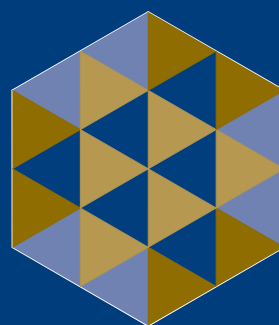


Financial assessment of the technology proposals under the UNFCCC

Executive summary and tables

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Summary

A successful 15th Conference of the Parties (COP15) of the UNFCCC in Copenhagen should be a defining moment for mitigation and adaptation technologies. We know that limiting global average temperature increases below 2°C rise will require a step-change in global innovation and technology transfer. This is essential to avoid high carbon lock-in and move all countries onto a sustainable growth pathway. Copenhagen will be crucial to provide this global framework and ensure both the advancement and transfer of climate technologies.

The Bali Action Plan established a reciprocal relationship between developing country enhanced actions and the provision of finance, technology and capacity support by developed countries. In the process towards COP15, Parties have submitted a large body of proposals, many of which have technology related elements. As a necessary condition for consensus on a technology framework, insight is needed connecting the technology proposals and the necessary financial requirements. This report aims to facilitate such a consensus by providing estimates of the financial requirements of the current technology proposals.

The IPCC has provided a comprehensive definition of technology transfer encompassing a broad set of processes covering the flow of knowledge, experience and equipment across a range of public and private stakeholders. This definition has met with broad agreement with bodies such as the Expert Group on Technology Transfer (EGTT), but what actually constitutes successful technology transfer is subject to controversy. This controversy runs deeper than purely technology-related issues; it concerns perceptions of the climate mitigation and adaptation debate, the technological hegemony of Annex-I countries and level-playing fields, fair competition and free trade, and the role of markets. The controversy has had a paralysing impact on the negotiations on technology transfer in the years running up to Bali. However, action by all the stakeholders since Bali has made significant progress to move beyond the old deadlocks. Leading studies point out that the key technologies will need to be demonstrated and deployed simultaneously in developed and developing countries. In this study, we thus focus on two key aspects of technology transfer: capacity to access a technology and capacity to adopt and use technology in local circumstances.

Developing and delivering the technologies necessary to avoid dangerous climate change will require a shift in global investment. This shift has three components: first, the overall change in public and private investment patterns required to deliver the technologies and infrastructure; second, compensation of the incremental cost of this additional investment over business as usual investments; and third, the financial flows to developing countries required to support their low-carbon development. Making this shift happen requires a balance of ‘push’ and ‘pull’ factors along the innovation chain, with varying levels of public and private finance and policy interventions at different stages of technological development. So although the overall level of investment is expected to mainly be provided by the private sector, this investment will only occur if firms are presented with the right balance of risk and reward. Public expenditure will therefore be critical in key sectors especially areas such as energy research and development (R&D) where public expenditure accounts for over 60% of total investment.

This study has grouped the technology related submissions to the UNFCCC and their financial implications into three concrete technology packages. These packages outline different levels of ambition consistent with the potential outcomes in Copenhagen. The assessment combines a bottom-up cost assessment of the individual elements with a top-down analysis of the necessary financial support. This approach provides a concrete image of what a potential technology framework in Copenhagen may look like. The study then assesses the current proposals in the negotiating text and translates the often abstract concepts into operational actions. In some cases this is straightforward, but ambiguities in the negotiating text imply that in other instances assumptions have had to be made to operationalise the language (these are clearly detailed in the report). Many of the technology proposals cannot exist as stand-alone measures as they are based on progress in other parts of the negotiations. The plausible packages reflect this interdependency in relation to the overall level of ambition for mitigation and financing.

Technology Package 1 - Low Ambition

Key assumptions for overall level of mitigation and financing ambition:

- Annex 1 countries agree to an overall 2020 target of a 10% reduction below 1990 levels.
- Non-Annex 1 countries agree to a 5-10% deviation below business as usual by 2020.
- Long-term (LT) vision of 50% global reductions by 2050, but no automatic review of this target.
- Financial pledges for mitigation support in developing countries of \$10 bln per annum.

