



USAID
FROM THE AMERICAN PEOPLE

ASIA

Low Emissions Asian Development (LEAD) Program

**FAST OUT OF THE GATE
HOW DEVELOPING ASIAN COUNTRIES
CAN PREPARE TO ACCESS INTERNATIONAL
GREEN GROWTH FINANCING**

Volume I



April 2013

This document was prepared for the United States Agency for International Development Regional Development Mission for Asia (USAID/RDMA) by Nexant, Inc. and ICF International on Contract No. AID-486-C-11-00002. The contents are not the responsibility of USAID and do not necessarily reflect the views of the United States Government.



USAID
FROM THE AMERICAN PEOPLE

ASIA

Low Emissions Asian Development (LEAD) Program

FAST OUT OF THE GATE

HOW DEVELOPING ASIAN COUNTRIES
CAN PREPARE TO ACCESS INTERNATIONAL
GREEN GROWTH FINANCING

Volume I

April 2013

This document was prepared for the United States Agency for International Development Regional Development Mission for Asia (USAID/RDMA) by Nexant, Inc. and ICF International on Contract No. AID-486-C-11-00002. The contents are not the responsibility of USAID and do not necessarily reflect the views of the United States Government.

Table of Contents

	Abbreviations and Acronyms	vi
	Executive Summary	i
1.	Introduction	1
1.1	The Climate Finance Challenge.....	1
1.2	Background on Low Emission Development.....	1
1.3	Report Objectives.....	2
1.4	Organization of the Report.....	3
2.	Emissions and Mitigation in Developing Asia: an Overview	4
2.1	Energy Access and Climate Vulnerability.....	4
2.2	GHG Emissions in the Focus Countries.....	4
2.3	GHG Abatement Opportunities.....	6
2.4	Low-Emissions Development Strategies (LEDS) as a Driver.....	6
3.	Financing Available for Low Emission Development	9
3.1	Barriers to Financing GHG Abatement.....	9
3.2	Defining Climate Finance.....	9
3.3	How Much Climate Financing is Available?.....	10
3.4	Existing Fund Inventories.....	15
3.5	Types of Financial Mechanisms.....	19
3.6	Types of Financial Intermediaries and Channels.....	20
4.	Public Sector Funds	21
4.1	International Climate Funds.....	24
4.2	Multilateral Development Finance Institutions.....	30
4.3	Bilateral Development Finance Institutions, Aid Agencies and Export Credit Agencies.....	39
5.	Private Sector Funds	53
5.1	General Overview.....	53
5.2	Nature of Private Sector Investment.....	56
5.3	Asset Management Companies.....	57
5.4	Private Equity and Venture Capital.....	59
5.5	Pension Funds, Insurance Companies, Endowments, Family Offices and Others.....	63
5.6	Commercial Banks.....	66
5.7	Public-Private Partnerships.....	69
5.8	Climate Bonds.....	70
5.9	Carbon Markets.....	72

6.	Accessing, Tracking, and Monitoring Climate Financing	75
6.1	Funding Eligibility	75
6.2	Tracking Climate Finance	75
6.3	MRV Systems for GHG Emissions	76
7.	Summary and Recommendations	81
7.1	Introduction	81
7.2	Climate Financing: How Much is Needed?	81
7.3	Summary of Findings	81
7.4	Recommendations	85
7.5	Conclusions	88
	References	90
	Annex: List of People Interviewed	93

Abbreviations and Acronyms

ADB	Asian Development Bank
ADAPT	Asia-Pacific Climate Change Adaptation Project Preparation Facility for Asia and the Pacific (USAID Program)
AFD	French Development Agency (Agence Française de Développement)
AfDB	African Development Bank
ATP	Arbejdsmarkedets Tillægspension (Danish pension fund)
AusAID	Australian Government Overseas Aid Program
BAPPENAS	National Development Planning Agency (Indonesia)
BNDES	Brazil's Banco Nacional de Desenvolvimento Econômico e Social
BRIC	Brazil, Russia, India, and China
CAIT	Climate Analysis Indicators Tool
CalPERS	California Public Employees' Retirement System
CalSTRS	California State Teachers' Retirement System
CAS	Country Assistance Strategy (World Bank)
CDM	Clean Development Mechanism
CDP	Carbon Disclosure Project
CER	certified emission reduction
CFC	chlorofluorocarbon
CIFs	Climate Investment Funds
CLEERE	Climate Change, Energy Efficiency and Renewable Energy
CO ₂	carbon dioxide
COP	Conference of the Parties
CPEIR	Climate Public Expenditure and Institutional Review
CTF	Clean Technology Fund
DECC	Department of Energy and Climate Change (UK)
Defra	Department of Environment, Food and Rural Affairs (UK)
DEG	German Investment and Development Corporation (Deutsche Investitions- und Entwicklungsgesellschaft mbH)
DFI	development finance institutions
DFID	Department for International Development (UK)
EBRD	European Bank for Reconstruction and Development
EDGAR	Emissions Database for Global Atmospheric Research
EEP Mekong	Energy and Environment Partnership with Mekong
E-FACE	Enhanced Facility for Global Cooperation in Low Carbon Infrastructure and Equity Investment

EIB	European Investment Bank
ESCO	energy service company
ESG	Environmental, Social, and Governance
ETFRN	European Tropical Forest Research Network
ETS	Emissions Trading System (EU)
EU	European Union
EUR	Euro (currency of the EU)
FAO	Food and Agriculture Organization (UN)
FFEM	French Global Environment Facility (Fonds Français pour l'Environnement Mondial)
FIP	Forest Investment Program
FY	fiscal year
GBP	British pound sterling (currency)
GCF	Green Climate Fund
GDP	gross domestic product
GEEREF	Global Energy Efficiency and Renewable Energy Fund
GEF	Global Environment Facility
GHG	greenhouse gas
GIZ	Gesellschaft für Internationale Zusammenarbeit
GPIF	Government Pension Investment Fund (Japan)
GREEN	Global action for Reconciling Economic growth and ENvironmental preservation (JBIC)
IADB	Inter-American Development Bank
IBRD	International Bank for Reconstruction and Development (World Bank)
ICCF	Interact Climate Change Facility
ICCTF	Indonesia Climate Change Trust Fund
ICSID	International Centre for Settlement of Investment Disputes
IDA	International Development Association (World Bank)
IFAD	International Fund for Agricultural Development (UN)
IFC	International Finance Corporation (World Bank)
IGCC	Investor Group on Climate Change Australia/New Zealand
IIGCC	Institutional Investors Group on Climate Change
IPCC	Intergovernmental Panel on Climate Change (of the UNFCCC)
IRR	internal rate of return
IRRCI	Investor Responsibility Research Center Institute

Abbreviations and Acronyms

ISO	International Organization for Standardization
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KfW	German Development Bank (Kreditanstalt für Wiederaufbau)
LCS-RNet	International Research Network for Low Carbon Societies
LDC	Least Developed Country
LEAD	Low Emissions Asian Development (USAID program)
LEDS	low emission development strategies
LP	limited partner
LULUCF	land use, land-use change, and forestry
MDB	multilateral development bank
MENA	Middle East and North Africa region
MIGA	Multilateral Investment Guarantee Agency (World Bank)
MOU	memorandum of understanding
MRV	measurement, reporting, and verification
MtCO ₂	million metric tons of CO ₂
MW	megawatt
NAMA	nationally appropriate mitigation action
NCF	Nordic Climate Facility
NDA	national designated authorities
NDF	Nordic Development Fund
NeCF	NEFCO Carbon Fund
NEFCO	Nordic Environment Finance Corporation
NGO	non-governmental organization
NIB	Nordic Investment Bank
NICFI	International Climate and Forest Initiative (Norway)
Nopef	Nordic Project Fund
ODA	official development assistance
ODI	Overseas Development Institute
OECD	Organization for Economic Co-operation and Development
OOF	other official flow
OPIC	Overseas Private Investment Corporation (US)
PAT	perform, achieve, and trade
PES	payment for ecosystem/environmental services

PINAI	Philippines National Infrastructure Alliance
PPCR	Pilot Program for Climate Resilience
PPP	public-private partnership
PSOD	Private Sector Operations Division (ADB)
REDD	Reducing Emissions from Deforestation and Degradation in Developing Countries
SACEF	South Asia Clean Energy Fund
SCF	Strategic Climate Fund
SGP	Small Grants Programme
SIDA	Swedish International Development Cooperation Agency
SME	small and medium-sized enterprise
SPA	Strategic Priority for Adaptation
SREP	Scaling-Up Renewable Energy in Low Income Countries
tCO ₂ e	tons of carbon dioxide equivalent
THB	Thai baht (currency)
UK	United Kingdom
UN	United Nations
UNCSD	United Nations Conference on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nation Industrial Development Organization
US	United States
USAID	United States Agency for International Development
USAID/RDMA	USAID Regional Development Mission for Asia
USD	United States dollar
USEPA	United States Environmental Protection Agency
VER	voluntary emission reduction
WBG	World Bank Group
WRI	World Resources Institute

Executive Summary

This report reviews the main public and private sector funds and mechanisms for financing low emission projects, businesses, and infrastructure in the Asia region that mitigate emissions of greenhouse gases (GHGs) and thereby address climate change.

In describing how public sector funds can be accessed and effectively allocated, the report highlights the critical role of strong frameworks for measurement, reporting, and verification (MRV) of GHG emissions. The report also summarizes available private sector funds, while providing a historical account of the importance of the private sector as the dominant source of climate finance and projecting its continuing importance over the next several decades. Countries that are first to develop MRV systems required by public and private sector funds will be “fast out of the gate” and well on the path to effectively accessing climate finance.

The public and private sectors embrace different and sometimes opposing objectives with respect to climate finance. The public sector is primarily driven by

development goals and the public good, whereas the private sector is primarily driven by profit maximization. Bridging the gap between these objectives to leverage financing will remain the greatest challenge in scaling up climate finance to the required volumes. To this end, the public sector must play an essential role over the coming decades in seeking innovative ways of mobilizing private sector climate finance.

The public sector must play an essential role over the coming decades in seeking innovative ways of mobilizing private sector climate finance.

Based on an extensive review of climate funds as well as interviews with public and private fund managers across the Asian region,¹ this report characterizes public and private sector financing mechanisms available in developing Asia. This report focuses on the developing Asian countries that are included in the Low Emissions Asian Development (LEAD) program: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Papua New Guinea, the Philippines, Thailand, and Vietnam (see map).



¹ The report is based on a review of more than 200 climate-related funds and financing mechanisms in the Asian region, along with interviews with 24 development financing institutions, banks, and private sector fund managers across seven countries. The research was conducted from July through December 2012. The report is available online at: <http://lowemissionsasia.org/resources/fast-out-gate-vol-1.pdf>.



LEAD Program Focus Countries

LEAD is a regional program funded by the United States Agency for International Development Regional Development Mission for Asia (USAID/RDMA).²

This report reviews financing mechanisms for GHG mitigation measures in the energy and forestry sectors,³ aiming to (a) help prepare developing Asian countries to access available financing, and (b) identify necessary elements of such preparations, among them improved GHG inventory systems and accounting, participation in carbon markets, and MRV of emissions reductions. The report aims to help a wide range of stakeholders acquire and manage finance in their quest for low-emissions development. These stakeholders include, but are not limited to, Asian governments and policymakers, public and private fund managers, project developers and proponents, and local communities.

This report supports the work of the Asia Low Emission Development Strategies (LEDS) Partnership and is intended as input to inform its regional activities. The Partnership brings together governments,

donors, technical experts, and financiers in a network for sharing experience, knowledge, and best practices in LEDS planning and implementation.⁴ Participants at the first Asia LEDS Partnership event, the Asia LEDS Forum (September 2012), called for greater coordination and dialogue among governments, development finance institutions, and the private sector on ways to finance LEDS and green growth across multiple economic sectors, including energy, agriculture, forestry, and industry.⁵ As a result, the Partnership has prioritized financing for LEDS and green growth.

The information on available climate financing mechanisms presented in this report will be converted into an on-line database that can benefit LEAD focus countries. The experience and findings from this research will be used as the basis for designing capacity building activities on climate finance for donors, recipients, and the private sector. These activities will be conducted under the framework of the LEAD program and the Asia LEDS Partnership.

² Further details regarding the LEAD program are available at <http://lowemissionsasia.org>.

³ Mechanisms for financing mitigation in the forestry sector are covered under the framework of Reducing Emissions from Deforestation and Degradation in Developing Countries (REDD). USAID's Climate Change Adaptation Project Preparation Facility for Asia and the Pacific (ADAPT Asia-Pacific) addresses financing for adaptation. This report does not explicitly address financing for climate change adaptation.

⁴ The Asia LEDS Partnership is a regional initiative/network under the LEDS Global Partnership. It provides a platform for regional exchange and collaboration to advance low-emission development in Asia. Partners include both developed and developing Asian countries as well as international partners (e.g., the Asian Development Bank (ADB), the World Bank, the Low Carbon Asia Research Network (LoCARNet), United Nations (UN) agencies, and USAID). For more information, see: http://ledsgp.org/about/Asia_LEDS_Partnership.

⁵ USAID LEAD Program, Meeting Report: Asia LEDS Forum 2012: Catalyzing an Era of Green Growth (Bangkok, Thailand, September 18-21, 2012).

WHAT IS IT, HOW MUCH IS NEEDED, AND HOW MUCH IS AVAILABLE?

HSBC, the British multinational banking and financial services company, estimates that during the decade 2010–2020, USD 10 trillion in cumulative capital investments into clean energy, or about USD 1 trillion per year, will be required globally.

WHAT IS CLIMATE FINANCE?

No universally accepted definition of climate change finance, or climate finance, is currently available. However, the term generally is understood to include financial resources directed toward two general activities: climate change adaptation and greenhouse gas mitigation. Adaptation covers ways of adjusting to the consequences of climate change, while mitigation involves reducing sources of GHG emissions or enhancing carbon sinks (UNDP, 2011). The focus of this report as well as the predominance of climate finance historically has been on mitigation, mostly in the energy, agriculture, and transportation sectors.

Climate finance includes public and private sources from both developed and developing countries, while recipients include both developed and developing countries. There may or may not be an intermediary actor, such as a development finance institution, collecting and disbursing funds made available through a wide range of financial sources and mechanisms.

HOW MUCH IS NEEDED?

The flow of investment required for the transition to a low-carbon economy globally is several orders of magnitude greater than those volumes currently deployed. HSBC, the British multinational banking and financial services company, estimates that, during the decade 2010–2020 a total of USD 10 trillion in cumulative capital investments into clean energy, or about USD 1 trillion per year, will be required globally⁶

(HSBC, 2010). Given a typical debt-equity ratio of 60:40 for capital investment, this amounts to an annual need for approximately USD 600 billion in bank loans or bonds and USD 400 billion in equity. Bloomberg New Energy Finance estimates that India and Southeast Asia alone will require USD 144 billion per year of climate investment, or 14.4 percent of the global requirement (Frankfurt School et al., 2012).

International donors and governments are establishing a Green Climate Fund, aiming for USD 100 billion per year in climate finance by 2020.⁷ Gaining actual allocations for this amount of public financing is a challenging goal, given the current geopolitical environment. Even with such a large public sector commitment from donors, in order to fill the gap in climate finance, private sector financing will need to increase from its current global volume of USD 200-300 billion to USD 900 billion annually. This is consistent with the United Nations Framework Convention on Climate Change (UNFCCC) estimate that more than 85 percent of all finance to address climate change will need to come from the private sector (UNEP, 2012).

HOW MUCH IS AVAILABLE?

Total current climate investment amounts to 20-30 percent of what is needed. Globally, estimates of existing public and private funds allocated for climate finance range from just over USD 200 billion to USD 364 billion annually (Frankfurt School et al., 2012, and Climate Policy Initiative, 2011). Yet this amounts to only between 20-30 percent of the approximately USD 1 trillion required annually over the next decade to finance the transition to a low-carbon economy (Robins, 2010). Even if the Green Climate Fund is successfully implemented, this would still leave a large gap requiring private sector participation. One of the key challenges over the next decade will be mobilizing private sector climate investments, using public sector funds to catalyze the private sector.

⁶ Estimated amount required to limit atmospheric CO₂ concentrations to below the critical threshold of 450 ppm, which is said to be required to keep average global increases in temperatures within 2°C.

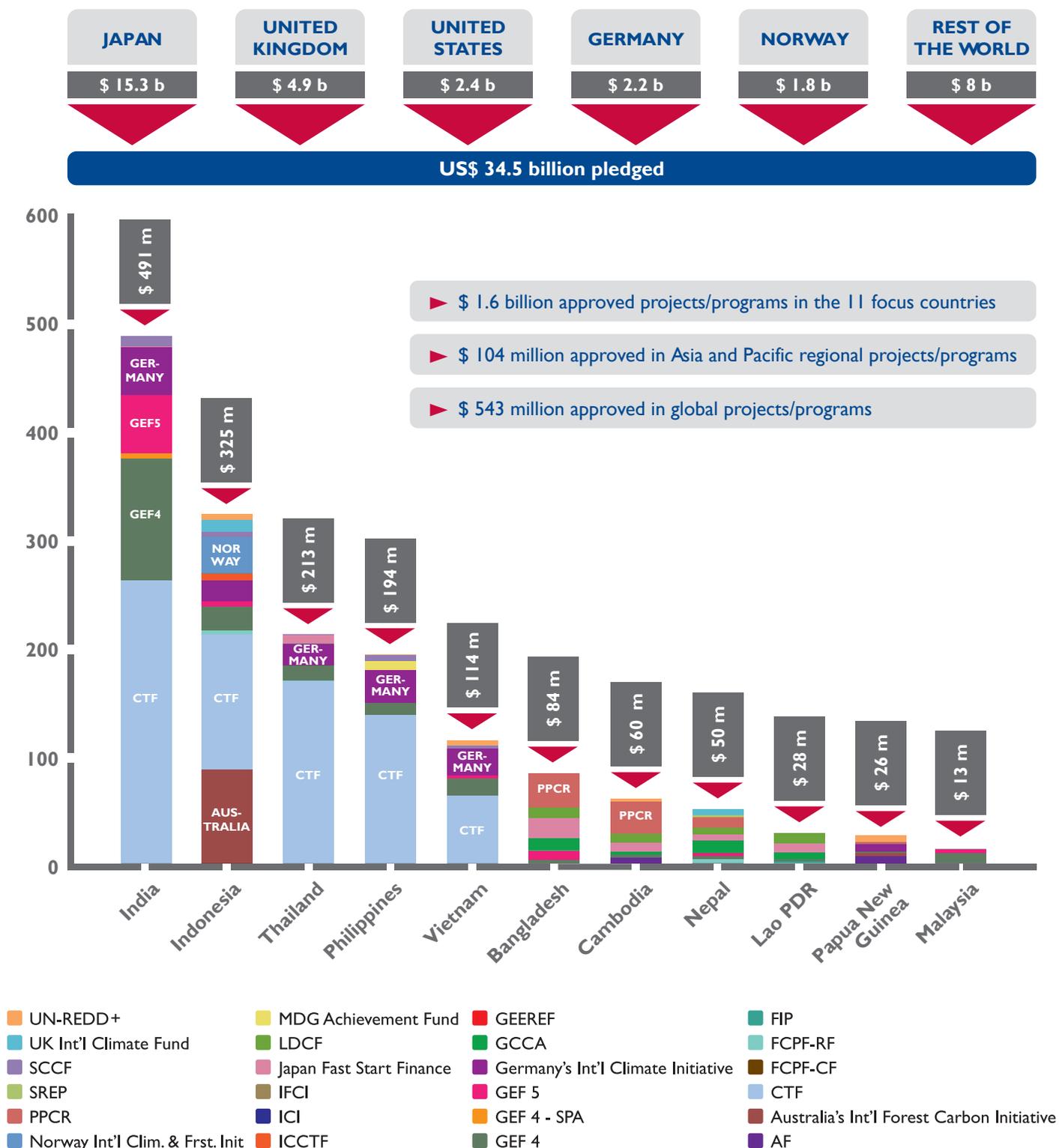
⁷ The Independent Secretariat of the Green Climate Fund will be established in Songdo, South Korea, before the end of 2013 (www.gcfund.net).

HOW DEVELOPING ASIAN COUNTRIES CAN PREPARE TO ACCESS INTERNATIONAL GREEN GROWTH FINANCING

Private sector investment dominates current climate investment. The private sector already plays a larger role compared to the public sector in climate finance, having accounted for up to about three-quarters of total public and private sector climate finance globally in 2011 and 2012

(Climate Policy Initiative, 2012). Nevertheless, private sector investment clearly needs to increase dramatically, and this can only be achieved by an innovative and successful partnership between the public and private spheres.

International Climate Fund Flows



Source: Climate Funds Update, and Nexant research. Numbers are through December 2012, and include 25 international climate funds.



Globally, investments in renewable energy assets (which represent the majority of climate investments) totaled USD 148.6 billion in 2012.⁸ Of this amount USD 8.2 billion, or 5.5 percent of the global total, was invested in the 11 countries in developing Asia, the vast majority of this from private sector sources.⁹ Between 2009 and 2012, the focus countries received an average of 6.7 percent of total global private sector allocation in renewable energy. This allocation of private sector resources is highly disproportionate on both a per capita and a GHG emissions basis,¹⁰ suggesting some asymmetry in the market and a market failure that public sector participants may be well placed to address.

To date, 25 international public climate funds have approved USD 1.6 billion of projects and programs for the 11 focus countries. In the 11 countries, USD 8.2 billion was invested in renewable energy in 2012 alone, with most of this from private sector sources.

India and Thailand have consistently been the largest recipients of private sector financing, consistently representing between 80-90 percent of total renewable energy investments in the 11 countries between 2009 and 2012. This has been driven largely by the favorable regulatory environment and investment climate (mostly for support of wind energy in India and solar energy in Thailand). The dramatic increase in private sector clean energy investment in India and Thailand can provide a positive example for other countries in developing Asia, specifically with respect to regulatory intervention, investment climate, and market readiness.

In contrast, with the exception of Bangladesh in 2011, Bangladesh, Cambodia, Nepal, and Papua New Guinea received insignificant amounts of private sector clean energy financing during the 2009–2012 period (Bloomberg New Energy Finance, 2013). This clearly points to an opportunity for the public sector to engage in capacity building with both governments and financial institutions to create a more conducive regulatory environment and investment climate for the private sector.

⁸ The data for private sector investment in this report was provided by Bloomberg New Energy Finance and only includes renewable energy investments and does not include energy efficiency, smart grid, non-renewable energy carbon reduction projects. The data also only includes investments in clean energy over 1 MW in capacity.

⁹ Between 2004-2012 Bloomberg estimates that the vast share of renewable energy financing in the 11 focus countries was provided by the private sector – e.g., 83 percent for Southeast Asia, 96 percent for India, and 73 percent for Nepal.

¹⁰ GHG emissions from the 11 focus countries comprise nine percent of the global total (WRI, CAIT, 2012), and 28 percent of the global population lives in these countries (CIA World Factbook 2010–2011).

USD 35 billion of donor contributions approved globally through 25 funds. Donor countries have so far pledged USD 35 billion for climate-related activities globally, and a total of USD 26 billion has been deposited into 25 public sector climate funds (Climate Funds Update and Nexant research). A total of USD 9 billion worth of projects and programs has been approved already, and annual approval amounts during the fast-start¹¹ finance period (2010–2012) were estimated at more than six times 2008–2009 levels. These figures apply only to public sector funds identified to date, and they do not include leveraging of funds through public or private institutions, which can be many times greater.

USD 1.6 billion donor funding approved for the 11 focus countries. To date, 25 international public climate funds have approved USD 1.6 billion of projects and programs for the 11 focus countries. This suggests that there is a significant shortfall in financing available for LEDS and green growth, relative to the USD 90 billion required per year in the 11 focus countries. Approximately one-third, or USD 491 million, of these approvals has been allocated to India, including USD 263 million approved in 2012 from the Clean Technology

Fund (CTF).¹² Indonesia, with USD 325 million of approvals, also receives most of its funding (USD 125 million) from the CTF, with another USD 87 million coming from Australia's International Forest Carbon Initiative, and USD 20 million from Norway's International Climate and Forest Initiative.¹³ Thailand and the Philippines are also experiencing some success in gaining access to these funds.

Aside from the public climate funds approved for projects and programs specific to the 11 focus countries, USD 104 million in funding has been approved for regional projects and programs, and a further USD 543 million approved for global projects and programs that benefit these countries only in part.

The CTF has contributed almost half of the total financing from the 25 funds to the 11 focus countries. Funds from the Global Environment Facility (GEF) contribute the next largest amount, making up another 18 percent of the approved sum. Other major contributions in the region come from Germany's International Climate Initiative (nine percent), Australia's International Forest Carbon Initiative (six percent), and the Pilot Program for Climate Resilience, or PPCR (five percent).



¹¹ 'Fast-start finance' refers to funds that result from a commitment made by developed countries during the United Nations Framework Convention on Climate Change (UNFCCC) 15th Conference of the Parties (Copenhagen, December 2009) to provide USD 30 billion of new and additional finance during 2010–2012 for mitigation and adaptation activities in developing countries.

¹² Three-quarters of private sector allocation in 2012, meanwhile, has gone to India.

¹³ Norway has signed a Letter of Intent with Indonesia to form the Norway-Indonesia REDD+ Partnership, through which Norway would provide up to USD 1 billion of funding to reduce GHG emissions from deforestation and degradation of forests and peat lands (http://unfccc.int/files/adaptation/application/pdf/norwegian_fast_start_finance_report_2012.pdf).

SUMMARY OF FINDINGS

This report draws on a review of climate-related funds and financing mechanisms in the Asia region, along with interviews with development finance institutions, banks, and private sector fund managers. Based on this research, the report identifies a number of key issues and opportunities.

Globally, estimates of existing public and private funds allocated for climate finance range from just over USD 200 billion to USD 364 billion annually. The private sector accounts for about three-quarters of the overall total and the share is expected to reach 90 percent over the next decade.

Private sector flows dominate climate finance.

The private sector has accounted for approximately three quarters of climate finance globally. Most of the currently available climate finance is allocated toward projects that mitigate climate change, as

opposed to financing adaptation measures. Most private sector climate change finance has been allocated toward mitigation, predominantly renewable energy, while funding for adaptation at present comes almost entirely from public sector sources. In order to meet the GHG emissions targets in the IEA 450 ppm scenario,¹⁴ private sector climate financing will need to increase to USD 900 billion annually over the next decade, or by a factor of three times. More specifically, private sector clean energy finance for the 11 focus countries needs to increase from about USD 10 billion annually¹⁵ to approximately USD 90 billion annually, or by a factor of nearly 10 times. In addition, the allocation of private sector renewable energy finance in the 11 countries has been concentrated in India (75 percent) and Thailand (15 percent), which collectively represented between 80–90 percent of the total during the period 2009–2012.¹⁶ This uneven allocation of investment across the region also needs to be addressed.



¹⁴ This is the scenario in the International Energy Agency's World Energy Outlook, in which global average temperature increases would be limited to 2°C.

¹⁵ According to Bloomberg New Energy Finance, investment in renewable energy in India and Southeast Asia peaked at USD 15 billion in 2011 and was USD 8.2 billion in 2012, most of this from private sector sources. Renewable energy is used as a rough proxy for climate investments in India and Southeast Asia, as accurate figures for total climate finance are not available. Renewable energy investment accounts for by far the largest share of investment in climate finance.

¹⁶ There is no reliable data on the amount of energy efficiency financing either globally or across the 11 focus countries.



Engagement needed with private sector investors. Given the fact that three-quarters of climate investments are currently from the private sector, that this amount is projected to increase to 90 percent, and that the public sector has only limited awareness of private sector investors, one priority should be to develop strategies for increasing access to finance using concessional financing and other public financing mechanisms to leverage the ‘viability gap’ and mitigate risk for marginal private sector climate investments.

Decreasing role of carbon markets in leveraging investment. During 2004–2012, a total of USD 229 billion in investments was allocated in the 11 focus countries to low-carbon

technologies (i.e., projects where Clean Development Mechanism (CDM) credits played a role). The amount of ‘carbon finance’ (i.e., certified emissions reductions, or CERs) involved in these projects was just USD 3.5 billion.¹⁷ This demonstrates that carbon markets have served as an effective instrument to leverage private sector investment, but are woefully inadequate in the greater scheme of climate finance required. However, given the current status of the carbon markets and the long-term outlook for supply and demand of carbon credits, it is not anticipated that the carbon markets will make a significant contribution to the overall requirement for climate finance, and that both the public and private sectors will need to develop other innovative, market-driven financing mechanisms.¹⁸

¹⁷ The estimated value of the CERs was based on an historic average price of USD 8 per ton for this portfolio, and for credits delivered up until the end of 2012. The USD 229 billion represents the total value of investment in these CDM projects.

¹⁸ For example, India has developed the Perform, Achieve, and Trade (PAT) scheme for industrial facilities and a Renewable Energy Certificate (REC) system. Other countries in developing Asia are studying and considering adoption of such alternative market mechanisms.



MRV frameworks and capacity are critical to access public finance. Interviews by the research team with public sector fund managers across the region make it clear that, as efforts to address climate change increase, the ability to measure and manage GHG emissions will become a critical precondition for the allocation of public financing. As investments into climate-related projects and businesses increase, it is likely that new elements of competition will arise for climate funds disbursed by international financial institutions. On the other hand, MRV was not highlighted as a requirement for access to private sector funds.

To achieve the incremental USD 600-700 billion of climate finance per year required globally to mitigate GHG emissions, the public sector will need to leverage its resources to mobilize capital flows through the private sector.

Donor financing of climate initiatives lacks a common MRV system. For public sector climate-related funds and mechanisms supported by development finance, a range of MRV requirements are in place. For funds where carbon is not specifically

monetized, no single international standard or protocol serves for MRV. The methodology, and level of rigor, vary by funder, and reflect specific fund objectives and rationales for reporting GHG emission reductions.

Multilateral development banks (MDBs) are developing an initiative to track GHG emissions and climate finance flows. A group of MDBs have announced a harmonized approach to measuring and tracking their project-level GHG emissions, while also harmonizing the tracking of their climate financing commitments.¹⁹ The ultimate objective of this initiative is to harmonize metrics for measuring and tracking climate-related finance activities across MDBs, aiming to improve monitoring of climate finance flows and their effectiveness.

Alternative asset investments present a new opportunity. Based on a review by Nexant, an estimated one percent or less of the alternative asset class globally is allocated to climate-related investments.²⁰ In Asia, about USD 31 billion of climate-related assets currently fall within the alternative asset class, including private equity. An increasingly greater allocation to this asset class creates a unique opportunity for the public sector to catalyze capital

¹⁹ International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting, issued at the Doha Climate Change Conference by the ADB, African Development Bank, Agence Française de Développement, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Finance Corporation, Nordic Environment Finance Corporation, and the World Bank (Doha, November 2012).

²⁰ An alternative asset is any non-traditional asset with potential economic value that would not be found in a standard investment portfolio. Examples include hedge funds, venture capital related projects, infrastructure, and private equity.

flows for investments related to climate finance. The private equity and venture capital asset class is expected to serve as one of the main channels of increased climate finance to the II countries.

Climate bonds are expected to make an increasing contribution. In addition to private equity and venture capital, climate bonds²¹ could serve as another mechanism to fund the gap outlined above for the private sector. The cumulative total of all climate-related bonds issued over the last decade is USD 751 billion, or an average of USD 75 billion per year (Climate Bond Initiative and HSBC, 2012). The issuance of climate bonds for the II focus countries to date has been limited, but this is expected to increase substantially, thereby helping commercial banks in providing the approximately USD 600 billion of debt-related climate finance required globally per year (and the USD 90 billion

required per year in the II focus countries) to address climate change.

Commercial banks are establishing specialized climate finance facilities. Most commercial banks lack designated business units or facilities for climate finance. Nevertheless, a number of banks have recently established such facilities with some success. These facilities typically use some form of partial risk guarantee, partial credit guarantee, interest rate subsidies, or term extension to motivate commercial banks to offer a specific climate finance product to their customers. The public sector might well underwrite these mechanisms to catalyze climate finance in the commercial banking sector. In addition to climate bonds, commercial banks will be the other major source of the USD 90 billion of debt required annually by the II focus countries to address climate change.

RECOMMENDATIONS

The regional interviews carried out by the research team elicited numerous recommendations, both general and specific, for training and capacity building activities that could help address some of the barriers to climate finance. This input will serve as the basis for designing capacity building activities for both donors and recipients conducted under the framework of the LEAD program and the Asia LEDS Partnership. Key recommendations are presented below, and a more extensive list is included in the main report.

Establish regulatory frameworks and MRV systems that support climate financing. Governments need to establish strong MRV systems that allow tracking and monitoring of GHG emissions reductions. Governments can also take a number of other important actions in order to

enhance their ability to attract climate financing. These include establishing strong and stable policy and regulatory frameworks for clean energy and other climate related investments, and enhancing in-country business capacity through market development and technology transfer activities, including entrepreneur incubators, investment promotion, and training.

Build the capacity to bridge the gap between project proposals and available financing. There appears to be a disconnect between government officials, development professionals, and entrepreneurs who identify projects, and those who provide resources such as financing and technical assistance. Capacity building is needed for project proponents to help them develop successful proposals to multi-lateral bilateral financing institutions for financing mitigation programs or projects.

²¹ Climate bonds are long-term debt securities issued to raise finance for climate change mitigation- or adaptation-related initiatives that are typically asset-backed or ring-fenced. They are issued by governments, MDBs, or corporations that guarantee repayment plus a fixed or variable rate of return over a defined period.



Significant amounts of capacity building and technical assistance will be needed in order for project proponents to develop successful proposals to multilateral and bilateral financing institutions for financing mitigation programs or projects.

Develop processes to understanding linkages between public budgets and climate finance.

Because climate financing is distributed across many government ministries and agencies, it is difficult to track and monitor at a national level. Climate public expenditure and institutional reviews (CPEIRs) can be conducted by cross-government steering groups led by finance and planning ministries, with technical input from environment ministries. CPEIRs provide analytical support, informing government decision-making and supporting the development of climate change strategy.

Focus on national and sub-national coordination on finance.

In developing Asia, national governments too commonly enter into international climate finance agreements for projects without first consulting extensively with local governments. Capacity building on preparing financing proposals, as proposed above, could be delivered in a manner that ensures the appropriate state and local agencies are included early in the proposal stage.

Build awareness of, and capacity for, climate financing among private sector banks and investors.

There is a need to make banks, fund managers, and investors aware of the opportunities for accessing grants, funds, loans, and guarantee mechanisms designed to support climate-friendly projects. Some of the remedial measures could include regulations to support energy efficiency and renewable energy finance; pricing analysis, such as to support tariff mechanisms; capacity building for vendors and project implementers to design and successfully implement projects; training energy auditors

in communicating with banks; organizing forums with energy efficiency companies to build finance literacy; and, more generally, building capacity within banks to understand energy efficiency and renewable energy businesses, and projects. This sort of capacity building is a necessary first step that should precede working specifically on the development of blended financial instruments.

Blend concessional financing with private sector financing.

A number of development financing institutions are developing targeted strategies to ‘blend’ donor funds with private finance, aiming to increase the amount of private sector investment. This can be done by raising awareness among private sector financiers, and in some cases through the formation of public-private partnerships (PPPs). Once private sector financial institutions are aware of the sources and criteria for key concessional funds, they can then steer developers toward the multilateral and bilateral agencies that operate these concessional funds.

Develop a learning network for effective policy, regulatory, and market mechanisms.

Capacity building for government officials is desperately needed in a number of areas, including policy frameworks, regulatory development and implementation, and removal of barriers to investment such as regulations that impede business licenses. Effective policy and regulatory mechanisms provide a market signal to private financiers that political, legal, and monetary risks are low, or at least manageable, thus reducing a barrier to private sector investment. There is also a need to build capacity among governments in the area of financial incentive mechanisms for climate finance. Such measures could include incentives for energy efficiency (e.g., demand-side management, rebate programs, tax incentives); renewable energy (e.g., renewable portfolio standards, feed-in tariffs); and forestry (e.g., payment for ecosystem services).

