

A UN ENVIRONMENT - WORLD BANK GROUP INITIATIVE

ROADMAP FOR A SUSTAINABLE FINANCIAL SYSTEM



UN Environment

The United Nations Environment Programme is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the United Nations system and serves as an authoritative advocate for the global environment. In January 2014, UN Environment launched the Inquiry into the Design of a Sustainable Financial System to advance policy options to deliver a step change in the financial system's effectiveness in mobilizing capital towards a green and inclusive economy – in other words, sustainable development.

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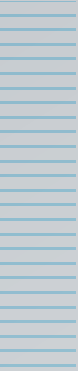
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Acronyms and Abbreviations

BACEN	Banco Central do Brasil
BIS	Bank for International Settlements
CBA	China Banking Association
CBI	Climate Bonds Initiative
CBRC	China Banking Regulatory Commission
CDP	Carbon Disclosure Project
CEBDS	Brazilian Business Council for Sustainable Development
CIPM	Certificate in Investment Performance Measurement
CRAs	Credit rating agencies
DNB	Dutch Central Bank
E&S	Environmental and social
ESCOs	Energy service companies
ESG	Environmental, social, and governance
ETF	Exchange-traded fund
FEBRABAN	Brazilian Federation of Banks
FI	Financial institution
fintech	Financial technology
FSAP	Financial Sector Assessment Program
FSB	Financial Stability Board
GDFA	Green Digital Finance Alliance
GW	Gigawatt
IAIS	International Association of Insurance Supervisors
IFC	International Finance Corporation (of the World Bank Group)
IFI	International financial institution
IMF	International Monetary Fund
INDCs	Intended Nationally Determined Contributions
ISE	Corporate Sustainability Index
IOSCO	International Organization of Securities Commissions
GHG	Greenhouse gas
MBA	Mongolian Bankers Association
MDB	Multilateral development bank
MFB	Multifamily building
NDCs	Nationally Determined Contributions
OECD	Organisation for Economic Co-operation and Development
PRI	Principles for Responsible Investment
RBI	Reserve Bank of India
SBN	Sustainable Banking Network
SDGs	Sustainable Development Goals
SEBI	Securities and Exchange Board of India
SERP	Social and Environmental Responsibility Policies
SFSI	Sustainable Finance Skills Initiative
SIC	Standard industry classification
SIF	Sustainable Investment Forum
SMEs	Small and medium enterprises
SRI	Socially responsible investment
TCFD	Task Force on Climate-related Financial Disclosures
UNEP FI	United Nations Environment Programme – Finance Initiative
UNFCCC	United Nations Framework Convention on Climate Change
WBG	World Bank Group



ROADMAP FOR A **SUSTAINABLE FINANCIAL SYSTEM**

EXECUTIVE SUMMARY

Historically the financial system has responded to the needs of the time. A global consensus has arisen that sustainable growth will be one of the greatest challenges of the 21st century—as demonstrated by the United Nations (UN) Sustainable Development Goals (SDGs) adopted as part of its 2030 Agenda for Sustainable Development—along with the measures to combat climate change and adapt to its effects that are part of the Paris Agreement. As in previous structural transformations, the financial system will play a major role in this process: the full potential of the financial system needs to be harnessed to serve as an engine in the global economy’s transition toward sustainable development.

The objective of this Roadmap is to propose an integrated approach that can be used by all financial sector stakeholders—both public and private—to accelerate the transformation toward a sustainable financial system. This approach can bring policy cohesiveness across ministries, central banks, financial regulators, and private financial sector participants to focus efforts.

The ultimate vision that the Roadmap seeks to reach is one of a financial system that integrates sustainability considerations into its operations, including the full costing of positive and negative externalities that sustainability implies, leading to a reorientation of the flow of resources toward more inclusive and sustainable activities.

THREE DRIVERS OF CHANGE

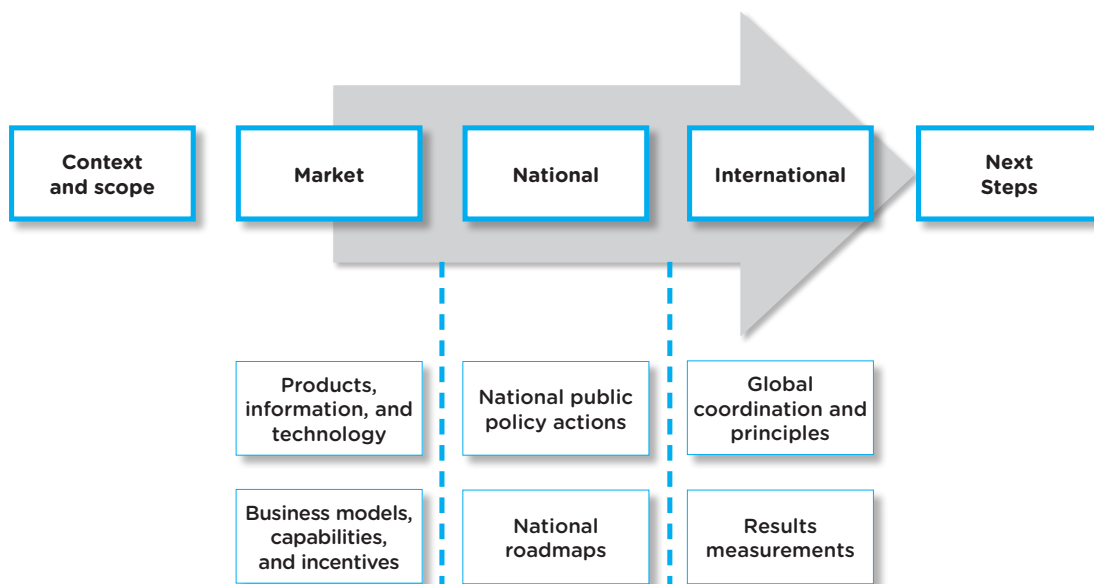
The ongoing transition toward a sustainable financial system is taking place through the interaction of three types of initiatives:

1. *Market-based initiatives.* Through the development of collective initiatives such as the Sustainable Banking Network (SBN) and the United Nations Environment Programme – Finance Initiative (UNEP FI), private and public finance institutions have worked to integrate environmental and social risks and opportunities into their business lines and approaches.
2. *National initiatives.* The initial momentum for sustainable finance has been driven by country-level initiatives that, in many cases, arose from national planning processes to implement climate change policies or other long-term strategic development initiatives.
3. *International initiatives.* Cooperative efforts carried out by the G20, the G7, the UN, and the Financial Stability Board (FSB) have all addressed different aspects of sustainable and green finance while at the same time increasingly involving the private sector. This effort has been complemented by the multilateral development banks (MDBs) and other international financial institutions (IFIs) that are continuing to actively promote sustainable finance with initiatives ranging from the adoption of sustainable practices in their core financial activities to the launching of new products aimed at driving capital to sustainable and green applications.

STRUCTURE OF THE ROADMAP

The Roadmap document is structured in five chapters that use the three drivers of transformation toward sustainable finance as its organizing principle (Figure ES.1).

FIGURE E.1 ROADMAP STRUCTURE



Source: UN Environment/WBG Roadmap Team.

MARKET-DRIVEN TRANSFORMATION

Markets have led the development of sustainable finance products, information, and technological innovations. More recently financial institutions (FIs) have started turning to adapt their business models, skills, and incentives to embed sustainability into their core strategies. The process of market transformation needs to be accelerated to meet global sustainability demands. This will require enhanced coordination with national and international initiatives to facilitate the process of FIs transitioning toward sustainable finance as well as additional regulatory prodding to increase the pace of change.

Products, Information, and Technology

Sustainability considerations are transforming the real economy, and the financial sector is evolving to respond to that reality. FIs are realigning existing products as well as creating new ones to match the risk-reward and maturity needs of sustainable investments. The expected financing needs are large: a review of the Nationally Determined Contributions (NDCs) and other policies in 21 developing countries that represent 48 percent of global greenhouse gas (GHG) emissions finds an initial investment opportunity of US\$22.6 trillion from 2016 to 2030 in key sectors. Although these estimates refer to levels of investments, most of these resources are intended to flow through the financial sector as bank lending, project finance, institutional investing, or equity investing.

Further growth in the supply of sustainable finance requires addressing important information gaps. Information relevant to sustainable finance will be critical to ensure the alignment of incentives, results measurement, proper valuation of assets, and effective risk management. Current efforts to move to a more advanced disclosure paradigm are uneven across asset classes and jurisdictions, but consensus is building around methodologies for the disclosure of certain types of information (such as the carbon footprint of investment portfolios). Measuring flows and stocks of green financial assets requires converging on criteria and methodologies to identify these assets in FIs and investors' portfolios. Identifying these assets is not only critical to assessing the evolution of the financial sector towards sustainability, but also permits measuring the risk performance of, for example, green assets, and contrasts them with non-green ones.

Digital finance, or innovative financial technology—*fintech*—has emerged as a powerful disruptor that is rapidly reshaping the real economy and the financial sector on a global scale. Digital finance has the potential to deliver environmental outcomes and support a transformation in financing for sustainable development by, for instance, mobilizing capital for critical priorities and mainstreaming social and environmental factors throughout the financial system. Ultimately, the impact of digital finance will depend on a number of policy and regulatory innovations that enable scaling and minimize its potential negative unintended consequences, such as cyber security risks.

Business Models, Capabilities, and Incentives

Sustainability considerations should be established as a key strategic pillar by shareholders and the senior management of FIs. Sustainable finance requires a strong commitment from owners and managers to make sustainability considerations a primary component of business strategy, not a niche area associated with other initiatives that—while also important, such as corporate social responsibility and environmental risk management—are not at the core of most FIs' business strategies. Putting sustainability considerations front and center requires incorporating sustainability strategies into the process to allocate resources—both the firms' own capital and intermediated resources—in support of creating new sustainable businesses lines, fostering the growth of existing ones, and moving away from activities not aligned with sustainability.

The capacity of financial sector stakeholders to use sustainability information needs to be enhanced. Differences in the familiarity, understanding, and capabilities of practitioners related to sustainability factors affect the capacities of institutions to appropriately consider and act on risks and opportunities stemming from sustainability factors. Gaps in skills, inadequate institutional frameworks, and a lack of clear leadership signals can hinder efforts to respond to dynamic market conditions, changing client demand, or new regulatory requirements, potentially posing competitive disadvantages. Because skills upgrading can pose significant costs to institutions, a lack of understanding of a clear business case for engagement on sustainability issues can further compound capacity issues. Capacity issues related to sustainable finance are also a pressing challenge for public authorities, including financial supervisors, regulators, and governments. Finally, a lack of understanding of the financial dimensions of sustainability challenges—such as investments in energy efficiency—can constrain consumer demand for sustainable finance products.

Ultimately, the success of efforts to effectively integrate sustainability information into financial decision making is significantly influenced by the incentives that shape practice within FIs. If information is available, and readily understood by practitioners, transformation is contingent upon the core values, culture, and policies of firms—which at their core are motivated by incentive structures. Increased sustainability disclosure in financial markets contributes to help align incentives *across* participants in the financial system. The cultural change needed in the transition to sustainable finance also requires an appropriate alignment incentive *within* FIs. This requires incorporating sustainability targets into the usual business key performance indicators to which officers in the institution are held accountable, as well as ensuring that initiatives such as internal carbon pricing are used to direct business units' behavior.

NATIONALLY DRIVEN INITIATIVES TOWARD SUSTAINABLE FINANCE

The multiplicity of market failures that constitute barriers to sustainable finance require governments to kick-start, sustain, and accelerate its development through the use of fiscal resources and public policy measures. A systematic approach is necessary to select government interventions; this can be accomplished through the development of national sustainable finance roadmaps with broad support across all parts of government and the private sector.

Public Finance Measures

Government responses with fiscal implications can be categorized into four categories depending on the area of involvement and instruments. Figure E.2 categorizes government interventions in support of sustainable finance that imply financial outlays or revenues forsaken. This is not meant to be a full catalog of potential interventions, but a categorization that can guide the development of specific national approaches.¹ The first (horizontal) dimension refers to whether or not actions are taken directly in support of the financial system or whether they seek to support the real sector of the economy or other parts of the government to facilitate their engagement with the financial sector. The second axis (vertical) categorizes them according to the mechanism used: direct financing, which includes risk sharing mechanisms; or activities in support of the “enabling environment” that would facilitate the operation of a sustainable financial system.

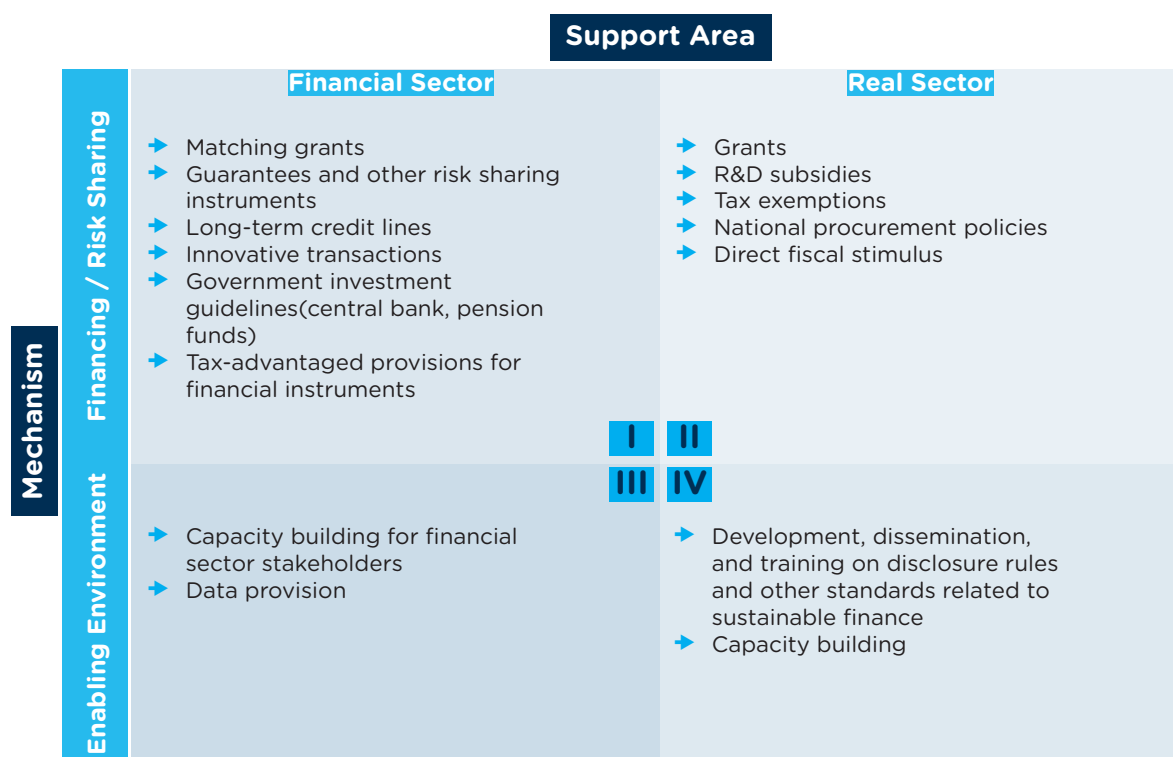
Financial Policy and Regulation

Public authorities—including governments, central banks, regulators, supervisors, and other bodies—are taking legislative, policy, regulatory, and supervisory steps to achieve a range of objectives linking sustainability and the financial system, such as:

- Enhancing market practice, including efforts that mainstream environmental factors into financial decision making and correct for market failures (such as unpriced environmental externalities);

¹ For a detailed description of certain types of interventions see, for example, Morgado and Lasfargues 2017.

FIGURE E.2 TYPOLOGY OF PUBLIC FINANCE INTERVENTIONS IN SUPPORT OF SUSTAINABLE FINANCE



Source: UN Environment/WBG Roadmap Team.

- Supporting market growth, including policy frameworks and standards that promote the issuance of green financial products (that is, green bonds and securities), the development of new market platforms (that is, crowdfunding and fintech), or the competitiveness of financial centers;
- Promoting transparency and efficiency, by improving flows of sustainability information through the financial system through voluntary guidance, labeling schemes, or mandatory requirements;
- Strengthening risk management, often by integrating environmental factors (such as physical and transition-related climate risks) into the prudential oversight of FIs, supervising financial markets, and providing sector and system-level stress testing;
- Facilitating flows and services, with investment and lending to priority sectors, restrictions or limitations on financing, insurance requirements, or the provision of financial services as a way to promote inclusion and support development;
- Clarifying legal frameworks, including the fiduciary responsibilities of FIs, with respect to long-term risks and opportunities (such as climate change); and
- Enhancing conduct and behavior, with codes of conduct and guidelines for environmental issues and compacts with FIs.

National Roadmaps

A growing number of countries are developing sustainable financial system policy frameworks. However, these are often not joined up or focused in a strategic way. National sustainable finance roadmaps have been launched in many countries over the past year. These identify system-wide needs, barriers to scaling up, and priority actions. Examples of these countries include Argentina, China, Indonesia, Italy, Mongolia, Morocco, Nigeria, Singapore, and South Africa. The specific mix of policy-led, market-led, and public-private initiatives in each country is a function of national development priorities and, as such, varies considerably. However, all have at their core the development of long-term, systemic plans to enhance the ability of the financial system to mainstream sustainability factors into decision making and to mobilize predominantly private capital for sustainable investment.

Based on an analysis of existing national roadmaps as well as engagement with stakeholders in other countries currently undertaking this process, roadmaps for sustainable finance are more likely to enjoy broad support and increase their opportunity of success if they include key components grounded in a systematic assessment of overall needs, estimation of required financing, identification of barriers, and identification of suitable policy measures whose progress and impact can be readily measured.

INTERNATIONAL COORDINATION AND SUSTAINABLE FINANCE

Meaningful global action requires global principles that can guide concerted international, national, and market-driven progress toward a sustainable financial system. Achieving sustainable development is, by its own nature, a global challenge because no country can be on a long-term sustainable path alone given the interconnectedness of problems such as climate change, communicable diseases, and biodiversity loss. International collective action is therefore critical to ensuring the alignment of ongoing efforts to support the development of sustainable finance. Maximum impact can be accomplished by embedding sustainability considerations into existing financial sector principles and standards.

Global Coordination and Principles

Establishing general principles does not imply standardization but rather an alignment of efforts. It is important to emphasize that agreeing on certain principles is very different from trying to standardize measures to develop a sustainable financial system across countries or even across different parts of the financial sector. Certainly the needs of developed countries with deep financial markets are very different from those of developing countries with substantial financially underserved populations. Similarly, efforts to develop sustainable banking in the retail segment are very different from efforts targeting large institutional investors and capital markets. The aspects to be considered in developing these principles (Box E.1) aim to follow the approach previously used in other components of the financial sector to guide and facilitate the development of initiatives and policies aligned toward a common global goal. Agreement on these principles does not imply the creation of new standards but rather the incorporation of sustainability consideration into existing ones.

BOX E.1 KEY CONSIDERATIONS FOR DEVELOPING PRINCIPLES OF SUSTAINABLE FINANCE

System-wide

- Make a statement defining the long-term objective of the financial sector in the context of sustainability.
- Agree on an approach to incorporate sustainability considerations to ensure the effectiveness, efficiency, and soundness of the global financial system.

Disclosure

- Establish approaches and methodologies to disclose the sustainability impact, opportunities, and risks arising from financial sector activities as well as the sustainability risks affecting the financial sector.
- Consider including sustainability information from the financial sector into the policy-making process to ensure that both the financial sector and the other relevant sectors (for example, environment, education, and so on) are directed toward sustainability objectives.

Business practices

- Price sustainability impacts, risks, and opportunities and incorporate them into financial institutions' strategies, governance, and business decision-making processes.
- Develop transition plans toward sustainable finance, with financial institutions identifying activities to be increased as well as business lines that need to be reoriented toward sustainability.

Financial instruments

- Agree on criteria to identify financial instruments and specific transactions aligned with sustainability objectives.
- Define mechanisms to promote innovative financial mechanisms, including through active regulatory encouragement, to increase the depth of sustainable financial markets.

Collaboration and alignment of efforts

- Develop mechanisms to promote and allow collaboration and sharing of information between financial sector participants on approaches, methodologies, and business practices for sustainable finance.
- Seek alignment of international and national policies, standards, and results measurement to ensure consistent global approaches that fit national needs

Results Measurement

To deliver the required transformation in the financial system, a performance framework is needed so progress can be measured. This framework would allow governments, IFs, and citizens to identify successful approaches, as well as areas lagging behind, thereby laying the basis for strategic adjustments in both policy and practice. Over the past five years, increasing efforts have been placed on how to measure the contribution of the financial system to sustainable development, specifically in the environmental dimension. Measuring progress to a sustainable financial system involves gaining an understanding of three core performance characteristics:

1. *Effectiveness.* The degree to which the market prices sustainability factors in asset valuations
2. *Efficiency.* The costs of running the financial system that delivers the flows of finance aligned with sustainable development requirements
3. *Resilience.* The strength of the financial system in the face of disruptions related to unsustainable development such as air pollution, climate change, or water scarcity

Understanding performance against these characteristics requires a focus on three key dimensions:

1. *Architecture.* This covers the principles, norms, standards, rules, regulations, and policies that directly or indirectly contribute to the sustainable development of finance. Metrics are needed that measure the degree to which the “rules of the game” are aligned with sustainable development needs.
2. *Markets.* This covers the behavior of market participants and the degree to which they are integrating environmental, social, and governance factors into their activities and the transparency with which they describe their sustainability efforts.
3. *Flows and stocks.* This covers the allocation of capital and financial services to both sustainable and unsustainable assets.

NEXT STEPS

Maintaining the momentum of the ongoing transition toward sustainable finance requires concrete actions to support the implementation of many of the measures described in each one of the chapters. This process is anchored in a continuing consultation process over the next 24 months combined with a series of actions that will benefit from that process, leverage ongoing initiatives, and support the design and implementation of new ones. Some of these initiatives will be coordinated by UN Environment and the World Bank Group, while in some other cases, part of the consultation process aims to identify the international, regional, and national institutions that may be better placed to lead each activity. Table E.1 summarizes the vision of the outcomes associated with each one of the areas discussed in the Roadmap along with an outline of proposed next steps to achieve those outcomes and

their expected timing. *Short-term* initiatives are expected to be completed by the end of 2018. *Medium-term* initiatives will be completed within the next 24 to 36 months.

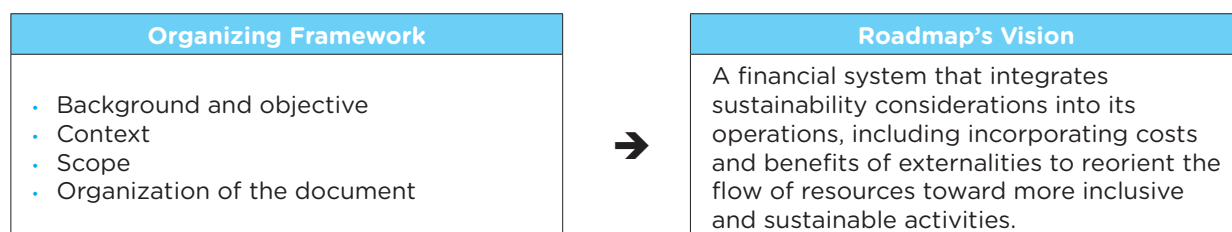
TABLE E.1 SUMMARY OF NEXT STEPS AND TIMING

Area	Short-term initiatives	Medium-term initiatives
Products, information, and technology	• Leverage existing partnerships to develop and implement methodologies to identify green assets. • Support embedding market-relevant sustainability information into the financial data ecosystem. • Support additional research into the risk performance of green assets. • Support the implementation of the TCFD recommendations in a pilot group of countries. • Establish a cooperative platform and/or industry task force of leading fintech companies, working with others to influence enabling business, policies, and standards to effectively connect fintech and sustainable development.	• Design and execute a set of key transformational transactions that can trigger new sustainable finance products. • Establish “challenge prizes” or other types of innovation funds to stimulate the development of new products and technologies in support of sustainable finance.
Business models, capabilities, and incentives		• Leverage existing market-led initiatives—such as the Sustainable Banking Network—or create new ones, to expand the skills of FIs necessary to embed sustainability considerations overall strategy and into day-to-day operations. • Develop a framework to align institutional incentives within FIs to sustainability considerations, including developing an understanding of the needs of financial sector users.
National public policy actions	• Review and classify different types of fiscal and policy interventions to create a framework to diagnose market failures and identify responses at the national level.	• Incorporate sustainability considerations into national fiscal frameworks, including a review of the effectiveness of fiscal interventions and subsidies in support of green activities and expenditures in unsustainable activities, including fossil fuel subsidies.
National roadmaps	• Support the development of national roadmaps in key countries.	
Global coordination principles	• Launch a consultation process to converge in the next 24 months in a set of global principles for sustainable finance.	• Promote the inclusion of sustainability considerations into global financial sector oversight and cooperation frameworks.
Results measurement		• Develop a results measurement framework for sustainable finance. • Promote the inclusion of sustainability data as part of global financial reporting frameworks (for example, central bank reporting to the IMF).

