

Report of the High-level Advisory Group on Climate Change Financing

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I. Introduction

1. Climate change is one of the greatest challenges of our time. In Copenhagen, political leaders emphasized their strong political will to urgently combat climate change in accordance with the principle of common but differentiated responsibilities and respective capabilities;
2. and that scaled-up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries, in accordance with the relevant provisions of the United Nations Framework Convention on Climate Change (UNFCCC).
3. In the context of meaningful mitigation actions and transparency on implementation, developed countries committed themselves to a goal of jointly mobilizing US\$100 billion a year by 2020 to address the needs of developing countries. This funding will come from a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance.
4. On 12 February 2010, the Secretary-General of the United Nations established a High-level Advisory Group on Climate Change Financing (AGF). The Advisory Group consisted of Heads of State and Government, as well as ministers of finance, high-level office holders and experts on public finance, development and related issues, from both developed and developing countries. The members served in their expert capacities without prejudice to national or institutional positions in the climate negotiations.
5. Following its terms of reference, the focus of the Advisory Group was to identify practical proposals on how to significantly scale up long-term financing for mitigation and adaptation strategies in developing countries from various public as well as private sources, and how best to deliver it. In undertaking this task, the Group emphasized its advisory role. It was neither a negotiating nor a decision-making body.
6. Following its terms of reference, the Advisory Group worked around the goal of mobilizing US\$100 billion per year by 2020. The Advisory Group did not assess total needs for climate financing in developing countries. However, the analysis provided is intended to be helpful for any envisaged scale of resource mobilization.
7. The Advisory Group did not consider short-term finance covering the period 2010-2012. It did, however, look into how potential sources could be mobilized across different time horizons. The Advisory Group acknowledged the collective commitment made by developed countries to provide resources approaching US\$30 billion in “fast start” climate finance during the period 2010-12 to help meet the adaptation and mitigation needs of developing countries. Times scales for medium-term resource generation depend, inter alia, on whether the resources would be primarily generated at national/regional levels or would require more coordinated international action.

8. The Advisory Group identified potential sources of finance which can be summarized in four groups: public sources for grants (including taxation and auctioning of emission allowances, removal of fossil fuel subsidies, other new taxes such as a financial transaction tax and general public revenues through direct budget contributions), development bank type instruments, carbon market finance and private capital. The sources were analysed based on the criteria defined in the terms of reference: revenues, efficiency, incidence, equity, practicality, acceptability, additionality and reliability.
9. The Advisory Group did not seek consensus on all issues and concepts. It rather took the view that its analysis can be useful to parties and decision makers by reflecting different perspectives.
10. The work of the Advisory Group was based on the recognition that there is a need for enhanced flows of both public and private capital to developing countries in order to combat climate change, and that meeting the goal of US\$100 billion per year by 2020 will need a combination of both. The Advisory Group also recognized the systemic nature of sources and instruments and therefore took a comprehensive approach in the analysis.
11. There were different perspectives within the Advisory Group on the role of public and private capital flows in meeting the goal of US\$100 billion per year. Some members focused on public financing as the primary source, covering incremental costs, and complemented by private flows. Others emphasized that private financing would be the primary source, inter alia, because of the important role that private investments already play in climate-relevant sectors in scaling up technology deployment and catalysing entrepreneurship, and because of its predictability and scalability.
12. The Advisory Group did not seek an agreed formula on what financing flows should count and on what should not count towards the US\$100 billion per year. There were different perspectives within the Advisory Group as to whether and how to measure revenues in terms of gross and net metrics, particularly regarding private and non-concessional flows. While the importance of private and non-concessional flows should be acknowledged, including especially their transformative role, some members felt that only the grant equivalent of private and non-concessional public flows would be relevant if contributions are to be consistent with the provisions of the UNFCCC. Another perspective was that counting gross private and non-concessional public flows towards the \$100 billion goal would be fully consistent with the relevant provisions of the UNFCCC. Under either approach, the size of such flows is likely to be greater the better the investment climate in the developing countries.
13. Gross flows would be measured at face value and would include, inter alia, private capital flows, offset finance and non-concessional lending mobilized through the Multilateral Development Banks (MDBs).
14. Net metrics of concessional public flows would adjust the gross values to take account of servicing obligations and alternative financing opportunities. The

group reports the grant equivalent transfers consistent with the methodologies used by the Development Assistance Committee (DAC) of the Organization for Economic Co-operation and Development (OECD).

15. In the case of private and public non-concessional financial flows, while conceptually the net benefit of these flows to a country could be calculated, in practice it is significantly more difficult to do than for concessional public flows as there is no internationally agreed or empirical basis on which to do such calculation. There were varying views within the Advisory Group about how robust any estimate would be on any net private or public non-concessional flows, given the practical difficulties. The report explains methodologies proposed by some members and gives examples on how one might calculate net private and public non-concessional flows.
16. One perspective within the Advisory Group was that carbon offsets should not count towards the US\$100 billion goal, since these are mechanisms that are designed to reduce the cost of mitigation in developed countries. Another perspective was that financial flows from offsets should count towards the US\$100 billion goal because these payments are a clear example of policy-driven financial transfers to developing countries, and because existing offset systems have demonstrated success in predictably and efficiently leveraging additional investment in developing countries. A third perspective was that only the net value of carbon offset flows should count towards the US\$100 billion goal, paralleling the proposed net approach to private capital flows.
17. Spending resources wisely is critical to building the mutual confidence needed to mobilize climate finance. The report therefore includes some illustrative examples of climate change financing, without prejudice to the UNFCCC negotiations. The full texts of the examples are found in annex III.
18. The Advisory Group worked in close collaboration; all members participated in drafting technical background papers from which this report is derived, as well as in distilling and condensing those papers into the final report. The Group met several times, at the principal and deputy levels, with working sessions held in several countries.
19. Outreach was an important element of the work of the Advisory Group. The Advisory Group consulted widely among numerous stakeholders. Consultations were held with representatives of UN member states, civil society and the private sector. Briefings were held for Parties at UNFCCC sessions. In addition, individual members of the Advisory Group had interactions with a wide array of stakeholders, including civil society and the private sector.
20. When announcing the launch of the Advisory Group, the Secretary-General expressed his expectation that the work of the Advisory Group would help to inform negotiations on climate change financing as an essential part of a comprehensive climate change agreement. The Advisory Group hopes that this expectation will be met through the process that has led to this report, and that the report itself will contribute to the discussions on financing within the ongoing UNFCCC negotiations.

21. Section 2 of this report presents the conclusions of the Advisory Group. Section 3 describes the concepts and methods used in carrying out the analysis at the basis of this report, focusing on the sources and assessment criteria considered (supplemented by annex II). Section 4 describes the assessment of the sources against the criteria, and draws the broad conclusions from this analysis. Section 5 examines the issues involved in combining the different individual sources.

II. Conclusions from the analysis

A. The overall challenge

22. The current range and potential of instruments available to meet the goal of US\$100 billion per year by 2020 point to the conclusion that it is challenging but feasible to achieve this goal.
23. Reaching the goal will likely require taking a systemic approach to the financing of climate action. This involves carbon pricing as well as implementing a wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance, a scaling-up of existing public sources and increased private flows. There were different perspectives within the Advisory Group on the appropriate composition of sources for reaching the goal.
24. A combination of sources will also be required to effectively address different types of climate actions. Given the purpose of the resources, to support both adaptation and mitigation in developing countries, both public and private sources, and both grants and loans would be necessary. Grants and highly concessional loans are crucial for adaptation in the most vulnerable developing countries, such as the least developed countries, small island developing states and Africa.

B. Sources and instruments

25. New public sources examined by the Advisory Group have the potential to generate flows of tens of billions of dollars annually, a significant step towards raising the US\$100 billion per year.
26. Strong commitments to domestic mitigation and the introduction of carbon-based instruments in developed countries are key for mobilizing climate financing, both public and private. New public instruments based on carbon pricing are in particular attractive because they both raise revenue and provide incentives for mitigation actions.
27. Higher carbon prices feed through into multiple public sector instruments (such as revenues from auctioning of emissions allowances, domestic carbon taxes, international levies/Emissions Trading Schemes (ETS)), into carbon offset markets, and into the effective prices for carbon abatement that influence investment patterns in developing countries. The higher or lower the carbon price, the larger or smaller the revenue, and the stronger or weaker the price signal to reduce emissions. While the Advisory group emphasized the importance of pricing carbon, it did not take a firm view on the choice of instruments to achieve carbon pricing, for example on whether this should be achieved via taxes or carbon markets.

