

# 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. The focus of the Advisory Group was to identify technically sound and politically feasible potential sources and options available for significantly scaling up long-term finances to developing countries by 2020. In undertaking this task, the Group emphasized its advisory role. It was neither a negotiating nor a decision-making body.
6. The Advisory Group did not assess total needs for climate financing in developing countries. Following its terms of reference, the Advisory Group worked around the goal of mobilizing US\$100 billion per year by 2020. 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 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. 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 taxes 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.
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. 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 would adjust the gross values of public and private flows to take account of servicing obligations and alternative financing opportunities. In the case of public funding this would mean counting only the grant equivalent value of transfers, as is found in, for instance, descriptions of IDA flows at the World Bank following OECD/DAC methodology.
15. Defining the net private flow is more difficult than for public, as there is no analytically or empirically agreed basis on which to do such calculations. One perspective within the Advisory Group was that only gross private flows are relevant, both because such flows are well-defined and observable, and because of the substantial impact of these flows in the context of the wider transition to a low-carbon resilient economy. Another perspective within the

Advisory Group was to recognise the potential role of private flows, but to argue that servicing obligations can be strong and there are alternative financing sources available, so that only the net flow relative to these sources, is relevant. The report explains some methodologies and gives some examples on how one might calculate net private flows. These are, however, not universally agreed methodologies and may not be easy to apply across the whole range of flows and countries where circumstances and opportunities may be very different.

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 is 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 AGF 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 AGF 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 and with the UN Secretary-General. Finally, individual members of the Group held several interactions with a wide array of stakeholders, including civil society and the private sector.
20. When announcing the launch of the AGF, the Secretary-General expressed his expectation that the work of the AGF 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 facilitate the discussions on financing within the ongoing UNFCCC negotiations.
21. Section 2 presents the conclusions of the Advisory Group together with a set of suggestions on potential next steps to take forward the AGF agenda of the report. 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 and next steps**

### **A. The overall challenge**

22. The 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 implementation of a mix of new public sources, 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 address effectively 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. Grant elements are of special importance for adaptation in particularly vulnerable countries.

### **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. 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 whether this should be achieved via taxes or carbon markets.
28. 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. For example, over the period 2010-2012, developed countries have committed to provide resources approaching US\$30 billion. The political acceptability of this source, depending on national circumstances and the size of the contribution, may appear challenging during

a difficult period for public finance in many developed countries. However, the Advisory Group expects that direct budget contributions will also play a key role in climate financing in the long term.

29. International private investment flows are essential for the transition to a low carbon and 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, although these instruments may present difficulties in terms of political acceptability and incidence on developing countries. Further work on such instruments, inter alia on design and implementation, will have to address these issues.
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 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 significant multiplier role, leveraging significant additional green investment in a way that integrates climate action into overall development programmes. Their capacity through additional capital replenishment should be strengthened in the course of the next decade.
34. A global Financial Transaction Tax would be a new and additional source, which could raise significant revenues. The share of the revenues to be allocated to climate would be a policy issue. A strong international coordination, allowing for international implementation, would increase the efficiency of such a source, limiting the distortive effects. The lack of political acceptability and unresolved issues of developing countries incidence makes it, however, difficult to implement universally. In this context, one perspective within the Advisory Group was that further work would be needed to overcome cooperation 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. 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 the readiness of developing countries to apply for and establish an enabling policy environment to receive new climate finance. 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.
37. How sources might be combined in overall revenue mobilisation depends on some key variables. This includes carbon prices, the percentage of fiscal revenues that are earmarked 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.
38. The AGF emphasised the importance of the development of new carbon-based public instruments and a carbon price in the range of US\$20-25 dollars a tonne of CO<sub>2</sub> equivalent in 2020 as key elements to reach the US\$100 billion goal per year.
39. Given a carbon price in this range, new public sources based on carbon pricing have the potential to generate flows up to US\$50 billion annually. 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, such as climate actions.
40. 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 and assuming up to 10% earmarking 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.



