Linked Trade
Other	Operating Fund/Cash Reserve
Other	Other
Other	Restructuring
Other	Working Capital
Project Finance	Aircraft Financing
Project Finance	Project Finance
Project Finance	Ship Financing
Project Finance	Water Infrastructure
Real Estate	Construction
Real Estate	Property Acquisition
Refinancing	Refinance Bank Debt
Refinancing	Refinancing
Security Related	Standby/CP Support

Table 5: Challenges using project level information (Use of Proceed) when estimating green loans

Estimate green: from Project level information			
Metric	**Availability**	**Data provider**	**Challenges**
Use of Proceed classification per project	Allows for most detailed allocation of green investment per project, but only some can be attributed to green finance	Thompson Reuters, Bloomberg	Only a fraction of the available Use of Proceed classifications are 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 sub-level, indicating 'green' (or not) per Use of Proceed (e.g. for the real estate sector when a certified green building gets financed).

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 each industry of the borrowing companies.

Sector level:

For projects in sectors that can only partly be considered green, approximations can be derived from existing research. Approximations 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, etc. Such estimates can be found via 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, to then define if and to what extend their activities can be considered as green. The more granular the classification, the better the definition for green will be:

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

Estimate green: from Sector level information			
Metric	**Availability**	**Data provider**	**Challenges**
Global Industry Classification Standard (GICS)[54], Industry Classification Benchmark (ICB)[55]	Only for listed companies (used at stock markets)	Bloomberg	No industry classification is used consistently across different data sets. For example, ISIC is referenced in every SEC filing, however it is a bit antiquated, for example Paypal falls under the category of "Other". NAIC is more current in its categories– using ecommerce as an industry – however its granularity might be too detailed to apply to green estimates. Thompson Reuters offers TF Macro and TF Mid codes, which combine ISIC and NAICs.
(International Standard Industrial Classification (ISIC)[56], North American Industry Classification System (NAICS)[57], European classification (NACE)[58], Australian and New Zealand Standard Industrial Classification (ANZSIC)[59]	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)	Thompson Reuters (SIC and NAIC of borrower and parent company, TR's own aggregation of those)	

Company level:

If information on the project itself is not insightful, a more accurate green estimate than sector information could be derived from the activities of the borrowing company itself. The share of green investments, projects, products and services per company can be estimated via the different sources, outlined in table 7.

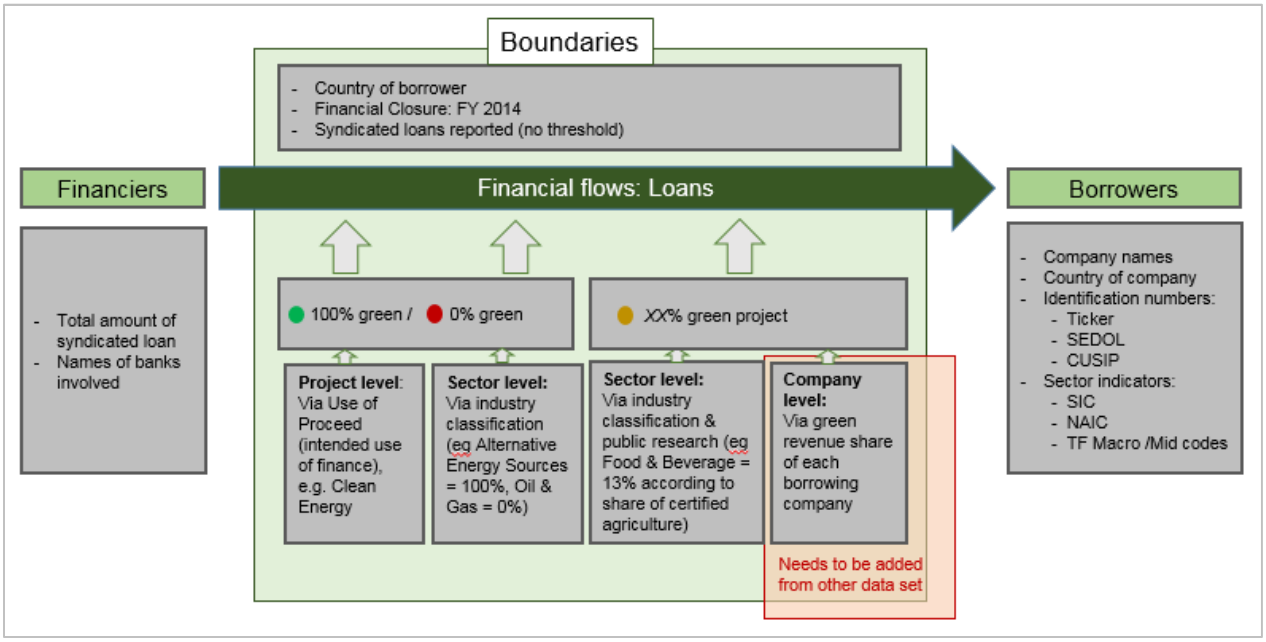
[54] https://www.msci.com/gics
[55] http://www.icbenchmark.com/
[56] http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27
[57] http://www.census.gov/eos/www/naics/
[58] http://ec.europa.eu/eurostat/statistics-explained/index.php/NACE_background
[59] http://www.abs.gov.au/ausstats/abs@.nsf/mf/1292.0

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

Estimate green: from Company level information			
Metric	**Availability**	**Data provider**	**Challenges**
FTSE LCE ICS Green revenue model[60] *(green revenue share per company)*	Indicates the portion of corporate activities in 'green' sectors according to their own methodology, covering a universe of 13,400 listed companies.	FTSE Russel	Only available for listed companies and data access might be costly.
Individual announcements in annual statements	If not available via the FTSE LCE data, portion of corporate activities in 'green' sectors can be estimated via 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 being in place, sustainability targets (reduction in carbon emission or deforestation, water usage), an external verification of environmental data etc. 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 " percent revenue from low carbon product/s" (CC3.2a)[61]	CDP Climate A List, CDP Water A List, CDP Forest Leaders[62]; Oekom Research company rating[63] (not public); GRI (Global Reporting Initiative: data on who reports)[64]	As rankings are mostly relative sector benchmarks, they do not necessarily match the definition of 'green' projects, and might be considered as not useful in this context.
Inclusion in sustainability indices	This poses the same questions on selection criteria as with rankings.	FTSE4Good Index Series[65], Dow Jones Sustainability Index (DJSI)[66]	Even if underlying information may exist as part of the research for the index composition, it is unlikely that index providers will share such granular information.

[60] http://www.ftserussell.com/files/press-releases/new-green-revenues-model-ftse-russell-tracks-global-transition-green-economy
[61] https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/guidance_docs/pdfs/000/000/227/original/CDP-Climate-Change-Information-request-2016.pdf?1456487092
[62] https://www.cdp.net/en/research#e5b0bda2d626c6063a144152e72888ca
[63] http://www.oekom-research.com/index_en.php?content=corporate-rating
[64] http://database.globalreporting.org/search
[65] http://www.ftse.com/products/indices/FTSE4Good
[66] http://www.djindexes.com/sustainability/

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



c. *Aggregate*: From project level to country and sector data

Depending on the data available and the compatibility of data sets, 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.