Establish financing mechanisms for smaller-scale infrastructure. A recurring theme in our regional interviews was the initial barriers faced by smaller-scale infrastructure investments that produce climate benefits. One recommendation was that a fund be established to provide seed

capital for small-scale infrastructure, one that would also provide technical assistance. Access to finance is probably the single greatest issue faced by recipients, whether public or private. Intervention in the form of capacity building among private financial institutions would address this barrier.

CONCLUSIONS

The private sector, which accounts for about three-quarters of available climate finance funding, already plays a major role in climate financing. To meet the needs of transitioning to a low-carbon economy, however, private sector investment must increase dramatically. Only an innovative and successful partnership between the public and private spheres can achieve this outcome.

Between 2009 and 2012, private sector climate finance investments have grown at an average of 26 percent. But bridging the climate finance funding gap outlined above will require a major increase in private sector climate finance. Based on current trends, available investments will fail to meet this need. In fact, a quantum shift in climate finance is needed in both the public and private sectors. This climate finance gap will remain the single greatest issue over the next decade, and will require the public sector at the national, regional, and global levels to develop innovative ways of leveraging public sector funds to mobilize private sector capital. The role of the private sector, meanwhile, should be to allocate capital and scarce resources efficiently in the climate finance sector.

To date, 25 international public climate funds have approved USD 1.6 billion of projects and programs for the 11 focus countries. In these 11 countries, USD 8.2 billion was invested in renewable energy in 2012 alone (the largest area of climate finance), with most of this from private-sector sources.

The amount of climate finance required for India and Southeast Asia²² is approximately USD 150 billion annually. This would suggest that the current amount of financing available for LEDS and green growth efforts in the focus countries is woefully low at present, and that this amount must increase by an order of magnitude in this region over the next decade (relative to a 3-times increase needed globally). In addition, the distribution of climate finance in the 11 focus countries has been extremely uneven, with India and Thailand receiving 80-90 percent of renewable energy investments.²³ Thus, in addition to the need for a dramatic increase in climate finance, a more even distribution of climate finance is required across the 11 focus countries, with a particular emphasis on Bangladesh, Cambodia, Nepal, and Papua New Guinea. To date, these countries have received only minimal amounts of climate financing.

To access climate funding and allocate investments effectively, the public and private sectors in these countries need to take systematic actions. Such action could include improved public awareness of the issues, training in tools such as GHG inventories and accounting, and development of strong MRV frameworks for both climate financing and the resulting GHG emission reductions.

Countries that prepare the fastest will be “first through the gate” to access current and upcoming climate financing, thereby positioning themselves for rapid economic and technological development at the same time as they limit their carbon emissions.

²² This refers to the amount of investment needed to mitigate enough GHG emissions to meet the IEA’s 450 ppm scenario that would limit global average temperature rises to 2°C.

²³ Renewable energy is used as a rough proxy for climate investments in India and Southeast Asia, as accurate figures for total climate finance are not available. Renewable energy investment accounts for by far the largest share of investment in climate finance.

I. Introduction

I.1 The Climate Finance Challenge

Globally, public and private financing for climate-friendly technologies, projects, and businesses (hereafter referred to as 'climate financing') ranges from an estimated USD 200 billion to USD 364 billion annually. Yet this amounts to only between one-fifth and one-third of the approximately USD 1 trillion needed every year over the next decade to finance the transition to a low-carbon economy (Robins, 2010).

The private sector currently accounts for about three-quarters of the overall total, so it already plays a major role in financing climate-friendly activities. Nevertheless, as climate financing is scaled up, there will need to be a dramatic increase in private sector investment, and this can only be achieved by an innovative and successful partnership between the public and private spheres.

I.2 Background on Low Emission Development

I.2.1 LEDS and the LEDS Global Partnership

In December 2009, more than 100 countries participating in the United Nations (UN) climate change negotiations agreed, as part of the Copenhagen Accord, that a 'low emission development strategy is indispensable for sustainable development.' An increasing number of developing countries, including many in Asia, are now preparing and implementing low emission development strategies (LEDS)

as the foundation for climate-smart transformative development. LEDS support the strategic planning, analytical, and policy processes to achieve low-carbon, climate-resilient development, and are thus a critical element of sustainable development and the broader 'green growth' agenda.

LEDS are country-led and country-specific national strategic analyses and planning processes covering all economic sectors for promoting economic growth while reducing long-term greenhouse gas (GHG) emission trajectories. Voluntary and non-binding, LEDS are centered within a national sustainable development context. Because each country presents unique national circumstances and priorities, each develops and drives its own low emission development strategy.

The LEDS Global Partnership¹ was founded in early 2011 to advance low-emission development through coordination, information exchange, and cooperation among programs and countries working to advance low-emission growth. The partnership currently brings together more than 100 governmental and international institutions, and is open to any interested party that undertakes relevant work. Under the LEDS Global Partnership there are three regional platforms, including the Asia LEDS Partnership. Operating in coordination with the broader LEDS Global Partnership, the Asia LEDS Partnership is a regional initiative and network that provides a venue for regional exchange and collaboration to advance low-emission development in Asia. Partners include both developed and developing Asian countries and a number of international partners including the Asian Development Bank (ADB), the World Bank, UN agencies, and several bilateral donors and non-governmental organizations working in Asia.

¹ More information on the LEDS Global Partnership is available at <http://ledsgp.org>.



1.2.2 The LEAD Program in Asia

The Low Emissions Asian Development (LEAD) program² is a regional program funded by the US Agency for International Development Regional Development Mission for Asia (USAID/RDMA). LEAD is a five-year program designed to help Asian governments, businesses, and other institutions develop and implement frameworks for sustained low-emission development. The program supports regional platforms that build capacity for planning and implementing LEDS, with particular emphasis on analysis and modeling of economic development pathways, emissions trajectories, and technology options; GHG inventories and accounting; carbon market development; and regional cooperation. The program engages up to 11 countries, including Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, the Philippines, Papua New Guinea, Thailand, and Vietnam.

1.3 Report Objectives

This report serves as the initial step in a multi-year strategy to enhance the capacity of developing Asian countries to access climate financing. It

characterizes the size and mechanisms of existing and anticipated climate financing, from public and private sources, available to the 11 developing Asian countries covered by the LEAD program. In focusing primarily on financing mechanisms for GHG mitigation measures in the energy, forestry, and agriculture sectors,³ the report aims to help prepare the countries covered by the LEAD program to access available financing and to identify prerequisites such as improved systems of GHG inventories and accounting, frameworks for measurement, reporting, and verification (MRV) of GHG reductions, and carbon markets. Such systems and tools establish candidate eligibility and selection criteria for much of the currently available green financing as well as for what promises to be greater amounts of funding that will be more broadly available in the future.

The report supports the work of the Asia LEDS Partnership, which has brought together governments, donors, technical experts, and financiers to establish a network for sharing experience and knowledge, including best practices in low emission development. The Partnership has adopted the topic of financing for LEDS and green growth as a top-priority area. Participants at the Asia LEDS Forum,

²The LEAD program is described at <http://lowemissionsasia.org>.

³Mechanisms for financing mitigation in the forestry sector are covered under the framework of Reducing Emissions from Deforestation and Degradation in Developing Countries (REDD). USAID has a sister program to LEAD, the Climate Change Adaptation Project Preparation Facility for Asia and the Pacific (ADAPT Asia-Pacific), which addresses financing for adaptation. This report does not explicitly include financing for climate change adaptation.

held in September 2012 in Bangkok, Thailand as the first event of the Asia LEADS Partnership, called for greater coordination and dialogue among governments, development finance institutions, and the private sector on ways to finance LEADS and green growth across multiple economic sectors including, among others, energy, agriculture, forestry, and industry.⁴ The data in the report will be converted into an on-line database of LEADS financing mechanisms which aims to coordinate and possibly merge with other online database and tracking efforts. It will also be used as the basis for designing capacity building activities on climate finance for both donors and recipients. These activities will be conducted under the framework of the LEAD program and the Asia LEADS Partnership.

I.4 Organization of the Report

The report is based on a review of more than 200 climate-related funds and financing mechanisms in the Asia region, as well as interviews with 27 developing financing institutions, banks, and private sector fund managers across seven countries.⁵ The research was conducted from July through December 2012.

The report is organized as follows:

Section 2 provides an overview of GHG emissions and mitigation in developing Asia.

Section 3 provides an overview of available climate financing globally and in Asia.

Section 4 describes public sector mechanisms globally, with an emphasis on programs and initiatives in developing Asia.

Section 5 describes the range of private sector financing mechanisms for climate finance, covering a range of investment types, including asset manage-

ment, private equity, pension and insurance funds, commercial banks, public-private partnerships, climate bonds, and carbon markets.

Section 6 looks at access, tracking, and monitoring of climate financing, including systems for tracking investment and reviewing public budgets. It also discusses the need for universally accepted protocols for MRV systems.

Section 7 provides a summary of the main report findings, as well as recommendations for capacity building in climate finance.

⁴ Meeting Report: Asia LEADS Forum 2012: Catalyzing an Era of Green Growth. USAID Low Emissions Asian Development (LEAD) Program (Bangkok, Thailand, September 18-21, 2012).

⁵ These interviews were conducted in November and December 2012 as part of the research for this report, and covered India, Malaysia, the Philippines, Singapore, Thailand, and the United States.



2. Emissions and Mitigation in Developing Asia: an Overview

2.1 Energy Access and Climate Vulnerability

Nearly 1.4 billion people worldwide, almost a quarter of the global population, live without access to electricity. More than half of them reside in Asia, where they face severe challenges. Sixty-five percent of Asians not connected to the electricity grid live in South Asia. Electrification rates in some Asian countries—e.g., Cambodia (24 percent), Laos (55 percent), and Indonesia (64 percent)—are among the lowest in the world. Together, South Asia and Southeast Asia include over 80 percent of the world's population without access to grid-connected energy (IFC, 2012A).

Given their long coastlines, high concentrations of population and economic activity in coastal areas, and heavy reliance on agriculture and natural resources, including forestry, South and Southeast Asia are those regions most vulnerable to climate change. Modeling by the ADB forecasts that, by the year 2100, the annual mean temperature in

Indonesia, the Philippines, Thailand, and Vietnam will rise by an average of 4.8°C from 1990 levels, assuming a high emissions scenario. The global mean sea level is projected to rise by 70 cm during the same period. By 2100, the mean cost of climate change for these four countries could be equivalent to losing 6.7 percent of their combined gross domestic product (GDP) each year, more than twice the global average loss.

2.2 GHG Emissions in the Focus Countries

Total GHG emissions have been increasing globally, not least in developing Asia, whose share of energy-related carbon dioxide (CO₂) emissions have increased from 17 percent in 1990 to 35 percent today.⁶ Additionally, the average annual growth rate of emissions in the II focus countries during the period 1990–2005 was higher than the global value of 1.8 percent⁷ in all but one country, and was even double or triple the global average in some countries (see Table 1).

⁶The Emissions Database for Global Atmospheric Research (EDGAR).

⁷Source: <http://www.unescap.org/tid/publication/tipub2614-chap2.pdf>.

Table I: Country Characteristics

Country	2005 GHG Emissions (excluding LULUCF)** (million tCO ₂ e)***	Emissions Growth Rate 1990–2005 (excluding LULUCF) (average annual percent)	2010 Population (millions)	2011 Nominal GDP (USD billions)
India	1,865.0	3.5%	1,210	1,843
Indonesia	576.5	3.7%	237	834
Thailand	351.1	4.3%	66	339
Malaysia	229.3	5.7%	28	247
Vietnam	179.0	5.6%	88	121
Bangladesh*	142.4	3.1%	142	115
Philippines	138.6	2.8%	94	216
Nepal*	40.4	1.9%	26	18
Cambodia*	22.8	3.3%	13	13
Laos*	17.4	3.4%	7	8
Papua New Guinea	8.6	1.4%	7	11

Emissions and emission growth source: WRI, 2012A (for 2005 values); six GHGs; excludes LULUCF. Population sources: Official country census for Bangladesh, Cambodia, India, Indonesia, Malaysia, and Nepal. National statistics office estimates for Laos, the Philippines, Thailand, and Vietnam. UN estimate for Papua New Guinea. GDP source: CIA World Factbook 2010–2011.

* Classified as an LDC (as defined by the UN).

** Land Use, Land-use Change and Forestry.

*** Tons of CO₂ equivalent.



2.3 GHG Abatement Opportunities

Globally, according to McKinsey, the greatest potential for cost-effective GHG emissions reduction lies in energy efficiency (~50 percent) followed by renewable energy (18 percent) (IEA, 2011). This general ratio of GHG abatement potential for energy efficiency relative to renewable energy is expected to be similar in South Asia and Southeast Asia. Emissions from the energy sector increased at the fastest pace. India is the largest source of GHG emissions in South Asia, followed by Bangladesh. In Southeast Asia, Thailand is the largest source of GHG emissions, followed closely by Indonesia (see Table 1).

Energy efficiency on the demand side and renewable energy on the supply side each present abatement opportunities for climate change mitigation in the energy sector. But the former, given its lower marginal abatement cost, promises the greater potential for mitigation. With demand-side reduction, many countries will focus on industrial clusters prioritized according to their specific national situations. On the supply side, the viability of renewable energy as a substitute for traditional fossil fuels varies according to the specific mix of generation and resources

in each country. Significant abatement opportunities are also found in forestry, land use, and agriculture, but these are more dependent upon carbon prices than are energy-sector interventions. Available abatement options are limited by carbon prices of less than USD 10 per ton, and the recent free fall in carbon prices limits the availability of carbon financing as a primary mechanism.⁸ Under the current international carbon regime, with the exception of Bangladesh, Cambodia, Laos, and Nepal,⁹ clean-energy financing mechanisms in most countries will be unable to rely on carbon revenues. This makes other innovative financing solutions even more important than previously envisioned under a more active CDM regime.

2.4 Low-Emissions Development Strategies (LEDS) as a Driver

Most countries in Asia are at various stages in formulating and implementing strategies to “green” their economies and reduce GHG emissions. Each of the 11 focus countries has developed a plan and a framework to continue development with reduced emissions (see Table 2). Each of these plans requires financing. LEDS plans will therefore be a significant driver for climate finance in the region.

⁸As of December 2012, the price of CERs ranged around USD 0.80-0.90/ton.

⁹Least Developed Countries (LDCs) have privileged status for the delivery of carbon credits into the European Union’s Emissions Trading Scheme (ETS), and therefore command a price premium.

Table 2: Low Emission Development Strategies in the Focus Countries

Country	Low Emission Development Strategies	Details
Bangladesh	Bangladesh Climate Change Strategy and Action Plan (September 2008, updated in 2009)	Although it primarily emphasizes adaptation and disaster preparedness, this plan features mitigation actions across all major emitting sectors. Bangladesh established a goal of meeting 10 percent of power demand with renewable energy by 2020.
Cambodia	Green Growth Roadmap (December 2009)	Cambodia has created a National Climate Change Commission with the aim of achieving climate-resilient, low-carbon, sustainable economic growth.
India	National Action Plan on Climate Change (July 2008) Low Carbon Growth Strategy (in development)	India is developing its Low Carbon Growth Strategy to achieve the goal it set at COP15: a reduction in GHG intensity of 25 percent between 2005 and 2020. In addition, nearly half of India's states have developed state-level Climate Change Action Plans.
Indonesia	National Action Plan Addressing Climate Change (November 2007) National Action Plan for Greenhouse Gas Emission Reductions (2011) Indonesia Climate Change Sectoral Roadmap (2009)	Indonesia's National Action Plan for Greenhouse Gas Emission Reductions has a target of reducing GHG emissions 26 percent below 'business as usual' levels by 2020, and an additional 15 percent with support from industrialized countries. Three provinces have developed their own LEDS plans.
Laos	National Strategy on Climate Change (2010)	The National Strategy emphasizes adaptation. The document also lays out mitigation strategies targeting all sectors.

Table 2: Low Emission Development Strategies in the Focus Countries (continued)

Country	Low Emission Development Strategies	Details
Malaysia	Renewable Energy Policy and Action Plan	Malaysia announced in 2009 a 'voluntary reduction' from 2005 levels of up to 40 percent in emissions intensity by 2020. Malaysia adopted a Renewable Energy Policy and Action Plan as part of the Tenth Malaysian Plan for 2011–2015, and began modeling mitigation measures across all major sectors as part of its Second National Communication.
Nepal	National Climate Change Policy (2011)	Although it focuses heavily on risk management and adaptation, the policy includes promotion of clean energy, energy efficiency, and low carbon development in general.
Papua New Guinea	Vision 2050 (2011)	Vision 2050 aims to be carbon neutral by 2050, while achieving annual economic growth of 7 percent in an environmentally sustainable manner. Papua New Guinea aims to conserve and manage 70 percent of its forests, and to participate strongly in carbon markets.
Philippines	The Philippines National Climate Change Action Plan (2011)	The Action Plan provides a rich and comprehensive set of goals, desired outcomes, and activities focused mainly on adaptation but embracing mitigation as well.
Thailand	National Strategic Plan on Climate Change Management (2008-12, approved in 2008) Draft National Master Plan on Climate Change (2011–2050)	Both set broad adaptation and mitigation goals for the country.
Vietnam	Green Growth Strategy (2012)	Vietnam is finalizing a national Green Growth Strategy that aims to reduce CO ₂ emissions per unit of GDP and increase the use of clean and renewable energy.

3. Financing Available for Low Emission Development

3.1 Barriers to Financing GHG Abatement

Given current trends, the amount of CO₂ emissions from energy use in Asia's developing countries is expected to increase from 33 percent of the world total in 2008 to 45 percent by 2030—almost doubling from 9,700 million tCO₂e in 2008 to 18,000 million tCO₂e in 2030 (USAID, 2011). Emissions from the forest and land-use sectors will further contribute to the increase. These increased emissions are indicative of a range of unsustainable development pathways. Financing for GHG mitigation and adaptation activities has thus become increasingly relevant to the Asia region (World Bank, 2010).

Useful and cost-effective mitigation technologies are available to address the twin challenges of GHG emissions and reliable access to energy. Their dissemination in the market, however, has so far been limited. The main obstacle to the dissemination of GHG abatement technologies has been insufficient climate finance in the energy, transport, forestry, agricultural, land use, and other sectors. Contributing factors have included (a) perceived high risk in target markets and projects, (b) lack of innovative financial products addressing market needs and opportunities, (c) lack of commercially viable business models, (d) lack of bankable projects, (e) lack of capacity to successfully implement large-scale projects, and (f) depressed carbon prices.

3.2 Defining Climate Finance

No commonly accepted definition of climate change finance, or climate finance, is currently available.

However, the term is generally understood to include financial resources directed toward two general activities: adaptation and mitigation. Adaptation covers ways of adjusting to the consequences of climate change, while mitigation involves reducing sources of GHG emissions or enhancing GHG sinks (UNDP, 2011).

- **Adaptation:** Initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects.
- **Mitigation:** Technological change and substitution that reduce resource inputs and emissions per level of output. Within mitigation, forest and land use-related measures are typically categorized, tracked, and financed separately from general mitigation measures such as deployment of energy efficiency and renewable energy (Climate Action Network Australia, 2009).¹⁰

Climate finance includes public and private sources from both developed and developing countries, and both developed and developing countries can be recipients. There may or may not be an intermediary actor such as a development finance institution collecting and disbursing funds, which are made available through a wide range of financial mechanisms.

3.3 How Much Climate Financing is Available?

Vagueness, opacity, and inconsistency in methods of tracking and counting climate finance have led to difficulties in quantifying it on both global and regional levels. This is due to the prevailing definitions of climate finance, which are inadequate, and to poor

¹⁰ Land Use, Land Use Change and Forestry (LULUCF) is an emission sector under the Kyoto Protocol. It covers cropland and grazing land management, land clearing, and forest management in developed countries. Reducing Emissions from Deforestation and Degradation in developing countries (REDD) is similar, but applies exclusively to developing countries.



monitoring, reporting, and verification of financial flows. Many studies of climate finance focus on public sources, but attempts to capture the full range of public and private finance are improving, and indicate that large amounts of financing are available for climate change, particularly for low-carbon activities.

As much as USD 364 billion of public and private climate finance¹¹ is made available every year, according to one report that investigated the entire chain of sources, intermediaries, instruments, channels, and uses of climate finance globally (Climate Policy Initiative, 2012). The private sector accounts for up to three quarters of the overall total (see Figure 1). Most of the climate finance (USD 350 billion) goes toward projects that mitigate climate change (see Table 3). All of private sector climate change finance goes toward mitigation, and the only funding for adaptation at present comes from public sector sources.

The largest private sector contributors are project developers, corporate actors, and commercial

financial institutions. Government and public financial intermediary budgets currently provide USD 82 billion to mitigation, with development finance institutions providing 78 percent of this (USD 64 billion). At the Copenhagen Climate Change Conference in December 2009, developed countries pledged to dedicate USD 30 billion during 2010–2012 for climate change during a ‘fast start’¹² period. This amount is expected to grow, as governments strive to meet the 2020 target of USD 100 billion in annual climate funding that was promised in the Copenhagen Accord.

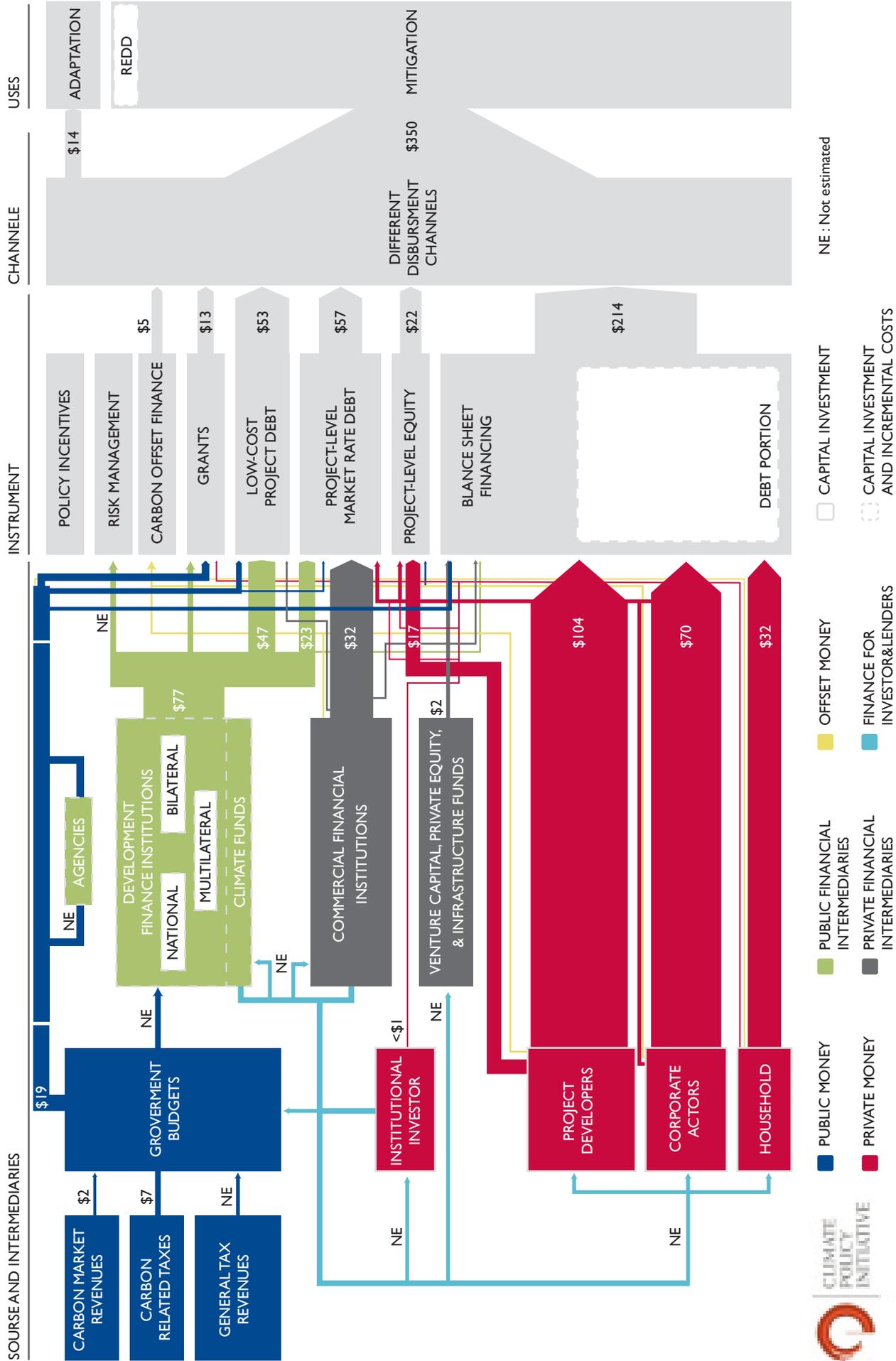
Investments in capital costs account for the majority (80 percent, or USD 293 billion) of climate change funding, and the largest share of this (USD 214 billion) is comprised of market rate loans. A smaller share (about 20 percent, or USD 71 billion) of the climate financing is through mechanisms for incremental costs¹³—low-cost debt, grants, and carbon offset finance (see Figure 2).

¹¹ This number is consistent with findings from other reports: USD 263 billion in public and private clean-energy investment in 2011 (Pew Charitable Trusts, 2012); global investment in renewable power and fuels rose of USD 257 billion in 2011 (Frankfurt School, et al., 2012); and USD 214 billion invested in 2010 in low-carbon projects in developing countries alone (International Finance Corporation, 2011).

¹² The Copenhagen Accord, arising out of the 15th Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC), ‘committed developed countries to collectively provide resources approaching USD 30 billion in the period 2010–2012 to support developing countries in their efforts to adapt to and mitigate climate change. This ‘fast start’ finance commitment was carried forward in decisions of the 16th Conference of the Parties in Cancun in December 2010.’ (From the U.S. State Department’s online account of the Fast Start program, at <http://www.state.gov/e/oes/climate/faststart/c48618.htm>). Whereas 2012 marked the final year of the initial three-year fast start finance period, further fast start funds are likely to be allocated in the next U.S. budget (see Section 4.3.1, above).

¹³ Capital costs are ‘tangible investments in mitigation or adaptation projects that need to be paid back.’ Incremental costs are ‘financial resources that cover the price difference between cheaper, more polluting options, and costlier, climate friendly ones, and do not need to be paid back’ (Climate Policy Initiative, 2012).

Figure 1: Current Climate Finance Flows (USD billions)



*This diagram illustrates the landscape of climate finance flows along their lifecycle for the latest year available, mostly 2011. The width of the arrows in the diagram represent the relative size of the flows.
 Source: Reproduced from the Landscape of Climate Finance 2012 (Climate Policy Initiative, December 2012).



Table 3: Global Climate Change Financing by Source (USD billions)*

Source	Adaptation	Mitigation	Total
Project developers	N/A	122	122
Corporate actors	N/A	75	75
Households	N/A	32	32
Institutional investors	N/A	0.6	0.6
Commercial financial institutions	N/A	36	36
Venture capital, private equity and infrastructure funds	N/A	2.4	2.4
Government budgets	2.7	17	20
National finance institutions	5.2	38	43
Multilateral finance institutions	2.9	18	21
Bilateral finance institutions	2.7	8.6	11
Climate funds	0.4	1.1	1.5
Total	14	353	364

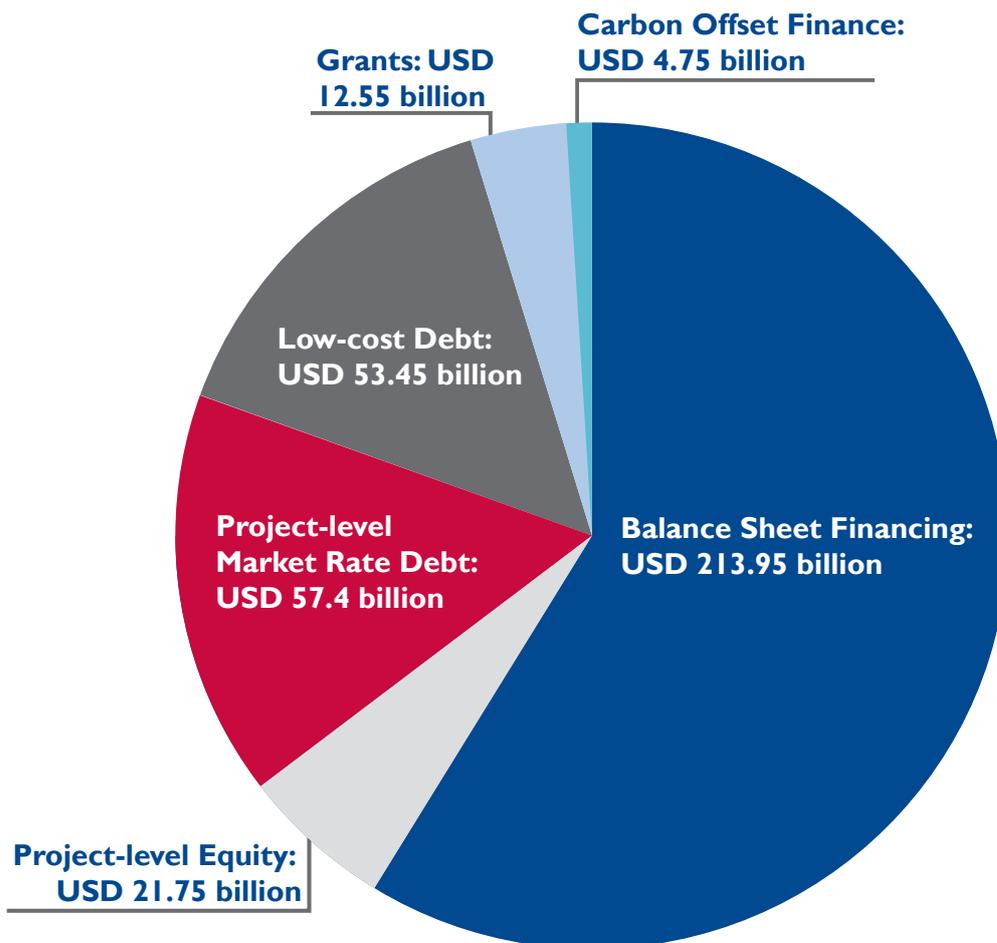
Source: The Landscape of Climate Finance 2012. Climate Policy Initiative, December 2012.

* Figures given in this table are averages of ranges given in the source.

Within the Asia region, USD 21.1 billion was invested in public and private clean energy activities in Oceania and Asia, excluding China and India, in 2011, and USD 10.2-12.3 billion was invested in India. Also, Indonesia passed the USD 1 billion mark in clean energy investment for the first time in 2012 (Pew Charitable Trusts, 2012; Frankfurt School, et al., 2012). The proportion of finance going toward other mitigation activities in the region is much smaller; an average of just USD 50 million per year was approved for REDD activities in the 11 focus countries over 2008–2012.¹⁴

Donor countries have so far pledged USD 35 billion for climate-related activities, and a total of USD 26 billion has been deposited into 25 public sector climate funds globally (Figure 3). A total of USD 9 billion worth of projects and programs has been approved globally, and it is estimated that annual approval amounts during the fast-start finance period (2010–2012) were more than six times annual approvals in 2008–2009. These figures apply only to public sector funds identified to date, and do not include leveraging of funds through public or private institutions, which can be many times greater.

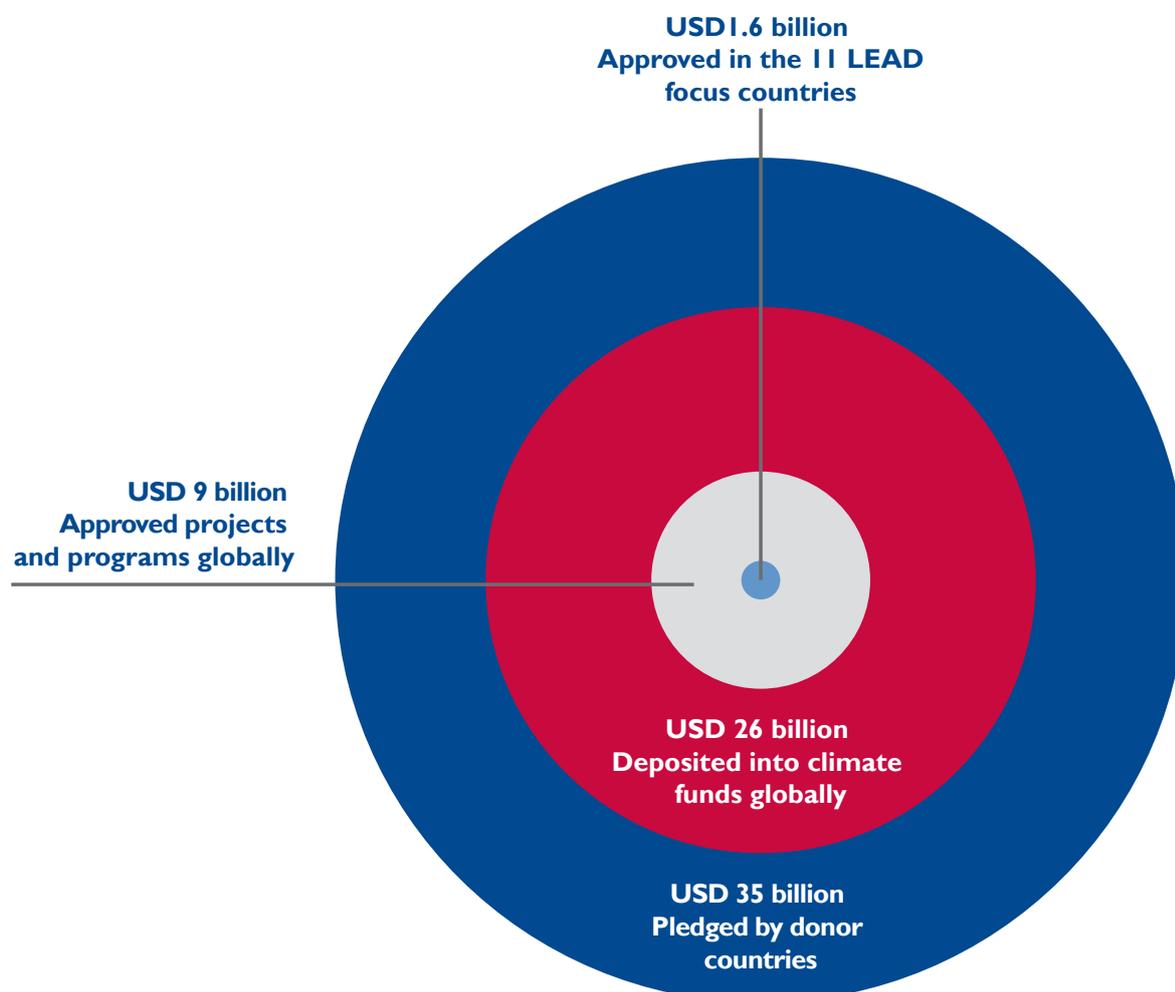
Figure 2: Annual Global Flow of Climate Change Finance by Instrument



Source: The Landscape of Climate Finance 2012 (Climate Policy Initiative, December 2012).

¹⁴Based on data acquired on Climate Funds Options website (www.climatefundsupdate.org) on January 10, 2012.

Figure 3: Public Sector Climate Fund Flows



Source: Climate Funds Update and Nexant research. Numbers current as of December 8, 2012, and include 25 international climate funds.

Based on data from the tracking website Climate Funds Update, Japan contributes almost one-half of the USD 34.5 billion total climate pledges out of all donor countries, followed by the United Kingdom with 14 percent, and then the United States, Germany, and Norway with each contributing five to six percent of total climate pledges (see Figure 4).

Of the USD 9 billion approved to date for projects and programs globally, USD 1.6 billion (about one-sixth) has been allocated to the 11 focus countries.¹⁵ This shows that significant financing is available for

LEDS and green growth in Asian countries, but these countries need to prepare to access this funding. About one-third, or USD 491 million, of these approvals has gone to India, including USD 263 million approved in 2012 from the CTF. Indonesia, with USD 325 million of approvals, also receives most of its funding (USD 125 million) from the CTF, with another USD 87 million coming from Australia's International Forest Carbon Initiative and USD 20 million from Norway's International Climate and Forest Initiative. Thailand and the Philippines are also experiencing some success in gaining access to these funds.

¹⁵These figures are based on data from the Climate Funds Update web site covering the period from 2003 onward. The vast majority of these approvals have occurred since 2008.