41. The AGF also pointed at the revenue potential of US\$10 billion to \$15 billion from other instruments such as redeployment of fossil fuel subsidies and energy royalties in developed countries, or some form of financial transaction tax at the national or regional level among interested countries.
42. Without underestimating the difficulties that will have to be solved, particularly in terms of national sovereignty and incidence on developing countries, the AGF 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.
43. From the perspective that most of the revenue towards the goal should be public, there is also likely a need to scale up existing public instruments channelled through direct budget contributions for climate actions to complement the revenue from new public sources.
44. 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 UN system and bilateral agencies, public-private risk-sharing instruments and more developed carbon markets can all play key roles in multiplying potential private flows for climate investment. The Advisory Group noted that revenues arising from carbon pricing, flows via MDB leverage, and private sector flows constituted a coherent set of mutually reinforcing sources
45. The analysis indicates that a carbon price of US\$20-25 could generate 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 explained in the report, such gross flows could lead to private net flows in the range US\$10 billion to \$30 billion.
46. A carbon price in the range of US\$20-\$25 could generate increased carbon market flows of between US\$25 billion to \$50 billion annually. One perspective within the 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 up to 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.
47. With high carbon prices (i.e. US\$50 per tonne), the application of new instruments domestically and to international sectors, and substantial (i.e. 10 per cent) earmarking of auction revenues, it is possible to deliver the US\$100 billion target on a net basis through new sources. At the other end of the

spectrum, with low carbon prices (i.e. US\$10 per tonne), limited earmarking (i.e. 2 per cent) and the exclusion of international sectors, net public revenues from new sources could be as low as US\$10 billion to \$20 billion, potentially increasing the need for significant direct budget contributions from general fiscal resources. Private sector flows also shrink proportionately, especially as a result of lower carbon prices.

#### **D. Time horizons**

48. 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**

49. 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 balanced allocation between adaptation and mitigation in the period 2010-2012. The Advisory Group presumes that the same will apply in the period up to 2020. 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, the Africa Green Fund and Indonesia's Geothermal Power Development Programme. The Regional Development Banks, the World Bank, the United Nations Agencies, other multilateral institutions and the REDD+ partnership will be crucial in scaling up national appropriate climate actions. Actions in these areas could be strengthened by developing financing windows in the context of "Green Fund(s)".

#### **F. Next steps**

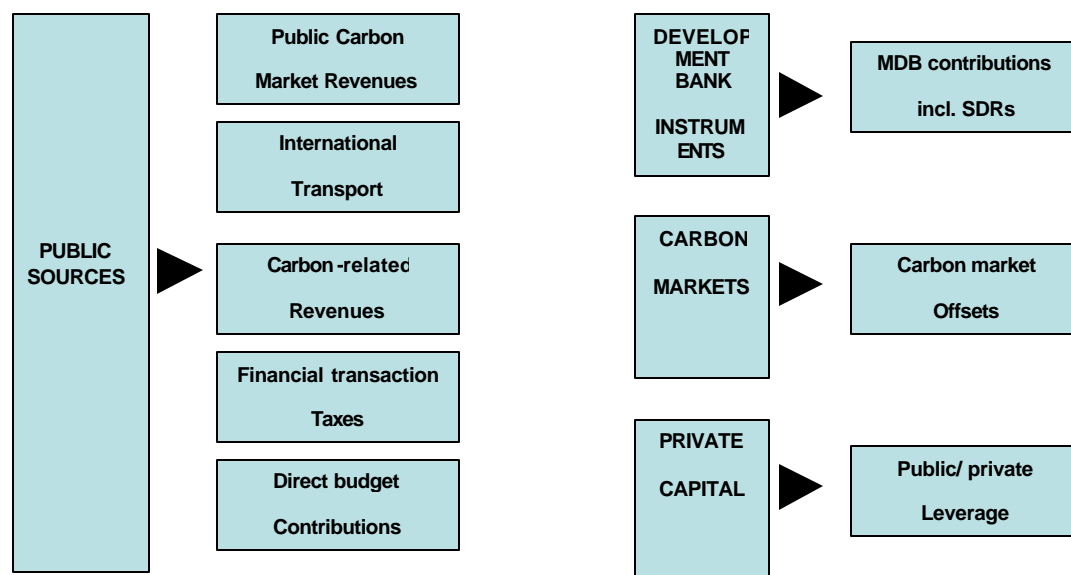
*(to be discussed)*

### III. Concepts and Methods<sup>1</sup>

50. The Advisory Group focused on sources and instruments<sup>2</sup>, 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 AGF did not examine formulae to allocate revenue targets across developed countries.