In addition, 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. Therefore, connecting factors must be found across datasets. This can be the unique identifiers per financed project (e.g. project ID), the operating company or the financing institution.

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

Aggregate data: via borrower or financier	
Type	**Challenges No. 3: Aggregating green**
Via Financing Institution	Due to the current availability of data, it remains challenging to attribute loans to certain financial institutions and their locations. Often, the amount contributed per bank is not displayed, but only the total amount per syndicated loan and the names of all banks that contribute.
Via Borrowing company	The database on borrowers includes data on their headquarter location. Some inaccuracies remain as, given companies' global activities, it is unlikely that this country is always with the same as the project location.
Linking different data sets	Many different identifiers are used across data sets and geographies which complicates linking different sources of information. For example, Ticker as well as ISIN (International Security Identification Number) are used only for public companies. CUSIP numbers (Committee on Uniform Securities Identification Procedures) are mostly used for products issued in the US and Canada but cover private companies. SEDOL identifiers (Stock Exchange Daily Official List) are assigned to securities by the London Stock Exchange.

d. Results: A first estimate of green loans currently supplied

Based on the availability of the data, the methodology outlined above has been applied to the Thomson Reuters data set 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 sought to pre-select possibly green sectors in alignment with the IFC Survey conducted for the G20 GFSG (see Table 3).

Step 2: Identification of data and proxies to estimate green finance shares

Due to the inconsistent application of the 'Use of Proceed' classifications, we define 'green' purely based on the industry of the borrowing company. We take a proxy for each industry (see Table 6) that can be considered as green, based on available industry studies (see below). The identified industries were grouped using Thomson Reuter's own industry classification – Thomson Financial (TF) Description prior to applying our proxies. These classifications have a broad category, TF Macro Description, and a more granular level, TF Mid Description. The TF Macro and Mid Descriptions both combine two widely used industry classification schemes, the broader ISIC and the more granular NAIC[67]. The proxies applied to these groups for the share of green activity per industry are currently 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 in industry classifications TF Mid Descriptions Alternative Energy Sources, Water and Waste Management, Power, Other Energy & Power. A manual check is applied via the Business Description of each loan to make sure it captures green projects (e.g. rule out projects including coal powered plants).
- Similarly, loans in the industry classification TF Mid Description Power can be further broken down by the Business Description. Those containing 'Hydro' or 'Wind' are selected as100% green as well (this category does not contain 'Solar').

0 percent Green: Oil & Gas, Petrochemicals, Pipelines, Coal Power

- Applied to loans in industry classifications TF Mid Descriptions Oil & Gas, Petrochemicals, Pipelines.
- In addition, loans in the industry classification TF Mid Description Power are selected here, based on a manual check to see if the Business Description excludes 'Hydro' or 'Wind'.

17 percent Green: Real Estate

- Applied to loans in the industry classification TF Macro Description 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 amongst all 1,026 survey

[67] ISIC = International Standard Industrial Classification, NAICS = North American Industry Classification System, for further clarification see Table 6

participants in 69 countries[68]. However, this estimate might be too high given a likely bias among the participants towards those who already focus on green buildings.

- For the US, the share of new homes certified with an Energy Star yields a more realistic picture. Out of all homes completed in 2015, 9.74 percent received an Energy Star.[69]
- 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: Energy Performance Certificate (EPC) in Europe, 3-star rating in China, 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 US has been taken as a proxy, resulting in a share of 16.87 percent, rounding up to 17 percent.

0.1 percent Green: Automobiles

- Applied to loans in industry classifications TF Mid Description Automobiles & Components and Automotive Retailing.
- According to BNEF, although some 1.3 million electric vehicles (EVs) have now been sold worldwide and 2015 saw strong growth, they still represent less than 1 percent of light duty vehicle sales last year[70]. In addition, according to a study by the International Energy Association (IEA), EVs account for just a tiny fraction of the global vehicle stock (0.1 percent for cars) for all transport modes except 2-wheelers[71]. Therefore, for the automotive industry, a green share of only 0.1 percent is applied.
- TF Mid Description Transportation & Infrastructure can be considered as 0.1 percent green if the Business Description refers to the automotive industry.

13 percent Green: Food & Beverages, Paper & Forest, Agriculture

- Applied to loans in industry classifications TF Mid Descriptions Food & Beverages / Food & Beverage Retailing, Paper & Forest Products, Agriculture & Livestock:
- It is difficult to set a green share for these industries, due to the wide variety of companies' activities, ranging from certified raw materials such as sugar cane, 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 (GAP) for soil management, water management, animal production, health and welfare, working conditions, health and safety, public health, and biodiversity.[72] In 2012, production compliant with global standards accounted for 40 percent of coffee production, 22 percent of cocoa production, 15 percent of palm oil production, and nine percent of forest land[73]. Taking the average of these shares as a rough indicator, the global green share of agriculture can roughly be considered as 13

[68] http://fidic.org/sites/default/files/World%20Green%20Building%20Trends%202016%20SmartMarket%20Report%20FINAL.pdf
[69] https://www.energystar.gov/index.cfm?fuseaction=qhmi.showHomesMarketIndex
[70] https://about.bnef.com/press-releases/electric-vehicles-to-be-35-of-global-new-car-sales-by-2040/
[71] International Energy Agency (IEA), Clean Energy Ministerial, and Electric Vehicles Initiative (EVI) (May 2016). " Global EV Outlook 2016: Beyond one million electric cars" (PDF). IEA Publications. See p.8 and 19..
[72] https://www.ceres.org/files/case-studies/sustainable-agriculture/at_download/file
[73] http://www.iisd.org/pdf/2014/ssi_2014.pdf, p.27

percent. However, progress is slow. For example, half of the companies with commitments to source certified soy are yet to get any into their supply chains[74].

10 percent Green: Infrastructure & Transport

- Applied to loans in industry classifications TF Mid Description Infrastructure & Transportation, excluding Business Description referring to automotive:
- Several studies exist addressing this industry, however, no clear estimate of a green share could be found. For the time being, as share of 10 percent has been used for the calculations as a best guess.
- Fitch Group BMI Research provides general data about the infrastructure sector, but not specifically on green infrastructure investments[75]. Similarly, IJ Global (Infrastructure Journal) published league tables on infrastructure investments per company, sector and value, but without the identification of green projects.[76]
- According to a 2016 McKinsey report, current infrastructure spending of $2.5 to $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[77]. The study looks at Energy, Transport, Water and waste, and Telecom, with energy and transport making up two-thirds of the needs. Barriers often lay in the lack of transparency of bankable project pipelines and viable funding models, inadequate risk-adjusted returns and unfavorable policies. However, infrastructure also includes airports, roads, railways, shipping, and public transportation.
- Progress on measurement is underway: The Institute for Sustainable Infrastructure (ISI) recently developed a sustainable infrastructure rating system utilizing 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[78]. The OECD publishes research on each transportation area[79], and various other organizations exist to promote sustainable infrastructure (e.g. the Sustainable Shipping Initiative), but data is rarely available.
- Another upcoming initiative is 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 is currently being developed through a pilot phase during 2016[80].
- Finally, the Global Infrastructure Basel (GIB) Foundation is a Swiss foundation based in Basel 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[81].

