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# Review of the 2008 UNFCCC meeting in Poznań

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ABSTRACT

Technology transfer is a central component in policies and action to prevent dangerous anthropogenic interference with the climate system. Without creation and adoption of suitable environmentally sound technologies it will not be possible to follow the basic principles of sustainable development. Technology transfer was expected to be a major item at the United Nations Climate Change Conference in Poznań, Poland, 1–12 December 2008, but was eclipsed by discussions on Reducing Emissions from Deforestation in Developing Countries. However, agreement was reached on a report from the Global Environment Facility called the 'Poznań strategic programme on technology transfer' outlining proposals to scale-up investment. At the meeting it was not possible to reach agreement on inclusion of carbon capture and storage technology under the clean development mechanism and other areas of unresolved discussion included intellectual property rights and revision of the principle of differentiated responsibility. Side-events to the main meeting provided two important indications of future directions. First, intellectual property rights were discussed at length primarily with the opinion that they were not a major barrier to technology transfer. Second, representatives from the business sector were regarding environmentally sound technologies as an opportunity for economic growth and development.



## 1. Introduction

Policies for sustainable development should enable the needs of the present generation to be met without compromising the ability of future generations to meet their own needs (WCED, 1987). Many of the present generation have an energy-intensive lifestyle based on fossil fuels and if their needs are to be met without increasing emissions of greenhouse gases then policies must promote energy efficiency and renewable energy sources. Creation, adoption and diffusion of environmentally sound technologies (EST) are central to sustainable development and to achieving the objective of Article 2 of the 1994 United Nations Framework Convention on Climate Change (UNFCCC): 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.[1] However, there is disagreement on mechanisms for transfer of ESTs. Developing countries favour direct granting of technologies, whereas developed countries prefer technology markets operating under internationally agreed environmental regulations.

The 14th conference of the parties (CoP14) of the UNFCCC was held in Poznań, Poland from 1–12 December 2008 as part of a United Nations Climate Change Conference which also included meetings of the parties to the Kyoto Protocol (CoP/MoP4) and subsidiary bodies associated with these two main CoPs.[2] In association with the CoP meetings there were hundreds of side-events together with displays of renewable and energy-efficient technologies. In all about 9250 participants attended consisting of 4000 government officials, 4500 members of non-governmental, intergovernmental and UN agencies and 800 media representatives. The Poznań meeting was regarded as a stepping stone between the December 2007 CoP13 in Bali, where a 'roadmap' and action plan was drawn up for future policy beyond 2012 when the Kyoto Protocol expires[3] and the December 2009 CoP15 in Copenhagen where it is anticipated that the Bali roadmap will

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[1] http://unfccc.int/essential_background/convention/background/items/1353.php

[2] http://unfccc.int/meetings/cop_14/items/4481.php, http://www.iisd.ca/climate/cop14/

[3] http://unfccc.int/meetings/cop_13/items/4049.php

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be converted into agreements. As such, the main aims of CoP14 were to develop a 'shared vision' and put in place foundations for agreements on key issues.

Some delegates at the Poznań meeting were calling it the 'Forestry CoP' due to the emphasis on Reducing Emissions from Deforestation in Developing Countries (REDD) policy and practice. Although they act as carbon sinks assimilating atmospheric carbon dioxide, forests are also major contributors to greenhouse emissions through deforestation and degradation. Global deforestation figures are around 7.3 Mha/year (FAO, 2006), representing about 20% of emissions (IPCC, 2007). Scientific evidence demonstrates that increase of woody biomass by photosynthesis and storage of carbon in existing vegetation and soils is a cheap and efficient method of carbon capture. REDD costs depend strongly on land opportunity costs; some studies estimate the lower requirements to address deforestation to be around \$1.74/ton-$CO_2$eq while broader implementation of REDD may imply costs as high as \$27.2 to \$100/ton-$CO_2$eq (Wertz-Kanounnikoff, 2008; Karousakis and Corfee-Morlot, 2007). The debate continues over activities (conservation, enhancement, reduced emissions, sustainable forest management), financial architecture (market based, fund or mixed) and instruments (national or sub-national approach; historical baseline, expected emissions) by which REDD could be effectively implemented.

Carbon capture and storage (CCS) technology as a potential option for funding under the clean development mechanism (CDM) was discussed, but made little head way.[4] There are two main problems with a technical solution to carbon capture. First, it does not offer a 'win–win' opportunity of combining socio-economic development with reduction of greenhouse gases and it requires continued commitment from the host country to operate. If natural vegetation is used for carbon capture under a REDD policy, then a payment system can be devised that transfers funding from Annex I industrialised countries to developing countries for sustainable forest management. This has the potential for helping to meet both environmental and social objectives, such as biodiversity conservation, sustainable natural resource utilisation and poverty alleviation, under a single policy by creating a market for the ecosystem goods and services being managed by poor rural people. Second, a technical solution to carbon capture offers little additional benefit other than the construction costs for a facility to enable removal of greenhouse gases and the host country is left with the liability of long-term running and maintenance.

