

Financing Climate Change Action, Supporting Technology Transfer and Development

Key messages and recommendations from recent OECD work

Summary

The OECD is ready to assist G20 countries in their efforts to find lasting solutions to finance action on climate change, building on the long-standing work of the organisation to share country experiences and identify lessons learnt and policy recommendations for good practice.

Public and private financing for climate action will need to be scaled up significantly in the coming years. The following could generate major new sources of funds to finance domestic and international action:

- *Put a price on carbon, through cap and trade schemes and/or carbon taxes, which will incentivise low-carbon investment can also be an essential source of public financing*
- *Shift public financing away from activities that encourage GHG emissions, such as subsidies to fossil fuel use or production*
- *Broaden and deepen carbon markets, for example through scaled up CDM or sectoral approaches, to steer private financing to low carbon development*
- *Explore ways to raise incentives for pension funds and other private pools of capital to invest in low carbon and climate proofed development*
- *Explore the use of official export credits as a means to contribute to the financing of climate change actions*

International finance should:

- *Use limited public finance to complement and act as a catalyst to leverage private investments*
- *Accelerate international transfer of 'clean' technologies by increasing public funding for technology research and development (R&D) and international cooperation*
- *Build capacity and experience on reducing emissions from deforestation and forest degradation in developing countries and enable a transition to use of markets in this area*

The following actions can strengthen governance of international public finance:

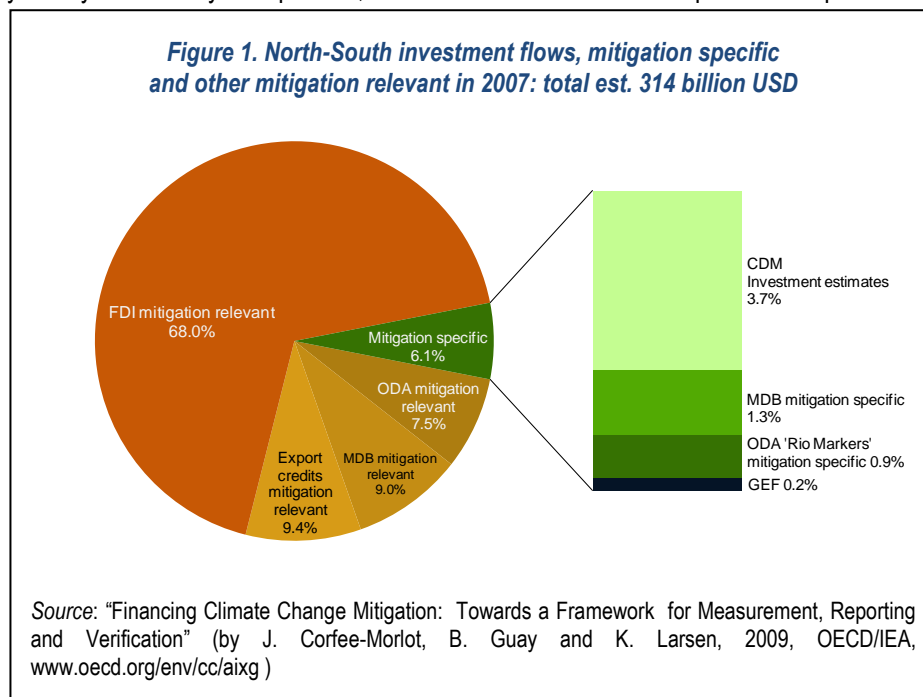
- *Work to improve the effectiveness of financial support and better match it to financing needs in developing countries through co-ordination across different funds or delivery channels*
- *Build on the existing multilateral institutions and monitoring systems to enhance measurement, reporting and verification of finance and climate action*

Financial and technology support for climate change action in developing countries is an essential ingredient for a successful post-2012 international agreement

Enabling increased capacity in developing countries to identify and deliver timely policy reforms will be essential to ensure that economic development is climate-proofed and contributes to low-carbon growth. To achieve ambitious climate stabilisation objectives, industrialised countries need to achieve deep emission reductions compared to current levels and support developing countries to reduce GHG emissions below business-as-usual levels in the medium term (2020 – 2030). Financial and technological support are also needed to help the most vulnerable countries adapt to the climate change that is already locked-in. On adaptation, practical ways for donors to support developing country partners in their efforts to reduce their vulnerability to climate change need to be identified, integrating adaptation to climate change into all development activities. Failure to adapt could stall development, particularly in the poorest of countries.