[74] CDP Forest Report 2015, https://b8f65cb373b1b7b15feb-c70d8ead6ced550b4d987d7c03fcdd1d.ssl.cf3.rackcdn.com/cms/reports/documents/000/000/651/original/CDP-global-forests-infographic-2015.pdf?1470409819
[75] http://www.bmiresearch.com/
[76] https://ijglobal.com/
[77] http://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/next-generation-of-infrastructure
[78] http://sustainableinfrastructure.org/envision/how-it-works/
[79] http://www.oecd.org/greengrowth/greening-transport/transport-and-environment.htm
[80] https://www.gresb.com/infra/home
[81] http://www.gib-foundation.org/gib-foundation/

Step 3: Aggregation of green finance data – Findings

The application of the sector estimates mentioned above allows for an analysis of the total green share for loans (both as a share of the number of loans issued and their dollar value), as well as by 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. The total green share of those loans is $164.7 billion (14.95 percent), spread across 3,610 loans with some green share attribution.

82 percent of all syndicated loans that closed in 2014 (number) financed projects in sectors with some green activities, the remaining 18 percent financed activities in sectors that cannot be considered green at all.

Considering the total monetary value of all loans in 2014, we estimate that almost 15 percent went into green finance, by **applying the proxies for the green share per sector.**

Figure 5: Share of green loans per total loans, displayed per number of loans and per $mil amount

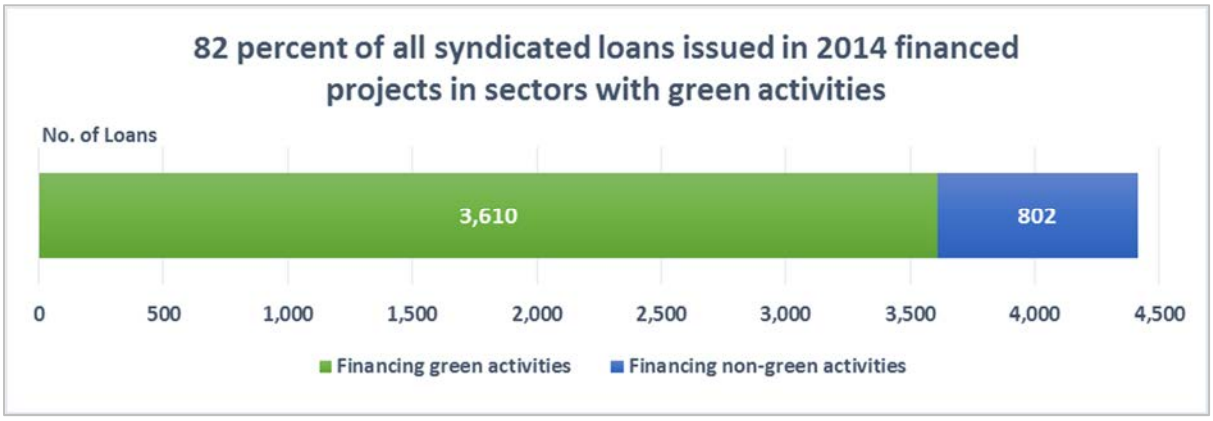
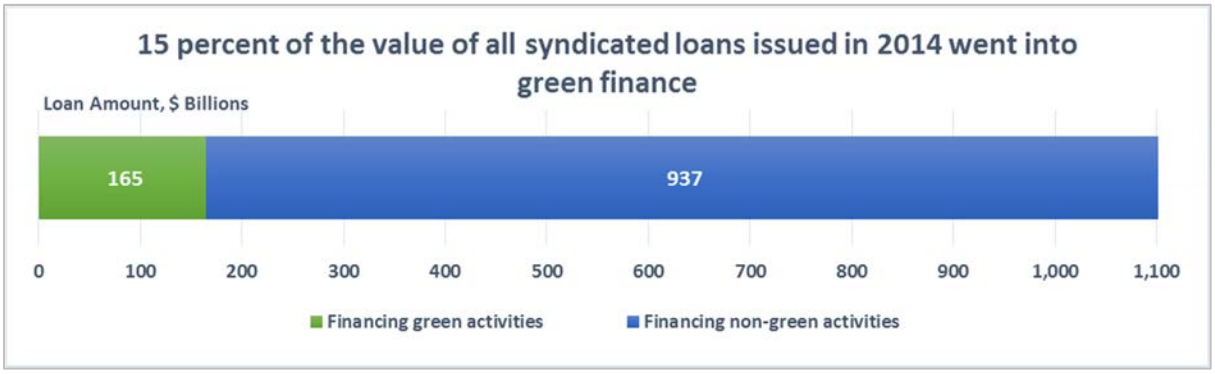
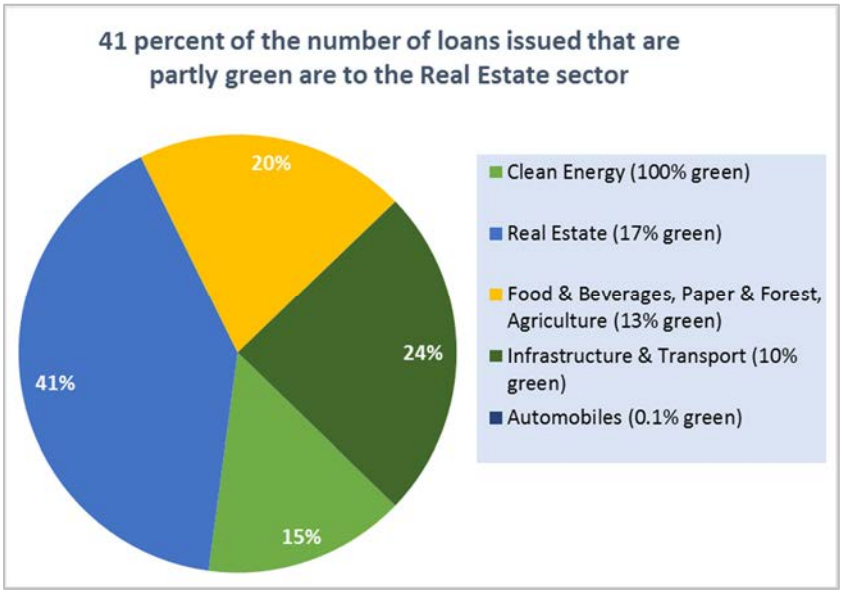


Figure 6: Share of green loans per total loans, displayed per $mil amount



Only looking at the universe of partly green loans (82 percent of all loans) and further at their monetary share attributed to green activities, the majority of these finance flows go into green Real Estate projects (38 percent) and Clean Energy projects (31 percent).