Malaysia ranks on the lower end of the scale, which, given its relative wealth and ODA recipient status as an Upper Middle Income Country, is to be expected. Other poorer countries that are also more vulnerable to climate change share that end of the scale, suggesting that they could benefit from capacity building to access available funds.

Aside from the public climate funds approved for projects and programs specific to these 11 countries, USD 104 million in funds have been approved for regional projects and programs and a further USD 543 million has been approved for global projects and programs that benefit these countries, as well as many others.

The CTF has contributed almost half of the total approved resources from the 25 funds to the 11 countries. Funds from the GEF contribute the next largest amount, making up another 18 percent of the

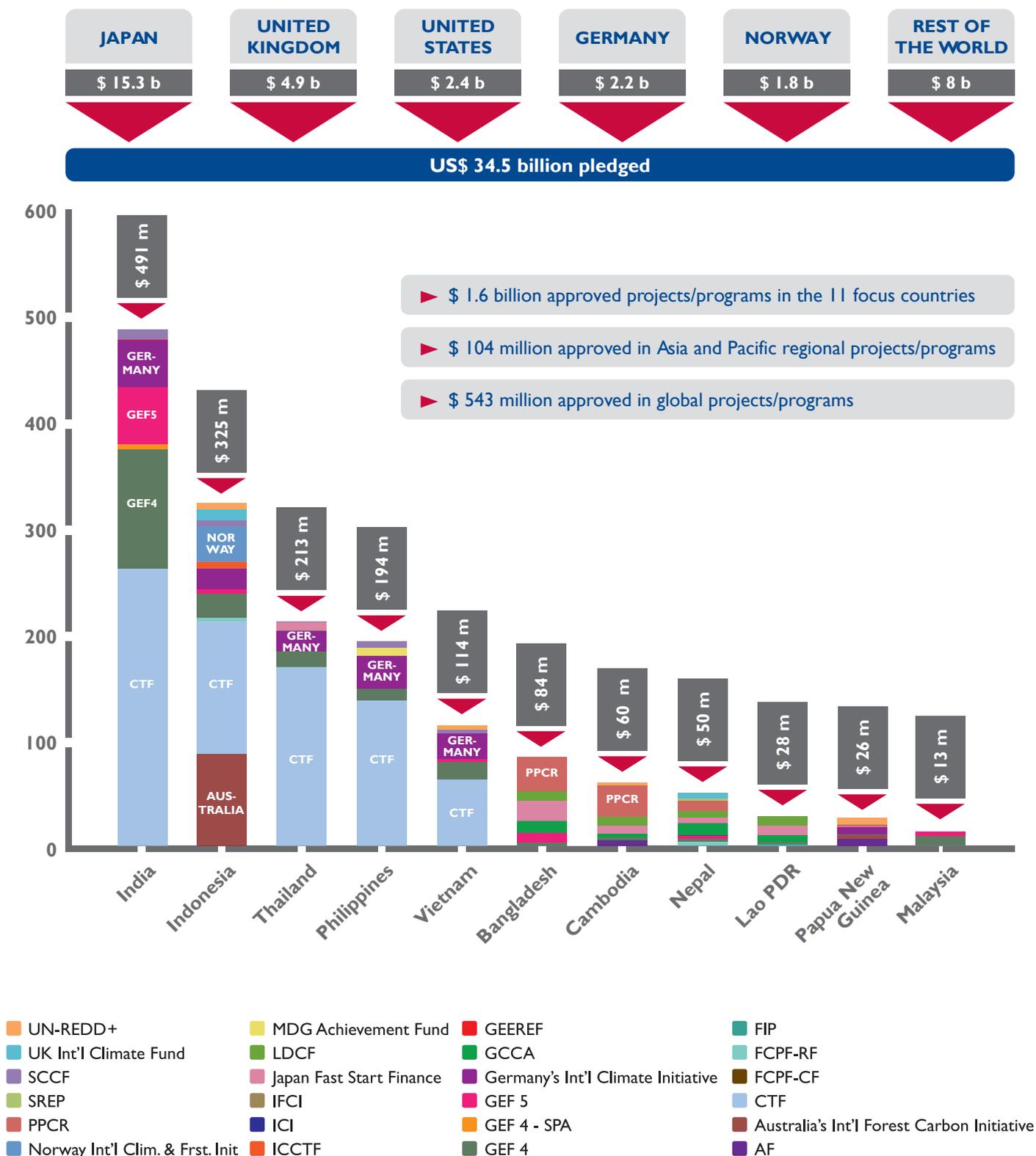
approved amount. Other major contributions in the region come from Germany's International Climate Initiative (nine percent), Australia's International Forest Carbon Initiative (six percent), and the Pilot Program for Climate Resilience, or PPCR, (five percent).

3.4 Existing Fund Inventories

A number of institutions manage inventories of funds, providing background information on the funds, their activities, and application processes. These inventories, listed in Table 4, typically focus on a specific type of finance. The study team compiled information on climate funds and finance mechanisms in Asia from these inventories, and supplemented this information with additional research, including desk-based and in-person interviews, to obtain a fuller picture of the availability and conditions for climate financing in developing Asia, and specifically in the 11 focus countries.

HOW DEVELOPING ASIAN COUNTRIES CAN PREPARE TO ACCESS INTERNATIONAL GREEN GROWTH FINANCING

Figure 4: International Public Climate Fund Flows



Source: Climate Funds Update, and Nexant research. Numbers are through December 2012, and include 25 international climate funds.

Table 4: Existing Climate Fund Inventories and Information Included

Inventory	By	Climate Change Focus	Fund Type	No. of Funds	Financial Mechanism	Organizational Structure	History	Objective/Purpose	Eligibility/Requirements	MRV Requirements	Contact Information	Other Information
Climate Funds Update ¹⁶	Heinrich BöllStiftung (HBF) and the Overseas Development Institute (ODI)	Adaptation, Mitigation – General, Mitigation – REDD+	Public	26	■	■	■	■	■			Includes detailed financial details on donor, project, and recipient country, fund access, and governance.
Climate Finance Options	World Bank and UNDP	Adaptation, Mitigation – General, Mitigation – REDD+	Public, Private	66	■			■	■		■	Includes total amount, qualifying project types, project examples, application procedures, decision-making structure.
ADAPT Asia-Pacific Adaptation Funds Compendium	USAID	Adaptation	Public	11								Includes funds pledged, activities supported, fund access, project examples.
ETFRN Funding Opportunities	European Tropical Forest Research Network (ETFRN)	Mitigation – REDD+	Public	N/A								Provides links to various funding opportunities internationally.

Table 4: Existing Climate Fund Inventories and Information Included (continued)

Inventory	By	Climate Change Focus	Fund Type	No. of Funds	Financial Mechanism	Organizer/ Institutional Structure	History	Objective/Purpose	Eligibility/ Requirements	MRV Requirements	Contact Information	Other Information
UNFCCC – Multilateral and Bilateral Funding Sources	United Nations Framework Convention on Climate Change (UNFCCC)	Adaptation, Mitigation – General, Mitigation – REDD+	Public	N/A								Provides links to climate change programs/projects at multilateral financial institutions and bilateral development agencies.
Boogar Venture Capital, Clean Tech Listing	Boogar Lists	Mitigation – General	Private	80								Global list of clean-tech funds.
Multi-Partner Trust Fund Office Gateway	United Nations Development Programme	N/A	Public	62								Includes detailed financial details on donor, project, and recipient country, assistance strategy, decision-making process.
Funding for Adaptation	UNFCCC	Adaptation	Public	25								Includes funding source and examples.

¹⁶ Beginning in February 2012, Climate Funds Update included a description of the monitoring and evaluation frameworks of each fund.



3.5 Types of Financial Mechanisms

Many financial mechanisms are available to recipients. Those most commonly used in low-carbon finance are defined below.

Climate bonds

Climate bonds are long-term debt securities issued to raise finance for climate change mitigation- or adaptation-related initiatives. They are typically asset-backed or ring-fenced, and are issued by governments, MDBs, or corporations that guarantee repayment plus a fixed or variable rate of return over a defined time period.

Carbon finance

This is a general term that refers to the payment for project-based GHG emission reductions. These emission reductions take the form of tradable financial instruments and include certified emission reductions (CERs), voluntary emission reductions (VERs), and renewable energy certificates (RECs).

Co-financing

In this type of financing, the different lenders agree to fund under the same documentation and security packages, but may apply different interest rates, repayment profiles, and terms.

Equity

This is risk capital provided by sponsors and investors in the form of funds subscribed for shares and subordinated loans or other credit facilities.

Grant

This is a fund disbursed by one party, such as a multilateral or bilateral institution, to a recipient for the purpose of project-related funding.

Concessional loan

In this case, the fund/facility acts as a lender, extending money to borrowers while being subsidized in terms of interest rate or tenor.

Official development assistance

ODA comprises loans, grants, and technical assistance (TA) that governments provide to developing countries.

Payment for ecosystem services (PES)

A PES is a financing instrument that internalizes externalities in the environmental sector in a localized area. The underlying principle is that those who provide environmental services get paid for doing so ('provider gets') and those who benefit from environmental services pay for their provision ('user pays').

Risk management

Risk management mechanisms entail the identification, assessment, and prioritization of investment risks, followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events.

Structured financing

This finance sector is designed to help provide increased liquidity and funding sources, and transfer risks via the creation of secondary investment markets.

Technical assistance

This mechanism provides entities with support in identifying, developing, and preparing projects to achieve financial closure.

Commercial debt

This type of fund/facility serves as a lender, extending money to borrowers at market interest rates.

3.6 Types of Financial Intermediaries & Channels

Financial intermediaries or channels available for climate finance include the following:

- commercial banks;
- non-bank financing institutions;
- project finance companies;
- micro-finance institutions;
- social enterprise financial intermediaries;
- private equity and venture capital;
- vendor finance companies;
- carbon finance companies;
- insurance companies; and
- finance guarantee companies.

Specific financial products available from the above financial intermediaries and channels address specific risks and issues within each market segment. In addition to more conventional financial products, other products related to climate change finance are designed to mitigate risk and enhance credit. Examples of financing mechanisms for specific market segments, outlined below, are discussed in more detail in later sections of the report:

- partial risk/credit guarantee;
- revolving credit facility with loan loss reserve;
- equipment finance and vendor finance and equipment leasing;
- yield output guarantees and off-take insurance;
- export credit agency programs; and
- development finance.

4. Public Sector Funds

Table 5 lists more than 40 public sector funds and facilities for LEDS activities for which the 11 focus countries are eligible. Most of these are available to all countries, while a handful focus on a select few countries. This chapter describes some of the major

international funds, multilateral development finance institutions, bilateral organizations, and national funds. Further information on these can be found in Volume 2 of this report.

Table 5: Focus Country Eligibility for Public Sector Funds*

Fund	Bangladesh	Cambodia	India	Indonesia	Laos	Malaysia	Nepal	Papua New Guinea	Philippines	Thailand	Vietnam	Global/Regional
Asia Pacific Carbon Fund (APCF)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?
Australia’s International Forest Carbon Initiative (IFCI)	?	?	?	☆	?	?	?	☆	?	?	?	?
Carbon Funds and Facilities	✓	✓	✓	?	✓	?	✓	?	?	?	✓	?
Clean Energy Financing Partnership Facility (CEFPF)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?
Clean Technology Fund (CTF)	✓	✓	☆	☆	✓	?	✓	✓	☆	☆	☆	?
Climate and Development Knowledge Network (CDKN)	☆	?	☆	?	?	?	☆	?	?	?	?	?
Climate Change Fund	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?
Climate Change, Energy Efficiency and Renewable Energy (CLEERE)	?	?	☆	?	?	?	?	?	?	?	☆	?
Climate Public Private Partnership (CP3)	☆	?	☆	?	?	?	?	?	?	?	☆	?
Deutsche Investitions- und Entwicklungsgesellschaft mbH (DEG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	?
Energy and Environment Partnership with Mekong (EEP Mekong)		✓			✓					✓	✓	

Table 5: Focus Country Eligibility for Public Sector Funds* (continued)

Fund	Bangladesh	Cambodia	India	Indonesia	Laos	Malaysia	Nepal	Papua New Guinea	Philippines	Thailand	Vietnam	Global/Regional
Forest Carbon Partnership Facility – Carbon Fund (FCPF-CF)	?	☆	?	☆	☆	?	☆	☆	?	☆	☆	
Forest Carbon Partnership Facility – Readiness Fund (FCPF-RF)	?	☆	?	☆	☆	?	☆	☆	?	☆	☆	
Forest Investment Program (FIP)	?	?	?	☆	☆	?	?	?	?	?	?	
Future Carbon Fund	√	√	√	√	√	√	√	√	√	√	√	?
GEF Small Grants Programme (SGP)	?	√	√	√	√	√	√	√	√	√	√	?
Germany’s International Climate Initiative (ICI)	√	√	√	√	√	√	√	√	√	√	√	?
Global action for Reconciling Economic growth and Environmental preservation (GREEN)	?	?	?	?	?	?	?	?	?	?	?	?
Global Climate Change Alliance (GCCA)	☆	☆			√		√					
Global Climate Partnership Fund	√	√	☆	☆	√	√	√	√	☆	√	☆	?
Global Energy Efficiency and Renewable Energy Fund (GEEREF)	√	√	√	√	√	√	√	√	√	√	√	?
Global Environment Facility Trust Fund	√	√	√	√	√	√	√	√	√	√	√	?
Green Climate Fund (GCF)	√	√	√	√	√	√	√	√	√	√	√	?
Green Commodities Facility	√	√	√	√	√	√	√	√	√	√	√	?
IFC Climate Catalyst Fund	√	√	√	√	√	√	√	√	√	√	√	?
Indonesia Climate Change Trust Fund (ICCTF)				√								
Japan’s Fast Start Finance (FSF)	√	√	√	√	√	√	√	√	√	√	√	?
MDG Carbon Facility (MDGCF)	√	√	√	√	√	√	√	√	√	√	√	
National Clean Energy Fund (India) (NCEF)			√									
NEFCO Carbon Fund (NeCF)		√	√	√	√	√	√		√	√	√	
Nordic Climate Facility (NCF)	√	√			√		√				√	√

Table 5: Focus Country Eligibility for Public Sector Funds* (continued)

Fund	Bangladesh	Cambodia	India	Indonesia	Laos	Malaysia	Nepal	Papua New Guinea	Philippines	Thailand	Vietnam	Global/Regional
Nordic Development Fund (NDF)	√	√			√		√				√	
Nordic Investment Bank (NIB)	√	√	☆	√	√	√	√	√	√	√	☆	?
Nordic Project Fund (Nopef)	√	√	√	√	√	√	√	√	√	√	√	?
Norway's International Climate and Forest Initiative (NICFI)	?	?	?	☆	?	?	?	?	?	?	?	√
Renewable Energy and Energy Efficiency Partnership (REEEP)	☆	√	☆	☆	☆	√	☆	?	?	√	☆	√
Scaling Up Renewable Energy Program for Low-Income Countries (SREP)	?	?	?	?	?		☆	?	?	?	?	
Seed Capital Assistance Facility (SCAF)	?	?	?	?	?	?	?	?	?	?	?	
Southeast Asia Prosperity Fund		√		√	√	√	√		√	√	√	
UK's International Climate Fund (ICF)	√	√	√	√	√	√	√	√	√	√	√	
Vietnam Green Credit Trust Fund (GCTF)											√	

* Based on Nexant research. A tick mark (√) represents eligibility for fund, a question mark (?) represents possible eligibility for fund, and no mark represents no eligibility for fund. A star (☆) indicates a pilot or focus country for the particular fund.

4.1 International Climate Funds

4.1.1 Climate Investment Funds

Recognizing that climate change is likely to disproportionately affect the urban and rural poor of developing countries, the UNFCCC acknowledged the need to provide additional financial resources to these countries to help them mitigate and manage the challenges of climate change. To this end, the UNFCCC established the Climate Investment Funds (CIFs).

The CIFs comprise two trust funds: the Clean Technology Fund and the Strategic Climate Fund. Each addresses a specific scope and objective and has its own governance structure (Table 6).

The [Clean Technology Fund \(CTF\)](#) promotes investments that help to initiate a shift toward clean technologies. This fund seeks to fill a gap in the international architecture for development finance, making funds available at rates more concessional than the standard terms applied by the MDBs and at a scale necessary to help provide incentives to developing countries to integrate nationally appropriate mitigation actions (NAMAs) into sustainable development plans and investment decisions. Countries, together with the MDBs and other partners, agree through the CTF upon country investment plans for programs that contribute to the demonstration, deployment, and transfer of low-carbon technologies with significant potential for GHG emissions savings.

The [Strategic Climate Fund \(SCF\)](#) serves as an overarching fund to support targeted programs with dedicated funding to pilot new approaches with potential for scaled-up, transformational action aimed at a specific climate change challenge or sectoral response. Targeted programs under the SCF include the following:

The [Forest Investment Program \(FIP\)](#), approved in May 2009, aims to support efforts by developing countries to reduce emissions from deforestation and forest degradation by providing scaled-up bridge financing for readiness reforms and public

and private investments. It will finance programmatic efforts to address the underlying causes of deforestation and forest degradation, and to overcome barriers that have hindered past efforts to do so.

The [Pilot Program for Climate Resilience \(PPCR\)](#), approved in November 2008, was the first program under the SCF to become operational. It aims to pilot and demonstrate ways in which climate risk and resilience may be integrated into core development planning and implementation.

The [Program for Scaling-Up Renewable Energy in Low Income Countries \(SREP\)](#), approved in May 2009, aims to demonstrate the economic, social, and environmental viability of low-carbon development pathways in the energy sector. It creates new economic opportunities and increases energy access through the use of renewable energy.



Table 6: Objectives, Donors, and Target Countries for the Climate Investment Funds (CIFs)

Climate Change Focus	Clean Technology Fund (CTF)	Strategic Climate Fund (SCF)		
	Mitigation – Clean Energy	Pilot Program for Climate Resilience (PPCR)	Forest Investment Program (FIP)	Scaling-up Renewable Energy Program (SREP)
Objective	Scale-up deployment of clean technologies to transform markets towards low-carbon growth	Climate adaptation: integration of climate risk and resilience into development policies and planning	Forestry projects: reduce emissions from deforestation and forest degradation (REDD)	Small-scale renewable energy in low income countries
Fund Size	USD 4.8 billion	USD 1.2 billion	USD 639 million	USD 364 million
Eligible Focus Countries (target countries in bold*)	Bangladesh, Cambodia, India, Indonesia, Laos, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam	Bangladesh, Cambodia, India, Indonesia, Laos, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam	Indonesia, Laos	Bangladesh, Cambodia, Laos, Nepal, Vietnam

Source: Adapted from International Finance Corporation, CIF 2011 Annual Report, and www.climateinvestmentfunds.org.

* While a number of countries are eligible for the funds, investments are directed to a few target countries at present.

4.1.2 Global Environment Facility

What It Does

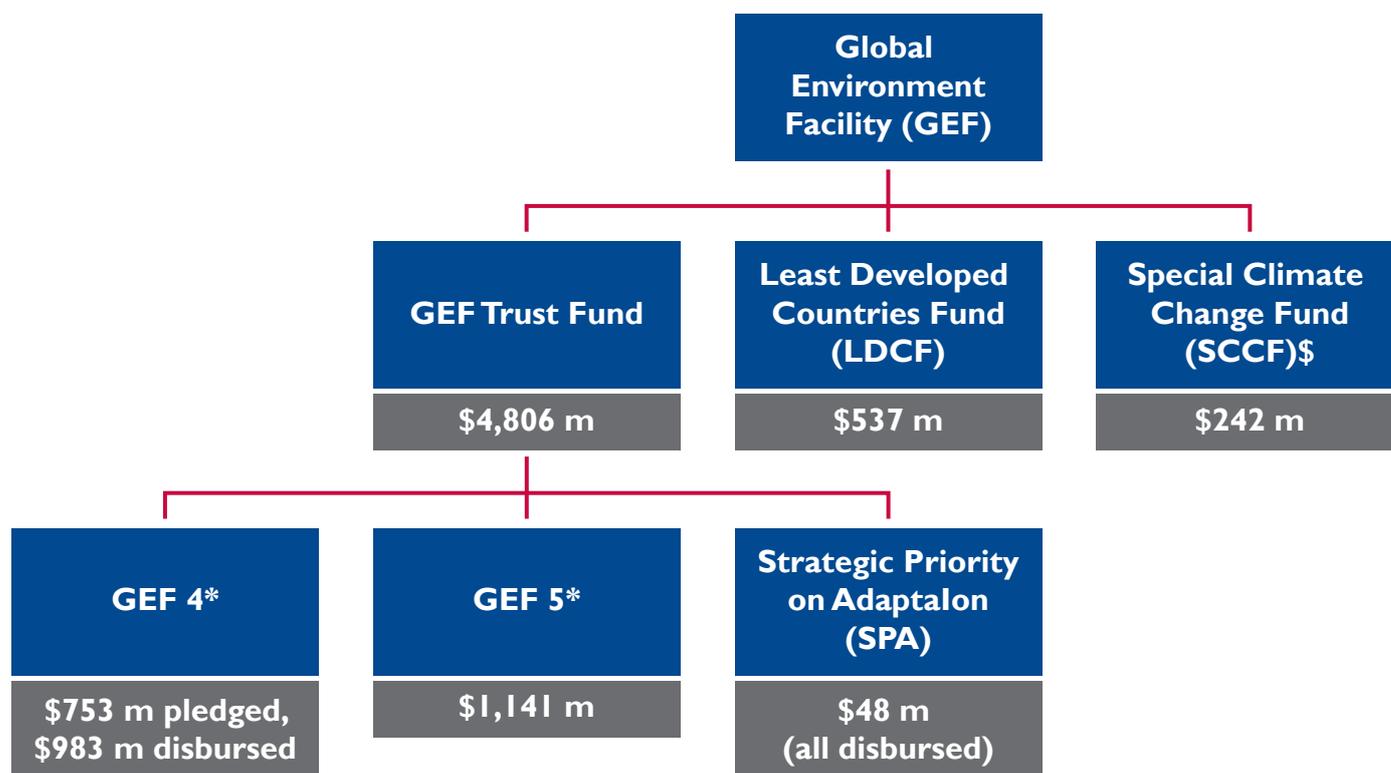
The Global Environment Facility (GEF) is the largest public funding organization for projects to improve the global environment. It was established in October 1991 as a USD 1 billion World Bank pilot program to assist in the protection of the global environment and to promote sustainable environmental development.¹⁷ It now operates as an independent financial organization providing grants for

projects related to climate change (mitigation and adaptation); biodiversity; chemicals; international waters; land degradation; sustainable forest management; and ozone layer depletion (GEF, undated).¹⁸ The GEF also works on several cross-cutting issues and programs, including results and learning, Earth Fund, public-private partnerships, capacity development, the SGP, and the Country Support Program. Figure 5 gives an outline of various funds falling under the Global Environment Facility.

¹⁷ Global Environment Facility, www.thegef.org.

¹⁸ Some of the information in this section is extracted from Dilip R. Limaye and Zhu Xianli, *Accessing International Financing for Climate Change Mitigation – A Guidebook for Developing Countries*.

Figure 5: Outline of Global Environment Facility



* GEF 1-3 are not shown. GEF 4 covers the period 2006-2010, and GEF 5 covers the period 2010-2014. Source for figures: Climate Funds Update website, October 17, 2012.

How It Operates

The GEF generally works in collaboration with an implementation agency, and offers grants to developing countries for climate-related programs and projects. The GEF partnership includes 10 agencies: United Nations Development Programme (UNDP); United Nations Environment Programme (UNEP); World Bank; UN Food and Agriculture Organization (FAO); UN Industrial Development Organization (UNIDO); African Development Bank (AfDB); ADB; European Bank for Reconstruction and Development (EBRD); Inter-American Development Bank (IADB); and

International Fund for Agricultural Development (IFAD). Since 1991, the GEF has achieved a strong track record with developing countries and countries with economies in transition, and has leveraged five times of the amount of funding it has provided (see Figure 6). GEF provided USD 10.5 billion in grants and leveraged USD 51 billion in co-financing for over 2,700 projects in more than 165 countries, including all 11 focus countries. Through its Small Grants Programme (SGP), the GEF has also made more than 14,000 small grants totaling USD 634 million directly to civil society and community-based

organizations. The funding for GEF in its Fourth Cycle (2006–2010), provided by 32 countries, amounted to more than USD 3 billion, of which USD 1 billion was dedicated to FAO efforts to address climate change. The current GEF funding cycle (Fifth Replenishment, 2010–2014, also known as GEF-5) has an overall pledged amount (from 34 countries) of USD 3.54 billion. Of this amount, the Climate Change Focal Area within GEF has pledged USD 1.14 billion (about 33 percent of the total amount pledged) and has set an emission reduction target of 500 million tons of CO₂ equivalent (tCO₂e).

How Funds Can Be Accessed

A key feature of GEF climate change financing is that specific amounts are allocated to various developing countries. Each country then develops and submits proposals to GEF within the appropriate focal areas.

The GEF projects are developed by host countries in cooperation with one or more of the 10 GEF agencies (above). Applicants need to submit a Project Identification Form to the GEF Secretariat through a GEF agency with an endorsement letter from the Operational Focal Point of the host country.

The following are eligibility criteria applied by the GEF for project financing:¹⁹

- project to be undertaken in an eligible country consistent with national priorities and programs;
- addresses one or more of the GEF Focal Areas, improving the global environment, or advances the prospect of reducing risks to the environment;
- consistent with the GEF operational strategy;
- seeks GEF financing only for the agreed-on incremental costs for measures to achieve global environmental benefits;
- involves the public in project design

and implementation; and

- is endorsed by the government of the country in which it will be implemented.

4.1.3 Green Climate Fund

What It Does

The Green Climate Fund (GCF) was approved by the UNFCCC at the 16th Conference of the Parties (COP) as an operating entity of the financial mechanism of that Convention under Article 11 (UNFCCC, 2010). The Independent Secretariat of the GCF will be established before the end of 2013.²⁰ The GCF will contribute to global efforts toward combating climate change, helping to attain the goals set by the international community. The Fund will promote sustainable development in line with the paradigm shift toward low-emission and climate-resilient development pathways. The Fund is expected to play a key role in channeling adequate and predictable financial resources to developing countries, and aims to catalyze climate finance, both public and private, in a transparent and accountable manner. It will also adopt a gender-sensitive approach to promoting environmental, social, economic, and development co-benefits.

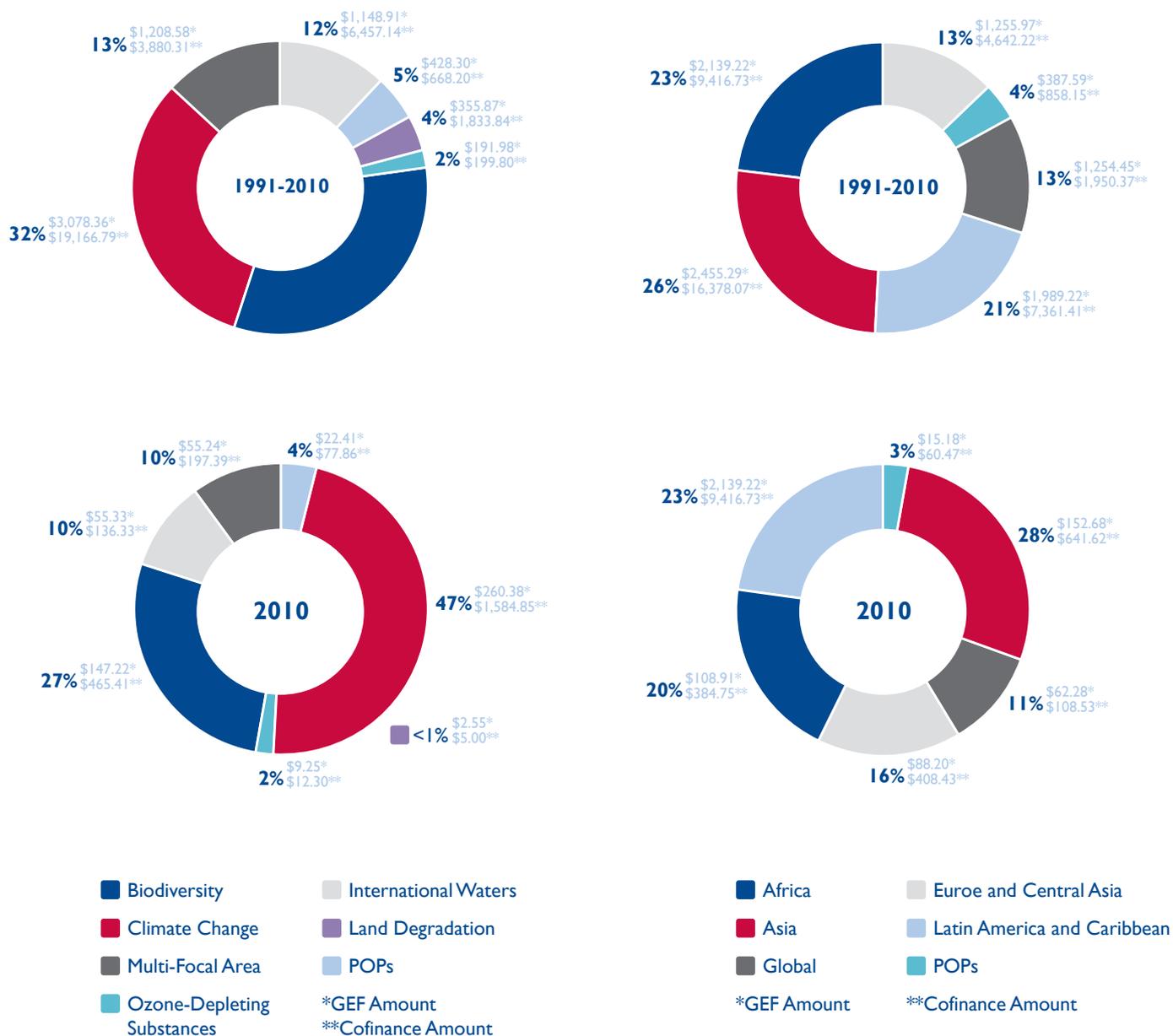
GCF will support developing countries in their efforts to limit or reduce their GHG emissions while adapting to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change (UNFCCC, 2010). The Fund will pursue a country-driven approach, promoting and strengthening engagement of relevant country institutions and stakeholders. Scalable and flexible, it will operate as an institution guided by and learning from monitoring and evaluation processes. Focusing on both adaptation and mitigation, the Fund seeks a balance between the two.

The GCF will support projects, programs, policies, and other activities in all developing-country parties to the UNFCCC, which includes all focus countries.

¹⁹ Source: Global Environment Facility, GEF-5 Focal Area Strategies.

²⁰ See www.gcfund.net.

Figure 6: Summary of Allocations and Co-Financing for the Global Environment Facility Portfolio



All amounts in millions of dollars. Totals may not equal 100 percent due to rounding.
 Source: Global Environment Facility, Annual Report 2010 (Washington, DC, 2011), p.10.

It will finance activities to both enable and support adaptation; mitigation (including the Reducing Emissions from Deforestation and Forest Degradation scheme, referred to as REDD); technology development and transfer, including climate change science; capacity building; and the preparation of national reports.

Countries will also be supported in the pursuit of project-based and programmatic approaches in accordance with strategies and plans, including LEDS, NAMAs, national adaptation plans of action, national adaptation plans, and others.

How It Operates

The World Bank will serve as Interim Trustee for the Fund, subject to a review three years after the Fund becomes operational. To provide interim Trustee services to the GCF, the World Bank has established a financial intermediary fund—the GCF Trust Fund—to receive, hold, and transfer contributions. Pending its establishment, UNFCCC, jointly with the GEF, has appointed an Interim Secretariat that will provide technical, administrative, and logistical support to the Board until the independent Secretariat is established. The Board has selected Songdo, Incheon City, Republic of Korea, as the GCF's host city.

The GCF is expected to total USD 100 billion per year by 2020. Where these funds are to come from remains in part uncertain. UN Secretary-General Ban Ki-Moon established a High Level Advisory Group on Climate Change Financing to investigate potential sources of revenue. The Group's report, delivered in November 2010, concluded that it would be a challenge, particularly in the light of the global financial crisis, to raise this sum of money. It remained optimistic, however, and identified the following potential sources of new and additional revenues (UN/AGF, 2010):

Public sources. National governments may generate new incomes through the introduction of new taxes, the removal of subsidies for fossil energy,

and the auctioning of emission allowances.

International development bank loans. These would provide leverage, channeling the funds that were raised by the other potential sources. They should be seen as a secondary source/channel for generating additional flows, rather than as a separate source in their own right.

Carbon markets, purchases of offsets in developing countries. The potential scale of these resources is dependent on the stringency of emissions reduction commitments among developed countries, on carbon market design, and on the availability of eligible emissions reductions in developing countries.

Private sector flows. Private sector flows to developing countries are likely to increase as the investment climate improves. Furthermore, developed-country policy actions, as well as those of multilateral development banks, the UN, and bilateral agency investments and instruments, can catalyze and foster additional private sector flows.

How Funds Can Be Accessed

The GCF is an operating entity of the UNFCCC's financial mechanism. Recipient countries can submit funding proposals through national designated authorities (NDAs). Recipient countries will be allowed direct access through these accredited sub-national, national, and regional implementing entities as long as these implementing entities fulfill certain fiduciary standards. The modalities of access remain to be agreed.²¹

GCF funds can also be accessed through multi-lateral implementing entities, such as accredited MDBs and UN agencies.

A private sector facility will also be established that allows direct and indirect financing by the GCF for private sector activities.²² NDAs, which can object to private sector activities, are to en-

²¹ Climate Funds Update, The Green Climate Fund, see <http://www.climatefundsupdate.org>.

²² Per paragraph 41 of the governing instrument (http://gcfund.net/fileadmin/00_customer/documents/pdf/GCF-governing_instrument-I20521-block-LY.pdf).

sure that private sector interests are aligned with national climate policies.

4.2 Multilateral Development Finance Institutions

Multilateral development finance institutions (DFIs) provide funding to either public or private sector recipients, or a combination thereof. Multilateral DFIs are an intermediary for nearly one-fifth (18 percent, or USD 21.2 billion annually) of global climate financing (Climate Policy Initiative, 2012). They serve as a delivery channel for international climate funds. They also have their own funds or facilities to which projects or programs may apply directly, or which they channel through their normal lending and investment channels to public or private sector recipients.

4.2.1 The World Bank Group

What It Does

The World Bank Group (WBG) is the largest multilateral financial institution. The core mission of the WBG is to support economic development and reduce poverty while recognizing the added costs and risks of climate change and the evolving global climate policy.²³ The World Bank comprises 187 member countries represented by a Board of Governors that serves as the ultimate policymaker. Generally, the governors are World Bank member country ministers of finance or development. The Board of Governors has committed the WBG to an effective response to climate change, one that encompasses both mitigation and adaptation. The World Bank has developed a strategy that aims to honor this commitment while helping developing countries to undertake NAMAs in the context of sustainable development without compromising economic growth. To this end, the WBG facilitates and manages finance and technology transfer to developing countries.

The WBG consists of five organizations: Inter-

national Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA), and International Centre for Settlement of Investment Disputes (ICSID). The focus of this report is on the public sector intervention from the WBG and the private sector intervention from IFC. The WBG's IBRD and IDA provide low-interest loans, interest-free credits, and grants to developing countries. Some of the programs and projects are co-financed with governments, other multilateral institutions, commercial banks, export credit agencies, and private sector investors. Over the past several years the WBG has substantially increased its lending for climate change mitigation activities. The Bank acts as an implementing agent for a number of GEF projects wherein it combines GEF grants with sovereign loans to scale up funding support for climate change mitigation activities.

How It Operates

In 2008, under the UNFCCC's Bali Action Plan, the WBG agreed to the creation of the CIFs, a pair of international investment instruments designed to provide scaled-up funding to help developing countries mitigate GHG emissions and to adapt to climate change (UNFCCC, 2008). These funds are discussed further in 4.1.1, above.

In addition, the WBG has been very active in carbon finance. The WBG's Carbon Finance Unit initiatives are part of the larger global effort to combat climate change, and go hand in hand with the WBG mission to reduce poverty and improve living standards in the developing world. The Carbon Finance Unit uses funds contributed by governments and companies in Organization for Economic Co-operation and Development (OECD) countries to purchase project-based GHG emission reductions in developing countries and countries with economies in transition through one of the carbon funds within the framework of the Kyoto Protocol's CDM or Joint Implementation

²³ See www.worldbank.org.

