



Green and Sustainable Finance: Markets and Instruments

5

■ Learning Objectives

After completing this reading you should be able to:

- Define and describe sustainable, green, and climate finance and understand their application.
- Identify trends and flows in sustainable and climate finance.
- Describe green, social, and sustainable bonds.
- Explain the core components of the Green Bond Principles.
- Explain green loans and their markets.
- Define and describe sustainability-linked bonds and loans.
- Explain the core components of Sustainability-Linked Loan Principles and Sustainability-Linked Bond Principles.
- Describe sustainable funds, green funds, and other sustainable finance products.
- Understand the integration of ESG and climate issues into investment and lending decisions.

- Understand how shareholders impact sustainability strategy of a company.
- Describe the existing and emerging approaches to defining sustainable and green finance.
- Explain the trends in ESG disclosure requirements for companies.
- Identify regulatory trends in sustainable and green finance.

This chapter focuses on financial-market developments relating to sustainability issues and climate-related risks and opportunities. The chapter begins by explaining what constitutes “green” and “sustainable” finance and covers trends and investment flows. It then includes a detailed examination of specific sustainable and green finance instruments and products, such as green bonds, green loans, and sustainability-linked bonds and loans. The chapter considers the integration of environmental, social, and governance (ESG) issues into investing, both through analysis and through investor engagement. The chapter finishes with existing and emerging taxonomies and regulatory definitions, building on the policy material covered in Chapter 4.

Key Learning Points

- Sustainable finance** refers to any kind of financial product or service that takes sustainability into account. **Green finance** is specifically environmental financing, and **climate finance** is climate-related financing. However, climate finance often refers to the use of public-sector funds.
- Sustainable finance and climate finance have both seen significant **growth** in recent years. The single largest actor providing financial flows for climate projects are public-sector development banks. The growth in membership and total size of climate- and sustainability-related private-sector coalitions highlights their importance.
- Green bonds** are bonds whose proceeds are earmarked for environmental projects. They combine several innovations: They are separately labeled, their proceeds are ring-fenced, and the (planned) use of proceeds is reported both to prospective bondholders *ex ante* and to current bondholders once projects are implemented.
- Other sustainable financial instruments include **social bonds**, where proceeds are earmarked for social benefit; **sustainability bonds** with dual environmental and social benefits; **green loans**, which are similar to green bonds but are loans; and **sustainability-linked bonds and loans**, where the bond coupon or loan interest rate is tied to the achievement of sustainability targets.
- The market for **sustainable funds** is large and growing and consists of both funds composed of sustainable instruments (e.g., green bond funds) and funds with shares in sustainable companies.
- Many financial institutions practice **ESG integration**, which involves using and collecting data on material ESG issues, integrating it into investing and lending decisions, and engaging with investee companies.
- As the market has matured, there is greater regulatory involvement and a move to **standardize** definitions across borders.

Chapter Outline

- 5.1 Introduction to Green and Sustainable Finance
- 5.2 Trends and Flows in Sustainable and Climate Finance
- 5.3 ESG and Climate Integration: Engagement and Asset Allocation
- 5.4 Sustainable Financial Products
- 5.5 Existing and Emerging Definitions and Taxonomies

GREEN AND SUSTAINABLE FINANCE: MARKETS AND INSTRUMENTS

5.1 Introduction to Green and Sustainable Finance

The awareness of sustainability has moved from development and international public discourse into private-sector corporations, including financial-market participants. Building on the examination of sustainability and corporate social responsibility in Chapter 2, this chapter looks specifically at the application of sustainability, especially in regard to environmental and climate issues and finance. **Sustainable finance** refers to any kind of financial activity that takes sustainability into account, across asset classes (including equity, debt—both bonds and loans—and other asset classes such as commodities or derivatives) and across different products and services, ranging from corporate loans to mutual funds with shares of sustainable firms, offered to retail investors. **Green finance** refers to sustainable finance focused on environment-related risks and opportunities—often, but not necessarily, climate change. Other topics falling under the “green” categorization can include waste management, water usage, conservation of natural habitats, and mitigating biodiversity loss. **Climate finance** refers exclusively to financial flows relating to climate change, whether mitigation or adaptation, but it has historically been associated with the public sector more than with private-sector funding.

Sustainable finance, both in its broadest sense and relating to its subtypes like green or climate finance, has been rapidly growing in popularity. Its growth can be measured in all sorts of ways, from assets under management invested in sustainable ways to the proliferation of specific sustainable financial instruments.

Given the increasing awareness of sustainability, there has been a temptation and tendency on the part of financial firms to label their offerings or their practices “sustainable” without a harmonization of definitions. Industry standards and oversight has evolved both through self-policing from industry associations and as a result of regulatory action. There is also increasing consensus on how to integrate

environmental, social, and governance factors into lending and investing practices, specifically scores and metrics for portfolio analysis. Further, sustainability is an area where the use of specific, defined, and labeled sustainable financial instruments, such as green bonds, has become more popular.

In general, the trend toward sustainable finance transactions, products, and offerings has been carried out by mainstream banks, insurers, asset managers, asset owners, stock exchanges, ratings agencies, and other parts of the financial system, sometimes through a dedicated sustainability division. There has also been a rise in smaller, specialist pure-play green or ESG financial firms.

5.2 Trends and Flows in Sustainable and Climate Finance

This section reviews trends in assets and flows in sustainable finance, an area that has seen significant growth in recent years. According to a very broad definition of sustainable finance used by the Global Sustainable Investing Alliance (GSIA), sustainably invested global assets under management stood at USD 30.7 trillion in 2018. Assets grew by over a third (35%) in just the two years from 2016. Of the major markets covered by the survey—namely the United States, E.U., Canada, Australia, and Japan—Japan saw the greatest growth in this period, with sustainable assets tripling every year on average. The survey also indicates that a large proportion of all professionally managed assets are now managed sustainably: around half in Canada and Europe, and a quarter in the United States.

Note, however, that the GSIA definition includes negative/exclusionary screening (where the shares of certain types of companies such as weapons manufacturers are left out of portfolios) as a type of sustainable investing, accounting for around half of the total. The second and third largest categories in the GSIA survey—ESG integration and shareholder engagement—will be the focus in the remainder of this chapter.

Another way to look at climate finance is to examine all the financial flows that are used for climate change-related projects and investments, regardless of their source—whether in the public or private sector or in financial or non-financial

UNDERSTANDING CLIMATE FINANCE FLOWS BY SOURCE, INSTRUMENT, AND SECTOR

The comprehensive accounting assembled bi-annually by the Climate Policy Initiative, an NGO, is widely seen as a gold standard in tracking climate finance flows from public and private sources, ranging from governments to public and private financial institutions to corporations and households. In general, climate finance has grown by 75% from 2012 to 2019, from USD 360 billion to over USD 600 billion per year (see graph).

It is more insightful to examine the comprehensive breakdown by source, instrument, and targeted sector than it is to only look at the simple amount. (See graphic).

In general, the largest single-actor group providing climate financing, according to the CPI's definition, are development banks—national, bilateral, and multilateral (USD 212 billion annually, on average). Corporations

are not far behind, with commercial banks accounting for a somewhat smaller proportion. Financing is fairly evenly split between debt and equity. The vast majority of financing is related to climate change mitigation, not adaptation, with large portions flowing into renewable energy generation (e.g., wind and solar) and low-carbon transport (such as electric vehicles).

Interestingly, for all the discussions of cross-border investments and financial flows, the CPI's tallies show the large majority of financing is domestic, with 78% of financing within higher-income OECD countries from domestic sources, and 74% in non-OECD countries, which are generally emerging markets.