Figure 7: Distribution of green loans (as a monetary share of total loans) per industry



Looking at distribution of the monetary value of green loans per country, the largest share of the global total goes to the US, accounting for 35 percent, followed by the United Kingdom with only 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 approximately 4 percent of the total global loans value. These differences might be due to the large size of the US loan market overall, and also due to a potential bias in the dataset containing more information about the US and other developed markets than other geographic areas.

Considering emerging markets independently, among World Bank Group client countries, borrowers in the following countries received the most financing through green loans from private financial institutions in 2014[82]: 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. 40 percent of the remaining emerging market countries received amounts between $100 and $500 million, and the remaining 60 percent amounts below $100 million.

[82] http://cmsdata.iucn.org/downloads/wb_client_countries.pdf

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

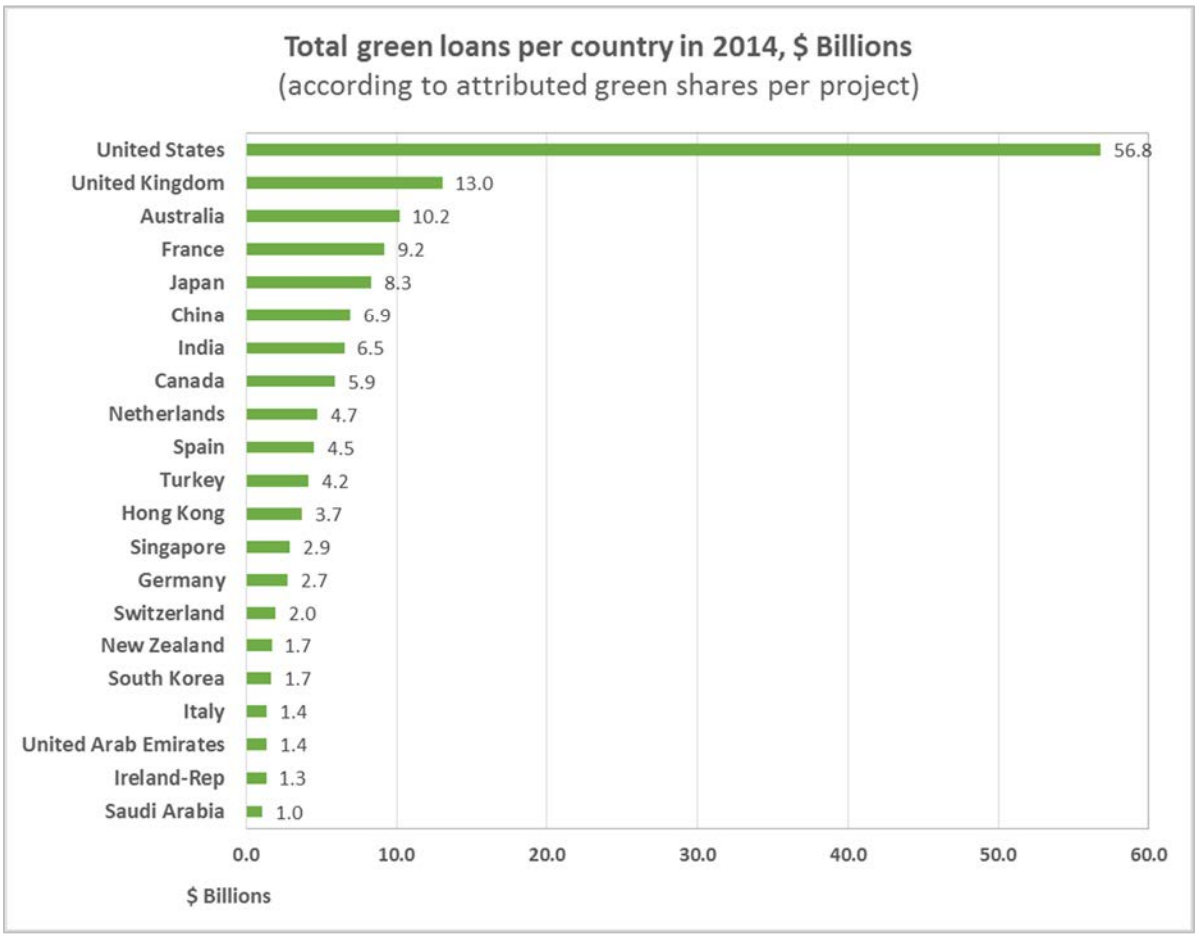
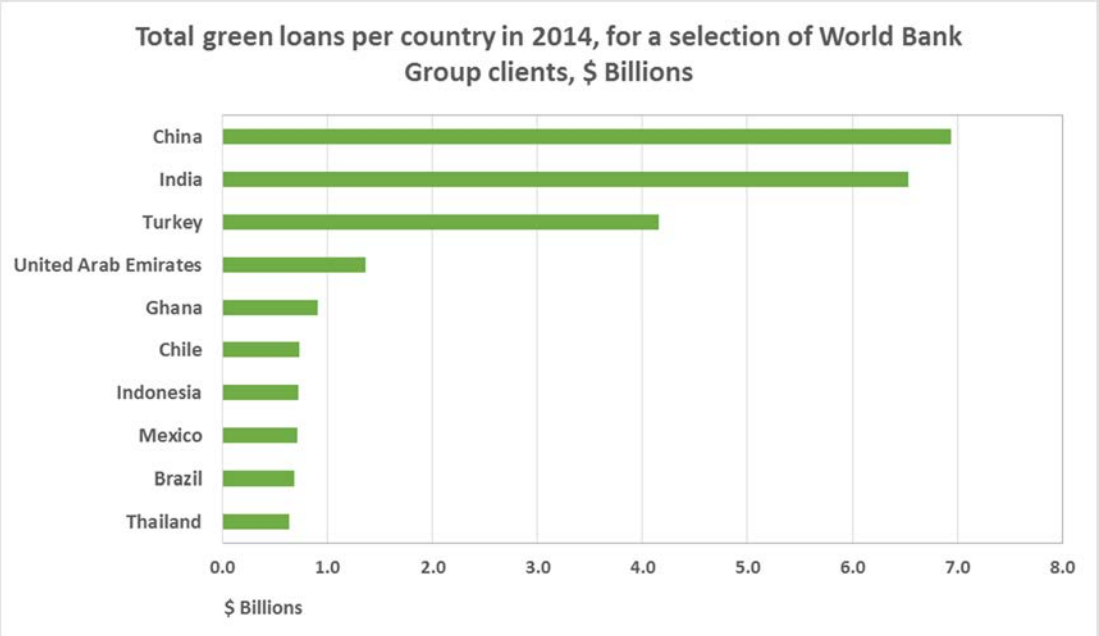