(11). A number of carbon funds were established by the WBG, and the new Carbon Partnership Facility (CPF) has now been created. A list of the carbon funds is provided in Volume 2 of this report. Other financing facilities related to climate change and managed by the WBG include special climate funds and the issuance of 'green bonds' to support climate change mitigation activities.

Climate change is causing adverse impacts on precipitation patterns, sea levels, and the frequency of weather-related disasters. These in turn entail risks for agriculture, food, and water supplies. With this in mind, the WBG developed a plan in 2008 for more investments, in cooperation with other international financial institutions, in clean energy in the developing world. The resulting Clean Energy Investment Framework is designed to help with the transition to a lower carbon development path and to adapt to climate variability and change (World Bank, 2007).

At the request of the WBG's Development Committee, the WBG embarked on a comprehensive strategy to help address climate challenges, launching extensive global consultations that concluded in September 2008. The resulting strategic framework on development and climate change takes a demand-based approach to identifying and tapping new business opportunities for developing countries and helping them cope with new risks (World Bank, 2008).

In 2012, 40 percent of WBG lending projects (nearly double the share in 2011) was expected to contribute to climate change adaptation, mitigation, or both. During 2011 and 2012, close to 200 projects aimed to address climate change. In 2012, clean energy, at USD 3.22 billion, continued to account for the largest share of mitigation support. Energy and mining are the sectors with the largest contributions to mitigation. To scale up resources for climate action, the WBG is also demonstrating innovative ways of mobilizing and leveraging finance and markets. Climate finance plays a key role here,

providing resources to address risks and build readiness. The WBG has successfully facilitated access to a menu of climate finance instruments, as seen by growing commitment to projects from the GEF as well as the CIFs.

How Funds Can Be Accessed

WBG financing assistance to each developing country is based on a Country Assistance Strategy (CAS) for financing from the IDA and IBRD. The CAS takes into account the country's own vision for its development, and is developed in consultation with country authorities, civil society organizations, development partners, and other stakeholders. The CAS aims to set out a selective program of WBG support linked to the country's development strategy and based on the WBG's comparative advantage in the context of other donor activities. CASs are designed to promote collaboration and coordination among development partners in a country.

Drawing on analytic work by the WBG, the government, and other partners, the CAS includes a comprehensive diagnosis of the development challenges facing the country, including the incidence, causes, and trends of poverty. The CAS identifies the key areas where WBG assistance can have the greatest impact on poverty reduction and economic development. In its diagnosis, the CAS takes into account the performance of the Bank's portfolio in the country, the country's creditworthiness, the state of institutional development, implementation capacity, governance, and other sectoral and cross-cutting issues. The WBG refers to this assessment in determining the level and composition of its financial, advisory, and technical support to the country. The CAS is increasingly results focused in tracking implementation of its programs, applying a framework of clear targets and indicators to monitor WBG and country performance in achieving stated outcomes.

4.2.2 International Finance Corporation

What It Does

IFC, a member of the WBG, is the largest global development institution focused exclusively on the private sector in developing countries. It covers all 11 focus countries. Established in 1956, IFC is owned by 184 member countries, a group that collectively determines IFC policies. This institution's work in more than 100 developing countries allows companies and financial institutions in emerging markets to create jobs, generate tax revenues, improve corporate governance and environmental performance, and contribute to their local communities. As the private sector arm of the WBG, IFC provides equity and debt financing to private sector organizations. IFC works with international partners to catalyze resources and to help business fill financing and knowledge gaps in areas such as renewable energy, energy efficiency, resource efficiency, and other proven measures for emissions reduction.

How It Operates

One of IFC's five strategic pillars is to address climate change and ensure environmental and social sustainability. Globally, IFC has a goal of increasing climate change investments in renewable energy and energy efficiency to 20 percent of the total portfolio by 2015. (The WBG is pursuing a similar objective of 20 percent.) IFC established its Climate Business Group in 2010 in response to its new strategic focus on climate change and the need to integrate related issues into its investment and advisory activities across the various sectors and regions. The Climate Business Group does not have a specific budget, but rather plays a supporting role to ensure that related objectives are met.

IFC invested USD 1.7 billion in clean energy and climate-friendly projects during 2010 and 2011, representing 14 percent of total commitments.²⁴ Ap-

proximately USD 500 million of this was in South Asia and East Asia, including about USD 300 million in renewable energy (IFC, 2012B).

In FY 2012, IFC committed USD 425 million directly to renewable energy generation capacity, and another USD 128 million through financial intermediaries. To date, IFC's Clean Technologies Investment Group has made 17 venture and growth equity investments totaling USD 190 million. A new USD 60 million Cleantech Innovation Facility is targeting up to 20 highly innovative investments, including technology transfer and base of the pyramid opportunities. IFC has invested USD 339 million in 17 private equity funds focused on climate, and plans to ramp this up by investing in a USD 500 million fund development platform, the Catalyst Fund, to be managed by the IFC Asset Management Company. The UK government is also an anchor investor. As of July 2012, IFC had closed more than 115 projects with local financial institutions in 35 countries for a total of USD 2.6 billion. Local financial institutions can channel IFC funding at scale to small clients that IFC cannot reach directly. Credit lines and risk sharing facilities are key offerings that encourage investment into green housing renovation, renewable power generation, and water.

IFC's financing activities related to climate change have included the following: resource efficiency, renewable energy generation capacity, supply chain for climate-related industries, companies with innovative clean technologies and business models, climate change funds, and banks investing in renewable energy and energy efficiency (IFC, undated). All of IFC's investments are made on a commercial basis. However, IFC utilizes concessional financing available from various donor agencies to provide a financing package that is more attractive to borrowers.

The Financial Mechanisms for Sustainability (Fin-Mech) unit manages funds provided by donors to be deployed in concessional ways in investment and advisory projects. These funds aim to address climate change by catalyzing private sec-

²⁴See http://www1.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/CB_Home/

tor investments and advisory projects that would not otherwise find support under current market conditions.

IFC's Green Bond offerings, which provide both development impact and returns for investors, are part of a strategy to double lending for clean-energy projects over the three years from 2010 to 2013.

IFC manages carbon facilities, offers a carbon delivery guarantee product to client companies, and provides up-front loans to projects earning in-

4.2.3 Asian Development Bank

What It Does

The ADB plays a major role in financing mitigation and adaptation measures for climate change in Asia and the Pacific. The three pillars of its strategy for financing development are inclusive growth, environmentally sustainable growth, and regional integration.

The ADB provides financing in the form of loans, grants, and guarantee mechanisms to its member

Table 7: Focus Country Eligibility for Asian Development Bank Funds and Facilities*

Fund	Bangladesh	Cambodia	India	Indonesia	Laos	Malaysia	Nepal	Papua New Guinea	Philippines	Thailand	Vietnam	Global/Regional
Asia Pacific Carbon Fund (APCF)	√	√	√	√	√	√	√	√	√	√	√	?
Carbon Market Initiative	?	?	?	?	?	?	?	?	?	?	?	?
Clean Energy Financing Partnership Facility (CEFPF)	√	√	√	√	√	√	√	√	√	√	√	?
Clean Energy Private Equity Funds	?	?	?	?	?	?	?	?	?	?	?	?
Climate Change Fund	√	√	√	√	√	√	√	√	√	√	√	?
Climate Public Private Partnership (CP3)	☆	?	☆	?	?	?	?	?	?	?	☆	?
FutureCarbonFund	√	√	√	√	√	√	√	√	√	√	√	?
Seed Capital Assistance Facility (SCAF)	?	?	?	?	?	?	?	?	?	?	?	?

* Based on Nexant research. A tick mark (√) represents eligibility for fund, a question mark (?) represents possible eligibility for fund, and no mark represents no eligibility for fund. A star (☆) indicates a pilot or focus country for the particular fund.

countries. The ADB also provides financing to the private sector in the form of equity and debt financing.

How It Operates

The ADB makes loans and investments related to climate change across a range of sectors including infrastructure, energy, transport, water, land-use, forestry, and agriculture.

The ADB provides financing to governments through five regional operational divisions—Central and West Asia, East Asia, Pacific, South Asia, and Southeast Asia. The ADB also provides non-sovereign financing to the private sector through its Private Sector Operations Division (PSOD). PSOD provides equity; loans in the form of project finance, corporate, and trade finance loans; and some technical assistance.

In terms of climate finance, the ADB provided USD 2.4 billion of climate-friendly investment in 2011: USD 2.1 billion for clean energy and USD 277 million for adaptation (ADB, 2012). Of the USD 2.1 billion of clean-energy investment in 2011, the majority was public sector, or sovereign loans, totaling USD 1.2 billion. The remaining USD 895 million (42 percent) went to the private sector.

The ADB is increasingly focusing on using donor funds to increase the amount of private sector investment. In recent years, the ADB has used concessional financing from the CIFs to expand its efforts to mitigate GHG emissions and address climate change. A total of USD 1.2 billion in mitigation co-financing has been endorsed through the CIFs for clean energy, sustainable transport, and land-use projects.

By 2020, the ADB aims to expand its impact and become a USD 100 billion bank through leveraging, relationships, knowledge, and capital from other public and private sector partners (Aiming Zhou, 2012).

How Funds Can Be Accessed

ADB revenues come from donor contributions to medium- and long-term funds, public bond issues, a private placements. The ADB has established a num-

ber of funds that it uses for its climate financing investments to governments and the private sector. These funds are dedicated to different areas, such as clean energy, or carbon, and provide combinations of co-financing for loans, grants, technical assistance funding, and in some cases equity contributions to private-sector funds.

Funds are distributed to governments through country investment plans. Working with its Developing Member Countries, the ADB develops five-year Country Partnership Strategies that establish development priorities and guide the investment planning.

The ADB's Private Sector Operations Division, as a minority shareholder, also provides funding to the private sector through direct loans and equity investments in funds.

4.2.4 Nordic Finance Group

The Nordic Finance Group consists of four international financial institutions, each with different mandates and financial mechanisms: the Nordic Development Fund (NDF), the Nordic Investment Bank (NIB), the Nordic Environment Finance Corporation (NEFCO), and the Nordic Project Fund (Nopef). The five Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) own NDF, NEFCO, and Nopef, while NIB is owned by the five Nordic and three Baltic countries (Estonia, Latvia, and Lithuania).

Together, NIB, NEFCO, and NDF directed EUR 1.34 billion (USD 1.78 billion) globally to climate projects in 2011, and this may increase. In the future they plan to strengthen lending power to climate and energy projects, and inject more capital into NDF to fund Nordic climate initiatives in developing countries. The table below shows eligibility for the 11 focus countries²⁵ for identified funds and facilities in the Nordic Finance Group. These are further described below.

²⁵ See <http://www.norden.org/en/news-and-events/news/nordic-council-demands-more-money-for-the-climate>.

Table 8: Focus Country Eligibility for Nordic Finance Group Funds and Facilities*

Fund	Bangladesh	Cambodia	India	Indonesia	Laos	Malaysia	Nepal	Papua New Guinea	Philippines	Thailand	Vietnam	Global/Regional
Climate Change, Energy Efficiency and Renewable Energy (CLEERE)	?	?	☆	?	?	?	?	?	?	?	☆	?
Energy and Environment Partnership with Mekong (EEP Mekong)		√			√					√	√	
NEFCO Carbon Fund (NeCF)		√	√	√	√	√	√		√	√	√	
Nordic Climate Facility (NCF)	√	√			√		√				√	√
Nordic Development Fund (NDF)	√	√			√		√				√	?
Nordic Investment Bank (NIB)	√	√	☆	√	√	√	√	√	√	√	☆	?
Nordic Project Fund (Nopef)	√	√	√	√	√	√	√	√	√	√	√	?

* Based on Nexant research. A tick mark (√) represents eligibility for fund, a question mark (?) represents possible eligibility for fund, and no mark represents no eligibility for fund. A star (☆) indicates a pilot or focus country for the particular fund.

Nordic Development Fund (NDF)²⁶

What It Does

Established in 1989, NDF is a multilateral development finance organization. It initially provided concessional loans to developing countries for social and economic development, until 2005 using finance from Nordic country development cooperation budgets. Since 2009, repayments from these loans, expected to amount to EUR 1 billion (USD 1.33 billion) over the next 35 years, are used to provide grants for climate change investments to low-income countries.

How It Operates

NDF funds climate change mitigation and adaptation activities in low-income countries eligible for support from the International Development Association (IDA). Grants range from EUR 500,000 (USD 663,000) to EUR 5 million (USD 6.6 million) per project, and are normally part of whole project or program financing. Between 2009 and 2011, NDF approved 39 climate change projects totaling EUR 107 million (USD 142 million). Mitigation projects make up about half of the NDF portfolio; these projects reduce an estimated 3.3 million tCO₂e per year (Nordic Development Fund Annual Report, 2011).

²⁶ See <http://www.ndf.fi/>.

NDF also provides funds to and co-implements a number of joint initiatives, including the Nordic Climate Facility (NCF) and Energy and Environment Partnership Mekong.

How Funds Can Be Accessed

Projects receiving NDF funding are normally identified by governments in the focus countries, which include Bangladesh, Cambodia, Laos, Nepal, and Vietnam, according to national priorities, and are co-financed with multilateral (e.g., World Bank and ADB) and bilateral partners.

Both the NCF and the EEP Mekong grants are accessed through annual calls for proposals.

Nordic Investment Bank (NIB)²⁸

What It Does

NIB is an international financial institution owned by the five Nordic countries and the three Baltic countries of Estonia, Latvia, and Lithuania. These eight member countries subscribe authorized capital according to their gross national income. NIB provides loans and guarantees with no subsidy or grant element, and covers up to 50 percent of the total project cost, which is typically more than EUR 50 million (USD 66 million). They finance small and medium-sized enterprises (SMEs) through intermediaries with specific-purpose on-lending programs. Outside of member countries, these intermediaries are financial (commercial banks and state-owned development banks) and governmental (Ministries of Finance and Economy).

How It Operates

NIB's EUR 3 billion (USD 4 billion) Climate Change, Energy Efficiency and Renewable Energy (CLEERE) facility provides loans targeting climate change mitigation and adaptation, mainly in the energy sector, but also in industry and transport. In 2012, USD 50 million was provided to Axis Bank Limited in India through this lending facility for construction of several wind-turbine parks with a total

capacity of 300 MW.

In 2011, NIB approved a total of EUR 2.6 billion (USD 3.4 billion) of new loans and increases in prior loans. While the majority of this was for activities in member countries, EUR 202 million (USD 268 million) of this went to loans in India. Lending to Vietnam to date totals USD 200 million.

How Funds Can Be Accessed

NIB operates in the member countries as well as selected focus countries, including India and Vietnam. Other countries are eligible for NIB financing where the projects are of mutual interest to the country of the borrower and the member countries. Applications should be directed to NIB's Lending Department. All projects should fit the NIB mandate to strengthen competitiveness and enhance the environment. NIB finances projects in the environment, logistics and communication, energy, transport, and innovation sectors.

Nordic Environment Finance Corporation (NEFCO)²⁹

What It Does

NEFCO is a multilateral financial institution that offers a variety of financing instruments, mostly to neighboring areas, but the NCF (jointly implemented with the NDF, described above) and the NEFCO Carbon Fund (NeCF) are available across developing Asia.

NEFCO and NDF also launched a Nordic Partnership Initiative with Vietnam in 2011 to demonstrate a sectoral effort to reduce emissions using international climate financing in developing countries. Authorized capital paid in by the Nordic countries amounts to EUR 113 million, or about USD 150 million (NEFCO, 2011).

How It Operates

NEFCO has managed the NeCF since its launch in 2008. It is a global public-private partnership carbon procurement vehicle for long-term purchasing

²⁸ See <http://www.nib.int/>.

²⁹ See <http://www.nefco.org>.

of GHG emission reductions under JI and CDM up to 2020. NeCF purchases carbon emission credits (ERUs/CERs/AAUs) through emission reduction purchase agreements with project owners, and covers carbon-related project costs. They also provide grants for climate projects in developing countries.

NeCF seeks to invest in a wide range of sustainable energy investments in Asia, Eastern Europe, and Latin America, including renewable energy, energy efficiency, and fuel switching. The principal target markets are renewable energy projects in China, Southeast Asia, and India. As of the end of 2011, NeCF had two projects in India, two in Indonesia, one in Laos, one in Thailand, and 19 in Vietnam (NEFCO, 2011).

The fund administered an initial target capital of EUR 50 million, but at the end of 2011 the total fund capital reached EUR 165 million (USD 219 million).³⁰ Total capital invested in their CDM-catalyzed projects is estimated at EUR 1.3 billion, or about USD 1.7 billion (NEFCO, 2011).

How Funds Can Be Accessed

Candidates for NEFCO funding contact them first to determine eligibility, either directly or by way of an online form. This is followed by an initial screening of the project and the applicant company.

Nordic Project Fund (Nopef)³¹

What It Does

Nopef is both an institution and a fund providing interest-free loans for feasibility studies for Nordic SMEs to set up companies in international locations outside the European Union/European Free Trade Association area. Nopef is bound by no other geographical or sector constraints.

Nopef was established by the Nordic countries in 1982, and the institution is administered under the Nordic Council of Ministers. It is funded by the five Nordic countries via the Council. In 2011, the fund

received EUR 2.1 million (USD 2.8 million), and the fund balance at the end of 2011 was EUR 5.52 million (USD 7.32 million). In 2010, Nopef lent EUR 2.11 million (USD 2.80 million).

How It Operates

The fund provides conditional loans for setting up an international business and are limited to 40 percent of feasibility study costs. If the feasibility study results in the establishment of a business, the loan can be fully converted into a grant. If it fails to establish an enterprise, then only up to 50 percent of the loan can be converted into a grant. The loans average EUR 30,000 (USD 40,000).

The fund works on three-year business contracts, currently for the period 2011–2013. They have aimed at 95 applications per year, approving 60 and resulting in about 25 established businesses. In 2011, they received 96 applications, 65 of which were approved, and they expect 26 of these to lead to established businesses. China and the rest of Asia dominate, with 46 percent of loans distributed to Nordic businesses setting up in Asia, including 18 percent to China and 28 percent to the rest of Asia.

Sustainable growth, environmental technology, and renewable energy together comprise a major focus area. In 2011, 33 of the 96 applications fell within this focus area.

How Funds Can Be Accessed

To be eligible, SMEs should have fewer than 250 employees, an annual turnover of less than EUR 50 million (USD 66 million), and be operational in Nordic countries. Furthermore, the enterprise must have experience in the same business area as the project, have sufficient financial and human resources, have been operating for at least one year, and must not be already established in the project country. The project must cater to the advantage of Nordic national, regional, and business interests (NOPEK, 2011).

³⁰ See http://www.nefco.org/en/financing/nefco_carbon_fund_necf.

³¹ See <http://www.nopef.com>.

4.2.5 European Investment Bank (EIB)

What It Does

EIB, the bank of the European Union (EU), provides project-oriented loans to the public and private sector that are linked to financing of fixed assets. The current EU mandate governing EIB authorizes lending of up to EUR 1 billion (USD 1.3 billion) to Asia, during the period 2007–2013, to support EU cooperation strategies and to complement other EU programs and instruments in these regions.³²

How It Operates

EIB prioritizes projects contributing to environmental sustainability, such as climate change mitigation and energy security. With these projects, EU companies need not be involved. EIB provides individual loans or credit lines of more than EUR 25 million (USD 33 million), and typically more than EUR 40 million (USD 53 million) to projects, governments, or financial intermediaries.³³ SMEs can access lending through framework loans to financial institutions.

Investment-grade countries and projects are also eligible to receive loans under EIB's EUR 4.5 billion (USD 6.0 billion) Energy Sustainability and Security of Supply Facility for projects promoting clean technology transfer to developing countries, which is additional to the mandate. EIB also supports the EU presence in Asia by financing Foreign Direct Investment and transfer of technology and expertise from Europe.

In addition, the EIB Group advises the Global Energy Efficiency and Renewable Energy Fund (GEEREF), and partners in the EIB/KfW EUR 100 million (USD 133 million) Carbon Fund for CDM projects in least developed countries.

Globally, in 2011, EIB provided EUR 18 billion (USD 24 billion)—one-third of its total lending—for climate finance. EIB currently funds more than

10 percent of all renewable investments in Europe (EIB, 2011). From 1993 to the end of 2010, EIB financed a total of EUR 4.1 billion (USD 5.4 billion) in Asia, with 43 percent of this in China; 36 percent in Southeast Asia (12 percent Vietnam, 10 percent Philippines, eight percent Indonesia, four percent Thailand, one percent Laos, one percent Bangladesh); and 21 percent on the Indian sub-continent (including nine percent in India itself).³⁴ In the current mandate period of 2007–2013 alone, EIB has financed EUR 1.9 billion (USD 2.5 billion): EUR 839 million (USD 1.11 billion) under that Asia mandate and EUR 1.06 billion (USD 1.40 billion) under the Energy Sustainability and Security of Supply Facility. More than three-quarters of this amount was invested in projects that mitigate climate change.

Recent EIB framework loans in the region include:

- EUR 250 million (USD 331 million) in 2012 to the Ministry of Finance in Vietnam for on-lending to select state-owned banks to support renewable energy, energy efficiency, and other climate change mitigation and adaptation sectors. This followed a EUR 100 million loan for the same purposes in 2009.
- EUR 200 million (USD 265 million) in 2011 to the ICICI Bank in India for climate change mitigation projects.
- EUR 100 million (USD 133 million) in 2011 to Srei Infrastructure Finance Limited, in India, to support investment projects that contribute to climate change mitigation.
- EUR 150 million (USD 199 million) in 2008 to the EXIM Bank of India for renewable energy and energy efficiency projects, followed by another EUR 150 million investment in 2012.

How Funds Can Be Accessed

In applying for loans, project promoters should pro-

³² See <http://www.eib.org/projects/regions/ala/index.htm>.

³³ See <http://www.eib.org/projects/regions/ala/index.htm>.

³⁴ Factsheet – EIB financing in Asia (EIB, 2011).



vide EIB with a detailed description of their capital investment and prospective financing arrangements. For smaller projects, those under EUR 25 million, project promoters should contact recipients of framework loans in their respective country.

4.3 Bilateral Development Finance Institutions, Aid Agencies and Export Credit Agencies

Bilateral finance for climate change totals USD 22.77 billion, more than 1.5 times total multilateral finance. USD 2.64 billion of this is allocated for adaptation, and USD 19.13 billion for mitigation.

Globally, in 2010, bilateral finance-institution climate finance contributions were topped by the Japan International Cooperation Agency (JICA), with USD 6.42 billion. The French Development Agency (AFD) provided USD 3.72 billion, the German Development Bank (KfW) provided USD 3.45 billion, and Brazil's Banco Nacional de Desenvolvimento Econômico e Social (BNDES) provided USD 3.15 billion (Climate Policy Initiative, 2011).

4.3.1 Japan

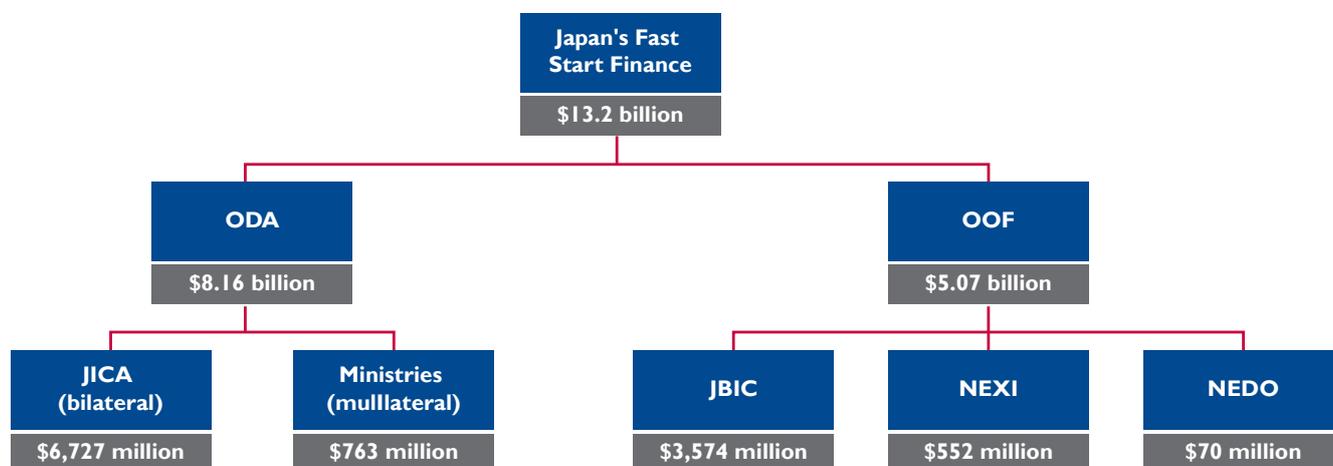
In 2008, Japan pledged USD 10 billion of climate finance for adaptation and mitigation measures in the Cool Earth Partnership, and increased this to USD 15 billion in the December 2009 Hatoyama Initiative, now referred to as Japan's Fast Start Finance. This pledge included USD 11 billion of public finance and USD 4 billion of private finance to be channeled in 2012 through bilateral and multilateral means.

By the end of February 2012, Japan had approved USD 13.2 billion. Over USD 8 billion had been approved for ODA (official development assistance), USD 6 billion of which were grants, and USD 2 billion of which were concessional loans (see Figure 7). JICA was the main climate finance implementer, channeling about half of the 2010–2011 funding bilaterally through grants, TA, and concessional loans. Finance for multilateral funds, primarily for grants, was USD 763 million in 2010–2011. The other USD 5 billion is classified as other official flow (OOF). USD 3.1 billion of the OOF is leveraged private finance. About a quarter of total Japanese Fast Start Finance

³⁰ See http://www.nefco.org/en/financing/nefco_carbon_fund_necf.

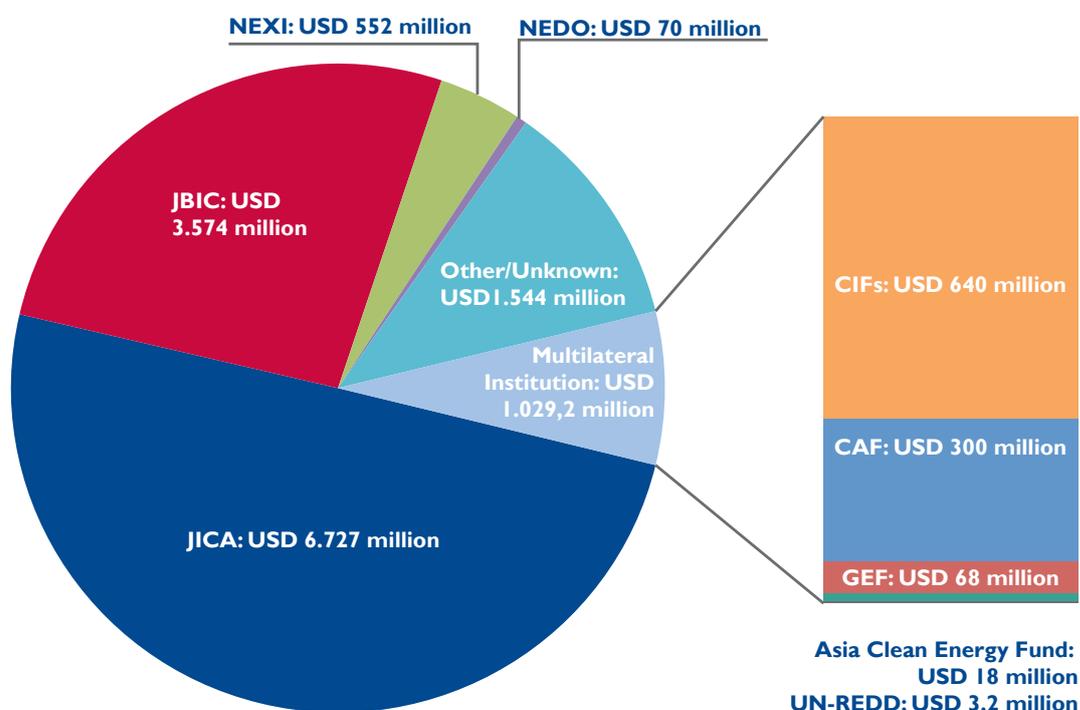
³¹ See <http://www.nopef.com>.

Figure 7: Approved Japanese Fast-Start Finance



ODA and OOF breakdown are official figures as of the end of February 2012, while breakdown by channel are based on IGES assessment (ODI, 2012). USD 1.5 billion worth of finance was distributed under another donor or an unidentified donor or project.

Figure 8: Japanese Fast-start Finance by Channeling Institution in 2010–2011



Source: ODI, 2012

³² See <http://www.eib.org/projects/regions/ala/index.htm>.

³³ See <http://www.eib.org/projects/regions/ala/index.htm>.

³⁴ Factsheet – EIB financing in Asia (EIB, 2011).

Guided by the Ministry of Foreign Affairs, JICA coordinates official development assistance, providing developing countries with grants or loans mostly for infrastructure. JICA typically finances public sector agencies, but can finance private sector activities where these incorporate a development perspective.

Japan Bank for International Cooperation (JBIC) is a public export credit agency, providing private sector firms with import and export loans, equity, guarantees, and loan securitization. It also conducts research. It has USD 275.8 billion in loan and equity commitments in Asia and the Pacific, representing 23.7 percent of its global investment. JBIC supports many sectors with a strong focus, in all of their projects, on environmental protection. In the energy sector, they support only supercritical power projects, focusing on combined-cycle gas in heavy industry, and supporting energy efficiency, especially in coal and gas-fired thermal power plants. It co-finances projects with private banks, providing a lower interest rate for projects that support the environment. It initially focused on Central America, and has started work in India. With ADB and IFC, it co-finances several environmental funds in Asia.

Traditionally, aside from responding to disruptions in the international economy, JBIC supported only Japanese companies for overseas development and acquisition of natural resources, improving international competitiveness among Japanese industries. In 2010, however, it launched the GREEN (Global Action for Reconciling Economic Growth and Environmental Preservation) program to promote overseas business in preserving the global environment. GREEN does not require the involvement of Japanese companies. Another recent prominent initiative in climate finance is the E-FACE (Enhanced Facility for Global Cooperation in Low Carbon Infrastructure and Equity Investment) Initiative to Finance Strategic Projects. This facility finances deployment of overseas infrastructure, including risk capital for energy conservation and

new energy projects, and supports environmental investment on the part of both governments and private sector firms in developing countries in Asia and elsewhere.³⁵

Japan's future contributions to climate finance are currently uncertain. Since the Fukushima Daiichi nuclear disaster in March, 2011, Japan has been re-designing its energy-mix policy, and will need to set a domestic energy reduction target before considering the international market.

Global Action for Reconciling Economic Growth and Environmental Preservation

Eligible projects for JBIC's GREEN program include: (a) renewable energy; (b) energy efficiency in industry, power and water, transport, and community/building utilities and appliances; and (c) other projects such as reducing methane or chlorofluorocarbons (CFCs), and carbon capture and storage.

Eligible entities include sovereign and sub-sovereign governments, government institutions, public service providers, and national and international financial institutions.

In Asia, closed finance includes a USD 200 million loan for renewable energy and a USD 300 million loan for energy efficiency with ICICI Bank in India, and a USD 20 million equity participation in the South Asia Clean Energy Fund.

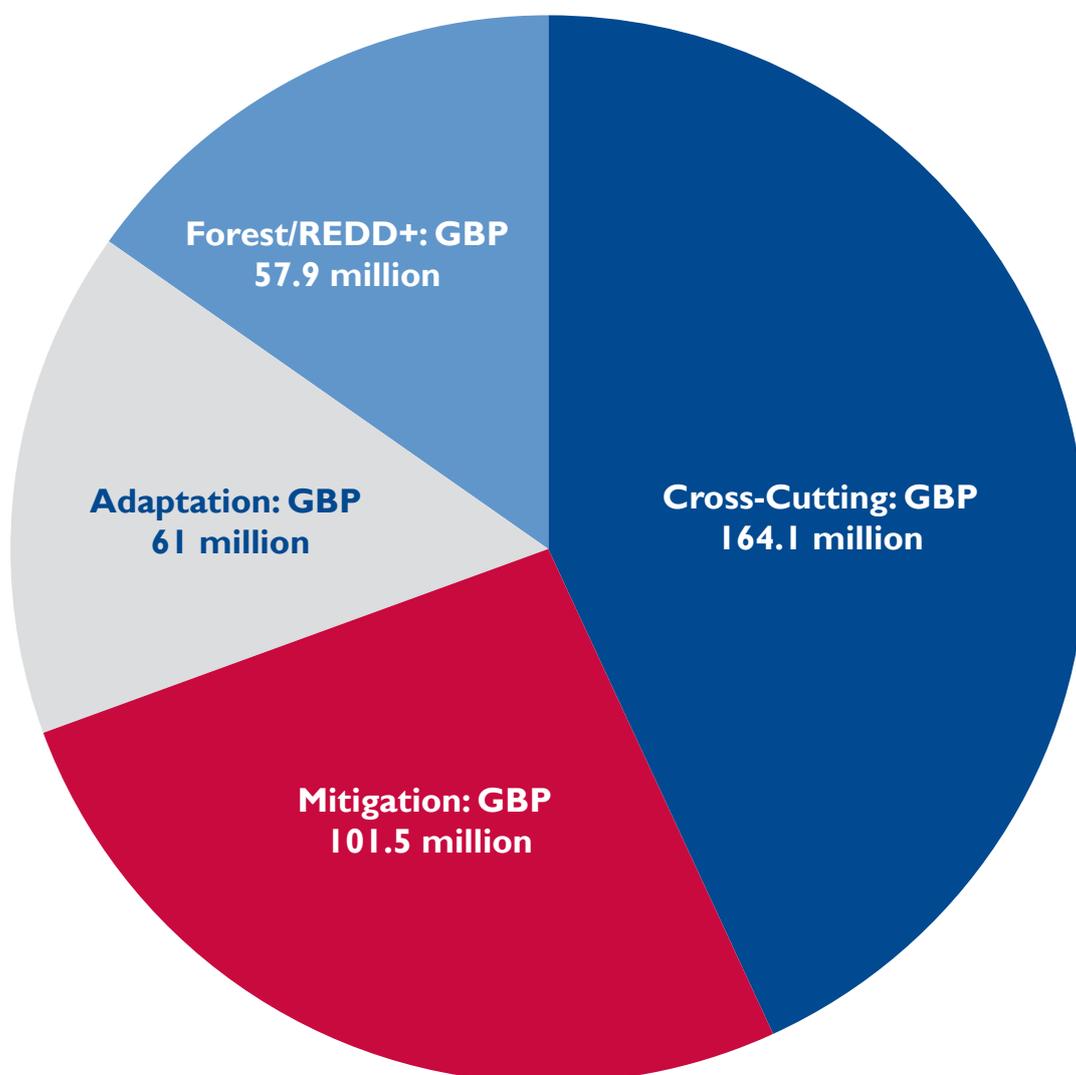
³⁵ See <http://www.jbic.go.jp/en/about/press/2011/0401-02/index.html>.

4.3.2 United Kingdom

The UK Government is on track to provide its GBP 1.5 billion (about USD 2.4 billion) Fast Start finance pledge. They have made GBP 1,050 million of multilateral commitments and GBP 385 million of bilateral commitments, and the remainder was

due to be disbursed by the end of 2012. Bilateral spending has been primarily directed toward mitigation and toward projects and programs supporting more than one climate change objective (see Figure 9).

Figure 9: Bilateral Fast-start Commitments from the UK Government by Climate Change Focus



Source: UK Fast Start Finance brochure, November 2012.



Climate finance is distributed through the Department for International Development (DFID), Department of Energy and Climate Change (DECC), Department of Environment, Food and Rural Affairs (Defra), and the Foreign Commonwealth Office. It is disbursed regionally, nationally for larger agencies, and through international climate funds and multilat-

eral financial institutions. Much of the funding is competitively bid, rather than allocating set country sums.