28. Direct budget contributions, based on existing public finance sources, could continue to play an important role. Direct revenues draw from a domestic revenue base, including domestic taxes. To address potential difficulties in the timely implementation of new instruments, governments may prefer to increase budget contributions. The political acceptability of this source over the longer term will depend on national circumstances and on the size of the contribution. The global fiscal environment has placed public finances in many developed countries under extreme pressure. The Advisory Group also recognised that some governments would be constrained from increasing the existing tax bases, whether through existing or new sources, due to the operation of domestic budgetary rules. However, the Advisory Group expects that direct budget contributions will play a key role in the long term.
29. International private investment flows are essential for the transition to a low-carbon, climate-resilient future. These investments can be stimulated through targeted application of concessional and non-concessional public financing. Careful and wise use of public funds in combination with private funds can generate truly transformational investments. Further work is recommended on finding the most effective use of grant funding for climate actions.
30. Carbon markets offer important opportunities for supporting new technologies and leveraging private investment in developing countries. The Advisory Group therefore recommends that the carbon markets are further strengthened and developed, while ensuring environmental integrity.
31. Domestically-based instruments have advantages in terms of political acceptability in developed countries, allowing flexibility and tailoring to the particular circumstances of these countries.
32. Carbon-related instruments coordinated internationally, for example on international transportation, could potentially mobilize significant public resources for climate action in developing countries. These instruments, however, may present difficulties in terms of political acceptability and incidence on developing countries. Some members were of the view that political acceptability and incidence on developing countries should be addressed by Parties to the UNFCCC and the Kyoto Protocol. These members believed that further discussion on the design and implementation should depend on the decision by these Parties. Other members were of the view that universal application of instruments on international transportation is necessary, inter alia, in order to avoid significant competitiveness issues. These members were of the view that incidence issues, particularly on developing countries, could be addressed by mechanisms other than selective application, for example through the appropriate collection and distribution of revenue. Any mechanism should not blunt abatement incentives or distort competitiveness. Further work on such instruments should be taken forward in the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).

33. The MDBs (Regional Development Banks and the World Bank), and the United Nations system are likely to play a key role both in fostering low-carbon growth and in meeting the adaptation needs of developing countries. The UN system can play a complementary role both in preparing the demand of developing countries for new significant climate finance, as well as in the implementation phase of specific mitigation and adaptation programmes. The MDBs in close collaboration with the UN system can play a multiplier role, leveraging significant additional green investment in a way that integrates climate action into overall development programmes. Their capacity to do so should be strengthened through additional resources in the course of the next decade.
34. A global financial transaction tax, as currently debated, would be a new and additional source. The share of the revenues to be allocated to climate action would be a policy issue. Strong international coordination, allowing for international implementation, would increase the efficiency of such a source, limiting its distorting effects. The lack of political acceptability and unresolved issues of developing countries incidence make it, however, difficult to implement universally. In this context, one perspective within the Advisory Group was that further work would be needed to overcome cooperative issues. A different perspective was that a financial transaction tax is only feasible among interested countries at the national or regional country level.
35. Some of the potential instruments examined by the Advisory Group, such as a carbon export optimization tax or a globally coordinated Special Drawing Rights (SDR)-based climate fund, appear to be unlikely instruments for meeting the 2020 goal of US\$100 billion; the issues of developing countries incidence and of political acceptability are particularly difficult.

C. Combining instruments

36. In line with the systemic approach taken in the analysis of sources, the Advisory Group examined issues involved in combining instruments, including overlaps and interactions. Public sources, for example, should be combined in ways that avoid double counting of likely revenue and inefficient double taxation. Sound design of public instruments, such as development bank instruments, can increase private flows as well as leverage paid-in capital. Equally, the United Nations system has considerable experience in helping developing countries to apply for and establish an enabling policy environment to receive new climate finance. Revenue potentials can not necessarily be added together, for instance, because of spill over effects and potentially diminishing political appetite to mobilize multiple sources. Combining different sources, both public and private, and examining their appropriate role and scale should be subject to further international and national analysis and discussions. National circumstances will be taken into account in evaluating the menu of options.
37. The Advisory Group recognised that some key elements of the flows would be mutually reinforcing. In particular, carbon prices, revenues from MDB flows

and private sector flows support each other in terms of both revenues and incentives.

38. How sources might be combined in overall revenue mobilisation depends on some key variables. This includes carbon prices, the percentage of fiscal revenues that is allocated for international climate action, the use of international coordinated sources, the willingness to channel funds through the MDBs and the size of carbon market finance. The Advisory Group addressed only potential developing country incidence.
39. The Advisory Group emphasised the importance of new carbon-based public instruments and a carbon price in the range of US\$20-25 dollars a tonne of CO₂ equivalent in 2020 as key elements to reach the goal of US\$100 billion per year.
40. Revenue estimates have been adjusted to reflect that some of these instruments encompass incidence on developing countries, and that a substantial share of the revenue is likely to remain in developed countries to support domestic priorities.
41. Of the new public instruments examined, the greatest revenue contribution potential is likely to come from auctions of emission allowances/new carbon taxes in developed countries. Given a carbon price of US\$20-25 per tonne of CO₂ and assuming allocation of up to 10% of total revenues raised going to international climate action, such sources have the potential of generating around US\$30 billion annually. These sources have strong carbon efficiency attributes, and will not have any direct incidence on developing countries.
42. The Advisory Group also pointed at the revenue potential of up to US\$10 billion from other instruments such as redeployment of fossil fuel subsidies in developed countries, or some form of a financial transaction tax that reflects the various perspectives of the Group.
43. Without underestimating the difficulties that will have to be solved, particularly in terms of national sovereignty and incidence on developing countries, the Advisory Group pointed at carbon pricing of international transport as an important potential source for climate financing (and mitigation) that could contribute substantially towards mobilizing US\$100 billion. Given a carbon price in the range of US\$20-25, a 25-50 per cent earmarking of such revenues to international climate action and no net incidence on developing countries, these sources have the potential of mobilizing approximately US\$10 billion plus of public finance annually.
44. From the perspective of some members that most of the revenue towards the goal should be public, there is a need to scale up existing public instruments channelled through direct budget contributions for climate actions in order to complement the revenue from new public sources.
45. The Advisory Group estimates that for every US\$10 billion in paid-in capital, MDBs could deliver US\$30 billion to 40 billion in gross MDBs flows. There is

no analytical or empirically agreed basis on which to do net MDBs flows calculations. However, based on methodologies suggested by some members and explained in the report, the net MDBs flows would be US\$11 billion.

46. Enhanced private flows will be essential to economic transformation towards low-carbon growth. Ultimately, these will need to be mobilised at a scale of hundreds of billions of dollars. The MDBs, the United Nations system and bilateral agencies, other international institutions, public-private risk-sharing instruments and more developed carbon markets can all play key roles in multiplying potential private flows for climate investment.
47. The analysis indicates that a carbon price of US\$20-25 could generate around US\$100 billion to \$200 billion of gross private capital flows for climate actions in developing countries. There is no analytically or empirically agreed basis on which to do net private calculations. However, based on some methodologies suggested by some members and explained in the report, such gross flows could lead to private net flows in the range US\$10 billion to \$20 billion.
48. A carbon price in the range of US\$20-\$25 could generate increased carbon market flows of between US\$30 billion and \$50 billion annually. One perspective within the Advisory Group was that such flows should count towards the US\$100 billion goal, while another perspective was that such flows should not count towards this goal. From yet another perspective, only net carbon market flows should count. Carbon market flows of this magnitude could deliver around US\$10 billion of net transfers, based on methodologies explained in the report. There is however no analytically or empirically agreed basis on how to do such calculations of carbon market finance flows.

D. Time horizons

49. Several of the sources examined by the Advisory Group could be operational relatively quickly. In particular, public sources implemented domestically could be implemented more quickly. On the private finance side, flows of investments will depend on a mix of government policies and on the availability of risk-sharing instruments. In some cases, confidence on policies and instruments could be built fairly quickly, but others may require more time to implement.