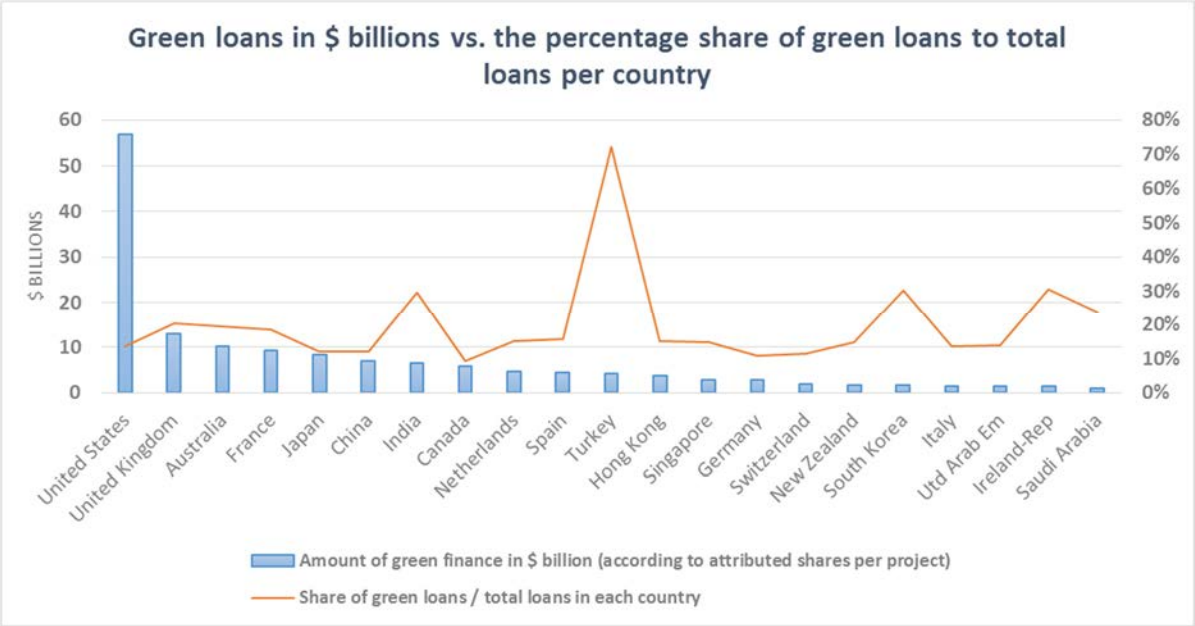
Figure 9: Distribution of green loans (as a monetary share of total loans) across for selected World Bank Group clients



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 (as stated above) 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 all loans in our data set to borrowers in Turkey go into alternative energies or transportation systems.

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

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



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 (CBRC), 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 approximately $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 harder for them to track or account for green investments.

This report's finding of approximately 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 data set used for this analysis and the proxies applied for green shares per sector.

First, the Thomson Reuter global data set on syndicated loans has a potential bias towards the US, where most loans are reported. Additional data sets focusing the emerging markets should be considered for a more holistic view of the loan market, especially as the analyzed data set does not contain enough loans for some emerging market countries to draw representative conclusions

Second, the applied estimates for the shares of green activities per sector reflect insights from current public research, and remain very 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.

By all means, the results of this analysis should be seen critically. However, they provide indicative insights and suggestions for where and how to improve existing data on green loans (see chapters 10 and 11 for specific recommendations).

Section 3: Bond Market and Institutional Investors

8) Green finance in the bond market

a. Stocktaking of definitions for the green bonds market

This chapter provides an overview of green finance tracking for bonds.

The green bond market represents the financial instrument furthest evolved in terms of green finance definitions and tracking. In 2014, the **Green Bond Principles (GBP)** were issued by a group of international banks, investors, and issuers, in collaboration with the International Capital Market Association (ICMA). 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 per green bond investment, and help underwriters facilitating transactions through standard disclosure processes[83]. Several guidelines and regulations issued since then have built on the framework of the GBP. The G20 GFSG input paper 6 provides an in-depth overview on green bond guidelines, challenges, and a future outlook including recommendations on how to grow the market further[84].

Table 9: Green Bond guidelines, standards and regulations

Guideline/ Standard/ Regulation	Voluntary/ mandatory	Details
ICMA: Green Bond Principles (**GBP**)[85]	Voluntary	▪ Launched in 2014 under coordination of the International Capital Markets Association (ICMA) ▪ 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 & control; sustainable management of living natural resources; terrestrial and aquatic biodiversity conservation; clean transportation; sustainable water management; climate change adaptation; eco-efficient products, production technologies and processes
CBI: **Climate Bond Standard** (incl. the Climate Bond Taxonomy) [86]	Voluntary	▪ Standard developed by the CBI on third party verification, functions as a screening tool for investors and governments ▪ Fully incorporates the GBP, 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, co-generation, infrastructure adaptation and resilience

[83] http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/green-bonds/green-bond-principles/
[84] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[85] file:///C:/Users/Laura/Downloads/GBP-2016-Final-16-June-2016.pdf
[86] http://www.climatebonds.net/files/files/Climate%20Bonds%20Standard%20v2_0%20-%202Dec2015%20(1).pdf

China: Green Financial Bond Guidelines; Green Bond Endorsed Project Catalogue[87]	Mandatory for green bond issuers	▪ Published by PBOC (People's Bank of China) and China Society of Banking and Finance ▪ Aligned with GBP and CBI's standard ▪ Quarterly reporting is mandatory, incl. details on Use of Proceed ▪ Most issuers obtain third party verification
India: Green bond requirements[88]		▪ Published by Securities and Exchange Board of India (SEBI) ▪ Follows GBP, turning some recommendations into requirements, seen as a tool to meet India's Nationally Determined Contribution (NDC) 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 disclosure in annual report
France: 'Transition Energetique Climat' label[89]	Mandatory	▪ To be awarded the label, green funds are required to invest in particular in green bonds aligned with the GBP and CBI Taxonomy
Sweden: Aggregation of single green loans into a portfolio[90]	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 bon proceeds to the portfolio of eligible loans
Stock Exchanges[91]	Mandatory	▪ Stock exchanges in London, Luxembourg, Mexico, Shanghai and Shenzhen are developing minimum requirements for listing of green bonds
KfW: minimum requirements based on GBP[92]	Mandatory	▪ public-law institution based in Germany, providing loans to mega trends ▪ defined minimum criteria based on GBP
Paris Green Bonds Statement (PGBS)[93]	Voluntary	▪ 27 global investors representing over $11.2 trillion of total AUM issued the PGBS 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

b. Available data on green bonds

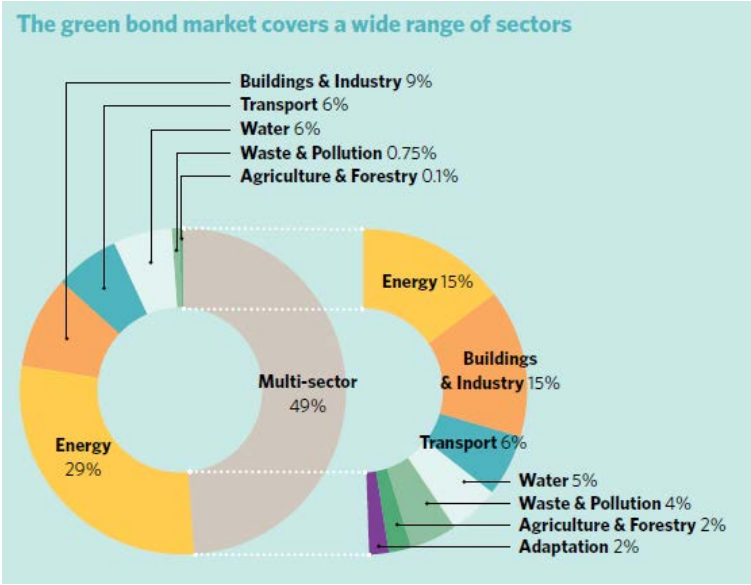
For the past five years, the Climate Bonds Initiative and HSBC have published an annual report on the state of the green bond market[94]. In their 2016 report, the size of **the global bond market has been estimated as a total of $90tn, with $694bn climate-aligned bonds, of which $118bn are labeled as green bonds (17 percent)**. There are six themes for the entire universe of climate aligned bonds: Transport, Energy, Multi-sector, Buildings & Industry, Water, Waste & Pollution Control and Agriculture & Forestry.