Note: FIs = financial institutions; IMF = International Monetary Fund; TCFD = Task Force on Climate-related Financial Disclosures.



1 CONTEXT AND SCOPE OF THE ROADMAP



1.1 BACKGROUND AND OBJECTIVE OF THE ROADMAP

Historically the financial system has responded to the needs of the time. From the development of industrialization and international trade starting in late 18th century Britain, to the massive industrial and infrastructure growth in East Asia in the last 50 years, the financial system has been fundamental to facilitating the structural transformation of economies. Today's society needs the financial system to help move the global economy toward sustainable development. A global consensus has arisen that sustainable growth will be one of the greatest challenges of the 21st century, as demonstrated by the United Nations Sustainable Development Goals (SDGs) adopted as part of its 2030 Agenda for Sustainable Development, along with the measures to combat climate change and adapt to its effects that are part of the Paris Agreement. As in previous structural transformations, the financial system needs to play a major role in this process: the full potential of the financial system needs to be harnessed to serve as an engine in the global economy's transition toward sustainable development.

The financial system is already transitioning to create, value, and transact financial assets in ways that shape real wealth to serve the long-term needs of an inclusive and more sustainable economy (UN Environment Inquiry 2015, 2016a). Shifting to a sustainable financial system does not imply a change of the traditional functions of the financial sector. Rather, these functions can be realigned toward sustainable goals to ensure the growth of a more inclusive and sound financial sector, one that intermediates resources, enables payments, and facilitates risk management with increased efficiency and effectiveness.

Developments in sustainable financial markets are taking place very rapidly. The complexity of challenges such as achieving the SDGs and addressing climate change requires aligning disparate initiatives to maximize the effectiveness and efficiency of these measures and to accelerate further this transformation. Until a few years ago, sustainable finance in its many forms—climate and green finance being probably its most discussed area—was an area of

interest mainly to a subset of practitioners in the financial sector. Today, sustainability is regarded as a fundamental component of the financial sector, essential to its soundness and effectiveness in fulfilling its intermediation role and contributing to a more inclusive world by providing broader access to financial services.

The objective of this Roadmap is to propose an integrated approach that can be used by all financial sector stakeholders—both public and private—to accelerate the transformation toward a sustainable financial system. This approach can bring policy cohesiveness across ministries, central banks, financial regulators, and private financial sector participants to focus efforts. This approach should also contribute to a broader cultural change, which would be evident in:

- *For financial sector stakeholders.* Understanding sustainability issues as an integral part of their business and an essential component to ensure the integrity, long-term growth, and soundness of financial markets, not a niche matter circumscribed to a smaller subset of investors and practitioners such as the impact investment community. This broader understanding will require embedding sustainability principles both in global regulatory and oversight frameworks, including the standards and principles that bodies such as the Financial Stability Board (FSB) oversee, and in other market-driven principles such as the UN-supported Principles for Responsible Investment (PRI) and the Green Bond Principles.
- *For sustainability stakeholders.* Seeing the financial sector, not just certain parts of it (such as national and multilateral development institutions and other specialized institutions), as a critical element in building a new sustainable economy.

The ultimate vision that the Roadmap seeks to reach is a financial system that integrates sustainability considerations into its operations, including the full costing of positive and negative externalities that sustainability implies, leading to a reorientation of the flow of resources toward more inclusive and sustainable activities. The Roadmap seeks to provide a framework that can support the development of the broader agenda of sustainable finance. Sustainable finance, at a broad level, includes “green” finance,² as well as finance for education, social development, health, and other aspects of sustainable development as defined by the 2030 Agenda and the SDGs. However, this document primarily focuses on climate and environment sustainability factors as they relate to finance—that is, green finance. For most countries, focusing on green finance can generate important lessons that can be expanded to cover other areas of sustainable finance. To facilitate this process, this first chapter discusses the characteristics of a sustainable financial system at large and then puts green finance in the context of other types of sustainable financing.

1.2 CONTEXT: CHARACTERISTICS OF A SUSTAINABLE FINANCIAL SYSTEM

Building on the work carried out by the UN Environment Inquiry (UN Environment Inquiry 2015, 2016a), this transition can be defined in terms of eight characteristics:

² The G20 Green Finance Study Group defines *green finance* as the “financing of investments that provide environmental benefits in the broader context of environmentally sustainable development” (G20 Green Finance Group 2016).

- From a *government and regulatory* perspective:
 - ➔ Policy alignment. Ensuring that the international, national, regional, and subnational financial regulators are aligned with long-term sustainable policy goals
 - ➔ Financial stability. Ensuring financial system resilience in the face of environmental and climate-related pressures and other sustainability risks
 - ➔ Public finance effectiveness. Ensuring the effective use of scarce public finance to catalyze sustainable finance
- From a *private financial markets* perspective:
 - ➔ Principles, cultures, and beliefs aligned to sustainability. Ensuring that the financial system is sensitized, responsive to, and rewarded for environmental stewardship and sustainability considerations
 - ➔ Market integrity. Ensuring effective transparency and accountability to underpin financial sector behavior with regard to its impact on sustainability
 - ➔ Innovation and dynamism. Ensuring that innovative financing instruments and business models are aligned to the financial system's purpose
 - ➔ Long-term horizon. Ensuring that financing decisions take into account longer-term risks and opportunities associated with the environment and sustainability
 - ➔ New information and capabilities. Ensuring the effective flow and use of market-relevant sustainability information

1.3 TRANSITIONING TOWARD SUSTAINABLE FINANCE

Moving successfully toward a sustainable financial system requires changing course from business-as-usual practices and avoiding transition pitfalls. Achieving a financial system exhibiting the characteristics mentioned above implies a transition process with risks along the way. Table 1.1 describes the transition process needed to achieve each one of these characteristics.

TABLE 1.1 TRANSITIONING TOWARD SUSTAINABLE FINANCE

Characteristic	Business-as-usual	Transition risks	New sustainable model
Policy alignment	• The sustainability agenda is primarily driven by ministries of environment, health, and education. • Financial sector authorities are not involved in developing and executing sustainability policies.	• In response to the drive toward sustainability, multiple policies arising from different parts of the financial sector may be developed with limited coordination and within policy silos.	• The role of the financial sector is an integral part of the development and execution of sustainability policies. • Incorporating sustainability considerations and the risks and opportunities that they entail becomes part of the financial sector culture, business, and regulation.

TABLE 1.1 TRANSITIONING TOWARD SUSTAINABLE FINANCE (CONTINUED)

Characteristic	Business-as-usual	Transition risks	New sustainable model
Financial stability	In the best of cases, only short-term environmental and social risks associated with specific projects are considered as having an impact on sector stability.	Increased risk-aversion may occur as the broader long-term sustainability risks begin to be considered, measured, and managed.	Both short- and long-term sustainability risks are measured, priced, and managed with respect to specific financial transactions and systemically.
Public finance effectiveness	Interventions are ad-hoc, with limited measurement of costs/benefits and scale-up viability.	Momentum may be lost behind innovative approaches as a result of increased selectiveness of interventions.	Integrated interventions are focused on removing barriers to sustainable finance.
Principles, cultures, and beliefs aligned to sustainability	Sustainability considerations are absent or limited to niche subsectors in the financial system.	As the understanding of the concept behind sustainability increases, stakeholders may focus excessively on risks, not opportunities.	Incentives across all stakeholders of the financial system will be aligned toward long-term sustainability.
Market integrity	- Sustainability impact is not disclosed and/or integrated into prices. - Disclosure initiatives are undertaken on certain segments only.	Multiple disclosure initiatives lacking common standards may damage the credibility of emerging initiatives.	Disclosure standards are implemented and incorporated as part of standard financial markets' integrity practices.
Innovation and dynamism	Financial innovation is limited and focused on sustainability.	At times of change and experimentation, many initiatives are bound to fail before successful ones are identified, tested, and rolled out.	Financial technology (fintech) and other mechanisms of financial innovation redefine the relationship among financial sector stakeholders with a focus on sustainable finance.
Time horizon	Focus is on short-term sustainability risks.	Inherent uncertainty of long-term sustainability risks may discourage risk-taking.	Standards to measure and manage long-term sustainability risks and opportunities are adopted.
New information and capabilities	Know-how on sustainability and its implication for the operation of the financial system is limited within the financial sector. Limited market-relevant sustainability information is integrated into the financial system.	Disjointed efforts to develop sustainability information and capabilities lead to a mismatch of practices across the financial system.	Common information metrics are used broadly across the financial system and stakeholders have the know-how to incorporate such information into day-to-day operations and long-term strategy formulation.

1.4 THREE DRIVERS OF CHANGE

The ongoing transition toward a sustainable financial system is taking place through the interaction of three types of initiatives:

1. *Market-based initiatives.* Through the development of collective initiatives such as the Sustainable Banking Network (SBN) and the United Nations Environment Programme – Finance Initiative (UNEP FI), private and public finance institutions (FIs) have worked to integrate environmental and social risks and opportunities into their business lines and approaches.³ Through these initiatives, market participants are building on frameworks initially developed for certain types of institutional investments and risk management—such as, respectively, the PRI and the Equator Principles— and are increasing their environmental risk assessment capabilities, allocating funds to specific green lending and asset classes, and making commitments to decarbonize their portfolios.
2. *National initiatives.* The initial momentum for sustainable finance has been driven by country-level initiatives that, in many cases, arose from national planning processes to implement climate change policies or other long-term strategic development initiatives. National policy makers and regulators, in coordination with their private sectors, are increasing their support and promoting efforts in sustainable finance, with many introducing measures to promote capital reallocation, improve risk management, and enhance reporting. About two dozen countries are already implementing national roadmaps for sustainable finance.
3. *International initiatives.* Cooperative efforts carried out by the G20, the G7, the UN, and the FSB have all addressed different aspects of sustainable and green finance while at the same time increasingly involving the private sector. This effort has been complemented by the multilateral development banks (MDBs) and other international financial institutions (IFIs) that are continuing to actively promote sustainable finance with initiatives ranging from the adoption of sustainable practices in their core financial activities to the launching of new products aimed at driving capital to sustainable and green applications.

1.4.1 Examples of Interaction among These Types of Initiatives

The creation and growth of green bond markets and the development of approaches to disclose climate-related financial information are examples of how national, international, and market-driven initiatives interplay. Green bonds were created in response to demand from institutional investors and led to the initial involvement of IFIs—the World Bank and the European Investment Bank in particular—in the pioneering transactions that triggered the development of these instruments. As market demand grew, international standards were developed and other financial infrastructure players (rating agencies, verifiers, and so on) further contributed to this asset class growth. A new step change in the market is taking place through the development of national standards (for example, China) that has led to a

³ In this document, *FI* refers to a variety of financial institutions such as universal banks, investment banks, private equity funds, venture capital funds, microfinance institutions, and leasing and insurance companies, among others.

substantial increase in issuance. Similarly, a bottom-up approach—starting with country-level market and regulatory initiatives and later strengthened through international cooperative arrangements—has contributed to the development of guidelines for incorporating climate risks into the calculation and disclosure of financial information (TCFD 2017a).

1.5 ROADMAP: DEFINITIONS, SCOPE, AND STRUCTURE

For purposes of the approach proposed in this Roadmap, the definition of sustainable finance will be broad enough to capture the different approaches being used around the world (Box 1.1). Appendix A presents a discussion of the approach used to converge on this working definition and facilitates its understanding by discussing other related concepts. This definition refers to the “system” at large, which is composed of all the stakeholders involved in sustainable finance—including government agencies, public and private sector financial entities, and users (that is, savers and borrowers). As the process of consultation on these proposed principles moves forward, this definition will be refined to reflect the views gathered in this process.

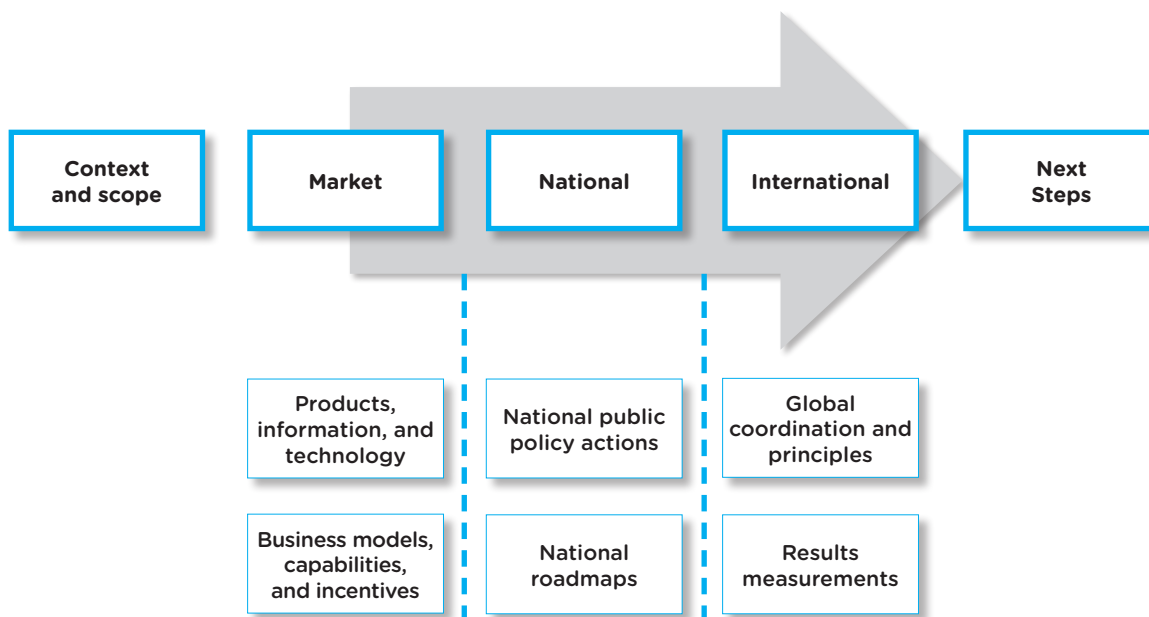
BOX 1.1 SUSTAINABLE FINANCIAL SYSTEM: A WORKING DEFINITION

A sustainable financial system is stable and creates, values, and transacts financial assets in ways that shape real wealth to serve the long-term needs of a sustainable and inclusive economy along all dimensions relevant to achieving those needs, including economic, social, and environmental issues; sustainable employment; education; retirement financing; technological innovation; resilient infrastructure construction; and climate change mitigation and adaptation.

1.6 STRUCTURE

The Roadmap document is structured in five chapters that use the three drivers of transformation toward sustainable finance as its organizing principle (Figure 1.1).

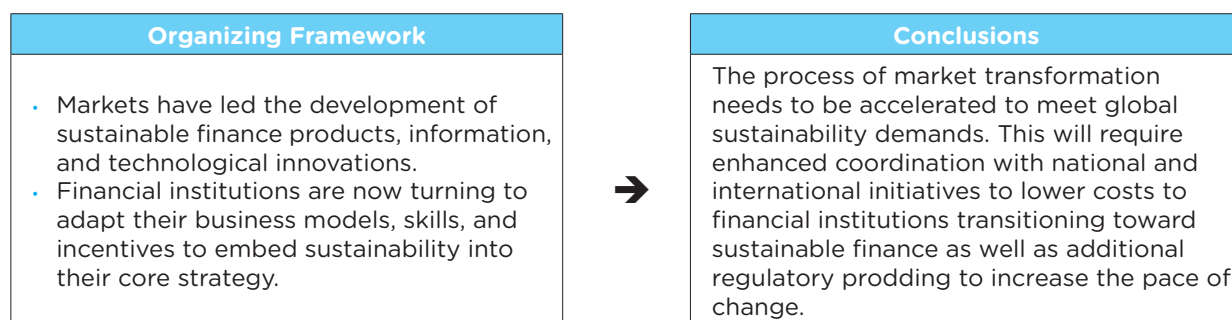
FIGURE 1.1 ROADMAP STRUCTURE



Source: UN Environment/WBG Roadmap Team.



2 MARKET-DRIVEN TRANSFORMATION



2.1 MARKETS HAVE LED THE INITIAL TRANSFORMATION TOWARD SUSTAINABLE FINANCE

The initial stage of transformation toward sustainable finance has been driven by a virtuous cycle of financial innovation that has facilitated the allocation of capital to real sector activities aligned with sustainability considerations (Figure 2.1). For example, institutional investors and international financial institutions (IFIs) were instrumental in creating green bond markets. The real sector's increased demand for sustainable finance led to a substantial growth in the depth of green bond markets. As this chapter notes, a similar path is being followed in the development of other financial instruments, but it will require continued financial innovation by market participants accompanied by an increased availability of market-relevant information, new approaches to leverage emerging financial technology (fintech), new business models, and upgrades to the financial sector infrastructure and skills.

2.2 PRODUCTS, INFORMATION, AND TECHNOLOGY

2.2.1 Financial Products

Sustainability considerations are transforming the real economy and the financial sector is evolving to respond to that reality. These changes are affecting the financial structure and the financing needs of entire industries, from gas and oil to transportation. For example, the growth of renewable energy and energy efficiency projects are shifting investments toward higher capital expenditures and relatively lower operating expenditures than those needed in traditional energy projects. Financial institutions (FIs) are responding to the new financing needs arising from these changes. In 2016, the International Finance Corporation (IFC) conducted a survey with its FI clients in emerging markets to understand their strategy

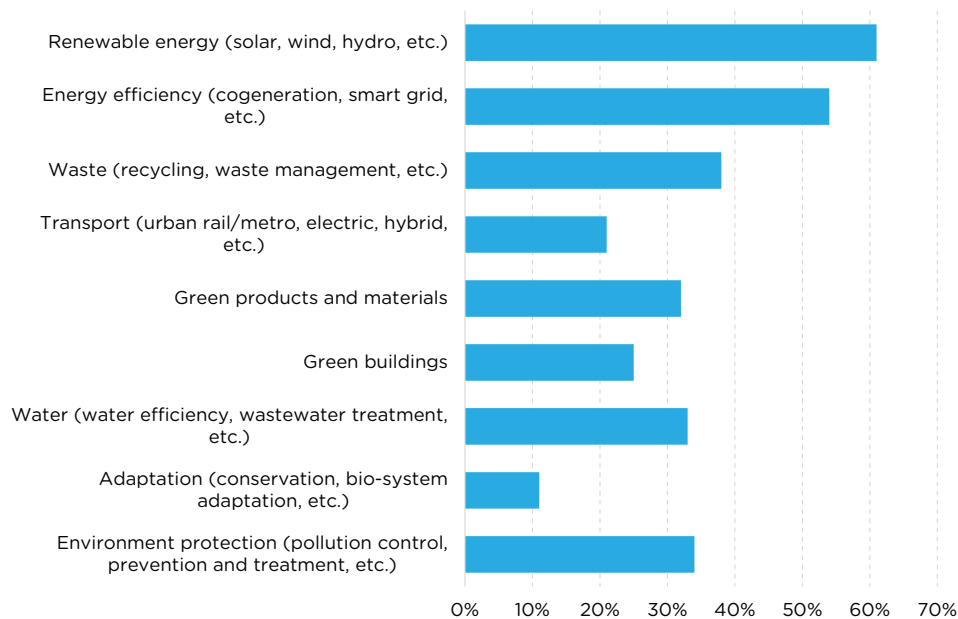
FIGURE 2.1 THE VIRTUOUS CYCLE OF MARKET-DRIVEN SUSTAINABLE FINANCE



Source: UN Environment/WBG Roadmap Team.

and approach to climate risks and opportunities. Over 60 percent of the 135 respondent FIs are already active in financing climate-related and green projects. In addition, another 9 percent of institutions expressed interest in pursuing investment opportunities in this space (IFC 2016a). Renewable energy and energy efficiency topped the list, with 61 percent and 54 percent respectively (Figure 2.2).

FIGURE 2.2 IFC SURVEY AMONG CLIENTS: PERCENTAGE ACTIVE IN CLIMATE/GREEN FINANCE



Source: UN Environment/WBG Roadmap Team.

For FIs, the size of the sustainable finance business will continue to grow. In part because the definition of sustainable or green financing is still evolving, there is not yet a global, systematic estimate of the size of this market. However, some specific estimates do exist for regions and/or sectors. A review of the Nationally Determined Contributions (NDCs)⁴ and other policies in 21 developing countries that represent 48 percent of global greenhouse gas (GHG) emissions finds an initial investment opportunity of US\$22.6 trillion from 2016 to 2030 in key sectors. A significant portion of this estimate is for green buildings, and this is probably an underestimate—there are large data gaps for important sectors such as climate-smart agriculture and transportation (IFC 2016b). In specific sectors, such as renewable energy, US\$7.4 trillion of global investments are expected through 2040 (BNEF 2017). Although these estimates refer to levels of investments, most of these resources are intended to flow through the financial sector as bank lending, project finance, institutional investing, or equity investing. For the insurance industry, the increase in climate-related perils has increased the protection gap to US\$100 billion per year according to ClimateWise, a network of 30 large global insurers (ClimateWise 2016).

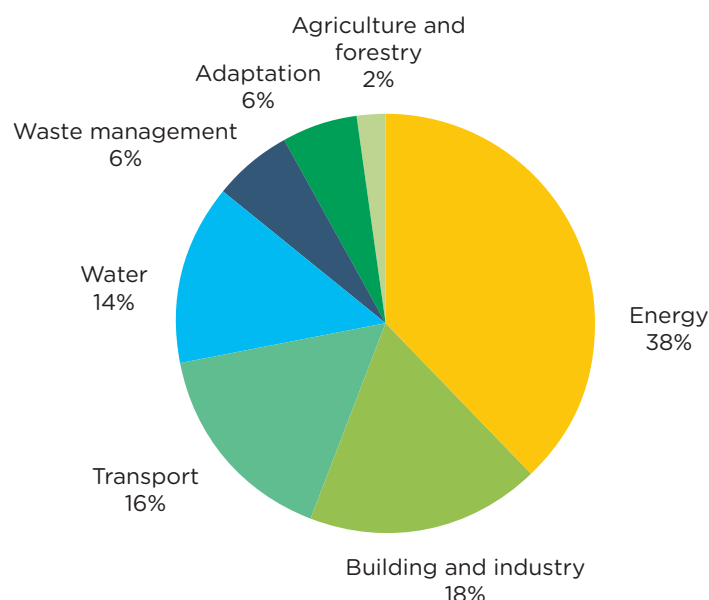
Banks are realigning existing products as well as creating new ones to match the risk-reward and maturity needs of sustainable investments. In many cases, realigning business activities toward sustainable sectors can be achieved with existing products adapted to the specific needs of new sustainable markets and, to ensure broad acceptability, with an accompanying set of standards that can facilitate origination processes. For example, in 2016 the European Mortgage Federation, along with the European Covered Bond Council, launched a mortgage financing initiative to support energy efficiency improvements in buildings by creating a standardized approach and market benchmark. This initiative will develop a standardized European instrument that takes into consideration the positive impact that retrofitting for energy efficiency has on buildings' value, thus increasing the underlying value of the collateral. It also provides the potential for lower default rates for this type of mortgage as a result of the decrease in energy costs.⁵ Similarly, sustainable finance energy products are built on traditional project finance for renewable energy projects, and on corporate or small and medium enterprise (SME) finance for energy efficiency equipment and retrofitting. In the case of retail finance, FIs are offering consumer loans to finance efficient electrical appliances and heating/cooling systems as well as to retrofit housing for increased energy efficiency—a critical development because about 20 percent of global energy consumption goes to residential and business buildings' heating, lighting, and appliances (EIA 2016).

In capital markets, the development of green bonds is addressing the need for longer-term financing that is generally required by sustainable projects. Green bonds are now being used to raise funds across multiple sectors (Figure 2.3). The European Investment Bank was the first issuer of a climate awareness bond in 2007, followed by the World Bank's first labeled green bond in 2008. Since then a market for bonds designated as "green" has emerged. This market was initially dominated by multilateral development banks (MDBs), but has grown significantly since then and now includes a much broader universe of issuers. In 2016, green bond issuances reached US\$80 billion, almost double the total issuance of 2015. Green bond issuances of financial institutions registered the highest growth, a seven-fold increase from 2014 to 2015, making up half of the corporate issuance in 2016 (Figure 2.4).