E. Spending wisely

50. The Advisory Group examined cases covering key areas; related to enhanced action on mitigation, including substantial finance to reduce emissions from deforestation and forest degradation, adaptation, technology development and transfer and capacity-building. There should/will be a balanced allocation between adaptation and mitigation in the period 2010-2012. The Advisory Group presumes that the same will apply in the future. In accordance with political commitments made at the United Nations Climate Change Conference

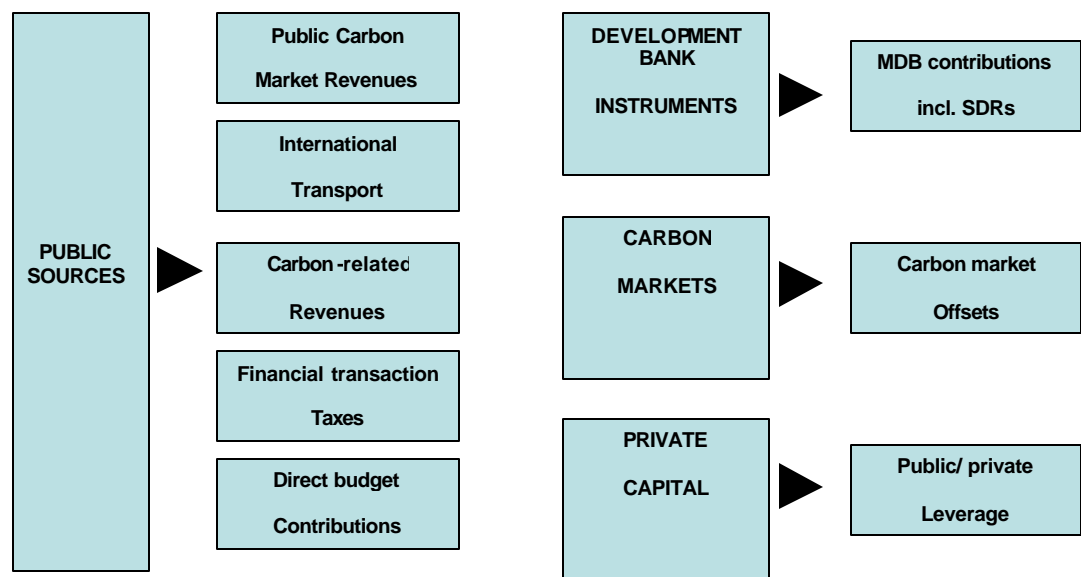
in Copenhagen in 2009, funding for adaptation will be prioritized for the most vulnerable developing countries, such as the least developed countries, small islands developing states and Africa. The illustrative cases are the African Water Facility, the South Africa Wind Energy Programme, Guyana's Low Carbon Growth Strategy, the Caribbean Catastrophe Risk Insurance Facility and Indonesia's Geothermal Power Development Programme. The Regional Development Banks, the World Bank, the United Nations system, other multilateral institutions and the REDD+ partnership will be crucial in scaling up national appropriate climate actions, for example via regional and thematic windows in the context of the Copenhagen Green Climate Fund, such as a possible Africa Green Fund.

III. Concepts and Methods¹

51. The Advisory Group focused on sources and instruments², examining their individual characteristics against a set of agreed criteria and exploring how they could potentially be combined. The Group also tried to assess the different sources and instruments with analytical rigour, finding common ground when possible and acknowledging differences when not. The Advisory Group did not examine formulae to allocate revenue targets across developed countries.

A. Sources

52. The work of the Advisory Group on potential sources was based on suggestions that have been made in the relevant literature³, public discussions, and ideas within the Group itself. Following the terms of reference of the Group, the focus was on the potential sources of revenues for the scaling-up of new and additional resources from developed countries. Having identified and discussed potential sources of finance, the Advisory Group grouped them into four categories (see chart below): (a) public sources; (b) development bank instruments; (c) carbon market finance; and (d) private capital.



¹ For more details on the methodology, see annex II on concepts and methods.

² Such sources and instruments are often used interchangeably but when a distinction is made the former term is more generic, referring to an area or broad base, and the latter more specific, for a particular type of measure.

³ A survey was conducted early in the Advisory Group's work and is available on the AGF website: www.un.org/climatechange/aggf

53. Each of these four types of finance could potentially play a different but complementary role in meeting the potential set of mitigation and adaptation end-uses. In many cases, such as that illustrated in Guyana's low-carbon growth strategy, these different sources need to be combined into an overall package of funding.

Case study

Guyana's Low-Carbon Growth Strategy – Aligning global and national low-carbon priorities through innovative financing

Background

The program is based on payments for climate services that come through the Guyana REDD+ Investment Fund. Funds are then channeled into nationally-determined low carbon investments. The program has defined financial, social and environmental safeguards, with annual assessment and verification carried out by third parties.

This national program is designed to eventually transition towards funding from international carbon markets, reducing Guyana's dependence on international public financing.

It is estimated that Guyana will provide US\$350 million of climate services during the period 2010-2015.

Key Messages

The case shows how various sources of financing could be combined into an overall package of funding to support a transition from public sources to carbon markets. In the case of Guyana's Low-Carbon Growth Strategy, the source/use matching includes :

- ! Reduction of current emissions addressed with bilateral and multilateral transfers from public sources.
- ! De-carbonizing future growth achieved through a mix of different measures, including targeted development lending and carbon market finance leveraging further private investment.
- ! Funding adaptation projects and programmes which are best achieved in the project through multiple foreign and domestic sources.

54. The Advisory Group formed eight work streams on different sources (six public and two private). Each work stream group carried out detailed analysis of the different sources, assessing them against the criteria laid out in the terms of reference. Each of the sources was considered and analysed carefully:

1. Public sources

These public sources could be grants⁴ or loans (via MDBs or elsewhere) but are, in principle, available to be used directly for grants.

- a) Revenues from international auctioning of emission allowances (such as Assigned Amount Units (AAU) under the Kyoto Protocol) – this would involve retaining some allowances from developed countries and then auctioning them to raise revenues;

⁴ Grants relate to sources that require no servicing and therefore constitute 'pure' transfers from developed countries to developing countries.

- b) Revenues from auctioning of emission allowances in domestic emission trading schemes – this would involve auctioning of domestic credits (as in the EU Emission Trading Scheme phase III) and allocating some part of associated revenues;
 - c) Revenues from offset levies – this would involve withholding a share of offset revenues as a global source as currently done in the Clean Development Mechanism (CDM);
 - d) Revenues generated from taxes on international aviation and shipping – this would either involve some levy on maritime bunker/aviation jet fuels for international voyages or a separate Emission Trading Schemes for these activities, or a levy on passenger tickets of international flights;
 - e) Revenues from a wires charge – this involves a small charge on electricity generation, either on kWh produced or linked to carbon emission per kWh produced;
 - f) Revenues generated by removing fossil energy subsidies in developed countries – this comprises budget commitments freed by removal of fossil energy subsidies which can be diverted towards climate finance;
 - g) Revenues from fossil fuel extraction royalties/licences – which could be allocated in part to international climate finance;
 - h) Revenues from carbon taxes – this is based on tax on carbon emissions in developed countries raised on a per tonne emitted basis;
 - i) Revenues from a financial transaction tax – this builds on existing proposals on global financial transaction tax (with a focus on foreign exchange transactions);
 - j) Direct budget contributions – this involves revenues provided through national budgetary decisions.
2. Development bank instruments.
- a) Resources generated via MDBs using current balance sheet headroom.⁵ These revenues are not included in the estimates for the source;
 - b) Resources created via potential further replenishments and paid-in capital contributions by countries to MDBs (i.e., generating new cash resources for MDBs). This includes both highly concessional IDA type loans and non-concessional loans;
 - c) Potential contribution to a fund dedicated to climate-related investment financed on the back of commitment of existing or new Special Drawing Rights (SDRs).
3. Carbon market finance refers to transfers of resources related to purchases of offsets in developing countries. Carbon markets offer important opportunities for directly financing new technologies in developing countries, and for leveraging private investment. Presently, the majority of resources are generated via private entities and governments in developed countries purchasing project-based offsets from private entities in developing countries

⁵ This is the amount of money the MDB can raise on the capital markets given the assets on its balance sheet.

through the CDM. Additional flows could be generated when and if carbon markets are further developed and deepened, taking into consideration environmental integrity. The potential scale of resources is dependent on the stringency of emissions reduction commitments of developed countries, on carbon market design, and availability of eligible emissions reductions in developing countries.