[87] http://www.icmagroup.org/News/news-in-brief/new-official-rules-for-chinese-green-bond-market/
[88] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[89] http://www.developpement-durable.gouv.fr/Le-label-transition-energetique-et.html
[90] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[91] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[92] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[93] http://www.climatebonds.net/2016/01/today-cop21-27-global-investors-representing-11trn-aum-back-paris-green-bonds-statement
[94] https://www.climatebonds.net/resources/publications/bonds-climate-change-2016

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

Climate-aligned bonds ($694bn)	Subset: Labeled green bonds ($118bn)
▪ Transport (mostly rail) is the by far largest theme making up a third of the universe (67 percent) ▪ The majority of issuance is from government entities ▪ The majority of issuance has tenors longer than ten years, and amounts larger than $100m ▪ The dominating currency is Chinese Yuan Renminbi (RMB) with 35 percent of bonds, followed by USD (23 percent) and EUR (16 percent)	▪ The sectors Buildings & Industry and Energy dominate here with 58 percent, while Transport is low (12 percent) as specific bonds for that sector are relatively new (see figure 5) ▪ 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 ten years ▪ The dominating currencies among labeled green bonds are USD and EUR (together 80 percent), followed by RMB ▪ Similar to recent years, approximately 60 percent of the labeled green bonds have received an external review, reconfirming the labels' credibility. ▪ The Chinese government has announced it will issue $46bn (RMB300bn) of labeled green bonds in 2016 alone[95]. With $18.5bn issued between January and July 2016, China accounts for about 42 percent of global issuance during the same period.

Figure 11: Labeled Green Bonds and sector coverage



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

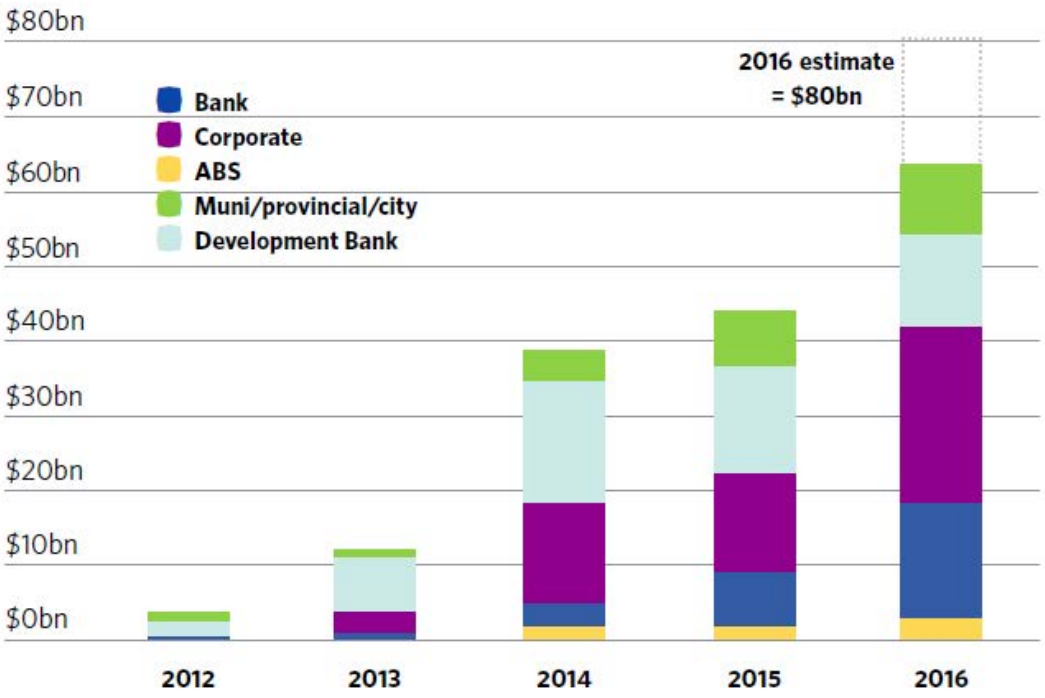
According to the G20 GFSG Input Paper on bonds, the annual issuance of labeled green bonds rose from just USD 3 billion in 2012 to USD 47.8 billion in 2015 (slightly more than the CBI figure) with issuance occurring in 14 of the G20 markets[96]. Annual issuance of green bonds has quadrupled between 2013 and 2015. As of October 31, total 2016 issuance is already 50 percent greater than the 2015 total. Moody's has estimated that total issuance of green bonds in 2016 will be USD 80bn[97].

[95] As cited in the Climate Bond Initiative and HSBC, Bonds and Climate Change State of the Market, 2016: http://finance.china.com.cn/money/bank/

[96] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf

[97] Climate Bond Initiative, Green Finance: Green Bond Directions, COP22, November 2016

Figure 12: Labeled Green Bond Issuance and Market Composition over time



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

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 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 currently only represent 17 percent of all identified climate-aligned bonds indicates the large potential for growth. According to Bloomberg data, the labeled green bond market has some $130bn of debt outstanding as of July 2016, or just 0.15 percent of the total global fixed income market[98], consistent with an estimate of below 0.2 percent by the Climate Bond Initiative (CBI)[99]. **Non-labeled climate-aligned bonds are currently captured if bond issuers derive 95 percent of their revenue from climate-aligned assets**. There are certainly many more bonds that could be identified as green if the respective project details would be known. However, information on a 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 GRI[100] or CDP[101] as significant drivers for large corporations to tap the green bond market, as they enable companies to

[98] https://www.blackrock.com/investing/literature/whitepaper/bii-climate-change-2016-us.pdf
[99] http://unepinquiry.org/wp-content/uploads/2016/09/6_Green_Bonds_Country_Experiences_Barriers_and_Options.pdf
[100] https://www.globalreporting.org/Pages/default.aspx
[101] www.cdp.net

demonstrate the credibility of their activities via labeled green bonds[102]. 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 in the near future.

9) Green finance among institutional investors

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

a. 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[103]. They have identified 19 initiatives, with more than 400 investors participating from 40 countries with a total of $25 trillion in assets under management. The **initiatives are classified in four categories: Measure, Engage, Reallocate, and Reinforce**.