Financial support for climate action will need to come from both public and private sources – both will need to be scaled-up significantly

The exact amount of financing needed to address climate change will depend on many factors, including the level of ambition of the international agreement to be achieved in Copenhagen. Estimates for additional investment to climate proof development and limit emissions in developing countries range from USD 50 billion to several hundred billion per year by 2030. By comparison, recent estimates of current public and private financing specifically targeted to



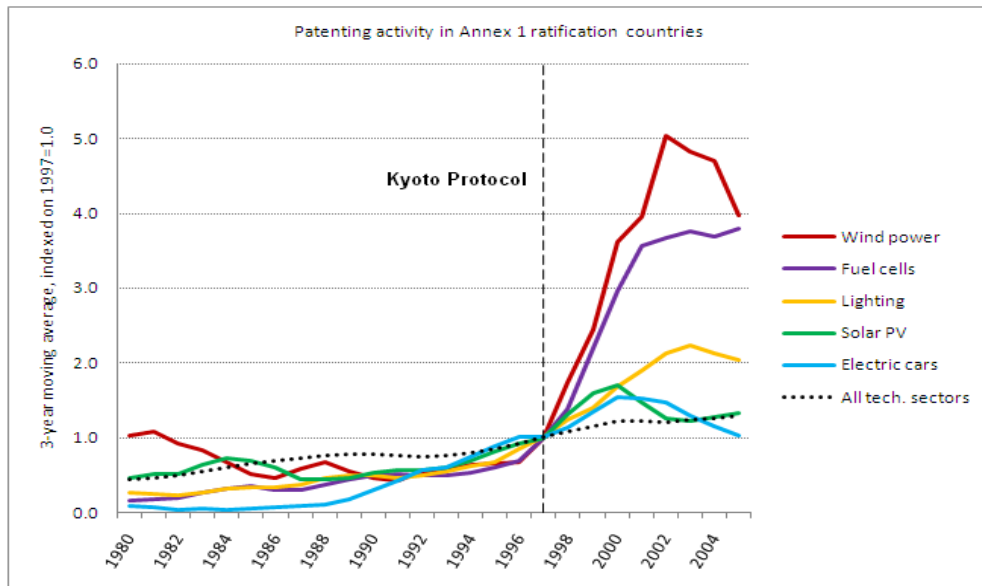
mitigation activities are in the range of USD 10 to 50 billion per year (depending upon how investment under the Clean Development Mechanism – CDM – is accounted for), accounting for less than one-sixth all relevant flows (Figure 1). Public funding for adaptation is much lower, with total funds pledged or available today amounting to less than USD 1 billion per year. This suggests the need to significantly scale up financing to support climate action in developing countries between now and 2030.

Put a price on carbon and use of market-based instruments as an essential source of financing

The private sector has the greatest potential to finance action on climate change and this can be best stimulated through the use of market-based instruments in climate policy frameworks. For example, if all industrialised countries were to use carbon taxes or auctioned emission trading permits to reduce their emissions by 20% in 2020 relative to 1990 levels, the size of the fiscal revenues could reach 2.5% of GDP in those countries by 2020. These revenues could be used to bolster economic growth, offset reductions in other taxes (e.g. on labour), and/or to help provide financing to support mitigation and adaptation action in developing countries.

A clear, credible and binding policy signal on climate change is also necessary to drive private investments in low-carbon technologies and infrastructure (Figure 2). Investors need price signals to ensure that it is worth developing technologies for a green future. For example, OECD analysis finds that patent activity related to a range of climate change mitigation technologies shot up after the 1997 agreement on the Kyoto Protocol. Putting a price on carbon emissions, for example through taxes or cap-and-trade schemes, will penalise carbon-intensive technologies and create markets for low-carbon technologies such as solar and wind energy and carbon capture and storage in the energy and industry sectors, and accelerate investment in energy efficiency.

