Mainstreaming Low-Carbon Climate-Resilient growth pathways into investment decision-making – *lessons from development financial institutions on approaches and tools*

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Abstract:

The integration or "mainstreaming" of the transition to a low-carbon climate-resilient future as a prism through which to make financial decisions poses a broad number of operational challenges. This background paper for the March 31 event is drawn from the report currently underway by CDC Climat Research supported by the Group *Agence Française de Développement* and the Group *Caisse des dépots* entitled "*Mainstreaming Low-Carbon Climate-Resilient Growth Pathways into International Finance Institutions' Activities: Identifying standards and tools and a typology for integration into operational decision-making"*.

Drawing from existing studies of current practice among mainly public development finance institutions (DFIs), this paper presents three families of tools and metrics used by DFIs to integrate climate change into investment decision-making. It presents a number of examples of how institutions have mainstreamed these issues into upstream strategic and downstream assessment processes. This paper also identifies the further challenge of moving from a system of tools and indicators that focus principally on climate finance tracking – important to foster trust and progress on international cooperation – to a means of aligning activities across financial institutions and the entire economy with the transition to a low-carbon climate-resilient economic model necessary to achieve the 2°C commitment.

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Executive Summary

Development finance institutions – as well as other financial actors – have taken steps to develop and introduce a number of tools and metrics to integrate climate change into investment decision-making. This has occurred as a means to contribute to international climate finance flows as well as mandated and voluntary efforts to align activities with a low-carbon climate resilient (LCCR) economy. Three broad categories of tools can be identified: positive-list, volumetric and exposure-based tools and instruments. The resulting tools are used to screen projects and investment opportunities coherent with climate targets and objectives, assess the impact of projects on emissions and resiliency as well as assess the exposure of projects to physical and climate policy-related risks.

To understand and present a framework for discussing how these issues can be integrated into investment decision-making, the process is divided into two parts: the "upstream" policy or strategy level and the "downstream" or "project" analysis. Mainstreaming in the "upstream" decision-making is crucial for introducing objectives and criteria that foster across-the-portfolio support of low-carbon, climate-resilient projects. Among DFIs, climate-related information has been introduced in upstream decision-making through portfolio-wide targets, climate finance tracking methodologies and initial assessment screening tools, based on investment policy strategies laying out priority areas of intervention. Aligning strategic intervention frameworks and screening criteria with climate and LCCR objectives is an opportunity to identify and prioritize projects where the involvement of the DFI could lead to significant emission-reductions or improved resiliency.

Mainstreaming climate criteria and objectives within "downstream" analysis can "optimize" projects and link co-benefits from low-carbon, climate-resilient development with other environmental issues and social issues (local air pollution, water quality, etc.). Thresholds can be set to ensure that projects eligible for financing prioritize technical solutions that are coherent with climate objectives. Institutions are also experimenting with the integration of a "social cost of carbon" and carbon prices (whether market-based or shadow) into the economic and financial analysis. Taking into account the future costs related to low-carbon development (i.e. increased fossil fuel prices due to carbon pricing, reductions in fossil fuel subsidies) and impacts on the financial models of projects can lead to a prioritization of low-carbon alternatives.

Scaling-up the financial flows to the trillions of dollars per year necessary to achieve the 2°C long-term objectives will require the mainstreaming of climate concerns and of the long-term low-carbon climate resilient transition across all operations. This is important not only to increase the flows going to climate-specific investments, but also to ensure that the majority of investments are coherent with this long-term transition. One of the principal challenges today is to move from a system of tools and indicators that focus principally on climate finance tracking – important to foster trust and progress on international cooperation – to a means of aligning activities across financial institutions with the "transition" to a LCCR economy coherent with the 2°C international target.

Fostering the decarbonisation of sectors through the deployment of new technical and financial solutions and encouraging deep behavioral changes must occur within a broader national and international vision for LCCR economic and social development. However, in many instances today, there is no explicit vision of what a low-carbon, climate-resilient future compatible with both development needs and climate needs would look like. As such, it will become increasingly important in the coming years to find the means of evaluating the "transition potential" or "transition impact" of individual investments.

List of Acronyms

ADB : Asian Development Bank

AFD : Agence Française de Développement

CDC : Caisse des Dépôts

COP : Conference of the Parties

DFI : Development Finance Institutions

EBRD : European Bank for Reconstruction and Development

EIB : European Investment Bank

ESG : Environmental, social and governance

EPS : Emission Performance Standards

GNP : Gross national product

IDB : Inter-American Development Bank

IFC : International Finance Corporation

KFW : Kreditanstalt für Wiederaufbau Development Bank

LCCR : Low-carbon, climate-resilient

LEDS : Low Emission Development Strategies

NEFCO : Nordic Environment Finance Corporation

SDSN : Sustainable Development Solutions Network

WB : World Bank

WRI : World Resources Institute

1 The Stakes: financing the transition to a "low-carbon, climate resilient" future

2015 is a pivotal year as the international community negotiates the international agreements that will follow both the United Nations Millennium Declaration and the Kyoto Protocol. While the right to development cannot not be denied nor sacrificed, the world is confronted at the same time with the urgency of limiting the global average temperature increase to 2 °C above pre-industrial level.

High-, medium- and low-income countries are confronted with the challenge of placing their economies and societies on low-carbon, climate-resilient (LCCR) paths of development. Developed countries are confronted with the systemic challenge of restructuring existing infrastructure networks and renovating or replacing existing – and often aging- infrastructure. Conversely, developing countries are today characterized by fast-growing populations, economic growth and increasing demand for infrastructure. As development needs are progressively met, the demand for energy in developing countries will swell. Following historical trends and development models, this economic development is expected to result in a rapid increase in carbon emissions, unless developing countries adopt less emitting development strategies.

In both cases, the massive needs in terms of building, replacing and renovating infrastructure offer the opportunity to place development on the 2°C pathway by shifting capital investments to low-carbon climate resilient projects (IEA 2014; Kennedy and Corfee-Morlot 2012; NCE 2014; OECD and CDC Climat 2014; WEF 2013). Whether action is based on explicit official mandates or on a forward-looking risk-based assessment, public and private financial institutions have a role to play to channel short- and long-term financing to the investments that are coherent with these types of pathways. Investment decisions made today and aligned with long-term low-carbon "transition" objectives can avoid the locking-in of emission-intensive infrastructures and development models and hold the potential to reduce the cost of achieving long-term objectives while simultaneously limiting shocks to the economy (Kennedy and Corfee-Morlot 2012; NCE 2014; Vogt-Schilb and Hallegatte 2014).