⁴ Nationally Determined Contributions spell out the actions countries intend to take to address climate change, in terms of both adaptation and mitigation. Further details can be found at http://unfccc.int/focus/indc_portal/items/8766.php

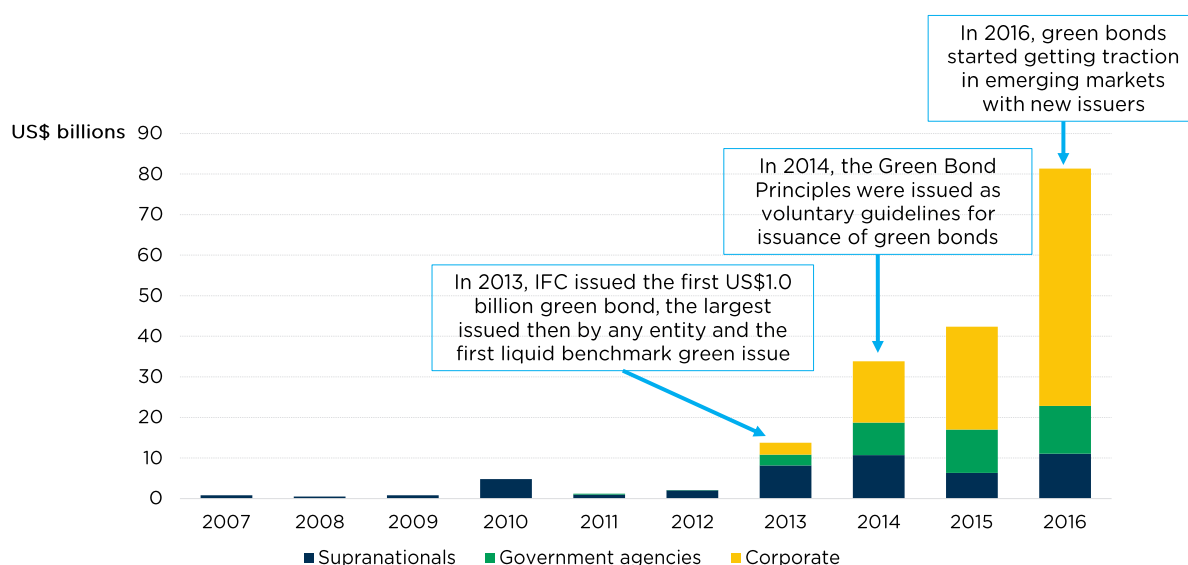
⁵ Additional details on this ongoing initiative can be found in the European Mortgage Federation and European Covered Bond Council webpage, www.hypo.org

FIGURE 2.3 USE OF GREEN BOND PROCEEDS: 2016 ISSUANCE



Source: UN Environment/WBG Roadmap Team based on Climate Bonds Initiative (2017) data.

FIGURE 2.4 EVOLUTION OF GREEN BOND MARKET, 2007-16



Source: UN Environment/WBG Roadmap Team.

Despite their impressive growth in recent years, green bonds remain a small and nascent segment of the overall bond market, which currently stands at almost US\$100 trillion. The momentum of demand for green bonds is expected to help drive more capital to low-carbon and climate-resilient infrastructure projects, including renewable energy projects. For investors, green bonds can achieve attractive risk-adjusted financial returns along with environmental benefits, in addition to meeting allocations for climate-aligned investment and green investment mandates without the need for time-consuming due diligence. Green bonds can also offer a hedge against carbon transition risks in a portfolio that

includes emissions-intensive assets. For issuers, green bonds help diversify the investor base, attracting new institutional investors with green or climate mandates. The bonds can also demonstrate and implement an issuer's approach to environmental, social, and governance (ESG) issues and deliver reputational benefits, enhancing the issuer's corporate sustainability strategy and its environmentally friendly brand. The upfront and ongoing transaction costs of the labeling and associated monitoring of a green bond, as well as the costs of reporting, verification, and tracking the use of its proceeds, can be offset through improved internal governance structures and environmental and social management systems.

Insurance companies are playing a double role in the development of sustainable finance products. As institutional investors they have been crucial in fostering the demand for green bonds as well as other long-term instruments to match their liabilities. They also play a more direct role by creating products to facilitate the management of risks. For example, their role in developing and providing the analytics to price catastrophe bonds can be used to promote investments in resilience by issuers (Kahn, Casey, and Jones 2017). At the retail level, products such as index-based weather insurance can facilitate the process of adaptation to climate change.

2.2.2 Market-Relevant Information Is Essential to Increase the Supply of Sustainable Finance

Further growth in the supply of sustainable finance requires addressing important information gaps. Financial markets depend on information to ensure a process of allocating resources that leads to efficient prices and effective risk management, and more generally to minimize information asymmetries that prevent markets from developing. Two elements to the concept of sustainable finance information are relevant to financial markets:

- *Disclosure.* This refers to the public availability of market-relevant sustainability information arising from real and financial sector entities, financial institution associations, stock markets, regulators, and other stakeholders of the financial sector. This information is also essential for investors to select portfolios aligned with sustainability criteria, for shareholders to monitor companies' compliance with sustainable strategies, and for policy makers and society at large to measure progress toward sustainable finance objectives.
- *Embedding of disclosed as well as non-public information into market-relevant information flows.* There is a well-established subset of financial infrastructure entities whose role is to increase market efficiency by collecting, processing, and making available information relevant to financial sector stakeholders. These include credit rating agencies, credit bureaus, credit registries, research houses, property and other collateral registries, and financial data providers. This information is essential for FIs to develop and appropriately price financial products and to manage risks, and for other market participants and regulators to assess FIs' performance with respect to strategic objectives and legal and regulatory requirements related to sustainability considerations.

2.2.3 Disclosure

Diverse approaches and evolving toolkits. Current efforts to move to a more advanced disclosure paradigm are uneven across asset classes and jurisdictions, but consensus is building around methodologies for the disclosure of certain types of information (such as the carbon footprint of investment portfolios). Emerging approaches can be grouped into five categories:

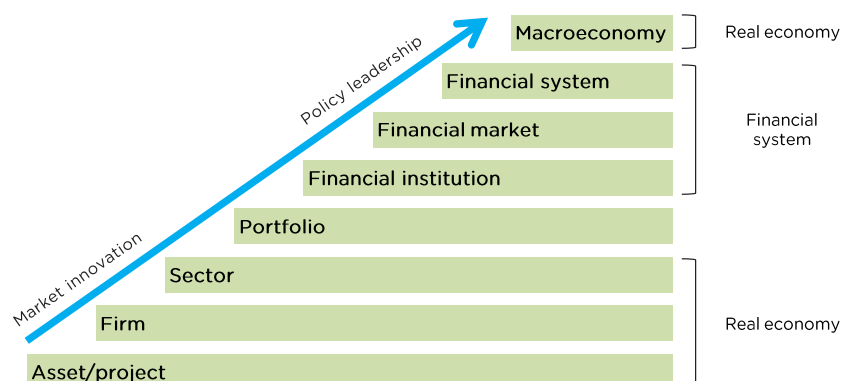
1. *Process.* Information relating to the operational processing of sustainability factors, such as ESG integration into investment disclosure and the overall mix of products aligned with sustainability considerations. Key tools include disclosure of investment policies.
2. *Performance.* Information relating to the performance of financial portfolios with respect to different green indicators or policy objectives (for example, decarbonization). Key tools include benchmarking against indices and exposure assessment (for example, exposure to fossil fuel holdings).
3. *Impact.* Information relating to positive impact achieved on sustainability objectives within the real economy, such as pollution abated or green jobs created. Key tools involve life-cycle assessment, monitoring, and evaluation.
4. *Scenario/strategic alignment.* Information relating to alignment with a low-carbon future, specifically examining exposure and performance of an institutional portfolio over a two-degree future scenario for the economy. Key tools involve scenario analysis and the use of asset-level data.
5. *Identification.* Information relating to the environmental characteristics of all financial assets. Key tools involve the tagging of green assets or the use of established data registries.

Linking across levels. Consistency in information is needed across multiple levels in the financial system to enable effective decision making (Figure 2.5). As risk assessment becomes more sophisticated, financial institutions and third-party service providers are being challenged with a range of issues in their efforts to translate financial risks to individual assets to the institutional level. Alignment across sources of data, classifications, analytical methodologies, and scenarios will be necessary to enable each successive level of analysis to be useful for corporations, FIs, and regulators. The main elements of alignment include:

- *Asset/project.* The specific climate challenges facing a new project or investment;
- *Corporate entities.* The implications for a specific firm as requested by a growing number of investors;
- *Corporate sectors.* Enabling a comparative view across companies in the same sector;

- *Investment portfolios.* Providing the basis for a cross-sectoral analysis at the portfolio level;
- *Financial institutions.* Portfolio implications aggregated across an entire financial institution;
- *Financial sector.* For supervisors, the overall implications for the insurance sector;
- *Financial system.* Exploring potential for firm-level disruptions to spiral into system-level impacts on financial stability; and
- *Macroeconomy.* Finally, the potential for financial system disruption to impact macroeconomic factors such as growth, prices, fiscal and trade balances, social inequality, and environmental health.

FIGURE 2.5 LINKING DISCLOSURE LEVELS



Source: UN Environment Inquiry 2017.

Sustainability information is being integrated into accounting standards and other mechanisms that are essential to ensure markets' integrity. This can involve reporting not only on the impact on sustainability of a firm's operations (for example, in terms of GHG emissions), but also on the levels of revenue that are associated with green businesses, an effort in which the Sustainability Accounting Standards Board (SASB) is involved in the context of facilitating the identification of firms that could be considered as eligible for ESG investors. The guidance from the Financial Stability Board's Task Force on Climate-related Financial Disclosures (TCFD) is providing further impetus to both the real sector and FIs to develop a coherent and consistent approach to incorporate climate-related risks into their decision-making process (TCFD 2017a).

Stock markets and institutional investors have played a key role in encouraging disclosure in the real sector. Stock exchanges are important in encouraging improved environmental disclosure by corporations, including through listing requirements. Momentum is increasing—the Sustainable Stock Exchanges (SSE) Initiative now includes over 60 stock exchanges, representing more than 70 percent of listed equity markets and some 30,000 companies with a market capitalization of over US\$55 trillion. Notable frameworks released within the last year include:

- The Singapore Exchange launched “comply or explain” reporting rules covering environmental policies and performance in June 2016, covering all listed companies by 2018.
- In February 2017, the London Stock Exchange Group (LSEG) released ESG guidance incorporating recommendations of the TCFD.⁶
- Following from the release of its first green bond in 2014 (JSE 2014), the Johannesburg Stock Exchange is developing green bond listing requirements in line with international best practice.
- In China, different public and private bodies have launched seven green bond indices since mid-2016 to complement the 19 existing green equity indices (UN Environment Inquiry 2017c).
- In Italy, Borsa Italiana has looked to build markets for securities beyond the corporate level by releasing a framework for green and social “mini-bonds” listing in March 2017.⁷

Market institutions are also advancing the information agenda through partnerships and coalitions. Market institutions are working together to help enhance flows of sustainability information, including through disclosure of investment policies, portfolio allocation, and alignment with a low-carbon future. Reporting and disclosure is a key aspect of the Principles for Responsible Investment (PRI), the world’s largest coalition of institutions sharing sustainable investment priorities—which has increased by over 185 members since June 2016 and now represents 50 percent of global assets under management. Launched in 2014, the Montreal Pledge has reached more than US\$10 trillion in assets under management with over 120 investors committed to measure and publicly disclose the carbon footprint of their investment portfolios on an annual basis.⁸ The Portfolio Decarbonization Coalition, a multistakeholder coalition of investors committed to reducing the carbon footprints of investment portfolios, releases information detailing the decarbonization approaches and strategies of its members.⁹ New market coalitions are looking beyond basic information on environmental performance (that is, in terms of carbon emissions) to build awareness of impacts achieved in the real economy. The Principles for Positive Impact Finance was launched in January 2017, supported by 19 global banks and investors totaling US\$6.6 trillion in assets.¹⁰

⁶ Additional information can be found at <http://www.lseg.com/resources/media-centre/press-releases/london-stock-exchange-group-launches-guidance-esg-reporting>

⁷ Information about Borsa Italiana can be found at <http://www.borsaitaliana.it/obbligazioni/greenbonds/socialbonds.en.htm>

⁸ The Montreal Carbon Pledge is available at <http://montrealpledge.org/>

⁹ Information about the Portfolio Decarbonization Coalition can be found at <http://unepfi.org/pdc/latest-annual-report-27-investors-representing-over-600bn-in-decarbonization-commitments-detail-progress-made/>

¹⁰ Details about the Principles for Positive Impact Finance are available at <http://www.unepfi.org/positive-impact/positive-impact/>

2.2.4 Embedding Sustainability Information into the Financial Sector

Information relevant to sustainable finance will be critical to ensure the alignment of incentives, results measurement, proper valuation of assets, and effective risk management. Information asymmetry is in fact one of the main obstacles to developing a sustainable financial system. A broad set of sustainability data providers arose in response to ESG investors' needs. These data providers include both the large international ratings agencies and specialized firms providing ESG ratings, indices, and other specific reporting such as governance and proxy voting reporting (Novethic 2013).

- *ESG ratings.* Rating agencies assign a score or rating to companies based on different types of criteria that may include exposure to ESG risks and their ability to manage them (for example, MSCI ESG ratings) and their ability to incorporate ESG considerations into business opportunities and other financially material issues (for example, RobecoSAM Corporate Sustainability Assessment).
- *Inclusion of ESG factors into credit ratings.* More recently, with support from the PRI and the UN Environment Inquiry, leading rating agencies have started to incorporate ESG considerations into the development of their credit ratings. This arises from the recognition that ESG risks are material and directly affect the long-term viability of firms. Nine rating agencies are signatories of the *Statement on ESG in Credit Ratings* and are undertaking a consultation process, to be finalized in 2018, to adapt their rating methodologies to include ESG parameters.¹¹
- *Financial data providers.* A broad set of financial data providers aggregate information such as ratings, financial statements, material news, and other relevant market data; these data providers have developed ESG modules. For example, Bloomberg, one of the largest data providers, collects ESG data on more than 10,000 publicly listed companies.
- *ESG indices.* Indices, many of them developed by rating providers, select companies based on ESG criteria and can be used to select investments and compare the performance of ESG portfolios using the index as benchmark. A broad range of ESG indices can select for criteria as specific as low-carbon footprint, fossil fuels-free status, and gender equality in addition to those using broader criteria with parameters for each one of three ESG pillars. More recently, regional indices have been developed. These include an ongoing initiative between S&P Dow Jones Indices, IFC, RobecoSAM, and the Stock Exchanges of the Mercado Integrado Latinoamericano (MILA) to develop an ESG index covering public companies in Chile, Colombia, Mexico, and Peru.

Mainstreaming sustainability across the financial data ecosystem is needed. At a higher level, recognition is building of the need to mainstream sustainability consideration across the existing ecosystem of information infrastructure within the financial system—including data sources and methodologies used by institutions to evaluate risk profiles

¹¹ For additional details on this initiative, see <https://www.unpri.org/press-releases/credit-ratings-agencies-embrace-more-systematic-consideration-of-esg>

of real economy investments and financial assets. Critical here is the role of credit rating agencies (CRAs), some of which have begun to integrate ESG factors into in mainstream credit risk analysis. Recent research undertaken by the PRI has confirmed progress within several leading agencies (such as S&P and Moody's), but identifies major differences in consideration of the materiality of ESG factors across different CRAs, and asymmetries between CRAs and investors (Beeching, Nuzzo, and Adams 2017). Beyond rating agencies, there are multiple other sources of information where sustainability factors have not yet been extracted—including credit bureaus, credit registries, and property registries. For example, including information regarding compliance with energy efficiency standards in property registries can facilitate the tagging of mortgages and potentially lead to lower financing costs for green investments.

Investments in data infrastructure for the financial sector will be critical for the green economy. There is an opportunity for significant improvement in the tracking and measurement of green finance, particularly in bank lending, by improving the way loans are tagged and by developing standards to identify green loans in each economic sector. Generating sustainability data has impact at multiple levels, as the ongoing process to develop green tagging of bank portfolios shows. IFC published a bottom-up methodology (IFC 2017) to track green finance by banks that provides a definition of *green* at a project level, based on the intended use of the investment in the real economy. This approach estimates the green share per project type and then aggregates flows at an industry and country level. The World Bank Group (WBG) is leading efforts to develop an approach to identify green assets within banks (Box 2.1). This process is also referred to as *green finance tagging*. The exercise undertaken will potentially provide multiple benefits:

- Facilitating the development of longer-term capital markets products by providing valuable information on the portfolios of green/climate-smart loans that could be packaged as asset-backed securities into green bonds.
- Contributing to measure the existing level of green finance and manage exposure to “non-green” or “brown” sectors. This effort would lead to a leap in market transparency on the flows of finance to green/climate smart assets and products.¹² This is particularly important in the banking sector where no criteria equivalent to that in debt markets—such as the Green Bond Principles managed by the International Capital Market Association—exists to identify green assets.
- Facilitating the identification of the risk characteristics of these portfolios. Green tagging could provide the basis for evaluating the financial performance of green/ climate-smart loans relative to their inefficient alternatives, including an appropriate level of capital charges. For example, initial evidence suggests that green assets may have lower default rates and higher valuations than other similar assets of otherwise identical risk characteristics (Principal 2017; Sahadi, Stellberg, and Quercia 2013).

¹² IFC Definitions and Metrics for Climate Related Activities can be accessed at <https://www.ifc.org/wps/wcm/connect/8ea3b242-c6bb-4132-82b1-ee4bd7007567/IFC+Climate+Definitions+v3.0.pdf?MOD=AJPERES>

BOX 2.1 GREEN TAGGING

Green tagging, or green finance tracking, is the process of identifying, tracking, and reporting the green share of a financial institution (FI)'s portfolio committed per year or accumulated in a given period. Based on the range of green percentages or shares, individual transactions can be tagged as: (a) green, (b) partially green, or (c) non-green—that is, brown. The approach leverages, whenever feasible, existing industry standard classification codes and certification and asset classification systems, such as the Energy Star rating system, green building standards, and agri-certification standards.

Existing Initiatives

Several new bottom-up approaches for tracking/tagging green finance are being piloted by various institutions.^a With Climate Strategies, the UN Environment Inquiry has launched an initiative with 10 of the largest European banks to explore the “state of the art” in linking lending to the real estate sector with energy performance standards. The European Investment Bank has also kick-started an initiative to align taxonomies for green projects following the IFI Framework for a Harmonized Approach to Greenhouse Gas Accounting.^b This includes the taxonomy developed by China to regulate the Chinese green bond market, and that developed by the Climate Bonds Initiative (CBI) for certifying green bonds.^c

New World Bank Group Initiative

The proposed World Bank Group initiative on green tagging seeks a broader approach to ensure that bank loans are being consistently and comprehensively tagged at the appropriate levels. To track and filter green transactions, the process primarily uses existing standard industry classification (SIC) codes to identify the industry to which the borrower belongs, not necessarily the type of activity that is being financed. For transactions that could be tagged as “partially green” based on SIC codes, additional information will be required to determine the green share of activities financed by the loan. Various standards, often sector/activity-specific, already exist in a growing number of countries that attribute “greenness.” This initiative will bring these standards into a collective framework in a way that is aligned with the needs and operating practices of the financial system. The key steps proposed under this initiative are summarized in Table B2.1.1.

The proposed approach will require developing an analytical framework that outlines the industry sector classification and green sectors. It will be necessary to leverage the existing initiatives, including certification schemes for agricultural commodities, small and medium enterprise loans, green building standards, and so on, and to work with external data providers. External data providers and credit bureaus could be relied on to implement this approach, and transform the existing data collected by FIs that use a paper form or that have inconsistent or missing industry classifications.

BOX 2.1 GREEN TAGGING (CONTINUED)

TABLE B2.1.1 STEPS OF THE WORLD BANK GROUP INITIATIVE ON GREEN TAGGING

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

Next Steps: Testing the Proposed Approach

The approach will be piloted with a few FIs. At minimum, FIs included in the study are expected to comply with the Equator Principles.^d The selection of participating FIs will ensure economic and geographic diversity with at least one developed market and one developing market institution included, with a view that these institutions are planning to issue a green bond in the short to medium term.

Note: a. Tracking Green Finance in the Banking Sector in IFC (2017), https://www.ifc.org/wps/wcm/connect/48d24e3b-2e37-4539-8a5e-a8b4d6e6acac/IFC_Green+Finance+-+A+Bottom-up+Approach+to+Track+Existing+Flows+2017.pdf?MOD=AJPERES

b. See the International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting, November 2012, http://www.ifc.org/wps/wcm/connect/518623004dc5f53c8e36aeab7d7326c0/IFI+Harmonisation+Framwwork+for++GHG+Accounting_Nov+2012.pdf?MOD=AJPERES

c. CBI is working to estimate sectors emissions thresholds that are compatible with low emission pathways.

d. For more information on the Equator Principles, please visit <http://www.equator-principles.com/>

2.2.5 Technology

Digital finance, or innovative financial technology—*fintech*—has emerged as a powerful disruptor that is rapidly reshaping the real economy and the financial sector on a global scale. By changing the way people pay, lend, and invest, digital finance could substantially change financial sector architecture and policies. Furthermore, it has the potential to advance sustainable finance and transform the future of the financial system, and to align it with policy goals such as those embodied in the 2030 Agenda for Sustainable Development and the Paris Agreement on climate change.

Broadly defined, *digital finance* is the evolving process by which technologically enabled financial innovation results in new business models, applications, processes, and products with an associated material effect on financial markets and institutions and on the provision of financial services (Bank of England 2017). These innovations include, for instance, digital payment solutions, e-commerce, crowd lending and aggregation platforms, equity crowdfunding, Internet-based services in the insurance industry, roboadvisors and gamification in the investment space, and peer-to-peer lending (GreenInvest 2017). Moreover, digital finance is part of a wider digital ecosystem that includes artificial intelligence, big data, cryptocurrencies, the Internet of Things, and a wide range of nonfinancial applications of blockchain technology.

Digital finance has the potential to deliver environmental outcomes and support a transformation in financing for sustainable development by, for instance, mobilizing capital for critical priorities and mainstreaming social and environmental factors throughout the financial system. For example, the Kenya-based M-KOPA, the Swedish start-up Trine, and the U.S.-based SolarCoin have all used a combination of crowd-sourcing, payment platforms, cryptocurrencies, and clean technology to mobilize capital and deliver distributed solar energy options to remote communities in Sub-Saharan Africa and elsewhere (GFDA 2017).

Recognizing that collaboration with industry peers and key stakeholders is important, the Green Digital Finance Alliance (GDFA) was established at the World Economic Forum's annual meeting in Davos in January 2017 by UN Environment and Ant Financial Services Group. The mission of the GDFA is to realize the potential for digital finance to help deliver environmental sustainability by deepening understanding, stimulating innovation, and facilitating collaboration (Box 2.2).

However, the emergence of such transformative technologies is not without potential consequences and implications. Unintended consequences may be greater than the planned, or even the foreseen, consequences. While many digital finance entrepreneurs set out with the vision that a profitable start-up could have major social or environmental benefits, few have fully explored the negative implications it may bring. From common cyber security risks and regulatory gaps of understanding fintech development to the potential of automation and displacement of labor, the downside implications of fintech development should also be considered by policy makers and financial regulators.

BOX 2.2 THE GREEN DIGITAL FINANCE ALLIANCE (GDFA) AND ANT FINANCIAL SERVICES GROUP

The Green Digital Finance Alliance was created to address the potential for fintech-powered business innovations to reshape the financial system in ways that better align it with the needs of environmental sustainability. The GDFA's participants comprise innovative financial institutions committed to using digital technology to advance green finance in lending, investment and insurance. The GDFA draws in allies from across the worlds of environment and finance whose expertise, insights, and networks can contribute to collaborative actions with timely and scaled potential (GDFA 2017).

Ant Financial Services Group—a related company of the Alibaba Group and parent company of Alipay, and a leading online and mobile payment platform—is a member of the GDFA. It is focused on serving small and medium enterprises as well as individuals (GDFA 2017). Ant Financial is dedicated to building an open ecosystem of Internet thinking and technologies while working with other financial institutions to support the future financial needs of society. The main businesses operated by Ant Financial include Alipay, Ant Fortune, Zhima Credit, and MYbank.

Ant Financial has also initiated the world's first large-scale pilot aimed at greening citizens' consumption behavior through the use of mobile payment platforms, big data, and social media. The Ant Forest app encourages users to reduce their carbon footprint through a three-part approach: providing individualized carbon savings data to people's smartphones, connecting their virtual identity and status to their earnings of "green energy" for reduced carbon emissions, and providing carbon offset rewards through a physical tree planting program. As of January 2017, the first six months of the Ant Forest pilot has resulted in 200 million people across China joining voluntarily—about 40 percent of Ant's user base in China—and resulted in an estimated 150,000 tons of cumulative avoided carbon emissions and over 1 million trees planted.

Ant is dedicated to building up a measurable carbon account for its 450 million users, promoting the development of personal avoided carbon emissions, establishing a green and open platform, and encouraging green and low-carbon activities. Ant next steps include improving and standardizing carbon methodology; establishing an open green platform, and driving a multipurpose green financing platform that will use its big data and other capabilities to build and operationalize voluntary emission reduction methodologies, including by helping small and medium enterprises in particular to enter the carbon trading market and reward carbon reduction activities.