#### A. Sources

51. The work of the Advisory Group on potential sources was based on suggestions that have been made in the relevant literature<sup>3</sup>, 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 AGF grouped them into four categories (see table X below): (a) public sources; (b) development bank instruments; (c) carbon market finance; and (d) private capital.



52. Each of these four types of finance could potentially play a different but complementary role in meeting the potential set of mitigation and adaptation

<sup>1</sup> For more details on the methodology, see annex II on concepts and methods.

<sup>2</sup> 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.

<sup>3</sup> A survey was conducted early in the Advisory Group's work and is available on the AGF website: [www.un.org/climatechange/aggf](http://www.un.org/climatechange/aggf)

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.

53. The AGF 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 grants<sup>4</sup> 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;
- b) Revenues from auctioning of emission allowances in domestic emission trading schemes – this would involve auctioning of domestic credits (as in

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<sup>4</sup> Grants relate to sources that require no servicing and therefore constitute "pure" transfers from developed countries to developing countries.

the EU Emission Trading Scheme phase III) and earmarking 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 earmarked 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.<sup>5</sup> 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 through the CDM. Additional flows could be generated when and if carbon markets are further developed and deepened, taking into consideration

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

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 such as 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 and 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. There is US\$500 million in CTF co-financing, leveraging US\$1.8 billion from bilateral and multilateral sources

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**

54. 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.

55. **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.
56. Generally, revenue estimates from the different sources cannot simply 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.
57. 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, providing incremental resources above those available on the market; these would be complemented by private flows. Others placed emphasis on the importance of mobilizing private flows, inter alia, because of their role in scaling up technology deployment and catalysing entrepreneurship. These different perspectives on the role of the public and private capital flows translated into different perspectives on how to measure revenues in terms of net and gross metrics.
58. 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.
59. One perspective within the AGF 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 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*

60. The Advisory Group discussed both the concept of net private flows, that is the grant equivalent of private flows (adjusted for servicing requirements relative to alternative sources), as well as gross private flows, meaning the total amount of private finance made available.
61. 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 through 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 corresponding net gain to developing countries.

62. 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 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\$150 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  $2\% \times \text{US\$150 billion} = \text{US\$3 billion}$  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\$3 billion cash flow would be US\$15 billion to \$18 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 \$15 billion to 18 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*

63. The Advisory Group also discussed the concept of net flows for carbon markets. These were defined as the inframarginal rents of carbon markets flows.
64. 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.



65. 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. The problem is that actual costs are never observed, only the market price.
66. 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.<sup>6</sup>

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 U S\$25 per tonne of CO<sub>2</sub> equivalents was estimated at US\$15 per tonne. This suggests an inframarginal rent of U S\$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. On an offset volume of 1.5-2 Gt, derived from the relevant price scenario considered by the Advisory Group, the resulting inframarginal rents (i.e. the net flows associated with carbon offset finance), would be U S\$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 U S\$5 per tonne and the total net would be only US\$8 billion to \$10 billion.

67. 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 in the table contained in section 3 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

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<sup>6</sup> 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 widely accepted OECD/DAC methodology to define the grant equivalent element of these flows<sup>7</sup>.
- 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.

68. 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 CO<sub>2</sub>); a medium-carbon price (US\$25 per tonne of CO<sub>2</sub>); and a higher-price scenario (US\$50 per tonne of CO<sub>2</sub>). The scenarios were built around a simple set of illustrative quantities and related prices, informed by the literature review of a broad range of models<sup>8</sup>.

