

# Technology Transfer in the International Climate Negotiations – The State of Play and Suggestions for the Way Forward

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*Facilitating the transfer of climate technologies is one of the main elements of the ongoing climate change negotiations. Despite limited progress overall during COP 15 in Copenhagen, clear progress has been made on the issue of technology transfer. Challenging issues remain for future negotiations, but consensus is evident on several important features, including the establishment of a technology mechanism and a new green climate fund. This article assesses the current state of the technology negotiations and draws lessons from experience and the academic literature to provide recommendations for the implementation of these proposed, new institutional mechanisms.*

## I. Introduction

Technology transfer is an important part of current international climate change negotiations under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC). A focus on transferring technology to developing countries was included in the so-called Bali Action Plan (BAP)<sup>1</sup> by the 13<sup>th</sup> Conference of the Parties to the UNFCCC in 2007 in Bali. The BAP set out a two-year path for negotiations through the 15<sup>th</sup> Conference of the Parties to the UNFCCC (COP 15) in 2009 in Copenhagen in order to forge a climate agree-

ment to follow the Kyoto Protocol. Technology transfer formed one of the four “building blocks” of the BAP to establish a new international climate framework. Despite the intentions of the BAP, COP 15 in Copenhagen did not manage to conclude the overall negotiations process by completing a binding and ambitious international climate change agreement. What did come out of Copenhagen, however, is the non-legally-binding and non-consensual Copenhagen Accord,<sup>2</sup> as well as a number of more or less advanced negotiation drafts on specific sub-issues, and a number of technical decisions on the improvement of existing mechanisms and structures. In addition, the mandate of the Ad-Hoc Working Group on Long-Term Cooperative Action (AWG-LCA), which is, inter alia, responsible for conducting the negotiations on technology transfer, has been prolonged until COP 16, to be held in late November and early December 2010 in Mexico.<sup>3</sup>

In part, the BAP placed specific emphasis on technology transfer, because developed countries have related legal obligations, as set forth in Art. 4.5 UNFCCC, to “promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies and know-how to other Parties”. Despite the fact that the Copenhagen negotiations did not result in a legally-binding agreement, it is likely that the technology negotia-

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1 Decision 1/CP.13, Bali Action Plan, UN Doc. FCCC/CP/2007/6/Add.1\*, 14 March 2008.

2 Draft Decision-/CP.15, Proposal by the President, Copenhagen Accord, UN Doc. FCCC/CP/2009/L.7, 18 December 2009.

3 See the overview of the decisions taken by COP15 available on the Internet at <unfccc.int/meetings/cop\_15/items/5257.php> (last accessed on 20 February 2010).

tions will continue in some form. The fact that the Copenhagen Accord contains passages that have importance for technology transfer, including a reference to a technology mechanism, also points in this direction. Analyzing the outcomes of the negotiations in Copenhagen and discussing options for filling the remaining gaps is, therefore, an important and useful undertaking, which will help inform negotiations in 2010 and beyond. The following article seeks to make this contribution by analyzing the outcomes from Copenhagen concerning the “Technology Mechanism” mentioned in the Copenhagen Accord, as well as other governance issues, and developing recommendations on how to approach some of the outstanding issues.<sup>4</sup>

The international climate negotiations on technology transfer are based on a broad understanding of the phrase itself. The Intergovernmental Panel on Climate Change defines technology transfer as a “broad set of processes covering the flows of know-how, experience and equipment for mitigating and adapting to climate change amongst different stakeholders such as governments, private sector entities, financial institutions, NGOs and research/education institutions.”<sup>5</sup> The first climate change negotiations took place in the early 1990s and were intricately linked with broader discussions of equity and sustainable economic development. At that time, the technological and economic position of a small number of developed countries – included in Annexes I and II of the UNFCCC – vis-à-vis the rest of the world was marked by comparative dominance. These developed countries made up what was termed the “global North” and all other countries – regardless of geography – made up the “global South.” In the early 1990s, negotiators operated under the working assumption that countries of the North would maintain their position of technological dominance and that technology transfer would be overwhelmingly dominated by the transfer of technology from North to South. Even though, by and large, players from the developed world still tend to dominate global markets, the economic and technological situation at the beginning of 2010 looks rather different from the early 1990s. New economic powers are emerging, and several of these countries (i.e. China, India, Brazil, and South Africa) also played a leading role in crafting the Copenhagen Accord itself. Technology transfer is no longer solely a North-South issue. However, at the political level, technology transfer is still mainly

framed as a North-South issue and for the purposes of this article attention will be paid only to technology transfer as it is considered in the negotiations themselves.

