From Climate Finance to Financing Green Growth

Briefing paper, 23 November 2010

ClimateWorks FOUNDATION

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About Project Catalyst

Project Catalyst is an initiative of the ClimateWorks Foundation. ClimateWorks is a global, non-profit philanthropic foundation headquartered in San Francisco, California with a network of affiliated foundations in China, India, the US and the European Union. The ClimateWorks family of organisations focus on the enactment of policies that reduce greenhouse gas emissions through three general policy areas: energy efficiency standards, low-carbon energy supply, and forest conservation/agriculture.

Project Catalyst was launched in May 2008 to provide analytical and policy support for stakeholders engaged in the United Nations Framework Convention on Climate Change (UNFCCC) negotiations on a post-Kyoto international climate agreement. Project Catalyst and its working groups provide a forum where key participants in the global discussions can informally interact, conduct analyses, jointly problem solve, and contribute ideas and proposals to the formal UNFCCC process. This paper summarises output from Project Catalyst, but the views expressed in this paper have not necessarily been endorsed by all of the members of Project Catalyst nor their governments or organisations.

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Executive Summary

This document outlines the benefits of green growth and the importance of developing the right policies to support a transition towards the low carbon economy. It assesses the financing needs of green growth in developing countries, the role of the financing described by the UN High Level Advisory Group on Climate Change Financing (AGF) and how the climate finance system should develop over the next decade. It finishes by illustrating why climate finance needs to be framed in the wider context of growth and development finance.

The transition to a green economy is already under way – driven by countries' interest in economic development, energy security and climate.

Globally, more and more countries are embarking on a transition towards a greener economy. Countries have realised that this transition not only provides global climate benefits but also lays the foundation for a more sustainable and prosperous economy in the future. Green growth helps a country improve energy security (by reducing reliance of imported energy), build the industries of the future, improve local health by reducing pollution, and manage scarce resources like water more effectively; it makes economies more resilient to a changing climate.

The green economy's needs for climate related investment are relatively modest compared to global infrastructure investment activities with domestic policy being one of the major drivers. The required finance differs by sector.

The green economy's investment needs are relatively modest compared to global infrastructure investment. Independent of green growth, there will be major investment in infrastructure over the coming 10 years. Total infrastructure investment worldwide is estimated at about $7 trillion per annum by 2020 of which $1.5 trillion is energy related. To move to a low carbon pathway consistent with 2ºC warming, Project Catalyst estimates that about $290 billion per annum by 2020 of this total capital investment will be needed for low carbon infrastructure in developing countries (these include all middle income, rapidly industrialising countries as well as least developed countries).

Effective policy will be critical to shift investment towards green growth. Shifting these flows towards a green economy will require (i) the right policy choices and (ii)

financial support where appropriate. Policy is critical to shift investment from high carbon to low carbon. Market failures often prevent low carbon investment, for example, agency problems[1] can prevent energy efficiency measures in buildings, and policy is often the only way to deliver the desired changes. These policies can also create significant value: building codes or vehicle standards that improve energy efficiency can lead to energy savings that far outweigh the investment required. Cleverly designed policies can reduce risk and hence financing cost of investments, and help to identify incremental cost financing needs. Using government guarantees and reverse auctions with feed-in tariff policies are examples of such policy design.

About $60 billion per annum by 2020 in incremental cost financing would be required to support policies and catalyse green growth that delivers a 2ºC pathway. While many countries have embarked on the transition to green growth, their actions are unlikely to deliver all the mitigation measures needed for a 2ºC pathway, nor will all countries be able to finance adaptation measures without support. To incentivise additional mitigation and adaptation measures incremental cost financing might be needed, covering the additional cost of those measures over high carbon alternatives. Project Catalyst estimates that $60 billion per annum in incremental cost financing by 2020 would help to catalyse the mitigation measures in developing countries that are needed to move to a 2ºC pathway (assuming the low end of the Copenhagen pledges and other planned climate policies are implemented effectively and unconditionally) – not adjusting for the economic and energy security benefits of those measures. This amount of finance is far less than fossil fuel subsidies which totalled $312 billion in 2009 and is small compared to the global spend on energy, estimated to be $5 trillion per annum on fossil fuels by 2020.

Financing needs differ by sector:

- Low carbon power: Project Catalyst estimates 700 GW of additional low carbon power generation capacity needs to be built in developing countries by 2020 to move towards a 2ºC pathway[2], requiring an estimated total investment of $155 billion per annum between 2010 and 2020. The majority of this capacity expansion already forms part of developing countries' existing domestic plans. The additional investment could be mobilised by $18 billion per annum in 2020 in incremental cost financing if used to support feed-in tariffs, provide concessional finance or support enabling measures, e.g., grid upgrades.

[1] Agency problems are market failures where projects are not undertaken because the benefits do not occur to the party that would make the investment. That is the case for rented buildings where the owner would need to make energy efficiency investments, but the tenant benefits from lower electricity bills

[2] ,Compared to a total new built generation capacity of ~1,200 GW

- Energy efficiency and other mitigation measures: Project Catalyst estimates energy consumption in developing countries needs to be reduced by 4,300 TWh (or 7 percent of business-as-usual consumption) to reach a 2ºC pathway. This will require $123 billion in investment capital per annum by 2020. Some of this is part of developing countries existing plans and will be driven by policy measures such as building or vehicle standards. With the right supporting policies, a large portion of the needed investment could also pay for itself through energy savings. Some incremental cost support (~$18 billion per annum by 2020) might nevertheless be required for transaction costs, to implement policy measures and support cost positive measures,
- Land use: Some countries like Brazil have taken major steps in reducing deforestation without international financial support. Other developing countries would require support to implement reduction measures and alternative economic development, such as Indonesia. Project Catalyst analysis suggests that deforestation in developing countries needs to be halved by 2020 (equivalent to 7 mHA of avoided deforestation) to be consistent with a 2ºC pathway; this and other land use measures could require about $25 billion per annum by 2020.
- Adaptation: Adaptation finance will be critical to enable the poorest countries to adjust to a changing climate and to make their economies climate resilient. Adaptation is often very closely linked to green growth, broader development, and mitigation. Estimating the financing required is made difficult by the large uncertainty about the climate and its impact, open questions about the definition of adaptation, and by the concept of additionality. Estimates for financing needs range from $10s of billions to $100 billion per annum.

The $100 billion in climate finance per annum by 2020 committed to in Copenhagen Accord could make a significant contribution towards the required financing. Developed countries have committed in the Copenhagen Accord to support developing countries' transition to green growth with $100 billion per annum in new and additional public and private finance by 2020. The recently released UN High Level Advisory group on Climate Change Financing (AGF) report concludes it is "challenging but feasible" to deliver this $100 billion through innovative sources like transport levies, capital increases to the multilateral development banks (MDBs), redirection of fossil fuel subsidies or royalties, and financial transaction taxes. Sources that raise finance by pricing the carbon externality are particularly attractive, (e.g., through carbon markets or taxes). Carbon prices of $20–25 per tonne and international coordination will be instrumental if these potential sources are to generate the $100 billion. Project Catalyst analysis suggests that the AGF contribution would almost halve the incremental cost financing gap, while potentially covering most of the investment capital needs.

The climate finance system needs to be scaled up in the coming decade. This will require creating confidence on short term (2013-15) financing and building a strong pipeline of programmes in developing nations while improving the effectiveness of finance delivery

Concrete, ramp-up financing targets are required for 2013-15. Credible financing sources in the short term are key to build the confidence required to create a pipeline of investment programme. Developed countries could commit to specific 2013-15 targets, based on mobilising new domestic and international sources, including carbon taxes, revenues from ETS auctions, redirection of fossil fuels and royalties, as well as laying the foundation for innovative international sources like revenues from international transport. A 2013–2015 commitment should also include lending for green growth through the MDBs either through dedicated capital increases or by shifting existing lending towards green growth. Carbon pricing also needs to be extended e.g. through reform of existing carbon markets and introduction of new markets. Concurrently, new mechanisms should be developed and tested that maximise the amount of private financing made available for low carbon investments.

Developing countries need to develop a credible investment pipeline based on domestic growth strategies and policy frameworks that show that effective delivery of climate measures is possible. This pipeline could be created through bilateral and multilateral partnerships. These programmes should drive a close integration of adaptation and mitigation with development measures and should be embedded in sound policy. Both the current REDD partnership between Indonesia and Norway to reduce deforestation in Indonesia and the South African Renewables Initiative (SARi), to secure the economic benefits from an ambitious renewables strategy, are examples of such programmes. More examples on how international climate finance can be spent effectively in developing countries is crucial to create the mutual trust required to quickly move forward on the next stage of scaling up climate finance.

Last, action is needed to build a better understanding of system-wide performance and to increase leverage of climate finance, i.e., to direct the wider financial flows towards green growth. Currently, climate finance flows are very intransparent and their impact is very poorly understood. However, given the constraints on finance and perceived lack of effectiveness of international climate finance, it is critical that effectiveness be improved. Going forward, improved transparency of the actual flows and their uses is required, combined with measures to enable donors and recipients to fully understand the economic and environmental benefits of the investments. This includes whether investment has been transformational to an economy, how many tonnes of emissions

have been mitigated, whether long term lock-in effects have been avoided and whether an economy has been made more climate resilient.

Climate finance needs to be closely integrated with and leverage other sources of finance, in effect "greening" these potentially much larger flows. On an international level, this can mean using climate finance to provide the incremental finance to make low carbon investment economically attractive and thus "green" the full investment flows. It can mean shifting more of the MDB concessionary funding towards green growth. On a national basis, it means fully integrating low carbon strategies into the wider growth and development strategy of the country, supported by effective policy measures. This will ensure that climate finance and other sources of development finance are spent in the most effective way possible.

It is clear that many countries have seen the benefits of green growth and that increasing momentum towards green growth is moving the world in the right direction. Action now needs to be focused on sustaining and accelerating this momentum.

1. Global Momentum for Green Growth

Globally, more and more countries are embarking on the transition towards green growth. Action is no longer limited to developed nations. Increasingly, developing countries are taking a clear leadership role in various low carbon initiatives and are using domestic policy mechanisms such as standards (for renewables, buildings, appliances, vehicles) or support mechanisms such as feed-in tariffs or tax credits to achieve results.

- China is pursuing an ambitious drive to increase renewable power generation. It already has the second largest wind capacity in the world. It is also implementing comprehensive energy efficiency measures including closing inefficient factories and setting appliance standards. Energy intensity has been reduced by 20 percent from 2005 levels. China is also investing heavily in low carbon transport, e.g., an expansive rail network. Of course, much remains to be done. China's emissions continue to grow rapidly driven by continued investment in coal fired power generation, increases in transport emissions and a rapidly expanding industrial sector. Nevertheless, recent actions are very encouraging.
- India has put in place its National Solar Mission to expand solar generation capacity to 20 GW by 2022, primarily funded by local Power Purchase Agreements. Additionally, India is reducing fossil fuel subsidies such as those for kerosene.
- Brazil has already reduced the deforestation rate in the Amazon by 70 percent from 2004 levels. Its power sector is mostly low carbon, relying primarily on hydropower, and almost 90 percent of the new car fleet is based on flex-fuel engine technology.
- Morocco plans to double its energy capacity and increase its renewable power generation from 1.5 to 6 GW by 2020. This would make renewables 42 percent of all power generation.
- The EU was the first block of countries to introduce carbon pricing and trading at a large scale, covering 40 percent of the emissions in the block. It has also pursued ambitious renewables programmes in its member states by using feed-in tariffs that have boosted renewable investment, especially in Germany, Spain, Italy, and more recently the UK. The EU is also pursuing comprehensive energy efficiency measures which include tough building and vehicle emission standards.
- Japan, already the most energy and carbon efficient of the large economies, is continuing to pursue energy efficiency programmes and is planning to introduce a cap-and--trade system.

Countries appear to have taken these actions in their national self-interest as it leads to a more sustainable and viable economic model. By moving investment towards green growth, countries can avoid becoming locked into high-carbon investments like major power plants or transport infrastructure whose 40–50 year life spans perpetuate the consequences of bad choices for generations. Avoiding such long-term, high carbon options means avoiding reliance on energy imports, cuts pollution, and limits exposure of economies to the fluctuations and potential increases in fossil fuel prices.