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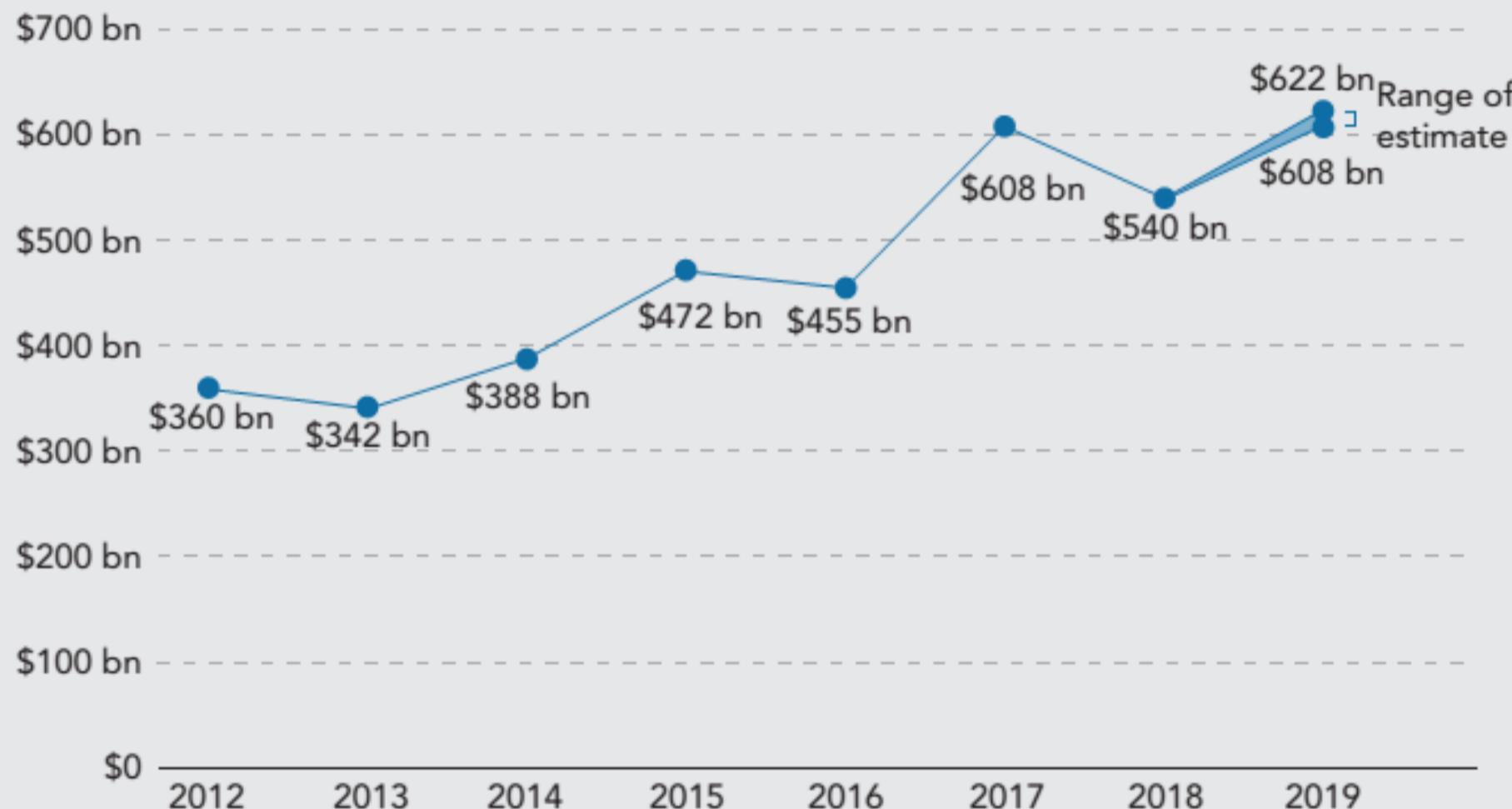


Figure 1

firms. Here, the comprehensive datasets compiled by the Climate Policy Initiative, an NGO, provide a common reference point (see box).

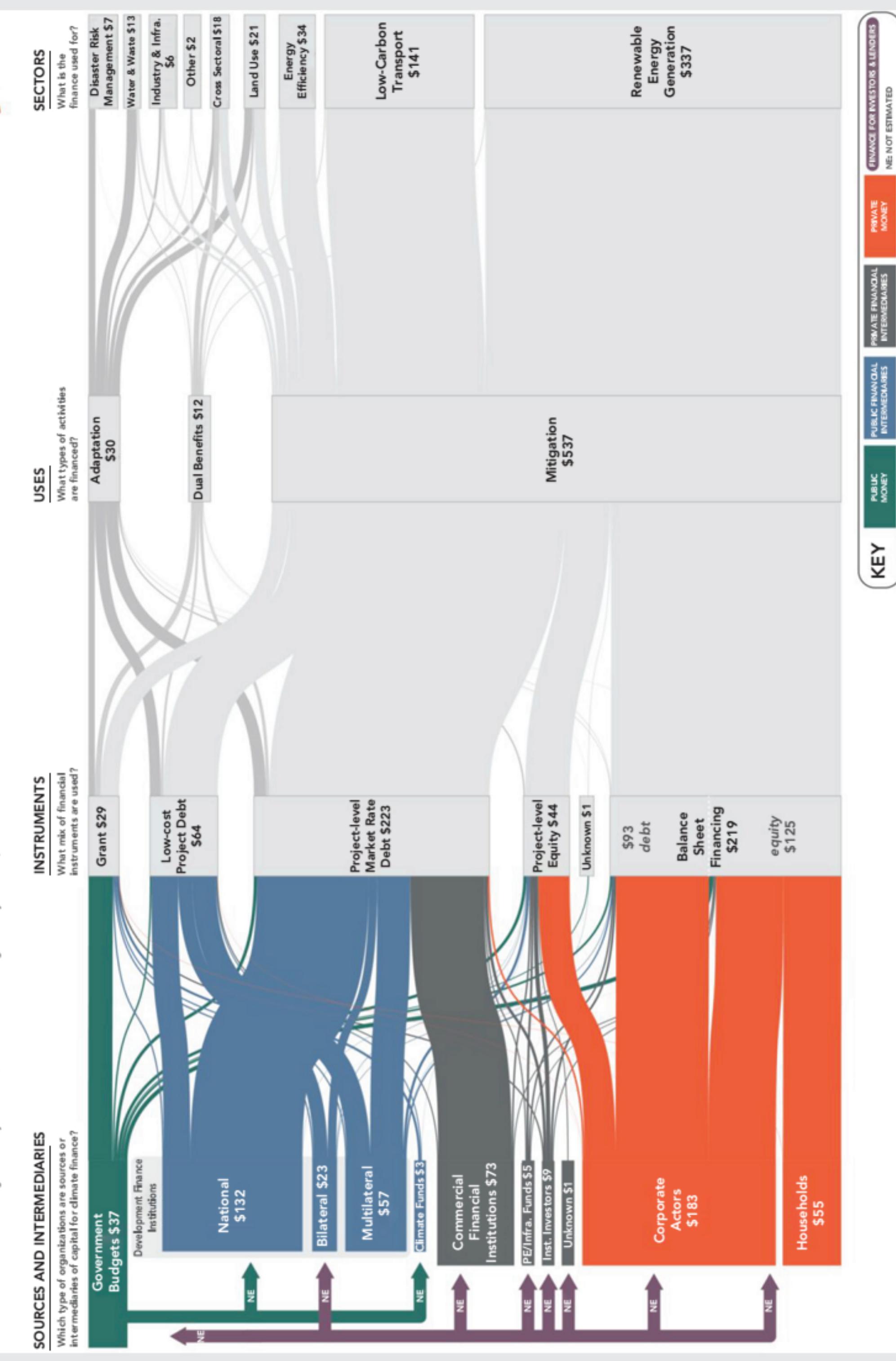
Yet another way to gauge the surge in sustainable and climate investing is to look at the proliferation and growth of

investor groupings and coalitions dedicated to sustainability and climate issues, as covered in Chapter 4. For example, in under two years from September 2019 to spring 2021, the Net Zero Asset Owner Coalition, a group of investors dedicated to aligning their entire portfolios with the goal of

Global climate finance flows along their life cycle in 2017 and 2018. Values are average of two years' data, in USD billions

LANDSCAPE OF CLIMATE FINANCE IN 2017/2018

Global climate finance flows along their life cycle in 2017/2018. Values are average of two years' data, in USD billions.



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Figure 2

Table 1**GROWTH IN SIZE OF SELECT CLIMATE GROUPINGS**

Name	Founding Year	Founding Members		2020/1 Members	
		Number	Assets (USD)	Number	Assets (USD)
Principles for Responsible Investment	2006	63	\$6.5tn	3038 (2020)	\$103.4tn (2020)
Taskforce on Climate-Related Financial Disclosures	2017	100+	\$25tn	1000+ (2020)	\$138tn (2020)
Climate Action 100+	2017	225	\$26.3tn	575 (2021)	\$54tn (2021)
Net Zero Asset Owners Alliance	2019	12	\$2.4tn	37 (2021)	\$5.7tn (2021)

net-zero emissions by 2050, grew from 12 members representing USD 2.4 trillion in assets to 27 members with 5.4 trillion (see table).

A final popular way to look at growth in sustainable finance is to look at the growth in sustainable finance instruments and financial products (see next section).

