

Technology Transfer for Climate Change

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Climate governance at all levels, from local to international, must be designed to promote technology innovation and to ensure fast and fair dispersion of new technologies. The governments that signed on to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol recognize the vital importance of technology. They also recognize that industrial countries need to provide funding for climate-friendly technologies, which ultimately are the key to avoiding dangerous levels of climate change due to human activities.¹

A technology needs assessment done by the UNFCCC identified many advanced technologies that can simultaneously reduce greenhouse gases (GHGs), increase profits, and create jobs. The benefits of these are particularly important for the developing world. Many of these technologies already exist and simply need to be deployed effectively. They include technologies:

- to use renewable energy sources;
- to improve energy efficiency in key sectors (cement, aluminum, steel, and other industries, along with transport, building, and consumer sectors);
- to recover or prevent methane emissions, fluorine gases, and other greenhouse gases beyond carbon dioxide (CO₂);

- to improve forest and soil management; and
- to adapt to climate change.

In addition, numerous technologies are currently in development, ranging from those in the research phase to those ready for demonstration and accelerated commercialization.²

Technology transfer has three key components: capital goods and equipment, skill and know-how for operating and maintaining equipment, and knowledge and expertise for generating and managing technological change. Since 1991 various institutions and funding mechanisms have successfully promoted technology transfer to developing countries—including the Global Environment Facility, the Special Climate Change Fund and the Least Developed Countries Fund of the UNFCCC, the Multilateral Fund (MLF) of the Montreal Protocol on Substances that Deplete the Ozone Layer, the World Bank, regional development banks, international partnerships, national development assistance programs, and non-governmental organizations. The Clean Development Mechanism (CDM) of the Kyoto Protocol has also played a part.³

The Montreal Protocol's MLF is widely acclaimed as having been particularly successful at helping developing countries meet scheduled reduction targets for the 97 ozone-depleting substances that had to be phased out. These substances are also powerful greenhouse gases, so phasing them out will mitigate climate change by 11 billion

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tons of CO₂-equivalent a year between 1990 and 2010. Because ozone-depleting substances are covered under the Montreal Protocol, they were not addressed in the Kyoto Protocol.⁴

Despite ongoing efforts since 1995, however, governments have been unable to agree on a technology transfer mechanism to address climate-specific emissions. In December 2007, at a Conference of the Parties to the UNFCCC, they laid out guidelines for revising the Kyoto Protocol in the Bali Action Plan, with the goal of finalizing agreement at a meeting in Copenhagen in December 2009. Several primary points of disagreement remain to be negotiated. (See Box.)⁵

Intellectual property rights (IPR) remain a contentious topic. For many years industrial countries have viewed IPR as essential for promoting innovation, while developing countries have viewed them as a hindrance to the transfer of critical technologies. In the last 20 years, however, many developing countries have achieved impressive economic progress and have been attracting foreign investment by creating a stable and enabling economic environment at the domestic level. These countries increasingly have access to technologies from anywhere in the globe. In fact, globalization favors developing-country production of many of the most advanced technology products, such as photovoltaic cells.

The 193 Parties to the Montreal Protocol found that most of the technologies needed to phase out the use of ozone-depleting substances were already in the public domain. Of the few technologies covered by IPR, most were owned by private businesses operating in a competitive market and eager to sell those rights on reasonable terms. In only two cases out of more than 4,000 projects were technologies held by companies that insisted on unreasonable conditions. In

both cases developing-country enterprises came up with their own processes in order to avoid paying licensing fees or meeting conditions they considered unacceptable. The lesson repeated over and over again is that IPR did not present a barrier to immediate action under that regime.⁶

Nonetheless, cases may arise where useful IPR-protected technologies are owned by only a few companies, operating in a less competitive market, that refuse to sell the technology unless monopoly profits are paid. Other cases where a premium may be demanded might include sales to buyers in developing countries deemed to have extensive internal problems or in markets that are too small for substantial investment. In such cases, industrial countries may need to apply political pressure on their domestic industries to share the technologies. They may also need to relax their IPR regime, as they have already done for essential medicines under the Trade-Related Intellectual Property Rights regime. But the bottom line is that IPR may not be a difficult problem in the vast majority of cases, nor a barrier to immediate significant action.

Funding is another area where a few key changes could overcome the current stalemate. The various climate funds for technology transfer are all voluntary, which makes funding highly unpredictable. This is not acceptable for near-term mitigation programs needed to avoid passing tipping points for abrupt climate changes, nor is it acceptable for the medium-term or long-term and larger-scale programs required. The voluntary nature also gives effective control to the donors, whatever the governing structure.

Committed contributions are needed to create trust among developing countries. A formula for the percentage to be paid by each donor should be agreed upon in advance. The ratio of state contributions to the United

Nations is a time-tested model.