69. **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 measures<sup>9</sup>. For example, instruments that impose significant deadweight costs or that significantly distort trade flows would therefore score negatively on the efficiency criteria.

70. **Equity:** Considerations of equity in terms of the distributional impact of different measures, was addressed under the incidence criteria.

71. **Incidence:** Incidence refers to “who really pays” for any given source. This criterion can be interpreted as developed countries incidence (which looks at the distribution of the burden among developed countries), and developing countries incidence (which looks at whether the source imposes any direct

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<sup>8</sup> See annex for a more detailed account of the review.

<sup>9</sup> 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.

burden on developing countries).<sup>10</sup> The Advisory Group addressed only potential developing country incidence. Revenues for each source were 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. The Advisory Group acknowledged the potential importance of secondary “economic” incidence, but absent good information on, for example, supply and demand-side elasticity data in relevant markets, did not believe it could generate reliable estimates of this measure.

72. **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 for the years that lead up to 2020.
73. **Reliability:** This criterion is taken to mean the extent to which the source of finance is likely to lead to a predictable revenue stream.
74. **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.
75. **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.

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<sup>10</sup> Particular care should be taken in assessing incidence of different sources, as incidence is highly dependent on model choices and parameters.

## IV. Assessment of sources

76. 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"> <li>‡ Total market size approximated by forecast developed country emissions of 15 Gt by 2020</li> <li>‡ Assumption that 2-10% of total market size would be auctioned and earmarked for international climate finance</li> <li>‡ 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</li> </ul>			

77. 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 earmark 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"> <li>‡ Assumes levy of 2-10% on offset market transactions</li> <li>‡ 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</li> <li>‡ Total levy amounts to 2-10% of \$37.5-50 billion or \$1-5 billion</li> </ul>			

78. 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 transport

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><b>Maritime</b></p> <ul style="list-style-type: none"> <li>‡ 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</li> <li>‡ 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</li> </ul> <p><b>Aviation</b></p> <ul style="list-style-type: none"> <li>‡ 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)</li> <li>‡ Total revenue pool at carbon price of \$25/t on 250 Mt equates to \$6 billion</li> <li>‡ Assuming 25-50% of these revenues can be earmarked for climate finance delivers estimate of \$2-3 billion</li> </ul>			

79. The maritime and aviation sectors constitute an important potential source of revenues. 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%. International coordination, especially involving the International Maritime Organization and International Civil Aviation Organization in the maritime and aviation sector respectively, is imperative in all cases, increasing the practicality of these instruments. Different perspectives can be taken regarding the nature of the international coordination required for this source. Depending on their design, these instruments could pose challenges to the fiscal sovereignty of countries and could have some potential incidence on developing countries. A view could also be that the robustness of these potential sources of finance would benefit from international coordination. Instruments would need to be designed to take into account the special characteristics of international shipping and aviation as well as to eliminate net incidence on developing countries (especially those with high international transport costs).

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

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
<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 <sub>2</sub> e		
<i>Removal of fossil subsidies</i>	3-8		
<i>Redirection of fossil royalties</i>	Approximately 10		
<i>Overview of assumptions</i>			
<p><b>Carbon Tax</b>            † Calculates that \$1 of tax on 11-13 Gt of energy related emissions translates roughly into \$10 billion of revenues; assumes 100% used for international climate finance</p> <p><b>Wires charge</b>            † Calculated that power sector emissions priced at \$1/t tax on CO<sub>2</sub> on 4.7 Gt of power generated emissions in OECD countries resulting in total of \$5 billion of revenues; assumes 100% 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><b>Removal of fossil subsidies</b>            † Fossil fuel subsidies estimated at up to \$8 billion in Annex 2 countries within G20; assumes 100% used for climate finance</p> <p><b>Redirection of fossil royalties</b>            † 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>			

80. 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 climate <sup>11</sup>, 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 is 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