5.3 Sustainable and Green Financial Products and Instruments

This section reviews sustainable financial instruments and products. These come in various forms, and different instruments involve different sorts of counterparties. Green or sustainability loans, like typical corporate loans, tend to be an agreement between a small number of banks and a borrowing company. Green and other sustainability bonds are used by all kinds of private and public entities to raise funds; as with other kinds of bonds, their issuance is underwritten by banks, and they are traded on secondary markets. For institutional or retail end investors, sustainable or green fund products are available. These may consist of sustainable instruments (a bond fund made up of green bonds) or of other assets (e.g., shares of sustainable companies).

In general terms, sustainable financial products come in three broad varieties. For some, the **use of proceeds** is earmarked and ring-fenced for sustainable use (e.g., green bonds). For **sustainability-linked** instruments, the financial instrument itself is linked to sustainability targets, such as through an interest rate penalty or reward on achievement of a specified target. For still other products, sustainability

acts as selection criteria for inclusion (e.g., in a sustainable equity fund) or for targeted engagement with the management of a company.

5.3.1 Green, Social, and Sustainable Bonds

Green bonds are bonds whose proceeds are earmarked for environmental projects. They combine several innovations: They are separately labeled, their proceeds are ring-fenced, and the (planned) use of their proceeds is reported both to prospective bondholders *ex ante* and to current bondholders once projects are implemented. In this way, they differ from typical corporate or government bonds, which function as general-purpose borrowings, where the issuer can then use the proceeds as needed.

Green bonds were pioneered by multilateral development banks. In 2007, the European Investment Bank issued a "climate awareness bond," and in 2008, the World Bank used the term "green bond" to describe debt issuance. Since these early developments, the EIB's initial USD 800 million bond—green bond issuance has grown markedly, to USD 270 billion in 2020. Green bond issuance is, so far, largely self-defined and self-policed by the market under broad, industry-led principles and definitions such as the Green Bond Principles from the International Capital Market Association (ICMA), although regulators are also moving toward setting definitions, as with the E.U. green bond standard (see Section 5.4).

As issuance has grown, the issuer base of green bonds has diversified and the market has matured. From its origins within public-sector development banks, green bond issuance has been embraced by both private- and public-sector

ICMA GREEN BOND PRINCIPLES—EXCERPTS

The [Green Bond Principles] have four core components:

1. Use of Proceeds
2. Process for Project Evaluation and Selection
3. Management of Proceeds
4. Reporting

1. Use of Proceeds The cornerstone of a Green Bond is the utilization of the proceeds of the bond for Green Projects, which should be appropriately described in the legal documentation for the security. All designated Green Projects should provide clear environmental benefits, which will be assessed and, where feasible, quantified by the issuer.

Eligible Green Project categories, listed in no specific order, include, but are not limited to:

- renewable energy
- energy efficiency
- pollution prevention and control
- environmentally sustainable management of living natural resources and land use
- terrestrial and aquatic biodiversity conservation
- clean transportation
- sustainable water and wastewater management
- climate change adaptation
- eco-efficient or circular economy adapted products, [...] technologies and processes
- green buildings

2. Process for Project Evaluation and Selection: The issuer of a Green Bond should clearly communicate to investors:

- the environmental sustainability objectives;

- the process [...] determin[ing] how projects fit within the eligible Green Projects categories;
- the related eligibility criteria, including, if applicable, exclusion criteria or any other process applied to identify and manage potentially material environmental and social risks. [...]

3. Management of Proceeds: The net proceeds of the Green Bond [...] should be credited to a sub-account, moved to a sub-portfolio or otherwise tracked by the issuer in an appropriate manner, and attested to by the issuer in a formal internal process linked to [...] lending and investment operations for Green Projects. [...]

4. Reporting: Issuers should make, and keep, readily available up to date information on the use of proceeds to be renewed annually until full allocation, and on a timely basis in case of material developments. The annual report should include a list of the projects to which Green Bond proceeds have been allocated, as well as a brief description of the projects and the amounts allocated, and their expected impact. [...]

External Review: It is recommended that in connection with the issuance of a Green Bond or a programme, issuers appoint (an) external review provider(s) to confirm the alignment of their bond or bond programme with the four core components of the [Green Bond Principles] as defined above. Independent external reviews [...] are broadly grouped into the following types:

1. Second-party opinion
2. Verification
3. Certification
4. Green bond scoring/rating

Source: Green Bond Principles Voluntary Process Guidelines for Issuing Green Bonds June 2018, International Capital Market Association.

borrowers, ranging from companies and banks to national and municipal governments. An ecosystem has sprung up around green bonds. As with traditional bonds, investment banks handle the underwriting of issuance. In addition to seeking credit ratings, it has become established industry practice for green bond issuers to seek a rating or "second opinion" on the environmental credentials of green bonds from organizations such as CICERO, a Norwegian research organization, or Sustainalytics, a consultancy.

Although green bonds were the first labeled sustainable bond and make up the largest portion of sustainable bond issuance, in recent years, other types of sustainable bonds have evolved. **Social bonds** are bonds with earmarked proceeds for projects that will bring social benefits. As with green bonds, the impetus initially came from a public-sector financial institution, in this case Spain's Instituto de Crédito, which issued the first social bond in 2015 to finance small and medium enterprises in disadvantaged parts of Spain.

Social bonds have also spread to the private sector. January 2021, alone, saw issuance from firms like German regional bank, Landesbank Baden-Württemberg, for financing affordable basic infrastructure and access to essential services, and British firm Motability Operations Group for operating a wheelchair-accessible vehicles initiative.

Sustainability bonds are a combination of the two, in that they are meant to simultaneously address both environmental and social objectives. The issuance of social and sustainability bonds increased dramatically in 2020, partly due to the global COVID-19 pandemic, and it is forecast by credit rating agency Moody's to grow further in 2021. Another variety of labeled bonds is the **SDG bond**, linked to UN Sustainable Development Goals. As covered in Chapter 2, the SDGs cover social, environmental, and economic goals.

5.3.2 Green Loans

Green loans are loans that have been made for environmental and climate-related projects. In international markets, under the definition set out by the Loan Market Association in the Green Loan Principles, green loans are expected to ring-fence and borrowers are expected to report on the use of their proceeds. In specific jurisdictions, green loans are sometimes governed by slightly different, national rules, most notably in China.

China, in its domestic market, is a notable and early adopter of green loans. The adoption of these loans stemmed from the government's 2007 Green Credit Policy rather than from a private-sector initiative. This policy requires banks to offer green credit for environmental protection, emission reduction, and energy conservation projects, and restricts loans to high-polluting and -emitting industries, and to ones suffering overcapacity. The policy aims both to reduce environmental harm and to reduce exposure to climate-related financial risks from heavily polluting industries, thus improving financial stability (Cui et al., 2018).

In China, the proportions of green loans in banks' balance sheets have grown, from 8.8% in 2013 to 10.8% at the end of 2019, representing a cumulative total of over RMB 10.6 trillion (USD 1.5 trillion). The vast majority of Chinese green loans went to clean transport (45%) and clean energy (29%) in 2019. Generally, green loans in China have performed better than conventional loans, with the non-performing loan (NPL) ratio for green loans at 0.42% in 2018, while the overall credit

NPL ratio stood at 1.83% (Choi, 2020). However, effects vary significantly between large, state-owned banks, where the green loan ratio is negatively associated with credit risk, and smaller city/regional level commercial banks, where increases in the proportion of green loans has been found to be associated with greater credit risk (Zhou, 2020). In other words, it seems that large Chinese banks' green loans tend to be "safer" than the rest of their loan book, whereas for small Chinese banks, green loans tend to be riskier.

Globally, green loan underwriting has grown from around USD 30 billion in 2015 to around USD 90 billion in 2019. Green loans have been highly concentrated in the power sector, with 47% lent to renewable energy projects and another 23% to the power generation sector as of October 2020 (Nordea, 2020). Utilities make up the next largest category, at 8%, and the first non-power sector, real estate, is in fourth place as a recipient of 6% of green loans outstanding. Indeed, on a global scale (but especially in Europe), green loans have been overshadowed by the even quicker growth of sustainability-linked loans, whose total volume in 2019 already exceeded that of green bonds despite a later start (see next section).

5.3.3 Sustainability-Linked Bonds and Loans

An important innovation among labeled sustainable instruments has been to introduce dynamism through linking financing to sustainability targets as an incentive, rather than simply ring-fencing certain funds for use in green or sustainable projects. In **sustainability-linked bonds (SLB)**, the coupon paid by the issuer is linked to the issuer firm's achievement of pre-agreed sustainability targets. Similarly, for **sustainability-linked loans (SLL)**, the interest rate on the loan is linked to a company's achievement of certain sustainability benchmarks. In contrast with green bonds and especially green loans, sustainability-linked instruments are rapidly being adopted by a variety of sectors, tied to a variety of targets (see highlighted examples). These targets are often called **key performance indicators (KPIs)**.

