



Fact sheet: Investment and financial flows for a strengthened response to climate change

The background

Parties to the United Nations Framework Convention on Climate Change (UNFCCC, see description at the end of factsheet) are aware that the available international financial flows and public and private resources cannot also lead to a meaningful transition to a low-carbon economy, nor can they address much-needed large-scale adaptation measures.

Additionally, if the level of resources for the climate change funds under the UNFCCC continue at their present rate, funding will be insufficient to address the future financial flows estimated to be needed for adaptation and mitigation under a strengthened future climate change regime post- 2012.

This is why the UNFCCC Parties meeting for the United Nations Climate Change Conference in Nairobi in 2006 asked the UN Climate Change Secretariat to make an assessment of investment flows needed in 2030 that will be necessary to meet worldwide mitigation and adaptation requirements.

A review entitled *Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change* was conducted by the secretariat of the UNFCCC in 2007.

The review provides an analysis and assessment of investment flows in 2030 that will be need to meet worldwide mitigation and adaptation requirements under the different scenarios of social and economic development, and the impacts this has on developing countries.

A number of international financial institutions, UN agencies, intergovernmental organizations and non-governmental organizations, other relevant agencies, and representatives of the private sector and civil society participated in a consultative process and shared their experience and views on existing and planned investment and financial flows.

Given the limited amount of time available to prepare the papers (6 months), the work was based on existing work and analysis wherever possible. Existing work used for the report includes the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Reports of Working Groups I, II and III, International Energy Agency (IEA), World Energy Outlook (WEO-2006), Stern Review and other published literature.

The results should be seen as **indicative** only. They should be seen as broad contours of what would be needed rather than exact figures. Further work in assessing investment and financial flows is needed.

The review found that the additional investment and financial flows in 2030 to address climate change amounts to **0.3 to 0.5% of global domestic product in 2030 and 1.1 - 1.7% of global investment in 2030**. This is large compared to funding currently available under the UNFCCC and its Kyoto Protocol, but small in overall global figures.

For mitigation

Mitigation measures needed to return global greenhouse gas emissions to current levels by 2030, require a small increase in global investments and financial flows: between USD **200-210 billion per annum in 2030**.

Investment flows to developing countries are estimated at about 47% of the total needed in 2030. The resulting emission reductions achieved by these countries in 2030 would amount to 68% of global emission reductions.

This means that there will be a high emissions reduction potential in developing countries in 2030. But it does not mean that they are being called upon to take the lead in reducing emissions. Industrialised countries need to continue to do that.

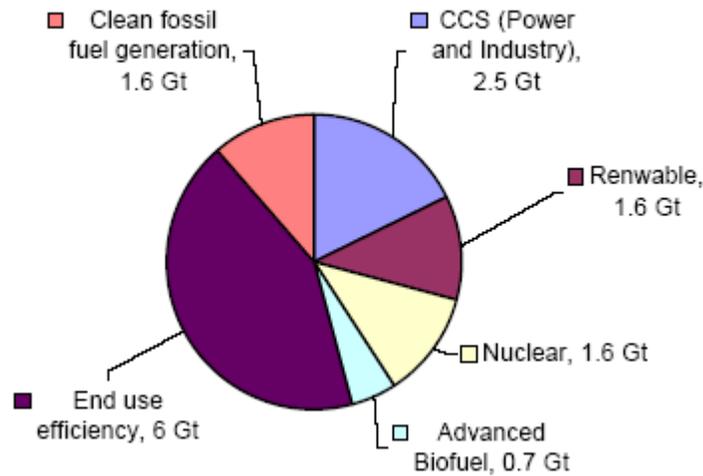
For mitigation in particular:

- **Energy supply**: USD 432 billion is projected to be invested annually into the power sector. Of this amount, USD 148 billion needs to be **shifted** to Carbon Dioxide Capture and Storage (CCS), renewables, nuclear and hydro. Investment into fossil fuel supply is expected to continue to grow, but at a reduced rate.