Benefits of green growth include:

- Energy and resource security: in a world with increasingly scarce natural resources, reducing reliance on imported fossil fuels that are likely to become even more expensive and that are already subject to high price fluctuations will improve energy security and make economies more competitive.
- Creation of new industries: industries like wind and solar have already become multi-billion industries and early movers will be able to build global leadership positions.
- The prospect of lower energy prices: the IEA estimates that in a 2ºC scenario oil prices would be 10 percent lower and coal prices 23 percent lower than under a business-as-usual scenario in 2020.
- Reduced local pollution and improved health benefits: low carbon energy generation and measures like afforestation typically also improve local pollution levels and thus improve the health of the local population. This both saves costs in health care and increases productivity of the workforce.
- Reduced risks from a changing climate: lower emissions from green growth avoid dangerous climate change, with all its negative impacts on agricultural productivity, water scarcity, and severe weather (which can disrupt production and supply chains and damage physical assets).

Where green growth has been developed at scale, investments have typically been supported by domestic support mechanisms and regulation, e.g., local feed-in tariffs in case of renewables as well as domestic finance (as in China). Of course, a transition to a low carbon economy is not without cost. Significant investment, even if small compared to global investment needs, will be required and significant transition costs need to be addressed. These issues will be explored in the following chapters.

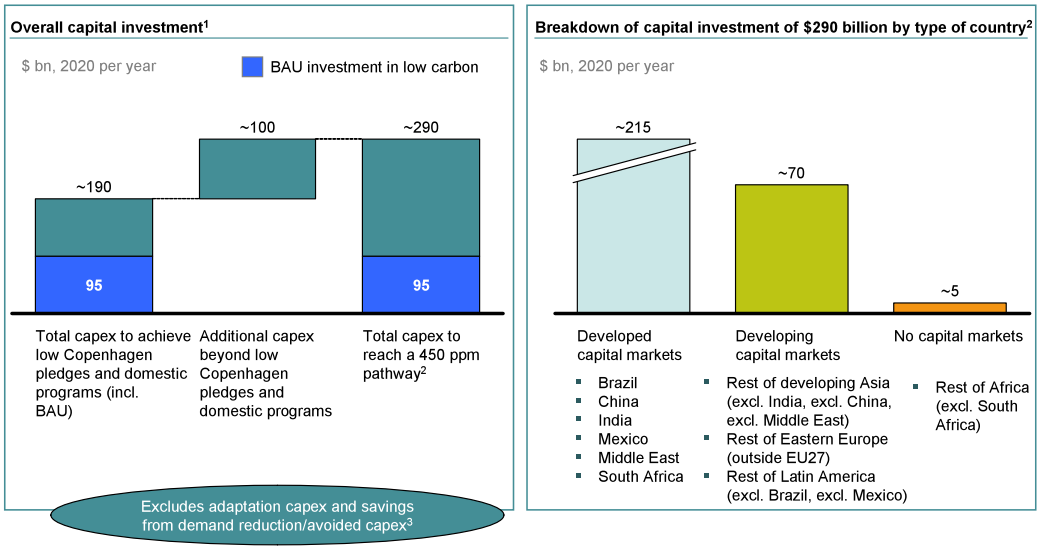
2. Financing Green Growth

2.1. Overall investment needs

There will be major investment in infrastructure over the coming 10 years, independent of green growth. Total infrastructure investment is estimated at $7 trillion per annum by 2020 (based on total construction activity estimates by Global Insights, Euroconstruct, and IMF) of which $1.5 trillion per annum is energy related (IEA estimates total spend on energy infrastructure to be $33 trillion from 2010 to 2035, with $16 trillion of that in power). This $1.5 trillion includes investment across the energy value chain by both developed and developing countries in coal, gas, oil, biofuels, and the power sector. To move to a low carbon pathway consistent with 2ºC warming, Project Catalyst estimates that developing countries will need about $290 billion per annum by 2020 of capital investment for low carbon infrastructure (as part of the global $1.5 trillion investment in energy), most of which is likely to be mobilised locally in advanced developing countries with well established capital markets (Exhibit 1).

Capital investment is defined as the upfront capital investment required for infrastructure and typically takes the form of debt, equity, or investment grants. This could be either on concessional terms, mostly from governments and MDBs, or commercial terms from MDBs or the private sector.

Exhibit 1: Overall investment needs



1 Is investment in all sectors for green growth technology. For low carbon power, total investment is BAU capital investment ($95 bn) + additional investment for green tech. for 450 ppm ($195bn). This does not include savings due to demand reduction (~$70bn) and BAU investment in high carbon projects ($120 bn)
2 Capital needs in developing world – based on Milken ranking
SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Capital Access Index by Milken Institute; Project Catalyst analysis

Most of the capital investment, $215 billion of the $290 billion, occurs in wealthier developing countries,3 which have well established capital markets and where project developers should be able to mobilise local capital as long as the projects are economically viable. This high share of mitigation measures in wealthier nations can be explained by the availability of mitigation opportunities as a result of these countries' higher overall emissions. Only $5 billion of the estimated required capital investment is needed in the least developed nations (approximated here by countries with no capital markets), which might not be able to raise investment capital locally but might require financial support from developed nations for the investment.

2.2. The importance of policy

Shifting these flows towards a green economy will require first the right, cleverly designed policy choices and secondly incremental cost support where appropriate. Policy is critical to shift investment, especially in power, energy efficiency and land use.

3 Well developed capital markets are used as an indication for well established domestic sources of capital such as banks, corporate investors, or the government.

- Power sector: in the power sector, policy needs to create the right environment to enable low carbon alternatives to compete against high carbon alternatives. This includes phasing out fossil fuel subsidies, which give high carbon power an unfair advantage relative to low carbon alternatives. It includes designing and building the grid in a way that allows renewables to be effective, for example by linking areas of wind or solar generation to potential storage capacity of hydro dams. It also includes well designed support mechanisms for renewables where they are not yet competitive, such as feed-in tariffs, renewable standards, tax credits, or investment grants. They have in common that the less uncertain the policy, the lower the financing costs will be. This is particularly critical for renewables, which are more capital intensive than their high carbon alternatives, so financing cost is a major element in their competitiveness. Feed-in tariffs have been a particular success in this regard: they have proved to be able to rapidly develop renewable energy technologies by creating cost certainty and providing a reasonable rate of return for investors. This makes it easier for developers to secure financing. Feed-in tariffs also reduce complexity and transaction costs as developers do not need to negotiate power purchasing agreements with utilities. This allows households and small businesses to install renewable energy, which ensures the investment and the resulting economic benefit stays local. Feed-in-tariffs shift the burden of renewable energy development from taxpayers to ratepayers. Policy makers have used feed-in-tariffs as a way to bring down the costs of renewable energy technologies and shift to a low carbon supply of electricity. For example,
  - Denmark implemented a feed-in-tariff programme in 1993, which helped the country to become the world leader in wind energy production. Denmark now obtains 21 percent of its electricity from wind turbines, most of which are owned by individuals and local electricity cooperatives. This also helped create 21,000 jobs in the wind industry.
  - Germany created a feed-in-tariff programme for wind power in 1991. With the help of this policy, Germany created the world's largest solar market and is able to meet its 2010 target of 12.5 percent renewables electricity. It also created about 250,000 jobs in the country.
  - Of course, there are some economists who have raised concerns about feed-in tariffs, in particular because they believe it is difficult for politicians to set the right level for the tariffs which might leave economies overpaying for renewable generation. Some countries like Spain have recently revised their feed-in tariff regimes, with very damaging effects for the local market. Using reverse auctions can potentially reduce the issue of overpaying by helping to uncover the true price at which developers are willing to make an investment.
- Energy efficiency: can be mobilised very effectively through emission standards. Building codes, appliance standards, or vehicle standards can be extremely effective at reducing energy consumption, without imposing any cost on public budgets. Often, higher upfront costs are passed on to consumers, who can more

than make up for the higher upfront investment in energy savings and reduced operating costs. Interventions can also be made in the power sector, such as utility decoupling, which creates incentives for utilities to reduce energy consumption, rather than to stimulate it.

- Land use: policy in this area can similarly be critical. Land reform and land rights are among those that are seen as key to reducing deforestation. Similarly, in agriculture, standards can help to shift behaviour towards more sustainable practices. Major policies in this sector are: land titleing programmes to remove incentives for deforestation as land grab; reducing pressure on primary forests; fire prevention programmes; inclusion of explicit environmental considerations in land use zoning and issuance of agriculture and timber concessions; moratoria on development of new intensive agriculture and timber extraction concessions; and agricultural intensification programmes.

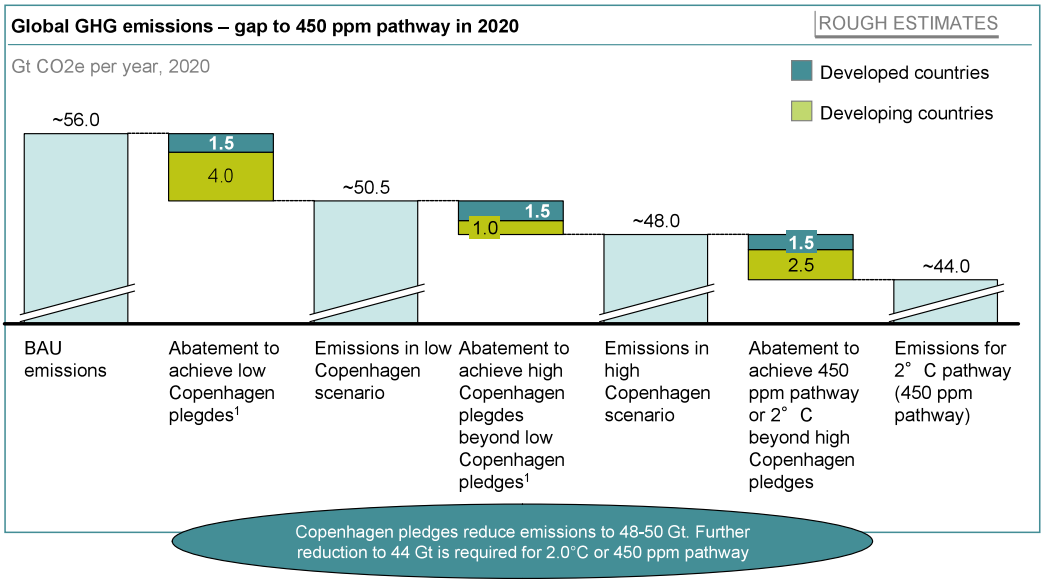
Policies need to be cleverly designed. Only then can they (1) reduce risk and hence financing cost and (2) use mechanisms such as reverse auctions that allow finding the lowest required support level for the desired policy measures. The example of feed-in tariffs shows how guarantees and changes in the structure can reduce risk and financing costs: In many feed-in tariff regimes, the counterparties are local electricity companies or local government. Since feed-in tariffs need to be maintained over long periods of time, often 20 years, for projects to be economically viable, the counterparty risk is an important consideration. Central governments, which typically have a better credit rating than municipal or state level government or utilities, can reduce this risk by explicitly guaranteeing the tariffs thereby reducing financing costs significantly. Another example is the point in time when governments guarantee feed-in tariffs. If that happens only once a plant is installed, developers face significant policy uncertainty during the construction period and will require a high risk premium on the capital invested. Shifting the timing to the start of construction can reduce this policy risk and hence the capital cost significantly.

The concept of reverse auctions is being used for India's Solar Mission. Here, the government aims to minimise the amount of support provided to its solar programme by using reverse auctions to find the market clearing price (effectively turning the feed-in tariff into a power purchase agreement, rather than a feed-in tariff). This mechanism uncovers the *incremental cost* of mitigation measures (further explained in chapter 3.3) which can be important in the context of international climate finance, given that this is what developed nations have committed to support.

2.3. Incremental cost support

While there are many clear benefits in transitioning to a green growth economy, there are often real transition costs that are a hurdle to acting at the speed required. From a global perspective, measures beyond the current level of action are required to limit warming to 2ºC (by limiting atmospheric CO_2e concentrations to 450 ppm on below). Countries have currently pledged an estimated 6–8 Gt of CO_2e of reductions relative to their business-as-usual baseline (BAU) under the Copenhagen Accord and other planned climate policies, which will help to bring the world to an emission level of 48–50 Gt by 2020. While countries might move beyond their current pledges for reasons of self-interest, there could be a gap of up to 4–6 Gt of CO_2e that would need to be addressed through further action both in developed and developing countries (Exhibit 2).