Development Finance Institutions (DFIs)[4] are important actors in channeling official development aid as well as providing capacity support to recipients on a number of development issues. Over the last decade, a number of these institutions have developed methods and indicators to ensure that a part of their activity contributes to low-carbon objectives and track their increasing contribution to climate finance flows.

Recent estimations of the level of financing needed at the global level to successfully manage the transition to a 2°C future differ by their orders of magnitude. Currently, the pledge made by developed countries to mobilize $ 100 billion financing annually by 2020 to support developing countries to cut their emissions serves as a reference for international discussions. However, estimates suggest that the order of magnitude of investment needs may be in the trillions rather than billions. Achieving this transition to a low-carbon, climate resilient future will thus require the integration or "mainstreaming" of these issues as a prism through which all investment decisions should be made. This poses a broad number of operational challenges.

[4] For the purpose of this study, DFIs include Multilateral Development Banks (MDBs), Multilateral Financial Institutions, Sub-Regional Banks and Aid Coordination Groups.

This background paper summarizes the principal findings from a CDC Climat Research / APREC study conducted for the *Groupe Agence Française de Développement* and the *Groupe Caisse des dépôts*. Drawing on existing studies of current practice among mainly public development finance institutions (DFIs),[5] it presents the families of indicators, tools and approaches in use today within the investment decision-making process. It then briefly presents the challenges that remain to be overcome in moving from a system of tools focused on tracking climate finance to the alignment with a "LCCR transition" of investment decision-making across all activities.

2 The contribution of DFIs in mobilizing climate finance flows

Development finance institutions are increasingly taking climate change into consideration in their operations for a variety of different reasons. In some instances, DFIs have an official mandate from their political stakeholders and shareholders to address sustainable development - and as a subset of issues, the climate challenge. In other instances, bilateral and multilateral development institutions are increasingly asked to scale-up and track their contributions to the $ 100 billion per year commitment described in further detail below. DFIs are also playing a role in implementing domestic policy objectives through the deployment of different financial tools and programs to leverage private sector contributions. Finally, DFIs are addressing this issue as they become increasingly aware that climate change can pose significant risks both in terms of physical impacts as well as future regulatory environments that can impact the financial viability of investments. This has led to DFIs being at the origin of substantial climate finance flows. However, scaling-up financial flows from the $ 100 billion objective to the necessary level implies that mainstreaming of these issues across all institutional activities will be necessary to align development with a LCCR future.

This section briefly presents the key rationale behind the inclusion of climate change in DFI operations as well as estimates of the scale of investment this has generated to date – and the estimated future investment needs.

2.1 Contributing to international and national climate objectives

Development finance institutions have a role to play in supporting their governments to enact climate change-related policy both domestically and internationally. Much of the international discussions concerning "climate finance" are connected to the commitment made at Copenhagen in 2009 to mobilize $ 100 billion annually of additional financing for climate action from developed to developing countries, from both public and private sources. This is a key piece of the international political negotiations as it focuses on providing financing and hence building trust between developed and developing countries. This trust is a necessary condition to reach any meaningful international agreement to tackle the climate challenge. Internationally, DFIs have an important role in making these transfers operational while domestically, these institutions contribute to national climate policy objectives and goals.

[5] This includes work by (Cochran et al. 2014; RICARDO-AEA 2013; Smallridge et al. 2012)

Box 1: Defining Climate Finance

The international community has spent significant time and effort in discussing what "climate finance" is and what types of sectors, projects, and technologies – as well as what part of total investments – count towards the quantified annual goal. From an operational perspective, this is equally crucial to resolve in order to provide those involved in the investment and financing decision with a coherent set of criteria and tools to prioritize certain investments in line with objectives.

The UNFCCC's first biannual assessment of climate finance flows conducted by its Standing Committee on Finance (SCF) states that "climate finance aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts" (UNFCCC 2014).[6]

Many DFIs have come together through various channels to work collaboratively on this topic. These concerted efforts address both definitions of what "green" or "climate" investment is, as well as the harmonization of impact assessment methodologies.[7]

Both domestically and internationally, DFIs and public financial institutions more generally, play a number of roles in facilitating the shift of public and private investments towards LCCR projects, and programs that could help foster evolutions in regulatory frameworks. They are in the front line for addressing market failures which limit positive investments and assisting in developing new markets that are coherent with both long-term development and climate objectives. Their instruments generally include long-term funding which is dedicated to the achievement of national and international policy priorities.

In practice, DFIs can contribute to the LCCR transition in developing countries by taking on three main responsibilities: i) facilitating access to capital, ii) assisting in the preparation of national development strategies coherent with a low-carbon objectives, and iii) working with national banking and financial industries. DFIs can channel donor aid as well as leverage capital at below-market rates and lend these resources to developing countries at attractive conditions. At domestic level, DFIs can then channel these funds to promote private-sector investment and financial and technological innovation, and thus serve as demonstration investments. In order to do so, they develop specific tools and instruments which are tailored to their objectives and adapted to the specificities of low-carbon, climate resilient finance.[8]

[6] For further details see (UNFCCC 2014).
[7] See International Financial Institution Framework for a Harmonised Approach to Greenhouse Gas Accounting (2012) and Joint MDB Report on Adaptation Finance (2012)
[8] For more information, see (Cochran et al. 2014)

Figure 1: Roles and instruments of DFIs in supporting the low-carbon climate resilient development

Role	Functions	Instruments
Facilitating access to capital	• Providing access to long-term capital • Identification of sectors and technologies • Prioritisation of actions in national climate action plans • Development of incentivising national policy framework to support investment	• Concessional and non-concessional lending • Equity investment • International climate funds • Public-private partnerships • Risk sharing instruments (guarantees, structured finance…) • Grants • Technical assistance
Assisting in developing national development strategies	• Develop facilities to channel financing through local banking network • Capacity building • Political dialogue	• Programme loans • Technical assistance • Information tools
Support innovation	• Direct financing of demonstration projects • Assist in leveraging additional sources of financing (international and domestic) • Provide international expertise	• Specific grant financing • Technical assistance • Risk sharing

Source: Authors, based on OECD (2014).

2.2 Addressing Climate Risks & Adaptation

The second reason for including climate considerations into investment decisions is the consideration of the impact of climate risks on expected financial returns when assessed. Climate-related risks can be categorised through two main sources: i) physical risks and ii) risks stemming from changes in policy, regulatory and behaviour or "carbon risks."