Figure 2. Innovation Trend in Climate Mitigation Technologies, Compared to All Sectors



Source: OECD 2009. Based on data extracted from EPO/OECD Worldwide Patent Statistical Database (PATSTAT). See also ENV/EPOC/WPNEP(2009)1/FINAL (www.oecd.org/environment/innovation); and The Invention and Transfer of Environmental Technologies (OECD, forthcoming 2010).

Shift public financing away from activities that encourage GHG emissions

An important first step in pricing carbon is to remove environmentally-harmful subsidies to fossil fuel energy consumption or production because these subsidies amount to a de facto reward for carbon emissions. OECD analysis finds that removing energy subsidies would save money for governments and taxpayers, shift the economy away from activities that emit CO₂, encourage energy efficiency, and promote the development and diffusion of low-carbon technologies and renewable energy sources. Removing these subsidies would lower the global cost of stabilising GHG concentrations.

Energy subsidies are particularly high in Russia, other non-EU eastern European countries, and a number of large developing countries, including India (Figure 3). According to the International Energy Agency (IEA), fossil fuel subsidies amounted to an estimated USD 300 billion in 2007. Recent analysis by the OECD and the IEA suggests that removing these subsidies in 20 emerging economies and developing countries could reduce GHG emissions in some of these countries by over 30% in 2050, and reduce global emissions by 10% in 2050 compared with business-as-usual. Removing subsidies would also increase the efficiency of these economies.

In September 2009, G20 Leaders committed to “rationalize and phase out over the medium term inefficient fossil fuel subsidies that encourage wasteful consumption.” They asked the OECD, together with other relevant institutions – notably the IEA, OPEC, and the World Bank -- to provide “an analysis of the scope of energy subsidies and suggestions for the implementation of this initiative and report back at the next summit.”

Phasing-out subsidies is often politically challenging, and can have negative impacts on low-income households. Such policy reforms must be implemented carefully to ensure that any negative impacts on household affordability are mitigated through appropriate measures (e.g. means-tested social safety net programmes). Delinking subsidies from

Figure 3. Energy subsidies by type of fuel in non-OECD countries¹
Average rate applied to subsidized demand of each type of fuel in 2007 (%)

Country	Coal	Gas	Refined oil	Electricity
China	18.1	27.0	7.1	22.3
India	0.0	53.6	51.8	19.6
Brazil	40.4	0.0	14.4	0.0
Russia	51.6	84.7	23.6	48.9
Oil-exporting countries ²	0.0	18.9	29.2	21.9
Non-EU Eastern European countries	30.0	39.6	5.4	37.4

1. Energy subsidies are approximated by the difference in the domestic energy price and world prices.
2. The region includes the Middle East, Algeria-Lybia-Egypt, Indonesia, and Venezuela.
Source: IEA, World Energy Outlook (2008)

environmentally-damaging activities such as the use of fossil fuels, and targeting the support directly to those who most need it, rather than through an across-the-board subsidy to all fuel users, can be more economically efficient, less environmentally damaging and more likely to achieve the intended social benefits. OECD analysis has built on country case studies to develop recommendations of how subsidy reform and removal can be implemented in practice, while addressing potential social impacts.

Broaden and deepen carbon markets, for example through scaled up CDM or sectoral approaches, to steer private financing to low carbon development

Deepening and extending the carbon market creates the scope for substantial transfers of private funds from advanced to developing countries. In the near term, the main channel for such transfers will likely be based on improved versions of existing crediting mechanisms such as the CDM. As an illustrative example, if industrialised countries were allowed to achieve as much as half of a 20% emission reduction by 2020 through purchases of credits from developing countries, the transfers generated in 2020 could reach over USD 12 billion (2005\$). This amount would rise rapidly if more ambitious cuts were pursued or greater use of offset credits allowed in industrialised countries. Hence, well-functioning crediting mechanisms can reduce the cost of mitigation in industrialised countries while benefiting developing countries in the form of transfers of private funds and clean technology.