Ultimately, the impact of digital finance will depend on a number of policy and regulatory innovations that enable scaling and minimize its negative unintended consequences. Some of these interventions are not specific to particular sustainable development considerations, but are good practice in enabling fintech innovations. Policy interventions can therefore be active on both the digital finance supply-side and on the manner in which financial system development is aligned to sustainable development (UN Environment Inquiry 2016a). These steps can include:

- Ensuring that digital finance is an integral part of financial system development plans and roadmaps focused on financing sustainable development, particularly at the national level, and especially for developing countries,
- Establishing a platform of leading digital finance companies, working with others to influence the right enabling business, policies, and standards to effectively connect fintech and sustainable development, and
- Incentivizing fintech to align with sustainable development, for example by supporting venture capital and social impact funds to fund start-ups with specific sustainable development ambitions. Another alternative would be to establish a challenge fund, similar in nature to the Longitude and X-Prizes, which seek to create a global community of purpose that can pilot and create replicable solutions over time.¹³

2.3 BUSINESS MODELS, CAPABILITIES, AND INCENTIVES

2.3.1 Business Models

Sustainability considerations should be established as a key strategic pillar by shareholders and the senior management of FIs. Sustainable finance requires a strong commitment from owners and managers to make sustainability considerations a primary component of business strategy, not a niche area associated with other initiatives that—while also important, such as corporate social responsibility and environmental risk management—are not at the core of most FIs’ business strategies. Putting sustainability considerations front and center requires incorporating sustainability strategies into the process to allocate resources—both the firms’ own capital and intermediated resources—in support of creating new sustainable businesses lines, fostering the growth of existing ones, and moving away from activities not aligned with sustainability. For example, the TCFD’s emphasis on strategic and governance considerations related to climate-related financial disclosures highlights the need to embed sustainability into the core business model of organizations.

There is already substantial interest in ensuring that sustainability strategies cascade down to day-to-day decision making through metrics that align incentives. Institutions have started looking at internal carbon pricing as a key tool to aid them in the process of deciding how they allocate their resources. By incorporating such internal prices, investments in carbon-emitting businesses become less attractive. According to the CDP, 65 FIs currently disclose the use of an internal carbon price and 68 more are expected to have this in place by the end of 2018 (CDP 2016). Nearly all of these institutions are applying a price to their operational emissions (for example, building energy use, employee travel, and so on). However, with the release of the TCFD report, the move by some governments (for example, France and the Netherlands) asking financial institutions to “stress test” their investment portfolios to address climate risk, and a growing number of investors looking into climate risk, banks are beginning to explore how to apply a carbon price to their investment decisions as a way to identify and manage climate risk.

¹³ The Longitude Prize is a £10m prize fund that will reward a competitor that can develop a diagnostic test that will conserve antibiotics for future generations and innovate the delivery of global healthcare (additional information is available at www.longitudeprize.org). The X-Prize Foundation supports competitions to meet challenges in a broad set of areas, including education, health, and technological innovation (see www.xprize.org).

Developing standards and addressing methodological issues is essential to ensure broader adoption of metrics such as carbon pricing. Although approaches to applying internal carbon prices vary in scope and methodology, many FIs are facing the same challenges in moving this forward around internal awareness-building and stakeholder management and by setting appropriate price levels, methodological challenges associated with corporate loans and equity investments, and capacity constraints. Institutional investors are also increasingly interested in ensuring the emergence of standards that could facilitate the process of the decarbonization of portfolios and the selection of investments for ESG portfolios.

New business models in FIs require effective metrics to assess their alignment with sustainability considerations. Assessing the level to which the business model of an FI is moving toward sustainable finance requires a review along several dimensions. In the case of green financing, current efforts, driven primarily by nongovernmental organizations, have focused on reviewing portfolios to assess banks' level of financing directed toward emissions incentive activities.¹⁴ This approach is partly driven by the fact that, by reviewing industry sectors in portfolios, it is easier to identify brown assets than green ones (the next section of this report reviews approaches to address this data gap). A more comprehensive approach to identify a financial institution as green would require a review along four dimensions:

1. Environmental and social (E&S) risk management. An assessment of how E&S risks standards and practices in the sector are applied in the conduct of business to assess the E&S impact of the financial institution's activities. This would encompass a review of the internal processes to categorize and incorporate into business decision-making these risks as well as approaches to develop risk mitigation strategies, ensure their application, and measure their success.
2. Green assets. Measurement of the institution's business intent and actual results in building and maintaining a green portfolio is needed.
3. Brown assets. Measurement of the institution's level of business-as-usual intent and actual results in reducing, building, and maintaining brown assets is needed. Although a formal definition of brown assets does not exist, existing initiatives associate them with the financing of emission-incentive activities (for example, oil and gas).
4. Internal footprint. This term refers to how the financial institution conducts its business operations to minimize its environmental footprint (for example, energy efficiency of facilities, water and paper consumption).

2.3.2 Capabilities in Financial Institutions

The capacity of financial sector stakeholders to use sustainability information needs to be enhanced. Differences in the familiarity, understanding, and capabilities of practitioners related to sustainability factors affect the capacities of institutions to appropriately consider

¹⁴ See, for example, the *Banking on Climate Change Fossil Fuel Finance Report Card 2017* prepared by the Rainforest Action Network, Banktrack, Sierra Club, and Oil Change International at www.ran.org/banking_on_climate_change

and act on risks and opportunities stemming from sustainability factors. Gaps in skills, inadequate institutional frameworks, and a lack of clear leadership signals can hinder efforts to respond to dynamic market conditions, changing client demand, or new regulatory requirements, potentially posing competitive disadvantages. Because skills upgrading can pose significant costs to institutions, a lack of understanding of a clear business case for engagement on sustainability issues can further compound capacity issues. Capacity issues related to sustainable finance are also a pressing challenge for public authorities, including financial supervisors, regulators, and governments. Finally, a lack of understanding of the financial dimensions of sustainability challenges—such as investments in energy efficiency—can constrain consumer demand for sustainable finance products.

The capabilities and skills gap among financial practitioners may be exacerbated by a number of different issues. Surveys of global financial institutions show that only a very small percentage of staff would be capable of appropriately managing sustainability information to use it in decision making either as a strategic driver of the business or, for example, to incorporate this information into regular due diligence of loans and overall risk management (IFC 2014). Some of the causes of this gap include:

- A lack of clear consensus on how to consider or evaluate risks within financial decisions (for example, standard approaches for discounting over time),
- Disagreements on the materiality of sustainability factors with long-term impacts,
- Inadequate impetus on the part of investors to build internal capacity on sustainability issues stemming from a lack of clear sustainability mandates, and
- A lack of mechanisms to catalyze skills upgrading through investment chain interaction (that is, regulations targeting buy-side stimulating a demand for specific capabilities or products from the sell-side)

Industry associations are leading many of the efforts to increase sustainability capabilities within the financial sector. With new emphasis being placed on sustainable banking approaches, capacity building efforts and the provision of technical guidance have been essential to assisting banks to build internal know-how and systems. The Sustainable Banking Network (SBN)—a grouping of banking regulators and associations from 31 emerging markets focused on enabling frameworks for environmentally and socially sustainable lending, supported by IFC—is, for example, supporting training and knowledge exchange among its members. Support ranges from training and workshops to technical guidance and sector-specific guidelines and checklists. Countries that exhibit recent activities include:

- **Brazil.** The Brazilian Central Bank (BACEN) and IFC partnered to provide capacity building for Central Bank supervisors in order to strengthen knowledge of E&S risk management and support the implementation of the Resolution on E&S Responsibility for financial institutions.
- **China.** Following the launch of the Green Credit Guidelines in 2012, the China Banking Regulatory Commission (CBRC) and the China Banking Association (CBA)

have led efforts to disseminate best practices and sector-wide capacity building, including a Green Credit training book and trainings. The CBRC has also led a series of awareness raising activities among banks, as well as dialogues with multiple ministries, to channel information and technical know-how to banks to enable green lending.

- **Mongolia.** The Mongolian Bankers Association (MBA), representing all Mongolian banks, launched the Mongolia Sustainable Finance Principles and Sector Guidelines in December 2014, which took effect in January 2015. All participating banks have since developed internal E&S policies and procedures and have hired full-time E&S staff. The sector guidelines provide guidance to participating banks on how to assess potential E&S risks and opportunities in the agriculture, mining, manufacturing, and construction sectors, and assess the ability of clients to manage E&S issues. They also include guidance on E&S risk rating criteria for assessing and categorizing E&S risks, and encourage the adoption of relevant industry international standards and best practices.

Financial industry organizations are also incorporating sustainability into their capacity building programs. The CFA Institute, the global association of investment professionals, is currently working to implement content on sustainability issues in the Level 1 CFA qualification, and is beginning to develop content at Levels 2 and 3 of the qualification exam, which address integration into valuation processes and portfolio decision making. Actions are also underway to integrate sustainability issues into the CFA Institute's Certificate in Investment Performance Measurement (CIPM) to ensure integrity in performance measurement in addition to valuation.

2.3.3 Aligning Incentives in Financial Institutions

Ultimately, the success of efforts to effectively integrate sustainability information into financial decision making is significantly influenced by the incentives that shape practice within FIs. If information is available, and readily understood by practitioners, transformation is contingent upon the core values, culture, and policies of firms—which at their core are motivated by incentive structures.

Increased sustainability disclosure in financial markets contributes to help align incentives across participants in the financial system. Taking advantage of the momentum gained from the work carried out by the Financial Stability Board (FSB)'s TCFD, continued action is needed to support voluntary disclosure standards and climate risk assessments for banks and FIs, helping to better manage emerging physical and transition risks. Moreover, transparency lends itself to more consistent definitions for sustainable finance and green lending, bringing clarity for more innovative financial products. Although a number of banking regulators, central banks, and banking associations have introduced such definitions tailored to national context and reflecting international experience, more work in mainstreaming transparency can still be done. This approach will ensure the alignment of incentives between customers, investors, shareholders, and governments seeking to promote sustainable developments and financial institutions.

The cultural change needed in the transition to sustainable finance also requires an appropriate alignment incentive *within* financial institutions. Although the first driver of any cultural change is the mandate and strategy set by financial institutions' senior management, adequate mechanisms need to be in place to ensure that an orientation toward sustainability permeates the organization. This requires incorporating sustainability targets into the usual business key performance indicators to which officers in the institution are held accountable, as well as ensuring that initiatives such as internal carbon pricing are used to direct business units' behavior.

Aligning compensation to sustainability targets is another powerful mechanism to align incentives internally. For example, the use of risk-adjusted compensation in banking can be expanded to incorporate sustainability risks and therefore ensure staff are provided with the right incentives in their business development activities. This can be expanded to other levels of the institution, not just business units, so that corporate procurement or facilities management units' performance measurement would include green indicators. Different approaches and instruments are being used to correct for a short-term bias, but many are relatively new—with unclear and inconsistent impacts on behavior. Approaches to aligning incentives are still relatively new and include:

- *Public policy action.* In recent years, an increasing number of central banks, financial regulators, and policy makers have started working to align the rules governing the financial system with broader social purpose—including tackling incentive issues, but not from a sustainability perspective.
- *Market leadership.* Linking core business models and strategies to broader societal mandates will help address incentive issues in an inclusive manner.

Lessons can be obtained from the experience of ESG institutional investors. ESG investors seek to tie compensation of their investment managers to the ESG performance of their portfolios. More importantly, investment managers may use the alignment of executive compensation to ESG considerations as screening criteria for investments. In 2012, the PRI identified the linking of executive pay to ESG performance as critical to achieving the PRI's mission of fostering responsible investments; it recommended tying compensation to clear metrics and disclosing the rationale and approach used to incorporate such ESG metrics into executive pay. Using this framework, the PRI reviewed how ESG metrics are incorporated into executive compensation in global utility and extractive industries, a sector particularly at risk of unsustainable activities. Its analysis showed that, although more than 80 percent of the firms analyzed (84 extractive and utility companies included in major stock indices in North America, Europe, and Australia) in some manner tied ESG issues to compensation, only 28 percent did this using disclosed metrics and 37 percent had claw-back provisions (PRI 2016).

2.4 CONCLUSIONS

The process of developing new products and greening existing ones in support of sustainable finance will have to be accelerated to meet the increasing needs of the global economy. Addressing information gaps will be essential to that process, with enhanced emphasis on forward-looking information. The focus of disclosure has shifted from

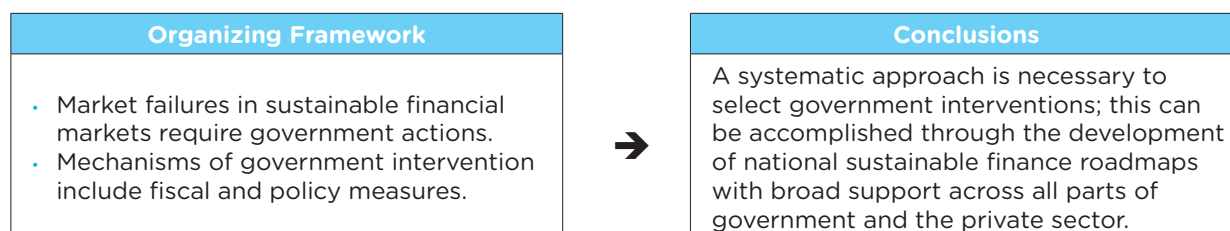
presenting only historic results and past performance to emphasizing the centrality of forward-looking material, which will be critical to enabling clients, investors, and other stakeholders to understand how well the institution is grappling with competing future trajectories. One striking result from the consultation undertaken by the TCFD was that “96% of respondents see scenario analysis as a key component of disclosure” (TCFD 2016, p. 8). A growing focus on the delivery of sustainability information by FIs themselves—for instance, disclosure of climate risks to investment portfolios—is broadening the base of end users beyond clients and shareholders.

More and more, financial supervisors are requesting such information from firms as a way to better inform their view of safety and soundness in the face of environmental hazards and shocks. Information on environmental performance is also becoming increasingly important for consumers of financial services, who are seeking to align their savings and investments with a low-carbon future—a development exemplified by the reputational risks facing firms invested in high-carbon assets. Finally, such disclosure can be relevant for policy makers who are looking to glean insights into potential real economy implications of asset allocations, such as consequences for fiscal policy, as well as the effectiveness of energy, environmental, and economic policy.

To accelerate the transformation of the financial system and the real economy toward a more environmentally friendly and sustainable path, fintech and various technological innovations will play a critical role. Regulators and financial policy makers will need to ensure that the development of fintech will continue to allow for disruption of inefficient and fossil fuel-intensive business models, products, and services, and instead offer products and services that are integrated with sustainability standards and meet consumer demand while providing platforms that help aggregate and reinforce the positive feedback loops. Additionally, to manage the potential downside risks and unintended consequences of fintech, regulators and financial policy makers need to start by engaging with innovators within the industry and begin identifying barriers to the successful scaling up of sustainability and fintech.

FIs are changing the manner in which they operate to internalize sustainable finance into their business models and upgrade the sets of skills and incentives of staff to embed sustainability considerations into their culture. Although this may also require a certain level of regulatory prodding, current market-driven initiatives are moving in the right direction, and the increased transparency that enhanced information will provide will also boost the incentive for FIs to move along this path.

3 NATIONALLY DRIVEN INITIATIVES TOWARD SUSTAINABLE FINANCE



3.1 NATIONAL PUBLIC POLICY ACTIONS

The multiplicity of market failures that constitute barriers to sustainable finance require governments to kick-start, sustain, and accelerate its development. In its seminal analysis of climate change economics, Stern (2007) referred to climate change as “the greatest and widest-ranging market failure ever seen.” To the degree that unsustainable growth paths arise from externalities, governments have a role to play in addressing market failures that prevent sustainable financial markets from developing.

3.1.1 Five Basic Types of Market Failures

A full analysis of market failures associated with climate change and sustainability is beyond the scope of this Roadmap, but it is important to highlight the shape that these failures, and their associated costs, take with respect to financial markets.

- *Negative externalities.* This is the market failure most directly associated with climate change because the negative impact of marginal emissions is incorporated into prices. In the case of the financial system, this could lead to underpricing loans for activities contributing to climate change or could result in other impacts leading to unsustainable growth. In the case of climate change, these externalities are generally intertemporal (that is, the effects of emissions are cumulative so that the marginal negative effect will occur in the future)—unlike the negative externalities associated with pollution or some externalities associated with biodiversity destruction.
- *Positive externalities.* In both adaptation and mitigation activities, there is scope for substantial positive externalities. For example, agriculture projects can be structured to ensure that they also lead to carbon sequestration, thus mitigating their impact on

climate change (Sakuyama and Stringer 2006); or they can promote the management of certain crops in ways that reduce landslide risks arising from new weather patterns (Tompkins and Eakin 2012). However, the additional efforts needed to achieve these benefits are, in fact, costs that would decrease a project's overall return on investment and that could lead to its rejection by potential financiers.

- *Information asymmetries.* Particularly in credit markets, information asymmetries are both the *raison d'être* and a source of costs for the financial sector. Although many new types of information asymmetries are found in climate financing, a key example is the lack of financing for new firms with innovative approaches to climate change mitigation, such as battery technology firms and energy service companies (ESCOs). In the case of ESCOs—firms that provide other companies with know-how and technologies to increase energy efficiency—they or their customers have difficulty accessing financing because banks do not have the expertise to analyze project proposals, firms generally lack physical assets that can be used as collateral, and there is the perception that the materialization of extra resources (that is, cash flows from energy savings) still depends on unproved technologies (Econoler 2011).
- *Coordination costs.* Institutional investors' growing interest in environmental, social, and governance (ESG) approaches as a mechanism to influence real sector companies reflects an effort to overcome coordination costs, which in the past have prevented institutional investors from being involved in the management of firms (Black 1998). Additional efforts to develop disclosure standards would further facilitate this process. Similarly, coordination costs can prevent the development of long-term financing, particularly in developing countries that have weaker creditor rights. Given the long-term nature of many climate change mitigation projects, such as green energy generation, this leads to credit constraints in this sector.
- *Incentive problems.* Bank managers and asset fund managers tend to be judged on short-term results, a situation that further exacerbates the bias against longer-term projects related to sustainable finance.¹⁵

3.1.2 Intervention Types: Public Finance and Policy

Governments can support the development of sustainable finance through the use of public finance or through policies and regulations. Though these two types of actions are not completely independent, the rest of this section divides government measures into these two categories.

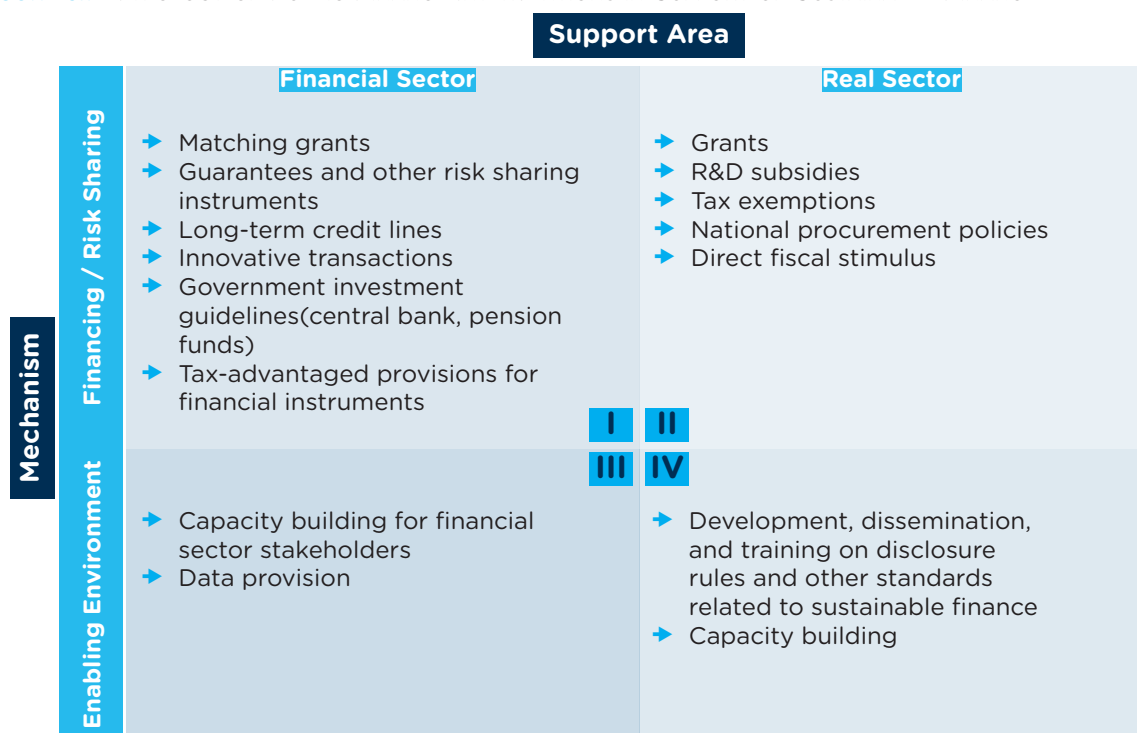
3.2 PUBLIC FINANCE MEASURES

Government responses with fiscal implications can be categorized into four categories depending on the area of involvement and instruments. Figure 3.1 categorizes government interventions in support of sustainable finance that imply financial outlays or revenues forsaken. This is not meant to be a full catalog of potential interventions, but a categorization

¹⁵ Martinez Peria and Schmukler (2017) present a discussion and literature review of the impact of coordination costs and incentives on the availability of long-term financing.

that can guide the development of specific national approaches.¹⁶ The first (horizontal) dimension refers to whether or not actions are taken directly in support of the financial system or whether they seek to support the real sector of the economy or other parts of the government to facilitate their engagement with the financial sector. The second axis (vertical) categorizes them according to the mechanism used: direct financing, which includes risk sharing mechanisms; or activities in support of the “enabling environment” that would facilitate the operation of a sustainable financial system.

FIGURE 3.1 TYPOLOGY OF PUBLIC FINANCE INTERVENTIONS IN SUPPORT OF SUSTAINABLE FINANCE



Source: UN Environment/WBG Roadmap Team.

Quadrant I: Financing and risk sharing in the financial sector. These interventions are aimed at directly addressing market failures that prevent the development of complete markets that allocate resources to sustainable finance activities. In many cases, this is done through public financial institutions that provide longer-term financing than is otherwise available in private markets; act as second-tier institutions, providing resources for on-lending to banks and specialized financial institutions (blended finance); or facilitate the leveraging of balance sheets of financial providers through the issuance of guarantees and other risk sharing mechanisms. Rather than providing direct financing, the government can also provide matching grants that are then leveraged by financing from private financial institutions (FIs). This category also includes governments’ use of their resources to facilitate innovative transactions that are meant to serve as “proof-of-concept” and trigger the development of new instruments. Governments can also foster the development of new instruments by providing tax-advantaged treatment of interest and other income received by investors when proceeds are used for eligible sustainable activities.

¹⁶ For a detailed description of certain types of interventions see, for example, Morgado and Lasfargues 2017.

Quadrant II: Financing and risk sharing outside the financial sector. This category includes programs that, while not directly tied to the financial sector, indirectly facilitate recipients' access to financing, contribute to building assets that can be used as collateral, and generally stimulate demand for green assets—thus contributing to increased financial sector involvement with producers and consumers of those assets. Examples include development grants for research and development for small and medium enterprises providing greening services such as ESCOs, tax exemptions associated with investments in green assets such as installing of household photovoltaic energy systems, and government procurement policies providing preferential treatment to suppliers committed to energy efficient practices.

Quadrant III: Support to the financial sector enabling environment. Governments can also support the development of elements of the sustainable finance infrastructure that have some characteristics of public goods or that private sector stakeholders may not be willing to develop because they do not see sufficient returns on their investment. For example, governments can work jointly with national banking associations to develop training programs for commercial loan officers to review and underwrite new financial sustainable financial instruments such as green mortgages (that is, mortgages associated with energy-efficient buildings) or to structure bankable green projects.

Quadrant IV: Support to the enabling environment outside the financial sector. This category of intervention is generally geared toward addressing information asymmetry problems and coordination costs not necessarily within the financial sector. For example, governments aggregate and make available information that would facilitate green project underwriting, such as weather and climate data and real estate transaction information associated with green buildings. This type of intervention also includes supporting ongoing efforts to define disclosure standards of environmental risks in the real sector, where the government could subsidize the process of developing and disseminating such standards.

3.2.1 The Role of Government Entities

Selecting the appropriate government entity to execute these interventions is key to success. Governments play different roles in the financial system. Besides their role as regulator and supervisor—discussed in the next section—governments are also *owners of financial institutions*. This role is particularly important for Quadrant I interventions, which are carried out through existing institutions or, particularly in countries lacking an established development or policy-oriented government bank, new green banks. Governments are also *institutional investors* through their role as central bankers and, in some cases, as managers of pension funds or sovereign wealth funds whose actions can contribute to facilitate the flow of funds toward sustainable activities. Finally—in what is probably their most obvious role—governments are *service providers*, and in that role they can channel much of the nonfinancial support described above. Close coordination between financial sector authorities and line ministries is essential to achieve results. For example, developing and rolling out criteria to identify green mortgages requires the close involvement of housing and construction government agencies to ensure that standards requirements are technically sound, verifiable, and aligned with global criteria.