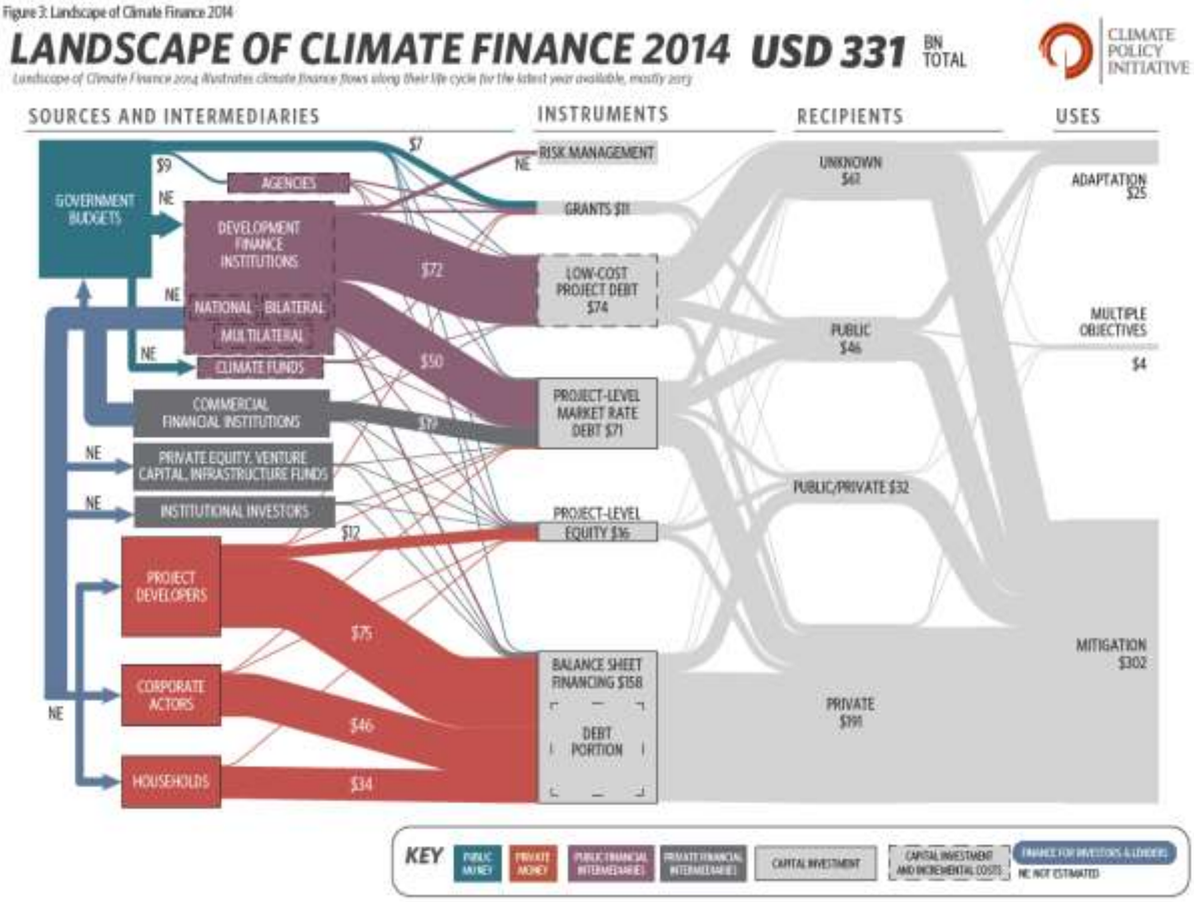
Risks linked to changes in climate policy - or "carbon risks" - can take the form of increased costs or changes in the business environment due to carbon pricing, regulations and standards, as well as subsequent changes in consumer behavior. Some DFIs are including climate considerations into investment decisions to maximize financial benefit and their risk/return ratio.

More generally, DFIs play a role in mainstreaming adaptation to future changes in the climate into development. These institutions have undertaken efforts to limit the vulnerability of communities to natural disasters which is strongly and inversely related to the level of social and economic development. Sound disaster risk management has been recognised as priority on the international development agenda.

2.3 Important progress made on "climate finance" but sufficient for the 2° objective?

Figure 2 presents the global landscape of climate finance as estimated by the Climate Policy Initiative (CPI 2014). Their analysis has constantly demonstrated that DFIs are important actors in facilitating global public climate finance flows. In 2013, DFIs committed USD 126 billion, or 38% of total climate finance flows. These include flows from international multilateral and bilateral institutions, as well as investments made and financing provided by national development finance institutions. Additionally, these institutions manage multilateral climate funds. DFIs have made strides in mobilizing both public and private finance to address mitigation and adaption issues. The amount of financing and resources dedicated to climate change has been growing – as well as the accountability requirements in terms of the direct impact of their activities.

Figure 2 - 2013 Climate finance flows as estimated by CPI



Source: (CPI 2014)

Nevertheless, despite the recent significant progress to mainstream climate change into development activities, the 2°C objective will necessitate further ambition whereby the focus shifts from climate change to a more dynamic "transition" to a low-carbon climate-resilient economic model. At the global level, the New Climate Economy Report estimates that approximately USD 92 trillion financing is necessary from 2015 to 2030 to meet infrastructure and development needs without jeopardizing global emission reduction objectives. Although this amount represents a net incremental cost of 4.1 trillion dollars over the period compared to BAU investment needs (NCE 2014), the shift of investments it will require is significant. It is even more true since solving the climate finance equation involves not only increasing flows to low-carbon projects, but equally capping – and reducing – investments in carbon-intensive activities.

Through 2020 and beyond DFIs will remain important actors in channeling international climate finance flows in line with agreed "climate finance" objectives. However, achieving the level of financing necessary to achieve long-term international objectives will require a systemic shift in terms of aligning the majority of activities with low-carbon, climate resilient development model. This will require that DFIs identify climate-specific investments and strive to achieve all development objectives in means that not only reduce emissions, but also increase resiliency in line with long-term objectives. In many instances, additional "climate finance" flows may be able to play a role in financing the associated increased cost of projects and programs. As described in Box 2, this process occurs within the broader context of both internal and external short-, medium- and long-term objectives.

Box 2: Objectives at Multiple Time Horizons

The integration of climate-change into operational decision-making and its weighting compared to other criteria is affected by the large number of short- and long-term objectives that financial institutions are confronted with. For example, Development Finance Institutions are confronted with mandates and objectives that span multiple time horizons. DFIs are subject to short-term performance objectives (signatures, disbursement and financial performance, among others), medium-term development objectives (such as the Sustainable Development Goals currently in discussion) or long-term objectives (such as contributing to the achievement of LCCR objectives by recipient countries). As a result, the teams involved in the project and program assessment and decision-making process must juggle multiple considerations across sectors, disciplines and time-horizons. These objectives are further nuanced given the need to respond to explicit and implicit objectives set by their mandating institutions and to be consistent with the local policies and priorities set by the recipient countries. While not included in the table below, for private sector actors financial return as well a regulatory adequacy and solvency requirements equally strongly influence the allocation of financial resources.