Table 1 *Costs of the low ambition technology package [mln. USD over five year]*

LOW AMBITION TECHNOLOGY PACKAGE	Operational cost	Additional programme support	Total
Technology needs assessments (TNAs): as a separate process from developing country low carbon growth plans, NAMAs and NAPAs, all NAI countries will receive financial support (50 k per country) to complete/strengthen their TNAs.	7.5 (delivered over 1-2 years prior to 2012)	N/A	7,5
Technology information platform consists of a database collecting information on sector-specific technologies, best practice dissemination both in the public and private sector, costs of technologies, barriers and manufacturers of technologies.	16	N/A	16
Global technology roadmap would set out the overall trajectory for key technologies' development and deployment and identify milestones and areas for international cooperation. This assumes 20 full-time staff will be working on this throughout two years, and that most underlying data is already available.	4.4 (over 1-2 years prior to 2012)	N/A	4,4
Matchmaking body for technology transfer consists of a new technology matchmaking service under UNFCCC which would provide an interactive facilitation service for private sector, governments, and multilateral financial institutions in order to deliver actions defined in NAMAs, NAPAs and TNAs.	31-41	N/A	31-41
Network of innovation centres represents an umbrella partnership of existing institutions with a focus on information sharing and limited capacity building. This would consist of 4 international technology cooperation centres and 10 cooperative implementation centres.	100	100	200
International academic exchange programmes , including undergraduate and PhD exchanges and visiting lecture/fellowships are also assumed to be a part of technology related capacity building.		500	500
Total over 5 years	159-169 mln.	600 mln.	759-769 mln.
Total per annum	32-34 mln.	120 mln.	152-154 mln.

Technology Package 2 - Moderate Ambition

Key assumptions for overall level of mitigation and financing ambition:

- Annex 1 countries agree to an overall 2020 target of a 20% reduction below 1990 levels.
- Non-Annex 1 countries agree to a 10-15% deviation below business as usual by 2020.
- LT vision of 60% global reductions by 2050, reviewing in 2015 linked to a 2°C target.
- Financial pledges for mitigation support in developing countries of \$60 bln per annum.

Table 2 *Costs of the moderate ambition technology package [mln. USD over five year]*

MODERATE TECHNOLOGY PACKAGE	Operational cost	Additional programme support	Total
New technology executive body under UNFCCC is established and responsible for commissioning global technology roadmaps, review progress and report back to COP. It is run by a centralised secretariat of 30 staff.	34	N/A	34
Technology component of low carbon growth plan are assumed to be prepared as a part of a single overall process in which developing countries will produce low carbon growth plans, NAMAs and NAPAs. All NAI countries will receive additional financial support (USD 200-500 k per country) to support the technology component of the plans.	29-76 (2-5 years)	N/A	29-76
Technology information platform consists of a database collecting information on sector-specific technologies, best practice dissemination both in the public and private sector, costs of technologies, barriers and manufacturers of technologies.	16	N/A	16
Global technology roadmap would set out the overall trajectory for key technologies' development and deployment and identify milestones and areas for international cooperation. This assumes 20 full-time staff will be working on this throughout two years, and that most underlying data is already available.	4.4 (1-2 years prior to 2012)	N/A	4,4
Matchmaking body for technology transfer consists of a new technology matchmaking service under UNFCCC which would provide an interactive facilitation service for private sector, governments, and multilateral financial institutions in order to deliver actions defined in NAMAs, NAPAs and TNAs.	31-41	N/A	31-41
Network of innovation centres is assumed to focus on near-market and existing technologies. The proposed network consists of, initially, five national or regional centers and supported by a secretariat that maintains global coordination. It provides support on enterprise creation and incubator services; funded mainly by public sector, it mobilises private capital. It also delivers technology-related capacity building through regional hubs in Asia, Africa, Latin America and the Middle East.	170	931	1.100
Cooperative R&D and demonstration is assumed to be delivered through a global partnership of existing R&D institutions in developed and developing countries. This partnership would focus on a portfolio of key technologies to be developed, demonstrated and deployed within a given timeframe. Public-private partnerships would also be encouraged, especially in demonstration and early-deployment stages. Overall 300 staff would run the partnership, ensure knowledge sharing and measure progress.	124	2.500	2.624
Enabling environments component draws from a UNEP submission and includes a variety of policy and financial instruments to strengthen enabling environments in developing countries. Policy support include financial innovation support facility, climate policy support, improving energy subsidy frameworks, and energy efficiency standards and labelling. Instruments include SME finance facility, risk mitigation facility, LDC credit facility for climate infrastructure, end-user finance facility, carbon finance facility, incentive facility for first movers in industry.		1.625	1.625
International academic exchange programmes , including undergraduate and PhD exchanges and visiting lecture/fellowships are also assumed to be a part of technology related capacity building.		500	500
Total over 5 years	408-465 mln.	5.6 bln.	6.0 bln.
Total per annum	82-93 mln.	1.1 bln.	1.2 bln.