4. Private capital refers to flows of international private finance resulting from specific interventions by developed countries. This includes the use of risk mitigation or revenue-enhancing instruments that compensate private investors for otherwise lower than risk-related required rates of return (also referred to as “crowding in”) as well as capacity-building for adaptation and implementation of climate policies in developing countries. Such instruments are illustrated in the case of the South Africa Wind Energy Programme, described below. The magnitude of flows would likely be higher, the better the investment climate in the developing country. Such flows cannot be committed *ex ante*, since they depend on private choices. However, developed country policy actions as well as MDBs, the United Nations and bilateral agencies investment/instruments can catalyze and foster additional private sector flows.

Case study

The South Africa Wind Energy Program – Meeting the rising demand for energy sustainability by leveraging private finance

Background

The South Africa Wind Energy program is an example of a multi-year technical assistance project implemented by United Nations Development Program (UNDP) and co-financed by the Global Environmental Facility (GEF) with US\$2.3 million in grant funding.

The project promotes large-scale commercialization of wind energy projects and the development of the domestic sector. Three fully operational wind farms are currently generating 10 MW with an excess of 3 GW in advanced-stage wind farm grid connection applications. It is estimated that approximately 5 GW could be commissioned by 2015 if other issues are addressed.

Key messages

The program provides an example of how public investments in risk mitigation can crowd in private capital:

- ! Technical assistance can be used to assist governments of developing countries in overcoming barriers – policy, institutional, capacity – and creating enabling environments for private sector investment ;
- ! Leverage ratios of such technical assistance can be high aiding in the development of private sector activity across industrial sectors.

B. Criteria

55. The Advisory Group assessed the different sources against the set of criteria set out in its terms of reference: revenue, efficiency, equity, incidence, practicality, reliability, additionality and acceptability.

56. **Revenue:** where possible, revenue potential was examined on a comparable basis across sources. Such comparability, however, is not necessarily easily achieved, given key distinctions for example between loans and grants and public and private sources.
57. Generally, revenue estimates from the different sources can not necessarily be added together since the revenues estimated are a mix of net and gross flows, as well as a mix of grants, loans, offset payments and equity investments. In addition it may not be possible to combine certain sources, such as taxes which place a duplicative burden on the same tax base. Finally, revenue potentials can not necessarily be added together, for instance, because of spill over effects and potentially diminishing political appetite to mobilize multiple sources.
58. There were different perspectives within the Advisory Group on the role of public and private capital flows in meeting the goal of US\$100 billion per year. Some members focused on public financing as the primary source, covering incremental costs, and complemented by private flows. Others emphasized that private financing would be the primary source, inter alia, because of the important role that private investments already play in climate-relevant sectors in scaling up technology deployment and catalysing entrepreneurship, and because of its predictability and scalability.
59. A net approach would include only the grant equivalent transfers from developed countries, while gross flows would include private capital flows, offsets finance and non-concessional lending mobilized through the MDBs. The size of these gross flows is likely to be greater the better the investment climate in the developing countries.
60. One perspective within the AGF Advisory Group was that private flows should be measured on both a gross and a net basis. Whether gross or net is to be used, the relevant flows are those triggered by the public sector interventions in developing countries (such as risk-sharing instruments targeted at international climate investments). Some took the view that since the challenges concern the finance of the net incremental costs which are to be incurred, only the net flow concept is relevant. Another perspective within the AGF Advisory Group was that only gross private flows should be measured, given the methodological difficulties of defining a net measure and also the crucial role of overall gross flows in providing the necessary scale and in driving entrepreneurship and technological innovation.

Net private calculation

61. The Advisory Group discussed both the concept of net private and non-concessional public flows, that is the grant equivalent of those flows (adjusted for servicing requirements relative to alternative sources), as well as gross private and non-concessional public flows, meaning the total amount of private finance made available.

62. The concept of private flows generated by policy action via developed countries is related to co-investment of private money and MDBs or bi-lateral funds, or to risk-reducing or revenue-enhancing mechanisms funded by public money. Under such circumstances, private investors often accept a lower return in exchange for reduced risk. For example, co-investments with MDBs are typically considered less risky, given the relationships these institutions have with local governments, which reduces the political and policy risks of the investment. This leads to lower financing costs, more investments and thus a corresponding net gain to developing countries.
63. There is currently no widely accepted methodology to calculate the net equivalent of gross private flows and significant work would be required to develop an approach that could be used in the context of international climate finance, across a broad range of countries and associated alternative financing opportunities. This includes the need to determine the reduction in the return achieved through risk-mitigating instruments and to quantify the value of this lower required return to developing countries relative to alternative opportunities. In addition, one would need to determine what percentage of the private flows is associated with risk-mitigating instruments. It is likely that not all instruments that crowd in private capital (e.g. carbon market offsets) do so in a way that reduces expected required returns. Net flows are likely to be higher for those countries (and sectors) which have a more restricted access to international capital markets.

The following is an example of how such a calculation could be done, although the assumptions on return rates are purely illustrative and not based on any empirical evidence. A mid-case scenario in 2020 might generate a gross total of US\$200 billion of international private capital flows to developing countries as the result of investments by MDBs, bilateral cooperation and other risk mitigating instruments. If investors of this capital modestly lowered their return expectations, for example by 2 per cent, this would generate a benefit of $2\% \times \text{US\$}200 \text{ billion} = \text{US\$}4 \text{ billion}$ each year over the life time of the projects. If one assumes a lifetime of 10 years and a cost of capital between 10 to 15 per cent, the net present value of the US\$4 billion cash flow would be US\$20 billion to \$24 billion. This would be a real reduction in the cost of delivering mitigation action in developing countries and could be treated as a net private flow of US \$20 billion to 24 billion per annum. The estimated net benefit could be particularly valuable for those developing countries with more limited access to international private capital.

Net calculation for carbon markets

64. The Advisory Group also discussed the concept of net flows for carbon markets. These were defined as the inframarginal rents of carbon markets flows.
65. Inframarginal rents are the difference between the average cost of a given mitigation measure or project compared to the market price (in a competitive market, the market price equals the marginal supplier's cost). If positive, this difference constitutes a rent available to the owners of the asset or project that can reduce emissions at less than the market price.

66. While in theory this concept is easy to define, both estimating the magnitude of inframarginal rents and establishing who captures them is not a trivial matter.
67. Measuring rents is challenging. Estimates of both average cost of abatements of different technologies and carbon prices are necessary to establish the magnitudes of the rents. While assumptions on carbon price levels can be used, estimates of cost across technologies in different countries require extensive analysis of the projected cost structures of technologies across geographic areas – information which is strategic to companies operating in this field and not easily accessible. In addition, inframarginal rents could be captured by a range of players across the value chain.⁶

There is currently no widely accepted concept for or methodology to calculate inframarginal rents. However, using the McKinsey marginal abatement cost curves, the average cost of mitigation measures for cost-positive measures under a carbon price of US\$25 per tonne of CO₂ equivalents was estimated at US\$15 per tonne. This suggests an inframarginal rent of US\$10 per tonne (the difference between carbon price and average cost). Assuming that a US\$3 transactional cost is extracted, rents are reduced to US\$7 per tonne. The Advisory Group assumed a strong offset demand and a volume of 1.5-2 Gt, with a resulting inframarginal rents (i.e. the net flows associated with carbon offset finance), of US\$10 billion to 14 billion compared to US\$38 billion to \$50 billion in gross flows. However, if transactions costs were higher at US\$5, the rents would be reduced further to US\$5 per tonne and the total net would be only US\$8 billion to \$10 billion.

68. Given this range of perspectives and the need at this stage to base the work on well-defined metrics covering the full range of flows, the revenues from the four types of sources were estimated as explained below :
- a. All public sources are estimated at face value. Estimates exclude any likely primary incidence on developing countries and reflect only the revenues that are generated by contributions from developed countries, that is only net resource transfers to developing countries. In addition, estimates reflect the fact that only a share of revenues raised with a

⁶ A concrete example of a wind farm in a developing country helps to illustrate. Developers will need to buy land which they are likely to bid up to a price level at which their projects barely break even. In this case, the landowner will make the bulk of the profits and hence capture any available inframarginal rents. From an outside point of view, it would be very difficult to identify whether the price of the land has indeed been higher than an alternative price and the landowner captured inframarginal rents. Therefore, depending on the market structure across the value chain, inframarginal rents could be captured by a range of players. Depending on the owners of the assets across the value chain, rents could be captured by foreign companies or publicly owned companies. Governments of developing countries could capture these rents, through ownership or taxation, but this will depend on domestic market structure and policies. It is impossible to determine *a priori* that such rents would be extracted by developing countries and would hence constitute a net flow. The reverse is also true – some projects might only be viable because of support from the developing country Government, e.g. where they pay feed-in-tariffs for wind generation. These projects might as a result be highly profitable, and it might appear that inframarginal rents exist. However, in that case all the inframarginal rent would have been paid for by the developing country and should clearly not qualify to count as a net flow.

source will be used for international financing purposes, with a portion remaining in the developed countries.