Exhibit 2: Required emission reductions for 2ºC pathway



1 Aggregate of individual country pledges in the low (unilateral) and high (conditional) cases; Pledges indicate targets in 2020

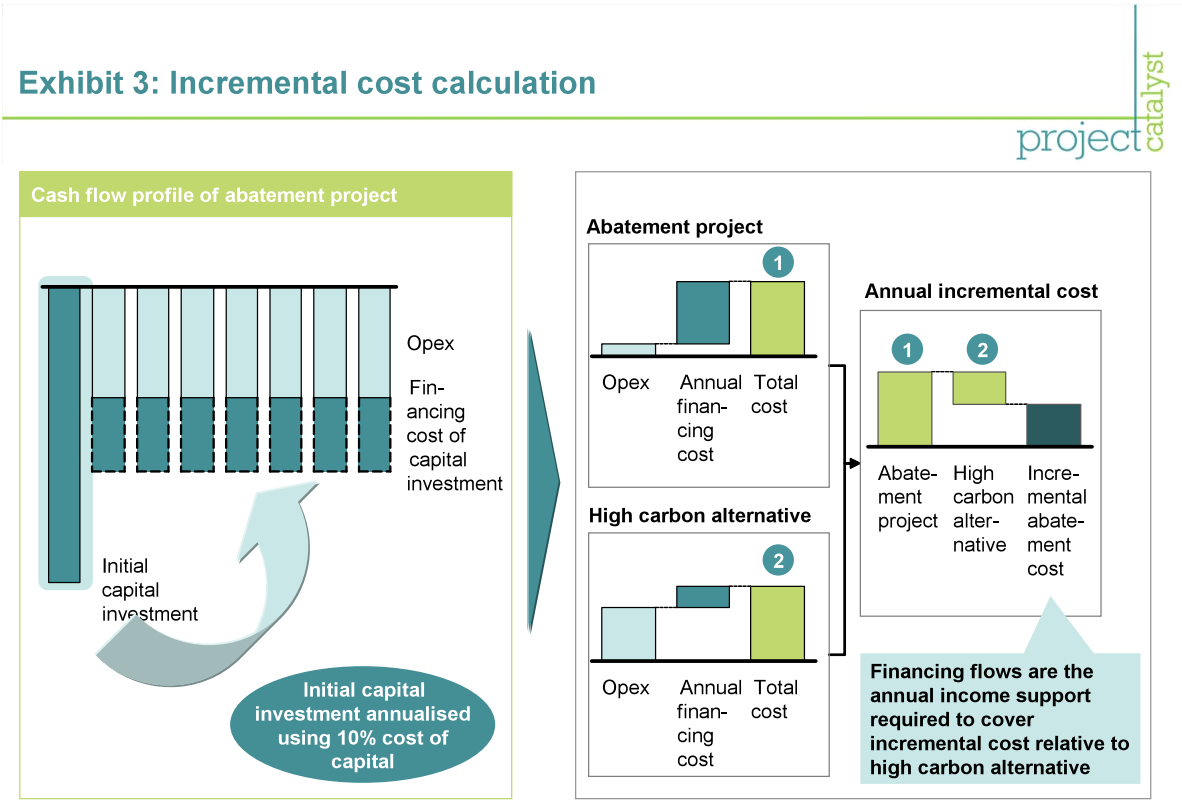
SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; IEA; US EPA; Houghton; IPCC; OECD; den Elzen; Meinshausen; van Vuuren

Climate finance can help close this gap and accelerate the transition to a low carbon economy in developing nations. If deployed effectively with other development flows, it can have catalytic effects and can help the countries with limited means to cover incremental or transition costs.

In the international context, climate finance is typically defined as incremental cost. The concept of 'agreed incremental cost' has been central to the international climate negotiations since it was included in the 1992 UN Framework Convention. Unfortunately, agreement has never been reached about how to operationalise this concept.

In its simplest expression, incremental cost covers the incremental cost of mitigation or adaptation measures, compared to their high carbon alternative or alternative without adaptation. For capital intensive investments like low carbon energy and many energy efficiency measures, its magnitude is highly dependent on the cost of capital (Exhibit 3).

Exhibit 3: Incremental cost calculation



SOURCE: Project Catalyst

The total amount of international concessionary public finance that is needed to catalyse the transition to a low carbon economy is difficult to estimate due to the lack of agreed parameters. Previous estimates published by Project Catalyst[4] have typically been based on an average 10 percent cost of capital (in real terms) and without quantification of second-order benefits such as energy security, growth from new industries, improved health and climate resilience, which are more difficult to quantify

4 Project Catalyst Brief: Overall financing needs

but clearly make a green growth, low carbon development pathway superior to an energy-intensive, high carbon development pathway. Hence, these estimates provide a rough indication of the required financial flows.

Project Catalyst estimates that the incremental cost of mitigation measures in developing countries to move to a 2ºC pathway is around $60 billion per annum in 2020 (Exhibit 4). This is less than total fossil fuel subsidies, which were $312 billion (based on IEA estimates) in 2009, and small compared to the global spend on energy (IEA has estimated that total spend on fossil fuels will be $5 trillion per annum by 2020).

Exhibit 4: Incremental cost

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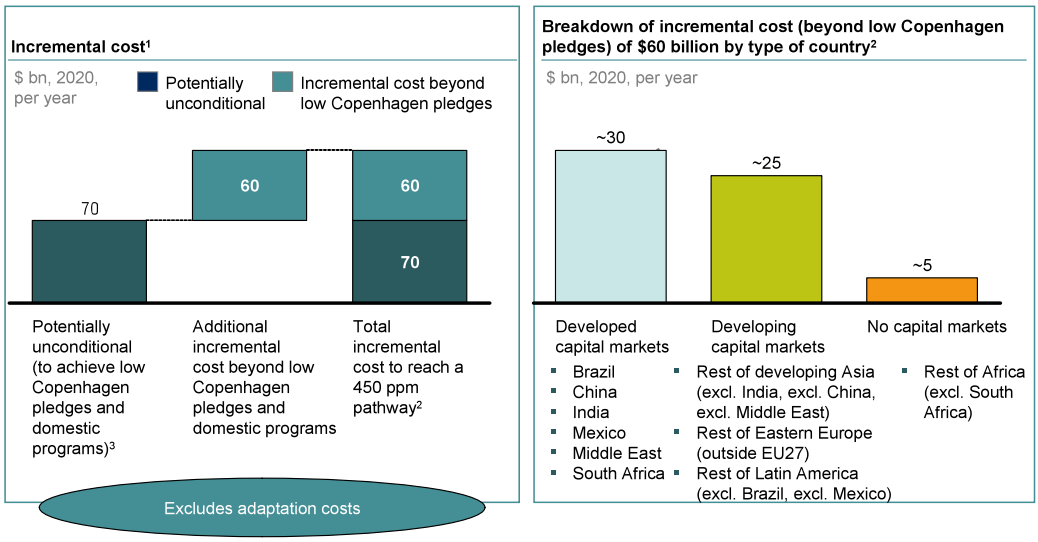

1 Includes transaction costs at $4.5/ tonne; $18bn for low Copenhagen pledges and $35 bn for 450 ppm
2 Capital needs in developing world – based on Milken ranking
3 Low end of Copenhagen pledges used by Project Catalyst as proxy for unconditional measures
SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Capital Access Index by Milken Institute; Project Catalyst analysis

The estimate includes two major assumptions:

1. On the level that measures might be taken on an unconditional basis, i.e., might not require international concessionary public finance
2. To what extent countries might take into account secondary benefits when implementing the remaining measures

Assumption 1: measures taken unconditionally

As discussed earlier in the paper, many developing countries have started to transition to green growth, often without any financial support. Some countries have also made significant pledges or announced domestic programs for which they indicated that they might not need international concessionary public finance.

However, for most developing countries, there is significant uncertainty on how much they might deliver unconditionally and without international concessionary public finance. Similarly, many pledges made following Copenhagen have not been specific on what part might be unconditional or what the threshold might be for the conditions to be met.

To estimate the financing requirements beyond what countries might do independently of international concessionary public finance, Project Catalyst has used the *low end of the Copenhagen pledges and other major announced cliamte policies* (see exhibit 5) as a rough proxy for the extent of what countries might implement without international support. This is of course a very crude approximation, and Project Catalyst plans to refine this estimate as countries state their positions more explicitly. Other studies have tried to make similar approximations. A recent UNEP report[5] has, for example, tried to distinguish which Copenhagen accord pledges are conditional pledges, with a view to determining the size of the "Emissions gap" under various assumptions. Other studies such as Houser (2010) and Carraro and Massetti (2010) assume that Copenhagen Accord financing could deliver further mitigation action on top of what has been pledged already in the Copenhagen Accord pledges. The Project Catalyst estimate falls somewhere in between this range of assumptions and is, we believe, a reasonable proxy, for what will be implemented with and without further climate finance– some countries are likely to require financial support to deliver their low pledges, others might deliver even their high pledges without support. Further clarity from Parties on the conditional elements of their pledges or suggestions to improve this methodology would of course be welcome.

The incremental cost estimates quoted are for those measures that would allow the world to move towards a 2ºC pathway and exclude financing requirements for existing plans/measures (approximated by low Copenhagen pledges).

Exhibit 5 summaries the Copenhagen pledges used in the Project Catalyst analysis.

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5 The Emissions Gap Report, 2010

Exhibit 5 : Overview of Copenhagen Accord pledges and other climate policies

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Country	Emissions reduction vs 2020 BAU	Programs
China	▪ BAU: 14.7 Gt ▪ 12% reduction equivalent to 1,730 Mt abatement	▪ Increase the share of non-fossil fuels in primary energy consumption by 15% by 2020 ▪ Increase forest coverage by 40 mHa and forest stock volume by 1.3 million cubic metres by 2020 from 2005 ▪ Reduce energy intensity by 20% below 2005 and 2010 ▪ Reduce carbon intensity by 40-45% by 2020 compared to 2005 levels
India	▪ BAU: 3.2 Gt ▪ Low case: 9% reduction; 287Mt abatement relative to BAU of ▪ High case: 20% reduction; 627 Mt abatement	▪ Install 20 GW capacity by 2020; increase nuclear capacity to 20 GW by 2020; add 15.6 GW hydro capacity by 2012 and create 50 GW new hydro capacity by 2025-26 ▪ Shift to super critical coal capacity ▪ Reduce transmission and distribution losses by 12% by 2030 ▪ Deliver 100% penetration of labelled appliances by 2030; 90% penetration of compact fluorescent lamp program in 2030 ▪ Improve efficiency of agricultural pump by 15% over next 20 years
Indonesia	▪ BAU: 2.8 Gt ▪ Low case: 26% reduction; 733 Mt ▪ High case: 26-41% reduction; 1,156Mt with international support	▪ Reduce deforestation rate and land degradation rate, develop carbon sequestration projects in forestry and agriculture, deliver sustainable management of peat land ▪ Promote energy efficiency ▪ Develop alternative and renewable energy sources ▪ Reduce solid and liquid waste ▪ Shift to low emission transportation mode
Brazil	▪ BAU: 2.7 Gt ▪ Low case: 36% reduction; 974 Mt ▪ High case: 39% reduction; 1,051Mt ▪ Reductions conditional on international financing	▪ Reduce deforestation in Amazon and Cerrado forest ▪ Restore grazing land, integrate crop-livestock system, deliver direct plantation system and biological nitrogen fixation ▪ Deliver energy efficiency, increase use of biofuels use, expand energy supply by hydropower, build alternative sources ▪ Substitute coal from deforestation with coal from plantations
Mexico	▪ BAU: 0.9 Gt ▪ Low case: 6% reduction; 51 Mt ▪ High case: 30% reduction; 265Mt ▪ Reductions conditional on international financing	▪ Adopted Special Climate Change Program in 2009 to take a set of mitigation and adaptation actions in various sectors

SOURCE: UNFCCC submissions; Project Catalyst analysis; Climate Action Tracker

Assumption 2: Secondary benefits

The second approximation of the analysis is that it excludes any second-order economic benefits (not captured by cost curve analysis, e.g., from energy security, trade, competitiveness, etc) and potential savings from measures that are economically viable, i.e., the 'left side of the abatement curve'. This means that cost estimates may overstate the true cost required.

It is important to note that the distinction between measures that are in self-interest and others that require finance might not fully reflect reality. In many instances, initiatives might only be viable if self-financing *and* international funds are combined for the same programme. The text box 1 at the end of this chapter on the South African Renewables initiative helps to illustrate this point.

Incremental cost finance will not only benefit the recipient developing countries but can yield significant potential benefits for the contributor country. For one, contributor countries can be beneficiaries of globally reduced fossil fuel consumption which would help to keep energy prices down globally. Developed nations can also benefit from the greater political stability of a world that faces less climate change and is better adapted to the change that does occur. And lastly, developed nations can also

benefit from the export markets they help create and the major investment opportunities that are linked to a low carbon pathway. For example, Denmark exported €8.6 billion worth of energy and environmental technologies in 2008, capturing 30 percent of the global world market in wind power products.