Sustainability-linked bond issuance and loan volume have grown significantly in a very short period of time. Despite the fact that the Sustainability-Linked Loan Principles, which set guidelines for the market, only launched in 2019, that year already witnessed more in SLL volume (around USD 90 billion) than did the green loan market, a more mature labeled loan category. The Sustainability-Linked Bond

GROWTH OF SUSTAINABLE BONDS BEYOND GREEN

Green bond issuance has grown significantly in a short amount of time, reaching USD 270 billion in 2020 (see graph). Social and sustainability bonds have likewise grown quickly in issuance, although with a later start and from a lower baseline. In 2020, when the world was hit with the COVID-19 pandemic and many institutions wanted to raise money to help address its impacts, saw a particularly large

upsurge in social and sustainability bond issuance compared to previous years. According to the credit ratings agency Moody's, this trend is set to continue in 2021, with forecast issuance of USD 375 billion in green bonds, USD 150 billion in social bonds, and USD 125 billion of sustainability bonds.

Adapted from "Trends in sustainable bonds issuance and a look ahead to 2021" (Environmental Finance and Moody's).

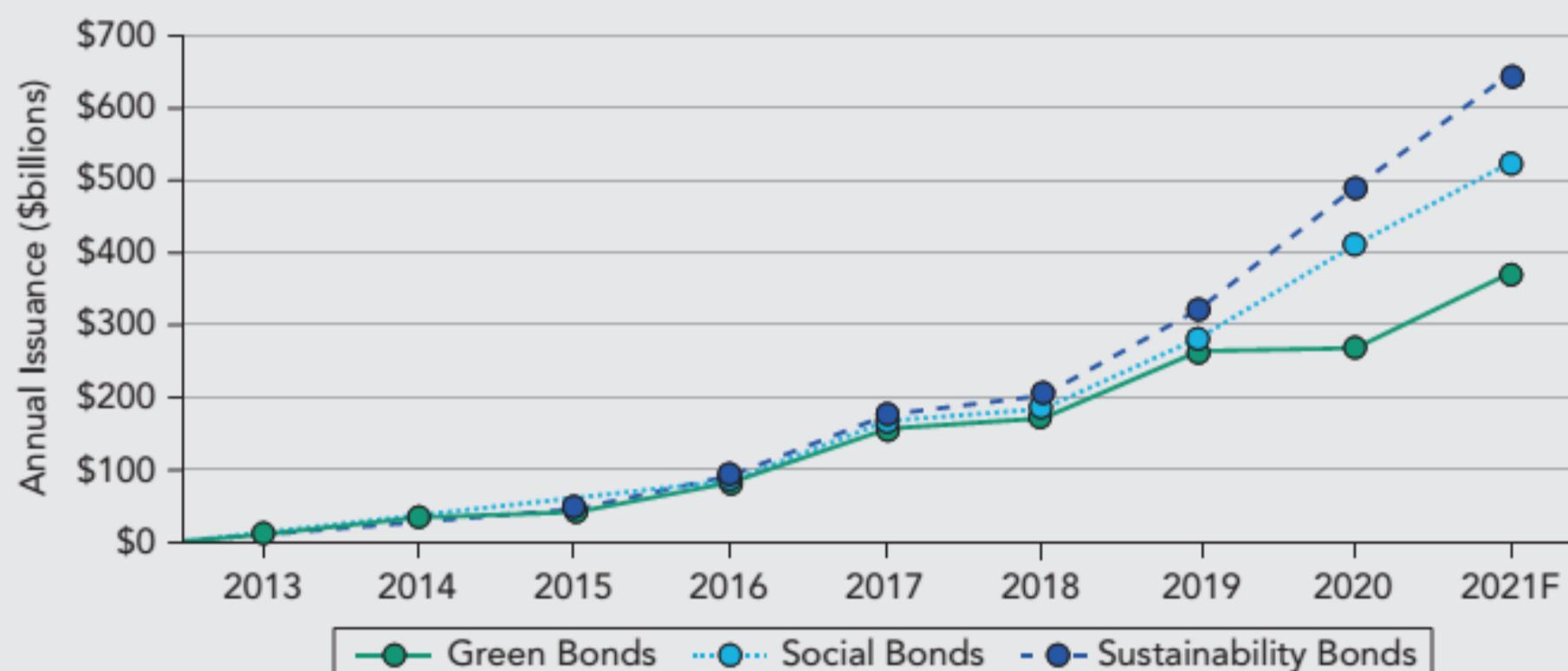


Figure 3

SUSTAINABILITY-LINKED BONDS AND LOANS: SELECT EXAMPLES

DSM (EUR 1 billion loan, 2018): In a very early deal for the sustainability-linked loan market, DSM, a Dutch health, nutrition, and materials company, took out a EUR 1 billion revolving credit facility with a group of 15 banks linked to its greenhouse gas (GHG) emissions. Specifically, the interest rate was linked to three indicators KPIs: cumulative GHG efficiency improvements, changes in the Energy Efficiency Index (EEI), and the proportion of the firm's electricity sourced from renewable resources.

Chanel (EUR 600 million [2 x 300 million] bond issue, 2020): Chanel, the famous French fashion company, issued a sustainability-linked bond in 2020 in two parts. The first EUR 300 million tranche was tied to cutting its corporate GHG emissions in half by 2030 and reducing supply chain emissions by 10%. The coupon on the bond of 1% will be supplemented by a penalty of 0.75% should the emissions targets not be met. The second EUR 300 million tranche is tied to transitioning the firm to 100% renewable energy use by 2025. The base coupon is 0.5% and, in case of non-fulfillment, the coupon increases to 1.0%.

Volution (GBP 150 million loan, 2020): Volution, a British ventilation systems manufacturer, was due to refinance an existing GBP 120 million loan facility. After conversations on integrating sustainability with its advisor Rothschilds and its banking syndicate, it agreed a GBP 150 million sustainability-linked revolving credit facility. It is tied to two KPIs: the percentage of sales revenue from low-carbon products and the percentage of plastic processed in its owned factories from recycled sources.

Schneider Electric (EUR 650 million bond issue, 2020): Schneider Electric, a French electrical equipment company, issued a EUR 650 million bond issue tied to three KPIs: GHG emissions, gender diversity in its workforce, and training underprivileged people. Specifically, the firm set a 2025 target of 800 megatons of saved and avoided CO₂ emissions; targets of reaching a workforce of 50% women, including 40% in front-line management and 30% among senior executives; and training one million people in energy management. Should its performance fall short, it has committed to pay its bondholders a penalty of 0.5% of the nominal value of the (coupon-free) bonds.

Sources: DSM; Raconteur; Rothschild; Schneider Electric.

Principles are even more recent, launching in 2020. Both are industry-led sets of guidelines, with the loan guidance developed by three loan-market umbrella organizations: the Loan Market Association (LMA), the Loan Syndication and Trading Association (LSTA), and the Asia Pacific Loan Market Association (APLMA). The bond guidance is by ICMA, the same body that developed the Green Bond Principles. The SLL and SLB principles are also being further coordinated so that the sustainability-linked market aligns better across bonds and loans. While they are based on the Green

Bond Principles to an extent, they also have some specific elements, notably in relation to the stringency requirements for KPIs and sustainability performance targets (see box).

5.3.4 Sustainable and Green Funds

A final category of sustainable financial products is for the end investor—institutional or retail. A large number of investment vehicles, both actively or passively managed, such as mutual funds, exchange-traded funds, or other types of funds, market themselves on their sustainable credentials.

SUSTAINABILITY-LINKED LOAN PRINCIPLES—EXCERPTS

"Sustainability linked loans are any types of loan instruments and/or contingent facilities (such as bonding lines, guarantee lines or letters of credit) which incentivise the borrower's achievement of ambitious, predetermined sustainability performance objectives. The borrower's sustainability performance is measured using sustainability performance targets (SPTs) [...] measuring improvements in the borrower's sustainability profile.

The use of proceeds in relation to a sustainability-linked loan is not a determinant in its categorisation and, in most instances, sustainability-linked loans will be used for general corporate purposes. Instead of determining specific uses of proceeds, sustainability linked loans look to improve the borrower's sustainability profile by aligning loan terms to the borrower's performance against the relevant predetermined SPTs.

The SLLP set out a framework [...] based around the following four core components:

- 1. Relationship to Borrower's Overall Sustainability Strategy**
- 2. Target Setting—Measuring the Sustainability of the Borrower**
- 3. Reporting**
- 4. Review"**

Sustainability-Linked Bond Principles—Excerpts

"Sustainability-Linked Bonds ("SLBs") are any type of bond instrument for which the financial and/or structural characteristics can vary depending on whether the issuer achieves predefined Sustainability/ ESG objectives. In that sense, issuers are thereby committing explicitly (including in the bond documentation) to future

improvements in sustainability outcome(s) within a predefined timeline. [...]