When considering the technology negotiations under the UNFCCC, it is important to note that the public and the private sector occupy different and – optimally – complementary positions in the field of climate technology. While nation-states, as Parties to the UNFCCC and the Kyoto Protocol, negotiate agreements on technology transfer, set goals for technology support, etc., private enterprises are currently the primary holders and developers of climate technologies. It is important to keep the roles and limitations of different actors in mind when dealing with what may be expected from the negotiations.

The following article first provides an overview of the technology segment of the international climate negotiations, focusing, in particular, on the outcome of Copenhagen (Section 2). Subsequently, we discuss – against the Copenhagen Accord’s reference to a Green Climate Fund – the lessons to be learnt for establishing a new fund by examining existing institutions in the climate field, namely the Global Environmental Facility (GEF), the World Bank’s Clean Technology Fund, and the Multilateral Fund under the Montreal Protocol. Moreover, we also draw lessons from the academic literature concerning the most appropriate set-up of a technology mechanism (Section 3). A final section presents overall conclusions (Section 4).

## II. Technology Transfer in the Climate Negotiations

As is well-known, the Copenhagen negotiations have not produced a new or modified post-2012 international climate change agreement. The Copenhagen Accord, the central document coming out of the Copenhagen negotiations, is non-binding and non-consensual, having only been taken note

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4 For reasons of limited space, other equally important issues, e.g. the role of intellectual property in climate-related technology transfer or rules on compliance will not be discussed.

5 Intergovernmental Panel on Climate Change, *IPCC Special Report: Methodological and Technological Issues in Technology Transfer – Summary for Policymakers*, 2000, available on the Internet at <[www.ipcc.ch/pdf/special-reports/spm/srftt-en.pdf](http://www.ipcc.ch/pdf/special-reports/spm/srftt-en.pdf)> (last accessed on 20 February 2010).

of by Parties in Copenhagen. Moreover, it is brief and, therefore, does not contain detailed rules or provide decisions on many of the outstanding issues under negotiation. Concerning technology, it states only the following:

*In order to enhance action on development and transfer of technology we decide to establish a Technology Mechanism to accelerate technology development and transfer in support of action on adaptation and mitigation that will be guided by a country-driven approach and be based on national circumstances and priorities.*

The Copenhagen Accord also provides for scaled-up funding for developing countries, in order to support enhanced action on mitigation, adaptation, technology development and transfer, and capacity-building. This money is to be disbursed through a Copenhagen Green Climate Fund; no details are mentioned with regard to the set-up, eligibility criteria, and operating procedures for that fund, however. The results of the technology negotiations, as reflected in the Copenhagen Accord, are, thus, limited at present.

At the same time, a quite advanced draft on technology-related rules in a future agreement resulted from the negotiations under the auspices of the AWG-LCA.<sup>6</sup> The latest negotiation draft, the December 15<sup>th</sup> version of the AWG-LCA negotiating text, reflects consensus among Parties on several key issues. While this is certainly a significant step forward, it is also worth noting that the areas where the current draft reflects consensus are also the ones where consensus was relatively easy to find. Challenging issues – financing, intellectual property, measurement, reporting and verification (MRV), and compliance – have not yet been settled.

A central element of the draft is rules on the establishment of a technology mechanism. According to the draft, this mechanism is to be composed of a Technology Executive Committee and a Climate Technology Centre, including a Climate Technology Network. While the draft specifies the responsibilities and tasks of different parts of the technology mechanism, it provides for, but says little about, the relationships between them, nor does

it provide sufficient detail concerning the set-up of the institutions, membership, or modes of establishment.

According to the draft, the different parts of the technology mechanism will have the following functions:

- The main functions of the *Technology Executive Committee* will be, inter alia, to: deliver analysis and policy advice on relevant issues; prepare criteria on which mitigation or adaptation activities undertaken by non-Annex 1 countries should receive support; cooperate with other technology bodies and initiatives; facilitate the development of technology planning; monitor and assess technology-related action and the requisite financing for such actions (in line with rules on measurement, reporting, and verification that are yet to be determined); and promote collaboration on technology. Cooperation is encouraged between the UNFCCC and other technology initiatives, between stakeholders and governments, as well as between the public and the private sector.
- The *Climate Technology Centre* is tasked with: providing advice to developing country Parties on technology needs and implementation of technology practices; improving access to information on available technologies; engaging in capacity-building; and developing tools for country-based technology planning.
- The *Climate Technology Network* is envisaged by the draft as a mechanism for harnessing the expertise of technology bodies, stakeholders, and experts and facilitating cooperation between them. The Network is charged with facilitating public-private partnerships and with providing in-country technical assistance and training. The Network is subordinate to the Centre, which may entrust it with additional tasks.