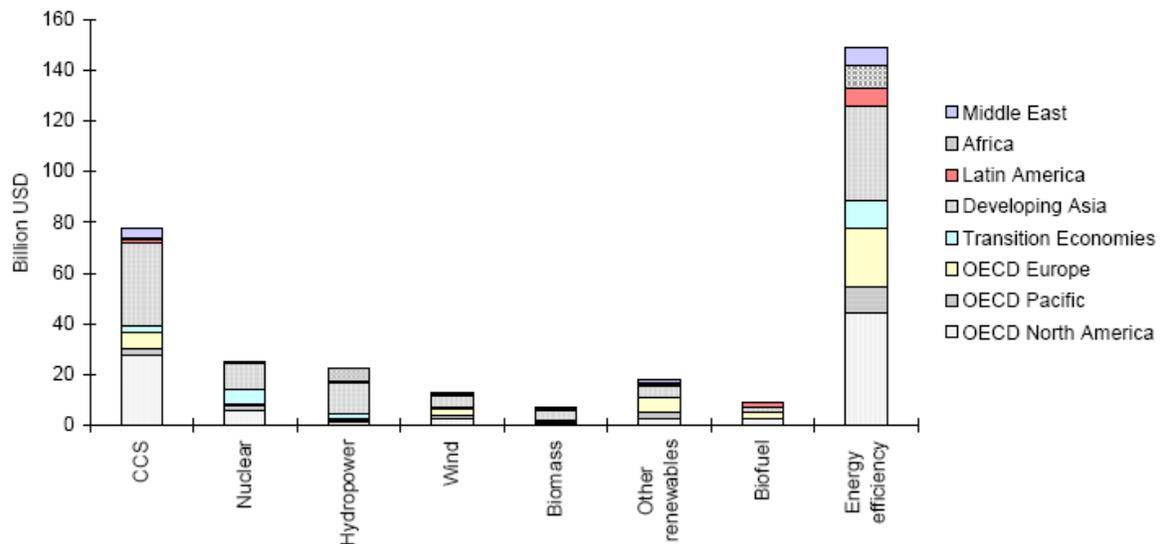
CCS for power plants, and to a lesser extent for industry, could be a significant contributor to emission reductions. The investment in CCS in 2030 under a mitigation scenario is over USD 75 billion, of which over 80 per cent is for power plants. Technology development, legal implications, public attitudes and long-term liability of CCS are the critical factors for large-scale implementation of CCS.

- **Industry**: additional investment and financial flows needed is estimated at USD 36 billion, of which more than half accounts for energy efficiency, and one third for CCS installations.
- **Buildings**: additional investment and financial flows estimated at USD 51 billion
- **Transportation**: additional investment and financial flows estimated at USD 88 billion
- **Agriculture**: additional investment and financial flows estimated at USD 35 billion. With a concerted effort, agroforestry could be expanded at a rate of 19million ha per year by 2030, with an annual investment of about USD 15 billion.
- **For forestry**: additional investment and financial flows estimated at USD 21 billion. An indicative estimate of the cost of reducing deforestation and forest degradation in developing countries to zero is USD 12.2 billion. Afforestation and reforestation is estimated at USD 01 - 0.5 billion.
- **For technology research, development and deployment**: additional financial and investment flows estimated at USD 35-45 billion.

Emission reductions by technology under the mitigation scenario in 2030, in Gt CO₂ eq.



Annual investment by technology by region in 2030



In many sectors, such as the power generation sector or industry, the lifetime of capital stock can be thirty years or even more. Investments should focus on new facilities in many of these sectors, because total investment in new physical assets is projected to triple between 2000 and 2030. Due to rapid economic growth, a large share of these investments will occur in developing countries.

According to the World Bank, there is currently a large financing gap of up to 50% of the actual needs for electricity generation. Access to energy is one of the over-riding developmental concerns of developing countries, since economic growth demands increased energy supply. According to the

reference scenario of the International Energy Agency (IEA), global energy demand will grow by 60% by 2030. In the period up to 2030, the energy supply infrastructure world-wide will require a total investment of \$20 trillion, with about half of that in developing countries.

This provides a window of opportunity to direct the investment and financial flows to climate-friendly and climate-proof facilities. The investment decisions that are taken today will affect the world's emissions profile and adaptive capacity for many more years to come.

Failure to achieve changes in investment and financial flows for mitigation will lead to unsustainable development paths and “lock-in” effects for the next 20-30 years. This will lead to higher emissions, more climate change impacts, and larger investment and financial flows needs for adaptation in the longer-term.

For adaptation

The review found that for adaptation, additional investment and financial flows needed for in 2030 amount to **several billions of USD**. No precise global figure is available at present and further analysis on this needs to be conducted.

Additional investment and financial flows for adaptation needed in developing countries is estimated between USD 28 to 67 billion. These figures are indicative and may represent the lower bound of the amount actually required.

Although the additional investment and financial flows needed for adaptation are significant, the value of the climate change impacts that those expenditures would avoid could be larger.