- b. MDB sources are estimated on both a gross and net basis. Gross revenue estimates are based on the 2020 potential for expanded lending arising from paid-in capital, split between concessional and non-concessional (for example towards adaptation and mitigation investments, where the former is assumed to require greater concessional finance). Net transfers are then estimated, based on the OECD/DAC methodology to define the grant equivalent element of these flows.
 - c. Carbon market offset flows are measured on a gross basis (i.e. total flows). Net carbon market flows are also indicated.
 - d. Private sector financial flows are measured as gross international flows (i.e. excluding capital mobilised domestically in developing countries). Net private flows are also indicated.
69. The 2020 carbon price is a key driver of revenue estimates across multiple sources. This is relevant both for sources directly related to carbon prices (such as AAU/ETS auction revenues) and for those indirectly related to carbon prices (e.g., bunker fuel taxes). Scenarios were therefore created around three carbon prices for these sources; a low-carbon price (US\$15 per tonne of CO₂); a medium-carbon price (US\$25 per tonne of CO₂); and a higher-price scenario (US\$50 per tonne of CO₂). The scenarios were built around a simple set of illustrative quantities and related prices, informed by the literature review of a broad range of models⁷. Estimates in chapter IV are based on these three carbon price scenarios, while revenue potentials referred to in chapter 2 reflect a price range of US\$20-25.
70. **Efficiency:** Efficiency has two parts. Carbon-related efficiency is defined as how well or poorly a given source contributes to creating a ‘price’ to correct for the carbon externality. Overall efficiency is also interpreted here from a broad, dynamic perspective, taking into account potential impact on growth and risk of the proposed measures⁸. For example, instruments that impose significant deadweight costs or that significantly distort trade flows would therefore score negatively on the efficiency criteria.
71. **Equity:** Considerations of equity in terms of the distributional impact of different measures were addressed under the incidence criteria.
72. **Incidence :** Incidence refers to “who really pays” for revenue for any given source among countries. Given the AGF focus on revenue raised by developed countries for developing countries, the AGF sought to address the issue of whether a source imposes direct burden on developing countries for any given source. Some members emphasized that this notion of direct burden only

⁷ See annex II for a more detailed account of the review.

⁸ Given the limited time available for the AGF to test the different sources against this criterion, only qualitative assessment was carried out by the AGF. Further work will be required to assess more formally, including through suitable models, the quantitative impact on growth of the different proposals.

referred to implied payments by developing countries towards the overall goal of mobilizing US\$100 billion. Revenue for each source was therefore estimated on a basis that sought to (a) recognise potential primary incidence on developing countries and (b) exclude any revenue arising from developing country contributions so as to include only net flows from developed to developing country. Some members were interested in secondary “economic” incidence, but absent good information on, for example, supply and demand-side elasticity data in relevant markets, did not believe reliable estimates of this measure could be generated

73. **Practicality:** Practicality is considered in terms of the feasibility of implementation – for example, in the required institutional design and in relation to rules and laws in different countries. The assessment of practicality includes an initial assessment of how rapidly different sources could ramp up by 2020.
74. **Reliability:** This criterion is taken to mean the extent to which the source of finance is likely to lead to a predictable revenue stream.
75. **Additionality:** Refers to the extent to which new resources add to the existing level of resources (instead of replacing any of them) and results in a greater aggregate level of resources. Operationalization of additionality, including through defining a reference case against which “greater” can be determined, is politically and analytically very difficult. Given likely pressures on existing sources and the difficulty of specifying a 2020 reference case against which additionality could be measured, a potential perspective is to treat the newness of a source as a useful, if partial proxy for additionality. However, there are also other interpretations, such as taking the view that the US\$100 billion target should be measured in a way that would be additional to a 2020 Official Development Assistance (ODA) reference case.
76. **Acceptability:** Refers to the extent to which a given source is politically acceptable to both developed and developing countries. Since a source may be more controversial in one country and less so in another, this criterion also illustrates the importance of having a variety of instruments available.

IV. Assessment of sources

77. This section provides an overall assessment of the different sources against the agreed criteria. Carbon prices indirectly affect several sources of climate finance, in which case estimates of potential revenues have been provided against carbon price scenarios. The section comments separately on how sources can be described in terms of potential ramp-up speed across different time horizons and how the funds might be spent wisely.

A. Revenue estimates and analysis

International auctioning of emission allowances and auction of allowances in domestic emission trading schemes (AAU/ETS auctions)

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
AAU/ETS auctions	2-8	8-38	14-70
<i>Overview of assumptions (with calculation for medium carbon price)</i>			
<ul style="list-style-type: none"> ‡ Total market size approximated by forecast developed country emissions of 15 Gt by 2020 ‡ Assumption that 2-10% of total market size would be auctioned and allocated for international climate finance ‡ Carbon price in medium scenario of \$25/t equates to market size of \$375 billion, 2-10% auctioning provides a total of \$8-38 billion in revenues 			

78. Both international auctioning of emissions allowances and auctioning of allowances in domestic emissions trading schemes would clearly be sources of revenue for new and additional resources. They would have strong carbon efficiency attributes, and would not have any direct incidence on developing countries. The revenue potential of this source depends on the volume of the carbon market, the carbon price, and the percentage of emission allowances auctioned and resulting revenues set aside for international climate finance. The governance of international auctioning would need to be resolved. In the case of revenues from domestic auctioning, a mechanism to allocate these revenues for international purposes would be needed for them to become a reliable source. This would be particularly important for developed countries that do not participate in international auctioning of emissions allowances. It seems unlikely that countries would introduce auctioning at both international and domestic levels in such a way that it could result in double taxation of carbon emissions.

Offset levies

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
<i>Offset levies</i>	0-1	1-5	3-15
<i>Overview of assumptions (with calculation for medium carbon price)</i>			
<ul style="list-style-type: none"> ‡ Assumes levy of 2-10% on offset market transactions ‡ Offset market size assumed at 1.5-2 Gt in medium scenario, or \$37.5-50 billion at an estimated carbon price of \$25/t ‡ Total levy amounts to 2-10% of \$37.5-50 billion or \$1-5 billion 			

79. This source is potentially reliable but the magnitude of the revenues that would be generated would depend on the volumes of the carbon market, the levy applied to offsets and the carbon price. While the measure is directly linked to carbon markets, concerns exist on the incentives it creates by de facto taxing action to reduce emissions. Also, depending on the elasticity, the instruments may have some incidence in developing countries. The offset levy already exists in the CDM, and therefore could be operationally scaled up in the short/medium term.

Revenues from international transportation

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
<i>Maritime</i>	2-6	4-9	8-19
<i>Aviation</i>	1-2	2-3	3-6
<i>Overview of assumptions (with calculation for medium carbon price)</i>			
<p>Maritime</p> <ul style="list-style-type: none"> ‡ Assumes 0.9-1 Gt of emissions, priced at a \$25/t price of carbon (captured through auctions or levies) equivalent to \$22.5-25 billion ‡ Subtracting developing country incidence estimated at 30% and estimating that of the remainder 25-50% could be used for international climate finance, leads to total estimate of \$4-9 billion <p>Aviation</p> <ul style="list-style-type: none"> ‡ Assumes total passenger and freight emissions in 2020 of 800 Mt of which 250 Mt are in scope (excluding intra EU flights and developing country incidence) ‡ Total revenue pool at carbon price of \$25/t on 250 Mt equates to \$6 billion ‡ Assuming 25-50% of these revenues can be earmarked for climate finance delivers estimate of \$2-3 billion 			

80. Carbon-related instruments coordinated internationally, for example on international transportation, could potentially mobilize significant public resources for climate action in developing countries. The variation in the level of revenues depends on the different options to create such funds: a fuel levy/emissions trading system for maritime bunker fuels, and either a fuel levy/emissions trading system or a passenger ticket tax for the aviation sector.