3.2.2 The Role of International Financial Institutions in Facilitating National Public Policy Interventions

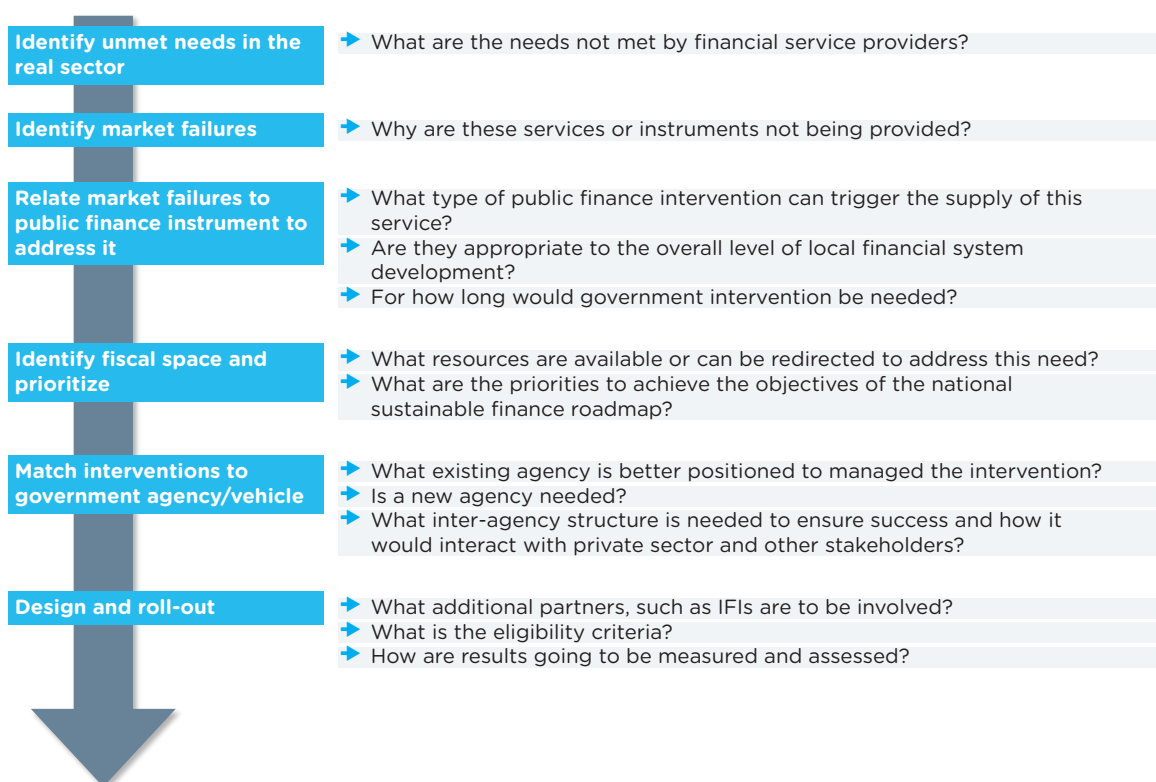
International financial institutions (IFIs) also play a key role in supporting governments in deploying resources in support of sustainable finance. Governments also can rely on IFIs to support them in the design and execution of policies in support of sustainable finance, leveraging their multiple roles. IFIs can play four roles in support of these interventions:

- *Facilitating the development of the enabling environment for sustainable finance.* Both internationally and nationally, IFIs have played a key role in developing and strengthening elements of the financial infrastructure, including credit bureaus and registries, payment systems and remittances, and standards of financial information. Integrating sustainability considerations into financial infrastructure is essential to successfully mainstream sustainable finance. For example, the initiative on green tagging described in Box 2.1 could be the basis for identifying green assets in credit reporting; this would facilitate the development of credit ratings and efficient pricing, and ultimately would help boost an increase in the origination of this type of asset.
- *Providing long-term financing bundled with technical support.* IFIs are providing long-term financing, which is needed to meet the maturity required for sustainable projects. Unlike commercial lenders, IFIs can also accompany governments as providers of technical advice during the entire project cycle, from the development of requests for proposals and technical requirements to its operation and evaluation.
- *Supporting innovative transactions.* IFIs have been instrumental in kick-starting some of the sustainable finance markets. For example, the World Bank and a private Swedish bank, SE Banken, responded to demand from institutional investors to structure and issue one of the first green bonds in 2008. The World Bank has since continued to expand the range of financial instruments related to climate financing, including by establishing regional facilities for disaster insurance in the Caribbean and the Pacific and supporting Malaysia in issuing the first Sharia-compliant green bond in June 2017.
- *Global knowledge sharing and convening.* IFIs also play an important role facilitating the process of scaling up successful interventions and sharing experiences among countries.

3.2.3 Approach to Selecting Public Finance Interventions

The process of developing national roadmaps should include an approach to select public finance interventions. The selection of needed government interventions should depend on an assessment that identifies unmet needs of the real sector, market failures that prevent the development of sustainable finance, and the level of development of national financial systems. Additionally, countries need to assess the level of fiscal space available to support interventions and the capacity of existing government institutions to design and manage programs to ensure that the appropriate agencies are involved. Figure 3.2 summarizes this approach, highlighting the type of analysis and questions that need to be addressed at each step of the process.

FIGURE 3.2 SELECTING PUBLIC FINANCE INTERVENTIONS



Source: UN Environment/WBG Roadmap Team.

3.2.4 The Other Side of Public Finance: Addressing Flows to Unsustainable Activities

This section has discussed approaches to using public resources to facilitate the flow of capital toward sustainable activities. However, it is equally important to assess the role that governments can play in the opposite direction by allocating resources to unsustainable activities, which have other public policy objectives. The most salient of these is the provision of fossil fuel subsidies. In addition to multiple drawbacks particularly related to equity and efficiency associated with fuel subsidies, the resultant decrease in fossil fuel prices leads to their overconsumption and to a resulting disincentive to develop green projects, particularly with respect to low-emissions energy (Merrill et al. 2015). There is substantial momentum to address this issue, and the recent decrease in oil prices has facilitated this process (Kojima 2016)—not only as a measure to improve fiscal sustainability but also as part of the process of reducing greenhouse gas emissions, with 13 countries mentioning fossil fuel subsidy reform in their Nationally Determined Contribution (NDC) submitted in the run up to the Paris Agreement (Terton et al. 2015). In addition to fossil fuel subsidies, governments are already undertaking a broader review of their public expenditures to identify and address flows to unsustainable activities, in many cases with technical support of the International Monetary Fund. The World Bank has also developed an approach to this process for climate change-related activities that is being incorporated into the public expenditures reviews carried out periodically by its member countries (World Bank 2014).

3.3 FINANCIAL POLICY AND REGULATION

Around the world, public authorities are deepening efforts to align financial systems with sustainable development.

3.3.1 The Rationale for Policy and Regulatory Action

Public authorities—including governments, central banks, regulators, supervisors, and other bodies—are taking legislative, policy, regulatory, and supervisory steps to achieve a range of objectives linking sustainability and the financial system, such as:

- *Enhancing market practice*, including efforts that mainstream environmental factors into financial decision making and correct for market failures (such as unpriced environmental externalities);
- *Supporting market growth*, including policy frameworks and standards that promote the issuance of green financial products (that is, green bonds and securities), the development of new market platforms (that is, crowdfunding and fintech), or the competitiveness of financial centers;
- *Promoting transparency and efficiency*, by improving flows of sustainability information through the financial system through voluntary guidance, labeling schemes, or mandatory requirements;
- *Strengthening risk management*, often by integrating environmental factors (such as physical and transition-related climate risks) into the prudential oversight of financial institutions, supervising financial markets, and providing sector and system-level stress testing;
- *Facilitating flows and services*, with investment and lending to priority sectors, restrictions or limitations on financing, insurance requirements, or the provision of financial services as a way to promote inclusion and support development;
- *Clarifying legal frameworks*, including the fiduciary responsibilities of financial institutions, with respect to long-term risks and opportunities (such as climate change); and
- *Enhancing conduct and behavior*, with codes of conduct and guidelines for environmental issues and compacts with FIs.

3.3.2 Categories of Public Action

Public action on sustainable finance priorities can be broken down into two main categories:

- Enhancing the alignment of financial institutions and markets with sustainability outcomes, looking across environmental (that is, climate and pollution), economic (that is, sustainable growth), and social (that is, financial inclusion and livelihoods resilience) dimensions; and

- Understanding and managing the impacts of sustainability factors (such as climate risks and opportunities) on financial institutions, markets, consumers, and the macroeconomy.

3.3.3 The Fundamental Relevance of Sustainability Factors

There is growing awareness of the fundamental relevance of sustainability factors to the core statutory obligations and mandates of financial authorities (Table 3.1). At the same time, there is increasing recognition of the critical importance of financial sector alignment for the achievement of sustainable development objectives across real economy policy frameworks, from small and medium enterprise finance to infrastructure planning. In developing countries, public authorities are leveraging the financial system to achieve national development objectives, including abatement of pollution, financial inclusion, and disaster resilience. In developed countries, an increasing number of supervisors, regulators, and central bank governors have publicly recognized the potential for sustainability factors—such as climate change—to hold implications for the resilience of firms and functioning of markets.

3.4 THE GLOBAL POLICY AND REGULATORY LANDSCAPE OF SUSTAINABLE FINANCE

Public intervention in the financial sector to promote sustainability has a long history. Instances of public interventions started with early frameworks for ethical and socially responsible investment in the 1990s, and included basic guidelines for the disclosure of environmental information in corporate reporting. Following the financial crisis, a growing number of public authorities began taking action on sustainability, leading to a steady expansion in the number, scope, and typologies of measures. Research conducted by UN Environment has found nearly 300 policy and regulatory measures in place as of October 2017, implemented in over 60 countries.¹⁷ Growth in measures has averaged roughly 20 percent year on year since 2010—with an increase of roughly 30 percent since July 2016.

One of the most significant changes in recent years has been a major increase in system-level measures—including major policy packages to advance sustainable finance across asset classes. Of particular note are China's 2016 Green Finance Guidelines (PBoC 2016b), which set out specific provisions to incentivize and promote green loans, green bonds, green funds, green insurance, and mandatory environmental information disclosures. Recent years have seen a marked increase in international measures, as sustainable finance has been taken up by international standard-setting institutions and regional bodies such as the European Commission. In addition, there has been a major increase in policy measures focused on specific asset classes (that is, securities markets), which are relevant to a broad range of financial stakeholders—a key example being efforts to support the development of green bond markets by providing guidance and standards.

¹⁷ UN Environment Inquiry internal database.

TABLE 3.1 THE RELEVANCE OF SUSTAINABILITY FACTORS FOR FINANCIAL AUTHORITIES

Agent/ Mandate	Implications of sustainability factors	Examples from practice
Central bank/ Financial stability	Increasing evidence suggests that sustainability factors, such as climate change, can pose significant risks to the safety and soundness of firms and the resilience of markets.	United Kingdom: The Bank of England has set out an integrated strategy on climate change, including engaging with firms facing climate risks (in insurance and banking), research, and enhancing financial system resilience by supporting a smooth transition (Scott, van Huizen, and Jung 2017).
Central bank/ Monetary policy	Monetary policy operations dictate risk/return expectations, affecting deployment of capital and the speed and smoothness of a transition to a low-carbon economy.	Bangladesh: Bangladesh Bank has used monetary policy instruments (including concessional refinancing) to promote the extension of credit for climate resilience and sustainability objectives.
Banking regulator/ Safety & soundness, consumer protection	Sustainability factors can influence the range of credit, market, operational, and reputational risks facing banks. These risks have impacts at asset, institutional, and market levels.	Brazil: In 2014, the Brazilian Central Bank introduced requirements for all banks to have environmental and social risk management systems in place.
Insurance regulator/ Safety & soundness, consumer protection	Increasing natural disasters and physical climate trends are having increasing impacts on the insurance industry. The safety of insurance sector investments may be impacted by transition factors affecting financial markets.	United States: In 2012, state regulators, working through the National Association of Insurance Commissioners, provided guidance on questions to ask insurers regarding any potential impact of climate change on solvency.
Pension regulator/ Fiduciary duties & obligations	Pension and other investment regulations are designed to protect savers' interests and ensure prudent management. Climate change can impact this in multiple ways, particularly over the long term.	South Africa: The South African Pensions Act has clarified that prudent investors must consider environment factors that may materially affect long-term performance.
Nonfinancial ministries/ Sectoral policies	Sustainable development policies—such as infrastructure strategies, economic development plans, and disaster risk management frameworks—require financial sector involvement but are developed and implemented by parts of the government not directly related to the financial sector.	

Source: UN Environment/WBG Roadmap Team.

3.5 NATIONAL-LEVEL ACTIONS

This section considers elements of risk, reallocation, and responsibility for national-level actions.

3.5.1 Disclosure

Approximately 30 percent of all policy and regulatory measures on sustainable finance implemented by public authorities are focused on disclosure.¹⁸ Governments in leading financial economies—such as the United Kingdom—were first movers in setting out mandatory corporate environmental reporting as part of exchange listing requirements. Over the last two years, public authorities have scaled up action, implementing frameworks across asset classes. The majority of these efforts have been either to build the information base necessary for green finance markets to develop or to build transparency on future risks and evaluate alignment with the low-carbon transition (Box 3.1).

BOX 3.1 ENHANCING DISCLOSURE ON CLIMATE RISK IN FRANCE AND CALIFORNIA

France: In August 2015, France set out the world's most ambitious disclosure regime under Article 173 of the French Energy Transition Law. The provisions of its Article 173 require institutional investors (more than 800 entities) to disclose information on their risk management of climate change consequences and to take into account their environmental footprint in their investment policy. In addition, larger institutions should notably describe how their investment policy has been affected by the outcome of the analysis process, and how it will contribute to the overall objective of limiting global warming. The French government implemented these requirements with considerable freedom for firms in their responses, considering flexibility to be a supportive element for the institutional innovation necessary to meet the complex challenges inherent in examining alignment with the low-carbon transition. In October 2016, global insurer AXA received the top award for the best investor climate-related disclosures, in a competition organized by the French Ministry of Environment (AXA Group 2016). An assessment by the government of the new disclosure framework regarding insurance companies is planned by the end of 2018.

California: In the United States, the California Department of Insurance was instrumental in the decision by the National Association of Insurance Commissioners to introduce the world's first climate risk disclosure survey for the insurance sector in 2009. In 2016 California Insurance Commissioner Dave Jones implemented the Climate Risk Carbon Initiative, which set out new requirements for insurance firms to disclose their investments in fossil fuel enterprises (including thermal coal, oil, gas, and utilities).

3.5.2 Risk

There is increasing recognition across jurisdictions that sustainability factors—such as climate change—may be material for the solvency of firms, safety of markets, and stability of the financial system as a whole. Public authorities are responding to these challenges in different ways, including by assessing exposure to sustainability risks, integrating environmental factors into the oversight of firms and markets, and implementing new requirements. For example:

¹⁸ UN Environment Inquiry internal database.

- **Australia.** The Australian Prudential Regulation Authority stated its views on climate change as a “material” physical and transition risk that it will consider much more closely in its monitoring of banks, insurers, and asset managers (Summerhayes 2017).
- **Brazil.** BACEN, the Brazilian Central Bank, issued guidelines on integrated risk management—including environmental risk—at the end of March 2017, building on its 2014 requirements for firms to have environmental and social risk system in place.
- **China.** Environmental risk analysis is a key component of China’s “Guidelines for Establishing the Green Financial System,” with a focus on stress testing led by the Green Finance Committee of China Society for Finance and Banking (PBoC 2016b).
- **France.** In February 2017, a synthesis report by DG Trésor, Banque de France and Autorité de Contrôle Prudentiel et de Résolution was published on climate-related risks assessment in the banking sector with a view to providing banks with a framework and guidance on how to develop their expertise going forward (French Treasury 2017).
- **Germany.** In 2016, the Federal Ministry of Finance released a commissioned research report on the potential impact of climate change on financial market stability (German Finance Ministry 2016).
- **Netherlands.** Since 2014, the Dutch central bank has considered financial and macroeconomic risks related to climate change in its assessment of soundness of major financial institutions (Box 3.2).

3.5.3 Reallocation

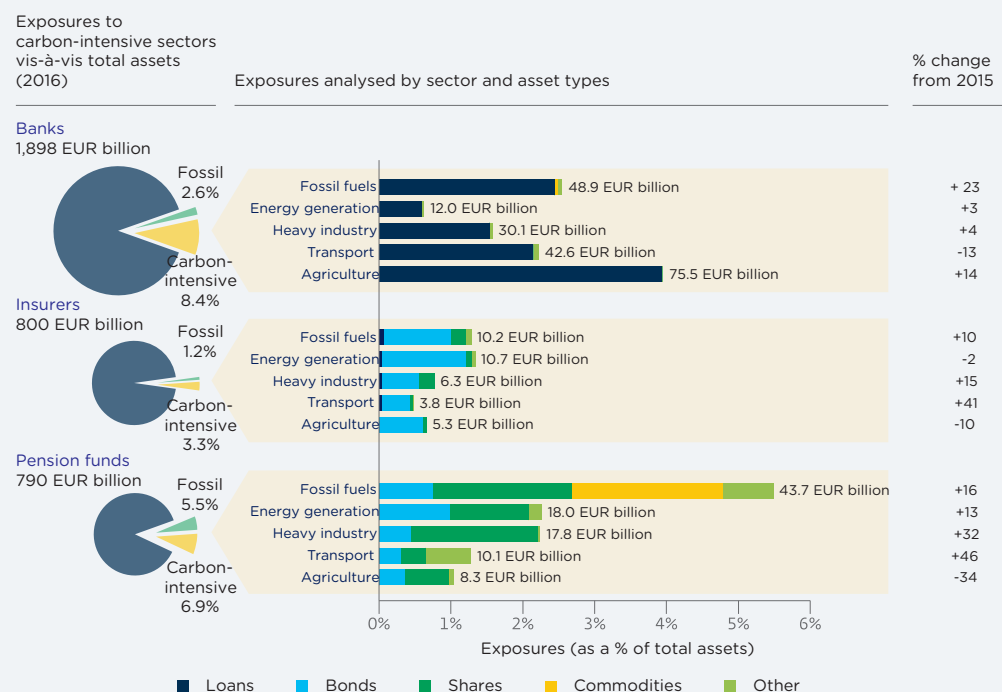
Action by public authorities to promote capital reallocation toward sustainable investments has been widespread, with instruments ranging from policies that support the growth of green financial markets to policy-directed lending. Efforts to enhance information are often a key component. A key example is the new frameworks for development and issuance of green financial products in countries such as China and Japan (MOEJ 2017); and also in subnational levels, such as California (Chiang 2017). Recently, in India, the Securities and Exchange Board of India (SEBI) issued disclosure requirements for the issuing and listing of green debt securities (SEBI 2017), while in Indonesia, regulator OJK announced it will launch a framework and introduce regulation for green bond issuance in Indonesia in 2017 (Jong 2017). The evolution of secondary markets is now coming into focus, with France authorizing the launch of the first green bonds as well as an ETF (Exchange-Traded Fund) tracking a portfolio of 116 investment grade green bonds in March 2017 (Lord 2017).

One interesting focus emerging for policy makers is at the consumer interface, seen in instruments to build awareness and transparency around sustainable investment option for everyday consumers. In France, the “the energy and ecology transition for climate” label was launched in November 2016 to help identify green investment funds, linked to broader policy package implemented under Article 173 (see Box 3.1).

BOX 3.2 EXAMINING THE IMPACTS OF THE ENERGY TRANSITION IN THE NETHERLANDS

DNB, the Dutch central bank, first examined financial risks relating to climate change in 2014, in response to a request from the Dutch parliament. In 2016, it completed a deeper assessment of the macroeconomic implications of the energy transition—considered by DNB to be “one of the greatest challenges that the economy faces in the long term.” For the study, DNB undertook primary research based on survey data from three major banks, five insurers, and three pension funds dominant in each market segment. Gathering these data enabled DNB to quantify the capital exposure of financial firms to carbon-intensive sectors, looking across asset equity, debt, and other holdings (Figure B3.2.1).

FIGURE B3.2.1 RESULTS OF DNB EXPOSURE ANALYSIS



Source: Regelink et al. 2017, Chart 4, p. 35.

In its study, DNB advocates a long-term policy ensuring a timely and controlled transition and highlights the importance of increasing transparency on climate risks—requiring unambiguous and broadly applied standards. Detailed carbon footprint reports and energy transition plans will make it easier for financial institutions to factor in climate risks and will help put a realistic price on such risks.

Currently, DNB is advancing new research into the impacts of physical and transition-related climate risks for financial institutions and supervision. This includes a report on climate risks to the financial sector investigating both transition and physical elements. On transition risks, it includes a data request into exposures of financial institutions, supplemented by a qualitative survey that asks institutions what risks they perceive and how they are managed. With respect to physical risks, DNB conducts a weather stress test for insurers and assesses the impact of flooding scenarios on financial assets of banks and institutional investors.

3.5.4 Capacities

Public bodies are also making efforts to increase sustainability capabilities in the financial sector. National governments are acknowledging the importance of skills and capabilities in supporting broader processes to align financial systems with sustainable development:

- Certain countries have specifically identified the importance of practitioner training to support the success of broader green finance initiatives. For example, in **China**, the People's Bank of China (PBoC) has specifically recommended training for investors and the promotion of green investment education as a central objective for a proposed Green Investor Network (UN Environment Inquiry and PBoC 2015).
- In **France**, a 2013 White Paper on Financing the Ecological Transition puts forward a range of measures to “re-centre the behavioural set of stakeholder practices around the objectives of ecological transition and funding,” including action to train fund trustees and financial intermediaries in technological and environmental risk assessment methodologies (Ministry of Economy & Ministry of Ecology and Sustainable Development 2013).
- Other countries are taking steps to improve the professional capacities of regulators with regard to climate and sustainability issues. In **Indonesia**, the financial services authority (OJK) has prepared a Roadmap for Sustainable Finance Implementation Plan that specifically identifies “the provision of environmental analysts trainings” as a roadmap action; a target of training 1,000–2,000 members of financial services institutions (FSIs), OJK officials, and OJK supervisors between 2015 and 2019 has been set (OJK 2014).
- In **Switzerland**, the Swiss government has recognized that “an indispensable and transversal requirement for facilitating the alignment of the financial system with sustainable development is a paradigm shift in business, economics and finance education” (Swiss Confederation 2015).

3.5.5 Financial Institutions' Fiduciary Duties

An increasing number of public authorities are considering ways in which environmental factors may relate to the core responsibilities and duties of financial institutions to shareholders and consumers. Legislators are re-examining how the frameworks governing these responsibilities may constrain the capacity of institutions to act, which is leading to clarifications and reforms. For example, the United Kingdom followed a multiyear process that began with an independent legal commission examining ESG consideration within fiduciary duties (The Law Commission 2014). The Pensions Regulator clarified in July 2016 that ESG material issues, including environmental issues, should be taken into account by pension fund trustees (The Pensions Regulator 2016). Recently, the Canadian Association of Pension Supervisory Authorities amended its guidance in February 2017 to list ESG issues as typical risks to be evaluated by pension trustees (Thomas 2017). Other examples include:

- **China.** The Securities Regulatory Commission publicly encouraged Chinese investors to become Principles for Responsible Investment (PRI) signatories in October 2016.
- **Germany.** The federal state of Berlin introduced a sustainability index to reallocate its pension fund investments as of 2017.
- **Singapore.** The Monetary Authority of Singapore supported the development of the Stewardship Principles for Responsible Investors, which were launched in November 2016 (Stewardship Asia 2016).

Aligning the fiduciary duties of FIs with sustainability considerations in fact highlights the close interaction of market- and nationally driven initiatives. For example, a number of real sector corporations and FIs are seeking to align their activities with the successful implementation of the Sustainable Development Goals (SDGs) and the Paris Agreement with particular emphasis on reviewing the sustainability of its supply and production chains. Others are using results-based financing to “crowd-in” private financing into climate change financing (World Bank 2017).

3.6 NATIONAL ROADMAPS

A growing number of countries are developing sustainable financial system policy frameworks. However, these are often not joined up or focused in a strategic way. Furthermore, action to deliver the SDGs and the Paris Agreement on climate change will need to involve a systemic approach to the financing challenge. For example, Agenda 2030 identifies the need for “integrated national financing frameworks.” As part of the implementation of the Paris Agreement, the Intended Nationally Determined Contributions (INDCs) submitted in 2015 will need to be translated into more granular *climate investment plans or green finance strategies*.

National sustainable finance roadmaps have been launched in many countries over the past year. These identify system-wide needs, barriers to scaling up, and priority actions. Examples of these countries include Argentina, China, Indonesia, Italy, Mongolia, Morocco, Nigeria, Singapore, and South Africa. The specific mix of policy-led, market-led, and public-private initiatives in each country is a function of national development priorities and, as such, varies considerably. However, all have at their core the development of long-term, systemic plans to enhance the ability of the financial system to mainstream ESG factors into decision making and to mobilize predominantly private capital for sustainable investment.

Case studies highlight different national approaches to sustainable finance roadmaps. A diversity of approaches to roadmap design is evident in the case studies compiled for this Roadmap, despite their common goal of mobilizing new sustainable investment and mainstreaming sustainability considerations into financial decision making. For example, Brazil has focused on building broad coalitions in support of sustainable finance, China has reinforced early private sector momentum with a comprehensive public policy framework, and Russia has made extensive use of public-private partnerships to build new markets in areas such as energy efficiency. In most cases, the national roadmaps have been anchored to a broader policy objective (Figure 3.3) that has facilitated the process of policy design

and contributed to building a broad coalition in support of the transformation to sustainable finance. A summary of these national roadmaps is in Appendix B at the end of this document.