Figure 3: Examples of different DFI objectives across time horizons

Short-Term Objectives	Medium-Term Objectives	Long-Term Objectives
Annual performance objectives and requirements - Volume of financing - Environnemental, social and Gouvernance (ESG) objectives - Climate Finance Reporting	Multi-year strategic plans and objectives Formal external performance objectives from mandating institutions National and international development aid financing objectives (0.7% of GNP, etc.)	Low-Carbon, Climate Resilient Energy "Transition" objectives Eradication of poverty Eradication of certain diseases Universal literacy Gender equality

The following sections present methods and approaches used by DFIs and other financial institutions to mainstream climate change and develop a system that seeks to track, prioritize and foster the integration of LCCR objectives.

3 Three "families" of metrics and indicators for mainstreaming

This section presents a typology of three "families" of metrics and indicators that are currently used to integrate these issues. It draws on the experience of Development Finance Institutions - including Multilateral and Bilateral Development Banks – in their efforts to "mainstream" LCCR considerations into their broader investment policies and analysis of individual projects. They have been active over the past decade in setting objectives and creating a broad range of standards and tools (procedures, guidelines, metrics, indicators, screening criteria, etc.) to “mainstream” climate into their operational procedures.[9]

A review of the integration of climate change into the operational activities of DFIs and other finance-sector actors has identified three broad families of tools: qualitative; quantitative; and exposure-based approaches.[10] The inclusion of these tools into the decision-making process pursues the following objectives, linked to measuring and limiting the impact of projects on climate-change and the local environment:

- Annual tracking of climate finance contributions for external reporting purposes;
- Contribution to and alignment with short- and long-term mitigation and adaptation objectives (and, if applicable, regulations and reporting requirements);
- Understanding exposure of assets to the physical risks posed by climate change;
- Understanding the exposure of assets to the impacts of climate-related policy (such as energy pricing, evolutions in regulation, emergence of new standards, etc.)

As described in Figure 4, these approaches can be used in different ways to assess both individual investments as well as to characterize the broader portfolio of institutions. Across all approaches a certain number of methodological and definitional issues need to be addressed to produce the needed data for analysis. Secondly, baselines scenarios, thresholds and other criteria are needed to “contextualize” the descriptive information to provide useful and meaningful input for investment decision making. Each approach requires different data inputs, a definitions or methodologies to aid in gathering and processing the descriptive information on each project, company or asset being assessed. These methods can be applied either to projects or activities that have a clearly defined outputs or “objects” (construction or renovation of infrastructure, other fixed capital investments) with describable and quantifiable impacts of technologies, industrial processes, among other characteristics. They are also increasingly applied to investment decisions in companies, issuers of stocks and bonds as well as policy support programs. In these cases where an “object” or measureable outcome is less easily described or assessed, different methods looking at the institutional and operational information concerning the entity or entities financed is assessed as done in “traditional” ESG assessment approaches. It should be taken into consideration – although not explored in detail here that moving from a positive-list approach to an exposure approach can significantly increase the amount of resources and data necessary for implementation. The below section focuses principally on the former “project or object-focused” metrics and tools.

3.1 Qualitative instruments

This approach consists of classifying projects and activities as contributing to, being neutral, or counter-productive to climate-related objectives and can be applied in multiple ways, based on project classification of sectors, technologies, and processes depending on the assessment

[9] See (RICARDO-AEA 2013) for a study commissioned by the DG Climate Action of the European Commission which maps and describes in detail the instruments applied by a broad range of institutions.

[10] While the above section has focused principally on mitigation, the different approaches can also be used in assessing the resiliency of projects to future climate change. Positive-list approaches can include classification of projects that increase the resiliency of projects. Volumetric approaches can quantify the reduction in vulnerability (persons / assets at risk, etc.). Finally, exposure approaches can calculate the impact of changes in the climate on project operations and returns on investment.

procedures each institution has in place. At the portfolio-level, a qualitative or positive-list approach allows institutions to define and track how their activities support specific project types, often expressed in percentage of commitments, signatures, total financial flows, or similar measures. At the project level, specific technologies can be prioritized for use in different sectors and project types. This can take the form of list-based screening criteria, exclusion lists and context-specific priorities. This approach can require comparatively less data than other approaches given that only basic project information is needed.

Figure 4 : Typology of LCCR Metrics for Project Decision-Making

	Qualitative or List-Based	Quantitative or Volumetric Impact	Exposure
Outcome of assessment	Projects, companies and/or activities are classified as contributing to, neutral or counter-productive to climate change objectives.	Impact of projects and activities on climate change (GHG emissions, other quantifiable indicators for climate change)[11]	Exposure of projects and or activities to direct and indirect: • Physical impacts of climate change • Impacts of climate policy and regulation regulatory impacts (energy-related costs, regulations standards, etc.); • Market behavior evolutions
Required definitions and methodological frameworks for data collection and analysis	• Qualitative definitions to classify "climate" projects • Check-list criteria (such as company ESG screening methods)	Quantitative methodologies: • GHG emissions • Energy use • Resource efficiency (energy savings, water use, etc)	Methodologies to calculate: • Country-level vulnerability • Project level physical impact • Exposure to climate policy and regulatory changes
Potential Data Inputs	Specifications allowing to identify: • sectors and sub-sectors of activity • involved technologies and techniques • physical context • company or asset-issuer descriptive information	Data allowing to quantify: • Energy use • GHG Emissions (potentially including all scopes) • Quantitative sector and country specific information	Context related information: • Energy data (consumption, fuel mix, price) • Technologies and techniques in use (efficiency, externalities) • Costs to users and consumers • Cost of externalities • Projected climate and economic scenarios • Adaptation-related data on vulnerability and resilience
Baseline scenarios, thresholds and criteria for contextualization and comparison	• Guidelines and qualitative criteria for screening and exclusion for sectors and technologies • Thresholds for exclusion based on company ESG criteria	Baseline scenarios and thresholds for acceptable levels of: • Energy use • GHG emissions • Other forms of resources use and efficiency	Thresholds for acceptable exposure levels from projects to: • Physical risks • Economic value at risk
Types of Application:			
Project or *object-focused analysis*	Screening and classification of individual project based on technical profiles and local context.	Assessment of total and avoided impact of project typically compared to a baseline or sector average.	Assessment of exposure of individual project or activity.
Company, asset issuer or *non-object focused*	Assessment of objectives, company, or asset issuer (eg. stocks and bonds) based on qualitative characteristics (eg. ESG checklists, sectors of intervention)	Assessment of: • GHG footprint of company or pro-rata footprint of asset held • Company resource use compared to benchmark	Assessment of: • Exposure of company, asset issuer, etc.