Both would promote environmental efficiency by taxing carbon emissions. But there could be an impact on the value of global trade in the range of 1.0-1.5%. These instruments, however, may present difficulties in terms of political acceptability and incidence on developing countries. Some members were of the view that political acceptability and incidence on developing countries should be addressed by Parties to the UNFCCC and the Kyoto Protocol. These members believed that further discussion on the design and implementation should depend on the decision by these Parties. Other members were of the view that universal application of instruments on international transportation is necessary, inter alia, in order to avoid significant competitiveness issues. These members were of the view that incidence issues, particularly on developing countries, could be addressed by mechanisms other than selective application, for example through the appropriate collection and distribution of revenue. Any mechanism should not blunt abatement incentives or distort competitiveness. Further work on such instruments should be taken forward in the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO).

Carbon-related revenues (other than AAU/ETS auctions)

2020 estimates, \$bn	
<i>Carbon tax</i>	Approximately 10 for every \$1/t
<i>Wires charge</i>	5 for a charge of \$0.0004/kWh or \$1/t of CO ₂ e
<i>Removal of fossil subsidies</i>	3-8
<i>Redirection of fossil royalties</i>	Approximately 10
<i>Overview of assumptions</i>	
<p>Carbon Tax † Calculates that \$1 of tax on 11-13 Gt of energy-related emissions translates roughly into \$10 billion of revenues; assumes 100% is used for international climate finance</p> <p>Wires charge † Calculated that power sector emissions priced at \$1/t tax on CO₂ on 4.7 Gt of power generated emissions in OECD countries resulting in a total of \$5 billion of revenues; assumes 100% is used for climate finance † Equivalent to wires charge of \$0.0004/kWh on ~12,000 TWh of power generated in OECD countries in 2020</p> <p>Removal of fossil subsidies † Fossil fuel subsidies estimated at up to \$8 billion in Annex 2 countries within G20; assumes 100% is used for climate finance</p> <p>Redirection of fossil royalties † Estimated at billions to tens of billions of US dollars based on survey of self-reported receipts of five key oil-producing developed countries</p>	

81. This category covers a number of measures (a carbon tax, a wires charge, the removal of fossil fuel subsidies in developed countries coupled with the redirection of revenues to climate⁹, the redirection of a portion of fossil royalties) that are domestic in nature and all effectively taxing carbon emissions. Revenue estimates here are based on a slightly different methodology, where the overall potential estimates are calculated for a US\$1 per tonne marginal tax in case of the carbon tax, a US\$0.0004/kWh charge for the wires tax, and qualitative/quantitative assessment of potential revenues from the other sources. There is a high level of uncertainty in these estimates. Furthermore, there are significant potential issues of double counting in any combination of these sources, as many of these measures are built on the same premise – charging for the externality. That said, some of these instruments have some important positive characteristics: low levies over a wide basis make for efficient taxes (in the case of the wire tax), they are reliable and relatively practical to collect, they are domestic in nature and hence allow different countries to choose different solutions without reducing the efficiency of the measure. In terms of political acceptability, these sources could be implemented in a phased programme over the short and medium term, potentially acting as short-term proxies bridging through to the introduction of more complex instruments.

Financial transaction taxes

82. The level of estimated revenues from the financial transaction tax (Tobin tax) is driven by three determinants: (a) the base the tax is applied to; (b) the tax rate; and (c) the elasticity of the volume of respective transactions to the tax rate. Revenue potential from financial transaction taxes was estimated to US\$2 to US\$27 in 2020, based on the following assumptions:

- Assumes \$3000 billion of trading per day through the continuous link settlement (CLS) times 255 trading days results in total trading volume of ~\$756 trillion.
- Assumes tax rate of 0.001% -0.01% and reduction in volume of 3-6% for 0.001% tax, and 21-37 % for 0.01% tax rate which translates into revenues of \$7-60 billion.
- Assumes 8.5 % compensation for developing country incidence based on share of transactions and use of 25-50% of total revenues for climate change which translates into \$2-27 billion.

A global financial transaction tax, as currently debated, would be a new and additional source. The share of the revenues to be allocated to climate action would be a policy issue. Strong international coordination, allowing for international implementation, would increase the efficiency of such a source, limiting its distorting effects. The lack of political acceptability and unresolved issues of developing countries incidence make it, however, difficult to implement universally. In this context, one perspective within the Advisory Group was that further work would be needed to overcome cooperative issues.

⁹ The AGF did not address the potential to remove/redirection agriculture subsidies in developed countries, given difficulties in measuring their direct and indirect emissions effects.

A different perspective was that a financial transaction tax is only feasible among interested countries at the national or regional country level.

Direct budget contributions

83. Direct budget contributions, based on existing public finance sources, could substitute in part for new sources. Governments may do this because they prefer existing sources to new options. Over the period 2010-2012, for example, developed countries have committed to provide resources approaching US\$30 billion, most of which will probably be direct budget contributions. Some members made reference to a proposal in the UNFCCC negotiations to dedicate 0.5-1 % of developed countries GDP to long-term climate financing, which would correspond to US\$200 billion to \$400 billion. Others believed that direct budget contributions will continue to play a role as they have in the past and determined by national circumstances.
84. As a public finance source, direct budget contributions are qualitatively different from the other sources as they do not refer to any particular instruments. There were different perspectives within the Advisory Group as to how best treat direct budget contributions and on potential revenue estimates. For example, they could serve as a proxy to an overall target to which new and additional (public) sources would contribute, potentially generating a funding gap that would need to be filled from existing sources.
85. Direct budget contributions, based on existing public finance sources, could continue to play an important role. Direct revenues draw from a domestic revenue base, including domestic taxes. To address potential difficulties in the timely implementation of new instruments, governments may prefer to increase budget contributions. The political acceptability of this source over the longer term will depend on national circumstances and on the size of the contribution. The global fiscal environment has placed public finances in many developed countries under extreme pressure. The Advisory Group also recognised that some governments would be constrained from increasing the existing tax bases, whether through existing or new sources, due to the operation of domestic budgetary rules. However, the Advisory Group expects that direct budget contributions will play a key role in the long term.

Development bank instruments

86. The MDBs can be an important channel of climate finance to developing countries. They have a track record in providing instruments to share risk with domestic and international investors. They provide technical assistance to countries and implementation support to projects. They back developing countries participation in carbon markets offset programmes. For all of these reasons, the MDBs can leverage substantial private finance in climate-related projects. The MDBs in close collaboration with the UN system can play a significant multiplier role, leveraging large additional investment in a way that integrates climate action into development programmes.

87. The Advisory Group examined the potential of revenues for climate change financing of additional resources channelled through MDBs, for example through capital replenishments, other appropriate mechanisms, or existing headroom. This resource is assumed to be split between IDA-type highly concessional lending, non-concessional lending or other blended arrangements as appropriate, depending on country/project specific circumstances, the total demand for grants vs. loans based on external circumstances such as the carbon price¹⁰ and the use of the financing (e.g. adaptation versus mitigation). The Group estimates that for every US\$10 billion of additional resource, the MDBs could deliver US\$30 billion to \$40 billion in grants and loans, depending on the mix between concessional and non-concessional loans¹¹. There is no analytically or empirically agreed basis on which to do net MDB flow calculations for non-concessional finance. However, based on a methodology suggested by some AGF members, the total net MDB flows would be US\$11 billion. The figures above are based on the following assumptions (with calculation for medium carbon price):

- Flows being counted arise from developed country resources.
- For gross flows, leverage factor of \$3-4 lending per \$1 of paid-in resource.
- For net flows, leverage factor is 1.1 per \$1 of paid-in resource, based on grant equivalence calculated using OECD DAC methodology for concessional finance and a methodology suggested by some AGF members for non-concessional finance.