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

Measure	▪ *PRI Montreal Pledge*
Engage	▪ Aiming for A ▪ Carbon Asset Risk ▪ CDP Carbon Action ▪ Ceres Shareholder Initiative on Climate & Sustainability ▪ GES Carbon Risk Engagement ▪ IIGCC Initiative on EU 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 Registry
Reinforce	▪ Global Investor Statement on Climate Change ▪ *CDSB Fiduciary Duty Statement (led by the Climate Disclosure Standards Board)* ▪ Climate Bond Initiative ▪ EU and G20 Governments to enable more investment in energy efficiency ▪ Investor Expectations for Oil & Gas Companies ▪ Investor Expectations on Corporate Climate Lobbying ▪ Statement of Investor Expectations for the Green Bond Market ▪ Other Actions

The initiative considered as most relevant for green finance tracking is the *Portfolio Decarbonization Coalition (PDC)*, an important driver in 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' *(CDSB) Fiduciary Duty Statement*. This encourages companies of all industries to publish information on climate-related corporate performance, risks and opportunities alongside mainstream corporate reports, stressing

[102] The percentage of companies reporting to CDP who have active emissions-reduction initiatives has increased from 47% in 2010 to 89% in 2015, http://www.eticanews.it/wp-content/uploads/2016/05/GreenBond_ReportAnnuale_StandardandPoors.pdf
[103] http://investorsonclimatechange.org/

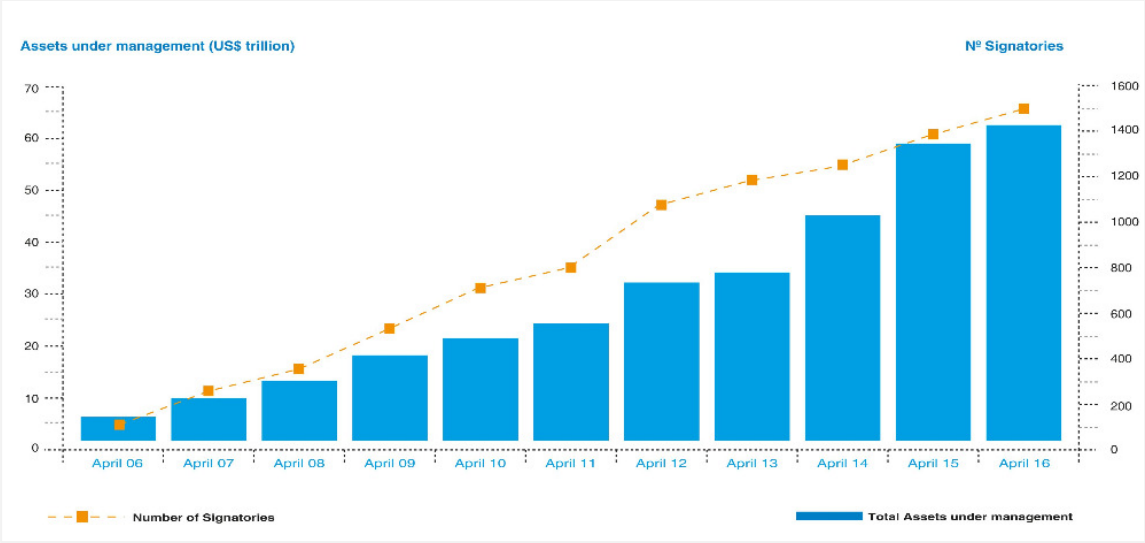
that the economic effects are tangible and have implications for the relevant prospects of firms, industries and investment portfolios[104]. The CDSB Framework for reporting environmental information & natural capital not only focuses on climate-related issues but is designed to help organizations prepare and present environmental information in mainstream reports for the benefit of investors.

Investors themselves report to the Principles of Responsible Investment (PRI) if they are members. PRI is an investor initiative in partnership with the UNEP Finance Initiative and UN Global Compact, advocating for responsible investments. It works to understand the investment implications of environmental, social and governance (ESG) factors and to support its international network of investor signatories in incorporating these factors into their investment and ownership decisions[105]. Signatories sign up to six principles:

- We will incorporate ESG issues into investment analysis and decision-making processes.
- We will be active owners and incorporate ESG issues into our ownership policies and practices.
- We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- We will promote acceptance and implementation of the Principles within the investment industry.
- We will work together to enhance our effectiveness in implementing the Principles.
- We will each report on our activities and progress towards implementing the Principles.

Since its founding in 2006, the number of signatories has grown from 100 signatories representing $6.5 trillion assets under management (AUM) to **1,553 members in September 2016 with $62 trillion AUM. 1,072 signatories have reported on their activities on ESG investing in 2015**, and while individual responses are not public, parts of the data can be accessed by member organizations. The largest number of signatories are in the European Union (696) and the US (256), followed by Australia (118), Canada (76), Brazil (57), South Africa (52), Japan (39) and China (17)[106].

Figure 13: PRI signatories and assets under management (US$ trillion)



Source: PRI website[107]

[104] http://www2.cdsb.net/fiduciarystatement/statement
[105] https://www.unpri.org/about
[106] http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf
[107] https://www.unpri.org/about, retrieved September 13, 2016

Each member receives feedback on their reporting, assessing their performance against peers. In order to underpin the implementation of their principles, PRI recently announced that they will be more vocal on members' performance in the future, naming leaders and laggards and be more transparent regarding their scoring and data availability[108].

As the G20 GFSG input paper 3 on Institutional Investments outlines, **several challenges need to be addressed in order to increase actual investments into green finance[109]**. 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's expertise. A legal review that was undertaken recently in seven G20 countries finds that in all cases, failure to consider material green issues is a breach of fiduciary duty[110]. Consequently, due diligence material such as green funds and credit ratings need to improve to decrease investment risk. Finally, investment opportunities 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 matched as investors are usually interested in larger investments.

b. Available data on green investments

Mainstreaming is underway in the global investment industry. However, 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, and its systematic assessment availability is limited. **Overall, while awareness seems to be widespread, implementation looks poor.**

Climate-related data is captured more widely: Bloomberg New Energy Finance (BNEF) provides the most comprehensive dataset in that area. The Global Investor Coalition on Climate Change created the Low Carbon Investment (LCI) registry in 2014, the first public, online database showing examples of global low carbon investments made by institutional investors[111]. And several large institutional investors have made individual announcements of how much they will invest in clean energy, sustainable investing, green bonds etc.; the G20 GFSG input paper 3 gives a good overview of leaders in that area.

PRI provides some comprehensive figures on sustainable investments: As at 2015, approximately 63 percent of professionally managed assets globally were held by PRI signatory investment managers ($46.3 out of $74 trillion), or 56 percent without double counting[112]. 455 signatories (42 percent out of total 1,072) held a total of $ 1.3 trillion Assets under Management (AUM) in ESG themed investments, or $1.2 trillion without double counting. Thus, **only 2.1 percent of total AUM held by PRI signatories are ESG themed investments**.

A joint study by PRI and Accenture finds that **76 percent of investors already see sustainability as a differentiator in determining industry leaders**[113]. PRI statistics provide further insights about listed equity being the most commonly held asset class for their signatories[114].