The UK has promised climate funding past the fast-start period, putting forward GBP 2.9 billion (USD 4.4 billion) until 2015 in its International Climate Fund (ICF).³⁶

The UK's International Climate Fund

Since 2011, the International Climate Fund has provided the primary channel for UK climate finance. It has GBP 2.9 billion (USD 4.4 billion) of ODA to spend during 2011–2015 in confronting climate change and reducing poverty. Of this sum, as of this writing, GBP 1.8 billion (USD 2.7 billion) has yet to be allocated. A total of GBP 1 billion (USD 1.5 billion) will be spent on adaptation, GBP 0.9 billion on low-carbon development, and GBP 0.9 billion on forestry. Most of the funding (GBP 1.8 billion) will go through the DFID, another large amount (GBP 1 billion) will go through DECC, and Defra will handle GBP 100 million (USD 150 million) for forestry.

Source: International Climate Fund Implementation Plan 2011/12 – 2014/15. Technical paper.

Southeast Asia Prosperity Fund

The UK Foreign and Commonwealth Office supports programs to improve climate change policymaking through the Southeast Asia Prosperity Fund, contributing to such efforts as improving the business environment for low-carbon investments, designing low-carbon policy frameworks, and encouraging sustainable production of palm oil. The GBP 600,000 (USD 900,000) fund provides one-year grants through an annual bidding process, ranging from GBP 13,000 to GBP 100,000 (USD 20,000 to USD 150,000), and covering up to 100 percent of program funding. The preference is to fund programs that promise a

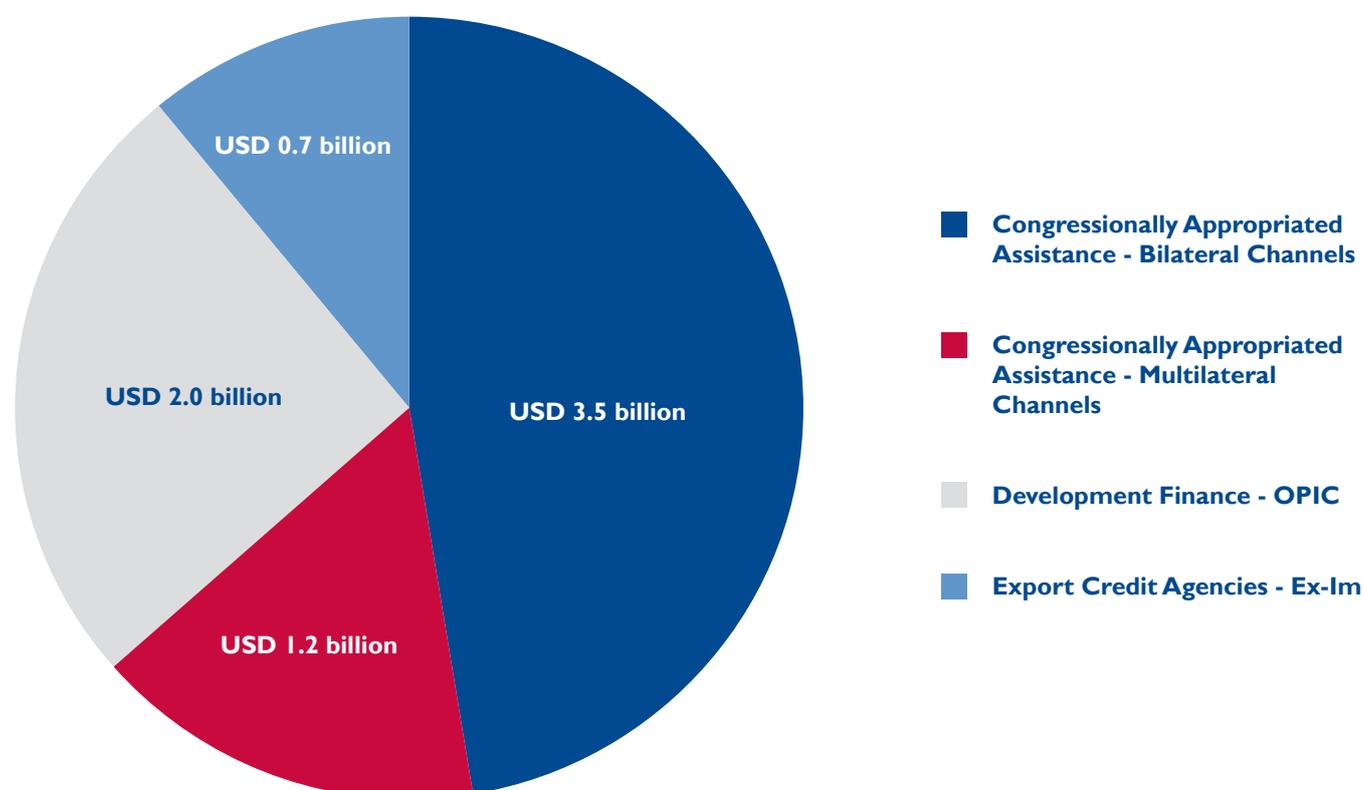
³⁶ See <http://www.decc.gov.uk/assets/decc/11/tackling-climate-change/international-climate-change/3758-uk-fast-start-climate-finance-brochure-2011.pdf>.

4.3.3 United States

According to the US Department of State, the US pledged USD 7.5 billion for the fast-start period (see Footnote 14, above), all of which has been committed. Almost two-thirds of this was Congressionally appropriated assistance, approximately one-quarter was development finance, and the remainder went through export credit agencies and multilateral channels (see Figure 10). USD 4.7 billion of Congressionally appropriated assistance was dedicated to climate change via the US Global Climate Change Alliance. USD 1.2 billion was con-

tributed to multilateral climate change funds, and the remaining USD 3.5 billion was delivered as grants through bilateral channels including USAID, the US Department of State, and the Millennium Challenge Corporation. USD 2.0 billion of development finance was channeled through the US Overseas Private Investment Corporation (OPIC), and USD 0.7 billion was channeled through the Export-Import Bank of the United States (Ex-Im Bank) (US Department of State, 2012). The US expects to continue its support for international climate change activities following the Fast Start period.

Figure 10: United States Fast-start Climate Contribution



Source: US Department of State, 2012.

US Overseas Private Investment Corporation

What It Does

OPIC is the US Government's development finance institution. It mobilizes private capital to help solve critical development challenges. OPIC works with the US private sector and helps US businesses develop projects in emerging markets.³⁷ OPIC achieves its mission by providing investors with financing, guarantees, political risk insurance, and support for private equity investment funds. OPIC's products are uniquely tailored to assist the US private sector with conducting business in a wide range of developing countries.

The renewable resources sector is one of OPIC's top priorities. OPIC commitments to renewable resources projects have grown dramatically to reach USD 1.6 billion of commitments in 2012, which is projected to catalyze an additional USD 1 billion in external capital financing.³⁸ While the majority of the commitments have been to energy projects, OPIC also focuses on projects tied to food security, delivering potable water and protecting forests.

OPIC is instrumental in helping to fulfill the US Government's commitments set out the UN Climate Change Conferences in Copenhagen, Cancun, Durban, and most recently, Doha. In fact, OPIC commitments to renewable resources projects represented more than one-fourth of all US 'fast start' climate financing. Upon completion, these projects are anticipated to generate 451 MW of renewable power and help avoid more than 1 million tons of CO₂ emissions. OPIC is also on target to meet its internal goal of reducing greenhouse gas emissions for its portfolio within 10 years.

How It Operates

OPIC financing provides medium- to long-term funding through direct loans and loan guarantees to eligible investment projects in developing countries

and emerging markets. By complementing the private sector, OPIC can provide financing in countries where conventional financial institutions often are reluctant or unable to lend on such a basis. OPIC's Small and Medium-Enterprise Financing is available for businesses with annual revenues of less than USD 400 million. OPIC's Structured Financing focuses on larger US businesses and supports large-scale projects that require large amounts of capital.

OPIC provides financing either through direct loans, which are reserved for projects sponsored by or substantially involving US small and medium enterprises (SMEs), or through loan guarantees, which are typically used for larger projects. OPIC can offer loans as small as USD 350,000, and can normally guarantee or lend up to USD 250 million per project.

Investment Funds. In response to the critical shortfall of private equity capital in developing countries, OPIC supports the creation of privately owned and managed investment funds. These funds make direct equity and equity-related investments in new, expanding, or privatizing emerging market companies. OPIC-supported funds help emerging market economies access long-term growth capital, management skills and financial expertise, all of which are key factors in expanding economic development and creating new opportunities for people in low-income and developing nations.

Since 1987, OPIC has committed USD 4.4 billion to support the creation of more than 63 private equity funds in emerging markets. These funds in turn have invested USD 5.6 billion in more than 570 privately owned and managed companies across 65 countries. Through these commitments, OPIC catalyzes US foreign direct investment and accelerates the economic and social development within these markets.

Political Risk Insurance. Investing in emerging markets can be unpredictable, even for the most so-

³⁷ See www.opic.gov.

³⁸ For more information on OPIC's investments in renewable energy, see <https://financere.nrel.gov/finance/content/opic-can-help-pick-check-renewables>.

phisticated investors. OPIC's insurance, combined with its financing options, allows US businesses to take advantage of commercially attractive opportunities in emerging markets, mitigating risk and helping them compete in a global marketplace. OPIC provides innovative, comprehensive, and cost-effective risk-mitigation products to cover losses to tangible assets, investment value, and earnings that result from political perils.

Political risk insurance is available to US investors, lenders, contractors, exporters, and NGOs for investments in 150 developing countries, including high-risk countries. Coverage is offered for small and large investments that provide positive developmental benefits.

How Funds Can Be Accessed

Applications for OPIC financing and insurance are made directly to OPIC. The application process typically takes six to 12 months depending on the amount of the investment and complexity of the project. See www.opic.gov for more information.

US Export-Import Bank

What It Does

Ex-Im Bank is the official export credit agency of the United States. Ex-Im Bank's mission is to assist in financing the export of US goods and services to international markets.³⁹ A key Ex-Im Bank function is enabling US companies to turn export opportunities into sales. Ex-Im Bank does not compete with private sector lenders, but provides export financing products that fill gaps in trade financing. They assume credit and country risks that the private sector may be unable or unwilling to accept.

Ex-Im Bank provides working capital guarantees (pre-export financing), export credit insurance, and loan guarantees and direct loans (buyer financing). With more than 77 years of operations, Ex-Im Bank has supported more than USD 456 billion of US exports.

Ex-Im Bank applies three basic financing mechanisms: (a) corporate loans based on the balance sheet of the borrower; (b) limited recourse project finance with a special-purpose company borrower and project cash flows as the source of repayment; and (c) structured finance transaction with the borrower's balance sheet with credit enhancement.

How It Operates

Corporate loans. Based strictly on the balance sheet of the borrower or a guarantor, Ex-Im Bank applies the following credit standards:

- positive operating profit over the previous two years;
- positive net income over the previous two years;
- positive cash flow from operations (latest year);
- EBITDA⁴⁰/Debt Service greater than 150 percent;
- total liabilities/total net worth less than 175 percent; and
- Ex-Im Bank exposure/total net worth less than 40 percent.

The borrower submits an application for either a direct loan to Ex-Im Bank, or has the mandated partner bank submit the same application in the case of a loan guarantee.

Limited-recourse project finance loans. Ex-Im Bank offers project financing in terms of limited-recourse loans, as defined by the contractual relationships within each project, with repayments from project cash flows. These types of loans rely on a large number of integrated contractual arrangements. Candidate projects for such financing include greenfield⁴¹ projects and significant facility or production expansions. These projects do not rely on the typical export finance security package, which provide lenders recourse to a foreign government, financial institution, or established corporation. Typically, in a project finance structure, Ex-Im Bank lends with a special-purpose company borrower, and project cash flows are the source of repayment.

³⁹ See www.exim.gov.

⁴⁰ Earnings before interest, taxes, depreciation, and amortization.

⁴¹ A 'greenfield' project is constructed on unused land, unconstrained by the need to remove or incorporate existing structures

Structured finance. Ex-Im Bank's structured finance loan is a transaction with the borrower's balance sheet enhanced by special features.⁴² Many projects are too large to be feasible strictly on a balance sheet, but too small to merit the time and expense associated with project finance transactions. 'Structured' finance may provide an alternative, especially in developing countries, where many companies lack sufficient credit strength in terms of asset size, operating history, or cash flows to provide reasonable assurance of repayment for multi-million dollar projects. For example, when a smaller company's balance sheet is not strong enough to justify a large but beneficial expansion, pure corporate finance, which relies on a company's existing assets, is not an option. For these borrowers, structured finance can provide the credit enhancements necessary to push Ex-Im Bank finance terms 'across the goal line' and meet Ex-Im Bank Board standards for reasonable assurance of repayment.

In contrast, the same borrowers may lack both the experience and the money needed to pay the legal and financial advisory costs associated with project finance. Even if they have the resources necessary for project finance, they often cannot justify such expenses, which often run into the millions of dollars. For these projects, structured finance offers a cheaper and faster option than traditional recourses.

Ex-Im Bank has recently introduced 'Renewable Express,' a new product that helps US exporters of solar energy equipment, technology, and services by providing streamlined financing of their exports to small solar energy projects in international markets. Ex-Im Bank can consider project financing for small renewable energy producers seeking loans of between USD 3 million and USD 10 million within as short a time as 60 days.

Ex-Im Bank is demand-driven, and most of its solar investments in the 11 focus countries in this report have been in India. Ex-Im Bank was the first international financing institution to approve a solar power

project under India's National Solar Mission, and one of the first for Gujarat. An example of Ex-Im financing in the solar sector is financing for a 40 MW Dahanu Power Project (solar PV plant) being constructed by Reliance Infrastructure Limited in the State of Rajasthan, India (Reliance Power, 2012). Other projects include the following (O'Connor, undated):

- Dalmia Solar Power, Ltd. is using a USD 30 million, 15-year direct loan from Ex-Im Bank to finance 2,918 Infinia Solar Stirling engine concentrated solar modules for a 10 MW project in Rajasthan.
- Ex-Im Bank has extended a 12-year loan guarantee to PNC Bank for a USD 19 million loan to ACME Solar to finance First Solar thin-film modules for a 15 MW project in Gujarat.⁴³
- Tatith Energies Gujarat Private Ltd. on September 30, 2011 received a USD 19 million Ex-Im direct loan to finance their purchase of SolarWorld modules for a 5 MW project in Gujarat under GUVNL off take.
- Ex-IM Bank authorized a USD 16 million, 16.6-year direct loan for Azure Power in July 2011 to finance a 5 MW solar power project applying First Solar thin-film modules in Rajasthan.
- Ex-Im Bank authorized a USD 9.2 million, 18-year loan to Punj Lloyd Solar Power Ltd. for thin-film solar modules from Abound Solar for a 5 MW solar power plant in Rajasthan.
- Ex-Im Bank authorized financing for a USD 3.7 million corporate loan to Universal Solar for a 2 MW ground-mount PV project using Miasole thin-film modules in Ahmedabad.

How Funds Can Be Accessed

Applications can be made directly with Ex-Im Bank, and typically take six to 12 months to process. Ex-Im recently launched the solar express program with stated processing time of two months for investments below USD 10 million.

⁴² Structured finance combines elements of both corporate and limited-recourse project finance. Like corporate finance, it involves full recourse to the project sponsor's balance sheet. Like project finance, on the other hand, it involves special features to enhance the credit of the borrower.

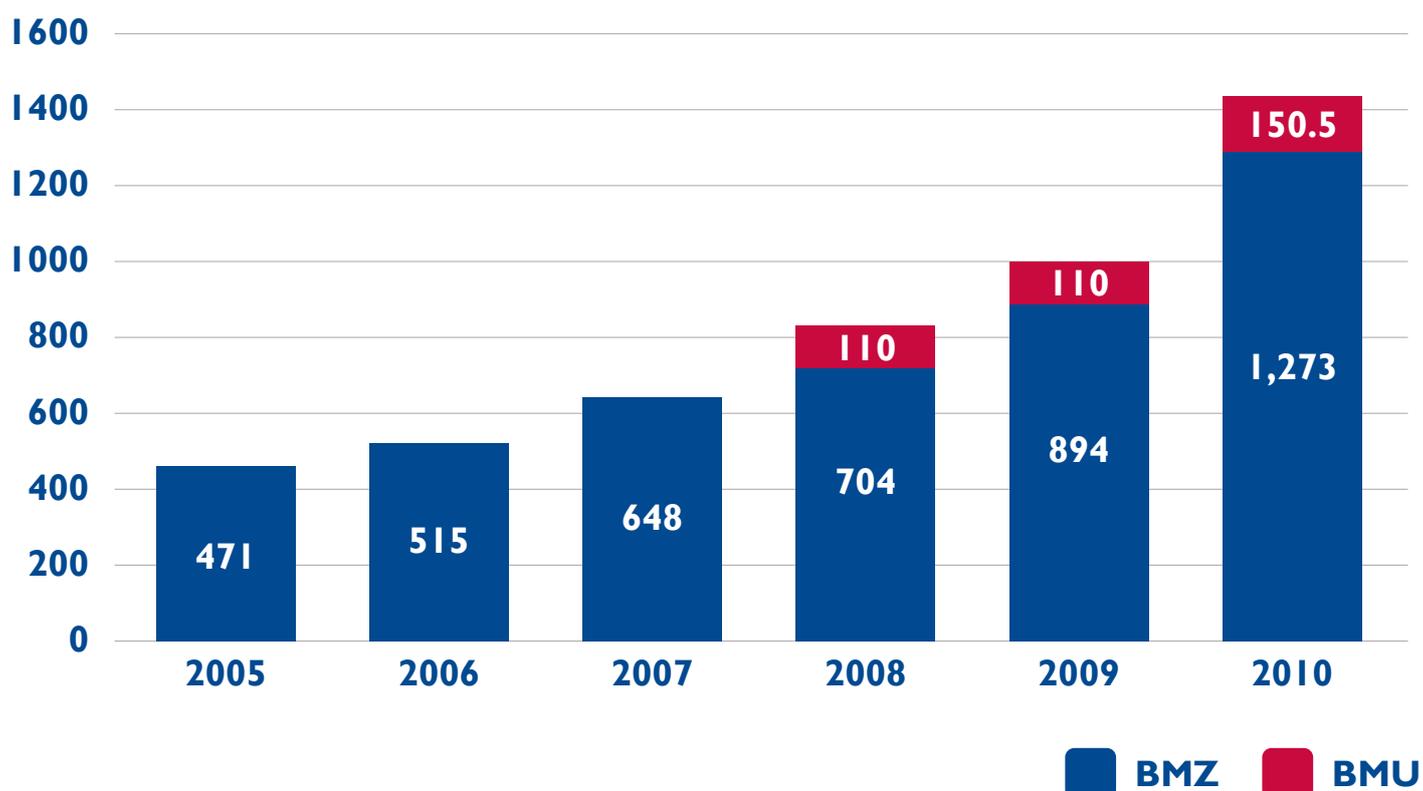
⁴³ GUVNL, or Gujarat UrjaVikas Nigam Limited, is an electrical services umbrella company in the state of Gujarat, India.

4.3.4 Germany

Germany is among the top climate finance donors, and its contributions have increased from year to year (see Figure 11). In 2010 and 2011, Germany's Fast-Start finance contribution was EUR 858.6 million (USD 1.1 billion); they plan to contribute another EUR 471 million (USD 614 million) in 2012. EUR 124 million (USD 162 million) went to projects in the 11 focus countries, and EUR 604 million

(USD 787 million) went to global and regional programs. Mitigation projects and programs received over half of the financing (55 percent, or EUR 326 million, USD 425 million), adaptation received just over a quarter (26 percent, EUR 155 million, USD 200 million), and REDD+ projects received just 18 percent (EUR 107 million, USD 240 million). In December 2012, Germany pledged to increase its climate financing to EUR 1.8 billion (USD 2.35 billion) in each of 2013 and 2014.

Figure 11: German Climate Commitments through BMZ and BMU⁴⁴ (EUR million)



Source: http://www.bmz.de/en/what_we_do/issues/klimaschutz/finanzierung/index.html.

⁴⁴BMZ is Germany's Ministry for Economic Cooperation and Development.
BMU is Germany's Ministry for the Environment, Nature Conservation and Nuclear Safety.

In 2010–2011, nearly half the financing (EUR 391 million, USD 510 million) went to international climate funds, and the remainder went through bilateral channels. Of these, KfW Development Bank (KfW Entwicklungsbank) manages financial cooperation, and Gesellschaft für internationale Zusammenarbeit (GIZ) primarily provides technical assistance. Other bilateral instruments also exist, among them the Initiative for Climate and Environmental Protection (Initiative für Klima- und Umweltschutz, IKLU), and the International Climate Initiative (Internationale Klimaschutzinitiative, ICI).

Three subsidiaries of the German government-owned development bank KfW banking group are active in Asia: IPEX-Bank serving import-export project and corporate finance; KfW Entwicklungsbank providing public sector development aid; and its private arm the German Investment and Development Corporation (DEG).

KfW IPEX-Bank promotes German industry, providing finance for German investors, for German exports or suppliers, and for raw materials that will be shipped to Germany. The total project costs they manage average about USD 800 million, and run a minimum of USD 50 million. KfW administers a EUR 1.5 billion (USD 2 billion) portfolio/credit line available for renewable energy and energy efficiency projects, and makes about EUR 500 million (USD 650 million) of new commitments per year in the energy sector. Half of their clean-energy investments are credit and half are direct investments.

KfW Entwicklungsbank committed EUR 2.75 billion (USD 3.6 billion) to environmental and climate relevant projects in 2011, including EUR 0.9 billion (USD 1.2 billion) to renewable energy and EUR 0.3 billion (USD 0.4 billion) to energy efficiency. Climate change mitigation projects totaled EUR 1.77 billion (USD 2.3 billion) in 2011, with Asia and Oceania the largest recipient region (KfW Entwicklungsbank, 2012).

DEG can support smaller projects than KfW-IPEX is able to, to a minimum of USD 20 million. DEG contributes to and can draw from the multi-actor Interact Climate Change Facility (ICCF).⁴⁵ Although DEG and KfW IPEX-Bank are incentivized by climate targets and have annual budget recommendations, they are driven by demand in the private sector.

Climate Protection Partnerships

With Climate Protection Partnerships, DEG supports private sector projects in developing countries and emerging markets that apply innovative, climate-friendly technology or adapt proven technology for GHG reduction. They provide up to EUR 200,000 (USD 260,000) and up to 50 percent of project costs. The first project was financed in 2010 for energy efficiency in the Indian textile sector. This is part of Germany's International Climate Initiative.

⁴⁵ ICCF is a joint investment facility for financing climate change and climate efficiency projects in developing countries. It is backed by the majority of the European DFIs. ICCF will provide long-term loans, guarantees, and mezzanine finance of up to EUR 45 million to private sector projects that reduce climate change by cutting greenhouse gas emissions. See [http://www.sifem.ch/portfolio/portfolio-composition/I-interact-climate change-facility](http://www.sifem.ch/portfolio/portfolio-composition/I-interact-climate-change-facility).

4.3.5 Norway

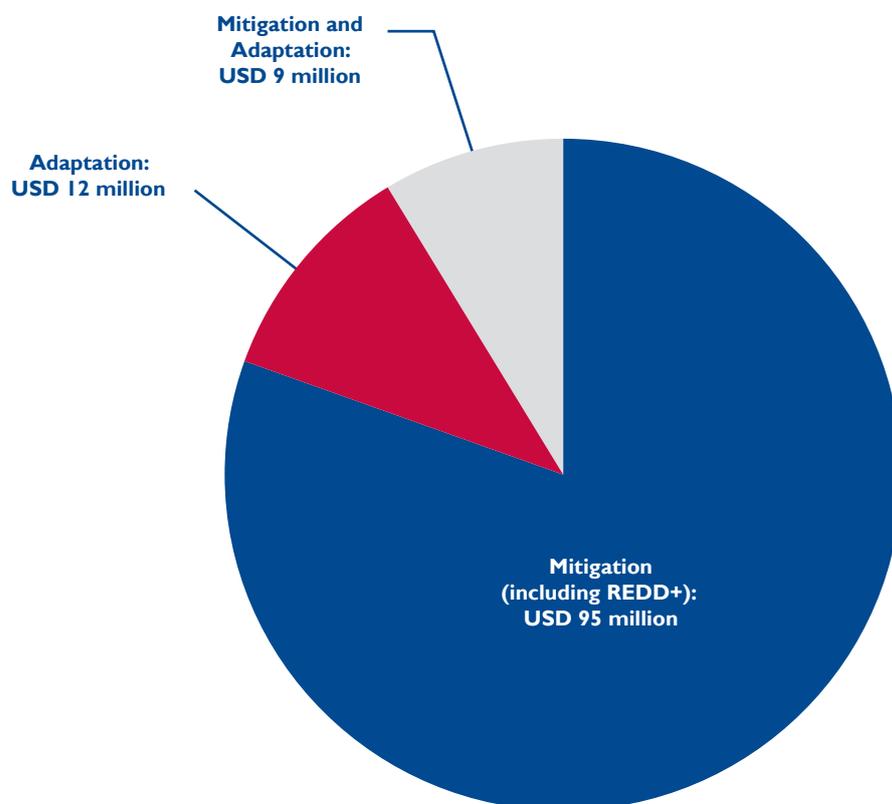
Norway is one of the top five donors of climate change finance, providing USD 1.4 billion of bilateral support during 2010 and 2011. The share of bilateral climate finance in their overall ODA increased from three percent in 2006 to 21 percent in 2011. They also contributed multilateral support of USD 726 million during 2010 and 2011.

Norway's main climate change focus is on mitigation (REDD+ and renewable energy), but it plans to scale up financial assistance for adaptation. The largest part of Norway's mitigation assistance is through the Government of Norway's International Climate and Forest Initiative (NICFI), which

aims to support the development of international REDD+ architecture, and reduce GHG emissions through REDD+.

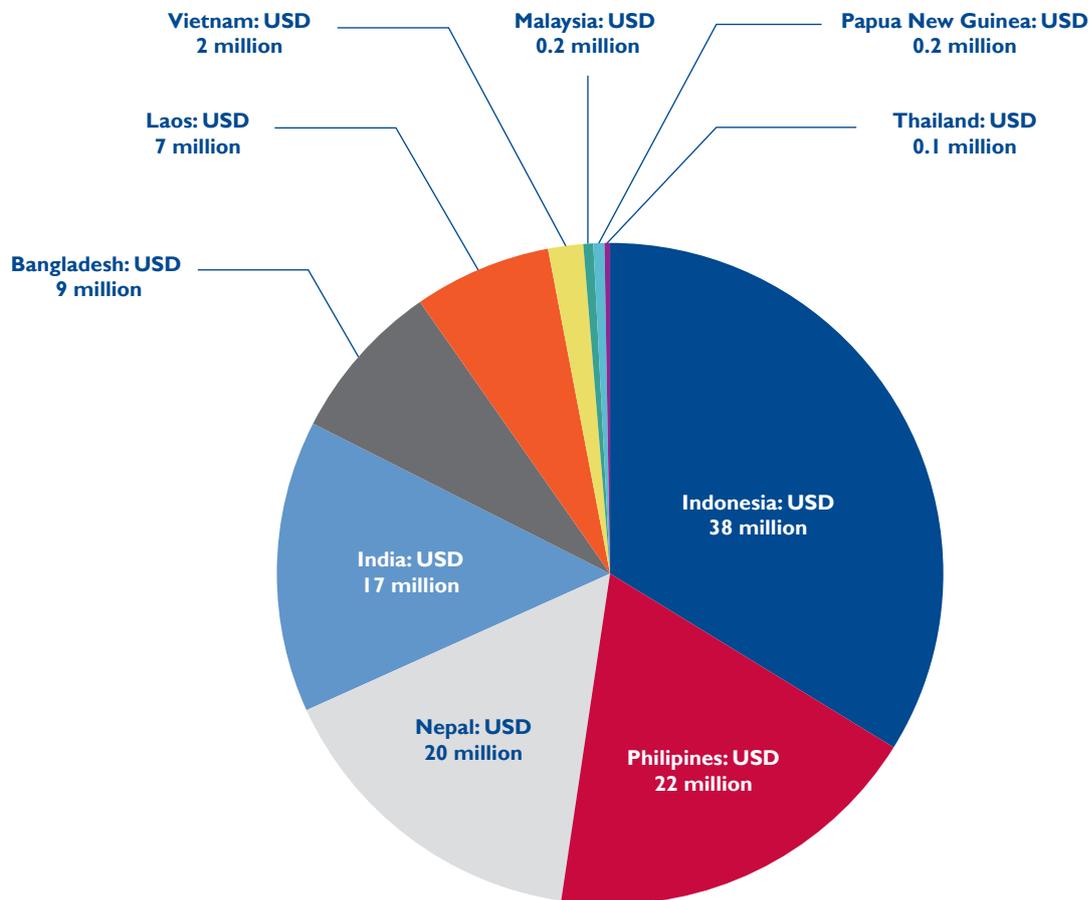
Of the USD 1.4 billion of Norwegian bilateral assistance during 2010–2011, USD 116 million went to the 11 focus countries, primarily to mitigation activities (Figure 12). Norway's primary bilateral presence in the region is Indonesia, with whom they have a performance-based memorandum of understanding (MOU) to support efforts to reduce emissions from forest and peat deforestation and degradation with up to USD 1 billion over a number of years. Norway also contributes significant amounts to India, Nepal, and the Philippines (see Figure 13).

Figure 12: Norwegian Bilateral Assistance to the 11 Focus Countries in 2010 and 2011



Source: http://unfccc.int/files/adaptation/application/pdf/norwegian_fast_start_finance_report_2012.pdf.

Figure 13: Norwegian Bilateral Climate Finance to the II Focus Countries 2010–2011



Source: http://unfccc.int/files/adaptation/application/pdf/norwegian_fast_start_finance_report_2012.pdf.

4.3.6 France

The Agence Française de Développement (AFD) is the primary outlet for France’s bilateral aid efforts. It is a public institution that provides financing and technical assistance for sustainable development projects and programs to government local authorities and public companies in developing and emerging economies, and the fight against climate change is one of its two main objectives. A subsidiary of AFD, Proparco, provides loans and investment capital to the private sector.

The number and size of allocations to climate change mitigation projects and programs have been increasing steadily since 2007. AFD provided USD 3.72 billion to projects and programs

tackling climate change in 2010 (Climate Policy Initiative, 2011), and during 2011 committed EUR 2 billion (USD 2.6 billion), including EUR 1.6 billion (USD 2.1 billion) on mitigation (AFD, 2011). France is continuing this commitment with a pledge of EUR 2 billion (USD 2.6 billion) in each of 2013 and 2014.

AFD’s presence in Asia began two decades ago, in Cambodia, Laos, and Vietnam. It has since expanded to India (where they have a significant presence), Indonesia, the Philippines, Thailand, and, since 2011, to Bangladesh. During 2007–2011, Asia received almost 30 percent of AFD’s total funding toward the mitigation of GHG emissions. In the past year, moreover, due to a scaling up of action to fight climate change, AFD activity has

grown in Asia. During 2012–2016, AFD aims to allocate 70 percent of annual funding in Asia to projects with positive impacts on the climate (AFD, 2012), and Proparco aims to allocate 30 percent of its annual funding to the same ends.

AFD's action plan for climate change during 2012–2016 indicates action will focus on supporting the implementation of low-carbon development policies. In emerging countries such as in Asia, furthermore, climate operations will focus mainly on renewable energy and energy efficiency in the urban, transportation, local government, forestry, and agriculture sectors (AFD, 2012).

AFD jointly finances projects and programs with other organizations, including ADB, JICA, and Korea Eximbank. Financial instruments for climate change and low-carbon development are primarily non-concessional or semi-commercial loans for energy, transportation, and cities. AFD provides budget support lending for activities such as national climate change plans—previously undertaken in Indonesia and Vietnam, and perhaps to be soon implemented in the Philippines—NAMAs, and sustainable city development policies. Guarantees, equity investments, grants and subsidies, and technical assistance may also be provided depending on the type of investment. For the private sector, AFD includes credit lines to banks, and multi-investor structured investments such as debt funds and venture capital funds (AFD, 2012). During 2012–2016, AFD will focus on developing tools such as guarantees, risk sharing, and credit lines to leverage and drive private sector involvement.

The French Global Environment Facility (Fonds Français pour l'Environnement Mondial, or FFEM) is a French bilateral fund that provides grants to sustainable development projects consistent with French development assistance strategic priorities. Although focused on Africa and the Mediterranean, funds are also available to Asia, and 75 percent of the FFEM's support goes to climate and biodiversity projects.

4.3.7 Other Countries

Many other developed countries contribute climate funds to the region, many of whom have pledged post-2012 commitments, among them the following:

- Sweden – SEK 2.5 billion (USD 400 million) in 2013;
- Denmark – DKK 500 million (USD 400 million) in 2013; and
- European Union – EUR 900 million (USD 1.2 billion) in 2013.

These funds will likely be disbursed through bilateral development cooperation agencies or multilateral funds and institutions.

4.3.8 National Climate Funds

National climate funds have been established in some countries to allow them to collect, blend, and manage their climate finance. They give countries the capacity to set and track their own climate change goals and activities based on national priorities. An example of one such fund is the Indonesia Climate Change Trust Fund (ICCTF), which was set up to attract investment and implement a range of financing mechanisms for climate change mitigation and adaptation programs. It disburses funding through calls for proposals. It was created by the Government of Indonesia in 2009, and is managed by Indonesia's National Development Planning Agency (BAPPENAS). The fund has three priority areas: energy and energy efficiency, sustainable forestry and peat land management, and resilience. So far, donor countries have pledged USD 18 million, USD 11 million of which has already been deposited by DFID, the Australian Government Overseas Aid Program (AusAID), the Swedish International Development Cooperation Agency (SIDA), and UNDP.

5. Private Sector Funds

5.1 General Overview

Because of its large and growing investments in clean energy infrastructure (primarily renewable energy), the private sector already accounts for the vast majority of climate-friendly investments. This section describes private sector mechanisms and the amount of investments being made in the 11 focus countries. It also describes how private sector investments can be combined (or blended) with public sector financing to scale up climate finance in the region.

HSBC, the British multinational banking and financial services company, estimates that, during the decade 2010–2020, there will be USD 10 trillion in cumulative capital investments in the low-carbon energy market globally, or about USD 1 trillion per year (HSBC, 2010). The private sector plays an important role in climate change financing, and the UNFCCC estimates that more than 85 percent of all finance to address climate change will need to come from this sector (UNEP Finance Initiative discussion paper, May, 2012). Current climate finance is estimated to be USD 364 billion globally, with approximately three quarters of this (74 percent) coming from the private sector (Climate Policy Initiative, 2012). Even if the current initiatives under the GCF are successful in reaching a public sector commitment of USD 100 billion per year in climate finance by 2020—and, given the current geopolitical climate, this may be challenging—at a minimum, private sector financing will need to increase by USD 650–800 billion or a three- to four-fold increase from current levels to fill the gap in climate finance (Climate Policy Initiative, 2012).

USD 257 billion was invested globally in clean energy in 2011, according to Bloomberg New Ener-

gy Finance—five percent more than the USD 247 billion invested in 2010, the previous record, and five times more than was invested seven years ago (Frankfurt School, et al., 2012).

Globally, in 2012, private sector investments in renewable energy assets (which represent the majority share of climate investments) totaled USD 148.6 billion.⁴⁶ Of this amount USD 8.2 billion, or 5.5 percent of the global total, was invested in the 11 focus countries in developing Asia, the vast majority of this from private sector sources.

Between 2009 and 2012, these countries received an average of 6.7 percent of total global private sector investors in clean energy. This allocation of private sector resources is disproportionate on both a per capita and a GHG emissions basis, which suggests some asymmetry in the market, a market failure that public sector participants may be well placed to address.

Table 9 shows a summary of renewable energy investments (which comprise the vast majority of climate finance) in the 11 countries covered by this report. The vast majority of these investments were made by private sector actors. The data were prepared for the LEAD program by Bloomberg New Energy Finance.

⁴⁶ The renewable energy investment data for this report were provided by Bloomberg Clean Energy Finance. The investment figures refer only to renewable energy—energy efficiency, smart grid, and non-renewable energy carbon reduction projects are not included. The data also only include investments in renewable energy projects greater than 1 MW in capacity.