It is important to note that the concepts of incremental cost and capital investment are different but closely linked. For example, the incremental cost of a capital intensive power plant can either be covered by providing a subsidy payment, for example in the form of a feed-in tariff, or the incremental cost can be lowered by reducing the financing cost, for example by providing concessional investment capital (concessional loans or equity with lower return expectations) or guarantees for specific project-related risks. The example of the South Africa Renewables initiative (SARi) helps to illustrate this point (see text box 1).

Text box 1: Case example of South African Renewables Initiative (SARi)

The case example of the South African Renewables initiative (SARi), which is currently being developed, helps to illustrate the interdependence between incremental cost and capital investment, and shows how domestic policy *and* international climate finance combined enable the programme to be financed and delivered.

SARi has been established to catalyze industrial and broader economic benefits through an ambitious scaling up of renewables. It is being built on a rationale of economic development rather than one focused merely on climate objectives. The economic case for SARi includes consideration of the development of local industries and associated employment, the decarbonisation of exports, as well as climate objectives.

The likely tax revenue inflows from the localisation of parts of the manufacturing value chain could be a third of the total incremental cost. Further, the renewables initiative will provide South Africa with significant domestic economic benefits: energy security, achieved by the ability to ramp up generation capacity much more quickly than what could be achieved for coal, the ability to ‘green’ South Africa’s exports and become better protected against potential carbon-related border tariffs in developed countries.

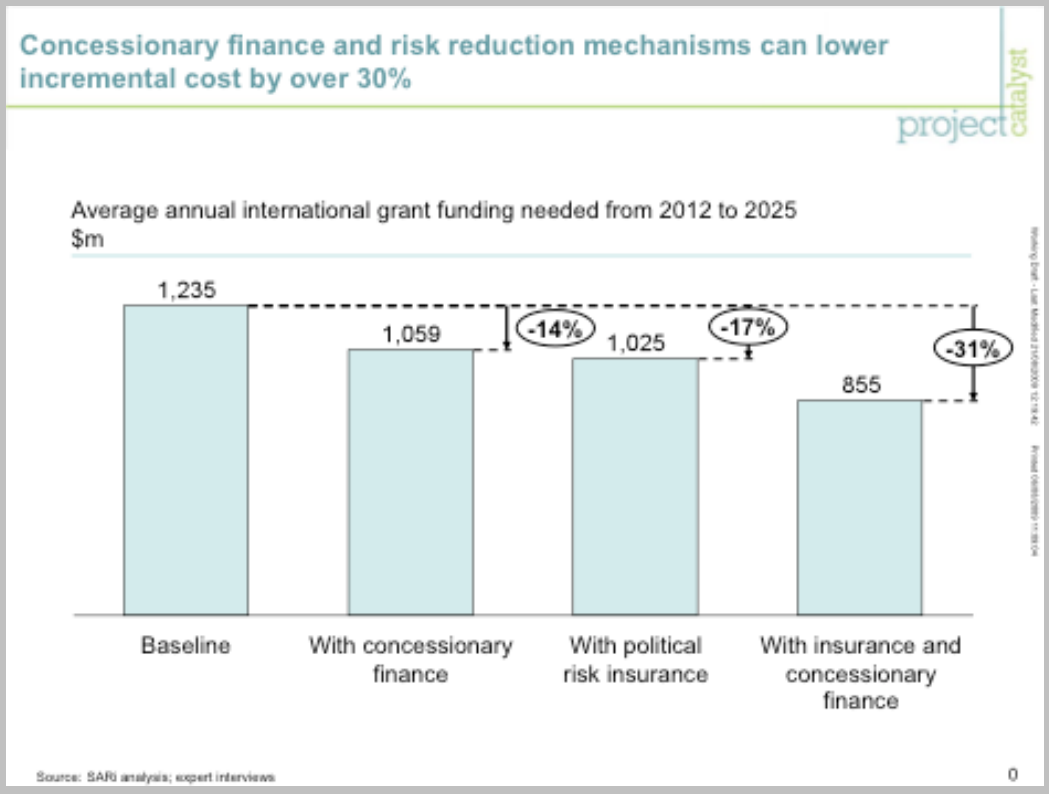
This value-add to the domestic economy can be further monetized, for example, through a green purchase obligation charged to energy-intensive exporters. The resulting funds could then be used to further offset the incremental costs.

Text box 1 (continued)

First estimates suggest that, at commercial finance rate (about 12 percent), the incremental cost of building about 20 GW renewable power by 2020 is $1.2 billion per year until 2025 (incremental over the cost of unabated coal). Concessionary finance can significantly reduce this cost: based on the rates charged by different development banks and using further risk insurance mechanisms, the incremental cost could be reduced by more than 30 percent to around $850 million.

In the case of South Africa, the financing could be made available through a combination of domestic policy and international concessional finance: feed-in tariffs could partly be financed by passing on a share of the cost to consumers and businesses, and partly by using public and international funds.

The use of concessionary international investment capital from different development banks means that feed-in tariffs can be kept lower than if investment capital was funded at market rates. Only by using *both* domestic financing measures (including policy mechanisms like feed-in tariffs) and international concessionary finance is it possible to deliver the renewables initiative.



2.4. Financing needs by sector

The financing differs by sector: Project Catalyst analysis suggests that most of the capital investment in developing countries is concentrated in the power sector ($155 billion per year by 2020) and energy efficiency measures ($123 billion per year by 2020). Forestry and agriculture on the other hand have little investment capital associated with them (Exhibit 6).

For incremental cost (without taking into account the potential benefits), Project Catalyst estimates that the power sector and energy efficiency measures might each require up to $18 billion per annum by 2020 in incremental cost support. Forestry and agriculture require largely operational expenditure, e.g., for planning, incentivising new land use patterns, securing land rights, monitoring and enforcement and creating alternative forms of development. Hence, these sectors have larger shares of incremental cost finance, close to $25 billion per annum by 2020. In all these sectors, adaptation benefits are intensely intertwined with mitigation.

Exhibit 6: Changes required by a sector

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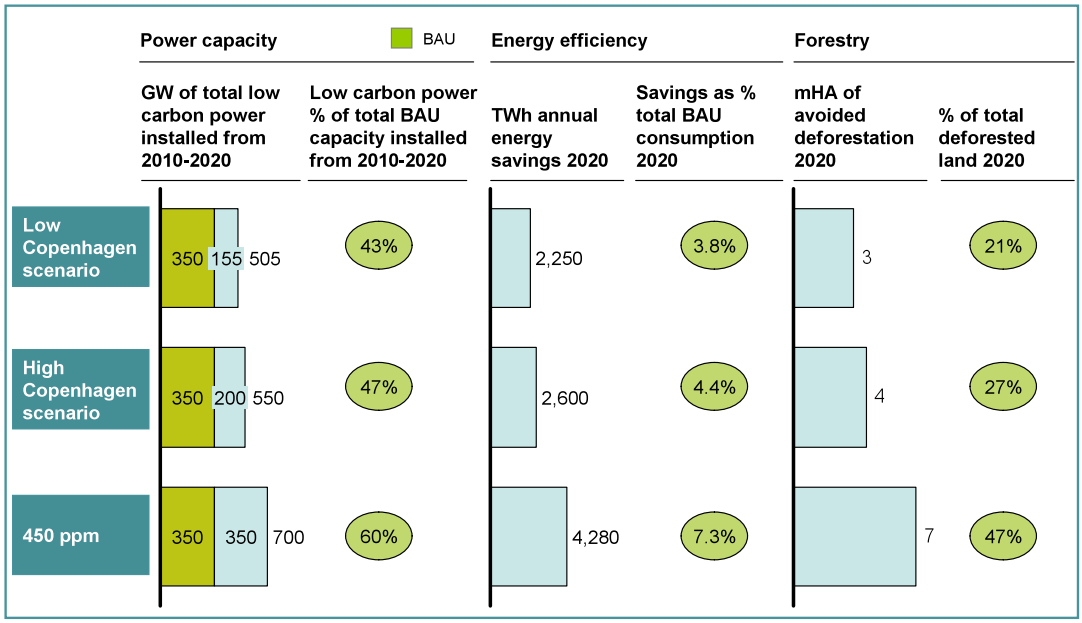
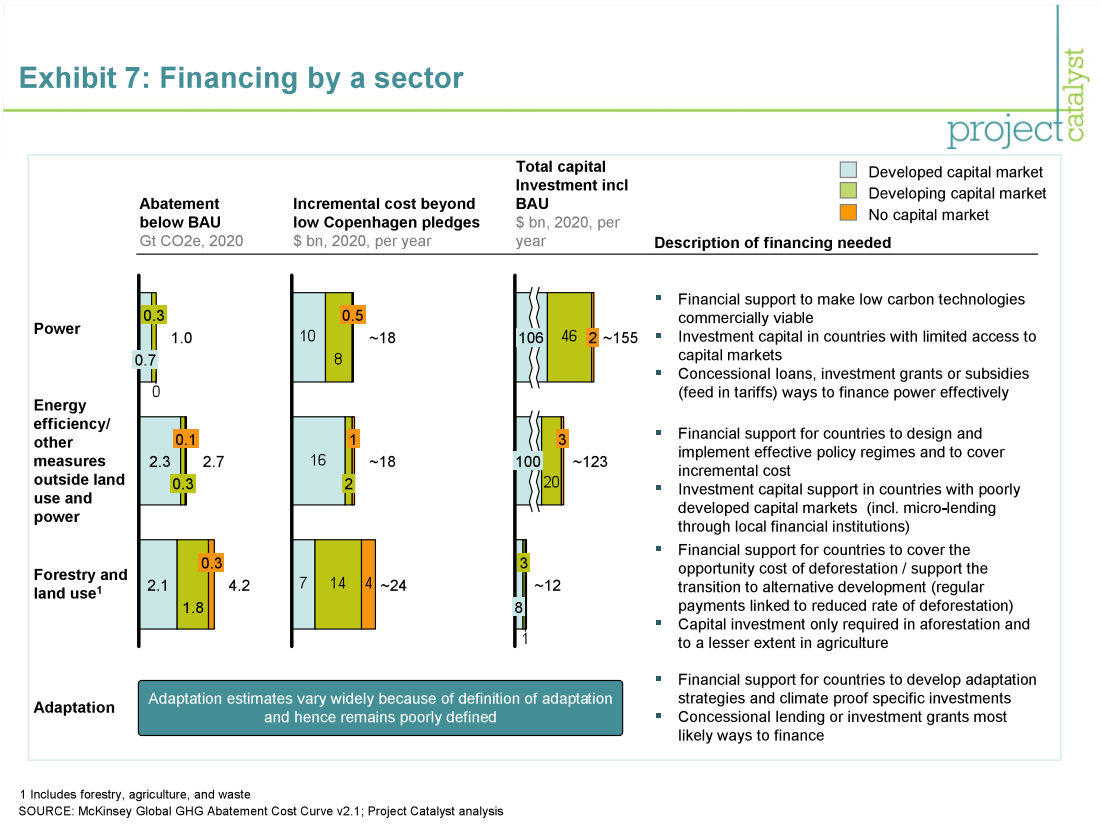


SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

Low carbon power

As shown in Exhibit 6, Project Catalyst analysis suggests that a total of 700 GW of low carbon power would need to be built in developing countries by 2020 to achieve a low carbon pathway consistent with 2ºC warming compared to a total new built generation capacity of ~1,200 GW. About half of that, 350 GW, is estimated to be built under business as usual or is part of developing countries' current plans. Another 150–200 GW is estimated to be built under low or high end pledges of the Copenhagen Accord. Hence, for a 2ºC pathway, a further 150–200 GW of clean power is needed.



1 Includes forestry, agriculture, and waste
SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

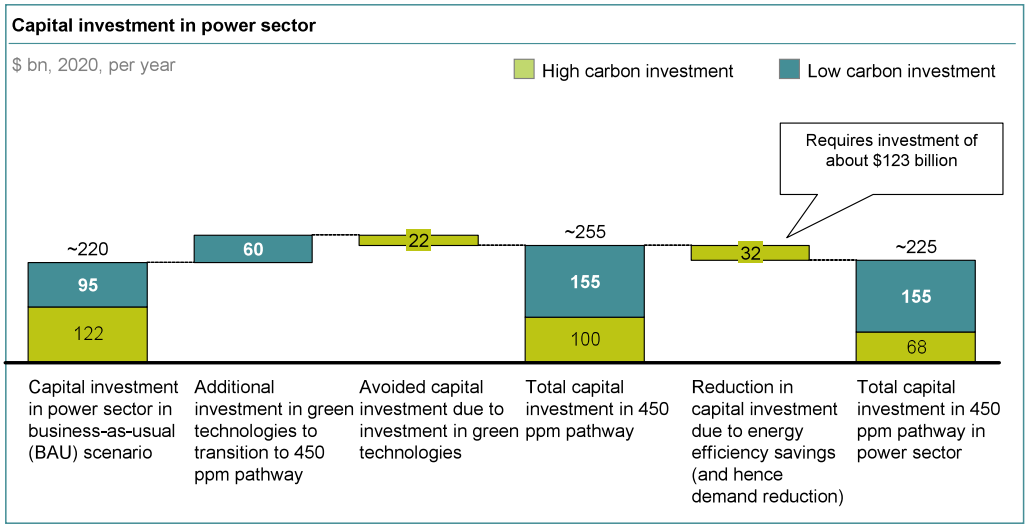
Building low carbon power capacity typically requires significant capital investment, an estimated $155 billion per year by 2020 in total (see exhibit 7). Most of this $155 billion, about $105 billion, is in countries with well developed capital markets.