FIGURE 3.3 NATIONAL ROADMAPS OF SELECTED COUNTRIES



Source: UN Environment/WBG Roadmap Team.

The emerging practice of developing national roadmaps indicates an increasing focus on how financial system reform can support the sustainability transition in the real economy. Countries are starting to make explicit links between action in the financial system and the realization of broader goals for sustainable development. What began as a series of tactical steps in response to specific sustainability issues has started to become more strategic. Traditionally, sectoral policies to deliver sustainability (for example, in clean energy or in agriculture) have largely ignored the need to consider the complementary role that financial reform can play to deliver effectiveness. The emergence of national sustainable finance roadmaps points to a change in this worldview.

National sustainable finance roadmaps encompass 10 broad components. Based on an analysis of existing national roadmaps as well as engagement with stakeholders in other countries currently undertaking this process, roadmaps for sustainable finance are more likely to enjoy broad support and increase their opportunity of success if they include the following key components:

- *Identifying the narrative.* This section of the roadmap outlines why a national financial system needs to be aligned with national sustainable development outcomes. Countries will have different starting points linked to national priorities; different individual, institutional, or structural drivers of change; and different capacities. A new narrative that has sustainability at its core can also be a response to factors that include global nudges from international bodies; bottom-up initiatives at subnational, national, or regional levels; or disruption caused by new technologies or business models. The narrative should clearly set out the opportunity a sustainable financial system can help deliver as well as the scope of key terms such as financial system and sustainable development in a national context.
- *Assessing overall needs.* This section describes the national sustainable finance requirements over a particular time period, as well as the magnitude of business-as-usual flows to high-carbon sectors. The needs assessment will also cover the broad financial characteristics of each major component—such as infrastructure or energy efficiency—within the national sustainable financing requirement such as the ratio of public to private finance, debt to equity ratios, and the tenor of finance required, as well as typical transaction sizes.
- *Estimating necessary flows.* To understand the magnitude of the challenge, this element estimates sustainable finance stocks and flows to generate a directional estimate of the investment gap. It is unlikely that these data will come from any single source; proxies and approximations will also probably be required.
- *Identifying potential barriers.* Barriers can hinder the flow of sustainable finance and investment at the level of the financial system or the enterprise. At either level, they can either be generic (such as underdeveloped capital markets or remuneration policies that incentivize short-termism) or they can be specific to sustainable finance (such as a lack of clarity over sustainable finance definitions, or information about sustainable projects and sectors might be poor).
- *Aligning with international experience.* Any sustainable finance roadmap would be firmly aligned with national priorities and would involve clear domestic leadership. Where appropriate, however, evolving international practice in sustainable financial system development could be considered.
- *Building scenarios.* The financial system is in a constant state of flux. This fluidity makes predictions about its future path risky. However, failing to take into account possible future scenarios for the financial system means potentially failing to take into account possible risks and opportunities. Change can be driven by many factors, including changes to the national or international governance of the financial system or from disruption caused by digital innovation.
- *Identifying suitable measures.* The specific measures that might make a national financial system more effective, efficient, and resilient are a function of a number of factors. Structurally, the architecture of the national financial system will theoretically determine what might be most appropriate, but international experience indicates

that factors such as capacity, ease of implementation, and the identification of an individual or institutional champion will also determine what measures are prioritized. Common measures include those related to disclosure, business practices, financial instruments, and knowledge-sharing networks.

- *Sequencing of measures and priorities.* Pivoting from tactical innovation to a more systemic approach to sustainable financing at a national level will reveal sequencing issues. Clear definitions or criteria might need to be agreed upon through a multistakeholder process before relevant financial instruments can be scaled up, for example. Similarly, consideration should be paid to trade-offs between ease of implementation and the potential effectiveness of a particular measure that might lead to the prioritization of certain measures.
- *Building capacity.* Aligning the financial system with sustainable development will require capacity building because new competencies and capabilities will need to be developed in key areas. New institutional configurations, such as those related to the scope of financial policy makers' and regulators' mandates, along with their interface with other policy institutions, might need to be addressed.
- *Measuring progress.* There is growing recognition that progress toward aligning the financial system with sustainable development must be measured. Existing data are often fragmented, incomplete, and do not allow for effective analysis within a country or between countries. An effective framework for measuring progress can help highlight areas for market, policy, or regulatory improvement and can also help assess the effectiveness of measures that have been introduced.

There is no single formula for developing national sustainable finance roadmaps. However, all have at their core an inclusive multistakeholder process spanning the public sector, private sector and civil society. Working groups consisting of subject experts examining measures related to specific topics are also a common feature of the process. The UN Environment Inquiry has developed an online Sustainable Finance Diagnostic Toolkit with embedded resources to help countries develop the core material for each of the 10 components outlined above (see also Box 3.3).

3.7 CONCLUSIONS

The richness of national initiatives in support of sustainable finance reflects a broad commitment to facilitate its development and promote government involvement to address structural obstacles. Most of these initiatives have had the support of far-reaching coalitions of multiple government agencies and other public and private sector financial sector stakeholders. However, governments lack a systematic approach to identifying market failures and designing viable policy and fiscal interventions to trigger the development of sustainable finance markets. The development of national roadmaps, which several countries are already implementing, constitutes an opportunity to more strategically—and systematically—approach the design of sustainable financial systems. The design of a framework to prepare these roadmaps will be critical to facilitate their design and adoption by a larger number of countries.

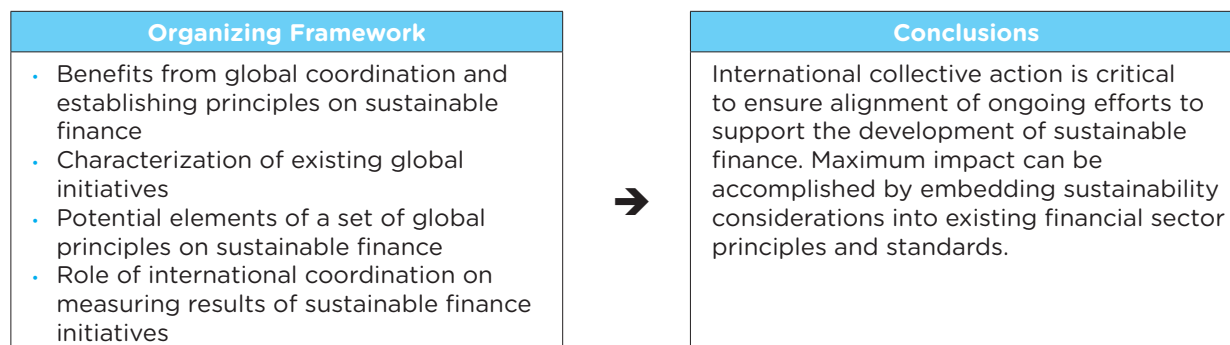
BOX 3.3 AN ONLINE SUSTAINABLE FINANCE DIAGNOSTIC TOOLKIT

Since 2014, the UN Environment Inquiry has built up a body of knowledge on how countries are aligning the rules that govern the financial system with sustainable development. The 2016 Inquiry annual report identifies more than 200 separate measures in 60 countries across banking, capital markets, insurance, investment, and the financial system as a whole.

With the demand rising, the Inquiry has pulled together the experience to date in systematic form, which has led to the development of the Sustainable Finance Diagnostic Toolkit. This can be used by stakeholders at the start of the process of developing a national sustainable finance toolkit. The toolkit can help develop a sustainable finance status report, structured using the 10-step framework described above. This status report can be a key input that will feed into the discussions around the development of national sustainable finance roadmap.

The Sustainable Finance Diagnostic Toolkit is designed to be a flexible platform and will be regularly updated as ongoing work brings to light new knowledge, approaches, and data. More information on the Sustainable Finance Diagnostic Toolkit can be found at <http://unepinquiry.org/diagnostic-toolkit/>.

4 INTERNATIONAL COORDINATION AND SUSTAINABLE FINANCE



4.1 GLOBAL COORDINATION AND PRINCIPLES

Meaningful global action requires global principles that can guide concerted international, national, and market-driven progress toward a sustainable financial system. Achieving sustainable development is, by its own nature, a global challenge because no country can be on a long-term sustainable path alone given the interconnectedness of problems such as climate change, communicable diseases, and biodiversity loss. The transition to sustainable finance is driven by country-level initiatives; continued transformation along this path should remain anchored in such bottom-up approaches to ensure that the ultimate structure of sustainable financial systems and the pace of change are adapted to country needs and the current state of development of national financial systems. However, agreeing on key global guiding principles can contribute to keeping the momentum of the ongoing transformation of the financial system and can magnify the efficiency and effectiveness of ongoing and future national, international, and market-driven initiatives. Potential benefits from agreeing on a set of global principles include the ability to:

1. *Guide the design and implementation of national roadmaps to sustainable finance.* National initiatives have been developed in relative isolation from each other, and there have been limited opportunities for cross-pollination between countries and/or markets while lessons are being learned. Building a sustainable financial system needs to be driven by the needs of society at large, and therefore the process involves a very broad set of stakeholders that go beyond financial sector policy makers and institutions. This makes the development of national roadmaps a complex process that could benefit from broad principles

to guide their development and facilitate the process of bringing together stakeholders with very different backgrounds.

2. *Facilitate coordination across multiple international efforts to expedite the creation of a global sustainable financial system.* Global cooperative efforts to create a sustainable financial system include initiatives to establish principles that have generally targeted specific parts of the financial sector (such as banks or stock exchanges) or that respond to the needs of a subset of stakeholders (for example, institutional investors). However, these efforts lack a comprehensive approach that can bring together all components of the financial system and ensure alignment of efforts and synergies that ultimately will lead to an increase in sustainable financial flows. For example, the issuance of green bonds by international financial institutions (IFIs) whose returns are tied to environmental, social, and governance (ESG) indices—such as the World Bank’s Green Growth Bonds¹⁹—contribute to not only increase the flow of sustainable finance to the issuer but more broadly promote the growth and importance of ESG equity indices.
3. *Facilitate the integration of sustainable finance considerations into existing international finance oversight and regulatory frameworks.* General global principles have been used successfully to develop other aspects of the financial sector, including banking supervision, capital adequacy, payment systems, and remittances. A sustainable financial system will have to be embedded in many of these initiatives and the existence of global principles can facilitate this process. Ongoing initiatives such as the Financial Stability Board’s Task Force on Climate-related Financial Disclosures (TCFD) and the efforts of the International Association of Insurance Supervisors (IAIS) to assess climate change-related risk in the insurance sector are already part of this process.
4. *Contribute to establishing a common definition of sustainable finance and some of the different forms it can take.* The concept of sustainable finance is relatively new and its definition is still evolving, with different organizations and initiatives having different understandings of the concepts that it encompasses. In many cases, the differences between the terms sustainable, green, and climate finance, and between ESG (environmental, social, and governance) investment criteria and impact investment are not fully understood. Clarifying the differences and relationship between these concepts can contribute to aligning national, international, and market-based efforts.
5. *Enhance the credibility of market-driven innovation and measurement of progress.* The establishment of global principles can contribute to ensuring a common understanding of the policy and market developments that need to take place to meet the sustainability challenges the world faces. Such principles are also critical to ensuring the credibility of policies and instruments to be developed and to aggregating national actions to measure global results in the transition to a sustainable financial sector. For example, savers, investors, financial

¹⁹ Financial details on the Green Growth Bonds issuance can be found at <http://treasury.worldbank.org/cmd/htm/WorldBankissuedtwomoreGreenGrowthBonds.html>

institutions, and financial regulators across the world require assurance that labels such as green bonds or ESG investment fund share key common principles across multiple jurisdictions.

Establishing general principles does not imply standardization but rather an alignment of efforts. It is important to emphasize that agreeing on certain principles is very different from trying to standardize measures to develop a sustainable financial system across countries or even across different parts of the financial sector. Certainly the needs of developed countries with deep financial markets are very different from those of developing countries with substantial financially underserved populations. Similarly, efforts to develop sustainable banking in the retail segment are very different from efforts targeting large institutional investors and capital markets. The approach to develop these principles presented in this section aim to follow the one previously used in other components of the financial sector to guide and facilitate the development of initiatives and policies aligned toward a common global goal. Agreement on these principles does not imply the creation of new standards but rather the incorporation of sustainability consideration into existing ones. Examples of such existing principles include the Basel Core Principles for Effective Banking Supervision, the Core Principles for Systemically Important Payment Systems, and the G20 Principles for Innovative Financial Inclusion.²⁰

4.1.1 Existing International Initiatives Related to Sustainable Finance Principles

In 2016, both the G20 and the Financial Stability Board (FSB) had raised the issue of sustainability to the forefront of the international financial sector dialogue. The policy dialogue at such bodies has focused on enhancing flows of sustainability information within the financial system, setting out new voluntary standards and policy options with immediate relevance for firms and public authorities.

Under its 2016 G20 Presidency, China launched the Green Finance Study Group (GFSG) to develop options for how to enhance the ability of the financial system to mobilize private capital for green investment. At the 2016 Hangzhou Summit, G20 heads of state for the first time recognized the need to “scale up green finance” and endorsed a set of options to achieve this goal—with information elements, such as product standards, established as a core aspect of frameworks to promote the development of markets for green assets (such as green bonds). In 2017, the GFSG concentrated its efforts on the information agenda with two specific research tracks: Enhancing Environmental Risk Assessment in Financial Decision-Making (UN Environment Inquiry 2017a), and Improving the Availability and Usefulness of Publicly Available Environmental Data for Financial Analysis (UN Environment Inquiry 2017b). In addition to the GFSG, the G20 has also advanced work on energy efficiency finance, with a G20 Energy Efficient Investment Toolkit launched in 2017 (G20 Energy Efficiency Finance Task Group 2017).

The FSB launched the Task Force on Climate-related Financial Disclosures (TCFD) in December 2015. The TCFD is a market-led effort mandated to develop voluntary,

²⁰ The Financial Stability Board keeps a compendium of these standards, which can be found at http://www.fsb.org/what-we-do/about-the-compendium-of-standards/key_standards/

consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers, and other stakeholders (FSB 2015). The TCFD's final recommendations were published in June 2017 (TCFD 2017a), setting out a framework for climate-related financial disclosures structured around four thematic areas: Governance, Strategy, Risk Management, and Metrics and Targets (Figure 4.1). As part of its recommendations, the TCFD released supplementary guidance for the implementation of the recommendations within different real economy and financial sectors, with specific guidance for banks, insurance companies, asset owners, and asset managers (TCFD 2017b).

FIGURE 4.1 RECOMMENDATIONS OF THE FINANCIAL STABILITY BOARD (FSB)'S TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD)

Governance Disclose the organization's governance around climate-related risks and opportunities	Strategy Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Risk Management Disclose how the organization identifies, assesses, and manages climate-related risks.	Metrics and Targets Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures			
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

Source: TCFD 2017a, p. 14.

Existing global, national, and market-driven initiatives point out the key elements that sustainable finance principles could have. Figure 4.2 summarizes the leading sustainable finance global initiatives, segmented into different thematic areas. A review of existing efforts to define standards and principles and more broadly support the development of sustainable finance can be divided into (a) disclosure policies, (b) business practices, (c) knowledge-sharing networks, and (d) financial instruments. Some of these initiatives

explicitly define high-level principles for specific parts of the financial sector (for example, the UN Principles for Responsible Investment), while others propose specific methodologies to define certain financial instruments as “green” (Green Bonds Standards) or disclose emissions related to financing activities (CDP). A review of the main thrusts of these initiatives presented in Table 4.1 identifies about a dozen key tasks that could be applied more broadly to the entire financial system.

FIGURE 4.2 LEADING SUSTAINABLE FINANCE GLOBAL INITIATIVES



Source: UN Environment/WBG Roadmap Team.

4.1.2 Additional Issues Identified by National Roadmaps

National roadmaps have identified additional issues that could be part of global principles. About two dozen countries have developed these roadmaps, in many cases with technical support of some of global initiatives mentioned above. Some countries, such as China, have also implemented detailed policy standards with respect to financial instruments, including national green bonds and green portfolios criteria. Box 4.1 summarizes some of the key actions that are common to many of these roadmaps, which are discussed in more detail in the following section.

Box 4.2 summarizes the key considerations that could be covered by an eventual set of global principles. These are meant to be consistent with the previously mentioned efforts and seek to provide financial sector constituencies with a set of high-level topics that can be further developed as part of a broader consultation process.

TABLE 4.1 KEY THRUSTS OF GLOBAL INITIATIVES ON SUSTAINABLE FINANCE

Focus	Key tasks
Cross-cutting	• Embed sustainability considerations into existing international financial standards.
Disclosure	• Maximize the measurement and disclosure of the sustainability impact of real sector firms along their supply chain as the basis through which to measure and disclose the sustainability impact, risks, and opportunities of the financial sector. • Ensure that the financial sector plays a pivotal role in ensuring its clients measure, manage, and disclose sustainability risks and opportunities. • Facilitate the development of a mechanism to account for the use, maintenance, and restoration of natural resources in the global economy.
Business Practices	• Incorporate measured and disclosed sustainability risks into financial institutions' risks management practices, governance framework, strategy, and business decision-making process (including origination processes).
Financial Instruments	• Adopt definition standards, adapted to national needs, to increase the depth of sustainable capital markets instruments. • Adopt standards to identify sustainable portfolios in banks to characterize their risk parameters, measure the sector's transformation toward sustainability, and align prudential regulation with sustainability risks. • Leverage technology to facilitate changes in the intermediation process to increase the effectiveness and efficiency of financial services.
Knowledge-Sharing Networks	• Establish public and private sector organizations' partnerships to aggregate and disseminate information on approaches, methodologies, business models, and other successful sustainable finance practices. • Create knowledge-sharing partnerships between financial sector participants.

BOX 4.1 CHARACTERISTICS OF NATIONAL ROADMAPS THAT CAN INFORM THE DEVELOPMENT OF SUSTAINABLE FINANCE PRINCIPLES

- Convene a very broad set of stakeholders to ensure broad support and strong political buy-in for the initiative. This process should include not only financial sector stakeholders (for example, regulators, supervisors, central bankers, private sector institutions, associations of financial services users) but also real sector and sustainability stakeholders (for example, government agencies involved in climate change, social policy, energy, water, and other sectors critical to sustainability; and civil society organizations).
- Leverage existing market-driven initiatives.
- Design policies and targets with a long-term horizon but with expected initial measurable results in four to five years. This ensures that roadmaps have clear deliverables and are not only aspirational documents.
- Align national roadmaps with sector policies, particularly in areas such as energy and water management, to maximize the impact of policies within the financial sector.
- Adapt emerging international standards, particularly with respect to financial instruments such as green bonds, to local market characteristics to attract both international and domestic investors.

BOX 4.2 KEY CONSIDERATIONS FOR DEVELOPING PRINCIPLES OF SUSTAINABLE FINANCE

System-wide

- Make a statement defining the long-term objective of the financial sector in the context of sustainability.
- Agree on an approach to incorporate sustainability considerations to ensure the effectiveness, efficiency, and soundness of the global financial system.

Disclosure

- Establish approaches and methodologies to disclose the sustainability impact, opportunities, and risks arising from financial sector activities as well as the sustainability risks affecting the financial sector.
- Consider including sustainability information from the financial sector into the policy-making process to ensure that both the financial sector and the other relevant sectors (for example, environment, education, and so on) are directed toward sustainability objectives.

Business practices

- Price sustainability impacts, risks, and opportunities and incorporate them into financial institutions' strategies, governance, and business decision-making processes.
- Develop transition plans toward sustainable finance, with financial institutions identifying activities to be increased as well as business lines that need to be reoriented toward sustainability.

Financial instruments

- Agree on criteria to identify financial instruments and specific transactions aligned with sustainability objectives.
- Define mechanisms to promote innovative financial mechanisms, including through active regulatory encouragement, to increase the depth of sustainable financial markets.

Collaboration and alignment of efforts

- Develop mechanisms to promote and allow collaboration and sharing of information between financial sector participants on approaches, methodologies, and business practices for sustainable finance.
- Seek alignment of international and national policies, standards, and results measurement to ensure consistent global approaches that fit national needs

4.2 RESULTS MEASUREMENT

To deliver the required transformation in the financial system, a performance framework is needed so progress can be measured. This framework would allow governments, financial institutions, and citizens to identify successful approaches, as well as areas lagging behind, thereby laying the basis for strategic adjustments in both policy and practice. Traditionally, the performance of financial systems has been measured across four key dimensions:

- *Financial depth.* The size of financial institutions and markets;
- *Access.* The degree to which individuals can and do use financial institutions and markets;
- *Efficiency.* The efficiency of financial institutions in delivering financial services; and
- *Stability.* The stability of financial institutions and markets.

Over the past five years, increasing efforts have been placed on how to measure the contribution of the financial system to sustainable development, specifically in the environmental dimension. Measuring progress to a sustainable financial system involves gaining an understanding of three core performance characteristics:

- *Effectiveness.* The degree to which the market prices sustainability factors in asset valuations;
- *Efficiency.* The costs of running the financial system that delivers the flows of finance aligned with sustainable development requirements; and
- *Resilience.* The strength of the financial system in the face of disruptions related to unsustainable development such as air pollution, climate change, or water scarcity.

Understanding performance against these characteristics requires a focus on three key dimensions already covered in this Roadmap:

- *Architecture.* This covers the principles, norms, standards, rules, regulations, and policies that directly or indirectly contribute to the sustainable development of finance. Metrics are needed that measure the degree to which the “rules of the game” are aligned with sustainable development needs.
- *Markets.* This covers the behavior of market participants and the degree to which they are integrating environmental, social, and governance factors into their activities and the transparency with which they describe their sustainability efforts.
- *Flows and stocks.* This covers the allocation of capital and financial services to both sustainable and unsustainable assets. This dimension addresses both the annual flows of finance as well as the overall stocks of assets held by banks and institutional investors and enables decision makers to assess progress toward meeting sustainable

finance needs. This could be accomplished by leveraging existing frameworks such as the periodic reporting of financial sector information from national authorities to the International Monetary Fund (IMF) to include green flows and stocks.

For a comprehensive picture of progress to be developed, metrics need to be chosen in each of these three dimensions at the system level, as well as in key sectors such as banking, debt capital markets, equity capital markets, institutional investment, and insurance. Currently only limited data are available to measure performance. However, signs of progress are emerging that now need to be consolidated so that a globally consistent framework can be developed using the limited but growing pools of data available. At the system level, there is a growing understanding of policies and measures in place to promote sustainable finance, but much less is known about either the effectiveness or the efficiency of policy interventions.

In the banking sector, the measurement of green financial flows was initially driven through local efforts now scaled up through international collective action. For example, in Brazil, the Brazilian Federation of Banks, FEBRABAN, has completed one of the world's first estimates of the number of loans and credit financing for the green economy. At the end of 2015, 17 percent of total corporate loans were allocated to the green economy, with sustainable transport the largest category.²¹ The Sustainable Banking Network (Box 4.3) is currently assessing the progress made by banking regulators in developing countries on integrating environmental and social factors.

Capital markets are perhaps the area where the most transparency that could facilitate results measurement is available. It is now possible to compare levels of disclosure on ESG factors across the world's stock exchanges. In addition, estimates of the flows of green revenues of the companies listed on different exchanges are available from data providers such as FTSE Russell. The value of issuance of green bonds is also available across countries: expressing the results as the share of total bond issuance in a given country helps to put these data into context.

A growing volume of data on the practices of institutional investors is also available. Signatories to the Principles for Responsible Investment (PRI) now manage over US\$70 trillion in assets under management. As part of their commitment, signatories are required to report on implementation and are then assessed on an A-E grading system across 12 modules (Box 4.4). A comprehensive Report on Progress is then made public to present the overall reports along with the individual reports from the signatories.²²

Internationally, there is growing interest in developing a flexible but consistent approach to measuring progress. At the September 2016 Hangzhou Summit, G20 heads of state welcomed seven broad financial sector options, “for voluntary implementation by countries in light of national circumstances,” to help scale up green financing (G20 Green Finance Study Group 2017). Improving “the measurement of green finance activities and their impacts” was one of these. In its 2017 *Green Finance Progress Report*, the UN Environment Inquiry concluded that

²¹ For further information about FEBRABAN and the green economy, see <https://portal.febraban.org.br/pagina/3114/43/en-us/financial-system-green-economy>

²² For information on the PRI Reporting Framework 2016 Overview and Guidance, see <https://www.unpri.org/report>

BOX 4.3 MEASURING PROGRESS IN SUSTAINABLE FINANCE: INNOVATION BY EMERGING MARKETS

About the Sustainable Banking Network (SBN)

The SBN (www.ifc.org/sbn) is a knowledge and capacity building platform comprised of financial sector regulators and banking associations from emerging markets committed to developing national sustainable finance frameworks to advance the sustainable financial market development, based on national priorities and leveraging international good practice. Launched in 2012, the SBN achieved a critical mass in 2016, reaching 34 member countries,^a and representing 85 percent of the banking assets across emerging markets. Fifteen of these countries have already launched national policies, guidelines, principles, or roadmaps on sustainable finance.