2020 estimates, \$bn	
<i>Financial transaction tax</i>	2-27
<i>Overview of assumptions</i>	
<ul style="list-style-type: none"> <li>‡ Assumes \$3000 billion of trading per day through the CLS times 255 trading days results in total trading volume of ~\$756 trillion</li> <li>‡ 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</li> <li>‡ 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</li> </ul>	

81. 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. A global Financial Transaction Tax would be a new and additional source, which could raise significant revenues. The share of the revenues to be allocated to climate would be a policy issue. A strong international coordination, allowing for international implementation, would increase the efficiency of such a source, limiting the distortive effects. The lack of political acceptability and unresolved issues of developing countries incidence makes it, however, difficult to implement universally. In this context, one perspective within the Advisory Group was that further work would be needed to overcome cooperation issues. A different perspective was that a financial

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<sup>11</sup> The AGF did not address the potential to remove/redirect agriculture subsidies in developed countries, given difficulties in measuring their direct and indirect emissions effects.

transaction tax is only feasible among interested countries at the national or regional country level

### Direct budget contributions

2020 estimates, \$bn	
<i>Direct budget contributions</i>	100+ <sup>12</sup>

82. 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.

83. 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 are different perspectives within the AGF 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.

84. Direct budget contributions could have a large revenue potential, potential reliability and practicality advantages. The political acceptability of this source, depending on the size of the contribution and on national circumstances, may appear challenging in a difficult decade for public finance in many developed countries. However, the AGF expects that direct budget contributions will play a key role in climate financing over the long-term.

### Development bank instruments

2020 estimates, \$bn	
<i>Development bank instruments</i>	For each 10 in capital replenishment, ~30-40 in gross MDB lending, corresponding to ~11 in net flows
<i>Overview of assumptions (with calculation for medium carbon price)</i>	
<ul style="list-style-type: none"> <li>▪ Additional paid-in capital provided by developed countries only, hence no incidence on developing countries.</li> <li>▪ For gross flows, leverage factor of \$3-4 non-concessional lending per \$1 of paid-in capital, based on borrowing headroom from callable capital</li> <li>▪ For net flows, leverage factor is 1.1 per \$1 of paid-in capital, based on grant equivalence calculated using OECD DAC methodology</li> </ul>	

<sup>12</sup> A proposal of 0.5-1 of developed countries GDP would correspond to US\$200 billion to \$400 billion.



85. 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 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.
86. The Advisory Group examined the potential on revenues for climate of additional capital replenishment to the MDBs provided by developed countries only. This capital is assumed to be split between IDA type highly concessional lending and non-concessional lending, depending on country/project specific circumstances, the total demand for grants vs. loans based on external circumstances such as the carbon price<sup>13</sup> and the use of the financing (e.g. adaptation versus mitigation). The Group estimates that for every US\$10 billion of paid-in capital, MDBs could deliver US\$30 billion to \$40 billion in grants and loans, depending on the mix between concessional and non concessional loans<sup>14</sup>, corresponding to US\$11 billion in net flows.
87. Based on the analysis of available public funds, if 10 per cent of public finance sourced by developed countries (which amounts to approximately US\$5 billion annually), together with additional direct budget contributions (in the range of US\$2billion to \$4 billion annually), were used as additional replenishment for the MDBs (based for instance on a series of 3 year recapitalization cycles), they could deliver a further US\$25 billion to \$35 billion annually of gross flows (through a mix of concessional and non-concessional loans) This would mean a 10-15 per cent increase of total MDB lending compared to 2009 levels.<sup>15</sup>
88. The assumption is that the paid-in capital would come from developed countries only, assuming that a MDB “climate change special facility” structured in a way that would require no net capital provision from developing countries, and hence no incidence on developing countries. The crowding-in private capital increase political acceptability of this source of revenues.
89. The Advisory Group also examined the proposal for a globally coordinated SDR-based climate fund but political acceptability was found to be limited,

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<sup>13</sup> A higher carbon price will tend to reduce the need for grants as higher revenues can be generated from mitigation projects (through offsets).

<sup>14</sup> 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.