Even though renewables are becoming increasingly competitive, they are often more capital intensive than the high carbon alternative. For this reason, investment is often catalysed through support mechanisms covering or lowering the incremental cost financing through feed-in tariffs, tax credits, investment grants, concessional finance, and so forth. Many developing countries have already started to implement renewables

without any international, concessional financial support. The reasons for building low carbon power are typically linked to improved energy security, lower pollution levels and the opportunity to build up new, competitive industries. About $18 billion in incremental cost per year by 2020 might be needed to catalyse measures over and above existing pledges to reach a 2ºC pathway. This does not include any second-order benefits or potential savings.

Exhibit 8: Capital investment in power sector

project catalyst



SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis

As a result of the increased investment in low carbon power generation, the overall investment in the power sector in developing countries could increase from around $220 billion per year by 2020 under business-as-usual to $255 billion (part of the increase in investment for clean power is offset by a reduced investment in high carbon power). If investments of around $120 billion per year by 2020 in energy efficiency measures in other sectors are implemented, this investment need could be reduced by around $30 billion to $225 billion per year by 2020, about the same as the baseline investment (Exhibit 8).

If investment capital is provided at concessional rates, it can lower incremental cost needs. If reformed, carbon markets can also play an important role. (Interviews with project developers suggests that currently carbon finance is not a deciding factor for many renewables investments that generate carbon credits, given the great uncertainty over cash flows beyond 2012.) If certainty for CDM post 2012 is improved, carbon

finance flows are likely to make a more significant difference in investment cases for emission reduction projects than they do today. However, Project Catalyst believes that public funds should not be invested in CDM related projects, i.e., CDM projects should not obtain public funding on top of the carbon finance flows they receive for the reductions generated by the project. The reason is that these public funds would in effect help to lower the cost of offsetting emissions in the developed world thus benefitting only developed country compliance buyers, but not lead to a higher emission reduction globally.

Despite the large investments already under way, investors in renewables still face multiple barriers, many of which need to be addressed by local policy, rather than international concessionary public finance:

- Incremental cost financing is a challenge in poorer developing countries and where abundant coal or other fossil fuel reserves provide a low-cost domestic resource. In these countries, support from developed countries can tip the balance in the domestic decision towards renewables. This can be achieved by financing a feed-in tariff regime through regular payments or through concessional loans and guarantees.
- Investment capital can also be a constraint in poorer countries, even where projects are viable. Bilateral institutions or MDBs often provide support for debt and equity finance in those cases.
- Policy risk, the enabling environment, or lack of specific finance can also be a significant challenge:
  - Policy risk around subsidy regimes like feed-in tariffs, which need to be addressed by sound policy design and international political risk insurance
  - Investment in the enabling environment, e.g., grid upgrades, which needs to be made by the local government, possibly with financial support from bilateral donors or MDBs, e.g., with concessional loans
  - Lack of a specific type of finance, often linked to unfamiliarity with new technologies/investments in new countries. This can be addressed by MDBs or bilateral donors making lead investments aiming at crowding in ideally local investors and helping to build the local infrastructure to support future investment.

Energy efficiency and other measures outside power and land use sectors:

Project Catalyst estimates that energy efficiency solutions that reduce energy consumption by about 4,300 TWh or 7 percent of baseline energy consumption are required to meet a 2ºC pathway. An estimated 2,250 TWh reduction could be delivered

under the low end of the Copenhagen pledges leaving about a further 2,050 TWh to move to a 2ºC pathway.

Energy efficiency is capital intensive: delivering 4,300 TWh in efficiency savings as well as delivering other measures outside power and the land use sector (e.g., process improvements or biofuels) in developing countries is associated with an estimated $123 billion in investment capital per year by 2020, 80 percent of this investment capital in developing nations with well developed capital markets (Exhibit 7). Many of the investments are small scale, e.g., energy efficiency in buildings. Policy, in particular standards (for buildings, appliances, or vehicles), is often the most important implementation lever. Individual home owners or small businesses often require investment capital ideally made available through local financial institutions. The main obstacle to seizing the efficiency opportunity is often a simple lack of understanding, so financing needs to be bundled with information materials or services like energy audits to identify and implement the opportunities. Development banks have built up considerable experience of this over recent years, which can nourish future efforts.

While many of the opportunities create real cost savings through reduced energy usage, an estimated $18 billion per year by 2020 of incremental cost finance might be needed to catalyse the investment, much of that for transactions costs like energy audits or support to government to implement policy measures, e.g., design and implementation of fuel efficiency or building standards, and as support for measures that are cost positive (e.g., in transport sector). By implementing these energy efficiency measures, countries can benefit from large savings, e.g., on energy costs, that typically far exceed the capital and operating costs of the measures.

Land use – deforestation, afforestation, and agriculture

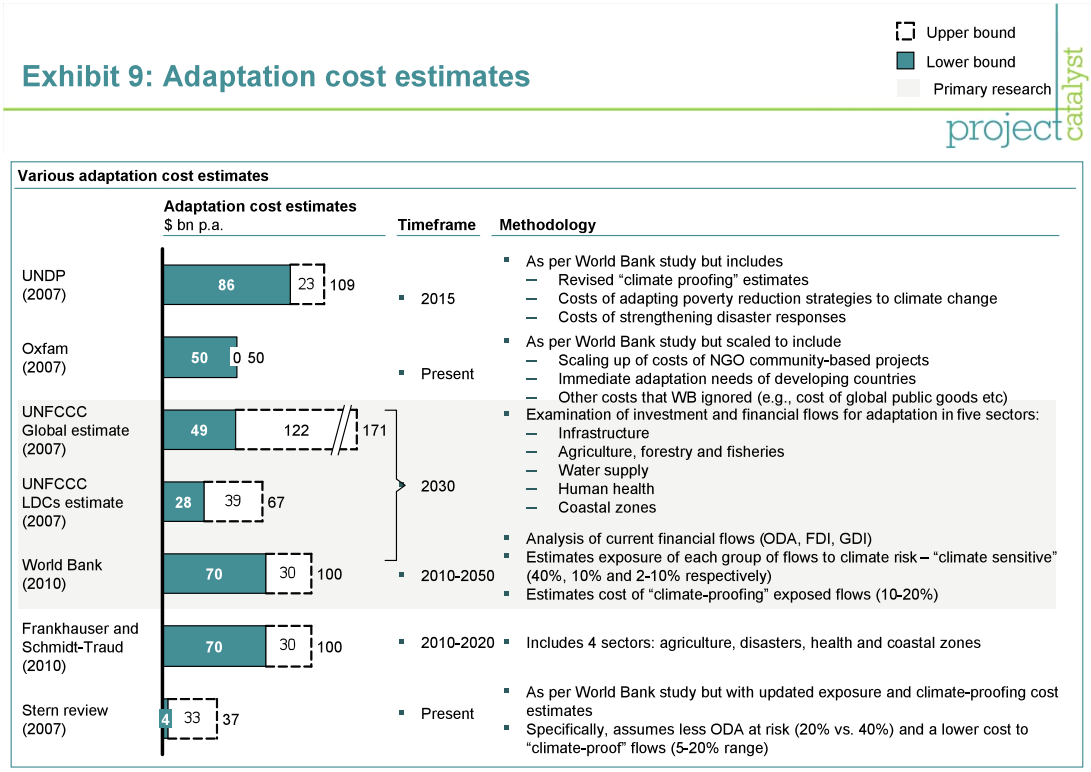
Mitigation land use measures, in particular avoiding deforestation, are often not in the immediate, short term self-interest of countries, given that the opportunity cost of keeping land under forest cover is often high. While some countries, most notably Brazil, have started to bring down deforestation rates sharply, more action is required. Project Catalyst analysis suggests that, to reach the low end of the Copenhagen pledges, deforestation needs to be reduced relative to baseline emissions by 21 percent (equivalent to 3 million hectares of avoided deforestation per year) and by 47 percent to meet a 2ºC pathway (7 million hectares of avoided deforestation per year). While some countries, such as Brazil and Indonesia, have committed to reducing deforestation rates further, part of that without financial support, for many countries significant payments might be required to develop and implement the programmes on

the ground to protect forests. These often include measures to establish land titles, law enforcement, and programmes to provide alternative livelihoods, e.g., linked to sustainable forestry. The total financing need is an estimated $24 billion per year by 2020 for deforestation, afforestation and agriculture, with only $7 billion of that in the economies with well developed capital markets, and $4 billion in the poorest countries. For some countries, it might be more appropriate to take an opportunity cost approach to define the financing needs, for others it might be about assessing concrete measures required to take the pressure off forests. Further, the investment capital in forestry and agriculture is around $12 billion per year by 2020, with afforestation getting the majority.

Adaptation

There are still large questions over how to define adaptation and the concept of additionality for adaptation, and estimates vary hugely given the uncertain impact of climate change. Estimates by various studies conducted globally vary from $30 billion to $100 billion per year (Exhibit 9); depending on the method of assessment of climate change and adaptation.

Exhibit 9: Adaptation cost estimates



Source: Agrawal & Fankhauser (2008); Oxfam briefing paper 04 (2007); IIED; EACC; Project Catalyst analysis

It is important to note that mitigation and adaption funding are often one and the same: planting mangroves not only acts as a carbon sink but also reduces flooding, improves

the agricultural productivity of land, and eliminates the need to cut down forests. Watershed management may increase soil carbon and forest cover, improve water and firewood availability, enhance harvests, and therefore combine mitigation, REDD, adaptation, and rural development.

In many countries, such actions might already have been part of a wider development programme which also means that development, adaption, and mitigation are closely linked and need to be coordinated.

For adaptation spend to be effective it is therefore critical that it is closely integrated into the wider development agenda and financial development flows.

2.5. Spending wisely

For any financing to be effective it needs to meet the following requirements:

- It should focus on catalytic effects, e.g., bringing technologies down the learning curve, supporting strategies and policies that aim at transforming a whole sector.
- Investments need to be embedded in smart local policy; policy can often mobilise investment without financial support, in particular on energy efficiency, and in other areas, like power, smart policy can cut investment risks and therefore costs.
- Investment should focus on existing or new nationally supported programmes, consistent with a low carbon growth strategy / national development plans that consider long term climate resilience. Projects that are inconsistent with a national strategy could waste money and should be avoided.
- It needs to be transparent – financing needs to be spent in a transparent way with governments held accountable both for providing and spending funds.

3. The AGF Contribution

Smart international finance, if reliable and significant, will be able to support the transition of developing nations to a green growth economy. In the Copenhagen Accord, developed countries committed to make $100 billion per year by 2020 in new and additional financing available to developing nations from sources that are public and private, bilateral and multilateral, including alternative sources of financing.