The SLBP have five core components:

- 1. Selection of Key Performance Indicators (KPIs)**
- 2. Calibration of Sustainability Performance Targets (SPTs)**
- 3. Bond characteristics**
- 4. Reporting**
- 5. Verification [...]**

The KPIs should be

- relevant, core and material to the issuer's overall business, and of high strategic significance to the issuer's current and/ or future operations;*
- measurable or quantifiable on a consistent methodological basis;*
- externally verifiable; and*
- able to be benchmarked, i.e. as much as possible using an external reference or definitions to facilitate the assessment of the SPT's level of ambition. [...]*

The SPTs should be ambitious, i.e.:

- represent a material improvement in the respective KPIs and be beyond a "Business as Usual" trajectory;*
- where possible be compared to a benchmark or an external reference;*
- be consistent with the issuers' overall strategic sustainability / ESG strategy; and*
- be determined on a predefined timeline*

Sources: SLLP 2020, SLBP 2020.

In practice, there are several ways in which these types of funds can be sustainable. Some of these, such as green bond funds, consist specifically of the sort of labeled sustainable financial instruments described above. Others consist of the shares of companies that engage in sustainable activities. The determination of whether the issuing firm counts as sustainable is often done through the use of ESG scores or ratings. This selection process can be done by a fund manager itself, or, often by an index provider such as MSCI or FTSE Russell, which compile various **green or ESG indices**. Sometimes, exchanges have their own **green labels**, such as the London Stock Exchange's Green Economy Label, used both for companies and for funds where over 50% of revenues are attributable to "environmental solutions." In Luxembourg, the exchange provider has instead opted to set up a separate Luxembourg Green Exchange.

A look at the exchange-traded funds (ETF) market, a rapidly growing segment of the overall funds market, helps show how sustainable funds have proliferated in recent years. The largest sustainable equity ETF in terms of assets is a fund of U.S. equities run by BlackRock's iShares division, and it was selected for high ESG scores based on MSCI scoring methodology. As of April 2020, the fund has USD 6.7 billion in assets. The fund completely excludes firms involved in industries such as weapons, tobacco, alcohol, and gambling, and has "further screens" on companies in thermal coal, oil sands, and oil & gas. Together, the ten largest

sustainable ETFs make up USD 38.3 billion in assets (as of April 2021). For comparison, the largest ETF, SPY, which tracks the S&P 500 index, has over USD 360 billion in assets in the same time period.

5.3.5 Other Sustainable Finance Products

Finally, there are a number of other primarily consumer-facing, sustainable finance products that have started to come to market. **Green car loans** are dedicated to financing environmentally friendly cars, such as electric vehicles. **Green mortgages** are mortgages for energy-efficient houses. Both of these products currently only exist in certain markets: Green car loans can be found in Sweden and Singapore, for example, and green mortgages in the UK. Both still make up extremely small shares of the total car loan and mortgage markets. However, industry associations see potential for growth. For example, in the UK, the Intermediary Mortgage Lenders' Association (IMLA) found in a survey that 74% of lenders expected green mortgage demand to grow, and that 14% of brokers had fielded enquiries about green mortgages (IMLA, 2020).

Another consumer-facing sustainable financial product, **sustainable credit cards**, are unlike other sustainable finance products in this section in that they tend to donate a small percentage of purchases to environmental charities and thus are more aligned with philanthropy than with the financial system per se.

Table 2

TEN LARGEST SUSTAINABLE EQUITY ETFs	USD billion
iShares MSCI USA SRI UCITS ETF USD	6.68
iShares Global Clean Energy UCITS ETF	5.70
iShares MSCI Europe SRI UCITS ETF	3.70
iShares Automation & Robotics UCITS ETF	3.61
iShares MSCI USA ESG Screened UCITS ETF USD	3.59
UBS ETF (LU) MSCI World Socially Responsible UCITS ETF (USD) A-dis	3.44
Amundi Index MSCI USA SRI UCITS ETF DR (C)	3.43
iShares MSCI World SRI UCITS ETF EUR	3.21
Xtrackers MSCI USA ESG UCITS ETF 1C	2.49
iShares Healthcare Innovation UCITS ETF	2.45

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5.4 ESG and Climate Integration in Investing

This section reviews the ways in which investors and lenders integrate ESG and climate considerations into their financing activities, building on the discussion of ESG in Chapter 2. This kind of broad integration is becoming more necessary as financial institutions commit their entire corporate strategies and portfolios to certain climate goals, such as alignment with net-zero emissions by 2050.

5.4.1 Use of Data and Scores

Integrating climate or broader ESG issues into investment and lending decisions starts with metrics—a numerical gauge for ESG and climate risks and exposures. On broader ESG topics, scores and ratings are the most widely used approach by investors and lenders to gauge the performance of investee or debtor companies. A number of data providers offer their services in this space, including Bloomberg, Refinitiv, MSCI, Sustainalytics, FTSE, ISS, and Vigeo Eiris, to name just the main ones.

ESG ratings are intended to express and distill a holistic assessment of a company into one, easily understood and cross-comparable score or rating. ESG ratings methodologies typically use a scoring approach, incorporating a wide range of quantitative and qualitative indicators. The underlying indicators and sub-scores are then aggregated into an overall score based on a ratings provider's methodology.

ESG scores, however, are a heterogeneous space with little standardization and a few shortcomings. One drawback is that the methods to calculate them are typically proprietary, making it hard for investors or lenders to see behind the scores they purchase from data providers. Another issue is that ESG ratings are not consistent with each other and are thus hard to compare, as rating methodologies differ substantially. Academic studies have provided ample evidence of the lack of cross-comparability, noting, for instance, that ratings do not converge over time (Chatterji et al., 2016) and that the ESG ratings of leading providers are only correlated by about 0.61, much less than standard credit ratings (Berg, 2019).

Beyond the leading providers, the picture is even more confusing, especially given the huge proliferation of ratings.

A report by SustainAbility (2019) found that the number of ESG ratings has grown more than fivefold between 2010 and 2019, with an estimated 600 ESG ratings now available globally.

A good anecdotal example of issues with ESG scores is the case of Tesla, the American electric vehicle company. It is ranked very highly by MSCI on environmental issues and moderate on governance, whereas FTSE, a competing provider, ranked it poorly on both. In this case, FTSE only took into account emissions from Tesla factories, not emissions saved by Tesla's electric vehicles during their lifecycle, as MSCI did. On governance, FTSE scored Tesla poorly due to lack of disclosure of information, whereas MSCI used an average score for the auto industry.

On climate change specifically, the available data is not straightforward either. For transition risk, carbon dioxide or greenhouse gas emissions seem like a neutral and easily cross-comparable quantitative metric, but they are often estimated rather than reported by the company itself. On physical climate risk, investors and lenders are typically reliant on physical risk scores that have similar shortcomings to ESG scores (see Chapter 3).