Source: Authors

Nevertheless, to function properly, qualitative approaches require definitions of what is considered low-carbon or climate-resilient. This is typically laid out in an institution's investment policy or strategic plan and applied during screening and eligibility decision-making. This set of definitions,

[11] This can include metrics such as: hectares of protected forests, emission intensity of the energy mix, access to clean energy, etc.

whether structured around economic sectors, technological families or sub-families, core-businesses of companies, etc., is essential in linking the DFI's long-term objectives with the operational standards through which projects are selected for further appraisal.

3.2 Quantified or volumetric instruments

Quantified or "volumetric" approaches quantify the impact of the projects and activities in relation to LCCR objectives. To date the most widely used approach is the quantification of a project's greenhouse gas emissions and comparison with a counterfactual scenario to calculate the emissions reduced or avoided. Volumetric approaches require defined methodologies to quantify the emissions, energy use or other relevant variables (energy use, etc.). Methodologies define what is included in the accounting boundaries (principally structured around Scope 1, Scope 2 and Scope 3 emissions[12]) the emission factors or other proxies to be used in estimates, and the methods for estimating impacts using different types of data (measured, modeled, downscaled, etc.). The use of carbon footprint estimation tools is gradually spreading across the major DFIs with ongoing efforts to harmonize methods. [13]

The quantification of greenhouse gas emissions from projects is typically seen as the initial step in producing the volumetric data necessary to understand the impact of projects, assess cost efficiency per ton of emissions reduced. This data can be used upstream in screening processes (through the establishment of maximum thresholds) or downstream during project-level assessment. Some institutions aggregate emissions levels and/or reductions of impacts at the portfolio level. Institutions can then use this information to assess the impact of and, if sufficient information is available, the efficiency[14] of their interventions.

The "contextualization" or assessment of calculated emission levels is a key part of producing information that will be useful for decision-making. This can include the comparison to a minimum or maximum performance standard for project types, technologies, sectors or countries; or a "counterfactual" baseline scenario.[15] If emission performance standards and baselines are not aligned with climate or long-term LCCR objectives, it may be difficult for institutions to assess the sufficiency of the resulting emission reductions.

[12] Scope 1 emissions are direct GHG emissions from sources that are owned or controlled by the entity/project. Scope 2 emissions are indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated off site but purchased by the entity/project. Scope 3 emissions include indirect GHG emissions from sources not owned or directly controlled by the entity but related to the entity's activities.

[13] To address differences in approach, nine members of the Working Group of the International Financial Institutions agreed to a harmonized framework for GHG accounting: Agence Française de Développement (AFD), the Asia Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the European Investment Bank (EIB), the Inter-American Development Bank (IDB), the International Finance Corporation (IFC), KFW Development Bank, the Nordic Environment Finance Corporation (NEFCO), and the World Bank (WB).

[14] Efficiency of intervention is assessed differently by DFIs. In many instances, DFIs focus on the ratio of emissions reduced and resources used. However, this may give very little indication in terms of progress or coherence of an action with long-term LCCR objectives.

[15] Selecting a baseline scenario is challenging, especially when it comes to assessing development projects. Some projects may be important for a country's economic development, yet emissive. The counterfactual scenario chosen to assess a project is often a "without project" scenario or an "alternative scenario" that reflects the most likely alternative project that would achieve the same outcomes or level of service.

3.3 Exposure and risk instruments

Over the past few years, DFIs and other financial institutions have begun to estimate the exposure of their portfolio or individual projects to the direct and indirect impacts of climate-related phenomena and climate and energy-focused policies. As described above, this can include the physical impacts of climate change (such as long-term changes in the water cycle, catastrophic events) as well as those stemming from the introduction of climate-related policies. Preferring and valuing "LCCR coherent investments" can help manage an investors' exposure to "climate risk" and "carbon risk", thus limiting the financial consequences of short-term policy changes, of stranded assets or of possible climate change effects in the medium to long-term (2°ii 2013; FTF 2015).[16]

Nevertheless, exposure-based approaches have principally focused on the physical impacts of climate change. Thus, a number of DFIs are developing tools to assess the vulnerability and the resiliency of projects and other targets of intervention to climate impacts. Tools have been developed to assess physical risk levels and potential future exposure at the country level. This process typically is data-intensive as it requires highly contextualized details concerning the projects' surrounding environment, as well as the climatic scenarios to assess future changes and detailed technical characteristics of the projects.

The relatively new "carbon-risk" approach involves assessing the exposure of the project to changes in the market and regulatory environment due to climate policies. A number of institutions use a theoretical "shadow" price of carbon in economic and financial analysis.[17] However, more widespread estimates of the impact of changes in the regulatory environment (performance standards, technologies, impacts on consumer demand for products and services) are rarely systematically assessed today. As in the case of physical risks, this can also be data-intensive depending on the focus (energy data - consumption, fuel mix, price; technologies and techniques in use - efficiency, externalities; costs to users and consumers, etc.).

4 Mainstreaming "climate" into investment decision-making

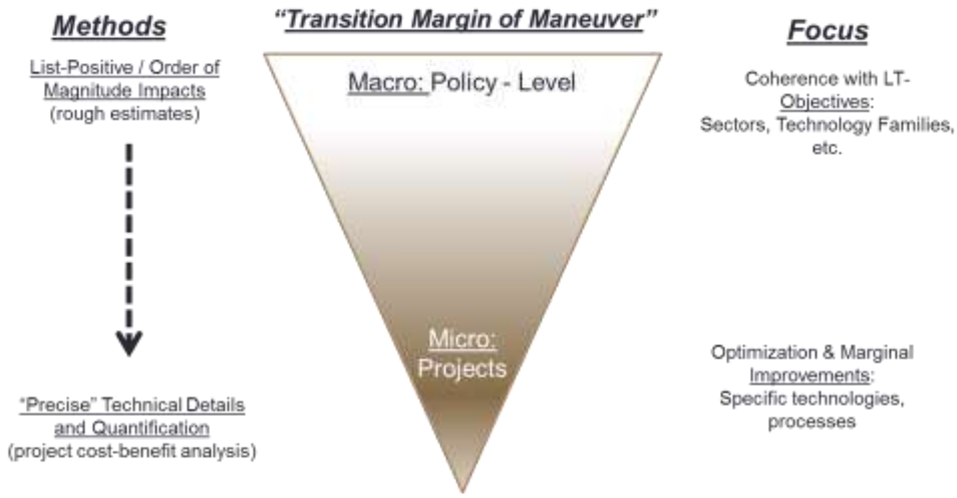
This section presents a stylized framework for thinking about how to integrate climate-oriented standards and instruments into investment decision-making. Investment decision making can be divided into two parts: the "upstream" policy or strategy level and a "downstream" or "project / intervention" analysis.[18] Dividing the investment process into these two broad phases allows a clearer understanding of how the investment framework set at the "upstream" policy level influences both the projects that are eventually analyzed at the "downstream" level as well as how this analysis occurs. The timing of the integration of climate change into the decision-making process can affect the capacity of the institution to make substantive or systemic changes (Cochran 2012; RICARDO-AEA 2013). As illustrated in Figure 5, the mainstreaming of climate-change at the upstream