However, current mechanisms will have to evolve so as to provide incentives for developing countries to take on increasing emission reduction objectives. This can occur via the scaling-up of CDM to sectoral crediting approaches, with negotiated baselines being gradually tightened and perhaps eventually converted into binding sectoral caps. If these sectoral approaches were implemented through the creation of domestic sectoral emission trading systems (ETS) that could be linked to economy-wide ETS in industrialised countries, they could trigger large international financial flows. In such a case, emission allocation rules could be specifically designed to shift some of the burden of the costs away from developing countries and increase their incentives to participate. Trading within and across carbon markets together with the negotiated allocation of caps across such markets enables a disconnect between *where* emission reductions occur – ensuring mitigation action takes place wherever it is least costly – from *who* pays for that action.

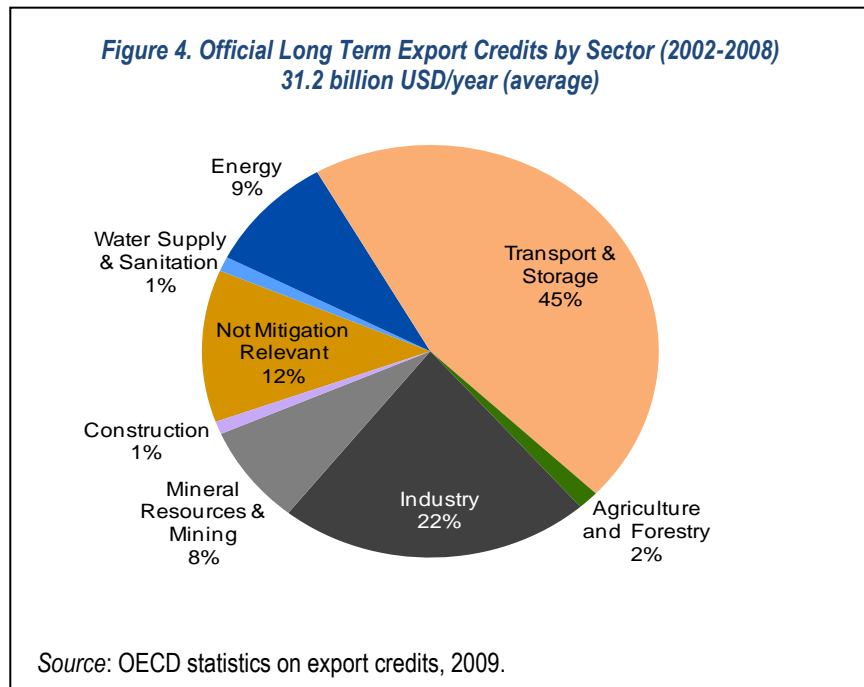
Explore ways to raise incentives for pension funds and other private pools of capital to invest in climate proof development projects

There is a need to promote private climate change funds to meet the financing challenges of low-carbon and climate-proofed development both in industrialised and in developing countries. This should build on the OECD Principles for Private Sector Participation in Infrastructure to incentivise investment. At present the absence of positive incentives and weak regulatory frameworks limit pension fund investment and do not tackle obstacles to international investment

flows to low carbon options. The incentives can be enhanced in a number of ways. Judging by the success of infrastructure funds more generally, tax incentives are very powerful. OECD is currently exploring various options, including the use of tax-free bonds. To qualify for the tax-free status of “climate change fund” bonds, projects would have to meet certain requirements for low-emission performance. There are many ways to build in the tax advantages for such bonds. Tax free yields and the deductibility on interest on borrowing to buy such bonds could be the central features. In essence, the tax treatment of climate change funding bonds would make certain low- or no-emission projects very attractive relative to others that would not receive the same tax advantages. As with infrastructure more generally, this approach would use the tax system to incentivise the private sector to fund essentially public goods. The projects that are invested in also need to have proper governance mechanisms and to be structured in ways that generate stable cash flows in order to make them attractive to private investors. A sound institutional and regulatory framework including, importantly, the phasing out unnecessary obstacles to capital movements and restrictions on access to local markets is essential.