For adaptation in particular:

- **Agriculture, forestry and fisheries: USD 14 billion, with USD 11 billion needed for production and processing.**
- **Water supply infrastructure: USD 11 billion, with 85% needed in developing countries.** Already **1.1 billion people are living in areas with acute water scarcity**. According to projections by the Intergovernmental Panel on Climate Change (IPCC), **water availability will be further stressed** because of climate change impacts, with up to **250 million additional people affected in 2020 in Africa alone**.
- **Human health; additional cost for treating increased cases of diarrhoeal disease, malnutrition and malaria** estimated at **USD 5 billion in developing countries**. ((This additional need is only in developing countries and corresponds with current annual ODA for health.))
- **Beach nourishment and dykes**: estimated at **USD 11 billion with half in developing countries**.
- **Adapting new infrastructure to climate change**: estimated at **USD 8-130 billion**, less than 0.5% of global investment in 2030. The large range is due to how costs from damages from extreme events are calculated.

At present, adaptation faces a huge investment challenge. Current sources of ODA are insufficient to cover the adaptation needs as estimated by the IPCC. Calculations indicate that current available per

capita money for adaptation in developing countries ranges from between 3 cents per annum to \$3.82 per annum.

How to finance the response to climate change

With **appropriate policies and/or incentives**, a substantial part of the additional investment and financial flows needed could be covered by the currently available sources. However, **improvement in, and an optimal combination of, mechanisms**, such as the carbon markets, the financial mechanism of the Convention, ODA, national policies and, in some cases, **new and additional resources**, will be needed to mobilize the necessary investment and financial flows to address climate change.

Financial issues under a future climate change regime with increased effectiveness will require:

- **Shifts** in investment and financial flows to more climate-friendly and climate-proof investments
- **Scaling up** international and public capital dedicated to climate-friendly and climate-proof investments
- **Optimize** the allocation of the funds available by spreading the risks across private and public investors, for example by providing incentives for private investment in the early deployment of new technologies.

Additional external public funding for climate change mitigation and adaptation will be needed particularly for sectors in developing countries that depend on government investment and financial flows.

Private sector investments constitute up to 86% of investment and financial flows and are thus another important means to enhance investment and financial flows to address climate change in the future.

Particular attention will need to be given to developing countries, because although they currently account for only 20–25 per cent of global investments, their expected rapid economic growth means that they will require a large share of investment and financial flows.

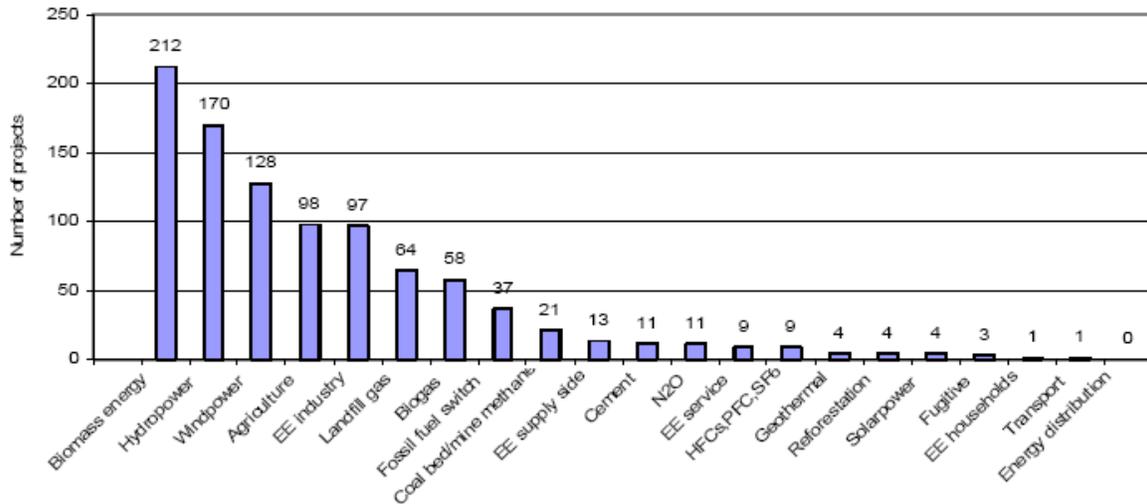
Potential of the carbon markets

One way of enabling increased funding is by means of the **carbon markets**. A high post-2012 demand for emission reduction credits could allow the expansion of existing market mechanisms, which would in turn stimulate additional supply of credits.

The Kyoto Protocol's Clean Development Mechanism (CDM), which permits industrialized countries to invest in sustainable development projects in developing countries and thereby generate tradable emission credits.

already shows a significant potential to leverage domestic and international investments. It is estimated that CDM project activities in the pipeline in 2006 generated investment of about USD 25 billion, of which approximately 50 per cent represents capital invested in unilateral projects by host country project proponents. Renewable energy and energy efficiency projects account for 90 per cent of the overall investment.