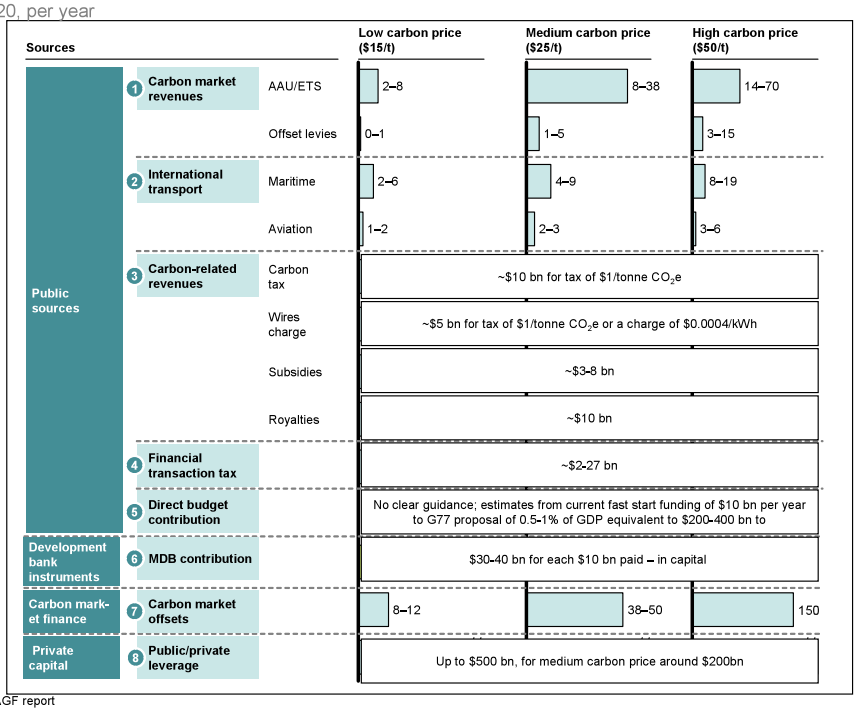
The recent work of the UN High Level Advisory Group on Climate Change Financing (AGF) has maintained the momentum created by the Copenhagen Accord and explored how this financing can be made available until 2020. It proposes to mobilise finance from multiple sources including innovative mechanisms such as international aviation and maritime levies, redirection of fossil fuel subsidies and royalties as well as capital increase for the MDBs. It acknowledges that a carbon pricing of around $20–25 per tonne will be crucial to meet these objectives.

The AGF has assessed a range of sources against eight criteria: revenues, efficiency, incidence, equity, practicality, acceptability, additionality and reliability. Exhibit 10 provides an overview of the revenue assessment of the key sources.

Exhibit 10: Overview of sources analysed by AGF

$bn, 2020, per year

project catalyst



SOURCE: AGF report

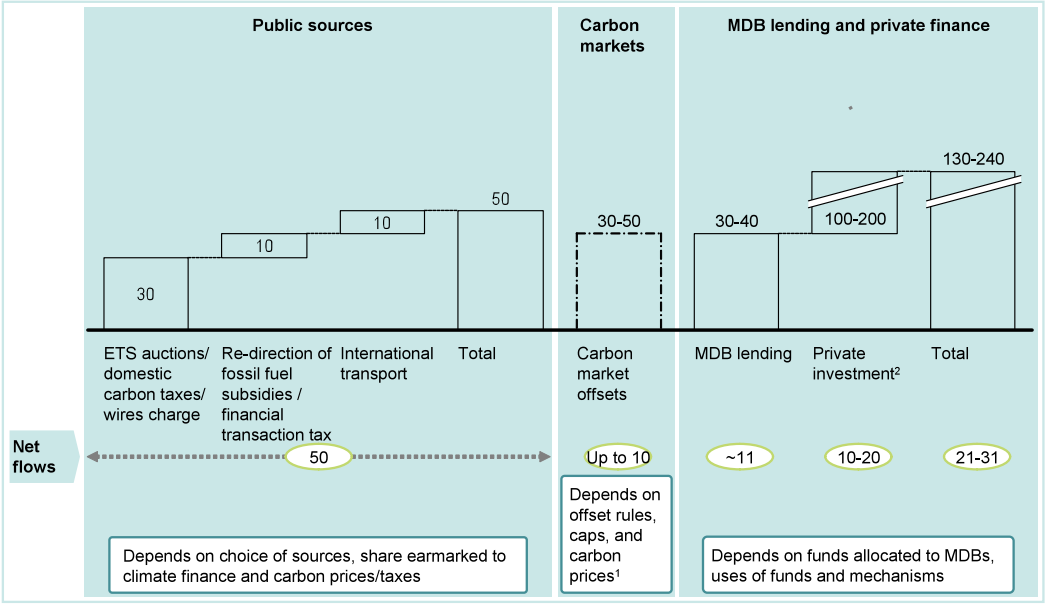
While the AGF has not made a single proposal on how the $100 billion should be delivered, it has indicated that it believes that the identified sources (Exhibit 11) could deliver financing of the following magnitude:

- $30 billion from carbon pricing, e.g., auction revenues or taxes, equivalent to a carbon price of $20-25/t of CO_2e and use of ~8-10% of potential proceeds on a base of 15 Gt for international climate finance
- $10 billion from international transport assuming a carbon price of $20-25/t of CO_2e and the use of around 50% of proceeds on a base of 0.9 Gt of emissions (excluding developing country incidence)
- $10 billion from sources like the re-deployment of fossil fuel subsidies ($3-8 billion), or a form of financial transaction tax ($2-27 billion)
- $30–40 billion from MDB finance for every $10 billion provided as paid--in capital
- $30–50 billion from carbon markets, assuming a carbon price of $20-25/t CO_2e on a total offset flow of 1.5-2 Gt
- $100–200 billion from additional private capital. These are the *international* private capital flows into developing countries mobilised by developed countries support actions; there would be expected to be additional domestic flows of capital of roughly the same size that might be leveraged. Of course, on top of that, there would be private flows mobilised through domestic policy and support mechanisms in developing countries

Exhibit 11: Breakdown of sources identified by AGF

$bn, 2020, per year

project catalyst



1 Not counted towards financing needs as carbon finance increases needs proportionally
2 International private finance; excludes domestic private finance
SOURCE: AGF report

It is important to stress that the different sources are unlikely to be achieved at their maximum potential at the same time. Some of them tax the same basis (e.g., emissions in the power sector in the case of ETS auctions, carbon tax and wires charges), so it is unlikely that they would be pursued simultaneously. Also, the political appetite for a combination of these sources will depend on domestic circumstances.

Allowing for different countries to choose and implement financial sources according to their domestic circumstances will increase the potential of raising funds. For example, some countries may find imposing domestic carbon taxes more desirable than others, while some countries may find contributions to MDBs more politically feasible than directly increasing domestic taxation.

The AGF has also stated that two definitions can be applied to different sources: net and gross. Gross flows are the face value of a flow while net flows represent the grant-equivalent share of the gross flows. For public sources, the net and gross flows are assumed to be roughly the same (assuming that the majority of the flows would be in grants or if loans, highly concessional loans). For MDB finance, carbon markets and private capital, some members of the AGF suggested the following approach to net and gross:

- For MDBs, the AGF estimates that $30–40 billion of gross flows (including a portfolio of more and less concessional loans) translate roughly into $11 billion of net flows (using the widely accepted OECD-DAC methodology).
- For carbon markets, net flows are approximated by an estimate for the inframarginal rents of the gross flows, i.e., the difference between the price and the cost of the abatement measures. The AGF estimates that $30–50 billion in gross flows could be equivalent to up to $10 billion in net flows.
- For private finance, net flows are defined as those flows that are co-invested with development banks and as a result benefit from lower return expectations and hence reduce the cost of capital faced by the local country. The net flows associated with $100–200 billion gross investment have been estimated at $10–20 billion.

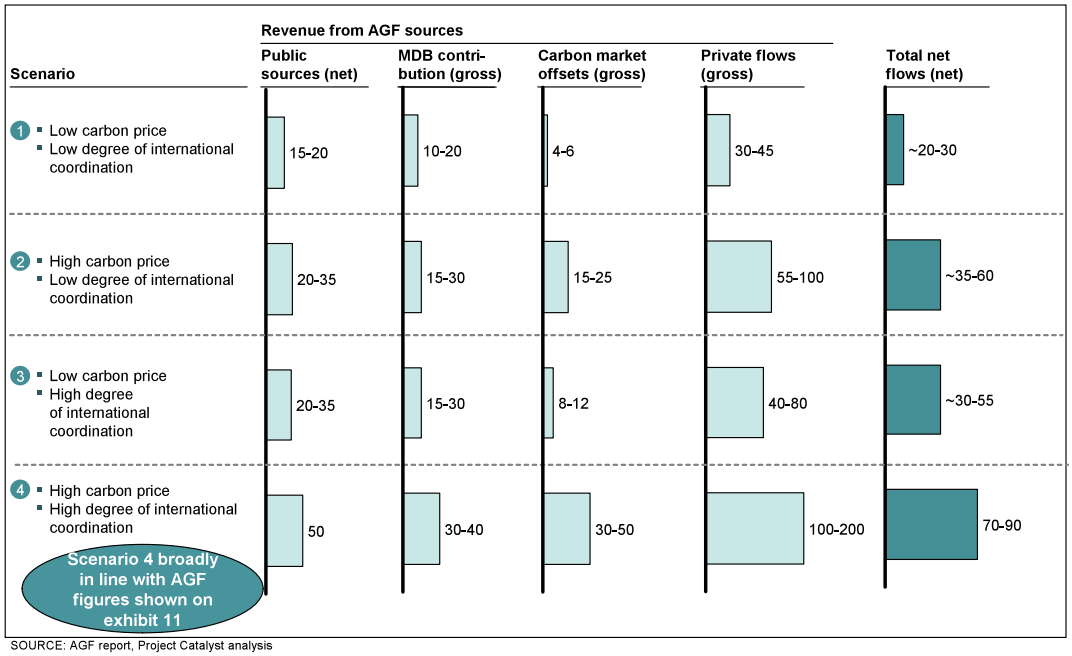
It is important that public finance is used to create ‘smart’ leverage, i.e., to generate as much investment flow as possible, for example through lending or equity investment. The design of the mechanisms is critical – some mechanisms can create leverage of more than 10 times.

As the ranges of the revenue estimates on exhibit 10 indicate, the amount of revenues eventually mobilised is highly uncertain. It relies heavily on (1) the level of international coordination and (2) the development of carbon pricing. Based on the figures calculated by the AGF, Project Catalyst has created four scenarios along those two dimensions to illustrate the range of possible outcomes Exhibit 12 shows the results of this scenario analysis. The figures shown are the total, net funding raised from different sources, excluding direct budget contributions from general tax revenues. The analysis therefore provides an indication for how much financing would need to be mobilised from direct budget contributions to make up for the shortfall in other sources.

Exhibit 12: Overview of four scenarios

$bn, 2020, per year

project catalyst



SOURCE: AGF report, Project Catalyst analysis

1. Low carbon price / low international coordination: in this scenario, low international coordination means that sources like international transport, financial transaction taxes and capital increases for MDBs are unlikely to be used. This scenario would raise an estimated $20-30 billion per year by 2020 in revenues which means that it unlikely that $100 billion could be delivered in net flows (assuming that this might be the definition agreed to for the $100 billion). Delivering $100 billion in net flows would require direct budget contributions of $70-80 billion on top of public flows of $15-20 billion, which appears very unlikely, or the use of a very generous definition for net flows private finance.
2. High carbon price / low international coordination: in this scenario, a high carbon price means that auctions in domestic emission trading schemes, or carbon taxes

are a significant source of revenue. However, low international coordination is likely to mean that international sources of finance are not available, offset markets are less well developed than in a scenario with global coordination, and that carbon regimes and regulatory approaches might differ significantly across countries. Project Catalyst believes that this could increase the risk of countries using carbon border tariffs to make up for these differences, with possible negative implications for global trade. Project Catalyst estimates that this scenario could raise $35-60 billion in net flows per year by 2020.

3. Low carbon price / high international coordination: in this scenario, high international coordination means that innovative sources like international transport and financial transaction taxes as well as MDB recapitalisation are available. Low carbon prices limit revenues from many sources as well as total carbon market flows. The scenario suggests that net flows could total $30-55 billion per year by 2020.
4. High carbon price / high international coordination: in this scenario, reaching the $100 billion is most likely and will rely least on non-carbon related sources. The high degree of international coordination will make for the most economically efficient global system since it means that carbon markets are most likely to be integrated, with a consistent price signal in different economies. This also means that any border adjustments or trade disputes are least likely and that inefficiencies across sectors, such as the coexistence of a domestic carbon price and an international transport sector where carbon is not taxed, are avoided. Under this scenario, which is broadly in line with the numbers provided by the AGF, the net flow could reach close to $100 billion.

As the scenario illustrates, achieving $100 billion is feasible but challenging. This financing could make a very significant contribution towards closing the gap towards a 2ºC pathway. Assuming about 50 percent of the funds go towards mitigation, and the remainder towards adaptation, $25 billion in public funds could cover most of the $30 billion per annum by 2020 in incremental cost financing needs of the developing countries with less-developed capital markets.

It is important to note that carbon finance would in itself not help to close the gap towards a 2ºC pathway unless the emission reduction commitments of developed nations are increased to account for the expected offset flows. Otherwise, offsets will merely shift emissions from developed to developing nations, which increases developing countries' mitigation requirement. This would increase the financing need by roughly the same amount as the flows constitute.