Explore the use of official export credits as a means to contribute to the financing climate change actions

Export credit agencies (ECAs) typically provide funds (direct loans) or guarantees to facilitate exports in overseas markets. Export credits provided officially by or on behalf of OECD governments are reported by contributing countries through the OECD, where rules to ensure a level playing field are negotiated and monitored. Over the last years, data show that a significant proportion of the medium and long term official export credits flows have gone to transport and industry sectors, followed by energy projects. In contrast, reflecting the export structure of OECD countries, the proportion of low-carbon export projects (e.g. renewable energies at USD 0.5 billion and less than 2% of total) remains a minor share of official export credits (Figure 4).



The OECD is taking three active steps to introduce and maintain environmental accountability in official export credits and to address climate change issues. First, export credit agencies are encouraged, under a 2007 OECD Recommendation, to assess the environmental impacts of projects that they finance or guarantee. While this does not guarantee that official export credits will go to only “green” projects, it aims to diminish the interest of investing in “dirty” projects, including high emission ones. The benchmark for project assessment are World Bank and IFC standards, and these also include GHG emission related criteria. Second, under the OECD auspices, a new set of rules called “Sector Understanding” was agreed in June 2009 to encourage the exports of projects in the renewable energies and water sectors. Under this, OECD Members are now in the position to support exports in these areas with favourable financial terms and conditions reflect the high up-front investment costs expected life of projects. Finally, as a follow-up to the adoption of the June 2009 Sector Understanding on Renewable Energies and Water projects, the OECD is also engaging in negotiations to address ongoing challenges related to climate change in the export credits area.

Negotiations are under way to consider whether and how key sectors and technologies, such as energy efficiency and other low carbon projects, could become eligible for the favourable financial terms and conditions applicable to the Renewable Energies and Water projects. These negotiations will continue over the end of 2009 and most likely spill over in early 2010.

Limited public finance can be used as a catalyst to leverage private investments

Limited public finance should be used as a catalyst to leverage private investments. Experience with the GEF and with CDM show that limited public funding can leverage investment by a factor of 7 or more. As well public financing should target activities unlikely to attract sufficient private funding. This includes capacity building to strengthen enabling environments for investment and integration of climate change concerns into sector and other economic policies, investing in education and training as well as technology research and development. Other priority uses include protecting forests and other natural resources, and adaptation. Finally, it is critical to ensure that policy frameworks emerge to guide investments conducive to lower carbon development. Policy dialogue on such issues and targeted capacity building to support policy reforms are an important part of development co-operation activities and can lead to strengthened, country-driven policies that drive low carbon development.

There is a need to boost technology research and development (R&D) and international cooperation to accelerate international transfer of 'clean' technologies

The latest OECD analysis shows that carbon pricing that stabilises greenhouse gas concentrations even at moderate levels could lead to a four-fold increase in world energy R&D spending by 2050. However, carbon pricing alone will not be enough. Specific R&D policies are also needed to bring forward low-carbon technologies that are in early stages of development. Government investment in research, development and demonstration projects holds promise for technology breakthroughs. Recent OECD analysis suggests that such breakthroughs – if in the power sector – could halve the costs of mitigation by 2050, create new business opportunities and make more ambitious climate policies affordable. However, IEA data show that public R&D expenditures in the energy sector, as a share of total R&D spending and of GDP, have been falling steadily since the early 1980s. In an encouraging move, when OECD energy ministers met in Paris recently, they called for an acceleration of public spending in this area with a view to doubling expenditures by 2015.

Development assistance and international research cooperation have a role to play in encouraging the international transfer of 'clean' technologies. Clearly, market factors are important and countries with close economic ties are most likely to transfer technologies between themselves. However, OECD analyses demonstrate that high technological capacity in the recipient country is a key factor in encouraging transfers. Countries that innovate themselves are more likely to benefit from innovations originating elsewhere. As such, actions by developing countries to put in place policies that constrain emissions and drive local innovation supported through capacity building will also be critical to encouraging more transfer of low-carbon technologies.