Funding needs to be committed for as long as it takes to reduce emissions and enhance sinks to avoid dangerous anthropogenic interference with the climate system. Because it often takes practical experience to gain an understanding of actual costs, funding commitments need to be reassessed every few years, as is done in the Montreal Protocol's MLF, which is replenished in three-year cycles. Similarly, governing bodies need to include equitable representation from all countries, both industrial and developing. A double majority, consisting of a majority of both donor and recipient countries, works well for the MLF and ensures transparency.⁷

The UNFCCC Secretariat estimates that more than \$200 billion will be needed annually to bring about a 25-percent reduction in global greenhouse gas emissions by 2030. Developing countries will need 35–40 percent of this total, or up to \$80 billion a year.

In addition, adapting to climate change may cost \$35–60 billion a year for developing countries. While this amount may seem large, it represents only about 1.5 percent of total global investment projected for the year 2030.⁸

The actual amount needed for funding on climate change cannot be calculated, even in the short term, until it is clear which items will be paid for as grants and which will be concessional loans, loan guarantees, market borrowings, the stock market, the CDM, and so on. Once this is known, it will be necessary to develop an indicative list of agreed incremental costs, as was done by the MLF. When the final numbers are uncertain, it is prudent to start funding and then to later replenish with additional amounts needed to achieve environment goals once recipient institutions prove that investments are cost-effective.

Funds must not only be predictable; they must be adequate. What is adequate

Government Positions on Key Issues in Revision of Kyoto Protocol

On commitments by developing countries to reduce GHG emissions

- Developing countries prefer the status quo and do not want to make additional commitments beyond those that apply to all parties under Article 4.
- Industrial countries maintain that “major and emerging economies” should commit to goals.

On technologies

- Developing countries want industrial countries to assure transfer of technologies (and meet incremental transfer costs through a financial mechanism) and to relax intellectual property rights on privately owned technology if needed.
- Industrial countries want intellectual property protection to continue under the current Trade-Related Intellectual Property Rights regime. They maintain that an enabling environment in developing countries will attract technologies via markets.

On a funding mechanism

- Developing countries call for a new mechanism modeled on the Montreal Protocol's highly successful MLF (committed funding by industrial countries to meet all agreed incremental costs, including cost of technologies, capacity building, and conversion of facilities).
- Industrial countries prefer existing mechanisms, with voluntary funding to be enhanced.

On the governance structure

- Developing countries want assurance of equitable representation in governance.

depends on the climate goals of the beneficiaries and the specific national actions they intend to achieve them. Options include overall emissions-reduction goals, sector-specific goals, or mitigation activity goals. They can be long-term, medium-term, or short-term. The goals will have to be worked out by each country. Most developing countries are already taking up mitigation activities on their own because of the many strong co-benefits. However, they are reluctant to commit themselves—especially to “stretch goals”—unless they are sure that they will get the technologies and funding needed.

In addition, goals can be mandatory or voluntary. They can be a part of an amended Kyoto Protocol or can be included in a new agreement with a new funding mechanism. In the Montreal Protocol, many developing countries agreed to phase out ozone-depleting substances in advance of the prescribed schedule in return for access to additional MLF funding.

Country goals are essential for all developing nations, not just the major or emerging economies. Climate change cannot be solved without the participation of all countries, industrial and developing. While the “biggest bang for the buck” can be achieved if the focus is on major or emerging economies, the other developing countries are also investing in infrastructure for economic progress. If they are ignored, their emissions will reduce the achievements of others. Also, some energy-inefficient industries might migrate to countries that do not have tough regulations or other programs to mitigate climate change. Including every country in the mitigation activities is the best way to

ensure a decrease in GHG emissions—and to guard against an increase.

But there may be some latitude for differentiation among developing-country groups. Industrial countries proposed that wealthier developing countries not receive assistance from any climate fund, even where they agree to accept mandatory targets. This approach was argued during the Montreal Protocol negotiations as well. That treaty ended up prescribing that developing countries with per capita consumption of ozone-depleting substances greater than the prescribed limits be treated on a par with industrial countries. A similar arrangement may be appropriate for addressing climate change.⁹

An upside of all these considerations for implementing technology transfer is that developing countries can start with modest initial investment goals and then strengthen these over time. With more confidence in the system, recipient countries will come forward with stiffer goals and donors may in turn provide more funds. Rather than let the quest for the perfect become the enemy of the effective, it will be better to implement a system capable of progress in the near term and of being strengthened over time. This has been the Montreal Protocol’s successful approach: “start and strengthen.” Hence the UNFCCC should agree immediately on goals and committed funding and then start negotiating on the few remaining contentious details so that governments can arrive at a functional solution in 2009. Overall, the path forward should aim to start now where consensus exists and then strengthen investments in technology transfer as further agreement is reached.

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