The technology transfer debate was dominated by the G77-China[5] who essentially preferred a 'business as usual' approach based on existing UNFCCC technology transfer agreements.[6] This requires developed countries to provide assistance for transfer of environmentally sound technologies. G77-China would like funding to cover all stages of the technology development cycle and include exemptions from patenting. Ultimately the only effective decision at the CoP on technology transfer was the 'Poznań Strategic Programme on Technology Transfer' which essentially mandates the parties to continued funding of the Global Environment Facility's (GEF) role.[7] The debate on technology transfer also included discussion on three issues. The first, proposed by China, was that the funding proposed was insufficient to meet the goals of the programme. The second, supported by the industrialised countries and opposed by the developing countries, was that contribution of financial resources should be based on the principles of 'effectiveness, efficiency and equity' (European Union) and 'polluter pays' (Japan), in other words the industrialising developing countries should have some commitments. The third area of contention was over intellectual property rights (IPR). On one hand, the industrialised countries generally supported IPR protection under present international trade-related agreements as these create part of the necessary conditions for private sector investment in EST. On the other hand, the G77-China perceived IPRs as a barrier to technology transfer and the Republic of Korea suggested that IPR regimes require fundamental change.

In this article we examine two areas of the technology transfer raised at the Poznań meeting. First, we will briefly review the GEF report which was adopted as the 'Poznań strategic programme on technology transfer', in particular focusing on the gaps identified by the report. Second, we will examine the debate on IPRs. This was a topic covered in detail in several of the side-events with some participants suggesting that IPRs are not as significant a barrier to technology transfer as often envisaged. Finally, we will examine the role of the private sector in developing and diffusing EST innovations through market mechanisms and the role of environmental regulation. We will suggest that discussions at the Poznań meeting lend support to the 'Porter Hypothesis' (Porter and van der Linde, 1995) which argues that environmental regulation can stimulate industrial competitiveness and can create markets for the spread of environmentally sound technologies. If this is the case then well-designed environmental standards can trigger innovation that may partially or more than fully offset the costs of compliance.

## 2. Poznań Strategic Programme on Technology Transfer

The Poznań Strategic Programme on Technology Transfer was one of the few substantive decisions made at CoP14. The primary focus of the programme is to scale-up investment in technology transfer through existing GEF processes. If developing countries can be assisted through a "development dividend" (Forsyth, 2007) enabled by the transfer of environmentally sound technologies, then two major objectives of the UNFCCC can be met. The first is to avoid dangerous anthropogenic interference with the Earth's climate system; the second is the need for developing countries to achieve sustained economic growth and eradication of poverty (UNFCCC, 1992). But, 16 years after the UNFCCC was originally signed and the original technology transfer process envisaged, the potential has yet to be realised and we are still far from an effective mechanism (Thorne, 2008; Forsyth, 2005). The Poznań Strategic Programme is thus more interesting for the gaps identified by the report rather than components which strengthen existing institutions.

This leads to the second significant aspect of the programme: the need to leverage private sector investment and promote innovative project development activities. Parties at CoP14 recognised the requirement for greater funding for the technology transfer programme to the extent that the G77-China made a call for developed countries to set aside 1% of their gross national product to finance projects to transfer EST to developing countries. To put this into perspective, the UNFCCC council agreed \$35 million to support recommendations of the GEF report. In total the GEF has contributed \$2.5 billion of direct financing over 17 years of existence with an additional \$15 billion in leveraged co-financing. One percent of annual global domestic product amounts to about \$545 billion. Amongst the developing countries, if China took a lead, then 1% of China's annual gross domestic product alone is \$32.8 billion.

The Poznań Strategic Programme report identifies four gaps in GEF support for technology transfer so far. These are stated as: (1)

[4] FCCC/SBSTA/2008/L.21.
[5] http://www.g77.org/
[6] Article 4 of the UNFCCC.
[7] FCCC/SBI/2008/16.

the weak link between GEF project development, Technology Needs Assessments (TNAs)[8] and national communications; (2) lack of adequate reporting and knowledge management on technology transfer activities; (3) an uneven engagement with the private sector; and (4) the limited synergy with the carbon market. The detailed accounts of these gaps make salutary reading. Few countries are developing projects based on their TNA reports and there is little systematic reporting by the GEF on its technology transfer activities. Engagement with the private sector is described as 'haphazard'. A public–private-partnership initiative, called the Earth Fund, was launched at the 2007 UNFCCC Bali meeting together with the International Finance Corporation (IFC) contributing $10 million and the GEF contributing $50 million, however these amounts are small compared to the levels required to make a global impact.