Technology Package 3 - High Ambition

Key assumptions for overall level of mitigation and financing ambition:

- Annex 1 countries agree to an overall 2020 target of a 25-30% reduction below 1990 levels.
- Non-Annex 1 countries agree to a 15-30% deviation below business as usual by 2020.
- LT vision of 60% global reductions by 2050, reviewing in 2015 linked to a 2°C target.
- Financial pledges for mitigation support in developing countries of \$100 bln per annum.

Table 3 *Costs of the high ambition technology package [mln. USD over five year]*

HIGH AMBITION TECHNOLOGY PACKAGE	Operational cost	Additional programme support	Total
New technology executive body under UNFCCC is established and responsible for commissioning global technology roadmaps, review progress and report back to COP. It is run by a centralised secretariat of 30 staff.	34	N/A	34
Technology facility consists of a dedicated fund under UNFCCC with two operating windows, one for supporting RD&D and the other for existing and near market technologies. It is run by its own secretariat of about 250 staff. Operating cost as a percentage of total expenditure is set reasonably low (less than 5%).	310	RD&D Window (USD 50,000)	50.310
Technology component of low carbon growth plan are assumed to be prepared as a part of a single overall process in which developing countries will produce low carbon growth plans, NAMAs and NAPAs. All NAI countries will receive additional financial support (USD 200-500 k per country) to support the technology component of the plans.	29-76 (2-5 years)	N/A	29-76
Technology information platform consists of a database collecting information on sector-specific technologies, best practice dissemination both in the public and private sector, costs of technologies, barriers and manufacturers of technologies.	16	N/A	16
Global technology roadmap would set out the overall trajectory for key technologies' development and deployment and identify milestones and areas for international cooperation. This assumes 20 full-time staff will be working on this throughout two years, and that most underlying data is already available.	4.4 (1-2 years)	N/A	4,4
Matchmaking body for technology transfer consists of a new technology matchmaking service under UNFCCC which would provide an interactive facilitation service for private sector, governments, and multilateral financial institutions in order to deliver actions defined in NAMAs, NAPAs and TNAs.	31-41	N/A	31-41
Network of innovation centres is assumed to focus on near-market and existing technologies. The proposed network consists of, initially, five national or regional centres and supported by a secretariat that maintains global coordination. It provides support on enterprise creation and incubator services; funded mainly by public sector, it mobilises private capital. It also delivers technology-related capacity building through regional hubs and in Asia, Africa, Latin America and the Middle East.	170	2.431	2.601
Cooperative R&D and demonstration is assumed to be delivered through a global partnership of existing R&D institutions in developed and developing countries. This partnership would focus on a portfolio of key technologies to be developed, demonstrated and deployed within a given timeframe. Public-private partnerships would also be encouraged, especially in demonstration and early-deployment stages. Overall 300 staff would run the partnership.	124	1.000	1.124
Enabling environments component draws from a UNEP submission and includes a variety of policy and financial instruments to strengthen enabling environments in developing countries. Policy support include financial innovation support facility, climate policy support, improving energy subsidy frameworks, and energy efficiency standards and labelling. Instruments include SME finance facility, risk mitigation facility, LDC credit facility for climate infrastructure, end-user finance facility, carbon finance facility, incentive facility for first movers in industry.		1.625	1.625
International academic exchange programmes , including undergraduate and PhD exchanges and visiting lecture/fellowships are also assumed to be a part of technology related capacity building.		500	500
Total over 5 years [USD]	718-775 mln.	55.5 bln.	56.3 bln.
Total per annum [USD]	144-155 mln.	11.1 bln.	11.3 bln.

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Cost of technology proposals

This study has grouped the technology related submissions to the UNFCCC and their financial implications into three concrete technology packages. These packages outline different levels of ambition consistent with the potential outcomes in of the COP15 negotiations in Copenhagen, December 2009.

The assessment combines a bottom-up cost assessment of the individual elements with a top-down analysis of the necessary financial support. This approach provides a concrete image of what a potential technology framework in Copenhagen may look like. The study then assesses the current proposals in the negotiating text and translates the often abstract concepts into operational actions. Many of the technology proposals cannot exist as stand-alone measures as they are based on progress in other parts of the negotiations. The plausible packages reflect this interdependency in relation to the overall level of ambition for mitigation and financing.

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