**Projects that entered the clean development mechanism pipeline in 2006,
by project type/sector**



EE = energy efficiency

The supply of Kyoto units will be abundant compared with to the level of compliance demand for the period 2008–2012. The voluntary market could represent about 15 per cent of the total carbon market.

Policy certainty is important for investors. A longer-term international agreement on climate change broadens the range of mitigation measures that are attractive investments.

Funding for the **Adaptation Fund** post-2012 depends on the continuation of the Clean Development Mechanism (CDM) and the level of demand in the carbon market. With a continued share of proceeds for adaptation from CDM projects, the level of funding could be USD 100–500 million for a low demand for credits from non-Annex I Parties and USD 1–5 billion in 2030 for high demand.

The level of funding available to the Adaptation Fund would be small compared with the estimated needs for adaptation. The Adaptation Fund could be further expanded with additional sources of funding.

Potential of ODA

Although Official Development Assistance (ODA) funds are currently less than 1 per cent of investment globally. **Least developed countries**, such as Sub-Saharan Africa, and smaller developing countries, still attract very limited private sector investment and continue to rely on ODA and soft loans from international financial institutions.

Promoting **reporting systems** and encouraging bilateral and multilateral agencies to integrate climate change costs in their funding is an important goal to pursue.

The expansion of the climate-focused funding from Annex II Parties (in accordance with Article 4, paragraph 3 of the Convention), will be needed.

Potential of national policies

Policies are needed both in developed and developing countries.

In terms of private funds, governments set the rules for the markets in which investors seek profits. If current market rules are failing to attract or drive private investors into lower-carbon, more climate-proof alternatives, governments can introduce policies or incentives to help address these market failures. This includes:

- Regulations and standards to overcome policy-based barriers to entry
- Taxes and charges to make the polluter pay
- Subsidies and incentives to pay the innovator

Governments also need to shift the focus of their own investments. Governments are responsible for 10–25 per cent of the investment in new physical assets. Currently most of those investments are driven by local development priorities. In developing countries in particular, shifting funding to climate change related investments has to take social and development priorities into account.

Potential of international coordination of policies

Governments set the rules for the markets in which investors seek profits. Relevant policies are needed both in developed and developing countries.

International coordination of policies by Parties in an appropriate forum will be most effective. Areas where international coordination would be beneficial include technology R&D and deployment, and energy efficiency standards for internationally traded appliances and equipment.

Findings relating to developing countries

Particular attention will need to be given to developing countries, as, while only 20-25 per cent of investment currently occurs in developing countries, due to expected rapid economic growth, a large share of investment and financial flows will be needed in developing countries:

- More than half of all the energy investment needed worldwide is in developing countries.
- Additional investment and financial flows for adaptation in developing countries is estimated between USD 28 to 67 billion.

Investment and financial flows in mitigation in developing countries are likely to be more cost effective. While additional I&F in NAI are estimated at about 46% of the total needed in 2030, the emission reductions achieved by the countries amount to 68% of global emission reductions.

The major reductions in emissions between the reference and the mitigation scenarios rely on the increased energy efficiency and shifts in the energy supply from fossil fuels to renewable, nuclear and hydro and large-scale deployment of CCS. Much of the shift will need to occur in developing countries where energy demand is projected to grow most rapidly.

There is need for better understanding of different national circumstances, specific analysis should focus on different groups of countries such as LDCs, rapid growth developing countries and EIT countries

Multilateral and bilateral funding is a significant source of investment in developing countries (1 to 7%).

Most of the investment in renewable energy and energy efficiency occurs in OECD countries and ODA funding for renewable energy is less than 4 per cent of the total ODA flows. Least developed countries, such as Sub-Saharan Africa, and smaller developing countries, still attract very limited private sector investment and continue to rely on ODA and soft loans from international financial institutions such as the World Bank

For a summary of *Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change* or the full report, please visit <http://unfccc.int/meetings/dialogue/items/4048.php>

About the UNFCCC

With 191 Parties, the United Nations Framework Convention on Climate Change (UNFCCC) has near universal membership and is the parent treaty of the 1997 Kyoto Protocol. The Kyoto Protocol has to date 175 member Parties. Under the Protocol, 36 States, consisting of highly industrialized countries and countries undergoing the process of transition to a market economy, have legally binding emission limitation and reduction commitments. The ultimate objective of both treaties is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.