In addition to such collaboration, special mechanisms may be needed to accelerate technology transfer to developing countries. These will need to balance the interests of businesses as well as governments. A first step would be to lower existing barriers to trade in climate-friendly goods. In specific circumstances, where transaction costs for transfer are very high, for example due to overlapping patents on complementary technology components, it may be of interest to use international financing to buy-down intellectual property related costs (e.g., application, examination, registration fees) so as to increase technology transfer. Support for education and training may also be helpful to protect intellectual property rights.

Other priorities include building capacity and experience to reduce emissions from deforestation and forest degradation in developing countries

Finance for reducing emissions from deforestation and forest degradation (REDD) in developing countries will be needed both for capacity building (e.g., institutional and monitoring capacities) and for emission reductions directly. Emissions from deforestation are substantial, particularly in developing countries, amounting to as much as 17% of global GHG emissions. Moreover, studies suggest that deforestation emissions can be reduced at relatively low cost,

potentially reducing carbon prices by up to 40% in 2020. Mechanisms to support REDD) will be essential as part of a cost-effective and comprehensive post-2012 agreement. Four key features critical to an effective REDD financing mechanism are: (i) establishing clear goals and objectives; (ii) ensuring sufficient and long-term sources of finance; (iii) developing eligibility and prioritisation criteria; and (iv) ensuring accurate and consistent monitoring and performance evaluation. Once developing countries meet any pre-defined eligibility criteria for participation in a REDD mechanism, market-based approaches to finance REDD are likely to generate significantly larger, more sustainable finance, compared to fund-based approaches.

Improve effectiveness of international financial support and better match it to needs in developing countries

Mobilizing public finance is essential but once available these funds will have to be managed efficiently and channelled towards the most effective investments and activities. Lessons learned from bilateral and multilateral official development assistance (ODA) activities and global funds will be important in informing future climate financing mechanisms. They include, in particular, the need to ensure that developing country partners exercise full ownership of climate change funding and integrate it within their own financial allocation mechanisms. Recording these resources in the national budget will help ensure that their use is subject to scrutiny by parliaments, civil society organisations and other domestic accountability institutions. In other words, activities undertaken in response to climate change should be country-driven and clearly based on the needs, views and priorities of partner countries.

On the mitigation side, a key challenge is that of better “matching” support with GHG mitigation actions in developing countries, in particular, how to connect potentially multiple sources of funding in a strategic way to actions in developing countries. Some co-ordination across different funds or delivery channels could be valuable to ensure that strategic goals are met, such as geographical or sectoral balance.

Build on the existing multilateral institutions and monitoring systems to enhance measurement, reporting and verification

Measurement, reporting and verification (MRV) of financial support may usefully build on existing reporting systems and multilateral institutions. Building on the UNFCCC National Communications and review process, as well as the OECD Creditor Reporting System, which tracks bilateral development assistance, it could be possible to develop a comprehensive framework for MRV of climate change support. Such a framework could provide information on the broad purpose of the support, such as for capacity building, as well as indicating the mitigation and/or adaptation outcomes. It could also include a description of sector end-points for support, such as water or forestry, energy or transport. An enhanced framework for MRV of financial support would need both industrialised and developing countries to report more data (and/or more frequently), and could eventually extend to include climate-specific flows of private investment (e.g. carbon finance flows in the mitigation area such as CDM). Particularly in the case of adaptation, there is a need not only to monitor flows of support but also for methodological work on how to construct baselines against which to measure and assess the effectiveness of financial support. The DAC is currently working to develop a statistical approach to monitor ODA flows towards climate change adaptation.