[16] See (2°ii 2013; FTF 2015) for an analysis of what these risks entail for institutional investors.
[17] See CDP 2013 for an analysis of the use of internal carbon prices by economic actors and (Cochran et al. 2014) for the state of practice of public financial institutions in the OECD.
[18] For simplification, the authors use the term project, however it is recognized that the institutions discussed here intervene through a number of different means beyond support for individual projects (budget loans, financial intermediation, investments in specific climate funds, etc).

policy level can facilitate a systematic assessment of choices, priorities and orientations in line with climate and the long-term transition to a low-carbon climate resilient economic model.

Figure 7 presents the integration of LCCR standards and tools into the different steps in the project-finance decision-making process. While structured principally around the approach taken by public development-focused investment institutions, a number of lessons can equally be drawn for other private actors. Lessons from current practice are presented in the following sub-sections.

Figure 5: Decision-Making Process and the Impact of Climate-Related information



Source: Authors after (Cochran 2012; RICARDO-AEA 2013)

4.1 Upstream Use of Approaches: Strategic Intervention Frameworks, Targets, Tracking, and Project Screening

At the policy level, institutions establish the broader framework of their strategic investment strategies, defining investment priorities (and exclusions) in terms of geography (regions, countries), sectors (balance across, priorities within), processes and technologies (prioritization of certain actions). This is a key piece of the development of sectoral, regional or country-specific investment strategies and investment framework guidelines. It is an opportunity to identify and prioritize projects where the involvement of the DFI could lead to significant emission-reductions or improved resiliency. Within this process, both qualitative and quantitative definitions can be established to set the investment framework within which the projects are screened to identify those that are eligible for a detailed appraisal. Among DFIs, climate-related information has been introduced in upstream decision-making through portfolio-wide targets (see Figure 6), climate finance tracking methodologies and initial assessment screening tools based on investment policy strategies laying out priority areas of intervention.

A starting point for a number of institutions has been an initial upstream focus on tracking the portion of the institution's portfolio funding "climate-related" projects and activities. Targets set at the highest level of the institution are principally used to manage allocation to priority sectors and geographic areas. When targets are set as percentages of total signatures and allocation, this requires the elaboration of lists of eligible project types, technologies and sectors of intervention based on institutional policy and, when compatible and in place, recipient-country LCCR objectives. These lists allow institutions to classify projects and allow for the consolidation of allocated funding.

When targets are set as an absolute portfolio emission level (carbon footprint), or as an emission reduction level, data on the quantification of total or avoided GHG emissions project by project must be centralized to calculate progress.

Figure 6 : Selected institutional climate-related targets and objectives[19]

	Portfolio-Wide GHG / Investment Target
ADB	40% of Asian Development Fund's operations; 50% for ADB's operations
AFD	50% of AFD's global portfolio
EBRD	2012-2014: 26-32 million tons CO_2 per year
EIB	Internally-established objective: 25% of all investment activities to be climate-related
IDB	25% of annual lending
IFC	20% LT finance; 10% trade finance.

Source: Authors from DFI's latest available official documentation

The integration of climate-related indicators into tracking can ensure a minimum portion of activity is dedicated to "climate" action. However on its own this may not be sufficient to ensure that climate-related considerations are integrated into the assessment of all of the institution's activities. Thus it is important for strategic investment frameworks and project eligibility criteria to take into consideration climate-related issues.

Increasingly, strategic investment frameworks – often developed jointly with client governments and other key stakeholders - now address climate issues.[20] This structuring of strategic intervention frameworks to support low-carbon climate-resilient development and respect long-term transition objectives is perhaps the most important step to ensuring that an institution's activities support the mainstreaming of climate and the LCCR transition. Once "enshrined" within the frameworks, at the operational level, DFIs can use a number of tools as described below to integrate climate into portfolio-wide targets as well as for applying selectivity criteria to projects and programs eligible for funding. Both quantitative and qualitative tools may be used in this process to i) screen and prioritize technological options and sectors, ii) understand the order of magnitude of the impacts, or iii) set thresholds for maximum emissions or other relevant indicators.

Eligibility and knock-out screening criteria can be used by institutions to ensure that projects that are aligned with the institutional investment policy and orientations are selected for further assessment, and eventually financing. Ensuring that the institution and portfolio-wide targets prioritize low-carbon, climate-resilient thus depends on the target itself as well as the definition of what is included in it. The criteria used in the screening process can be based on the same positive-list approach used in the tracking of institution-wide targets. This includes lists of country/region eligible projects, technologies and sectors for intervention based on institutional policy. However, unless using detailed, country/region-specific and stringent guidance aligned with LCCR objectives, these may not be able to sufficiently analyze the "ambition" of projects and to link them with long-term issues. Therefore, there may be value in combining positive-lists with rough volumetric thresholds to prioritize action in key sectors.

[19] While institutions have been working together to classify and track financial flows contributing to climate-related objectives, the definitions of the perimeter of inclusion can vary greatly.
[20] Approximately 60% of those institutions studied by Ricardo AEA (2013) address climate issues.