Public finance flows should not be used to generate offsets, unless they create substantial mitigation net of offsets generated. Otherwise, these public funds are not used to reduce global emissions, but merely to reduce the cost of reductions in

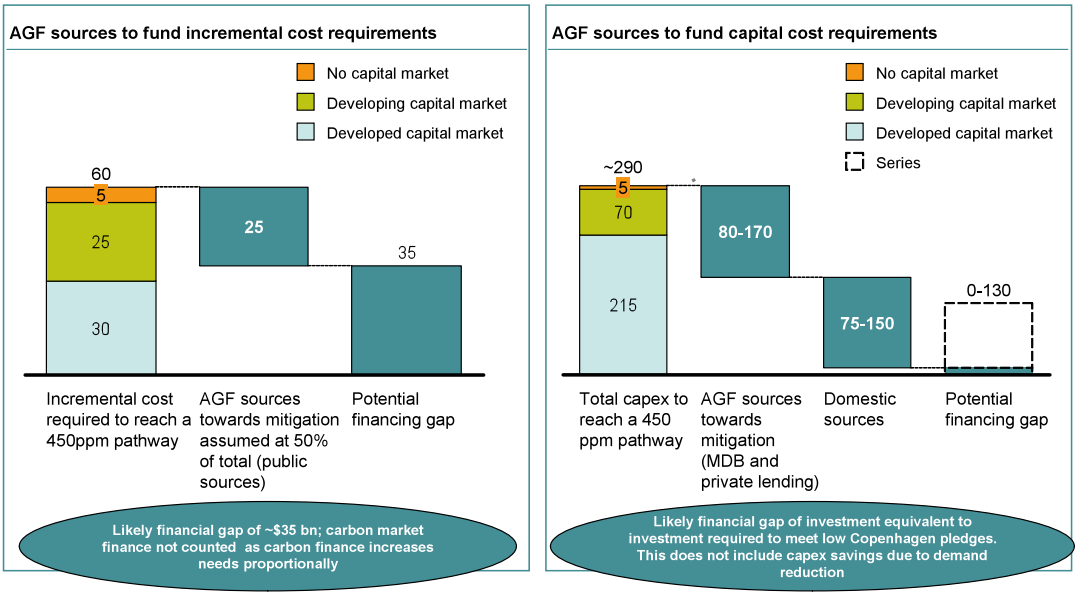
developed nations. This does not mean that carbon markets should not be further developed and that they cannot play an important role – they are critical for establishing a price for carbon, creating shared global incentives for mitigation, and reducing the global cost of action on climate change. However, it is important that public money is used efficiently and that offset flows are not double-counted as both developed and developing nation reductions as well as a climate finance flow.

A large share of the investment capital in climate related activities is assumed to flow to mitigation; all private flows mobilised by carbon markets, in addition to the private flows mobilised by public funds and MDBs would flow towards mitigation. Project Catalyst estimates that as much as $75–150 billion per annum by 2020 of private finance and $15–20 billion of MDB flows might go towards mitigation, totalling $80–170 billion in international investment flows per annum by 2020. The AGF estimates that domestic private flows would roughly be the same order of magnitude as international flows, i.e., $75–150 billion per annum by 2020 (Exhibit 13), which suggests that a large share of the required private finance flows for low carbon investments in developing countries could be mobilised by the financial support mechanisms outlined by the AGF.

Exhibit 13: Contribution of AGF financing towards financing needs

$bn, 2020, per year

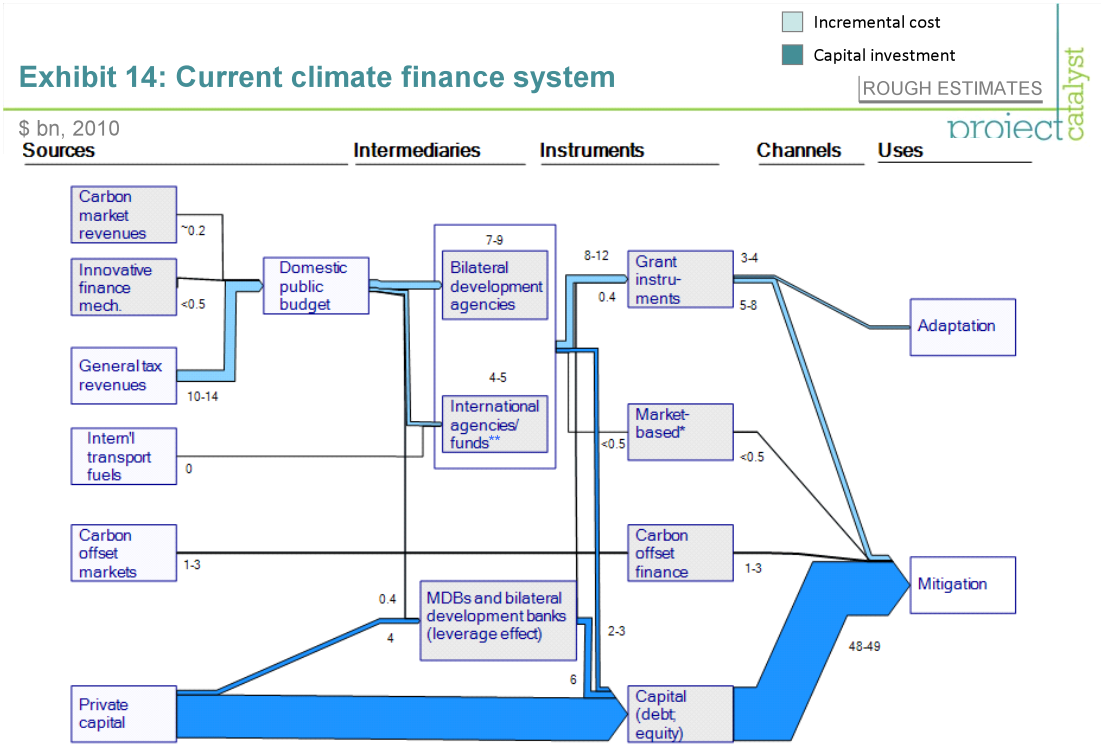
project catalyst



SOURCE: McKinsey Global GHG Abatement Cost Curve v2.1; Project Catalyst analysis; AGF report

4. The Way Forward

To support the transition of developing nations towards green growth, the international community will need to take steps to grow the current climate finance system towards its long term financing objective and to improve its effectiveness. Exhibit 14 shows the current international climate flows from developed towards developing countries. The main elements of the system include bilateral development agencies, bilateral development banks, international agencies and funds, and MDBs which transfer public finance from developed nations. Together these elements provide around $10 billion per annum for the period of 2010–12. This is complemented by carbon market flows of $1–3 billion and by private finance. Current international private finance flows to low carbon investments are estimated roughly at $40 billion.



* Includes mechanisms for risk reduction, income enhancing, finance enhancing and payment for eco-system services
** Includes Adaptation Fund and Climate Investment Funds
SOURCE: McKinsey analysis; CPI analysis

To build up the global climate finance system, three types of action are needed:

1. Define the ramp up for financing during the 2013–15 period to lay the foundation for 2020. Mobilise new sources, in particular revenues from international transport,

and increase the capital for MDBs while shifting more of their lending towards clean energy.

2. Scale up the investment pipeline through bilateral and multilateral partnerships. Ensure that measures are part of low carbon growth strategies. National low carbon growth plans should closely integrate adaptation and mitigation financing with development measures and include a policy framework that helps to minimise cost of mitigation and adaptation measures. This will ensure that climate finance can create real leverage and catalyse the much larger underlying investment flows in the economy towards green growth.

4.1. Ramp up sources

Policy makers should create an interim ramp-up climate finance period from 2013–2015, and concrete financing targets for this period should be agreed at COP16 in Cancun or latest at COP17 in South Africa. The financing provided during this new period is critical to continue the momentum created through Fast Start Funding, to continue to build credibility of the system, to achieve real, measurable climate benefits, and to set the stage for more ambitious action.

Creating this new period is critical because:

- It provides a goal for policy makers to work towards on a more politically relevant time frame than the current 2020 pledge. A more immediate objective would provide incentives for both developed and developing countries to reach consensus in the near-term on outstanding issues in international climate finance discussions.
- Second, increasing financing now towards long-term objectives is important for both environmental and political reasons. Environmentally, providing inadequate short-term financing for action in developing nations causes future emissions to be locked in by high-carbon infrastructure. Politically, agreement to create and fund a ramp-up period would help restore trust and build credibility between developed and developing nations, and would help advance international climate negotiations.
- Third, although mobilising $100 billion is critical for meeting global climate protection goals, intermediate steps are important. Policy makers are likely to be more receptive to supporting feasible, but meaningful, short-term objectives.

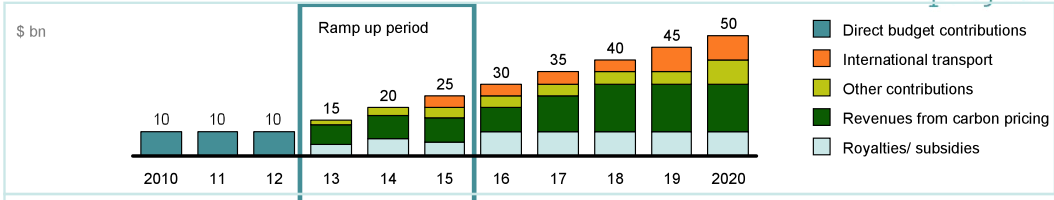
Achieving these goals will require mobilising financing from different sources. During the ramp-up period, many sources are likely to derive from existing budgets. Some financing may come from new sources that are tapped on a national level, e.g., redirected fossil fuel subsidies and royalties, or revenues from carbon pricing.

Exhibit 15 illustrates how public sources could grow until 2020 and what an appropriate ramp-up commitment for 2013–15 might be. Assuming linear growth, financing of $15–25 billion per annum should be made available each year between 2013–15, and should gradually be increased thereafter towards $50 billion per annum by 2020 (assuming that this would roughly be the public finance figure agreed to, in line with the figure suggested feasible by the AGF report, see exhibit 11). Revenues from the removal of subsidies and the redirection of royalties, revenues from a passenger tax implemented by national governments without much international coordination, plus some revenues from carbon pricing could likely be implemented quickly.

For international transport levies, the timing will probably be somewhat longer; international transport levies are only likely to provide significant revenues in the second half of the decade. A first step could be action by individual countries or groups of countries to introduce taxation on specific routes with limited substitution potential, e.g., flights between US and Europe. In the mean time, the International Civil Aviation Organization (ICAO) and International Maritime Organization (IMO) should facilitate international negotiations to agree levies for international transport over the next 2–3 years. Following that, the required processes could then be devised, allowing the levies to be implemented towards the second half of the decade.

Exhibit 15: Overview of illustrative scale up of public sources ILLUSTRATIVE

project catalyst



Revenues in $bn from new sources				Ramp up requirements
▪ Public contributions from new domestic sources	~5	~5	~10	
– Removal of fossil subsidies redirection of fossil royalities				▪ Requires phasing out of subsidies and redirection of royalties in with about 50% redirected starting 2012
– Revenues from carbon pricing	~5-10	~10–15	~15-20	▪ Carbon pricing introduced in majority of Annex I countries through taxes or emission trading ▪ Requires domestic legislation ▪ Assumes pricing rising to $25/t; share earmarked for international climate finance at 2-10%
– Other	~5	~10	~10	▪ Further budget contributions mobilised over coming 10 years
▪ International transport	~1–2	~2–3		
– Passenger tax in individual countries/ regions				▪ Passenger tax introduced by 2013 in majority of Annex I
– Levy for aviation and maritime			~10	▪ Global negotiations led by IMO/ ICAO to agree int'l approach ▪ Approach to international transport agreed to by 2012/13, implementation of infrastructure and processes by ~ 2017; levy collection starting 2017

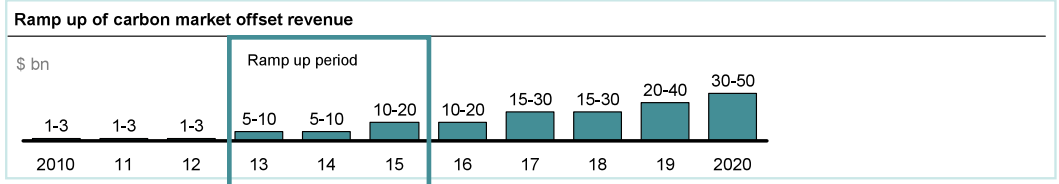
SOURCE: Project Catalyst analysis

Additionally, international agreement should be reached on increasing the capital committed to the MDBs, with concrete earmarking of the funds for climate finance.