Table 9: Renewable Energy Investments by Country, 2009–2012 (USD millions)

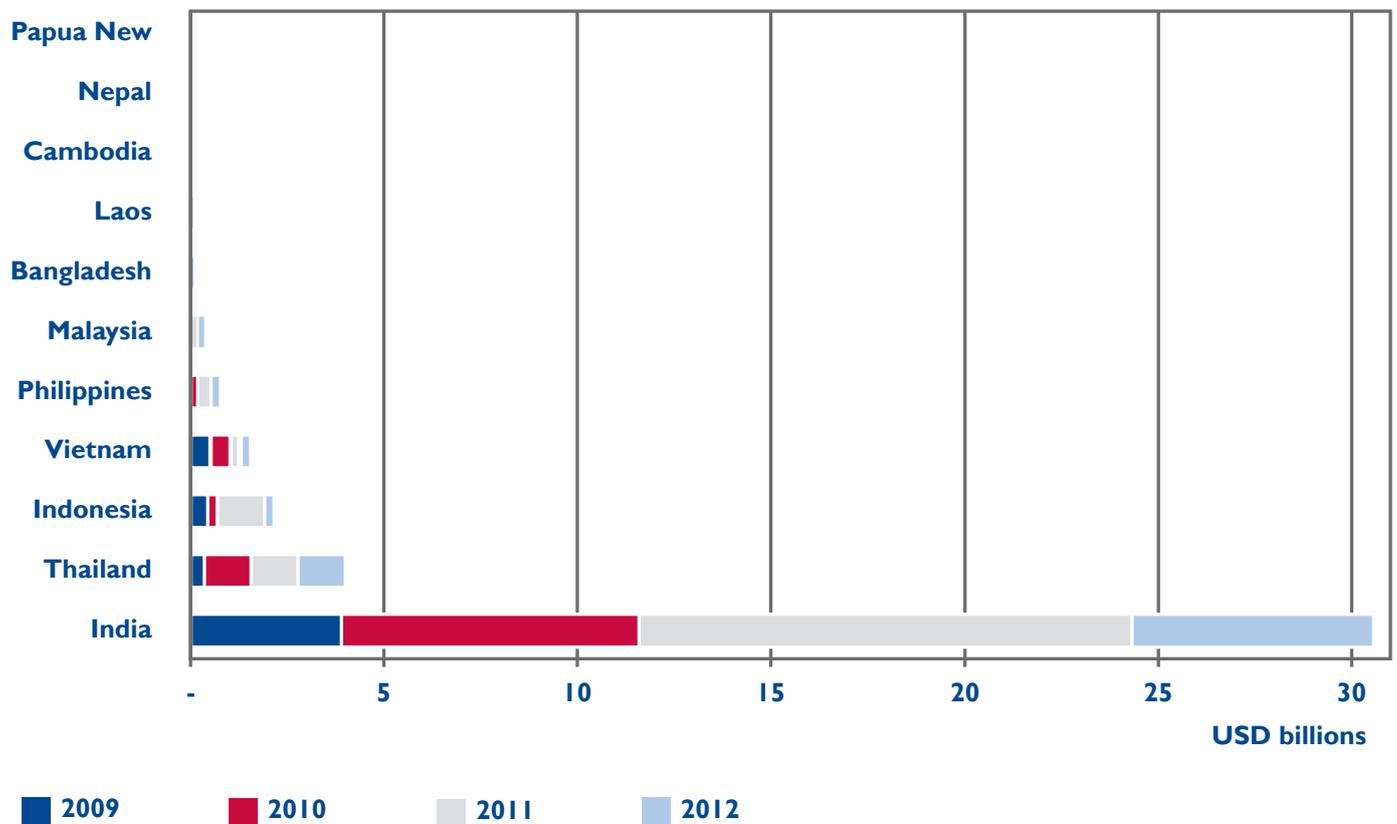
Country	2009	2010	2011	2012	2009-2012
Bangladesh	-	-	28.08	-	28.08
Cambodia	-	-	-	-	-
India	3,918.34	7,792.78	12,687.54	6,143.99	30,542.65
Indonesia	368.16	269.63	1,079.15	225.40	1,942.34
Laos	-	4.17	-	-	4.17
Malaysia	66.96	108.74	32.43	143.85	351.98
Nepal	-	-	-	-	-
Papua New Guinea	-	-	-	-	-
Philippines	137.80	14.59	334.11	175.68	662.18
Thailand	207.07	1,158.16	1,216.76	1,245.79	3,827.78
Vietnam	402.94	428.22	208.95	309.28	1,349.39
II focus countries	5,101.27	9,776.28	15,587.02	8,244.00	38,708.57
Rest of world	104,357.81	133,995.18	164,447.32	140,393.58	543,193.90
Total	109,459.08	143,771.47	180,034.34	148,637.58	148,637.58

Source: Bloomberg New Energy Finance, 2013.

Among the 11 focus countries, between 2009 and 2012, India and Thailand were the largest recipients of private sector financing, consistently representing between 80-90 percent of total renewable energy investment (see Figure 14). This is largely due to the favorable regulatory environment for wind power in India and solar energy in Thailand. The dramatic increase in private sector clean energy investment in India and Thailand can serve as positive examples for other countries, specifically with respect to regulatory intervention, investment climate, and market readiness.

In contrast, during the same period Bangladesh, Cambodia, Nepal, and Papua New Guinea, with the exception of Bangladesh in 2011, have received no significant private sector clean energy financing. This situation presents a clear opportunity for the public sector to engage in capacity building both with governments and financial institutions to create a conducive regulatory environment and investment climate for the private sector.

Figure 14: Renewable Energy Investment in the 11 Focus Countries, 2009-2012



Source: Bloomberg New Energy Finance, 2013.

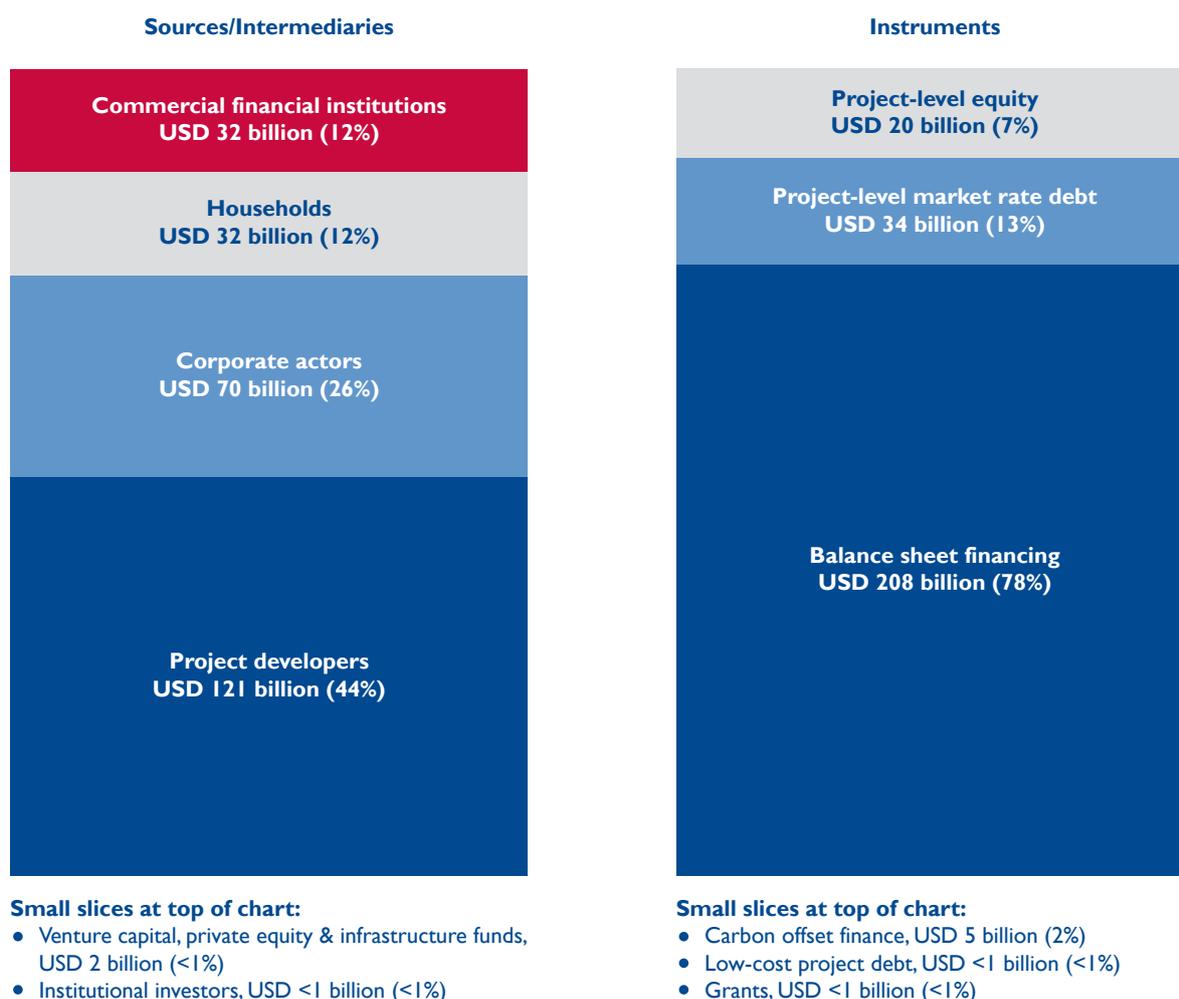
5.2 Nature of Private Sector Investment

The private sector is highly fragmented. An estimated 6,000 funds are active in the climate finance sector, and investment decisions, unlike those involving public sector funds, are highly decentralized. In addition, investment decisions are shaped largely by the profit motive, and rarely subject to other criteria such as environmental or development objectives. However, there is great potential for investment in

climate friendly infrastructure, such as clean energy, and if the appropriate investment climate exists, and risks can be adequately mitigated, the private sector is well positioned to allocate the additional capital required for climate-friendly investments.

Figure 15 shows the breakdown of private sector finance globally, in terms of sources and instruments. Most of the investment is made by either project developers or corporate actors. In terms of instruments, more than three-quarters (78 percent) is balance sheet financing. This is due to

Figure 15: Breakdown of Private Finance Globally



the very limited availability of non-recourse financing⁴⁷ for renewable energy investments.

According to Bloomberg New Energy Finance, an estimated USD 74 billion of investment in clean energy will be required each year until 2025 in Southeast Asia, and USD 70 billion will be required annually in India, in order to address global warming.⁴⁸ This adds up to a total of USD 144 billion for the 11 focus countries (excluding Bangladesh, Nepal, and Papua New Guinea). By 2025 and for the next several decades, Asia will represent the largest climate finance market in the world. This investment, furthermore, will come mainly from the private sector. Private sector actors that allocate assets for climate finance, whether directly or indirectly, include the following:

- asset management companies;
- private equity and venture capital;
- hedge funds;
- pension funds;
- public-private partnerships;
- university endowments;
- insurance companies;
- family offices and high net individuals;
- climate bonds; and
- commercial banks.

In 2010, conventional assets administered by the global fund-management industry increased by 10 percent to USD 79.3 trillion. Pension assets accounted for USD 29.9 trillion of the total, with USD 24.7 trillion invested in mutual funds and USD 24.6 trillion in insurance funds. Together with alternative assets (sovereign wealth funds, hedge funds, private equity funds, and exchange-traded funds) and funds of wealthy individuals, assets of the global fund management industry totaled around USD 117 trillion. Growth in 2010 increased 14 percent over the previous year, and was due both to the recovery in equity markets during the year and an inflow of new funds. The

United States remained by far the biggest source of funds, accounting for about half of conventional assets under management, or some USD 36 trillion. The UK was the second-largest center in the world, and by far the largest in Europe, with about eight percent of the global total.⁴⁹

Many of the private sector investors listed above administer dedicated facilities or funds for climate-related investments, while others invest from general capital pools such as infrastructure funds. Typically, private sector climate-related investments, including infrastructure, real estate, private equity, agricultural land, and forestry, would be channeled through alternative asset classes such as asset management companies and private equity funds.

5.3 Asset Management Companies

Assets managed by the leading 100 alternative investment managers globally now exceed USD 3 trillion, about 2.6 percent of total assets under management globally (Financial Times and Towers Watson, 2012). Of the alternative assets class, based on a partial survey by Nexant, it is estimated that approximately 1 percent or less is allocated to climate finance-related investments.⁵⁰ The following table summarizes some of the largest asset-management companies that operate dedicated and non-dedicated global or regional climate finance-related funds or facilities.

The funds presented in the table above are a representative sample of the climate finance-related funds managed by the top 50 asset-management companies globally, equivalent to a total of USD 13 billion in assets under management.

Armstrong South East Asia Clean Energy Fund. The fund formally announced its first close at USD 65 million, led by European development finance

⁴⁷ A non-recourse loan is secured by the revenue of the project the loan intends to fund, and nothing else. That is, non-recourse financing does not allow the bank or other lending institution access to the borrower's other assets in the event of default.

See <http://www.hanovercompanies.com/non-recourse-financing>.

⁴⁸ The Bloomberg New Energy Finance scenarios estimate the investment needed to meet the IEA's 450 ppm scenario, which would limit the global temperature rise to 2°C.

Table 10: Climate Related Funds Managed by Asset Management Companies

Fund or Facility Name	Assets (USD million)
Armstrong South East Asia Clean Energy Fund	150
Cleantech Energy Group (Blackstone)	3,500
Deutsche DWS Premier Climate Change Equity Fund	N/A
J.P.Morgan Asian Infrastructure & Related Resources Opportunity Fund	859
Macquarie International Infrastructure Fund	1,140
Morgan Stanley Infrastructure	4,000
New Energy Fund (BlackRock)	1,369
SAM Group Clean Growth Private Equity	2,500
Total	13,518

Source: Nexant.

institutions GEEREF and DEG, and an Asian-based corporation. Targeting a full fund size of USD 150 million, the Armstrong fund focuses on small-scale power generation and resource efficiency projects and aims to provide early-stage capital to infrastructure developers in Thailand, Indonesia, Malaysia and other emerging markets.

Cleantech Energy Group. The Blackstone Group established a business group in 2008 focused on investments in the cleantech energy sector. It now advises on renewable energy strategies across Blackstone's diverse asset base. Blackstone, the 34th-largest asset-management company globally, has USD 205 billion in assets under management, of which USD 50 billion is allocated to private equity. Currently seven percent of this, or USD 3.5 billion, has been allocated to Asia across all industries and sectors including clean energy and other climate-related investments (Towers Watson, 2012).

Deutsche DWS Premier Climate Change Equity Fund. Deutsche Asset Management, the eighth-largest asset management company globally, with USD 1,433 billion under management, has USD 3.2 billion in assets, including thematic funds, in the area of climate change, representing 0.2 percent of total assets. At the end of 2010, total environmental, social, and governance (ESG) assets under management amounted to EUR 2.9 billion. Despite this decrease of 12 percent, Deutsche Asset Management remains among the world's largest providers in this field. Deutsche DWS Premier Climate Change Equity Fund is Deutsche Asset Management's dedicated climate finance fund targeting Asia.

J.P. Morgan Asian Infrastructure & Related Resources Opportunity Fund. J.P. Morgan, the 10th-largest asset-management company globally, with USD 1,347 billion, has invested USD 3.8 billion and raised USD 3.9 billion from co-investors for 95 renewable

⁴⁹ See http://en.wikipedia.org/wiki/Global_assets_under_management.

⁵⁰ Investments that result in reduced GHG emissions.



energy projects for a total of USD 7.7 billion, representing 0.6 percent of assets. In 2010, J.P. Morgan established the J.P. Morgan Asian Infrastructure & Related Resources Opportunity Fund, with USD 859 million of assets under management.

Macquarie International Infrastructure Fund. Macquarie has USD 523 billion in assets under management and, through Macquarie Infrastructure and Real Assets, is a global leader in the creation and management of specialist funds focusing on infrastructure, real estate, and adjacent sectors. As of September 30, 2012, Macquarie Infrastructure and Real Assets had more than USD 105 billion of assets under management through a range of listed and unlisted vehicles investing in toll roads, airports, communications infrastructure, renewable energy, utilities, transport, directory services, aged care, and commercial real estate. Macquarie International Infrastructure Fund is an Asia-focused, listed infrastructure company managed by Macquarie Infrastructure Management (Asia) Pty Limited, a subsidiary of Macquarie Group Limited. Macquarie International Infrastructure Fund currently has USD 1.1 billion of assets under management, representing 1.0 percent of assets under management.

Morgan Stanley Infrastructure. Morgan Stanley, the 17th-largest asset-management company globally, with USD 573 billion under management, has USD 4.0 billion assets allocated to infrastructure global-

ly, representing 1.0 percent of total assets (Morgan Stanley, 2013).

The New Energy Fund. BlackRock is the largest asset-management company globally, with USD 3,560 billion under management. It has USD 4.0 billion in assets allocated to infrastructure globally, representing 0.1 percent of its total assets. The New Energy Fund is a dedicated asset management company established by BlackRock that focuses exclusively on the clean energy sector. The Fund invests at least 70 percent of its total assets globally in the equity securities of new energy companies. New energy companies are those engaged in alternative energy and energy technologies including renewable energy technology, renewable energy developers, alternative fuels, energy efficiency, and enabling energy and infrastructure. The New Energy Fund is private, and has not disclosed its assets under management.

5.4 Private Equity and Venture Capital

Private equity and venture capital are both considered part of the alternative asset class. Given higher risk as well as lack of liquidity, this asset class typically seeks a higher rate of return. The following table summarizes some of the dedicated private equity and venture capital funds in Asia that focus on climate finance.

Table 11: Private Equity and Venture Capital Funds in Asia Focused on Climate Finance

Fund or Facility Name	Assets (USD million)	Fund or Facility Name	Assets (USD million)
2i Capital India Infrastructure Development Fund	300	3i India Infrastructure Fund	1,200
Abraaj Infrastructure and Growth Capital Fund	2,000	Abundance Cleantech Energy Fund	250
Actis South Asia Fund	129	Aditya Birla Private Equity Fund I	N/A
Affinity Equity Partners	4,000	Aloe Environment Fund	420
AMP Capital Asian Giants Infrastructure Fund	500	Aqua International Partners	223
Ashmore PTC India Energy Infrastructure Fund	750	Asia Development Partners (Olympus)	300
Asia Environmental Partners (Olympus Capital)	200	Asia Infrastructure Fund	96
Asia Water Fund	100	Asian Private Equity and Henderson Infrastructure	1,200
Baring India Private Equity Fund II Limited	1,000	BTS Clean Energy Fund	150
Camco SE Asia	120	Carlyle Riverstone Renewable Energy Infrastructure Fund I	685
Challenger Mitsui Emerging Markets Infrastructure Fund	273	Clean Resources Asia (CLSA)	200
Clear Investments Power and Infrastructure Fund	1,200	Climate Change Investment	134
Climate Solutions Fund (Generation)	683	Daiwa	200
Dragon Capital	45	Equis Funds	650
FE Clean Energy Group	N/A	Global Environment Fund	1,000
Green Investment Asia Sustainability Fund I	38	Hudson Clean Energy Partners	1,000
IDFC Hybrid Infrastructure Fund	100	Impax Asian Environmental Markets (Ireland) Fund	174

Table 11: Private Equity and Venture Capital Funds in Asia Focused on Climate Finance (continued)

Fund or Facility Name	Assets (USD million)	Fund or Facility Name	Assets (USD million)
India Development Fund	192	India Infrastructure Fund	927
India Infrastructure Ltd	N/A	Indian Enterprise Fund	60
Indvision I	425	Inerjys	1,000
Lombard Asia	300	Maybank Clean Energy Fund	500
Mekong Renewable Resources Fund	200	Middle East & Asia Capital Partners Clean Energy Fund	150
New York Life International India Fund I & II	167	Pan Asia Project Development Fund	45
Power Finance Corporation	1,000	Renewable Energy Asia Fund	187
Riverstone Carlyle Renewable and Alternative Energy Fund II	1,200	Robeco TEDA Sustainable Private Equity Fund	885
SACEF Holdings (South Asia Clean Energy Fund)	300	SBI Macquarie India Infrastructure Fund	1,037
South East Asia Strategic Assets Fund	147	Southern Cross Venture Partners	200
Standard Chartered IL&FS Asia Infrastructure Growth Fund	650	SUN Group	200
Tata Cleantech Capital	N/A	USRG Emerging Market Fund	300
VantagePoint Cleantech Partner	435	Virgin Green Emerging Market Funds	200
Wolfensohn Low Carbon Energy Fund	300		
Total			30,327

Source: Nexant.

The 62 private equity funds listed in the table above represent a total asset allocation of more than USD 30 billion. Most of the private equity funds have less than USD 500 million of assets under management, which is largely driven by the typical investment size of clean energy and other climate-related projects. Targets for these funds include both project investment and investment in technology and operating companies. Most of the funds are regional and can be invested across several countries. Allocation to alternative assets such as private equity in Southeast and South Asia will probably continue to increase. It is also expected that the number of private equity funds focused on clean energy, cleantech, and other climate-related investments will continue to grow.

Although fund-raising conditions remain challenging around the globe, Asia-focused private equity funds are showing considerable momentum. Significantly, institutional investor interest in the region is strong, and looks set to remain so in the private equity and venture-capital deal markets over the coming years. Of the current private equity funds in market, 386 (21 percent) are Asia-focused vehicles seeking to raise USD 129.8 billion collectively, making up about 17 percent of the aggregate capital being sought globally.

5.4.1 Global Environment Fund

The Global Environment Fund is an example of a private investment fund that invests in businesses that provide cost-effective solutions to environmental and energy challenges. The Global Environment Fund profile, investment objectives, and investment parameters are representative to many of the other funds listed in the table, specifically their respective climate finance-related activities. The firm manages private equity dedicated to clean technology, emerging markets, and sustainable forestry. The Global Environment Fund's investors include prominent endowments, foundations, family offices, and pension funds.

The Fund was established in 1990 and currently administers about USD 1 billion of assets under management. The Global Environment Fund invest-

ment team has completed more than 30 private equity or early-stage technology investments in businesses operating in a broad array of economic sectors and in all of the world's major geographical regions. The Global Environment Fund focuses on investments in companies operating in four major areas: clean energy; environmental services; efficient transportation; and sustainable natural resources. The typical range of equity investments is USD 5 to 7 million at the low end, rising as high as USD 50 to 100 million. All investments are on a commercial basis, and expected returns on investment are commensurate with market returns.

All investments are subject to rigorous environmental and social standards consistent with the guidelines of the US Environmental Protection Agency (USEPA) and IFC. The fund managers conduct substantial formal due diligence on potential investments to assure that these standards are met.

Two of the Global Environment Fund's funding vehicles are available to the 11 focus countries:

Global Emerging Markets Fund. This fund makes investments in companies that address environmental challenges arising from industrialization and rapid urbanization in the developing world. The Fund invests in clean energy, integrated waste management, water and wastewater treatment, clean industrial technology, and healthcare services. It is currently in its third generation, and has invested about USD 300 million. About 50 percent of its investments have been in China and India.

South Asia Clean Energy Fund. This fund operates out of Mumbai, India, and is a first-generation fund with capital of USD 125 million. Investors include the ADB (USD 20 million of seed capital), US OPIC, IFC, Wells Fargo, AES,⁵¹ and JBIC. Most of the Fund's investments will be in small companies in India, addressing wind and solar developers, as well as off-grid solar opportunities.

Below are two examples of climate-friendly investments made by the Global Environment Fund in India.

Greenco Group, Hyderabad, India, is a leading clean-energy producer supporting India's rapidly increasing energy demand and energy security needs. This company has become one of the largest players in the renewable energy market in India, with small biomass and hydro projects scattered across the country.

Saisudhir Infrastructures Ltd., also in Hyderabad, is an engineering, procurement, and construction company focused primarily, on behalf of municipal and state-level clients, on developing water supply and sanitation, irrigation and electricity transmission, and distribution infrastructure in several states throughout India.

5.4.2 Private Equity Funds Supported by DFIs

Globally, OPIC has committed USD 4.2 billion to support the creation of more than 46 private equity funds, 10 of which are located in Asia, and are included in the table above. These funds in turn have invested USD 5.6 billion in more than 570 privately owned and managed companies across 65 countries. Through these commitments, OPIC seeks to catalyze US foreign direct investment and accelerate the economic and social development within these markets.

IFC and ADB both also invest as limited partners in private equity funds. IFC has invested in emerging market private equity funds since the 1980s and, in 2000, it created a group dedicated to investments in funds. IFC has since become a significant player in the emerging market funds space, having backed about 10 percent of the funds coming to market since 2000. IFC's portfolio currently stands at around USD 3.0 billion committed to about 180 funds. The portfolio is widely distributed across all regions including Africa, East Asia, Southeast Asia, South Asia, Eastern Europe, Latin America and the Middle East. In Fiscal Year 2012, 16.5 percent of

IFC's total commitments globally (USD 2.5 billion) went toward the 11 focus countries.⁵²

5.5 Pension Funds, Insurance Companies, Endowments, Family Offices and Others

With about USD 60 trillion under management, pension funds, insurance companies, endowments, and family offices collectively represent the largest source of assets under management in the world. Taken together, their investment and allocation decisions will greatly affect the growth of climate finance globally.

With the exception of Europe, interestingly, pension funds everywhere are relatively unfocused on environmental, social and governance (ESG) issues. For 71 percent of these limited partners (LPs), ESG considerations play little or no role in fund selection. Two thirds (64 percent) of European LPs say ESG considerations materially impact their fund selection process (with 19 percent of them having investment mandates directly restricted by ESG issues), compared with only one-fifth of North American LPs and one-quarter of Asia-Pacific LPs (see Figure 16) (Coller Capital, 2011).

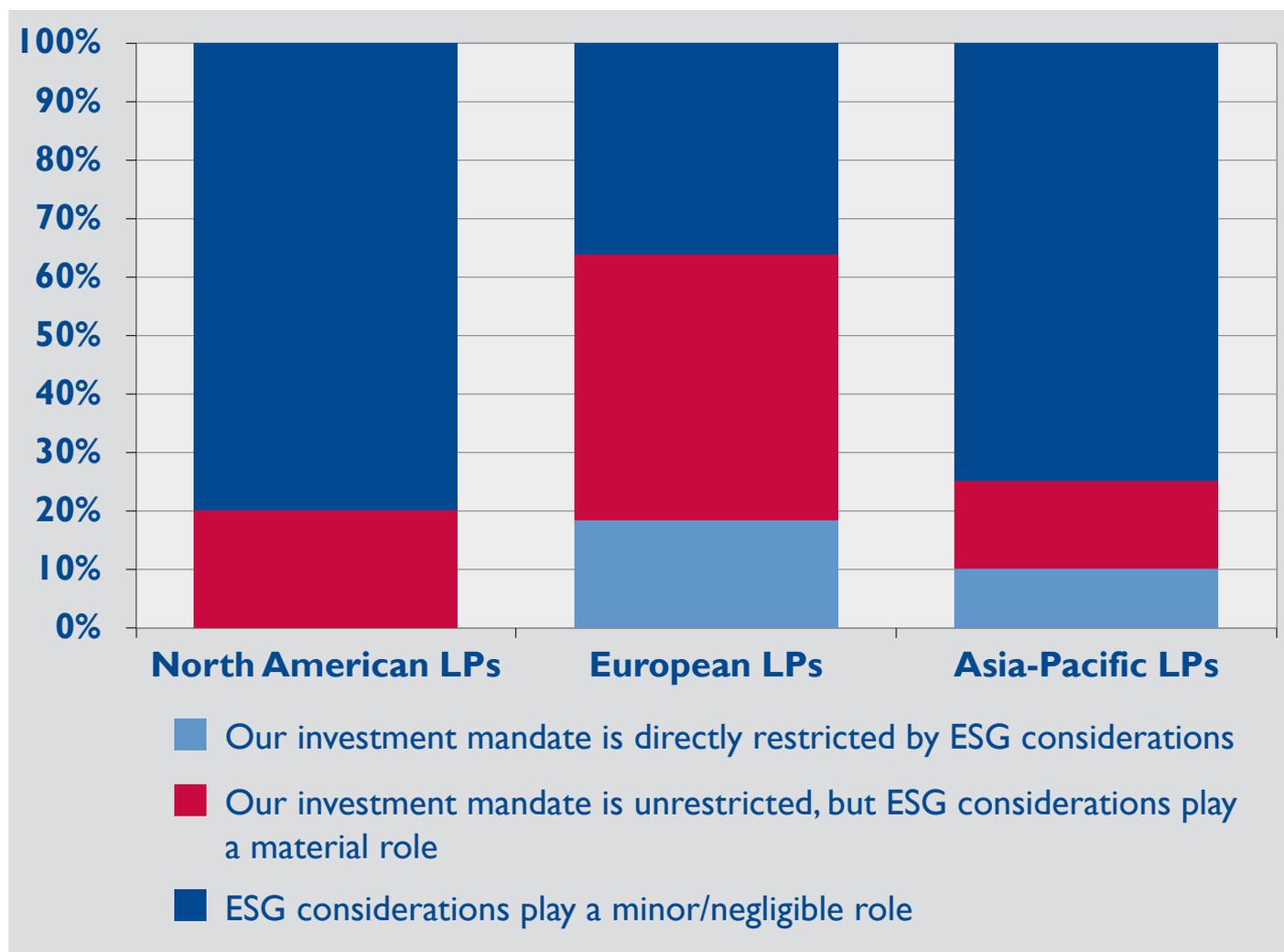
The following are examples of institutions with active agendas for climate finance that are integral with their asset allocation and investment decisions.

Japan's Government Pension Investment Fund (GPIF), with USD 1.4 trillion of assets under management, is the largest pension fund globally. GPIF was established as an independent administrative institution with the mission of managing and investing the Reserve Funds of the Employees' Pension Insurance and the National Pension, taking over the responsibilities of the old Government Pension Investment Fund, which was dissolved on March 31, 2006.

⁵¹ See <http://www.aes.com/Aboutus/Home>.

⁵² Calculated from 'Investment Project Commitments' for July 1, 2011 through June 30, 2012, accessed on January 22, 2012 from http://www.ifc.org/wps/wcm/connect/CORP_EXT_Content/IFC_External_Corporate_Site/Annual+Report/Projects+and+Portfolio/

Figure 16: ESG Criteria for Asset Allocation



Source: Global Private Equity Barometer: Winter 2010-11 (Coller Capital).

The California Public Employees' Retirement System (CalPERS), with assets of about USD 235 billion, is the largest public pension fund in the United States, and actively invests across Asia. It administers retirement benefits for more than 1.6 million California state, local government, and public school employees, retirees, and their families on behalf of more than 3,000 public employers, as well as health benefits for more than 1.3 million enrollees. CalPERS has created a fiduciary framework to integrate

sustainability across the pension fund's USD 235 billion investment portfolio, expecting it will help achieve long-term, risk-adjusted returns. CalPERS is building a 'best of breed' diversified portfolio of clean technology-focused investments by investing across stages, strategies, geographies, and structures. CalPERS defines environmental or clean technologies as solutions that are more efficient and less polluting than existing or legacy products, services, or technologies. Areas of particular interest, among

others, include alternative and renewable energy, water technologies, advanced materials or nanotechnology, air-purification technologies, and transitional infrastructure opportunities. It is expected that investment returns in this sector will be commensurate with the risk-adjusted returns of the general private equity market. Since 2007, CalPERS has invested USD 600 million in private equity funds through its Environmental Technology Program Investment Managers. California State Teachers' Retirement System (CalSTRS), the nation's second-largest public pension fund, manages USD 146 billion in assets and pursues an objective and approach similar to those CalPERS follows with respect to climate finance and associated asset allocation.

ATP, the Danish pension fund, with USD 123 billion of assets under management, is the 17th-largest pension fund globally. It will direct up to USD 1.3 billion, or 1.1 percent of assets under management, over the coming years into climate-relevant investments, including infrastructure and clean technology. The pension fund will make the investments through the institutional investor Climate Change Action Fund for Emerging Economies, which will seek unlisted climate-friendly, ready-to-implement infrastructure projects in the BRIC countries⁵³ and North America. ATP is looking for private infrastructure investment opportunities, but the projects must also be endorsed in some way by government. ATP plans to cooperate with international organizations and financial institutions that have similar schemes in place to mitigate some of the investment risk. The fund will acquire a maximum 33 percent stake in projects, and use up to 50 percent leverage. ATP Pension Infrastructure has been actively investing in the infrastructure asset class since 2005. The pension fund currently has a separate five percent allocation to infrastructure that targets a 50/50 split between unlisted funds and direct investments. Fund managers with which ATP has invested include GS Infrastructure Investment Group, CP2, RREEF Infrastructure and LS Power Group.

AXA Group, with USD 950 billion in assets, is one of the largest insurance companies both in Europe and globally. To enable group entities to underwrite innovative risks in the area of green energies, the AXA Technical Innovation Pool has come up with an in-house reinsurance solution. The pool offers an alternative for covering risks that would be refused by traditional reinsurance companies. It supports the construction, assembly, and operational phases of onshore or offshore wind turbines as well as geothermal, solar, and biomass power plants. The capacity of the Pool, adapted to this particular type of risk, represents the sum of the contributions of each participating AXA subsidiary. The Technical Innovation Pool contributes to the goal of leveraging and sharing AXA's expertise in the field of renewable energy, thus helping promote their development.

Munich Re, with over USD 300 billion in assets, is one of the largest insurance companies in Europe. Over the past few years, Munich Re has initiated major innovative projects, among them the Munich Climate Insurance Initiative and the Desert Power Initiative. Munich Re offers innovative insurance solutions that are geared to the risks of new technologies, thus promoting the development and propagation of renewable energy sources. Solar cell manufacturers generally provide a performance guarantee that is considerably beyond what is required of them by law. Munich Re has devised a new cover that meets existing guarantees even over a period of up to 25 years. Munich RE insures reductions in the output of photovoltaic modules below specified levels, thereby making it much easier to obtain funding for major solar energy projects while giving all stakeholders greater planning certainty.

University endowments have directed only limited formal investment decision-making to climate change. US college and university endowments are estimated at about USD 400 billion. In the US, only eight colleges and universities, or one percent of the total, reported sustainability investing in 2011. Another five percent of the full sample, or 41 schools, used

⁵³ Brazil, Russia, India, and China.

‘environmental criteria’ but did not provide specifics, according to the National Association of College and University Business Officers’ Commonfund Study of Endowments. This statistic is reported in a new study, commissioned and funded by the Investor Responsibility Research Center Institute (IRRCI) and conducted by Tellus Institute, which analyzed existing data and publicly available surveys on sustainable investing (IRRCI and Tellus Institute, 2012). It found that US college and university endowments’ environmental, social, and corporate governance investments are less prevalent than often believed. According to IRRCI, participating schools reported collective holdings in sustainable industries totaling USD 2.5 billion, or only 0.6 percent of assets under management.

Learning from the Private Sector: Hedge Funds

Innovest is launching the ‘Carbon Beta™ Basket.’ This hedge fund focuses on risks and opportunities associated with climate change by shorting companies with weak carbon management profiles. The product also uses the standard hedge-fund strategy of counter-balancing short-selling with long positions, focusing on companies with strong management on carbon issues.

The Carbon Beta™ methodology assesses industry-, geographic-, and company-specific data. At the industry level, for example, Innovest’s 14-person ‘carbon finance’ and ‘clean technology’ team employs a three-pronged approach to examining climate change intensity on a one to five rating basis (lowest to highest exposure). First, the team examines direct climate change intensity—e.g., steel-makers emit CO₂ directly in the coking process. Second, it looks at indirect climate change intensity—e.g., aluminum producers rely on large amounts of electricity, which in turn may produce large CO₂ emissions if reliant on fossil fuels. Third, the team evaluates climate change

demand sensitivity, ranging from high-demand sectors such as oil and gas and automotive, to those sectors that support high- and low-carbon emissions, such as finance and insurance, as well as sectors with significant opportunities, such as energy-generation technology manufacturers. Finally, the Innovest team calculates a weighted average of these three indicators to come up with climate change combined intensity.

Using this methodology, Innovest determined the 10 industries most exposed to climate risk. Electric utilities topped the list with a combined intensity of 4.9; construction materials came next at 4.3; oil, gas, and combustible fuels followed at 4.2. At the company level, Innovest looks at seven factors, including energy efficiency and source mix, geographic locations of production facilities, product mix, company-specific risk-management capabilities, and ability to identify and capture upside and revenue opportunities.