Figure 7: Tools, decision points and climate mainstreaming

	Positive-List	Volumetric Impact	Exposure
Assessment Tools	• Qualitative definitions of “climate” projects • Criteria for screening and exclusion for sectors and technologies	• Quantitative methodologies (GHG emissions, energy use, etc.) • Emission performance thresholds and standards	• Country-level vulnerability assessment tools and guidelines • Project level physical impact screening methods • Methods of calculating exposure to climate policy and regulatory changes
Stages	**Upstream Policy and Screening**		
Elaboration of strategic policy frameworks and tracking	Integration of climate-related criteria and priorities into sectoral plans through the inclusion of metric-based objectives and definitions • Set investment priorities based on climate-compatible sectors, technologies, risk and exposure levels • Set an exclusion to investments on highly emissive projects • Set quantitative objectives of climate related activities (eg. x% of climate investments in the overall or sectoral portfolios) • Set volumetric objectives on reduced emissions achieved through investments • Set a cap on total portfolio GHG emissions (including non-climate investments)		
Project Eligibility Screening	Screen for eligible project types, technologies, etc.	Screen activities based on rough estimates of: • Emissions performance compared to thresholds • Avoided emissions or impacts compared to baseline	Identify and screen activities based on rough estimates of: • Vulnerability to physical risks (country, regional or other aggregated approaches) • Exposure of project types (sector, tech.) to climate policy risks
Stages	**Down-stream Assessment**		
Options assessment and technical analysis	• Selection of project alternatives based on technology and process eligibility lists established by country, sector, level of development	• Detailed GHG footprint calculations of individual projects to compare options • Assess avoided emissions of individual technical options for projects	• Detailed assessment of direct physical impacts • Detailed assessment of policy-risks and resulting impacts on financial returns and future cash flows.
Economic and Financial Analysis		• Inclusion of emission data in economic analysis to assess welfare impacts • Integration of a social cost of carbon into economic analysis	• Inclusion of quantified physical and climate risks in financial analysis • Integration of a “real” or “shadow” price of carbon in financial analysis

4.2 Downstream or Project-Level Assessment

Once a project or program has successfully passed the initial round of screening based on an institution's investment policy priorities, it enters the downstream or project-level assessment. This process is often iterative, with increasingly detailed studies and assessments undertaken as the process continues. The methods and instruments used to integrate climate into these decision-making steps may increase in detail and complexity as the project appraisal moves from a "macro or meso" to a "micro" level of precision.

In general, as the project becomes more concrete, there are fewer opportunities to reduce emissions beyond "marginal" optimization linked to project design and deployment. Nevertheless, specific decisions concerning technologies, materials, network configurations, etc., can influence a project's emissions. Thus criteria based emission thresholds, limits, best-available-technologies, etc., can contribute to GHG mitigation objectives. This "optimization" of projects in terms of their impact on emissions and resiliency allows for room for case by case improvement. It can also provide an opportunity to introduce new technologies or approaches that could have a transformative impact through demonstration, etc.[21]

Project-level assessment can be broken into two parts: the technical options analysis and the economic and financial assessment of alternatives. Firstly, the ***technical assessment*** of identifies the different options and alternatives (technology, process, etc.) available to achieve project aims. Detailed environmental and risk assessments of the proposed options are then produced. The environmental and social studies and screening undertaken during the technical analysis assess the impact on the local environment and society. These studies can be used to link co-benefits from low-carbon, climate-resilient development with other environmental issues and other social issues (local air pollution, water quality, etc.). Thresholds can be set to ensure that projects eligible for financing prioritize technical solutions that are coherent with long-term objectives. For example, in 2013, the EIB established an "Emission Performance Standard" (EPS) whereby the institution systematically screens energy-intensive projects and excludes those where the emissions are likely to reach 550gCO_2/kWh or more.[22]

Within the technical analysis process, climate risk screening and proofing methodologies have been increasingly deployed by DFIs to assess the exposure of the project to future changes in the climate during the technical analysis of projects. Evaluating climate vulnerability is a complex matter as it depends on various factors such as: i) the type of impact that could be faced, ii) the potential magnitude of the risk, iii) the rate and duration of the event(s), and iv) the irreversibility of its effects[23]. For example, the ADB has developed guidelines for climate proofing in the transport, energy and agriculture, rural development and rural sector. The EIB has developed an in-house guide

[21] However, in many instances when a project is sufficiently developed to be proposed for financing to IFIs and other large-scale financing institutions, it may be too late in the process to influence the systemic choices that could have much larger direct emission reductions as well as ability to support a low-carbon development pathway.

[22] EIB (2013) : EIB Emission Performance Standard

[23] Lavell, A., M. Oppenheimer, C. Diop, J. Hess, R. Lempert, J. Li, R. Muir-Wood, and S. Myeong, 2012: Climate change: new dimensions in disaster risk, exposure, vulnerability, and resilience dimensions in disaster risk, exposure, vulnerability, and resilience

that outlines general principles and methodologies that can be followed to build resilience to current climate risks, build adaptive capacity and planning and take action to address future climate risks. The WB is also developing methodologies and tools across the main climate sensitive sectors for climate screening (urban risk, and agriculture and natural resources).

Secondly, the resulting information is used in economic and financial analyses that look at the overall impact (economic analysis) and feasibility (financial analysis) of the different options. The ***economic assessment*** attempts to measure the net impacts of the project on economic welfare and, when applicable, the variation between the technical alternatives. This integration requires principally an externally set "social cost of carbon"[24] as well as estimated GHG emissions, energy use, or other relevant values into assessment methodology. For example, the EIB has integrated the results of the project carbon footprint in the economic evaluation methodology applied to projects.

The ***financial assessment*** of projects and proposed alternatives aims at assessing and evaluating the costs and revenue streams of the project owner over a certain period of time. Integrating climate- and transition-related criteria within this process can have two main impacts. Firstly, taking into account the future costs related to low-carbon development (i.e. increased fossil fuel prices due to carbon pricing, reductions in fossil fuel subsidies) and impacts on the financial models of projects can lead to a prioritization of low-carbon alternatives. This typically occurs through the inclusion of a "shadow price of carbon"[25] in calculations when no "market" price signal exists (see Box 3). Secondly, inclusion in financial analysis can also assist in the selection between competing alternatives, allowing the comparison of impacts of different project scenarios to test financial returns of options. This process can equally include other carbon-related risks. Other potentially material carbon risks include short-term carbon risks as well as asset impairments due to physical and climate policy risks.[26]

Box 3: A quantitative approach to climate policy related risks

The EIB implements a shadow price of carbon as part of its financial appraisal procedures. The financial analysis measures the financial viability of the project by considering market distortions, subsidies and environmental externalities. In practice, a shadow price of €30 per tCO_2 to 50€ per tCO_2 by 2030 is included in EIB's financial appraisal of projects. For instance, EIB measures the viability of mature renewable projects on the basis of the economic cost of fossil fuel alternatives. The estimation includes the environmental externalities resulting from carbon emissions and other pollutants, and an additional benefit related to security of supply. Other institutions, such as the World Bank, are testing the use of the quantification of emissions of their projects in order to integrate a carbon price into project financial assessment.