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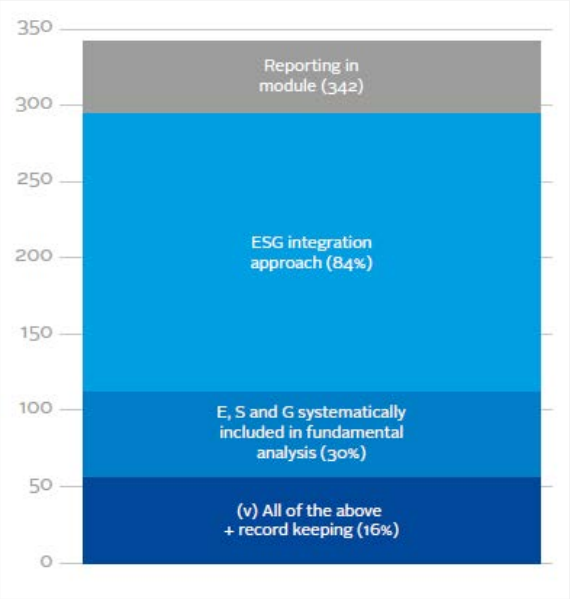
[108] https://www.environmental-finance.com/content/analysis/pri-to-expel-poor-performers.html
[109] http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf
[110] http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf quoting http://www.unepfi.org/fileadmin/documents/fiduciary_duty_21st_century.pdf
[111] http://globalinvestorcoalition.org/low-carbon-investment-registry/
[112] PRI Report on Progress 2015: https://www.unpri.org/download_report/13718
[113] https://www.accenture.com/t20150523T042350__w__/us-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_15/Accenture-Investor-Study-Insights-PRI-Signatories.pdf
[114] PRI Report on Progress 2015: https://www.unpri.org/download_report/13718

- Within listed equity, the proportion of investment managers incorporating ESG into decision-making grew to 95 percent in 2015, from 93 percent the year before. **342 investors reported further details**:
- The most commonly reported ESG incorporation strategy remains the integration of ESG factors into buy-sell-hold decisions with 84 percent (286) of respondents[115].
  - Only 30 percent (103) do so as part of fundamental analysis.
  - **Only 16 percent (56) keep systematic records on ESG integration influence on actual decision-making**.
- 76 percent (259) positively or negatively screen stocks based on ESG considerations.
- 36 percent (108) manage ESG-themed funds.

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



Source: PRI Report on Progress 2015

[115] http://unepinquiry.org/wp-content/uploads/2016/09/3_Greening_Institutional_Investment.pdf , p.20

Section 4: Conclusions and Recommendations

This analysis shows that a lot of work has been developed by different actors to gain traction regarding incentivizing and also measuring green finance. It proves that it is possible to roughly estimate green finance flows through private financial institutions. However, it also highlights that further 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. For ***banking***, existing tracking processes on loans should be improved; while ***institutional investors*** need to develop clear approaches in their decision making to move from awareness to implementation.

Only a better understanding of the status quo of green finance will allow for a thorough analysis against policy targets and to derive implications for multinational organizations, national governments and regulators, the private financial sector, and data providers and standard setters. China provides an example for a regulation on banks to disclose their green loan data on a regular basis. Other countries considering such regulations should build on the learnings both from China's policy implementation as well as from any insights gained by the data collected. The following next steps outline specific action points for each stakeholder group to improve the tracking and thereby the shaping of green finance in future, by leveraging existing sources of green finance information.

10) Short term steps: Raise awareness, understand and improve current practice

Multinational Organizations
▪ **Analyze clients' demand for green finance:** Especially for Multinational Development Banks, it is crucial 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 SBN meetings, COP side events, or working groups at organizations such as UNEP-FI, WRI, WEF, 2DII, CDP, GRI, IIRC and standard setters (e.g. SEC, CDSB, and the new ISO standard on climate finance).
National Regulators
▪ **Understand market players' current practice of green finance tracking:** To develop explicit regulations and guidelines for green finance in the medium term, policy makers need to gain insights into local market player's practice on green finance tracking, both in broader terms, but also in detail considering data compilation (who tracks what). ▪ **Understand and articulate national needs for green finance:** For the implementation of policy targets to reach the Paris Agreement and SDG, national plans need to get translated into clear indicators per sector and ideally the different financing instruments needed for the planned transitions. ▪ **Promote transparency and standardization in financial data sets:** 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 'Use of Proceeds' classifications where already used:** One easy way to improve the quality of existing data is to ensure a consistent application of the Use of Proceed classification indicating the use of each project finance. ▪ **Institutional investors - integrate existing ESG criteria more resolutely into decisions:** In order 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 data sets, data providers should put more emphasis on sustainability, climate and green indicators, to address new data needs. ▪ **Engage with peers to increase consistency in indicators across data sets:** For a better usability of data sets, company unique identifiers and industry classifications should be harmonized, and a joint typology around green finance should be developed.

11) Medium term steps: Develop a comprehensive system for green finance tracking

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 (SDG), 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 interests and existing approaches to green finance by different actors, recommendations need to be put into action and consistent green tracking standards need to be developed that are coherent with policy targets. Organizations such as IFC, SBN, UNEP-FI, WRI, WEF, 2DII, CDP, IIRC, CDSB and GRI are well placed to facilitate such processes. ▪ **Link bottom-up approach on green finance with top-down research:** Organizations such as the FAO, WHO, IEA, G30, and IPCC 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 in the future[116].
National Regulators
▪ **Develop new regulations for banking, bonds, and institutional investors:** Without regulations, standardizations rarely happen or take 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 e.g., China's green banking regulation:** China provides an example for regulating the tracking of green bonds and green lending. Other countries should consider this example when developing own regulations.
Private Financial Sector
▪ **Bank lending - build on the green bonds experience**: The Green Bond Principles (GBP) provide a positive example for clear definitions and tracking mechanisms across the industry. Similar processes should start for the loan market, and possibly also for equity investments labeling. The tracking could be done via a new data point, or integrated into existing measures such as Use of Proceeds categories. ▪ **Institutional investors - integrate 'green revenue' data point 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 of individual research.
Data Providers & Standard Setters
▪ **Advocate for better data on green activities at company level:** A 'green revenue share' data point could be integrated into existing reporting procedures, such as CDP, GRI, or integrated annual reports (IIRC), and thereby into Bloomberg terminals and other financial data sets by provided such as Thomson Reuters, Bureau van Dijk etc. ▪ **Development of 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 (data sets) and services (research) could provide a new business model for data providers.

[116] UNEP Inquiry, The Financial System We Need, Aligning the financial system with sustainable development, 2015

Annex: 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 data set 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 data set (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	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%
Ireland-Rep	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%

sian Fed	RU	0.4	0.2%
Philippines	PH	0.4	0.2%
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	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 Is	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 Rep	DR	0.0	0.0%
Ecuador	EC	0.0	0.0%
Kenya	KE	0.0	0.0%
Lithuania	LT	0.0	0.0%
Slovak Rep	SV	0.0	0.0%