88. One perspective within the AGF was that these resources would need to come from new capital increases in order to be new and additional. Another perspective was that this could be met by some or all of these resources coming from enhanced use of existing paid in capital. If US\$7-9 billion annually were used as additional resources for the MDBs (based for instance on a series of regular resource additions), they could deliver a further US\$25 billion to \$35 billion annually of gross flows (through a mix of concessional and non-concessional loans or other blended arrangements) This would mean a 10-15 per cent increase of total MDB lending compared to 2009 levels.¹²

89. One perspective within the AGF is an assumption that paid-in capital would come from developed countries only, assuming a MDB “climate change facility” structured in a way that would require no net capital provision from developing countries, and hence no incidence on them. Another perspective was that, while only MDB flows for climate purposes arising from developed country contributions could be counted towards the \$100 billion target, this could arise from a variety of new or existing structures and that some

¹⁰ A higher carbon price will tend to reduce the need for grants as higher revenues can be generated from mitigation projects (through offsets).

¹¹ In the long term reflows from loans could be used give additional loans, so the NPV of the loans over a longer period of time could be higher.

¹² Total MDB lending in 2009 was approximately US\$200 billion.

developing countries might contribute as well. The crowding-in of private capital would increase the political acceptability of this source of revenues.

90. The Advisory Group also examined the proposal for a globally coordinated, SDR-based climate fund, but political acceptability was found to be limited, due to a lack of consensus on the appropriate role of the SDR in the international monetary system. That said, some countries may find this option attractive depending on how such instruments might be treated in their national accounting systems, noting that any use of SDRs would likely require support from the broader IMF membership and could have implications for the IMF and its membership that would need to be considered
91. It is worth noting that the international financial institutions could play a particularly important role in terms of financial innovation for climate investment, as they evolve their approach to take account of the new requirements of climate finance (e.g. enabling payment for emission reductions/ecosystem services). The capacity of the MDBs to leverage their balance sheet, to blend public and private instruments, to provide guarantees against policy risk, and to hedge carbon price risk, makes them potent multipliers of both public and private finance.

Carbon market offsets

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
<i>Carbon market offsets</i>	8-12	Gross 38-50. Net 8-14, depending on transaction costs	150
<i>Overview of assumptions (with calculation for medium carbon price)</i>			
† Assumes offset price of \$25/t on 1.5-2 Gt of offset flows. This would require a high level of mitigation ambition in developed countries with correspondingly tight caps. † A net estimate of carbon market offset flows (medium carbon price) would be in the range of US \$8-14 per year, depending on transaction costs.			

92. Revenues raised through this source depend on demand for and supply of emissions reductions commitments, and carbon market mechanisms. It is uncertain which actors will capture the rents associated with the transfers. Nonetheless they are consistent with the carbon efficiency criterion.
93. Carbon markets offer important opportunities for directly financing new technologies in developing countries, and for leveraging private investment.

Private finance

94. Revenue potential from private finance was estimated to be up to US\$500 billion in 2020, generated with a leverage factor of 2-4 on public flows/carbon market offsets. A medium carbon price (US\$25) might result in approximately \$200 billion gross flows and an estimated \$20-\$24 billion in net flows based

on the methodology presented in this report. The potentially large scale of private flows could be essential for the transition to a low-carbon world. Therefore it could become crucial to the dynamics of change and thus to the broader, more dynamic notion of efficiency. The central role of private flows is most obvious in mitigation investments, but is also critical for many investment decisions in adaptation. It is important to note, however, that many low-carbon technologies still present higher cost than the high carbon alternatives. For technologies such as these, private capital will only be mobilized with sufficient public finance, carbon pricing or domestic policies that make these technologies economically viable. Furthermore, improved investment climates in developing countries will enhance the mobilization of private capital as it is not possible to commit private finance flows *ex ante*, given that it is driven by investor demand, which is itself a function of available investment opportunities, capital availability and the quality of the policy environment.

B. Sources and instruments over time

95. Given the scale of the challenge of mobilizing US\$100 billion per year by 2020 and the requirements for administrative practicality, many of the sources identified by the Advisory Group will need to be built in advance of 2020 to allow for sufficient time to develop both the capacity to deliver and the capacity to wisely use the flow of funds made available. The Advisory Group acknowledges the collective commitment made by developed countries to provide resources approaching US\$30 billion in “fast start” climate finance during the period 2010-12 to help meet the adaptation and mitigation needs of developing countries.
96. Several of the sources examined by the Advisory Group could be operational relatively quickly. In particular, direct budget contributions and other public sources which build on existing domestic revenue-generating instruments could be triggered earlier, depending on political will. The scale-up speed of these instruments would naturally depend on the extent to which governments would dedicate resources collected through these mechanisms to international finance and on the time-pathway of carbon reduction commitments. Similarly the MDBs/RDBs, together with the United Nations system and bilateral agencies, could respond relatively quickly to a substantial increase in demand for climate-related finance. The United Nations system, for instance, has the relevant experience, presence and mandate to assist countries in developing their own national capacities to remove market development barriers (information, regulatory, financial, and administrative) and to access climate finance. On the private finance side, flows of investment in mitigation and adaptation activities will depend on a mix of government policies, including regulation, standards, support for new technologies, implicit/explicit carbon pricing, improved investment climate, and on the availability of risk-sharing instruments. In some cases, confidence and instruments could be built rapidly but for others it may require more time to implement.
97. Time scales also depend, inter alia, on whether the resources would be primarily generated at national/regional levels or would require more

coordinated international action. Instruments which are purely domestic, such as the removal/redirection of fossil fuel subsidies, could potentially scale up more rapidly than those which require significant international coordination. Among instruments that could potentially deliver resources in the short to medium term are carbon related revenues, such as carbon taxes, wire charges, removal/redeployment of fossil fuel subsidies; contributions from MDBs; direct budget contributions; and using public finance to leverage private investments. Among instruments that might only deliver in the medium to long term are public revenues from carbon markets; aviation and maritime policy measures; financial transaction taxes and SDRs; and carbon market offsets.

C. Spending wisely

98. The focus of the work of the Advisory Group has been on revenue-raising and examining the key criteria for assessing the different sources. However, spending resources wisely is critical to build the mutual confidence needed to mobilize long-term finance. Getting early financing right and then establishing credible plans for long-term financing are critical to starting this confidence-building process in a way that accelerates practical learning and strengthens the trust and delivery capacity of all parties.
99. It is clear that there are important links between resource mobilization efforts and how such money is spent. On the one hand, developing countries need predictability in resource commitments before they can commit to systematic transformation in key sectors of their economy. On the other, developed countries can only be expected to scale up climate finance if they are confident that these monies will be spent wisely. New climate finance instruments – with clear, simple links between payments and performance (for instance ecosystem services) or between risk transfer mechanisms and better planning controls – can reinforce this dynamic. Some principles on spending wisely include:
 - a) Ownership on behalf of developing countries will be crucial - action should be consistent with country priorities, guided by national or regional adaptation and mitigation strategies;
 - b) Reliable and predictable long-term funding commitments are necessary to enable the development and implementation of long-term, consistent adaptation and mitigation strategies in developing countries;
 - c) Accountability and transparency on both spending in developing countries and on financial flows from developed countries will enable reciprocal trust to improve over time;
 - d) Programs need to be responsive to the challenge of climate change.
100. The present report therefore includes some cases of climate change financing, without prejudice to the UNFCCC negotiations, such as on monitoring, reporting and verification regimes and institutions. The cases cover key areas related to enhanced action on mitigation, including finance to reduce emissions from deforestation and forest degradation, adaptation, technology development and transfer and capacity-building. The Regional Development Banks, the World Bank, the United Nations system, other multilateral institutions and the

REDD+ partnership will be crucial in scaling up national appropriate climate actions, for example via regional and thematic windows in the context of the Copenhagen Green Climate Fund, such as a possible Africa Green Fund.

Illustrative example

Scaling up Investment in Africa: Providing the means to scale up public and private support for adaptation and mitigation efforts, and towards a high growth path in Africa on a low carbon basis

Background

Within the global strategy, make adequate provision for Africa by providing additional resource targeted at adaptation, climate resilient infrastructure, clean energy and climate action in general, enhancing delivery through African regional, institutional and innovative instruments.

Key Message

The delivery of finance for adaptation and mitigation needs to be scaled up through regional institutions given their strong regional ownership.

101. The cases are Guyana's Low Carbon Growth Strategy, the South Africa Wind Energy Program, the African Water Facility, the Caribbean Catastrophe Risk Insurance Facility, and Indonesia's Geothermal Power Development Program, contained in boxes throughout the report as well as in more details in annex III to the report.