5.4.2 Integration into Investment Decisions and Portfolio Analysis

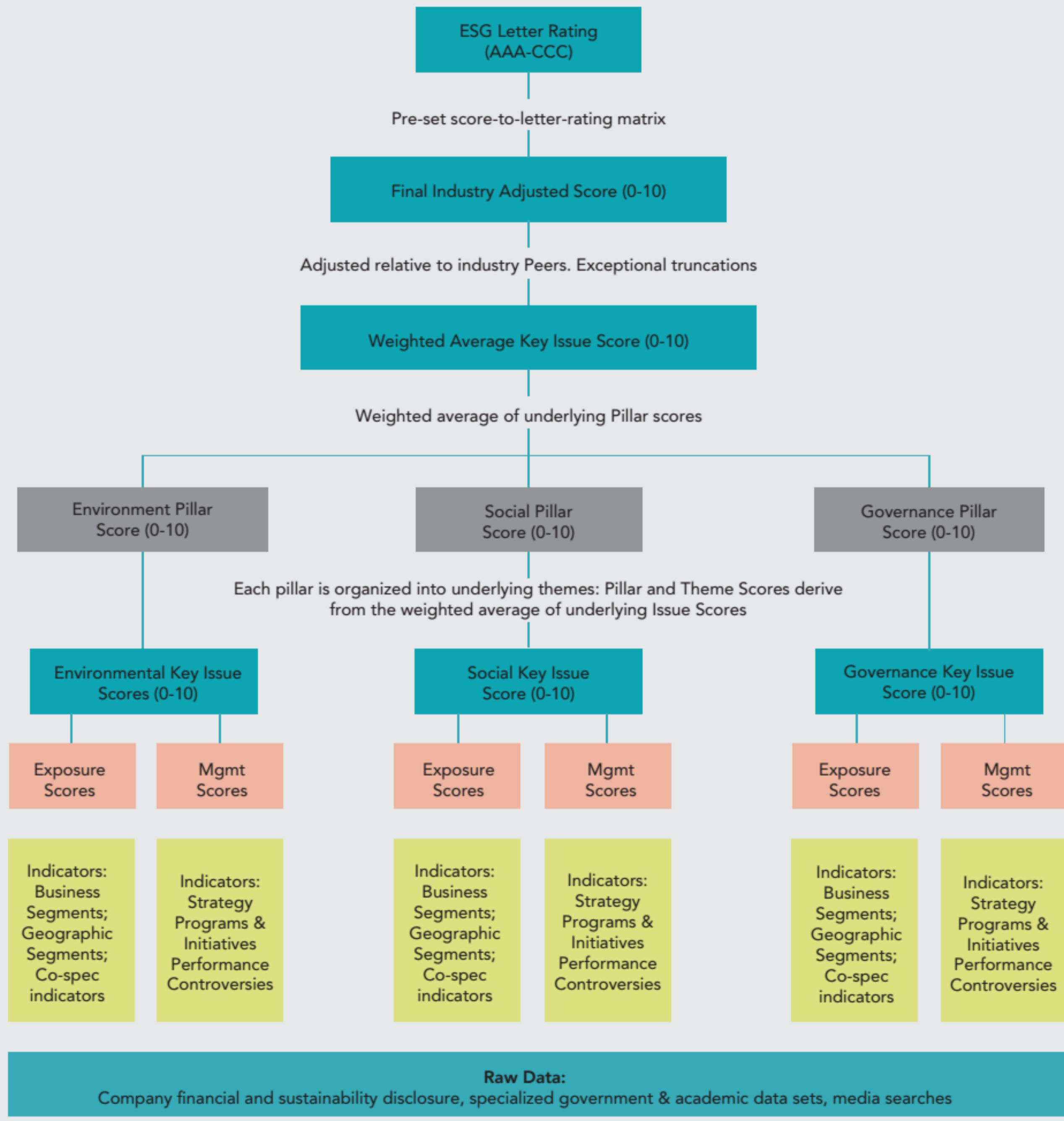
Many investors and lenders are increasingly integrating ESG and climate considerations into their operations, or they are planning to do so given their firm-wide sustainability commitments.

In practice, there is a spectrum of organizational structures and states of readiness within financial firms. At some firms, there is a separate ESG or sustainability division, separate from the main investment or lending functions of the firm, that informs and guides these functions indirectly. Their ESG division output, in the form of sustainability research and company level analysis, is available for portfolio managers and other staff who are initiating transactions to consider if desired. At other firms, a separate division exists, but it is more closely integrated into the work of portfolio managers and investment teams, with investment decision-makers required to complete some kind of ESG assessments in their investment analysis and consult with the firm's in-house experts. Full ESG integration is where every

CREATING ESG SCORES

ESG scores are built up from raw data and turned into indicators, and then scores, of which weighted averages

are taken in several stages to arrive at an overall score (see graphic).



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Figure 4

analyst, portfolio manager, and decision-maker is trained, understands ESG issues, and applies ESG to their job function. Here, ESG expertise and practice is so widespread that a separate team is not as important.

There are also a number of means through which investors and lenders can collect ESG data on investee and debtor companies. The primary sources for ESG scores and ratings are 1) external providers, 2) discussions with the company, 3) corporate sustainability reports, and/or 4) regulatory disclosures. Finally, ESG issues can be integrated throughout investment, management, and operational processes, from initial investment through to regular portfolio and risk management analysis (see graphic).

ESG integration is practiced in a number of ways by various institutional investors and banks, with slightly differing processes and emphases on different sorts of information sources (see examples). However, ESG integration does not occur in isolation. Often, it is paired with engagement with companies (see next section) or decisions about company over- or under-weights in loan books and investment portfolios.

Indeed, although the notion of “divestment” is promoted much more enthusiastically by activists than by investors, there are some cases where investors have started to rule out certain kinds of investments on ESG grounds. For instance, many funds exclude sectors such as weapons, tobacco, alcohol, and gambling. On climate issues, growing numbers of banks are announcing the phase-out of new coal lending (BankTrack, 2020). Many have also committed to restrictions, exclusions, or additional requirements for the financing of tar sands, offshore oil & gas, hydraulic fracturing, and Arctic oil projects (Rainforest Action Network et al., 2020).

5.4.3 Shareholder Engagement

Investor engagement with company management around sustainability has become an increasingly important channel for the financial sector to exert influence and thereby bring about corporate change. Financial firms practice engagement for a variety of reasons, including gaining credibility with clients, mitigating financial risks resulting from ESG-related issues, aligning with corporate strategy, and pressure from regulators. The scale of engagement activities

pressures can pressure large, emissions-intensive corporations to become more sustainable and, in aggregate, produce macroeconomic effects.

Initially, a principal focus of shareholder engagement was to push companies for better disclosure of ESG performance metrics (e.g., carbon emissions, water usage) and sustainability policies. Investors have used shareholder resolutions and engagement as well as public advocacy, to call for increased and improved calculation and disclosure on ESG factors (Srinivas, 2015). Part of the push for disclosure has also come from regulators, notably through the TCFD.

In 2021, shareholder engagement went even further, demanding that investee companies align with certain targets, such as, Paris alignment, or publishing credible plans for implementing a corporate transition to a net-zero emissions-compatible business model. Companies that do not oblige are “named and shamed,” and their shareholders draw up, and pass, resolutions forcing management to tackle these issues. Some investment firms have had success at exerting this kind of climate pressure from within. For example, Legal & General Investment Management (LGIM), a UK asset manager, grades investee companies on their climate performance according to in-house Climate Impact Pledge scores, which LGIM uses to rank companies (see Case Study).

More often, however, investors are finding success as part of larger coalitions, such as Climate Action 100+. With 575 members representing USD 54 trillion in assets under management, signatories to Climate Action 100+ make up a substantial proportion of the shareholders of any publicly listed company, and therefore Climate Action members are able to exert much more pressure on management than any individual investor could.

There is strong evidence of the power and results achieved by shareholder engagement in the academic literature. One review found that companies comply with shareholder engagement requests at success rates ranging from 18% to 60% (Köbel et al., 2019). Shareholder proposals have also been linked to subsequent increases in the ESG ratings of the firms targeted for engagement, meaning that the results of shareholder engagement can be significant enough to show up in third-party data (Barko, 2017; Dyck et al., 2019).