For further reading:

Financing climate change action

“Financing Climate Change Mitigation: Towards a Framework for Measurement, Reporting and Verification” (by J. Corfee-Morlot, B. Guay and K. Larsen, 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

“Matching Mitigation Actions with Support: Key Issues for Channelling Support” (by J. Kim, J. Ellis and S. Moarif, forthcoming 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance (OECD 2009)

Bridge Over Troubled Waters: Linking Climate Change and Development (OECD 2006)

"Measuring Aid Targeting the Objectives of the United Nations Framework Convention on Climate Change" (OECD, August 2009, www.oecd.org/dac/stats/analyses)

Economic Aspects of Adaptation to Climate Change - Costs Benefits and Policy Instruments (OECD 2008)

"New & Innovative Funding for Climate Change" (by Jessica Brown, prepared for the Africa Partnership Forum at the OECD, 2009, www.africapartnershipforum.org)

"Strengthening the Environmental Profile of the OECD Policy Framework for Investment" (OECD, forthcoming 2010)

The Economics of Climate Change Mitigation: Policies and Options for Global Action Beyond 2012 (OECD 2009)

Subsidy Reform and Sustainable Development: Political Economy Aspects, (OECD 2007)

Subsidy Reform and Sustainable Development: Economic, Environmental and Social Aspects (OECD 2006)

Environmentally Harmful Subsidies: Policy Issues and Challenges (OECD 2003)

Improving the Environment through Reducing Subsidies (3 parts). (OECD 1998)

"Measuring Aid Targeting the Objectives of the United Nations Framework Convention on Climate Change" (OECD, August 2009, www.oecd.org/dac/stats/analyses)

"Development Perspectives for a post-Copenhagen Climate Financing Architecture" (OECD, forthcoming 2009/10)

Engaging the private sector, mobilising resources

"Engaging the private sector in support of a low-carbon future" (OECD forthcoming 2010).

"OECD Futures Project on Global Infrastructure Needs: Prospects and Implications for Public and Private Actors" (OECD 2004).

"Guidelines on Pension Fund Asset Management" (OECD 2006).

"OECD Principles for Private Sector Participation in Infrastructure" (OECD 2007).

"Infrastructure to 2030", OECD Policy Brief. (OECD 2008).

"Pension Fund Investment in Infrastructure", OECD Working Papers on Insurance and Private Pensions, No. 32 (OECD 2009).

Arrangement on Officially Supported Export Credits (in particular Annex IV). TAD/PG(2009)21, OECD (2009), Available at: [http://www.ois.oecd.org/olis/2009doc.nsf/LinkTo/NT00004C12/\\$FILE/JT03268495.PDF](http://www.ois.oecd.org/olis/2009doc.nsf/LinkTo/NT00004C12/$FILE/JT03268495.PDF)

Revised Council Recommendation on Common Approaches on the Environment and Officially Supported Export Credits. TAD/ECG(2007)9, OECD (2007), available at: [http://webdomino1.oecd.org/olis/2007doc.nsf/Linkto/tad-ecg\(2007\)9](http://webdomino1.oecd.org/olis/2007doc.nsf/Linkto/tad-ecg(2007)9)

Incentivising technology innovation and REDD

The Invention and Transfer of Environmental Technologies (OECD, forthcoming 2010).

"Financing Mechanisms to Reduce Emissions from Deforestation: Issues in Design and Implementation" (K. Karousakis and J. Corfee-Morlot, 2007, OECD/IEA, www.oecd.org/env/cc/aixg)

Strengthening governance

"Climate Change & Development: Key Principles to Inform Climate Change Financing" (OECD factsheet, 2009, www.oecd.org/dac)

"Matching Mitigation Actions with Support: Key Issues for Channelling Support" (by J. Kim, J. Ellis and S. Moarif, forthcoming 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

"Reporting and Recording Post-2012 GHG Mitigation Commitments, Actions and Support" (J. Ellis, S. Moarif and J. Kim, 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

"Linking Mitigation Actions in Developing Countries with Mitigation Support: A Conceptual Framework" (J. Kim, J. Corfee-Morlot and P. de T'Serclaes, 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

"Reporting and Recording Post-2012 GHG Mitigation Commitments, Actions and Support" (J. Ellis, S. Moarif and J. Kim, 2009, OECD/IEA, www.oecd.org/env/cc/aixg)

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