<sup>15</sup> Total MDB lending in 2009 was approximately US\$200 billion. These numbers are based on the following calculation: a carbon price of \$20-25 (the mid-case scenario) could generate up to US\$40 billion of public finance for international climate action, even allowing for 80 to 90 per cent of the fiscal revenues to be retained for domestic purposes. An additional US\$10-\$15 billion could be redeployed from fossil fuel subsidies/energy royalties to climate finance. 10 per cent of this is US\$5-6bn. Adding \$2-4 from direct budget brings a total of US\$7-9billion as additional paid-in capital for MDBs. At 3.5X leverage could produce approximately US\$25 billion to \$ 35 billion p.a. in gross flows.

mostly due to a view in some countries that the nature and scope of SDRs as originally intended does not fit well with climate finance. That said, some countries may find this solution attractive depending on how such instruments might be treated in their national accounting systems.

90. 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>			
<ul style="list-style-type: none"> <li>‡ 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.</li> <li>‡ 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.</li> </ul>			

91. 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.
92. Carbon markets offer important opportunities for directly financing new technologies in developing countries, and for leveraging private investment.

### Private finance

2020 estimates, \$bn	Low carbon price	Medium carbon price	High carbon price
<i>Private finance</i>	Up to 500 billion, generated with a leverage factor of 2-4 on public flows/carbon market offsets.  A medium carbon price (US \$25) might result in approximately \$150 billion gross flows and an estimated \$15-\$18 billion net flows on the methodology presented in para. 35 .		

93. The potentially large scale of private flows is essential to the transition to a low-carbon world, and therefore crucial to the dynamics of change and thus 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 are still higher cost than the high carbon alternatives. Therefore private capital will only be mobilized with sufficient public finance or carbon pricing that makes these technologies economically viable and mobilizes private capital. In addition, 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**

94. 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 use wisely 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. The Secretary-General asked the Group to examine which sources could deliver financial flows over the years leading up to 2020.
95. 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, given 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, 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.
96. 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.

97. The following table gives a summary of the potential of different resources to deliver over the short, medium and long terms:

<b>Short – Medium-term</b>	<b>Medium – Long-term</b>
<i>Carbon-related revenues such as a carbon tax, wire charges, the removal/redeployment of fossil fuel subsidies and fossil royalties</i>	<i>Public revenues from carbon markets</i>
<i>Contributions from MDBs</i>	<i>Aviation and maritime policy measures</i>
<i>Direct budget contributions</i>	<i>Financial transaction tax and SDRs</i>
<i>Using public finance to leverage private investment</i>	<i>Carbon market offsets</i>

### **C. Spending wisely**

98. The focus of the work of the AGF 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 is 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 transfer large amounts if they are confident that these monies will be spent wisely. New climate finance instruments – with clear, simple links between payments and performance (e.g. 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) The scale of programmes, and the relative funding, need to be adequate to the scale of 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. Some new funding arrangements or windows, consistent with and without prejudicing UNFCCC arrangements in connection with, for example, “Green Fund(s)”, would help to turn these illustrations into programmatic action on the ground. Both developed and developing countries have a strong interest in developing funding arrangements which are harmonised with other sources of development finance, create real accountability, and help expand access to new, innovative resources.

101. The cases are the African Water Facility, the South Africa Wind Energy Program, Guyana’s Low Carbon Growth Strategy, the Caribbean Catastrophe Risk Insurance Facility, the Africa Green Fund 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**

##### **Africa Green Fund – Providing the means to scale up public and private support to adaptation and mitigation efforts, and towards a lower carbon growth path in Africa**

#### **Background**

Within the global strategy, create a window in the AfDB and World Bank which provides additional resources specifically targeted at climate resilient infrastructure, clean energy and climate action in general, while giving African countries an appropriate voice in managing the new window.

#### **Key message**

Transparent and predictable public funding underpins Africa’s own efforts to address climate challenges, to begin to close the huge energy gap by developing renewable and cleaner energy, and to design and implement longer term integrated approaches to adaptation, mitigation and development.