A Member-Led Initiative to Track and Support Progress

SBN members have identified measurement as a top priority in order to benchmark country progress and support countries in designing effective roadmaps that leverage lessons and good practice from other jurisdictions. With this in mind, in December 2016 the SBN launched the first member-led technical Working Group that focuses on measurement.

The goal of the Working Group is to develop a methodology and tools to support SBN members to develop effective and fit-for-purpose measurement mechanisms for assessing the progress and impact of sustainable finance adoption at national level.

The objectives of the Working Group include:

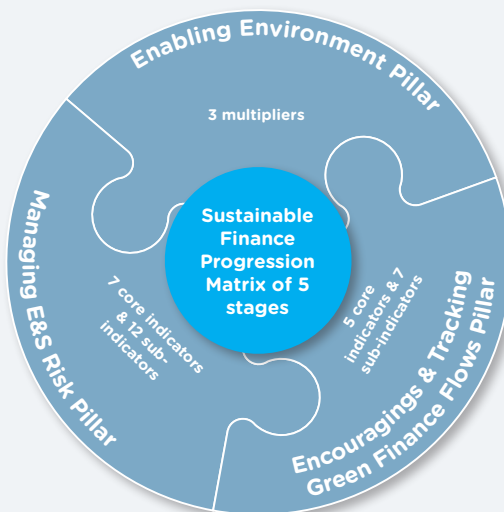
1. Analyze the approaches and indicators currently being used to measure sustainable finance adoption and impact;
2. Provide options to members in designing nationally appropriate measurement frameworks to assess progress in areas such as:
 - mainstreaming of environmental and social consideration into risk management and business operation,
 - financial flows to green projects,
 - environmental and social impacts, and
 - effectiveness of different strategy choices; and
3. Design benchmarking tools to assist members to track progress, assess outcomes, and compare approaches.

A First Comprehensive Assessment Tool for National Sustainable Finance Efforts in Emerging Markets

Supported by the SBN Secretariat, the Working Group has developed a comprehensive draft measurement framework and indicators to assess country-level progress in designing and implementing national roadmaps for sustainable finance (Figure B4.3.1 and Figure B4.3.2).

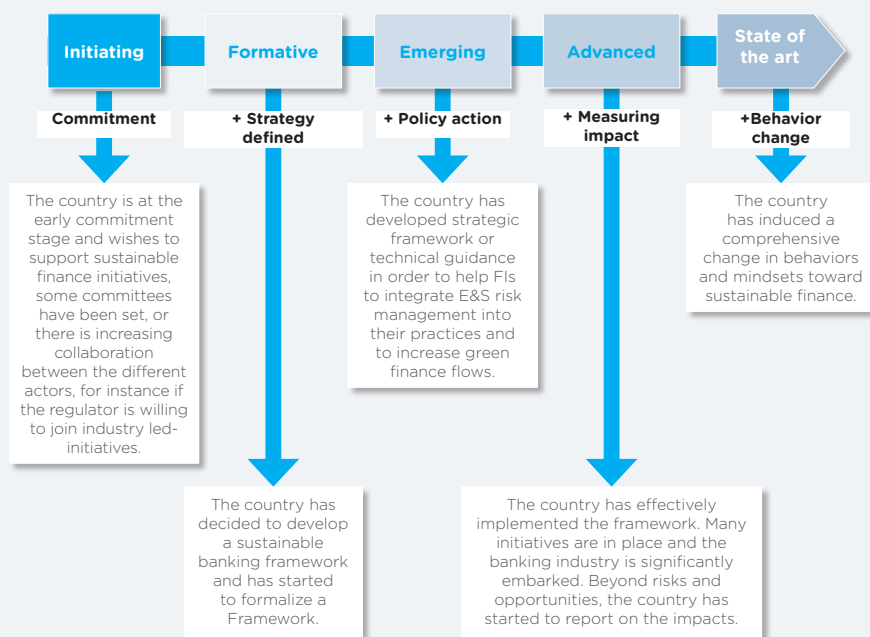
BOX 4.3 MEASURING PROGRESS IN SUSTAINABLE FINANCE: INNOVATION BY EMERGING MARKETS (CONTINUED)

FIGURE B4.3.1 SBN MEASUREMENT FRAMEWORK



Source: UN Environment/WBG Roadmap Team.

FIGURE B4.3.2 SBN PROGRESSION MATRIX



Source: UN Environment/WBG Roadmap Team.

The results of the first benchmarking exercise, including country case studies, will be published in an aggregate report in late 2017.

Note a. The 34 members countries are Argentina, Bangladesh, Brazil, Cambodia, Chile, China, Colombia, Dominican Republic, Ecuador, Egypt, Fiji, Georgia, Ghana, Honduras, India, Indonesia, Jordan, Kenya, Lao PDR, Mexico, Mongolia, Morocco, Nepal, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, South Africa, Sri Lanka, Thailand, Turkey, and Vietnam.

BOX 4.4 PRI REPORTING FRAMEWORK

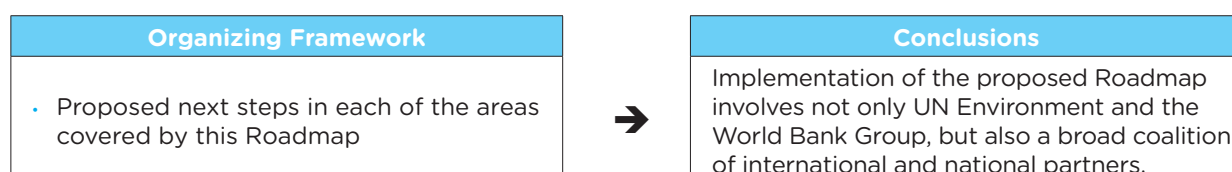
Reporting on Responsible Investment is one of the six Principles to which organizations commit when they become a signatory to the Principles for Responsible Investment (Principle 6: We will each report on our activities and progress towards implementing the Principles). Annual reporting ensures accountability of the PRI and its signatories, provides transparency through the use of a standardized tool for signatories' reporting, and allows signatories to receive feedback from which to learn and develop. There are 12 reporting modules, two of which are "core" modules and the rest are asset class-specific, depending on the line of business of the signatory. The core modules are related to the organizational structure and the strategic approach to responsible investment being implemented by the organization. The rest of the modules describe the approaches to responsible investment undertaken for different asset classes.

"there is no systematic methodology for assessing progress on the greening of the financial system and the number of initiatives in this space has been relatively small. Progress has been most pronounced in relation to improved reporting by financial institutions particularly on climate change" (UN Environment Inquiry 2017c, p. 25).

4.3 CONCLUSIONS

International collective action is critical to ensure alignment and effectiveness of the multiple market- and national-driven initiatives in support of sustainable finance. In most cases, this can be accomplished through existing global cooperation and oversight frameworks for the financial sector. However, it will require a strong commitment from a broad coalition of international stakeholders to embed sustainability considerations into long-standing financial sector structures and, if necessary, develop new ones.

5 NEXT STEPS



Maintaining the momentum of the ongoing transition toward sustainable finance requires concrete actions to support the implementation of many of the measures described in each of the chapters. This process is anchored in a continuing consultation process over the next 24 months combined with a series of actions that will benefit from that process, leverage ongoing initiatives, and support the design and implementation of new ones. Some of these initiatives will be coordinated by UN Environment and the World Bank Group, while in some other cases, part of the consultation process aims to identify the international, regional, and national institutions that may be better placed to lead each activity. Table 5.1 summarizes the vision of the outcomes associated with each one of the areas discussed in the Roadmap along with an outline of proposed next steps to achieve those outcomes and their expected timing. *Short-term* initiatives are expected to be completed by the end of 2018. *Medium-term* initiatives will be completed within the next 24 to 36 months.

TABLE 5.1 SUMMARY OF NEXT STEPS AND TIMING

Area and vision	Short-term initiatives	Medium-term initiatives
Products, information, and technology Vision: <i>Sustainable finance products and data are embedded into financial information infrastructure that permits the appropriate pricing and identification of green assets.</i>	- Leverage existing partnerships to develop and implement methodologies to identify green assets. - Support embedding market-relevant sustainability information into the financial data ecosystem. - Support additional research into the risk performance of green assets. - Support the implementation of the TCFD recommendations in a pilot group of countries. - Establish a cooperative platform and/or industry task force of leading fintech companies, working with others to influence enabling business, policies, and standards to effectively connect fintech and sustainable development.	- Design and execute a set of key transformational transactions that can trigger new sustainable finance products. - Establish “challenge prizes” or other types of innovation funds to stimulate the development of new products and technologies in support of sustainable finance.

TABLE 5.1 SUMMARY OF NEXT STEPS AND TIMING (CONTINUED)

Area and vision	Short-term initiatives	Medium-term initiatives
Business models, capabilities, and incentives Vision: <i>Sustainability considerations are embedded into the day-to-day business models, strategies, and operations of financial sector stakeholders.</i>		• Leverage existing market-led initiatives—such as the Sustainable Banking Network—or create new ones, to expand the skills of FIs necessary to embed sustainability considerations overall strategy and into day-to-day operations. • Develop a framework to align institutional incentives within FIs to sustainability considerations, including developing an understanding of the needs of financial sector users.
National public policy actions Vision: <i>Countries have a clear process for selecting policy instruments to support sustainable finance.</i>	• Review and classify different types of fiscal and policy interventions to create a framework to diagnose market failures and identify responses at the national level.	• Incorporate sustainability considerations into national fiscal frameworks, including a review of the effectiveness of fiscal interventions and subsidies in support of green activities and expenditures in unsustainable activities, including fossil fuel subsidies.
National roadmaps Vision: <i>Countries can develop national roadmaps to sustainable finance with clear blueprints and a framework to adapt to their national needs and level of market development.</i>	• Support the development of national roadmaps in key countries.	
Global coordination principles Vision: <i>Global principles can guide concerted international, national, and market-driven progress toward a sustainable financial system.</i>	• Launch a consultation process to converge in the next 24 months in a set of global principles for sustainable finance.	• Promote the inclusion of sustainability considerations into global financial sector oversight and cooperation frameworks.
Results measurement Vision: <i>Clear, transparent frameworks and metrics exist to measure results in the path toward a sustainable financial system.</i>		• Develop a results measurement framework for sustainable finance • Promote the inclusion of sustainability data as part of global financial reporting frameworks (for example, central bank reporting to the IMF).

Note: FIs = financial institutions; IMF = International Monetary Fund; TCFD = Task Force on Climate-related Financial Disclosures.

The proposed next steps summarized in Table 5.1 are expanded below.

5.1 MARKET-LED INITIATIVES

5.1.1 Products, Information, and Technology

- *Leverage existing partnerships to develop and implement methodologies to identify green assets.* Based on a review of ongoing work, including initiatives led by UN Environment as well as by the International Finance Corporation (IFC), develop—in partnership with financial institutions (FIs) and other financial infrastructure stakeholders—a general methodology to identify green assets. The approach should be sufficiently flexible that it can be adapted to markets with different data environments, but it should be sufficiently robust to allow it to support market and regulatory decisions.
- *Support embedding market-relevant sustainability information into the financial data ecosystem.* Given the broad nature of the stakeholders involved—FIs, financial data providers, credit rating agencies, national financial regulators, and global financial sector oversight bodies—global coordination is required to develop a multiasset green finance data system. This would promote convergence around defining, tagging, measuring, and reporting green assets. It would aim to connect existing initiatives at the sector and national levels to ensure a connected approach across asset classes and markets.
- *Support additional research into the risk performance of green assets.* The rate of default of green loans in some markets has been observed to be lower than that of non-green loans with otherwise similar characteristics. Additional systematic research, taking advantage of increasing availability of data on green assets, is needed to confirm these results and allow FIs to incorporate these performance characteristics into their loan origination processes.
- *Support the implementation of the Task Force on Climate-related Financial Disclosures (TCFD) recommendations in a pilot group of countries.* This could be undertaken as part of the process of supporting countries to develop their national roadmaps for sustainable finance.
- *Design and execute a set of key transformational transactions that can trigger new sustainable finance products.* This may require the financial involvement of the international financial institutions (IFIs) and could explore innovative approaches to identify potential transactions, including requests for proposals or the use of innovation competitions.
- *Establish “challenge prizes” or other types of innovation funds to stimulate the development of new products and technologies in support of sustainable finance.* This approach can be explored initially to facilitate the development of innovative fintech solutions where the use of prizes and “hackathons” can focus the efforts of a large range of technical experts who may not otherwise concentrate on sustainable finance solutions.

5.1.2 Business Models, Capabilities, and Incentives

- *Leverage existing market-led initiatives—such as the Sustainable Banking Network—or create new ones, to expand the skills of FIs necessary to embed sustainability considerations overall strategy and into day-to-day operations.* This could lead to the establishment of a Sustainable Finance Skills Initiative (SFSI). This would have a dual focus. The first focus would be to stimulate training and capacity building for financial supervisors, regulators, and policy makers. The SFSI would draw together the existing ecosystem of capacity building within multilateral development banks (MDBs)—for example, the Bank for International Settlements (BIS), the Financial Stability Board (FSB), the International Association of Insurance Supervisors (IAIS), the International Organization of Securities Commissions (IOSCO), and the Organisation for Economic Co-operation and Development (OECD)—and key sustainable finance initiatives such as the Sustainable Banking Network (SBN), Sustainable Investment Forum (SIF), and the Toronto Centre—to develop and deliver harmonized capacity building on key topics (sustainability risk, green financial products, and so on). The second focus would be to convene and encourage professional bodies, trade associations, universities, and financial institutions to develop and deliver effective capacity building for finance sector employees on sustainable finance.
- *Develop a framework to align institutional incentives within FIs to sustainability considerations.* The starting point for this initiative would be a review of the lessons learned by the Principles for Responsible Investment (PRI) on aligning incentives of investment managers with responsible investment considerations. This work could also be expanded to review the needs of consumers (individual, corporate, and government) to ensure the alignment of incentives also with respect to their interests. This would require exploring mechanisms to enhance consumer engagement in a sustainable financial system—that is, consumer literacy, information, costs, and so on—and use this to design incentives and financial products to better meet consumer needs and thereby drive demand.

5.2 NATION-LED INITIATIVES

5.2.1 Public Policy Actions

- *Review and classify different types of fiscal and policy interventions to create a framework to diagnose market failures and identify responses at the national level.* This methodology could be developed as part of the process of supporting the preparation of national roadmaps.
- *Incorporate sustainability considerations into national fiscal frameworks, including a review of the effectiveness of fiscal interventions and subsidies in support of green activities and expenditures in unsustainable activities, including fossil fuel subsidies.* This would require developing a methodology to assess national fiscal measures that may have an impact on flows toward sustainable activities. It would include an approach to carrying out an inventory of direct and indirect subsidies, including risk

sharing schemes that exist in support of activities that have a positive or deleterious impact on promoting the flow of resources toward sustainable activities, as well as approaches to prioritize fiscally sound policy measures that facilitate the transition toward sustainable finance.

5.2.2 National Roadmaps

- *Support the development of national roadmaps in key countries.* This could be part of a broader approach to develop a general framework that can be adapted to each country's needs and level of economic and financial markets development. Selecting the countries to be part of this initial set of roadmaps would be demand-driven but would also seek to include a balanced mix of levels of markets development and readiness to ensure that lessons learned through this process can enrich subsequent roadmaps.

5.3 INTERNATIONAL INITIATIVES

5.3.1 Global Coordination and Principles

- *Launch a consultation process to converge in the next 24 months in a set of global principles for sustainable finance.* A strong consultation process incorporating the views of all stakeholders of the financial system is essential for ensuring that any principles that are adopted can be used as a blueprint to design and implement global, regional, and national sustainable financial systems. Following the approach undertaken in the process of developing and adopting other global financial standards, the Roadmap team will convene five different working groups—one of each one of the five types of principles—to further develop these concepts. Membership of the working groups will reflect a broad range of international, national, and market participants' views.

- *Promote the inclusion of sustainability considerations into global financial sector oversight and cooperation frameworks.* Public authorities are seeking to deepen their understanding of how sustainability factors may be relevant to their core mandates, including the safety and soundness of markets. There are leadership groups of regulators working together in these areas (for example, the SIF and the SBN), and global efforts are linking activities across asset classes in order to develop best practice guidance on the integration of sustainability risks into supervisory frameworks.

The groups of regulators also consider sustainability factors in the design of regulatory reform and policy interventions. The promotion of sustainability standards would be broadly applicable across jurisdictions and relevant across asset classes, including banking, insurance, investment, and securities. Initial efforts, many in the form of pilots, could include developing and testing a sustainable finance module for the Financial Sector Assessment Program (FSAP), reviewing the impact on fiscal analysis frameworks such as the World Bank's Public Expenditure Review and the International Monetary Fund (IMF)'s Article IV methodologies, and their relevance to investments of large pools of official assets such as pension and sovereign wealth funds.

5.3.2 Results Measurement

- *Develop a results measurement framework for sustainable finance.* This could be done as part of the consultation process for global principles and the preparation of national roadmaps.
- *Promote the inclusion of sustainability data as part of global financial reporting frameworks (for example, central bank reporting to the IMF).* This effort would be crucial to ensuring that the results of multiple ongoing initiatives can be measured using common metrics.

5.4 IN CLOSING: A BROADER PERSPECTIVE WILL BE REQUIRED TO ADDRESS ALL ELEMENTS OF SUSTAINABLE FINANCE

This Roadmap focuses on green finance, but the challenge posed by the 2030 Agenda for Sustainable Development is much broader and touches all the Sustainable Development Goals (SDGs). Many of the areas discussed in this Roadmap with respect to green finance are applicable more broadly to developing a financial system that supports the attainment of the SDGs. They are also applicable to addressing some of the systemic issues identified in 2015 at the Addis Ababa Action Agenda (United Nations 2015) endorsed by the United Nations General Assembly, such as the need for a sound, inclusive, and resilient financial system and increased cooperation among international organizations to attain global objectives. Implementation of elements of this Roadmap can generate some of the pieces to develop a broader plan of action to support the 2030 Agenda and address systemic issues hindering the development of a financial system that can facilitate sustainable development in the three dimensions identified in Addis Ababa: promoting inclusive economic growth, protecting the environment, and promoting social inclusion.

APPENDIX A: SUSTAINABLE FINANCE AND RELATED CONCEPTS: A SHORT REVIEW

Converging on a definition of *sustainable finance* can be facilitated by understanding related concepts, including some developed before the idea of sustainable finance began to be used. A subset of institutional investors emerged seeking a socially responsible investment (SRI) approach that used a negative list screening approach to exclude investments in certain sectors (for example, tobacco, alcohol). SRI investing initially remained a niche area of primary interest to investment funds associated with religious organizations in the United States. SRI investing growth was triggered from the 1970s onward in response to pressure on large institutional investors in the United States and Western Europe to divest from certain industries, such as armaments, and to refrain from supporting investments in apartheid South Africa. From the 1990s onward, a broader set of investors sought to use environmental, social, and governance (ESG) criteria to select investments (Knoll 2002). This type of “new SRI” is generally known as *ESG investing* or *responsible investing*, a concept that is defined by the Principles for Responsible Investment as “an approach to investing that aims to incorporate ESG factors into investment decisions, to better manage risk and generate sustainable, long-term returns.”²³ No standards exist to define the three types of ESG criteria. For example, the PRI considers climate change impact, resource depletion, waste pollution, and deforestation as examples of environmental criteria. ESG investing has benefitted from the wide range of indices and other financial information that has become available. Financial data information providers have more strict criteria to, for example, screen companies to decide whether they can be placed into ESG equity indices. Thomson Reuters, for example, uses three types of environmental indicators to screen companies to be included in ESG indices: resource use, emissions, and product innovation.

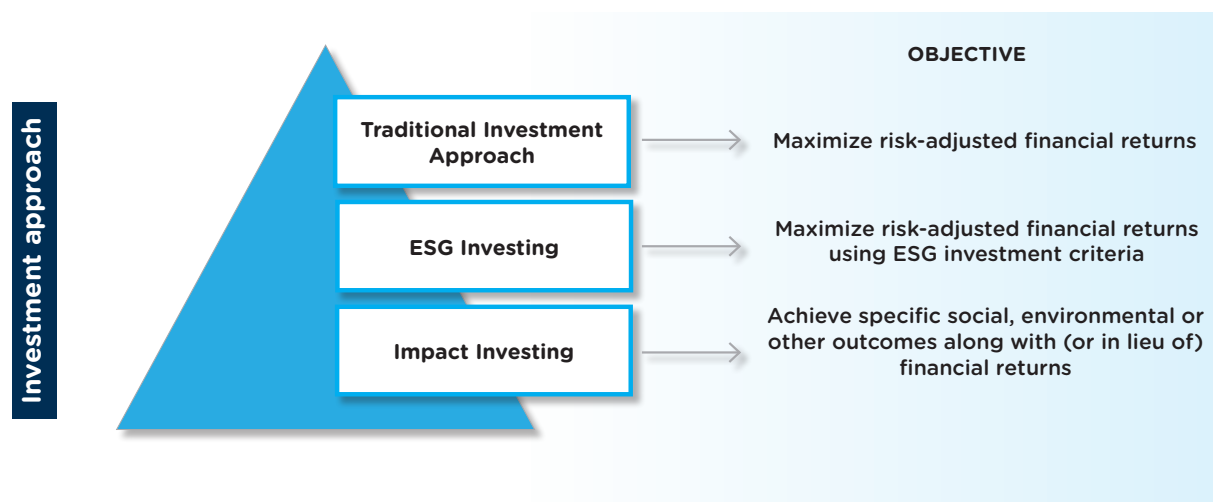
ESG investing could be considered to be a traditional type of investing because it seeks to maximize risk-adjusted returns, as traditional investors would—but it uses ESG criteria as a screening tool to achieve that objective. In the 2000s another set of institutional investors sought to move from the passive negative screening (that is, excluding certain types of companies or projects from investment portfolios) associated with early SRI investing to a more active approach that seeks to support specific outcomes along with (or even in lieu of) financial returns. This investment approach is known as *impact investing*. Figure A.1 illustrates these concepts. It is important to understand these concepts because several definitions of sustainable finance rely on them (BlackRock 2016).

SUSTAINABLE FINANCE DEFINED

Sustainable finance can be understood as a broad concept defined by the use given to resources raised and allocated. Although the definition of concepts such as ESG and impact investing relies on approaches used to select investments and investors’ objectives, the definition of *sustainable finance* and concepts such as *climate* and *green finance* refer to the use given to financial resources. Sustainable finance is a broader and newer concept whose meaning is still evolving. Table A.1 presents a selection of definitions used by different organizations.

²³ This definition and additional background on the PRI is provided in www.unpri.org/about/what-is-responsible-investment

FIGURE A.1 INVESTMENT APPROACHES: ESG AND IMPACT INVESTING



Source: UN Environment/WBG Roadmap Team.

TABLE A.1 SELECTED DEFINITIONS OF SUSTAINABLE FINANCE

Definition	Source
Sustainable financial system is [...] one that creates, values and transacts financial assets in ways that shape real wealth to serve the long-term needs of an inclusive, environmentally sustainable economy.	The UN Environment Inquiry Report: <i>The Financial System We Need</i> (UN Environment Inquiry 2015)
Financial flows—public or private—that are allocated in a way that simultaneously promotes sustainable development, including its economic, social and environmental imperatives.	Homi Kharas and John McArthur – Brookings Institution (Kharas and McArthur 2016)
Sustainable finance refers to any form of financial service integrating environmental, social and governance (ESG) criteria into the business or investment decisions for the lasting benefit of both clients and society at large.	Swiss Sustainable Finance Initiative (as defined in the glossary presented in http://www.sustainablefinance.ch/)
Three definitions (from narrow to broad): 1. Integrating ESG factors in financial decisions; 2. Finance fostering sustainable economic, social and environmental development; 3. A financial system that is stable and tackles long-term education, economic, social, environment issues, including sustainable employment, retirement financing, technological innovation, infrastructure construction and climate change mitigation.	EU High-Level Expert Group on Sustainable Finance. Interim Report, July 2017 (EC HLEG 2017)
Sustainable finance in Indonesia is defined as comprehensive support from the financial service industry to achieve sustainable development resulted from a harmonious relationship between economic, social and environmental interests.	Indonesian Financial Authority Roadmap for Sustainable Finance in Indonesia 2015–2019 (OJK 2014)

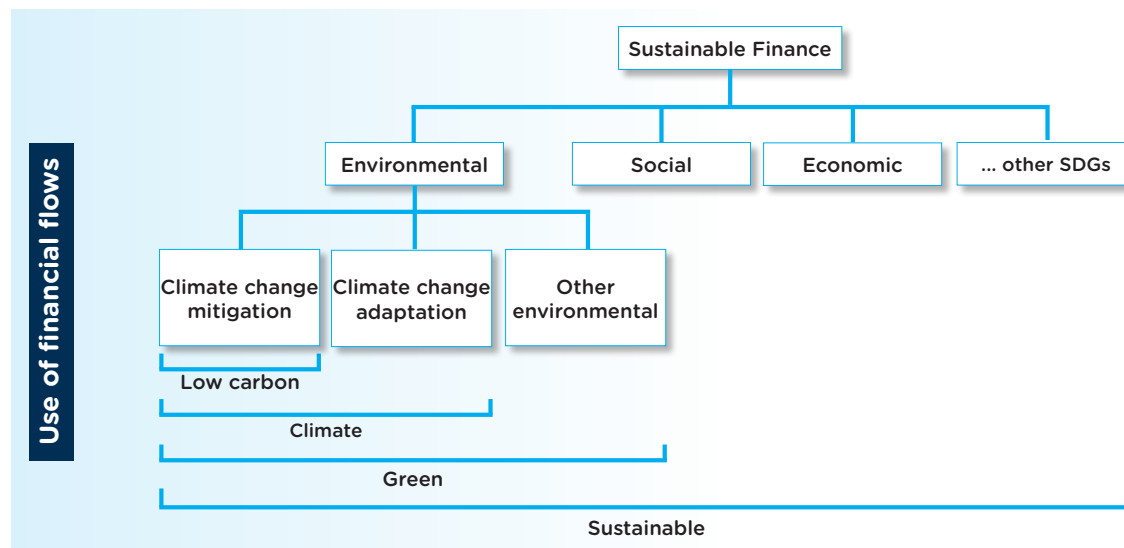
SUBSET OF SUSTAINABLE FINANCE: CLIMATE FINANCING AND GREEN FINANCING

Further clarification of the meaning of sustainable finance can be obtained by defining a subset of sustainable finance; these definitions sometimes, erroneously, are used interchangeably. The UN Environment Inquiry prepared a Background Note on Definition and Concepts seeking to illustrate some of the components of sustainable finance (Figure A.2).