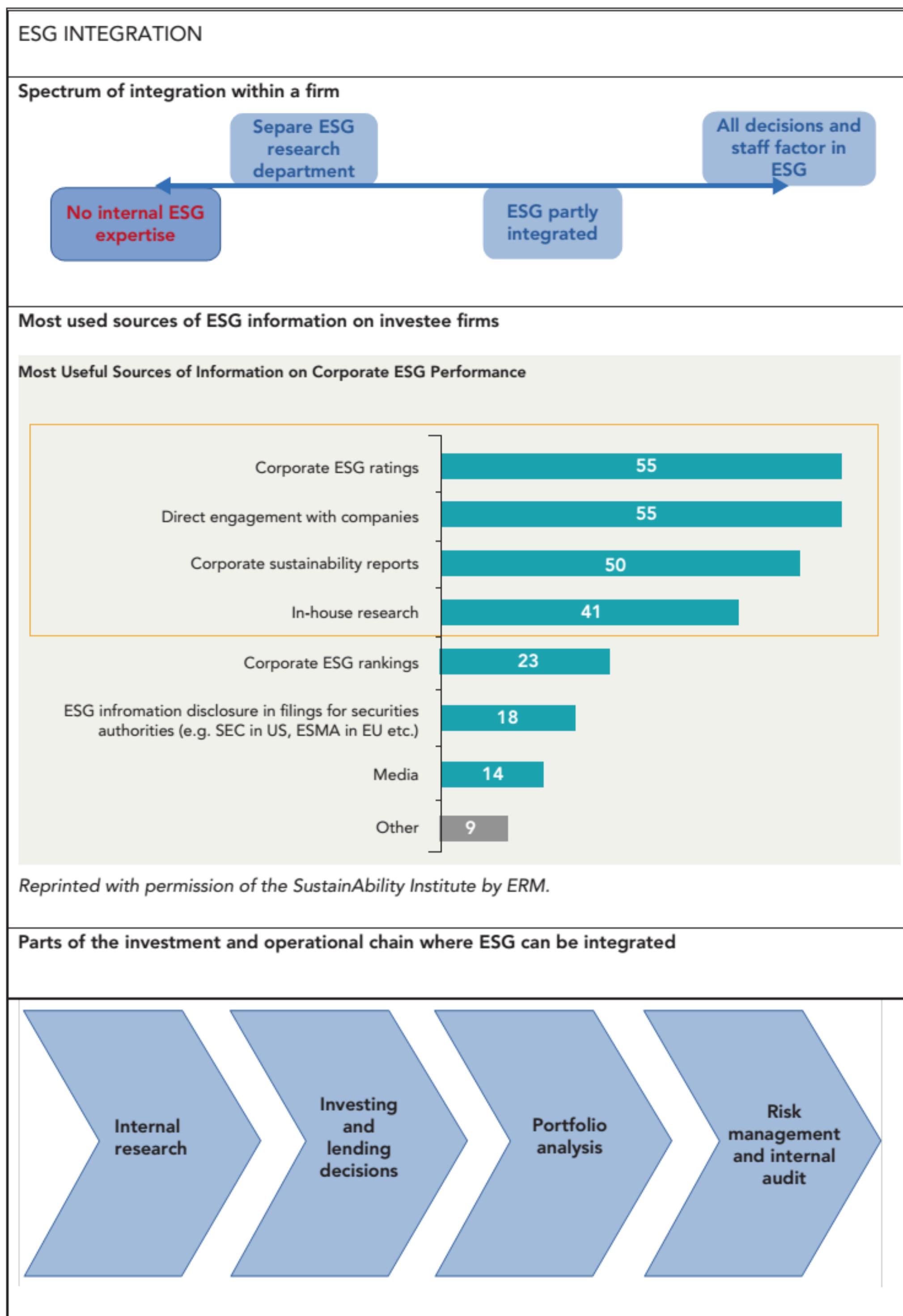


Figure 5

EXAMPLES: ESG INTEGRATION IN PRACTICE

Neuberger Berman (asset manager)—ESG Integration for Japanese investments:

The American asset manager uses two pillars to integrate ESG into its investment process, the first focusing on material environmental and social issues, and the second on governance. The firm uses the Sustainability Accounting Standards Board (SASB) framework to identify the factors that are likely to affect companies, industries, and sectors. The lead portfolio manager or analyst for a company evaluates the firm in detail, including its supply chains, through the use of company disclosure documents and meetings with firm executives. Neuberger Berman then blends this data, which it sources itself, with ESG ratings from third-party providers. Neuberger Berman uses its own scoring model to put together these data points and determine the weighting of a particular firm in its portfolio.

Columbia Threadneedle (asset manager)—ESG Integration through use of in-house scores:

In 2017, Columbia Threadneedle decided to build a solution for itself to cut through the tangle of different commercially available ESG ratings. Drawing on its own 130 financial analysts and research staff, it developed a proprietary ratings system intended to provide useful investment signals. The ratings are based partly on proven academic models that have demonstrated their reliability as strong indicators of companies' financial stewardship. This model is then paired with a second model focused on the financial materiality of ESG factors, which makes use of SASB standards to help define materiality. Columbia's model is on a rating scale of 1–5. The asset manager applies these ratings to approximately 6000 companies.

Sources: SASB (2020), SASB (2019).

Often, engagement is paired with the threat of divestment, which is the ultimate penalty, if all engagement efforts are unsuccessful. This is also the case for the LGIM approach. But this threat obviously requires market power and flexibility to be effective, meaning it can only be credibly made by

larger asset managers or hedge funds. Passively managed funds, by definition, follow an index and therefore cannot divest by their own choice. They shift the fund composition only if the underlying index composition is changed, or if the tracker index of a fund changed.

CASE STUDY: LEGAL & GENERAL INVESTMENT MANAGEMENT AND CLIMATE CHANGE

Legal & General Investment Management is a large, UK-based asset manager with over GBP 1 trillion in assets under management. In 2016, LGIM launched its Climate Impact Pledge, a program of targeted engagement with about 80 companies and with the aim to speed up the economic transition to a low- or zero-carbon economy.

This original pledge focused on the largest companies in sectors crucial to energy transition (energy, transport, financials) and deforestation and land use change (food retail). Companies were assessed and ranked on a wide range of indicators—from governance structures to business targets and lobbying activities—to gain a well-rounded view of their exposure to climate risks and the available opportunities, and to produce a Climate Impact Pledge score. The firm then published these scores and used them to “name and shame” firms. When companies failed to demonstrate sufficient action, LGIM voted

against their management and divested from them within some of their funds—as it did, for instance, with oil & gas major ExxonMobil in 2019.

As of 2020, LGIM has renewed and expanded its original pledge to better meet the challenge of achieving economy-wide net-zero emissions. It has expanded the number of companies and sectors covered by the pledge; shifted the way in which it engages; and updated its scoring methodology.

In an upgrade to its engagement practices, LGIM divided its investee companies into two groups—a broad group of 500 firms that LGIM will write a letter to and with, and a targeted group of 50 companies it considers “pivotal” to the transition and that will receive more involved and frequent engagement.

Source: Legal & General Climate Impact Report, 2020.

5.5 Existing and Emerging Definitions and Taxonomies

Amid the proliferation of sustainable finance and investments, the need for harmonized definitions has grown. So far, much of this has been satisfied through bottom-up approaches from market participants coming together through industry associations that agree to voluntary guidelines and frameworks. However, there is also growing regulatory involvement in this area.

Regulatory involvement has come in many different forms and depends to some extent on the regulatory frameworks and traditions in different jurisdictions (as covered in Chapter 4). Common-law jurisdictions, such as the UK and its former colonies, tend to rely more on case law and evaluating situations as they come up, whereas civil-law jurisdictions tend to specify laws and rules in advance. In the field of sustainable finance regulation, this has meant that the UK regulator, the Financial Conduct Authority, has focused on audits to ensure that products marketing themselves as sustainable are in fact living up to the promise. In the E.U., regulators are focused on specifying green bond definitions, sustainable fund marketing parameters, and the limits of sustainable economic activities in advance. Indirect regulatory action has also played a role. For instance, in jurisdictions where central banks practice monetary easing through large-scale bond purchases (i.e., quantitative easing), the eligibility requirements for these purchases can end up significantly affecting market practices and the growth of nascent sustainable instruments.

5.5.1 Defining Financial Products

Many of the labeled financial products covered in this chapter were invented or standardized in a bottom-up way, by financial market participants. Green bonds abide by the Green Bond Principles, with extra confidence coming from the second-opinion providers that vouch for their green credentials, such as Sustainalytics, CICERO, or the Climate Bonds Initiative.

The trend has been similar with social and sustainability bonds and sustainability-linked bonds and loans. In general, Green loans have been similar in most countries, though their use in certain jurisdictions, such as China, is mainly due to domestic regulatory pressure.

There has been a limited trend in regulatory involvement at the product level. As part of the Sustainable Finance Action Plan, the E.U. has gone the furthest toward creating a regulatory green bond standard, with consultations undertaken in autumn 2020. Indirect regulator recognition has also helped. Regulatory initiatives have encouraged the growth of green finance, such as through the Network for Greening the Financial System (NGFS). The recognition by the European Central Bank in November 2020 that sustainability-linked bonds are acceptable as collateral has also helped grow that market.

5.5.2 Disclosure Requirements: Regulators and Exchanges

One important trend that has grown in recent years is that of increased disclosure requirements for companies, usually through regulatory action.

In the E.U., a directive on disclosure of non-financial information requires certain large firms and firms of public interest to disclose ESG-related matters. (The directive is set to be expanded in 2021, with all firms with more than 500 employees that are doing business in the E.U. required to disclose.) In the UK, listed firms have been required to report on greenhouse gas emissions and diversity since 2006. And starting in 2022, the country is requiring all listed companies and limited liability partnerships to report on climate risk in line with TCFD recommendations. China's securities regulator has introduced rules to mandate all listed firms to disclose ESG risks. In Canada, listed firms are required to report some ESG parameters around diversity, and all companies receiving extraordinary government support in the COVID-19 pandemic are required, in return, to start TCFD reporting.

However, some disclosure requirements have instead come through exchanges themselves. Exchanges can serve as important gatekeepers, because they are the only venues where companies can be publicly listed. The Shanghai and Shenzhen stock exchanges require ESG disclosure from the firms listed on them; one of Shanghai's requirements to conduct an initial public offering (IPO) is to provide annual sustainability reporting. At least 25 stock exchanges worldwide—from Buenos Aires and Lagos to Lisbon and Manila—have similar rules requiring firms to disclose ESG to be listed on their exchanges.