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[24] The social cost of carbon (SCC) measures the full global cost today of an incremental unit of carbon emitted now, summing the full global cost of the damage it imposes over the whole of its time in the atmosphere In other terms, the SCC estimates what society should, in theory, be willing to pay now to avoid the future damage caused by incremental carbon emissions. DEFRA (2007): The Social Cost Of Carbon And The Shadow Price Of Carbon: What They Are, And How To Use Them In Economic Appraisal In The UK

[25] A Shadow Price of Carbon is a value based on the price of carbon necessary to achieve long-term mitigation objectives. Institutions may calculate their own or use the values given my carbon taxes or market-based pricing systems.

[26] See for more information: 2II (2013) :From financed Emissions to long-term investment metrics – State of the art review of GHG emissions accounting for the financial sector

Downstream analysis typically results in a set of detailed assessment scores and rankings which prioritize the technical specifications that the DFI would like to be seen adopted by the project developer. Using this information, the financial "package" that the DFI is willing to provide will depend on the final structure of the project. Finally, the DFI will identify the issues (environmental, social, LCCR-specific) that must be addressed and mitigated before the financing is granted.

5 Next Steps and Challenges: operational tools to mainstreaming the LCCR Transition

Development finance institutions have made substantial progress and developed a broad number of instruments to finance climate change mitigation and adaptation activities. As experience from implementation comes to light, further analysis will be useful to identify their relative potential to align activities with long-term LCCR objectives. While not treated in detail in this background paper, a number of operational concerns such as the trade-offs between complexity, precision, cost and comprehension by operational teams merit further analysis. Furthermore, the internal instructional and governance arrangements - such as the creation of a transversal climate services - deserve further attention to identify the opportunities presented by different approaches.

As discussed above, one of the principal challenges today is to scale-up the financial flows to the trillions of dollars per year necessary to achieve the 2°C long-term objectives. This will necessitate a move from a system of tools and indicators that focus principally on climate finance tracking to a focus on aligning activities across financial institutions with the LCCR transition. Mainstreaming climate concerns and the long-term low-carbon climate resilient transition across all operations could be an important issue to not only increase the flows going to climate-specific investments, but also to ensure that the majority of investments are coherent with this long-term transition.

5.1 A paradigm change climate finance to financing a LCCR Transition

Systemically considering transition pathways could allow developing countries to shape their energy and production structures around technologies and practices coherent with long-term climate objectives. A key part of this process relies on how the coherence of investments is assessed in terms of their contribution to a development pathway aligned with a LCCR future. In some instances, this could mean that highly-emissive projects could be eligible for funding when they contribute to a country's transition. Furthermore, this would influence how mitigation options would be assessed. For example, using only the most inexpensive abatement options to reach the 2020 target can create a carbon-intensive lock-in and make the 2050 target more expensive to reach in the medium and long term (Vogt-Schilb and Hallegatte 2014).

When the LCCR transition becomes a prism through which economic and development objectives are evaluated, mainstreaming implies looking at how to achieve development objectives in a LCCR-coherent fashion rather than looking to finance individual "climate" investments. Thus the coherence of each investment with a country's strategy to achieve the LCCR transition will be part of the "baseline" against which investment decisions could be assessed.

5.2 Adapting assessment tools for a LCCR transition

In practical terms, this implies moving from "static" assessment tools - that identify whether or not emissions are reduced or resiliency is increased by an action – to a "dynamic" process within which the "transition potential" or "transition impact" is assessed. This may have substantial impact on the tools, methods and decision points through which this issue is integrated into decision making. The lists of eligible technologies and emission performance standards could evolve and tighten as countries progress to a low-carbon, resilient model. However, volumetric approaches - measuring GHG emissions and consolidating total or avoided emissions at the level of the portfolio - will need to be assessed in terms of a transition-coherent emission trajectory estimated to be necessary to achieve long-term goals.

The challenge resides in developing and forecasting different pathways for the progressive evolution of a country's development model. Different possibilities will exist that minimize emissions and increase resilience while simultaneously contributing to economic growth and social welfare. Evaluating whether the choices made are in line with what the pathway that each country has established to achieve the 2°C climate objective becomes a necessity. However, to do so, finding a way of linking short-term investment decisions and long-term LCCR objectives becomes essential.

Ideally, this should be done by national governments who are best placed to implement many of the economic and regulatory changes needed to foster such a transition. A number of initiatives exist today to assist both developed and developing countries to establish a LCCR vision of economic development. These include the Low Emission Development Strategies (LEDS) process launched in the COP16 in Cancun; and the United Nations' Global Initiative called the Sustainable Development Solution Network (SDSN) pursuing the development of Deep Decarbonisation Pathways.[27] The development of these potential development pathways could be used as baselines or counterfactuals in assessing investment decisions. They could also contribute to identifying how to align individual investments and short- and medium-term objectives with long-term objectives.

6 Conclusions

DFIs have taken steps in designing, implementing and linking upstream climate criteria and objectives with downstream strategies, screening and assessment tools. This is a key part of ensuring that the actions of these institutions contribute to climate-change related objectives. Positive-list, volumetric and exposure-based tools and instruments have been integrated at both upstream and downstream stages of investment decision-making. These tools are used to screen for projects and investment opportunities coherent with climate targets and objectives, assess the impact of projects on emissions and resiliency as well as assess the exposure of projects to physical and climate policy-related risks.

One of the principal challenges today is to move from a system of tools and indicators that focus principally on climate finance tracking – important to foster trust and progress on international cooperation – to methods facilitating the alignment of activities across financial institutions and the entire economy - with the LCCR transition. This paper opens the discussion on how to effectively mainstream low-carbon, climate-resilient transition into the operations of financial institutions.

[27] For more information, see http://unsdsn.org/what-we-do/deep-decarbonization-pathways/

Increased precision in terms of the direct impacts of projects on GHG emissions and resiliency – without further information on how to contextualize this information in terms of the LCCR pathway or "baseline" of the recipient country – may lead to limited added value for decision-making.

Achieving a LCCR transition cannot be achieved by a single financial institution acting individually. Broader policy and economic regulations, incentives and policies are needed to integrate the negative externalities of a fossil-fuel based economy – particularly given the inter-generational and global nature of the challenge.

Thus, fostering the decarbonization of sectors through the deployment of new technical and financial solutions as well as deep behavioral changes must occur within a broader national and international vision for LCCR economic and social development. However, in many instances today, there is no clear vision of what a low-carbon, climate-resilient future compatible with both development needs and climate needs would look like. As such, it will become increasingly important in the coming years to find the means of evaluating the "transition potential" or "transition impact" of individual investments.

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