Sustainable finance supports investments across a broad set of sectors that are required to build an inclusive, economically, socially, and environmentally sustainable world. The UN SDGs in fact define multiple areas—from health to resilient infrastructure—that are required to create a sustainable world. Driven particularly by the immense challenge posed by climate change, there has been a substantial interest and increase in climate change financing. The United Nations Framework Convention on Climate Change (UNFCCC) defines *climate financing* as “local, national or transnational financing, which may be drawn from public, private and alternative sources of financing ... to significantly reduce emissions, notably in sectors that emit large quantities of greenhouse gases ... and to adapt to the adverse effects and reduce the impacts of climate change.”²⁴ Several terms are used for financing for emissions reduction (that is, *mitigation*, in the terms used by the UNFCCC) including *zero-emissions*, *low-carbon*, *low-emissions*, and *clean energy financing*.

It is important to differentiate *climate financing* from the term *green financing*, which, in addition to climate, includes other areas necessary to support environmental sustainability, including biodiversity and other resources conservation. Furthermore, the term *green financing* is increasingly associated with financial flows from *private* institutions.

FIGURE A.2 ELEMENTS OF SUSTAINABLE FINANCE



Source: Adapted from UN Environment Inquiry 2016b.

²⁴ This definition and additional background for the UNFCCC’s view of climate finance can be found at http://unfccc.int/focus/climate_finance/items/7001.php



APPENDIX B: CASE STUDIES

CASE STUDY: BRAZIL – STEPS TO SUSTAINABLE FINANCE

Brazil has a long tradition of harnessing its financial system for sustainable development. This process has involved a powerful dynamic between government policy, financial regulators, public financial institutions, and market actors (Vendramini, Belinky, and Monzoni 2015). This stretches back to the launch of the Corporate Sustainability Index by the B3 market in 2005, which has since outperformed the traditional benchmark.²⁵ The Banco Central do Brasil (BACEN) took its first steps to address socio-environmental risk factors in 2008. Following the Paris Agreement, the country is now developing a strategic approach to mobilizing private capital for climate action and sustainable development. Importantly, sustainable finance offers one route out of the country's current economic difficulties. The emerging recovery is "investment led and sustainability shaped," with green and sustainable finance offering a way of mobilizing capital for high-quality vital agri-business and infrastructure projects.

Over the past decade, key steps in Brazil's move toward a sustainable financial system include:

- *Strengthening risk management.* Beginning in 2008, Brazil's central bank introduced new requirements limiting landowner access to subsidized rural credit to those who can demonstrate compliance with environmental legislation. In 2014, BACEN introduced requirements for socio-environmental factors to be mainstreamed into the governance of risk by banks and other financial institution and published guidelines for financial institutions to implement Social and Environmental Responsibility Policies (SERP) regulations.
- *Measuring green lending.* The Brazilian Federation of Banks, FEBRABAN, has completed one of the world's first estimates of how much lending has been provided for the green economy. At the end of 2015, 17 percent of total corporate loans were allocated to the green economy, with sustainable transport the largest category.²⁶ This exercise is rooted in a low-carbon economy database that provides the foundations for more comprehensive green tagging of loans in Brazil. The most recent edition of the study "Measuring Financial Resources Allocated to the Green Economy" accounted for 87 percent of the total credit loans of the banking sector (FEBRABAN 2017). The full report presents the methodology used to measure the volume of financial resources allocated to sectors of the green economy as well as to sectors that have the potential to cause environmental damage. In 2015, a total of R\$51 billion was invested in projects for the generation of renewable energy, representing less than 2.3 percent of total financing for corporate clients (R\$2.1 trillion).

²⁵ For more information about the Corporate Sustainability Index (ISE), see http://www.bmfbovespa.com.br/en_us/products/indices/sustainability-indices/corporate-sustainability-index-ise.htm

²⁶ For more information about FEBRABAN, see <https://portal.febraban.org.br/pagina/3114/43/en-us/financial-system-green-economy>

- *Integrating sustainability into the investor and insurance sectors.* A growing number of Brazil's major asset owners and asset managers have a good awareness of ESG issues. The Superintendence of Private Pension Funds (PREVIC) could strengthen this trend by ensuring that the consideration of material environmental, social, and governance (ESG) factors is part of the primary analysis of a prudent investment process (PRI 2017). In 2016, the Superintendence of Private Insurance surveyed the insurance sector to better understand the integration of sustainability factors. It is now considering a range of actions including improving disclosure, incentivizing green investments, and integrating environmental risks into underwriting policy.
- *Mobilizing the green bond market.* In 2016, FEBRABAN, along with the Brazilian Business Council for Sustainable Development (CEBDS), issued voluntary recommendations to grow the green bond market, based on global best practice tailored to Brazil's circumstances (FEBRABAN 2016). Since the guidelines were brought out, the number of Brazilian issues has more than doubled.
- *Designing a strategic investment plan.* Brazil's Council for Sustainable Market Development first came together in September 2016 to address the market challenges to leveraging green finance. It brings together Brazil's public and private banks, private companies (in the energy, agriculture, and logistics sectors), asset managers, pensions, and insurers (Kidney 2017). The Council is working on a Strategic Investment Plan to identify the key opportunities, challenges, and solutions for green financing, both debt and equity.
- *Carbon pricing.* FEBRABAN is currently working on measuring the impact of carbon pricing in the financial system, which is expected to lead to the development of a methodology for pricing carbon and related distressed assets within the banking sector.

CASE STUDY: CHINA – ESTABLISHING THE GREEN FINANCIAL SYSTEM

The understanding and exploration of green finance has been a gradual, evolving process in China. For a long period after the “reform and opening-up” policy in 1978, economic development was central to the Chinese government; environmental factors, on the other hand, were not considered to be important variables that could affect the decision making of financial institutions. Until after the mid-1990s, China's financial policies gradually imposed restrictions on certain high-pollution and energy-intensive industries in response to the central government's requirements for economic restructuring and upgrading as well as environmental protection (PBoC and UN Environment 2015).

In 2007 China's Banking Regulatory Commission (CBRC) began by developing Green Credit Guidelines that evolved from an initial, principle-based approach to a standardized, metrics-driven performance assessment. In 2014, the People's Bank of China established a Green Finance Task Force that produced 14 recommendations across four broad themes: information flows, legal frameworks, fiscal incentives, and institutional design (UN Environment Inquiry 2016d). Following these key initiatives, and an estimate that an annual investment of at least 2 trillion yuan (US\$320 billion) is needed to achieve China's environmental targets during the

13th Five-Year Plan (2015–2020) (IISD 2015), China made rapid progress in developing a green financial system to demonstrate a systematic approach with a series of high-level policies. The aim of these policies was to address the enormous environmental challenges and ecological civilization as national strategic priorities.

The CBRC introduced the Green Credit Statistics System in 2014; this system was among the first emerging market examples of regulatory guidance to define green loans. Green credit loans are classified into 12 categories with subcategories, reflecting consensus within industries on what projects are considered green. A tool has also been developed for banks to calculate the environmental benefits from green credit lending, including reduction in carbon emissions, water pollution (chemical organic demand, or COD), and savings on water use. With a standardized definition for green banking assets, it is easier for banks to issue green bonds or pilot other green banking products, such as asset-backed securitization. CBRC Green Credit Statistics also track data on loans with compliance issues on (a) environment, (b) safety, (c) deploying technologies mandated to be phased out, and (d) occupational health.

At the end of 2015, CBRC's green credit statistics for the top 21 Chinese banks (accounting for around 80 percent of total banking assets) show that (a) on the risk management side, the majority of the top 21 banks have adopted environmental and social (E&S) risk management practices at different levels; and (b) on the green loan origination side, the loan balance toward green credit exceeded US\$1 trillion, representing 16 percent growth year-on-year, which is 2 percent higher than the overall lending growth rate. Green credit now makes up approximately 10 percent of these banks' portfolios.

The policy signal culminated in August 2017, right before the G20 Summit in Hangzhou. The China State Council approved the “Guidelines for Establishing the Green Financial System”—issued jointly by seven ministerial agencies including the People's Bank of China—providing essential next steps for implementing the overall strategy of promoting ecological civilization and determining how to mobilize and incentivize more social (or private) capital to invest in green sectors, while restricting investment in polluting sectors. The Guidelines set forth 35 measures and incentives that can be grouped into the following nine action items (PBoC 2016a, 2016b):

- Establish the green financial system;
- Develop green lending;
- Enhance the role of the securities market in supporting green investment;
- Launch green development funds and mobilize social capital through public and private partnerships;
- Develop green insurance;
- Improve environmental rights trading market and develop related financing instruments;

- Support local government initiatives to develop green finance;
- Promote international cooperation in green finance; and
- Prevent financial risks and strengthen implementation.

The Guidelines also called for relevant government departments in China to adhere to the responsibilities assigned by the Guidelines, and faithfully implement all their requirements. There are follow-up documents for each of the key ministries on how to support and implement each of the action items.

Key findings show some impressive progress being made in the Guidelines. This list is only a sample, as there are many other examples (UN Environment Inquiry 2017c):

- Green bond issuance (domestically and internationally) reached US\$34 billion in 2016, up from US\$1 billion in 2015, following the issuance of a domestic green bond catalogue and green bond guidelines. The China Security Regulatory Commission issued guidelines for green bonds issued by listed corporations in March 2017.
- Promoting environmental stress testing by financial institutions became a key component of the Guidelines. A seminar was held in Beijing in mid-July 2017 to discuss the scope, methods, and purpose of environmental risk analysis. This effort is led by the Green Finance Committee of China Society for Finance and Banking.
- The Securities Regulatory Commission publicly encouraged Chinese investors to become Principles for Responsible Investment (PRI) signatories in October 2016.
- Pilot zones will be set up in the Guangdong, Guizhou, Jiangxi, and Zhejiang provinces and the Xinjiang Uyghur autonomous region to boost green finance in China. The decision was made at the State Council executive meeting on June 14 to improve the green financial system (english.gov.cn 2017).

CASE STUDY: EUROPEAN UNION – STEPS TOWARD A SUSTAINABLE FINANCIAL SYSTEM

The European Union (EU) has often been at the forefront of efforts to promote green and sustainable finance, driven by civil society advocacy, financial institution efforts, and initiatives by Member State governments as well as by action taken at the EU level itself. However, what has been missing has been an overarching strategy that responds to the scale of the financing challenge represented by the Paris Agreement and the Sustainable Development Goals. For this reason, the European Commission launched a high-level expert group in September 2016 to produce a roadmap for a sustainable financial system.²⁷ The group brings together experts from across the financial system along with academics, civil society representatives, and public sector organizations.

²⁷ For details about the European Commission's work on this roadmap, see https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance_en

Until recently, EU action to promote sustainable finance focused mostly on the deployment of public finance through the European Investment Bank and the EU budget. This approach was given added importance with the launch of the EU's plan for economic recovery following the financial crisis: at least 40 percent of the next phase of the European Fund for Strategic Investments is expected to be allocated to climate action. Increasingly, however, sustainability factors have also been incorporated into EU financial regulation, notably in terms of corporate disclosure and pension regulation. In addition, there has been growing interest in incorporating the sustainability dimension into the EU's Capital Markets Union, which is designed to find new ways of mobilizing finance for infrastructure and small and medium enterprises (SMEs), for example, through fintech innovations (UN Environment Inquiry 2016e).

The momentum for change built on increasing action at the national level to incorporate sustainability into financial system strategy. Key policy highlights include:

- **France.** The Energy Transition Law has a specific focus on finance, with new reporting requirements for financial institutions and investors on their alignment with climate goals. In addition, France has introduced labels for green financial products and Paris has launched a dedicated Finance for Tomorrow initiative.²⁸
- **Italy.** A one-year national dialogue on sustainable finance produced a comprehensive set of recommendations in February 2016. This has led to the establishment of a new national observatory, focusing on Milan as a center for sustainable finance and on ways to mobilize sustainable finance for the country's reindustrialization plans (UN Environment Inquiry 2017d).
- **Netherlands.** The Dutch Central Bank (DNB) has led a national assessment of the implications of climate change for the economy and financial system. This has prompted the integration of environmental, social, and governance (ESG) factors into financial supervision as well as the formation of a sustainable finance platform with private sector institutions.²⁹
- **Sweden.** The government has made sustainable development a goal for the financial sector. This has been followed by initiatives to promote sustainability disclosure by pension funds, explore labeling for financial products, and scale up green bond issuance (Government of Sweden 2017).
- **United Kingdom.** The Prudential Regulatory Authority has investigated the implications of climate change for the insurance sector; this has been extended to the banking sector. The City of London has established its own Green Finance Initiative,³⁰ and the government is promoting green finance in its international relations with Brazil, China, and India.

²⁸ For further details about France's Finance for Tomorrow initiative, see <http://www.paris-europlace.com/en/our-priorities/sustainable-finance>

²⁹ For information about DNB's Sustainable Finance Platform, see <https://www.dnb.nl/en/about-dnb/co-operation/platform-voor-duurzame-financiering/>

³⁰ Information about the Green Finance Initiative can be found at <http://greenfinanceinitiative.org/>

The interim report of the EU's high-level expert group was published in July 2017. This identified a two-fold focus for sustainable finance: first, strengthen financial stability and asset pricing by improving the assessment of long-term sustainability factors; and second, mobilize capital to support the transition to sustainable development in the real economy, notably for households, SMEs, and infrastructure—identifying a gap of €180 billion per year in investment for climate action alone. Although many initiatives are underway across Europe, urgent action is still needed both to help stimulate economic recovery and to meet key environmental targets.

To start with, a set of five principles was highlighted. These stressed the need for the financial system to consider full value, to be productive, to be resilient, to demonstrate alignment with sustainability, and to take a long-term perspective. Putting these principles into practice led to a series of early recommendations for reforms in the policy architecture and market infrastructure, including:

- The introduction of a classification system for green and sustainable assets, including an EU green bond standard;
- The establishment of a common set of principles for implementing fiduciary duty;
- Further strengthening of disclosure rules, notably to incorporate recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures;
- The introduction of “sustainability tests” for all future EU financial regulations and policies;
- Consideration of a Sustainable Infrastructure Europe to match-make between private investors and public authorities; and
- Positioning the European supervisory authorities—for banking, insurance, and securities—to respond to the sustainability challenge.

A range of tough issues was identified for further discussion, including how to overcome market short-termism, how to integrate sustainability into credit ratings and market benchmarks, how to establish “capital raising plans” setting out investment pipelines, and how to involve society more actively in the development of sustainable finance.

Following consultation, a final roadmap will be delivered by the expert group at the end of 2017, followed by a formal response from the European Commission. Importantly, the exercise has already had results, bringing the sustainability agenda more fully into the Capital Markets Union and generating a positive debate on how finance can move from a post-crisis focus on stability to one emphasizing contribution to the wider economy.

CASE STUDY: INDIA – DEVELOPING RENEWABLE ENERGY AND ENERGY EFFICIENCY MARKETS

Financing India's goals for inclusive and sustainable development requires more, lower cost, and longer-term capital. Raising incomes for the 800 million people living on less than US\$2 per day, creating livelihoods for the 12 million people entering the workforce every year, and regenerating the natural resource base at a time of climate change requires innovative approaches to sustainable finance.

The past two years have seen a marked shift in both market and policy efforts to rise to the challenge. In 2016, a joint report produced by the Federation of Indian Chambers of Commerce and Industry and the UN Environment Inquiry outlined a set of steps, which were welcomed by the government (UN Environment Inquiry 2016f). A set of interlocking actions have been taken to scale up finance for renewable energy:

- *Priority sector lending.* The Reserve Bank of India (RBI) requires banks to allocate 40 percent of their lending to priority sectors in the Indian economy, including agriculture, infrastructure, education, and small and medium enterprises (UN Environment Inquiry 2016f). In April 2015, the priority sector lending framework was expanded to include lending for decentralized renewable energy (RBI 2015). The aim was to encourage lending for renewables, which would increase access to energy and would not necessarily be financed through market forces alone.
- *Market commitments.* As part of its effort to increase India's renewable energy capacity to 175 gigawatts (GW) by 2022, the Ministry of New and Renewable Energy has agreed to voluntary financing commitments with 40 banks to finance 78 GW of renewable energy capacity by 2019.³¹ This will require investments of approximately US\$100 billion, US\$70 billion of which would come from debt.
- *Green bonds guidelines.* As of July 2017, Bloomberg estimates that US\$2.1 billion of green bonds were issued in India (compared to US\$9.3 billion in China). Last year, the Indian market represented the 7th largest green bond issuer worldwide, with a total issuance of US\$2.7 billion. A key factor in the growth of this market has been the role of the development of disclosure requirements by the securities regulator, the Securities and Exchange Board of India (SEBI).³² The guidelines build on international best practice, provide greater certainty for issuers and investors, and will be a catalyst for market development. L&T Infrastructure Finance Company raised R677 crore (US\$103 million) in the first green bond approved by SEBI (Mahapatra 2017). The International Finance Corporation (IFC) provided the financing. While India may not be the largest national green bond market, it has been notably innovative. In 2016, IFC also invested in the country's first green bond focused exclusively on green residential buildings with Punjab National Bank Housing Finance. Several financial institutions—both traditional banks and nonbank

³¹ Information about India's Ministry of New and Renewable Energy commitments is available at <https://re-invest.in/about-re-investment/green-energy-commitments/#>

³² The Securities and Exchange Board of India's Circular No. CIR/IMD/DF/51/2017 describing Disclosure Requirements for Issuance and Listing of Green Debt Securities is available at http://www.sebi.gov.in/legal/circulars/may-2017/disclosure-requirements-for-issuance-and-listing-of-green-debt-securities_34988.html

financial institutions—have used green bonds to access capital markets and attract new investors, both local and international. This market is expected to continue to expand quite quickly.

Bloomberg New Energy Finance projects that there will be US\$10 billion invested in India's clean energy this year, with over 13 GW of renewable energy capacity added every year from 2017 onward.

CASE STUDY: MOROCCO – A NATIONAL ROADMAP FOR SUSTAINABLE FINANCE

At the 22nd Conference of the Parties (COP 22) in November 2016, Morocco launched a national roadmap for aligning the Moroccan financial sector with sustainable development (Bank Al-Maghrib 2016). Developed in collaboration with Bank Al-Magrib (Morocco's central bank), regulatory authorities, and market associations, the roadmap sets out a strategic vision for Morocco's financial center around five axes:

- Extending risk-based governance to social and environmental risks;
- Developing sustainable financial instruments and products;
- Promoting financial inclusion as a driver for sustainable development;
- Building capacity in the field of sustainable finance; and
- Ensuring disclosure (transparency and market discipline).

Several Moroccan authorities are now seeking to take the recommendations of the roadmap and put them into practice.

Insurance: ACAPS, Morocco's supervisory and regulatory authority for insurance, is now designing a strategic approach to implement roadmap targets into the insurance market. At a high level, the roadmap confirms the importance of insurance firms as sources of sustainable finance instruments and as sources of capital for investments in development projects. ACAPS is now developing a strategy to achieve targets for the insurance sector in the roadmap alongside other priorities, including:

- Systematically assessing the sustainability impacts of financing and investment decisions;
- Integrating sustainability factors into risk management and assessment systems;
- Assessing the potential for carbon risks to investment portfolios;
- Scaling up capital allocation toward green assets, with a projected target of MAD6 billion over a five-year timeframe; and
- Developing new insurance solutions for environmental risks, such as climate change.

Financial center development: Incorporating sustainability considerations can facilitate the development of financial centers (UN Environment Inquiry 2017d). The Casablanca Finance City Authority is now working toward this goal by convening a first meeting of international financial centers working on sustainable finance, with the support of UN Environment (UN Environment Newscentre 2017).

CASE STUDY: RUSSIA – CREATING MARKET FOR RESIDENTIAL ENERGY EFFICIENCY FINANCE

The Challenge

Over 140 million people live in Russia, with almost 100 million living in multifamily buildings (MFBs). Most of these buildings require energy efficiency repairs because little consideration for energy efficiency was given at the time these buildings were built (the average age of an MFB in Russia is 43 years). With the Russian housing sector being the second largest end-user of energy, Russia can significantly reduce its greenhouse gas (GHG) emission footprint (Russia is the world's fifth-largest GHG emitter) by mobilizing private sector investment in the energy-efficient modernization of its housing stock.

Despite this potential, little investment into MFB energy-efficient retrofits has taken place because of a range of barriers. These barriers can be categorized into three main groups: (a) an underdeveloped legal and regulatory environment, (b) a lack of financing mechanisms for MFB retrofits (despite a well-developed mortgage market to finance purchases of individual apartments/houses), and (c) the low level of awareness about energy efficiency among all stakeholders (government, financial institutions, and home owners). Addressing these barriers required a systematic approach and change.

This case study describes how the Russian government, with support from the World Bank Group, has been addressing these challenges to create a new market for financing energy-efficient retrofits of MFBs. The key milestones on the way to a new market included: (a) the development of a new legal and regulatory framework for MFB retrofits, (b) the development of a corresponding institutional framework, (c) the launch of a state incentive program targeted at energy efficiency in MFBs, and (d) capacity building for all groups of stakeholders (the public sector, the financial sector, and the general public). In the four years since the Russian government has embarked on this reform agenda, a combination of policy actions, institutional development, and public finance measures has resulted in over US\$4 billion mobilized for investment in MFB modernization across the Russian Federation.

Key Milestones

Russia lacked a basic legal framework for facilitating the capital renovation of MFBs. Putting this framework into place was a prerequisite for enabling energy-efficient renovation in MFBs. Therefore the first and most critical step toward reforming the housing sector was the adoption of the Law on Capital Repairs in 2013—a groundbreaking legislation that gave impetus to a new system for financing the renovation of MFBs. This law formed the basis for private sector participation in MFB retrofits: it made homeowners financially responsible for their building retrofits, created a mechanism for channeling funds from homeowners

into financial institutions, and created conditions for private sector players (for example, commercial banks, construction companies, energy efficiency equipment manufacturers) to work together to facilitate MFB renovation.

The new system became functional as the law removed main risks that had precluded these players from entering this market. It has also enabled banks to create specialized savings and loans products. The new legal framework introduced the notion of special accounts—a bank account attached to an MFB with special features designed to accumulate and protect savings for building retrofits. As part of its strategy for the development of the housing sector, the Russian government has placed an emphasis on the transition to a special accounts system and the development of private sector financing for capital and energy-efficient repairs of MFBs. In four years since the start of a new system about 80,000 buildings have set up special accounts, having accumulated US\$500 million.

Once the basic framework for MFB renovation had been put into place, the Russian government took the next step on its housing sector reform path with a focus on energy efficiency. In 2017 the government piloted a state program that provides financial incentives to MFB homeowners for combining building retrofits with energy efficiency measures. The program is designed in a way that integrates private sector investment with public policy objectives. This program provides financial assistance to homeowners in exchange for achieving measurable reduction in buildings' energy consumption. At the same time, the program aims to spur market growth in bank lending for MFB retrofits by providing access to bank loans on preferential terms.

Early Signs of a New Market Developing

The Russian market for residential energy efficiency financing is in an early stage of development but has already reach several milestones: (a) over US\$4 billion in private savings have been mobilized over the last three years, (b) banks have made their entry into the sector by providing specialized savings and loan products, (c) a government program has been put into place that provides targeted financial incentives to promote energy efficiency, and (d) a multitude of private sector players are working together to make the Russian housing stock energy efficient.

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