5.6 Commercial Banks

Traditionally, commercial banks have provided capital through two different mechanisms: corporate finance, and project finance. For the most part, they have offered corporate finance that provides guarantees, collateral, or other credit enhancements to the sponsoring company. As commercial banks become more familiar with the sector and the risks associated with renewable energy and energy efficiency, however, non-resource or limited recourse financing is becoming more available.⁵⁴

Most commercial banks do not have business units or facilities specifically dedicated to climate finance. Nevertheless, some have recently established such facilities (a few of these are presented in Table 12, below). As the demand for climate finance increases, the number and size of such facilities is expected to keep growing over the next several years.

⁵⁴The lender of a non-recourse loan is only entitled to repayment from specific assets and cash flows, and is not allowed to pursue the borrower’s assets, beyond collateral. A limited recourse loan gives the lender a limited amount of recourse to the borrower’s other assets.

Table 12: Commercial Banks with Climate Finance Business Units or Facilities

Fund or Facility Name	Description	Assets (USD million)
ICICI	To cater to the strong demand for small- and medium-sized renewable energy and energy efficiency projects in India, the ADB is collaborating with ICICI Bank, one of India's leading private banks, in a USD 100 million credit-line deal. The credit line will be ADB's first non-sovereign loan that supports energy efficiency enhancement projects in India, with a particular focus on cogeneration and waste-heat recovery; replacement of inefficient motors, pumps, and fans in industry; and manufacturing and deployment of compact fluorescent lights or LED lights. The credit line will also support such renewable energy development as wind and solar power.	100
KBank	Kasikorn Bank (KBank) established a THB 3 billion loan facility (about USD 98.14 million) to finance energy efficiency investment projects in Thailand. The K-Energy Saving Guarantee Program features equipment leasing/hire purchase financing or long-term loans aimed primarily at energy efficiency projects under management of an energy service company (ESCO). ESCOs are consultancy firms that offer integrated services for the implementation of energy efficiency projects, and provide a guarantee that energy savings generated by the project will be sufficient for loan repayment (a self-financing project). KBank, through assistance from a number of technical partners, also offers standardized energy performance contracts.	100
Bank of the Philippine Islands	Through the Sustainable Energy Finance Program, companies can access financing opportunities that allow them to invest in technologies aimed at improving the efficiency of energy generation, energy distribution, and energy use. Sustainable energy projects include energy efficiency modifications and renewable energy technologies. Such technologies can reduce operating and energy expenses by at least 20 percent. The program offers (a) working capital finance, (b) capital expenditure financing, and (c) leasing. The facility is structured as a partial risk guarantee with IFC.	400

Table 12: Commercial Banks with Climate Finance Business Units or Facilities (continued)

Fund or Facility Name	Description	Assets (USD million)
YES Bank	YES Bank, an entrepreneurial commercial bank in India, is one of India's five largest banks that have developed energy efficiency lending programs targeting small and medium enterprises. 'Financing for Bundled Small-scale Rural Renewable Energy and Energy Efficiency Ventures in India' was developed by YES Bank's Agribusiness, Rural & Social Banking and Sustainable Investment Bank Teams. The goal of the project itself is to develop new credit practices financing bundles of small-scale renewable energy and energy efficiency ventures in rural and peri-urban India. In the first transaction, YES Bank provided financing of about EUR 15 million to a bundle of 25,000 farming households across the states of Maharashtra, Gujarat, and Rajasthan in a deal to finance the purchase of energy efficient drip irrigation systems. Loans averaged about EUR 594 per household. YES Bank has become a thought leader in responsible banking and sustainability integration. Beyond energy efficiency lending, YES Bank measures its direct GHG emissions footprint.	20
Total		620

Source: Nexant

5.7 Public-Private Partnerships

Increasingly, public-private partnerships (PPPs) are being used as vehicles to catalyze private sector investment in climate finance. In the area of climate finance, PPPs involve a private sector investment,

combined with some type of public sector support, such as concessional financing, credit guarantees, or technical assistance. The following funds, with cumulative assets of more than USD 12 billion, are examples of current PPP initiatives that have been developed in the area of climate finance.

Table 13: Public-Private Partnership Initiatives in Climate Finance

Fund or Facility Name	Assets (USD million)
Carbon Finance and Funds	193
Carbon Funds and Facilities	2,500
Clean Energy Private Equity Funds	100
Forest Carbon Partnership Facility	429
Fund Solutions for Climate Finance	500
Global Climate Partnership Fund	500
Global Energy Efficiency and Renewable Energy Fund	170
Green Commodities Facility	N/A
Infrastructure Leasing & Financial Services Ltd	N/A
Investor Group on Climate Change Australia/New Zealand (IGCC)	N/A
Japan's Fast Start Finance	6,000
Keppel Green Trust	549
MDG Carbon Facility	Project-specific
Philippine Investment Alliance for Infrastructure	625
Post-2012 Carbon Credit Fund	161
Renewable Energy and Energy Efficiency Partnership	318
The Institutional Investors Group on Climate Change (IIGCC)	N/A

Source: Nexant research and estimates.

5.8 Climate Bonds

Despite the prevailing global financial crisis, institutional investor commitment to action on climate change has grown rather than declined. Back in 2009 at the Copenhagen climate summit, 187 institutions with over USD 13 trillion of assets under management supported a statement asking for robust policy action. By the time of the 2011 Durban conference, this backing had increased to 285 institutions with more than USD 20 trillion of assets under management. It is estimated that about USD 10 trillion in cumulative capital investments will be needed globally between 2010 and 2020 to drive low-carbon energy alone (HSBC, 2010). The typical 60:40 split between debt and equity for clean-energy project finance means that USD 6 trillion in terms of bank loans and bonds could be required. Currently, USD 174

billion, invested in 1,000 climate-themed bonds with 207 issuers, is outstanding (see Figure 17). Issuers include corporates, including listed, state-owned, and private companies, which account for 82 percent of the total; development banks and financial institutions (13 percent); project bonds (three percent); and municipal bonds (two percent). Beyond this core universe, there could be another USD 204 billion in outstanding bonds from issuers, with more than 50 percent of revenues and activities linked to the climate economy. In addition, a further USD 373 billion in bonds is 'conditionally aligned.' The cumulative total of all climate-related bonds is USD 751 billion (Climate Bond Initiative and HSBC, 2012). Climate bonds are one potential mechanism or vehicle that is expected to fund the private sector gap—one that may make a substantial contribution relative to commercial banks and alternative assets.



Figure 17: Climate Bonds Outstanding, 2011

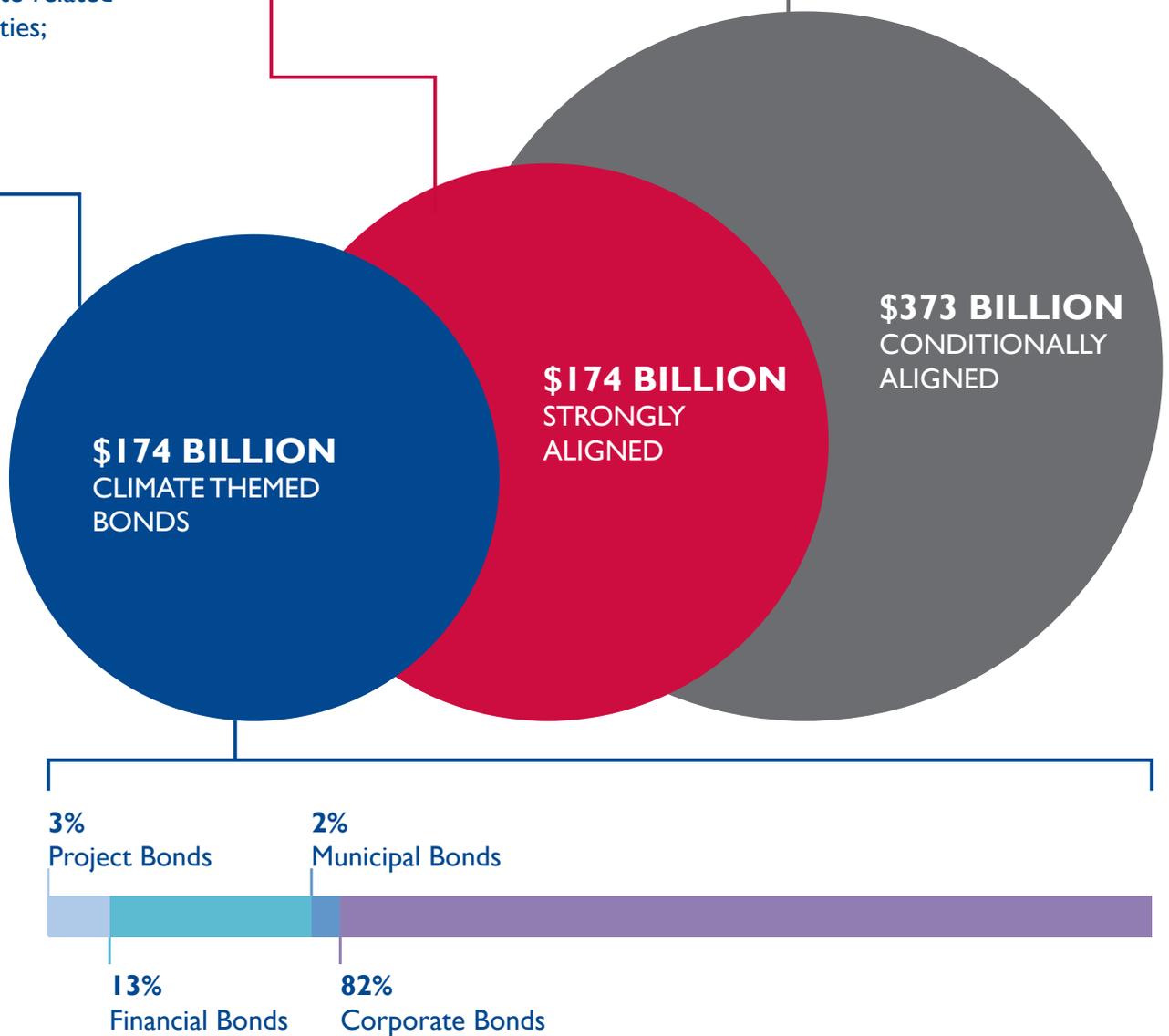
Climate-themed bonds

Where future growth could com from

FULLY ALIGNED:
bonds that are labelled green/climate and bonds from issuers or projects which are wholly dedicated to climate-related activities;

STRONGLY-ALIGNED:
bonds from issuers that have revenues or other relevant metrics greater than 50% dedicated to climate-related activities.

CONDITIONALLY ALIGNED:
bonds from issuers whose contribution to the climate economy is conditional on factors such as a feedstock, size, and specificity of activities



Source: Climate Bond Initiative.



5.9 Carbon Markets

5.9.1 Carbon Finance As Opposed to Climate Finance

‘Carbon finance’ refers to the payment for project-based GHG emission reductions. These emission reductions usually take the form of carbon credits, RECs, or energy performance certificates. A spectrum of financial structures is involved: spot-based trades (payment against delivery); secured pre-payments (early payments to co-finance capex investments against future delivery); or collateralization (use of future carbon finance revenues to secure a bank loan).

The main use of carbon finance is to leverage and redirect underlying commercial investments to low-carbon technologies by increasing the profitability of investments into such technologies above a threshold or a high-carbon technology alternative (baseline investment). USD 1 of carbon finance has leveraged between USD 4 and USD 10 of investment into low-carbon technologies (Scotney, et al., 2012).

‘Climate finance’ is a broader term. It describes a variety of financial resources flowing into low-carbon activities as well as funding for adaptation measures, but not necessarily with the expectation of a return in carbon credits. (Carbon finance is the sub-set of climate finance that expects a return in carbon credits or other environmental commodity that captures the value of the GHG emission reduction.)

5.9.2 South and Southeast Asia Carbon Markets

In the 11 focus countries, USD 3.5 billion in CDM credits has helped to facilitate a total of USD 229 billion of investments into low-carbon technologies (see Table 14). This demonstrates both (a) the leverage of the CDM, and (b) the capacity of the CDM to track financial flows. As donors and countries scale up their investments in climate finance, it will be increasingly important to have frameworks (i.e., MRV systems) to verify GHG reductions and also mechanisms to accurately track the financial flows. The frameworks established under the CDM process provide a platform on which to build.

⁵⁵ Capital expenditure, or capex for short, describes expenses incurred when acquiring or upgrading physical assets such as equipment, property, or buildings.

⁵⁶ This represents the value of the CDM credits, assuming an historic average price of EUR 6 per ton and delivered up to the end of 2012.

Table 14: Annual and Total Investment (Capex) in Registered CDM Projects in Focus Countries (USD million)

Host Country	Reg. Inv.*	2004	2005	2006	2007	2008	2009	2010	2011	2012	All Years
Bangladesh	4	-	6	25	-	-	-	-	39	29	98
Cambodia	7	-	-	10	-	6	4	-	3	326	348
India	962	5	116	1,468	4,335	1,410	4,449	7,067	17,504	4,826	41,179
Indonesia	93	-	-	484	53	254	126	910	633	1,224	3,683
Laos	4	-	-	-	1	-	-	-	206	157	364
Malaysia	115	-	-	252	69	53	370	48	203	217	1,211
Nepal	6	-	15	-	-	-	-	18	19	-	53
Papua New Guinea	6	-	-	170	-	-	-	-	25	7	201
Philippines	58	-	-	97	25	100	49	33	104	1	409
Thailand	83	-	-	-	140	19	98	55	241	232	785
Vietnam	167	-	-	169	-	-	151	479	1,321	1,866	3,985
Total	4,327	5	278	5,134	11,169	13,903	27,143	44,574	65,561	61,351	229,118

* Interventions registered at UNFCCC.

Source: UNEP Risoe database.

Going forward, and considering the low price of CERs today (around USD 0.80/ton at the time of this writing), the CDM will likely lose its leverage for new projects unless demand for CERs picks up.

It is also noteworthy that the total amount of investment leveraged by the CDM—USD 229 billion over the last nine years and USD 65 billion in 2010—dwarfs the amount of approved climate finance.

5.9.3 Post-2012 Carbon Market in the II Focus Countries

The post-2012 global carbon market has traded 173 million tons in CERs in 2011 and already surpassed the traded volumes of the pre-2013 market in that year. At the same time, the World Bank estimates the total size of international demand for CERs for offset purposes to be around 2.7 billion tons for the whole 2013–2020 period and a total supply of

5.8 billion CER in the same period. This means that total demand can be met twice over by supply from existing and registered CDM projects. This does not even include projects and Program of Activities currently in the validation pipeline—these are expected to increase supply by an additional 35 percent.

Considering this supply-demand imbalance, CER prices are at a record low and, for the time being, carbon finance seems to have lost its leverage effect on new investments. The overall outlook is less negative, however, when one takes into account trends in domestic and regional efforts regarding the II focus countries:

- Some EU government buyers have started to purchase CERs at premium prices to (a) support the implementation of new projects with substantial co-benefits, (b) ensure the continued operation of

existing projects that would otherwise risk shut-down, and (c) support projects that are integrated with domestic policies in host countries.

- CER from new projects in focus countries (e.g., Bangladesh, Cambodia, Laos, and Nepal) enjoy a special status in the post-2012 European Union Emissions Trading Scheme (EUETS) trading period, whereby CER from all other countries are ineligible. This creates a premium value for such CERs.

- Japan has moved almost completely out of CER procurement via the CDM in the post-2012 period and into the use of its Bilateral Offsetting Credit Mechanism. This mechanism integrates Japanese technology export interests with the procurement of bilateral offset units at a premium over the current CER price. The 11 focus countries, due to their relative importance as a recipient of Japanese foreign investment, could prove a primary beneficiary of this scheme, with an estimated demand for carbon credits of 540 MtCO₂.

- Thailand, India, Indonesia, and Vietnam are involved in the World Bank's Partnership for Market Readiness, which might see the creation of (a) domestic carbon markets, including domestic demand for carbon credits, and (b) operation of bilateral/regional scaled-up carbon market mechanisms starting in 2015.

- India has recently launched two major market-based mechanisms for renewable energy and energy efficiency: Renewable Energy Certificates (RECs) and Perform, Achieve, and Trade (PAT), and is thus already operating its own nascent domestic carbon market.

- Starting in 2015, Australian entities under their new emissions trading system are allowed, subject to special eligibility criteria, to buy a defined quantity of CER for compliance purposes.

Thus an emerging fragmentation of post-2012 carbon markets is discernible, with differentiated domestic, regional/bilateral systems integrated neither with each other (no mutual recognition of units) nor with the international multilateral carbon market. Consequently, instead of maintaining a

homogenous global level, carbon prices can be expected to vary. On the one hand, then, there are drivers for mutual recognition of units, i.e., to increase market liquidity and harmonize climate policy-induced costs on the regional trade of carbon intensive goods. On the other hand, there are drivers against rapid market harmonization, including the desire of countries to limit their own climate-policy support efforts to domestic actions.

In addition, the emergence of new market mechanisms, possibly linked to voluntary targets (absolute, intensity-based, or other) of developing countries, might enter the picture. At this point it is unclear whether these systems will operate at the level of governments ('government crediting,' e.g., whereby carbon credits are issued to government entities that trade them with international partners), or continue to operate in the private sector, like a scaled-up CDM.

In any case, the harmonization of domestic and regional carbon markets requires common accounting frameworks and registry systems for GHG emissions and carbon credits. The 11 focus countries do not have such systems in place, but many countries have started work on such systems. Some have already started to coordinate their respective effort within the context of the World Bank's Partnership for Market Readiness initiative.

6. Accessing, Tracking, and Monitoring Climate Financing

6.1 Funding Eligibility

All climate funds and financing mechanisms, whether public or private, stipulate conditions for eligibility. Candidates for funding should research and, as best they can, understand the perspectives, objectives, and investment criteria of the fund manager.

In our review of climate financing mechanisms in developing Asia, we identified the following typical eligibility requirements and screening criteria:

Climate change focus. The broader mitigation focus areas include GHG mitigation that excludes REDD and GHG mitigation focused on REDD. Within these areas, there is often a sub-focus on specific project types: renewable energy, energy efficiency, poverty reduction, or carbon capture and sequestering.

Geographic focus. Funding is usually directed to either national or regional focuses.

Target economic sector. Agriculture, forestry, energy, power, transport, and industry are among possible target sectors.

Socio-economic group. Funders may be interested only in certain focus areas or socio-economic groups (e.g., low-income, SMEs).

Differential public/private eligibility. Requirements and screening criteria may differ according to whether the candidate fundee is a public or private entity, i.e., a government agency as opposed to a company or NGO.

Investment eligibility. Funders may impose requirements with respect to amount of available funding and whether the agreement is to involve co-fund-

ing/co-financing, majority or minority stakes, or investment into start-ups or ongoing ventures.

MRV requirements. Funders may insist on MRV, including standards and protocols for MRV, particularly on carbon or GHG inventories.

Initial screening is conducted on the basis of primary criteria such as mitigation or adaptation, geographic focus, and target economic sector. Once these conditions are satisfied, then targeting may shift toward a specific socio-economic group, such as low-income or rural communities, or SMEs.

‘Investment eligibility’ refers to the requirements attached to a given investment. For public sector candidates, this may include such criteria as co-funding, minority or majority stake, loan tenor, and minimum project size. With private sector funds, the main requirements may be investment threshold (‘minimum ticket size’), internal rate of return (IRR) threshold, target sector, and deal structure (debt vs. equity, type of debt, minority vs. majority stake). One of the most important conditions for private sector equity investment is a clear exit strategy—a specifically designed process for the investor to sell or redeem his or her shares or initial investment, freeing up capital for further investments.

6.2 Tracking Climate Finance

6.2.1 MDB Tracking Initiative

A group of MDBs (African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, and World Bank Group) has been working together to better coordinate and improve technical and financial support for GHG mitigation and adaptation to climate change in developing countries. The MDBs are developing

common tools and metrics for internal reporting, monitoring, and evaluation efforts. In a joint statement issued on the eve of the Rio+20 conference⁵⁷ in June 2012, they announced a plan to develop a joint approach to tracking financing for mitigation and adaptation, as well as a joint methodological framework for GHG accounting and reporting.⁵⁸

The MDBs further advanced this initiative at the 2012 UN Conference on Sustainable Development (Rio+20) in Doha in November 2012, by announcing a harmonized approach to measuring and tracking their project-level GHG emissions, while also harmonizing the tracking of their climate financing commitments.⁵⁹ The ultimate objective is to harmonize metrics for measuring and tracking climate-related finance activities across MDBs to improve monitoring of climate finance flows and their effectiveness.

6.2.2 Public Reviews of Climate Financing

Since climate financing is distributed across many government ministries and agencies, it is difficult to track and monitor at a national level. Public budget reviews provide a mechanism for understanding, identifying, tracking, understanding, and improving climate financing at the national and sub-national levels.⁶⁰ Climate Public Expenditure and Institutional Reviews (CPEIRs) are typically conducted by cross-government steering groups led by Finance and Planning Ministries, with technical input from Ministries of Environment. They build and expand

on the common government practice of public expenditure reviews; review policies and institutions; and review the whole budget, including at the sub-national level, to assess activities relevant for climate change. UNDP and UNEP have supported the undertaking of a number of CPEIRs in the 11 focus countries. They started with Nepal in 2011, and have since undertaken CPEIRs in Thailand, Bangladesh, and Cambodia (UNDP, 2013).

CPEIRs provide analytical support, informing government decision-making and supporting the development of climate change strategies. They also raise awareness regarding climate change issues among public finance managers, and enable better integration of climate issues into mainstream development plans and budgets. CPEIRs promote reforms that strengthen accountability, transparency, good governance, and environmental sustainability. Finally, such reviews also can assess the role played by communities, civil society, the private sector, and international support in responding to climate change, at the same time promoting financing from domestic sources.

6.3 MRV Systems for GHG Emissions

Donors and investors increasingly require GHG emission reports from their funding recipients. In determining the cost effectiveness and impact of climate investments, it is important to have strong MRV systems at the project level. Such systems should address both financial flows and the relative

⁵⁷The United Nations Conference on Sustainable Development (UNCSD), also known as the Rio+20 Conference, or 'Earth Summit 2012.' As with its two predecessor international conferences on sustainable development, the agenda focused on reconciling the economic and environmental goals of the global community.

⁵⁸'MDB Joint Statement for Rio+20.' Issued at the UN Conference on Sustainable Development 2012 (Rio+20) by ADB, African Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, and the World Bank (Rio de Janeiro, Brazil, June 20, 2012).

⁵⁹'International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting.' Issued at the Doha Climate Change Conference by ADB, African Development Bank, Agence Française Développement, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Finance Corporation, Nordic Environment Finance Corporation, and the World Bank (Doha, November 2012).

⁶⁰A workshop was held in Bangkok in September 2012 to share experiences regarding a process for reviewing climate expenditures in national budgets. Participants from more than 22 countries around Africa, Asia Pacific, Europe, and Latin America representing Ministries of Finance, Ministries of Planning and Ministries of Environment met to discuss climate public expenditure and institutional reviews (CPEIRs) together with multilaterals and bilateral agencies including the EU, Germany (GIZ), Korea, Sweden (SIDA), OECD, UK (DFID), USAID, the UN (UNCDF, UNDP and UNEP) and the World Bank.

success of both GHG emission reductions, as well as improved resilience.

Given the available climate finance options, the backbone of any MRV system is the capacity to understand GHG accounting and to conduct GHG emission inventories to determine the amount of GHG that has been reduced as a result of emissions reductions efforts. Such mechanisms must be fully integrated with financial tracking, thereby ensuring that recipient countries are able to accurately track measures disaggregated by funding source.

At a more macro level, data are needed to ensure that actions are effectively addressing national, regional, and international targets. An increasing volume of public climate finance for mitigation—known as performance-based payments—are being disbursed to recipient countries post facto, based on results. This is particularly the case with bilateral climate finance, where donor and recipient countries sign advance purchase agreements for mitigation activities. A fixed price (in USD/tCO₂e) is agreed at the outset of the project, and delivered once results are proven. Similarly, an increasing volume of contingent grant mechanisms are available, where repayment of finance is linked to achieved results.

6.3.1 Benefits of Strong MRV Frameworks

Interviews with public and private sector fund managers across the region make it clear that, as efforts to address climate change increase, the ability to measure and manage GHG emissions will become an ever-more critical precondition for access to financing.

Strong MRV frameworks are currently required only for projects that rely on carbon revenues on both the CDM and voluntary markets. Meanwhile, publicly funded projects that receive grants or concessional financing from donors, require less extensive MRV methodologies. These differ depending on

the funding agency, but are similar in the way they use ‘with’ and ‘without’ project scenarios to build estimates of the energy savings and consequent GHG impacts.⁶¹ These projects are also similar in that they have less rigorous validation and certification requirements.

As investments into climate projects and businesses increase, more competition for climate funds made available by international financial institutions is expected. For example, the World Bank’s Partnership for Market Readiness has thus far allocated funds to only a limited number of countries in Asia, and this means that there will likely be increased competition among candidates to access technical assistance funding for activities to address climate change.

In the future, despite the current volatility of carbon markets, the ability to measure and verify carbon will doubtless represent a critical step in accessing finance, and therefore in monetizing the value of the carbon. Good MRV systems will thus become increasingly important. This will enable performance-based payments, while improving market efficiency. Countries operating large programs with robust MRV frameworks will be well positioned to access climate financing. In contrast, countries with less capacity in project management, weak or no MRV frameworks, and limited fiduciary capacity will be in a more challenging position.

Initiatives are under way that should encourage more systematic and careful tracking and MRV of GHG emissions, both from public sector investments (i.e., development financing), and from private sector investors such as large corporations and banks. Such initiatives include the Global Reporting Initiative, the Carbon Disclosure Project, Bank Track, and the Climate Registry.

⁶¹ This is a common method of estimating energy use and GHG emission reductions resulting from a project. Emissions are calculated to a specific time in the future for two scenarios: a ‘business as usual’ scenario, which assumes the project is not built, and a scenario in which the project is built. The energy savings or GHG emission reductions resulting from the project is then the difference between the two scenarios (assuming they have diminished rather than increased).

6.3.2 Private Sector Perspective on MRV

Overall, the private sector is commercially driven, with the focus on economic returns. Requirements for the MRV of GHG emissions are therefore more important in the public sector than in the private sector—especially within volatile carbon markets, when relying on carbon income presents a significant financial risk. The exception has been CDM projects, which require strict MRV to verify the carbon emissions reductions (CERs).

Except for carbon-focused investments, in which the value of the carbon is explicitly monetized, none of the private sector funds reviewed by the research team that focused on clean energy had specific requirements in terms of MRV of GHG emission reductions. The focus was usually on the financial criteria, especially the IRR, and on risk factors associated with investment. In the case of private sector projects with attached CERs, the value of the CERs was either not included in the financial assessment or, due to the risk of delay or changes in the carbon price, was steeply discounted. This is why mechanisms such as ADB's Future Carbon Fund can be so important—the Fund pre-purchases a portion of the value of CERs, monetizing the carbon before the project has even started, thus providing, in essence, a small form of co-financing.

Nexant research also shows that, while current practice is to ignore MRV of GHG emissions in most privately funded projects, there is an expectation of increased regulatory risk surrounding GHG emissions. This is driving companies to better understand their exposure to potential carbon taxes and regulation. A report on Asia by the Carbon Disclosure Project (CDP) found that emerging carbon-based regulations in fact promised significant climate-related business opportunities (CDP, 2012). According to CDP, 61 of the world's 500 largest companies have established emissions reduction targets. And just over half of the respondents to a CDP survey of the top Asian

companies identified climate-related business opportunities due to related to climate regulation.

6.3.3 Public Sector Perspective on MRV

A range of MRV requirements are in place for climate-related funds and mechanisms supported by development finance. There is no single global standard for MRV, and donors have typically relied on simple calculations of 'before' and 'after' emissions to estimate GHG emission reductions. These are described below, first for carbon-based financing, and then for non-carbon-based financing.

For funds where carbon is not specifically monetized, no single international standard or protocol for MRV was found to be used. The methodology and degree of operational rigor varies by funder, and reflects the fund objectives and rationale for reporting GHG reductions.

Limitations of current practices include (a) inconsistent and/or incomplete self-reporting of financial support; (b) infrequent reporting; (c) limited and incomplete information on multilateral development banks and other non-UNFCCC funds; and (d) lack of primary data on financial flows and limited verification procedures (OECD and IEA, 2009).

Below is a summary of the feedback on MRV from development agencies and public funds that Nexant obtained through researching and interviewing various organizations on climate financing.

Agence Française Développement. AFD measures emission savings and cost of emission reductions using its AFD Carbon Footprint Tool. This is a simplified analysis tool developed by the French Development Agency to calculate emissions from development projects, but it also provides for assessments of vulnerability to climate change. The aim is to allow managers of projects financed by AFD to analyze their carbon content and to enhance project content by integrating climate change.⁶²

⁶² Source: www.banktrack.org/show/pages/banks_and_financed_emissions.

Asian Development Bank. ADB bases its calculations of avoided CO₂ on ‘with’ and ‘without’ project assumptions, which is similar to the approach used by the CDM. For energy-related projects, the CO₂ emissions reductions are based on energy calculations, and these are laid out in the Manual for Calculating Energy Output (ADB, 2011). ADB has also established a proxy emissions factor for Asia, and formulas for demand and supply-side projects.

The World Bank. The World Bank Group conducts formal monitoring and evaluation of all of its projects, including the logical framework approach (which includes baseline, key performance indicators, targets, and reporting procedures), annual reviews, and mid-term and final project reviews. For projects related to clean energy, GHG reductions are one of the key performance indicators. No specific tools are available to measure GHG reductions. These are usually calculated from the energy savings, or energy produced from renewable energy, by using national emissions indicators relating energy use to GHG emissions. When a World Bank project includes funding from GEF or one of the CIFs, additional MRV may be conducted based on the requirements of these funds.

International Finance Corporation. With most IFC investments, which go to private sector organizations, MRV requirements are less formal than the World Bank procedures. When IFC uses a ‘blended financing’ approach, however, in which funds from GEF or the CIFs are utilized as supplemental funds to IFC financing, IFC applies the formal requirements of these funding sources. Currently, IFC relies on self-reporting to gather data on GHG emissions from the projects it finances. To estimate energy savings, IFC developed a tool called the Sustainable Energy Calculator.

Since IFC is increasing its portfolio of climate-related investments, aiming to have that portion reach 20 percent by 2015, it is developing a more formal

MRV approach for its own investments. IFC’s own methodology for MRV has been developed and is managed by IFC Development Group 6—the Global Group on Greenhouse Gas Emissions Avoided. The Group develops methods for measuring GHG emission reductions. It has set targets for two regions, Eastern Europe and South Asia, with South Asia having piloted the MRV scheme first, and Eastern Europe following. The methodology accounts for both direct and indirect impacts.

Japanese International Cooperation Agency. JICA has prepared a Climate Finance Impact Tool (JICA Climate-FIT), which includes methodologies for implementing MRV based on quantitative evaluation of mitigation projects that contribute to reduction or sequestration of GHGs. JICA has also developed concepts and guidelines for mainstreaming adaptation into projects that reduce vulnerability to climate change, while sustaining and increasing adaptive capacity and resilience.

Japan Bank for International Cooperation. JBIC has its own MRV guidelines, Guidelines for Measurement, Reporting and Verification of GHG Emission Reductions in JBIC GREEN Operations (JBIC, 2012). The J-MRV guidelines are based on proposals from a working group of outside experts. This group considered lessons learned from the Kyoto Mechanisms and International Organization for Standardization (ISO) standards, and developed proposals aimed at establishing simple, practical, and internationally acceptable guidelines for quantifying GHG emission reductions among JBIC-funded projects. These were initiated in 2010 and updated in 2012. There is a built-in third-party review of the guidelines, and an ongoing advisory committee.

In cases where JBIC is co-financing a project with other international institutions such as MDBs, who have their own quantification measures of emission reductions, JBIC will consider using the other agencies’ MRV quantification measures, where they prove viable and reliable.

United Kingdom. The UK's climate financing is provided by the Department for International Development (DFID), the Department of Energy and Climate Change (DECC), and the Department of Environment, Food and Rural Affairs (Defra). The three UK departments are working toward aligning the monitoring and evaluation systems to ensure a coherent approach to monitoring the impact of their activities. They are also providing technical assistance on MRV through some of their international development assistance.

KfW (Germany). KfW is implementing Climate Check, a tool it developed in cooperation with GIZ and BMZ, to factor climate issues and emission reductions into investment decisions and to evaluate project results. The two main objectives of KfW's GHG monitoring activities is to (a) have quantitative GHG emission monitoring in place for internal and external evaluation; and (b) prepare for using CDM as a source of finance where appropriate. The basic principles for the monitoring efforts include cost-effectiveness, accuracy, transparency, and consistency with existing frameworks and protocols,⁶³ as well as making use of CDM methodologies where available and appropriate.

Clean Technology Fund (CTF). Investments through the CTF are prioritized according to the potential reductions in GHG emissions growth per quantity of CTF investment. Each project or program proposal is required to include three GHG emission trajectories: (a) a baseline trajectory; (b) a trajectory taking into account the CTF project; and (c) a trajectory if the project were to be replicated throughout the targeted area, region, or sector of the country/region. The indicator used demonstrates the potential for emission reductions in both absolute terms, in terms of avoided GHG emissions (tCO₂e), and relative in terms, as a percentage of total emissions (CIF, 2009).

6.3.4 MRV for Carbon-Based Financing

The clearest, most rigorous requirements for the MRV of GHG emissions appear among projects in which the value of the carbon from GHG emissions reductions is actually monetized. In developing Asia, this means CDM projects and carbon funds. Carbon funds aim to facilitate financing of development projects in the energy and infrastructure (energy, water, transport), agriculture, and forestry sectors by leveraging independent investments via the carbon markets.

The most robust MRV frameworks are for funds such as ADB's Future Carbon Fund, which pre-purchases post-2012 carbon credits for projects, providing an immediate fixed payment on a percentage (e.g., 30 or 50 percent) of their value. Since the Future Carbon Fund is investing in CERs, the projects have to be CDM projects and registered with the UNFCCC. Thus far, the Future Carbon Fund has invested in 20 CDM-registered projects.

The NEFCO Carbon Fund requires that projects conform with the requirements of the Kyoto Protocol, in particular the requirements of the Joint Implementation Supervisory Committee and CDM Executive Board of the UNFCCC Secretariat, and the second and subsequent trading periods of the EU Emission Trading Scheme.

The MDG Carbon Facility uses GHG reduction estimates in the project selection process. The selection of emission reduction projects is determined by 'assessing the project's impact on average pool costs, specific development and environmental attributes of the project, project risks, size of emission reductions, and project time frames.'

⁶³ These include the Intergovernmental Panel on Climate Change of the UN Framework Convention on Climate Change (IPCC/UNFCCC); ISO standard 14064; The Global Reporting Initiative (GRI); and the World Business Council for Sustainable Development/World Resources Institute's GHG Protocol (KfW, 2009).

7. Summary and Recommendations

7.1 Introduction

This section summarizes some of the main report findings, noting key issues that can be addressed by the LEAD program in developing Asia. It also describes the magnitude of the financing challenge and the vital importance of better understanding private sector investment and of linking it to climate finance efforts. In this context, the report proposes a number of recommendations for private sector financiers, banks, and fund managers. The section concludes with a summary of the main capacity building suggestions for climate finance received during the research team's interviews with stakeholders in the Asia region in November and December 2012.

7.2 Climate Financing: How Much is Needed?

The level of investment flows needed for the transition to a low-carbon economy is several times higher than what is currently being deployed. HSBC, the British multinational banking and financial services company, estimates that USD 10 trillion in cumulative capital investments will be required globally during the decade 2010–2020, or about USD 1 trillion per year (HSBC, 2010). Given the typical debt-equity breakdown of capital spending, this means that about USD 600 billion annually is needed in the form of bank loans or bonds, and USD 400 billion annually is required in equity. Bloomberg New Energy Finance estimates that India and Southeast Asia alone will require USD 144 billion per year of clean energy investment, or 14.4 percent of the global requirement (Frankfurt School, et al., 2012).