At the same time, focus should continue to be placed on the development of the carbon markets. On the international level, the main focus should be on scaling up the Clean Development Mechanism (CDM), for example by reducing transaction costs and streamlining the UNFCCC processes, by making more use of programmatic approaches, and by developing methodologies for Nationally Appropriate Mitigation Actions (NAMA) and sectoral crediting. Of course, the most important factor in growing carbon markets is the development of cap-and-trade legislation in Japan, Australia and especially the US, plus tightening the EU cap to 30 percent. As exhibit 16 illustrates, ramping up to the levels suggested by the AGF is only possible if a significant share comes from the US. Given the current political environment, this assumption might appear ambitious and it is important that the climate finance system can mobilise sufficient flows also under a scenario where cap-and-trade is not implemented domestically in the major developed nations. In the short term, the factor most likely to affect carbon finance flows will be the EU decision to move to a 30 percent cap.

Exhibit 16: Overview of illustrative ramp up of carbon markets ILLUSTRATIVE

project catalyst



Demand offset flows in $bn (Gt)

EU	4-5 (0.2)	6-8 (0.3)	6-8 (0.3)	
US			12-25 (0.6-1.0)	
Other		2-5 (0.1-0.2)	2-5 (0.1-0.2)	
AAU	2-3 (0.1)	4-5 (0.2)	10-12 (0.5)	

Ramp up requirements

- EU increasing scope of ETS and increasing cap to 30% below 1990
- US to implement cap and trade in second half of decade
- Requires cap and trade bill similar to Kerry Lieberman / Waxman Markey
- Requires all major Annex I economies to implement cap and trade incl. Australia and Japan
- Requires continuation of AAU market with high end of caps as proposed in Copenhagen Accord
- Assumes regular compliance periods between 2013-20

SOURCE: Project Catalyst analysis

4.2 Delivery through concrete, achievable programmes

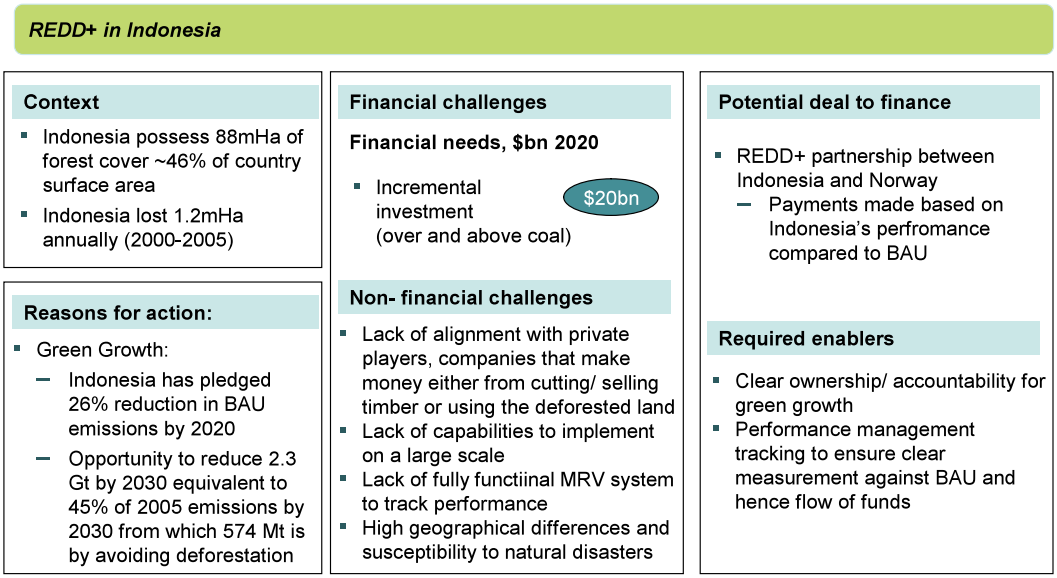
Delivering financing and real changes on the ground will only be possible if action is taken to ramp up both an investment pipeline (through comprehensive country programmes) and the corresponding sources of funding at the same time. Both financing and new investment opportunities need to be accompanied by a comprehensive policy approach and need to be aligned with the development goals of the countries.

As a first step, countries should develop low carbon growth plans, which is what many, including Ethiopia, Brazil, Indonesia, Mexico and Costa Rica are already doing. These could be economy wide plans, or focused on key sectors of the economy. The South African Renewables initiative (SARi) is an example for a comprehensive, sector-plan. It is an initiative of the South African Government to explore how best to secure the economic benefits from an ambitious renewables strategy and to design financing arrangements that minimise the incremental cost burden to South Africa. South Africa has the potential to build 20 GW of renewable power generation capacity reducing emissions by 300 Mt by 2020.

Many low carbon growth plans are supported by bilateral and plurilateral relationships, which are shaping up as the most important vehicles to deliver large scale programmes, e.g., the Norway-Indonesia partnership on REDD (Exhibit 17). Such relationships can be built on mutual self interest to allow trust to develop between providers and recipients of funds.

Exhibit 17: Norway-Indonesia partnership

project catalyst



SOURCE: Interviews, Project Catalyst

It will be important that low carbon growth plans include concrete goals for adaptation, increasing energy efficiency, reducing deforestation, and deploying clean technology – goals that can be translated into a concrete investment pipeline.

5. From Climate Finance to Green Growth

As developments in recent years have shown, an increasing number of countries are seeing the benefits of green growth and are putting measures in place to transition their economies to a climate resilient and sustainable future. This transition has progressed largely independent of climate finance. Action is now required to accelerate this transition and international climate finance can play an important role in achieving this goal. Developed countries have committed to support developing countries' transition to green growth with $100 billion per annum in public and private finance by 2020. This focus on climate finance has delivered practical results. For example, the REDD+ partnership between Indonesia and Norway is based on Indonesia's performance in reducing emissions and thereby ensures investment as emissions decrease. Mobilising this $100 billion per annum by 2020 will be challenging but feasible according to the AGF. These $100 billion committed by developed nations can make a significant contribution towards the financing requirements in developing countries to achieve a 2ºC pathway.

For this climate finance to be effective, it will be important that (1) system performance is better understood than today and (2) that climate flows leverage the much larger underlying capital flows including development finance and private capital flows towards green growth. This critically requires a reframing: from climate finance to financing green growth.

5.1. System performance

Currently, climate finance flows are very intransparent and their impact is very poorly understood. However, given the likely constraints on finance, it will be critical that funds are spent in the most effective way possible.

First, this requires improved transparency. This includes information on how much financing is provided for climate (in particular what type of money has been provided – grants, loans, equity, or guarantees), what it is spent on (what share is mitigation and adaptation, which sectors is it spent on and which countries) and how effective this spending has been (how many tonnes of mitigation have been delivered, how much of

that is truly additional, what was the effective cost per tonne of mitigation delivered, how many lives have been protected by adaptation measures, etc.). Currently, there is no standard way of reporting on these issues, and reviews of effectiveness are likely to be intrusive and hence likely to be objected to by providers and recipients of funds. While existing institutions like the OECD that already track ODA spending might be able to expand their remit, creating transparency might require NGOs to step into the vacuum to collect and analyse the data. In addition, data quality could be improved by encouraging providers and recipients to adhere to common report standards.

Second, performance of the system needs to be more fully understood. This does not just require data but a set of principles based on which it is evaluated and measured against. Performance measures will need to be developed that enable donors and recipients to understand for a dollar spent how many tonnes of emissions are mitigated, whether investment has been transformational to an economy, whether long term lock-in effects have been avoided and whether an economy has been made more climate resilient.

There are some encouraging examples of countries moving in the right direction. For example, in the REDD+ partnership between Norway and Indonesia payments will be based on the country's performance compared to a business-as-usual scenario. Similarly, the Amazon Fund has secured $1 billion from the Norwegian government and payments are based on the deforestation achieved in Brazil. Lastly, the Copenhagen Green Fund could play a role in increasing transparency, in particular if part of its remit is to fill funding gaps left by other funding organisations. It will only be able to do that if it has access to good data on both the global financing landscape and a sense for the available programmes on the ground.

5.2. Creating leverage

To create leverage, it will be important to move away from the traditional framing of climate finance, towards one of green growth. This will ensure that climate finance will be an important catalyst, but at the same time embedded in the much larger international and domestic flows of finance. On the international level, it would allow governments and MDBs to re-direct their much larger development finance flows towards green growth. An initial step could be to gradually increase the targets for "green" lending. On the national level, moving to "green growth" would reshape the way governments assess the financing needs in their economies as they will be able to reflect the full benefits to their nations, rather than just look at a technically defined incremental cost.

To date climate finance, the focus of much of the international climate negotiations, was framed by the principle of common and differentiated responsibilities, and has become synonymous with the accountability of richer nations to support the mitigation and adaptation efforts of poorer nations. This crucial principle has informed the work of the UN High-Level Advisory Group on Climate Finance, discussed elsewhere in the paper, and underpins its conclusions and insights.

The focus on climate finance has delivered practical results, including significant financing for REDD+, funds associated with carbon markets, and additional international public financing for adaptation. As the AGF analysis has shown, the $100 billion committed to by developed nations can make a significant contribution towards the financing requirements in developing countries but might fall short of what is needed.

On the ground, however, practice has already progressed largely independently of either climate finance or the associated principles of responsibility and accountability. Ambitious renewables programs from Morocco to China and South Africa, and broader green growth strategies from South Korea to Brazil exemplify how green growth and development are becoming the lens through which our responses to climate change are and need to be framed, designed, and implemented. Such a reframing remains fundamentally about how to advance mitigation and adaptation rapidly and effectively.

Economics assessed with the full range of national benefits in mind, rather than a technical costs analysis should be the frame that is used for defining a green growth approach. Much of the work done to date on ‘low carbon growth plans’, for example, remains centrally about least cost mitigation and adaptation, how to avoid or solve a problem as cost-effectively as possible. Such plans, with notable exceptions, do not take account of the potential benefits and additional challenges associated with investing in green. Policy debate about mitigation is rarely placed within a broader economic analysis, and so remains limited to individual ministries responsible for the environment, energy and finance.

Reframing the conversation towards green growth and development is more than a change in words, opening up new financing opportunities, because of the economic and broader policy objectives that are addressed as a result:

- Energy security concerns in Europe make the potential for renewables generation in Morocco seem attractive. Europe is therefore becoming more open to investing in, and paying a premium for such energy.

- Economic growth and related employment gains from localising parts of the global value chain in renewables – manufacturing, servicing and in some instances research and development – underpin policy-led initiatives from Ontario to South Africa. They also make governments more willing to put public funds on the table, often with the prospect of seeing much of it return through increased tax revenues from the economic activity that results. Concessionary finance, especially debt, must be made available for mitigation not only from climate-focused funds, but those focused on export and investment promotion where industrial joint venture opportunities exist, as they increasingly do.

Finance to address *"only"* climate is likely to be a moderate proportion of the funds needed and available to pay for the transition of economies onto low carbon trajectories. Reality on the ground is that finance for green growth and development is already coming, and will continue to come in many shapes and forms, from domestic policy measures, reconfigured international development assistance, local banks through to international private equity players. That does not mean that economic opportunities, and associated national self-interest, will always and everywhere exist. And negative impacts of climate change on vulnerable communities will remain a core issue that needs to be addressed with new public money from the international community. But even in such cases, specialised climate finance is so far playing a relatively small, remedial role, and the challenge and opportunity is to leverage what is out there to better effect. That is, to remain within a 'climate finance' paradigm is self-limiting given what needs to happen on the ground. The broader view is starting to emerge in some countries' programs, and much good will be achieved if their examples are followed elsewhere.

The opportunity and need is to allow for innovations in financing that take advantage of national self-interest and international co-operation within the framework of international accountability that underlies the negotiations. Treating them as alternatives, or worse still as mutually exclusive, narrows the scope for action and reduces the potential of the negotiations to advance change on the ground.

Of course, at the same time climate finance needs to be scaled up in line with commitments made in Copenhagen. This will require concrete commitments for climate finance in particular for a ramp up period of 2013-15. At the same time, effective programmes need to be established in developing countries, built on partnerships that are in the self interest of both recipients and contributor countries. This can be effective ground to test and refine new approaches to embedding climate finance into the wider financial flows. Critically, this will require embedding them in low carbon growth strategies and effective, enabling policy measures.

In conclusion, recent efforts by many countries to transition to green growth have been encouraging. The international community should now recognise these efforts and ensure that they are sustained and accelerated through concrete commitments for the coming years focused on:

- Making concrete financing commitments, in particular for a ramp-up period of 2013-15 consistent with long term financing in 2020.
- Developing a credible investment pipeline for mitigation and adaptation measures in developing countries built on concrete bi-lateral or multi-lateral partnerships, integrated into and driven by domestic growth strategies and policy frameworks.
- Improving understanding of system wide performance and increasing leverage of climate finance, in particular by "greening" the wider development flows and catalysing domestic and international investment through climate finance.

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