#### **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 MtCO<sub>2</sub>e/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 borrowing capacity is a second example of a positive spill-over, since for each dollar of new paid in capital, MDBs are potentially able to increase international lending for climate investments by US\$3-4.
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 (e.g. including the FTT) 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. Increasing general tax rates by, for example, 0.5 per cent of GDP in developed countries might generate significant distortions, feeding back into global growth rates.
108. The overall magnitude of public flows available is influenced by (a) the selection of domestic instruments; (b) the extension of these instruments to cover international sectors; (c) the degree of revenue earmarking to international climate finance; and (d) for the majority of instruments considered, the carbon price. There are many possible combinations of new, potentially acceptable sources which could result in mobilising several tens of billions of dollars of public finance.
109. For example, given a carbon price in the range of US\$20 to \$25 per tonne of CO<sub>2</sub> equivalent in 2020, new public sources based on carbon pricing have the potential to generate flows up to US\$50 billion annually. The revenue estimates from these sources have been adjusted to reflect that some of these instruments encompass incidence on developing countries, and that a substantial share of the revenues from these sources is likely to remain in



developed countries to support domestic priorities, including climate-related investments. This estimate of US\$50 billion from new sources is based on combining approximately US\$30 billion from auction revenues (or equivalent carbon taxes), US\$10 billion from removal/redeployment of fossil fuel subsidies and energy royalties (developed countries only), and approximately US\$10 billion from taxing the carbon emissions of the international transport sectors. And deploying 10 per cent of available public funds along with additional direct budget contributions of US\$2 billion to \$4 billion as average yearly additional replenishment to the MDBs could deliver a further US\$25 billion to \$35 billion per year of gross flows (through a mix of concessional and non-concessional loans).

### **C. Leveraging gross flows**

110. 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.
111. 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.
112. Second, the use of public instruments to help mitigate policy-related risks associated with the transition to low-carbon economies acts 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.
113. 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 sufficiently tight. This generates up to US\$50 billion in gross flows, crowding in up to US\$150 billion in additional private capital investment (of which an estimated 50 per cent is international). If caps were not sufficiently tight, it is possible that offsets of this volume would lead to a much lower carbon price (i.e. closer to US\$10 per tonne), resulting in only US\$20 billion of gross flows, crowding in an additional US\$60 billion of private capital.
114. 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.

115. 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 (up to several hundred billion dollars). However this result is very sensitive to the available flows to leverage and the instruments used: if carbon market offsets do not materialize and/or leverage instruments are not used effectively, private flows could be limited to tens rather than hundreds of billions.

#### **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 €77 million with approximately €60 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**

116. How different sources might be combined depends on some key variables which impact the revenues available. Such key variables identified by the AGF were (a) carbon prices (values considered were US\$15, US\$25 and US\$50 per tonne); (b) the percentage of fiscal revenues that are earmarked 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; and (e) the expansion and degree of openness of carbon markets.

117. With high carbon prices (i.e. US\$50 per tonne), the application of new instruments domestically and to international sectors, and substantial (i.e. 10 per cent) earmarking of auction revenues, it is possible to deliver the US\$100 billion target on a net basis through new sources. It is also possible to generate very significant private capital multipliers, adding US\$200 billion to \$400 billion of additional resources to invest in green growth. At the other end of the spectrum, with low carbon prices (e.g., US\$10/tonne), limited earmarking (for example 2 per cent) and the exclusion of international sectors, net public

revenues from new source could be as low as US\$10 to \$20 billion, potentially increasing the need for significant direct budget contributions from general fiscal resources. Private sector flows also shrink proportionately, especially as a result of the lower carbon prices. In the mid-case, a US\$25 carbon price, combined with for example, 10 per cent earmarking, the inclusion of international sectors and deployment of other complementary public instruments, could generate up to US\$50 billion to \$60 billion of net public flows, US\$25 billion to \$35 billion of gross MDB flows, US\$25 billion to \$50 billion of carbon market offset flows, and approximately US\$100 billion to \$150 billion of private international capital flows.