Even if the Green Climate Fund achieves a commitment of USD 100 billion per year in climate finance

by 2020—and, given the current geopolitical climate, this may be challenging—at a minimum, private sector financing will need to increase by USD 700 billion to USD 850 billion annually from current levels to fill the gap in climate finance. This is consistent with the UNFCCC estimate that more than 85 percent of all finance to address climate change will need to come from the private sector (UNEP, 2012). Currently, private sector climate finance is provided mainly through asset management companies, private equity, venture capital, public-private partnerships, commercial banks, and climate bonds. Compared to public sector mechanisms, the private sector is inherently more efficient at allocating capital based on a risk-return adjusted basis. To achieve the incremental USD 700-850 billion of climate finance required annually, the public sector will need to leverage its resources to stimulate additional capital flows through the private sector.

7.3 Summary of Findings

The recent emergence of the Asia LEADS Partnership has brought together governments, donors, technical experts, and financiers to establish a network for sharing experience and knowledge, including best practices. The Partnership has adopted, among its top priority areas, financing for LEADS and green growth. Partnership participants have called for greater coordination and dialogue among governments, development finance institutions, and the private sector on ways to finance LEADS and green growth across multiple economic sectors, including energy, agriculture, forestry, industry, and others (USAID, 2012).

This report addresses the call for dialogue and capacity building in the area of climate finance. Based on a review of more than 200 climate-related funds and financing mechanisms in the Asia region, along with interviews with 27 developing

financing institutions, banks, and private sector fund managers across six countries,⁶⁴ the report identifies key issues and opportunities. These are described below.

Donor climate funds are available in developing Asia. To date, 25 international public climate funds have approved USD 1.6 billion of projects and programs for the 11 focus countries.⁶⁵ This suggests that significant financing is available for LEDS and green growth in developing Asian countries. However, countries need to make systematic preparations in order to successfully access this funding. Examples of such preparations are given in the recommendations below. So far, India and Indonesia have performed particularly well: about one-third, or USD 491 million, of these approvals has gone to India, including USD 263 million approved in 2012 from the Clean Technology Fund. Indonesia, with USD 325 million, also receives most of its funding (USD 125 million) from the Clean Technology Fund, with another USD 87 million coming from Australia's International Forest Carbon Initiative and USD 20 million from Norway's International Climate and Forest Initiative. Thailand and the Philippines are also gaining access to these funds with some success.

Private sector flows dominate climate finance. As much as USD 364 billion of public and private climate finance is made available every year, according to one report that investigated the entire chain of sources, intermediaries, instruments, channels, and uses of climate finance globally (Climate Policy Initiative, 2012).⁶⁶ The private sector accounts for approximately three quarters of the overall total. Most of the climate finance (USD 350 billion) goes toward projects that mitigate climate change. All of private sector climate

change finance goes toward mitigation, and the only funding for adaptation at present comes from public sector sources. Almost 80 percent (more than USD 30 billion) of private sector renewable energy investments in the focus countries during 2009-2012 were mobilized in India, followed by almost 10 percent (USD 3.8 billion) in Thailand.

Engagement needed with private sector investors. The single top priority identified at the Asia LEDS Forum in Bangkok in September 2012 was to 'improve public-private linkages by bringing together development finance [institutions] with bankers and investors to understand and discuss climate finance strategies.' Given the fact that approximately three quarters (about 74 percent) of climate investments are currently from the private sector, and that the public sector has only limited awareness of public sector investors and more specifically their clean energy and climate related investments, one priority should be to develop strategies for increasing access to finance using concessional financing and other public financing mechanisms to leverage the 'viability gap' and mitigate risk for marginal private sector climate investments.

Benefits of leveraging the carbon markets. Carbon finance refers to the payment for project-based GHG emission reductions. These emission reductions take the form of tradable financial instruments. One of the benefits of carbon finance, in particular the CDM, is that it provides a method for tracking project investment flows.⁶⁷ During 2004-2012, a total of USD 229 billion of investments was allocated in the 11 focus countries to low-carbon technologies (i.e., projects where CDM credits played a role). The largest share of this investment capital came from domestic sources. The amount of 'carbon finance'

⁶⁴ These interviews were conducted in November and December 2012 as part of the research for this report, and covered India, Malaysia, the Philippines, Singapore, Thailand, and the United States.

⁶⁵ Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Papua New Guinea, the Philippines, Thailand, and Vietnam.

⁶⁶ This number is consistent with findings from other reports: USD 263 billion in public and private clean-energy investment in 2011 (Pew Charitable Trusts, 2012); global investment in renewable power and fuels rose of USD 257 billion in 2011 (Frankfurt School, et al., 2012); and USD 214 billion invested in 2010 in low-carbon projects in developing countries alone (International Finance Corporation, 2011).

⁶⁷ In any future scenario in which the implementation of GHG mitigation activities is dramatically scaled up, it will be essential to track and measure not only investment flows, but also emissions reductions. In that sense, the CDM regime has provided a

(i.e., CERs) involved in these projects was just USD 3.5 billion.⁶⁸ This demonstrates that carbon markets have served as an effective instrument to leverage private sector investment. However, given the current status of the carbon markets and the long-term outlook for supply and demand of carbon credits, it is not anticipated that the carbon markets will make a significant contribution to the overall requirement for climate finance, and that both the public and private sectors will need to develop other innovative, market-driven financing mechanisms.

Carbon markets are beginning to fragment. In the post-2012 period, carbon markets are likely to become regionally fragmented. For example, differentiated domestic and regional (bilateral) systems are arising, where they are integrated neither with each other (no mutual recognition of units) nor with the international, multilateral carbon market. This regional fragmentation will lead to different regional carbon prices, rather than a homogenous global price. It will increase the need for mutual recognition of units to increase market liquidity and to harmonize climate policy-induced costs of the regional trade of carbon-intensive goods. The eventual harmonization of domestic and regional carbon markets will require common accounting frameworks and registry systems for GHG emissions and carbon credits. The 11 countries do not have such systems in place, but many countries have started work on such schemes. Some countries have already started to coordinate their respective efforts within the context of the World Bank's Partnership for Market Readiness.

Donor financing of climate initiatives lacks a common MRV system. For public sector climate-related

funds and mechanisms supported by development finance, a range of MRV requirements are in place. For funds where carbon is not specifically monetized, no single international standard or protocol serves for MRV. The methodology, and level of rigor, varies by funder, and reflects specific fund objectives and rationales for reporting GHG emission reductions. While no single global standard for MRV currently prevails, the basic principle applied by donors everywhere is similar. They typically rely on simple calculations of 'before' and 'after' GHG emissions to develop estimates of the GHG emissions reductions. The MRV procedures used for mitigation actions, however, need to be improved and standardized.

MRV frameworks and capacity is critical to access public finance. Interviews by the research team with public sector fund managers across the region make it clear that, as efforts to address climate change increase, the ability to measure and manage GHG emissions will become a critical pre-condition for the allocation of financing. As investments into climate-related projects and businesses increase, it is likely that new elements of competition will arise for climate funds disbursed by international financial institutions. For example, the World Bank's Partnership for Market Readiness has thus far allocated funds to only a limited number of countries in Asia, already suggesting competitive forces at work. On the other hand, MRV was not highlighted as a requirement for access to private sector funds.

MDBs are developing an initiative to track GHG emissions and climate finance flows. A group of MDBs has been working to better coordinate and improve technical and financial support to developing countries in GHG mitigation and adaptation

useful example, and perhaps foundation, for a future in which investments in GHG mitigation options, and the resulting emissions reductions are carefully measured, reported, verified, and tracked.

⁶⁸ The estimated value of the CERs was based on an historic average price of USD 8/ton for this portfolio, and for credits delivered up until the end of 2012. The USD 229 billion represents the total value of investment in these CDM projects.

to climate change. At the 2012 UN Conference on Sustainable Development (Rio+20) in Doha, November 2012, the MDBs announced a harmonized approach to measuring and tracking their project-level GHG emissions, while also harmonizing the tracking of their climate financing commitments.⁶⁹ The ultimate objective is to harmonize metrics for measuring and tracking climate-related finance activities across MDBs, aiming to improve monitoring of climate finance flows and their effectiveness.

Alternative asset investments present a new opportunity. Assets in global alternative investments rose to USD 6.5 trillion in 2011, and this asset class is expected to grow an additional 13 percent by 2015 (Wall Street Journal, 2012). Based on a review by Nexant, an estimated 1 percent or less of the alternative asset class globally is allocated to climate-related investments.⁷⁰ In Asia, about USD 31 billion of climate-related assets currently fall within the alternative asset class, including private equity. An increasingly greater allocation to this asset class creates a unique opportunity for the public sector to catalyze capital flows for investments related to climate finance. The private equity and venture capital asset class is expected to serve as one of the main channels for more climate finance to the 11 focus countries.

Climate bonds are expected to make an increasing contribution. In addition to private equity and venture capital, climate bonds⁷¹ could serve as another mechanism to fund the gap outlined above for the private sector. The public sector could underwrite portions or components of risk to catalyze climate bonds in the private sector. The cumulative total of all climate-related bonds issued over the last decade is USD 751 billion, or an average of USD

75 billion per year (Climate Bond Initiative and HSBC, 2012). The issuance of climate bonds for the 11 focus countries to date has been limited, but this is expected to increase substantially, and complement commercial banks, in providing the approximately USD 600 billion of debt-related climate finance required per year (and the 90 billion required per year in the 11 focus countries) to address climate change. 'Covered bonds,' a financing mechanism used primarily for mortgages, are now being viewed as a method for financing clean energy projects and raising much of the estimated USD 1 trillion a year in new private capital needed to keep GHG emissions at safe levels (Frankfurt School, et al., 2012).

Commercial banks are establishing specialized climate finance facilities. Most commercial banks lack designated business units or facilities for climate finance. Nevertheless, a number of banks have recently established such facilities with some success. The number and size of such facilities should continue to grow over the next several years, as the demand for climate finance increases. These facilities typically use some form of partial risk guarantee, partial credit guarantee, interest rate subsidies, or term extension to motivate commercial banks to offer a specific climate finance product to their customers. The public sector might well underwrite these mechanisms to catalyze climate finance in the commercial banking sector. In addition to climate bonds, commercial banks will be the other major source of the USD 90 billion of debt required annually by the 11 focus countries to address climate change.

⁶⁹ International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting, issued at the Doha Climate Change Conference by ADB, African Development Bank, Agence Francaise de Developpement, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Finance Corporation, Nordic Environment Finance Corporation, the World Bank (Doha, November 2012).

⁷⁰ An alternative asset is any non-traditional asset with potential economic value that would not be found in a standard investment portfolio. Examples include hedge funds, venture capital related projects, infrastructure, and private equity.

⁷¹ Climate bonds are long-term debt securities issued to raise finance for climate change mitigation- or adaptation-related initiatives that are typically asset-backed or ring-fenced. They are issued by governments, MDBs, or corporations that guarantee repayment plus a fixed or variable rate of return over a defined period.

7.4 Recommendations

The regional interviews carried out by the research team elicited numerous recommendations, both general and specific, for training and capacity building activities that could help address some of the barriers

to climate finance. This input will serve as the basis for designing capacity building activities for both donors and recipients, which will be conducted under the framework of the LEAD program and the Asia LEDS Partnership. Table 15 lists these capacity building ideas, and suggests their respective targets.

Table 15: Examples of Capacity Building Needs for Climate Financing

Capacity Building Need Identified	Govts.	Banks and FIs	Other (NGOs, academics, etc.)
Establish regulatory frameworks and MRV systems that support climate financing	√	√	√
Build the capacity to bridge the gap between project proposals and available financing	√		√
Develop processes to understanding linkages between public budgets and climate finance	√		√
Focus on national and sub-national coordination on finance	√		√
Build awareness of, and capacity for, climate financing among private sector banks and investors		√	
Blend concessional financing with private sector financing	√	√	√
Develop a learning network for effective policy, regulatory, and market mechanisms	√	√	√
Establish financing mechanisms for smaller-scale infrastructure		√	
Develop a pipeline of bankable climate finance projects			
Train utility officials in renewable energy financing	√		√
Hold roundtable for fund managers on climate investments		√	
Help the countries that most need the help	√		√
Facilitate access to climate financing	√	√	√

Source: Nexant research

Establish regulatory frameworks and MRV systems that support climate financing. Governments need to establish strong MRV systems that create baselines and allow tracking and monitoring of GHG emissions reductions. Governments can also take a number of other important actions to enhance their ability to attract climate financing. These include establishing strong and stable policy frameworks and regulatory mechanisms for clean energy and other climate-related investments; and enhancing in-country business capacity through market development and technology transfer activities, including entrepreneur incubators, investment promotion, and training.

Build the capacity to bridge the gap between project proposals and available financing. There appears to be a disconnect between government officials, development professionals, and entrepreneurs who identify projects, and those who provide resources such as financing and technical assistance. Capacity building is needed if project proponents are to develop successful proposals to multilateral and bilateral financing institutions for financing mitigation programs or projects. As noted earlier, project proponents need to research the specific requirements of the financing sources from which they seek assistance. Related training should cover scoping, design, implementation, expected impacts, and evaluation. A good example of such a training module can be found in *Accessing International Financing for Climate Change Mitigation: A Guidebook for Developing Countries* (UNEP, 2012). Training courses on preparing financing proposals, such as this one, should be delivered in a manner ensuring that the appropriate state and local agencies are included early in the proposal stage. This sort of capacity building is a necessary first step, one that should precede working specifically on the development of blended financial instruments.

Develop processes to understanding linkages between public budgets and climate finance. Since climate financing is distributed across many government ministries and agencies, it is difficult to track

and monitor at a national level. Public budget reviews provide a mechanism for understanding, identifying, tracking, understanding, and improving climate financing at the national and sub-national levels (UNDP; World Bank, 2012). CPEIRs can be conducted by cross-government steering groups led by finance and planning ministries, with technical input from environment ministries.⁷² CPEIRs provide analytical support, informing government decision-making and supporting the development of climate change strategy. They also raise awareness on climate change issues among public finance managers, and enable better integration of climate issues in mainstream development plans and budgets.

Focus on national and sub-national coordination on finance. In developing Asia, and indeed in developing nations worldwide, national governments too commonly enter into international climate finance agreements for projects without first consulting extensively with local governments. In these cases, project managers typically discover a gap upon project implementation, one that quickly leads to difficulties. Often, miscommunications arise between the national government and implementing agency—i.e., a gap between the planning ministry and the line ministry.

Build awareness of, and capacity for, climate financing among private sector banks and investors. Large amounts of investment are flowing into such areas of infrastructure as energy, water, transport, and forestry, where there are potential climate benefits. There is a need to make banks, fund managers, and investors in the region aware of the opportunities for accessing grants, funds, loans, and guarantee mechanisms designed to support climate-friendly projects. They generally do not have a strong understanding of either climate-friendly financing or specific sub-components such as renewable energy project development and related business models. In the absence of clear carbon markets or mechanisms, the focus should be less on CDM and carbon markets per se, unless the value of GHGs can be monetized. Some of the remedial measures could include regulations to support energy efficiency and

⁷² This process has already been done in some Asian developing Asian countries. See www.snap-undp.org/elibrary/Publication.aspx?id=725.

renewable energy finance; pricing analysis, e.g., to support tariff mechanisms; capacity building for vendors and project implementers to design and successfully implement projects; training energy auditors in how to effectively interact with banks; forums with energy efficiency companies to build literacy in finance; and, more generally, building capacity within banks to understand energy efficiency and renewable energy businesses, and projects.

Blend concessional financing with private sector financing. Plenty of private sector projects are capable of succeeding on their own, but many of these projects need a ‘push’ to make them viable. This is sometimes referred to as filling the viability gap (World Bank; AusAID, 2012). A number of development financing institutions are developing targeted strategies to ‘blend’ donor funds with private finance, aiming to increase the amount of private sector investment. This can be done by raising awareness among private sector financiers, and in some cases through the formation of public-private partnerships (PPPs). One example of such an initiative is ADB’s newly established Climate Public-Private Partnership Fund. It would also be useful to identify a number of examples of successful PPPs in the climate finance area, and showcase them in workshops with private sector investors. Once private sector financial institutions are aware of the sources and criteria for key concessional funds, they can then steer developers toward the multilateral and bilateral agencies that operate these concessional funds.

Develop a learning network for effective policy, regulatory, and market mechanisms. Capacity building for government officials is desperately needed in a number of areas, including policy frameworks, regulatory development and implementation, and removing such barriers to investment such as

regulations that impede business licenses.⁷³ Effective policy and regulatory mechanisms provide a market signal to private financiers that political, legal, and monetary risks are low, or at least manageable, thus reducing a barrier to private sector investment. There is also a need to build capacity among governments in the area of financial mechanisms for climate finance. Such measures could include incentives for energy efficiency (e.g., demand-side management, rebate programs, tax incentives); renewable energy (e.g., renewable portfolio standards, feed-in tariffs); and forestry (e.g., payment for ecosystem services). Some examples of success in using such measures are the ‘adder scheme’ for renewable energy in Thailand; the new feed-in-tariff in Malaysia; and the perform, achieve, and trade (PAT) scheme for industrial energy efficiency in India.

Establish financing mechanisms for smaller-scale infrastructure. A recurring theme in our regional interviews was the initial barriers faced by smaller-scale infrastructure investments that produce climate benefits. One recommendation was that a fund be established to provide seed capital for small-scale infrastructure, one that would also provide technical assistance. Access to finance is probably the single greatest issue faced by recipients, whether public or private. Intervention in the form of capacity building among private financial institutions would address this barrier.

Develop a pipeline of bankable climate finance projects. The public sector can catalyze capital flows into the alternative asset class by developing a pipeline of bankable climate finance projects such as infrastructure and private equity. In addition, the public sector can blend and leverage public finance by establishing PPP funds such as the recently formed infrastructure fund in the Philippines managed by

⁷³ Among the focus countries supported by USAID’s LEAD program, between 2009 and 2012, India and Thailand have been the largest recipients of private sector financing, consistently representing between 80-90 percent of total clean energy investments (Bloomberg New Energy Finance, 2013). This is largely due to the favorable regulatory environment for wind energy in India and solar energy in Thailand. The dramatic increase in private sector clean energy investment in India and Thailand can serve as positive examples for other focus countries, specifically with respect to regulatory intervention, investment climate, and market readiness. In contrast, during the same period Bangladesh, Cambodia, Nepal and Papua New Guinea, with the exception of Bangladesh in 2011, have received no private sector clean energy financing. This situation presents a clear opportunity for the public sector to engage in capacity building both with governments and financial institutions to create a conducive regulatory environment and investment climate for the private sector.

Macquarie, with Philippine Pension Fund and ADB as Limited Partners.

Train utility officials in renewable energy financing.

To expand the financing of grid-connected renewable energy projects in Asia, state electricity officials need to be trained in key aspects of renewable energy. Areas that require attention include (a) how renewable energy technologies work, the costs of investment and installation, grid capacity for renewable energy, how renewable energy affects the grid, and what needs to be done to the grid to accommodate it; (b) better project sustainability and environmental impact assessments; (c) improvements in local bank capacity to understand renewable energy; (d) greater coordination across government departments; and (e) reference renewable energy projects built by the private sector. Some countries in the region such as Malaysia have experience in this region which could be valuable to other countries.

Hold roundtable for fund managers on climate investments.

One suggestion gathered in interviews with stakeholders is holding an outreach event for fund managers working on cleantech and other climate investments in the Asia region. The roundtable would focus on fund managers involved in climate finance, with the objective of raising awareness of concessional financing for climate change and discussing how to improve the effectiveness of climate finance.

Help the countries that need the most help.

A number of Asian countries have large climate financing programs with relatively robust MRV frameworks—e.g., CDM in place, GHG accounting and inventories well established, strong consultant base—and these countries have an advantage in accessing climate financing. It is important to provide extra capacity building assistance to countries with less capacity,

weaker MRV frameworks, and limited fiduciary capacity.

Facilitate access to climate financing. A common refrain during meetings with respondents was that, while there has been much discussion about creating financing mechanisms, not nearly enough effort has gone into helping countries access these mechanisms. Additionally, governments and donors need to decide what they must do to encourage the private sector to direct money to mitigation investments that address climate change.

7.5 Conclusions

The private sector, which accounts for about three-quarters of available climate finance funding, already plays a major role in climate financing. To meet the needs of transitioning to a low-carbon economy, however, private sector investment must increase dramatically. Only an innovative and successful partnership between the public and private spheres can achieve this outcome.

Between 2009 and 2012, private sector climate finance investments grew at an average of 26 percent. But bridging the climate finance funding gap outlined above will require an increase of more than 300 percent in private sector climate finance. Based on current trends, available investments will fail to meet this need. In fact, a quantum shift in climate finance is needed in both the public and private sectors. This climate finance gap will remain the single greatest issue over the next decade, and will require the public sector at the national, regional, and global levels to develop innovative ways of leveraging public sector funds to mobilize private sector capital. The role of the private sector, meanwhile, should be to allocate capital and scarce resources efficiently in the climate finance sector.



To date, 25 international public climate funds have approved USD 1.6 billion of projects and programs for the 11 focus countries. In these countries, USD 8.2 billion was invested in renewable energy in 2012 alone (the largest area of climate finance), with most of this from private-sector sources.

The amount of climate finance required for India and Southeast Asia⁷⁴ is approximately USD 150 billion annually. This would suggest that the current amount of financing available for LEDS and green growth efforts in the 11 focus countries is woefully low at present, and that this amount must increase by an order of magnitude in this region over the next decade (relative to a 300 percent increase needed globally). In addition, the distribution of climate finance in the 11 focus countries has been extremely uneven, with India and Thailand receiving 80-90 percent of renewable energy investments.⁷⁵ Thus, in addition to the need for a dramatic increase in climate finance, a more even distribution of climate finance is required across the 11 focus countries, with a particular emphasis on Bangla-

desh, Cambodia, Nepal, and Papua New Guinea. To date, these countries have received only minimal amounts of climate financing.

To access climate funding and allocate investments effectively, the public and private sectors in these countries need to take systematic actions. Such actions could include improved public awareness of the issues, training in tools such as GHG inventories and accounting, and development of strong MRV frameworks for both climate financing and the resulting GHG emission reductions.

Countries that prepare the fastest will be first through the gate to access current and upcoming climate financing, thereby positioning themselves for rapid economic and technological development at the same time as they limit their carbon emissions.

⁷⁴ This refers to the amount of investment needed to mitigate enough GHG emissions to meet the IEA's 450 ppm scenario that would limit global average temperature rises to 2°C.

⁷⁵ Renewable energy is used as a rough proxy for climate investments in India and Southeast Asia, as accurate figures for total climate finance are not available. Renewable energy investment accounts for by far the largest share of investment in climate finance.

References

- Aiming Zhou. (2012). Regional and Sustainable Development Department, ADB. Personal communication.
- ADB. (2011) *Manual for Calculating Energy Output Indicators*. Regional Sustainable Development Department (RSDD).
- ADB. (2011). *Clean Energy Investments: Project Summaries*. June 2012. Page 1.
- ADB. (2012). *Annual Report: 2011*. Volume 1.
- ADB, African Development Bank, Agence Française de Développement, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, International Finance Corporation, Nordic Environment Finance Corporation, the World Bank. (2012). *International Financial Institution Framework for a Harmonized Approach to Greenhouse Gas Accounting*. Issued at the Doha Climate Change Conference. Doha, November 2012.
- AFD. (2011). *Agence Française de Développement 2011 Annual Report*.
- AFD. (2012). *Action Plan 2012-2016: Reconciling Development and the Fight against Climate Change*.
- AusAID. (2012). *MRV Capacity Development Modules: Sharing Australian MRV Expertise*.
- Bloomberg New Energy Finance. (2013). Research carried out for Nexant to support the USAID Low Emissions Asian Development (LEAD) Program.
- CDP. (2012). *CDP Asia ex-Japan Climate Change Report 2012*. Carbon Disclosure Project
- Climate Bond Initiative and HSBC. (2012). *Bonds and Climate Change – The State of the Market 2012*.
- Climate Policy Initiative. (2011). *The Landscape of Climate Finance 2011*.
- Climate Policy Initiative. (2012). *The Landscape of Climate Finance 2012*.
- Climate Investment Funds. (2009). *Clean Technology Fund Investment Criteria for Public Sector Operations*.
- Climate Action Network Australia. (2009). *Count down to Copenhagen: LULUCF and REDD*.
- Coller Capital. (2011). *Global Private Equity Barometer: Winter 2010-11*.
- EIB. (2011). *Factsheet – EIB financing in Asia*.
- EIB. (2012). *Annual Report 2011*. Activity report.
- EU Joint Research Center (JRC). (2011). *Emissions Database for Global Atmospheric Research (EDGAR)*.
- Financial Times and Towers Watson. (2012). *Global Alternatives Survey 2012: Including the Top 100 Alternative Investment Managers*. Available at <http://www.towerswatson.com/research/7415>.
- Frankfurt School–UNEP Collaborating Centre for Climate & Sustainable Energy Finance and Bloomberg New Energy Finance (2012). *Global Trends in Renewable Energy Investment 2012*. Global Environment Facility, www.thegef.org.

GEF. (2010). *Annual Report, 2010*.
Global Environment Facility.

GEF. (undated). *GEF-5 Focal Area Strategies*.

IFC. (2011). *Climate Finance: Engaging the Private Sector*. International Finance Corporation, World Bank Group.

IFC. (undated). *Climate Business at IFC*.
See http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/CB_Home/.

IFC.(2012A). *Lighting Asia: Solar Off-Grid Lighting, Market Analysis of India, Bangladesh, Nepal, Pakistan, Indonesia, Cambodia and Philippines*. International Finance Corporation, World Bank Group. May.

IFC.(2012B). *IFC Activities in Cleantech*. International Finance Corporation, World Bank Group

IRRC Institute and Tellus Institute. (2012). *Environmental, Social and Governance Investing by College and University Endowments in the United States: Social Responsibility, Sustainability, and Stakeholder Relations*.

ICF. (undated). *International Climate Fund Implementation Plan 2011/12 – 2014/15*. Technical Paper.

JBIC. (2012). *Guidelines for Measurement, Reporting and Verification of GHG Emission Reductions in JBIC GREEN Operations*.

KfWEntwicklungsbank. (2012). *Commitments on Climate and Environment 2011*.
KfW Entwicklungsbank. Available at:
http://www.kfw-entwicklungsbank.de/ebank/EN_Home/Climate_Change/Climate_-_Facts_and_Figures/KfW_EB_Umwelt-KlimaZusagenstatistik2011_web_E.pdf.

KfW Development Bank. (2009). *Greenhouse Gas Emission Monitoring of Development Projects: Issues and Options*. Presented by Jochen Harnisch, Coordinator Climate Change Policy, KfW Development Bank at the EU Practitioners Network Meeting, Paris March 4, 2009.

Limaye, Dilip R.; Xianli Zhu. (2012). *Accessing International Financing for Climate Change Mitigation – A Guidebook for Developing Countries*. DTU Department of Management Engineering. TNA Guidebook Series.

Morgan Stanley. (2013). *Earnings Call*. January 18, 2013. Available at <http://seekingalpha.com/article/1120641-morgan-stanley-management-discusses-q4-2012-results-earnings-call-transcript>.

NDF. (2012). *Annual Report 2011*. Nordic Development Fund.

NEFCO. (2012). *Carbon Finance and Funds – Operational Review 2011*.

NEFCO. (2012). *Annual Report 2011*. Nordic Environment Finance Corporation.

Nopef. (2012). *Nordic Project Fund Annual Report 2011*. In Norwegian. Nordic Project Fund.

O'Connor, Craig. (undated). *Financing Renewable Energy: The Role of the EXIM Bank*. Presentation.

Project Finance Group. (2012). Personal communication. Reliance Power Limited.

Robins, Nick; Singh, Charanjit; Clover, Robert; Knight, Zoe; Magness, James. (2010). *Sizing the Climate Economy*. HSBC.

Röser, Frauke; van Tilburg, Xander; Davis, Stacey; Höhne, Niklas. (2012). *Annual Status Report on Nationally Appropriate Mitigation Actions (NAMAs), ECOFYS, ECN, and CCAP*

(2011). Retrieved from http://www.ecofys.com/files/files/namas_annualstatusreport_2011.pdf.

Scotney, Richard; Chapman, Sarah; Gilchrist, Liam; Phillips, Gareth; Haefeli-Hestvik, Susanne. (2012). *CDM in Crisis – What is at Stake?* Climate Bridge. Available at <http://www.pd-forum.net/files/8b0d5e379acd08206618bafb7fde803a.pdf>.

The Pew Charitable Trusts. (2012). *Who's Winning the Clean Energy Race? 2011 Edition*. Towers Watson. Global Alternatives. Survey.

Twidale, Susana. (2012). *Countries target CO₂ markets by year-end under World Bank scheme*. Point Carbon. Retrieved from http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/Countries_target_CO2_markets_by_year-end_under_World_Bank_scheme.pdf. U.N. (2010). Report of the Secretary-General's High Level Advisory Group on Climate Change Financing.

UNDP. (2011). *Catalyzing Climate Finance – A Guidebook on Policy and Financing Options to Support Green, Low-Emission and Climate-Resilient Development*.

UNDP; World Bank. (2012). *Summary of the Workshop: Climate Public Expenditure and Institutional Reviews: (CPEIR) Workshop on Past Experience and the Way Forward*. September 10-12, Bangkok.

UNDP. (2013). *Climate Public Expenditure and Institutional Reviews (CPEIRs) in the Asia-Pacific Region What have We Learnt?*

UNEP. (2012). *Risoe CDM Database*. Retrieved from <http://www.cdmpipeline.org>.

UNEP. (2012). *Finance Initiative discussion paper*. 22 May 2012.

UNFCCC. (2008). *Report of the Conference of the Parties on Its Thirteenth Session, Held in Bali, 2007*. UN Framework Convention on Climate Change.

UNFCCC. (2011). *Report of the Conference of the Parties on Its Sixteenth Session, Held in Cancun from 29 November to 10 December 2010*.

USAID. (2011). *Energy Trends in Developing Asia: Priorities for a Low Carbon Future*. USAID. (2012). *Meeting Report: Asia LEADS Forum 2012: Catalyzing an Era of Green Growth*. USAID Low Emissions Asian Development (LEAD) Program. Bangkok, Thailand, September 18-21.

US Department of State. (2012). *Meeting the Fast Start Commitment: U.S. Climate Finance in Fiscal Year 2012*.

Wall Street Journal. (2012). December 17.

World Bank. (2007). *Clean Energy for Development Investment Framework: The World Bank Group Action Plan*.

World Bank. (2008). *Development and Climate Change: A Strategic Framework for the World Bank Group*.

World Bank and AusAID. (2012). *Green Infrastructure Finance: Framework Report*.

World Bank News Release (2011). *Partnership Approves Grant for Eight Carbon Market Initiatives*.

World Bank. (2010). *World Development Report 2010: Development and Climate Change*.

ODI. (2012). *The Japanese Fast-Start Finance Contribution*. Published by ODI, in partnership with the Institute for Global Environmental Strategies (IGES) and the World Resources Institute (WRI).

WRI. (2012A). *Climate Analysis Indicators Tool (CAIT) version 9.0*. Washington, DC. Available at <http://cait.wri.org>.

WRI. (2012B). *Developed Country Fast-Start Climate Finance Pledges*.

Annex: List of People Interviewed

The list of people interviewed that follows is organized alphabetically by organization, and the location of the interview is given in parentheses.

Adaptation Fund

Marcia Levaggi, Manager,
Adaptation Fund Board Secretariat (Telephone)
Mikko Ollikainen, Adaptation Officer,
Adaptation Fund Board Secretariat (Telephone)

AFD (Agence Francaise Developpement) and Proparco (Groupe Agence Francaise de Developpement)

Thibault Foucher, Investment Analyst,
Proparco (India)
Xavier Exchasseriau, Project Office for South Asia,
AFD (India)

Agrinergy

Ben Atkinson, Managing Director (Singapore)

Asia Green Capital

Edgare Kerkwijk, Managing Director (Singapore)

Asian Development Bank (ADB)

David McCauley, Climate Lead, ADB (Philippines)
Don Purka, Regional and Sustainable
Development Department (RSDD) (Philippines)
Michael Rattinger, LEDS Coordinator (Philippines)
Silverio Navarro, ADB Consultant,
Solar Power Generation Specialist (Philippines)

British High Commission

Mr. Muru Loganathan,
Climate Change Officer (Malaysia)

CLSA Capital Partners

Sanjeev Krishnan, Director,
Clean Resources Capital (Singapore)

Deutsche Investitions- und Entwicklungsgesellschaft mbH (DEG)

Dr. Hubertus Pleister, Director Asia (Singapore)
Hubert Jaeger, Senior Investment Manager (Thailand)

Global Environment Facility Junu Shrestha,
Climate Change and Chemicals (United States)

Global Environment Fund

James Castanino, Vice President (United States)

IL&FS Environment (IL&FS Environmental Infrastructure and Services Limited)

Ashwani Kumar Thakur,
Assistant Vice-President (India)
Debashish Tripathy, VP – Strategy (India)
Mahesh Babu, Managing Director (India)

Indonesia Climate Change Trust Fund (ICCTF)

Amin Budiarjo, National Project Manager,
ICCTF (Thailand)
Muhamad Suhud,
Energy Window Team Leader, ICCTF (Thailand)
Takako Morita, Programme Analyst,
Environment Unit, United Nations
Development Programme (Thailand)

International Emissions Trading Association (IETA)

Dirk Forrister, President and CEO (Thailand)

International Finance Corporation (IFC)

Chandra Govindarajalu, Team Leader for
Clean Energy, Senior Energy Specialist,
Sustainable Business Advisory (Delhi, India)
Joyita Mukherjee, Senior Operations Officer,
Blended Finance Unit (United States)
Miles Stump, Sustainable Energy Finance Specialist,
Asia and Pacific (Philippines)
Pravan Maholtra, Climate Business Group –
Investments & Technologies (Mumbai, India)
Rajesh Miglani, Regional Climate Change Specialist,
South Asia (Delhi, India)
Romel Carlos, Sustainable Energy Finance,
Access to Finance (Thailand)
Stephanie J. Miller, Director,
Climate Business Department (United States)
Vikram Widge, Head,
Climate Finance and Policy (United States)

Japan Bank for International Cooperation (JBIC)
Deepa Salvan, International Finance Specialist (India)
Fumitaka Machida, Chief Representative (Singapore)
Takao Kawasaki, Representative (Singapore)

Japan International Cooperation Agency (JICA)
Aditi Puri, Senior Development Specialist (India)
Kazuyoshi Ohnuma, Representative, India (India)
Sei Kondo, Representative, India (India)

KFW
Mr. Andreas Thermann (India)

KfW IPEX-Bank
Wolfgang Kassel, Director,
Head of Representative Office Singapore (Singapore)

Philippines
National Infrastructure Alliance (PINAI) Fund
Mr. Michael Rodriguez,
Managing Director, Macquarie Infrastructure
and Real Assets (Singapore) Pte Ltd (Philippines)

Standard Chartered Bank
Pauline Chong, Clean Energy,
Project & Export Finance (Singapore)

**Swedish International
Development Cooperation Agency (SIDA)**
Jenny Nilsson, Intern,
Development Cooperation Section (Thailand)
Kriangkrai Thitimakorn,
National Programme Officer,
Development Cooperation Section (Thailand)
Ulrika Åkesson, First Secretary,
Senior Programme Manager – Environment
and Climate Change,
Regional Development
Cooperation Section (Thailand)

US Export-Import Bank (EX-Im)
Craig O'Connor,
Business Development Officer (United States)

**US Overseas Private Investment
Corporation (OPIC)**
Lynn Tabernacki, Managing Director;
Renewable Energy and
Sustainable Development (United States)

World Bank
Jane Ebinger, Head, Climate Policy Team,
Climate Policy and Finance Department
(United States)
Philippe Ambrosi, Environmental Economist,
Climate Policy Team, Climate Policy
and Finance Department (United States)
Samira Elkhamlichi,
Senior Climate Change Specialist (United States)

For more information, please visit:
asia.usaid.gov
LowEmissionsAsia.org



U.S. Agency for International Development

Regional Development Mission for Asia

Athenee Tower, 25th Floor

Bangkok, 10330 Thailand

Tel: (66-2) 257-3000

Fax: (66-2) 257-3099

asia.usaid.gov