The Clean Development Mechanism (CDM) carbon market established under the Kyoto Protocol is a major source of funding for technology transfer, but there is limited synergy between GEF technology transfer activities and CDM projects. The scale of difference between initiatives such as the Earth Fund and the carbon market is staggering. In 2007, the carbon market was valued at $60 billion of which CDM accounts for $5 billion.[9] However, the Clean Development Mechanism is regarded as being overly bureaucratic with high transaction costs (Forsyth, 2005). As a result, the CDM has favoured countries with the expertise to absorb large projects such as those in Asia, whilst other areas in much greater need of development investment, such as Africa, have received little help.

## 3. Intellectual property rights: are they a barrier?

The current UNFCCC approach is for developed countries producing environmentally sound technologies to hand them over to developing countries in line with the principle of common but differentiated responsibilities. This principle is based on the premise that globally we have common aims for climate stabilization and poverty alleviation, but the richer industrialised countries, who are historically the main greenhouse gas emitters, should shoulder the burden thereby allowing poorer countries to develop economically. This principle is being questioned for several reasons. First, many countries defined as 'developing' under the UNFCCC agreements are now themselves major industrial greenhouse gas emitters. Second, it is being argued that open distribution of ESTs is not the best way to stimulate novel technologies. An inventor needs protection of intellectual property rights so that they can reap the benefits of their ingenuity and be able to disseminate their knowledge widely. For some it may be sufficient to have grateful future generations, but most need returns now, both for themselves and business shareholders. Third, arguably the most industrially developed of developing countries, such as those in the top 20 of global gross domestic product for example China, Brazil, India, Mexico and Indonesia, are in an economic position to adopt environmentally sound technologies without the need for special measures. Fourth, there is evidence that well-designed environmental regulation can foster innovation and international competitiveness rather than hampering it (Porter and van der Linde, 1995). While inflicting costs on certain industries in the short term, it can stimulate resource productivity in those industries making them more competitive in the longer run and lead to further expansion of the industry for environmentally sound and energy-efficient technologies (Constantini and Crespi, 2008). Differentiated standards can thus have a negative effect on those countries that do not need to comply.

Transfer of innovations occurs in five stages: importation, absorption, assimilation, improvement and self-development (Krabbendam et al., in press). Lax intellectual property rights were a feature of the assimilation and improvement stage of technological development of countries such as the Republic of Korea and Taiwan, but these countries are now tightening IPRs as they develop their own innovations (Lall, 2003). China, which produces one million engineering graduates a year and experiencing rapid industrial growth, is moving quickly towards the same position as its neighbours. Interestingly, the level of technological development of these countries was not reflected in their stance on IPRs at the Poznań meeting. The Ambassador for the Republic of Korea spoke eloquently about the need to share publicly funded research on ESTs and called for a fundamental change in the IPR regime. The G77-China emphasised IPRs as a barrier to technology transfer and drew parallels with exemptions on IPRs in the public health sector such as bypassing patents on HIV/AIDS drugs protected by the TRIPS agreement[10] to produce cheaper generic copies. However, a review of the literature indicates that the role of IPRs in technology transfer is far from clear cut and depends very much on individual countries; with good IPR protection benefiting low- and high-income countries, but not middle-income countries (Falvey et al., 2006a, b).

Several side-events at the meeting discussed IPRs at some length. The opinion was expressed that IPRs can enhance transfer through knowledge spill-overs, legal copying and reverse engineering. There are also large volumes of transfer through licensing and trade. Moreover, participants in the side-events emphasised that the role of IPRs in facilitating transfer of EST and medicines were completely different. Technologies for energy efficiency and renewables were usually complex and diverse and might contain many IPRs, in marked contrast to patent protection for a specific medical drug. There is also sufficient flexibility within the TRIPS agreement for relaxation of patents relating to public health[11] (Abbott, 2002). However, several sessions also made the point that access of developing countries to more advanced technologies may pose a problem as effective transfer hinges upon a multi-faceted process of technological learning, a process which developing countries can often only start when the relatively mature technology is put into the market. There is a complex relationship between access to the knowledge that underlies ESTs, the associated impact on development of new technological capacity, and the necessity of this to ensure technology diffusion.[12]

Cases of IPRs being a barrier to transfer of ESTs appear to be few and far between. The Ambassador of the Republic of Korea sat on the panel of a side-event on IPRs organised by the United Nations Industrial Development Organisation (UNIDO). At the event he asked the audience if anyone could give examples of IPRs being a barrier to technology transfer. No-one in the meeting replied, so the Ambassador gave two examples. The first concerned the impact of the 1987 Montreal Protocol on chloro-

[8] The GEF has funded TNAs for more than 90 developing countries and 50 TNAs are available on the UNFCCC website.