5.5.3 Regulatory Trends: Defining Sustainability by Economic Activity

An increasing amount of regulatory activity in relation to sustainable finance involves neither financial products or disclosures, but rather the underlying economic activity being financed.

There has historically been some divergence on these issues between jurisdictions, notably between China and OECD countries. For a long time, China has allowed “clean coal” and other types of “clean utilization of fossil fuels” to be financed by green bonds, whereas prevailing market-led standards in the West have not allowed fossil-fuel financing of any kind. However, in a sign of growing moves toward harmonization, China announced a proposal in 2020 to exclude clean fossil fuels from a revised standard, thus bringing it in line with other countries and market-led rules.

Regulators have also been moving to pin down the definitions of sustainable activities in ever greater detail. The furthest along in this regard is the European Union. The E.U. **Taxonomy**, first published in draft format in March 2020, sets performance thresholds (referred to as “technical screening criteria”) for economic activities, by sector and subsector. The taxonomy is agnostic to financial instruments or means of funding. Once the taxonomy is in force, any investment or lending for a recognized activity, whether through a loan, a green bond, or project financing, would count as sustainable.

The E.U. taxonomy is notable for its high level of prescriptive detail for each and every subsector covered (see box). To count as “green,” activities must make a substantive contribution to at least one of six environmental objectives: climate change mitigation, climate change adaptation, the sustainable use and protection of water and marine resources, the transition to a circular economy, pollution prevention and control, and the protection and restoration of biodiversity and ecosystems. They must also explicitly do no harm to any of the other five objectives and must meet a series of minimum safeguards.

Other countries are also developing taxonomies, including the UK, Canada, and the ASEAN countries of Southeast Asia. Given the E.U.’s role as the first major jurisdiction to finalize its taxonomy, it may well end up providing a model or template for many of these others. The UK process, for example, is explicitly “tak[ing] the scientific metrics in the E.U. taxonomy as its basis.”

In parallel, the magnitude of global cross-border investment flows creates an incentive to harmonize definitions on sustainable economic activities, just as there has been on the definitions of sustainable investment products. In April 2021, for instance, China and the E.U. announced plans for joint technical work on harmonizing taxonomies, with the aim to develop a jointly recognized classification system for signifying which businesses are considered sustainable by the end of 2021.

5.6 Conclusions and Prospects

Sustainable finance has grown tremendously within the financial sector, and it is notable for how much private-sector involvement it has garnered. However, in project finance linked to climate change, public bodies like development banks remain major actors. The financial sector has brought its innovation capacities to bear and come up with many kinds of novel financial instruments that earmark funding for sustainable projects. Many of these have sprung up organically, with standards and guidelines born from industry associations. Integrating ESG into the fabric of operations occurs at an increasing number of financial firms. However, as the ESG market grows further, there is also a trend toward more regulatory involvement as well as cross-border harmonization of definitions.

The portion of all financial activities that incorporates sustainability is expected to continue rising amid increased stakeholder, government, and peer pressure, and as sustainability becomes a societal norm. However, for sustainable finance to develop further it likely will require further action not only on harmonization and possibly regulatory oversight but also on more fundamental measures such as ways to measure non-financial impact in cross-comparable ways.

E.U. TAXONOMY: SELECT EXAMPLE CRITERIA

The technical criteria of the E.U. taxonomy set out in detail, by sector and subsector, what activities count as sustainable. This box highlights some illustrative examples.

Cement manufacturing:

The manufacturing of cement is associated with significant CO₂ emissions. Minimising process emissions through energy efficiency improvements and switch to alternative fuels, promoting the reduction of the clinker to cement ration and the use of alternative clinkers and binders can contribute to the mitigation objective.

[The eligibility of the activity/factory requires the following:]

(A) Cement clinker: Specific emissions (calculated according to the methodology used for EUETS benchmarks) associated to the clinker production processes are lower than the value of the related EU-ETS benchmark. As of February 2020, the EU-ETS benchmark value for cement clinker manufacturing is: 0.766 tCO₂e/t of clinker

(B) Cement: Specific emissions associated to the clinker and cement production processes are lower than: 0.498 tCO₂e/t of cement or alternative binder

Passenger rail transport (interurban):

[These must] demonstrate substantial GHG emission reduction by:

- Increasing the number of low- and zero emission fleets, and improving fleet efficiency, and
- Improving efficiency of the overall transport/mobility system

Zero direct emissions trains are eligible. Other trains are eligible if direct emissions (TTW) are below 50g CO₂e emissions per passenger kilometre (gCO₂e/pkm) until 2025 (noneligible thereafter).

Cogeneration of Heat/Cool and Power from Concentrated Solar Technology:

Any cogeneration technology can be included in the taxonomy if it can be demonstrated [...] that the life cycle impacts for producing 1 kWh of heat/cool and power are below the declining threshold.

Declining threshold: The Cogeneration Threshold is the combined heat/cool and power threshold of 100 gCO₂e/kWh.

- This threshold will be reduced every 5 years in line with a net-zero CO₂e in 2050 trajectory
- The threshold must be met at the point in time when taxonomy approval is sought for the first time
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions

Anaerobic digestion of sewage sludge:

Net GHG emission reduction from sewage sludge treatment through the capture and utilization of the generated biogas in various forms and applications, often displacing fossil fuels.

Anaerobic digestion of sewage sludge treatment is eligible provided that (cumulative):

- methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan;
- the produced biogas is used directly for the generation of electricity and/or heat, or upgraded to biomethane for injection in the natural gas grid, or used as vehicle fuel (e.g. as bioCNG) or as feedstock in chemical industry (e.g. for production of H₂ and NH₃).

Source: Taxonomy Report: Technical Annex EU Technical expert group on sustainable finance March 2020.

REFERENCES

- BankTrack. (2020). Bank moves out of coal. https://www.banktrack.org/campaign/bank_moves_out_of_coal#inform=1
- Barko, T. C., M.; Rennebog, L. (2017). *Shareholder Engagement on Environmental, Social, and Governance Performance*. S. S. R. N. (SSRN). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2977219
- Berg, F. K., Julian F.; Rigobon, Roberto. (2019). Aggregate Confusion: The Divergence of ESG Ratings. *Social Science Research Network (SSRN)*. <https://doi.org/http://dx.doi.org/10.2139/ssrn.3438533>
- Chatterji, A. K., Durand, R., Levine, D. I., & Touboul, S. (2016). Do ratings of firms converge? Implications for managers, investors and strategy researchers. *Strategic Management Journal*, 37(8), 1597–1614. <https://doi.org/10.1002/smj.2407>
- Choi, J. E., Donovan; Larsen, Mathias Lund. (2020). *Green Banking in China—Emerging Trends* (CPI Discussion Brief, Issue. <https://www.climatepolicyinitiative.org/wp-content/uploads/2020/08/Green-Banking-in-China-Emerging-Trends-1.pdf>
- Cui, Y., Geobey, S., Weber, O., & Lin, H. (2018). The Impact of Green Lending on Credit Risk in China. *Sustainability*, 10(6). <https://doi.org/10.3390/su10062008>
- Dyck, A., Lins, K. V., Roth, L., & Wagner, H. F. (2019, 2019/03/01/). Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, 131(3), 693–714. <https://doi.org/10.1016/j.jfineco.2018.08.013>
- IMLA. (2020). *Green mortgages*. <http://www.imla.org.uk/resources/publications/imla-green-mortgages.pdf>
- Köbel, J. F., Heeb, F., Peaetzold, F., & Busch, T. (2019). Can Sustainable Investing Save the World? Reviewing the Mechanisms of Investor Impact. *SSRN Electronic Journal*. <https://doi.org/http://dx.doi.org/10.2139/ssrn.3289544>
- Nordea. (2020, Oct 29 2020). *The sustainable loan market: A snapshot of recent developments*. Retrieved Apr 30 2021 from <https://insights.nordea.com/en/sustainability/sustainable-loan-market/>
- Rainforest Action Network, BankTrack, Indigenous Environmental Network, Oil Change International, Reclaim Finance, & Club, S. (2020). *Banking on Climate Change: Fossil Fuel Finance Report 2020* (Banking on Climate Change, Issue. http://priceofoil.org/content/uploads/2020/03/Banking_on_Climate_Change_2020.pdf
- SustainAbility. (2019). *Rate the Raters 2019: Expert Views on ESG Ratings*. <https://sustainability.com/wp-content/uploads/2019/02/SA-RateTheRaters-2019-1.pdf>
- Zhou, X. C., Ben; Hoepner, Andreas; Wang, Yao. (2020). Bank Green Lending and Credit Risk. *Social Science Research Network (SSRN)*. <https://doi.org/http://dx.doi.org/10.2139/ssrn.3618744>