Case study

The Caribbean Catastrophe Risk Insurance Facility – Managing adaptation needs with efficient use of funds

Background

The risk insurance facility is a multi-country risk pool that provides insurance solutions against natural catastrophes such as hurricanes and earthquakes. In addition to providing traditional insurance products, the facility strengthens the fact base for decision makers regarding the magnitude of future risks while reducing uncertainty and providing guidance on how to prioritize activities between adaptation projects, insurance and risk bearing

This effort followed the 'Economics of Climate Adaptation' (ECA) approach, which is structured around five questions, each driving a different set of analyses:

- (1) Where and from what are we at risk?
- (2) What is the magnitude of the expected loss?
- (3) How could we respond?
- (4) How do we execute a response?
- (5) What are the outcomes and lessons of implementation?

The first three steps have already been carried out in selected Caribbean states and form the basis for later execution and evaluation

Key messages

The project shows how public resources can be spent in innovative and efficient ways to reduce reliance on ODA spending by:

- | Considering specific country circumstances as it was determined that there are considerable differences in terms of future expected losses and optimal adaptation strategies even among SIDS in the same geographic region
- | Applying rational economic choice to prioritize measures (not a one-size-fits-all solution)
- | Using different approaches based on efficiency/cost (e.g. insurance vs. building sea walls)

V. Combining Instruments

102. The assessment of potential sources provides a disaggregated picture of what each individual source might provide on its own. Based on the assessment, there are clearly a range of promising sources, each with different strengths and weaknesses. There are, however, no individual sources that can simultaneously deliver the US\$100 billion target and meet the full range of end-use requirements. There are also significant substitutabilities and complementarities between different sources. Finally, there are some key variables – notably, the carbon price and the willingness to weight policy towards more international approaches – which may have correlated effects across multiple sources.

A. Sources and end-uses

103. A combination of sources will be required to address effectively different types of climate actions. For example, climate activities that generate direct revenues might be suitable for some mix of loan finance and carbon market finance (e.g. low-carbon electricity). Other climate activities, (e.g. coastal flood defences) may require long-term grant elements or, as in the case of REDD, may need to evolve from an upfront public finance model to predictable financing based on payments for ecosystem services. Yet others may need combinations in different models of public-private partnership. Private flows are likely to play a key role in entrepreneurial and technology transfer activities and in the risk-sharing needed to finance new low-carbon business models and investments. Indonesia's geothermal power program provides a case showing how these different sources can be combined.

Case study

Indonesia's Geothermal Power Development Program – Utilizing bilateral, multilateral and private financing for mitigation benefits

Background

The programme is a package of multiple financial instruments designed to help finance immediate scale-up needs in Indonesia for geothermal power. The package is a mix of financing from MDBs as well as other assistance, including:

- | Concessional loans of \$300 million from the CTF
- | \$500 million in loans from the ADB and the World Bank
- | \$4 million in grants from the GEF
- | Bilateral assistance from Germany, the Netherlands, Japan, the United States, France and Australia
- | In addition, it is expected to mobilize an additional \$2 billion from a range of other sources
- | The program is expected to deliver GHG reductions of about 3.2 MtCO₂e/year, resulting in cumulative emissions savings of 63 million tonnes over the typical 20-year plant life

Key messages

The project shows how MDBs can play an integral role to attract sufficient investment volume through the ability to leverage the invested public money and crowd in further private investment by reducing upfront financial and technological risks. The scale of bilateral, multilateral, and private financing will emerge to meet project-by-project needs, rather than by being determined ex ante

B. Combining public instruments

104. Instruments to generate net public funds cannot simply be added together, but need to take into account positive and negative spill-over effects.
105. The link between domestic carbon regimes and international transportation levies is an example of a positive spill-over effect. Domestic carbon regimes which have broad coverage make it easier to extend that coverage to the international transport sectors. Extending coverage beyond domestic sectors would be both fiscally efficient/consistent and more political acceptable. Increasing the MDB capacity to provide additional resources is a second example of a positive spill-over, since for each dollar of new resources, MDBs are potentially able to increase international lending for climate investments by US\$3-4, equivalent to US\$1.1 in net flows.
106. At the other end of the spectrum, the overlap between AAU auction revenues and ETS auction revenues is the most obvious example of substitutability. Showing both instruments would amount to double counting of likely revenue. There are also many other instances of potential double counting likely revenue. For example, many of the instruments that would tax carbon emissions (e.g. wire charges, a direct carbon tax) would amount to double counting if combined with a carbon-market based auction revenue regime. On the other hand, instruments which simply remove existing distortions (i.e. elimination of fossil fuel subsidies) or are based on underlying public ownership rights (i.e. re-allocation of energy sector royalties) could potentially be combined with instruments that tax carbon emissions.
107. Finally, there is a question of dynamic efficiency. Even if it were possible to tax a range of different (non-carbon) sources and/or to mobilise additional funds through direct budget contributions, there is a broader macro-consideration about the potential impact such an approach might have on developed country growth.
108. The overall magnitude of public flows is influenced by (a) the selection of domestic instruments; (b) the extension of these instruments to cover international sectors; (c) the degree of revenue allocation to international climate finance; (d) for the majority of instruments considered, the carbon price and (e) the political appetite to mobilize multiple sources. There are many possible combinations of new, potentially acceptable sources which could result in mobilising several tens of billions of dollars of public finance.

C. Leveraging gross flows

109. While different perspectives can be taken on how to count gross flows towards the US\$100 billion target, and in particular to the role of private finance and offset flows, there is broad agreement that fostering gross flows is

a key enabler of green growth. There are three main multipliers in fostering gross flows – the MDBs, bilateral risk-mitigating instruments and carbon offsets.

110. First, the MDBs play a significant multiplier role. As described above, they have the capacity to translate one dollar of public capital into up to four dollars of gross lending. In addition, each dollar of lending is estimated to generate three dollars of private capital co-investment, of which approximately 50 per cent is mobilised from international sources. Finally, the participation of MDBs in the carbon markets means that they are potentially able to help pilot and scale up innovative offset schemes.
111. Second, the use of public instruments to help mitigate policy-related risks associated with the transition to low-carbon economies acts as a further multiplier of gross resource flows. Each public dollar invested in such risk-mitigation instruments is estimated to generate three dollars of gross international resource flows.
112. Third, carbon market offsets also generate significant gross flows. In the Advisory Group mid-case scenario of a US\$25 carbon price, offset volumes are estimated to be approximately 2 billion tonnes, provided that caps are consistent with the Copenhagen Accord commitments. This generates up to US\$50 billion in gross flows, crowding in up to US\$75 billion in additional international private capital investment. If prices were lower or offsets were restricted, it is possible that offsets of this volume would lead to lower private sector flows (i.e. closer to US\$10 per tonne), resulting in only US\$5-8 billion of gross flows, crowding in an additional US\$8-12 billion of private capital.
113. While each multiplier works independently, they are all – to a greater or lesser degree – affected by carbon prices. Lower carbon prices potentially reduce the net public resources that could be used to support sector transformation programmes in developing countries. They potentially constrain the expansion of MDBs (and bilateral) risk-sharing capacity. And for a given offset capacity in the carbon markets, lower carbon prices reduce the implicit carbon price in developing countries, potentially reducing the low-carbon investment flow.
114. If available public funds, MDB lending and carbon market offsets are used effectively to crowd in investment, private capital has the potential to deliver substantial gross flows.

Case study

The African Water Facility – Long-term solutions for improved water resource management and use delivers multiple benefits

Background

The project is a portfolio of 65 projects targeting water resource management. It includes activities covering the following topics; National and transboundary water resources management, water resources information management; water supply and sanitation; and water for agriculture. The overall portfolio is valued at US\$110 million with approximately US\$370 million leveraged in

investment funds.

Key messages

The project is an example of how the right investments and policies in the agriculture sector can deliver multiple benefits simultaneously. In this case, the benefits include:

- | Agricultural and income benefits through more efficient water use and better planning
- | Climate change mitigation and adaptation benefits through more climate-resilient water supply and sanitation

D. Creating coherent combinations

115. How different sources might be combined depends on some key variables which impact the revenues available. Such key variables identified by the Advisory Group were (a) carbon prices (values considered were US\$15, US\$25 and US\$50 per tonne); (b) the percentage of fiscal revenues that are allocated for international climate action; (c) the use of sources that are more international in nature such as coordination on international transportation levies; (d) the willingness to channel funds through the MDBs; (e) the expansion and degree of openness of carbon markets and (d) the political appetite to mobilize multiple sources.