[9] http://unfccc.int/files/press/news_room/statements/application/pdf/080220_speech_monaco.pdf

[10] Trade-Related Aspects of Intellectual Property Rights signed in Marrakesh, Morocco on 15 April 1994.

[11] The 2001 WTO Doha Declaration affirms that "the TRIPS Agreement does not and should not prevent Members from taking measures to protect public health". http://www.who.int/medicines/areas/policy/doha_declaration/en/index.html

[12] http://www.sussex.ac.uk/sussexenergygroup/documents/ockwell_et_al_-conflicting_discourses_of_dev_diffusion.pdf.

fluorocarbon (CFC) use in Korea, forcing it to use more expensive hydrofluorocarbons (HFC) protected by patents.[13] The second concerned prevention of access by Toyota to US publicly funded energy efficiency research on the grounds that they were a 'foreign' firm even though they were manufacturing in the US.

Ideally, environmentally sound technologies should be sufficiently attractive and competitive to diffuse in the open market. After all, who would want to install an outdated polluting system when a cleaner more efficient product is available? The problem of ESTs take-up is three-fold. First, old plant is costly to replace. Second, it is often cheaper to install existing well-known technologies, both in terms of capital costs and in availability of builders and operators. Third, if IPR protection is inadequate, then foreign enterprises do not locate up-to-date technology in case it is misappropriated, as has been reported for China (Falvey et al., 2006a). Uptake of ESTs is thus context specific and dependant on many factors (Ockwell et al., 2008).

## 4. Private sector activities working with environmental regulation

Failure of the UNFCCC to stimulate private or private–public agreements for technology transfer does not mean that such initiatives are not being developed parallel to UNFCCC actions. Whilst disagreement over differentiated responsibilities and relaxation of IPRs might seem intractable, there is evidence of major changes behind the scenes. Many local actions have been taken in the US, despite not ratifying the Kyoto Protocol. Side-events at the meeting organised by industry described how businesses are no longer seeing action on climate change as a cost, but as a major opportunity with implementation of environmental standards leading to innovation and gains in competitiveness. For example, Philips is diffusing energy-efficient lighting in developing countries and considers appropriate environmental regulation as a key success factor. During the Poznań meeting the decision was made by the EU to phase out incandescent light bulbs in favour of compact fluorescent lights (CFL) by 2012 with the aim of cutting annual carbon emissions by 15 million tonnes[14] and opening a huge market for CFL manufacturers. Cities, such as Portland, Oregon, have been making major strides towards energy efficiency over the last decade and President Obama pledged to improve energy use in federal buildings. Similar action is being taken in China: a presentation by ARUP in a parallel Energy Event discussed planning and construction on sustainable energy and water efficient cities in China, such as the Dongtan eco-city.[15]

## 5. Conclusions

The Poznań meeting reaffirmed importance of concerted international effort on climate change. The Prime Minister of Sweden said the world has the economic and technical capability to mitigate climate change and the EU highlighted linkages between climate change, biodiversity, poverty and inequality. There was positive discussion on simplifying the CDM and increasing the geographical distribution of the funds, especially to Africa; and the parties agreed to continue to support the GEF's role in technology transfer.

The parties did not agree on a number of issues. For example, carbon capture and storage technology was not made eligible for CDM funds. Changes in IPR regimes to make environmentally sound technology more readily available to developing countries were an area of contention, as was the revision of the principle of differentiation between developed and developing countries. This latter point has always been particularly problematic: it was central to the 1997 Byrd-Hagel resolution in the United States senate which prevented the US from ratifying the Kyoto Protocol.[16] Ironically, some delegates expressed concern that China was moving into the 'American position' of using the need for economic growth to prevent any serious discussion on positive engagement for reducing national GHG emissions.

However, presentations in the side-events paint a different picture. Environmental standards do not prevent countries from being internationally competitive and IPR are not thought to be an insurmountable barrier to technology transfer. Instead, as has been hypothesized by Porter and van der Linde (1995), the numerous initiatives and companies active parallel to UNFCCC shows that appropriately designed international environmental agreements can trigger innovation that may partially or more than fully offset the costs of complying with them.

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[13] The ambassador said that Korea invested $10 million in alternatives to CFCs, but did not use this technology because HFCs became cheaper once Korea's own technology was developed. Whilst worldwide CFC production has dropped from 1,072,295 metric tonnes in 1986 to 33,274 metric tonnes in 2006, Korea's production increased from 1406 to 4601 metric tonnes over the same period. Data from the United National Environment Programme.

[14] http://www.eubusiness.com/news-eu/1228761122.39/

[15] http://www.arup.com/eastasia/project.cfm?pageid=7047

[16] http://www.nationalcenter.org/KyotoSenate.html

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