The position of the proposed technology mechanism in the overall UNFCCC framework is left open. The passage of the draft according to which the mechanism is “under the authority and guidance of, and accountable to, the Conference of the Parties” is still in square brackets, marking a point of continued disagreement between negotiators. While the latest negotiating draft and the Copenhagen Accord provide some direction for technology transfer, negotiators will still have to agree on details – even where consensus already exists.

<sup>6</sup> Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention – Draft Conclusions proposed by the Chair, UN Doc. FCCC/AWGLCA/2009/L.7/Add.3,15 December 2009.

### III. Assessment of the Copenhagen Outcome and Lessons for Future Negotiations

In the following section, the technology-related outcomes of the Copenhagen Accord (specifically the formation of a new Climate Fund and the proposed technology mechanism) are assessed from an institutional point of view and considerations are provided for the negotiations in 2010 leading to COP 16 in Mexico.

#### 1. The Copenhagen Green Climate Fund – Lessons from Existing Funds

As described above, the Copenhagen Accord provides for the establishment of a Green Climate Fund. While this fund is not dedicated specifically to technology, the details of its operations have not been spelt out yet and it is not clear if the Copenhagen Accord will guide the future negotiations process. Therefore, it is a useful exercise to take a look at already existing funds in the climate field in order to develop a sense of which design aspects may smooth the functioning of a new fund and which may not. In the following, we evaluate the performance of the Global Environment Facility, the World Bank's Climate Investment Funds (particularly the Clean Technology Fund), and the Montreal Protocol's Multilateral Fund, and drawing from the respective experiences of the funds we highlight key lessons for negotiators.

##### a. The Global Environment Facility

The Global Environment Facility (GEF) was created in 1991 as an interagency partnership between the United Nations Environment Programme, United Nations Development Programme, and the World Bank. It is charged with providing financial and technical support to developing countries that have ratified global environmental conventions. Grant funding is provided for projects that enable developing countries to meet the objectives of the conventions.<sup>7</sup> Climate change projects make up the second largest group of GEF-funded projects after biodiversity.<sup>8</sup> As the financing mechanism for the UNFCCC,<sup>9</sup> the GEF follows guidance given by the UNFCCC's Conference of the Parties (COP) with

respect to policy, program priorities, and eligibility criteria related to the Convention.<sup>10</sup> Every four years, funding is contributed by donor countries to the GEF Trust Fund through the GEF replenishment process.<sup>11</sup>

In the beginning, developing countries strongly opposed the GEF and demanded changes in its governing structure and operational principles. Agreement on its structure was eventually reached after years of negotiations between donor and developing countries.<sup>12</sup> The GEF's main governing body, the GEF Council, consists of representatives from developing countries (16 members), developed countries (14 members), and two members from countries with economies in transition. Decisions are made by consensus.<sup>13</sup> Civil society is involved in the GEF's decision-making and project and program implementation through NGO participation in GEF NGO Consultations and Council Meetings. Here, NGOs put forward concerns and positions and make interventions as observers. Roughly 600 NGOs are currently accredited to the GEF.<sup>14</sup> Scientific and technical advice is provided by the Scientific and Technical Advisory Panel (STAP).<sup>15</sup>

To date, the GEF is by far the most significant funding mechanism focusing on the acceleration of the development of climate-friendly technologies in

7 Global Environment Facility (GEF), 2010, available on the Internet at <[www.gefweb.org](http://www.gefweb.org)> (last accessed on 20 February 2010).

8 Ibid.

9 The relationship between the Conference of Parties to the UNFCCC and the GEF Council was agreed in a memorandum of understanding (MOU) between the COP and the GEF Council (see UNFCCC Decision 12/CP.2 and Decision 12/CP.3) in accordance with Article 11.1 of the Convention, which defines "a mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology." Through the MOU, the GEF is entrusted with the operation of such a mechanism.

10 Decision 12/CP.2, Memorandum of Understanding between the Conference of the Parties and the Council of the Global Environment Facility, UN Doc. FCCC/CP/1996/15/Add.1, 29 October 2006.

11 Global Environment Facility (GEF), 2010, available on the Internet at <[www.gefcountrysupport.org](http://www.gefcountrysupport.org)> (last accessed on 20 February 2010).

12 Gareth Porter et. al., *New Finance for Climate Change and the Environment*, 2008, at 13, available on the Internet at: <[www.odi.org.uk/resources/download/2980.pdf](http://www.odi.org.uk/resources/download/2980.pdf)> (last accessed on 20 October 2010).

13 Global Environment Facility, *supra*, note 7.

14 Heinrich Böll Stiftung and Overseas Development Institute, "Climate Funds Update", 2010, available on the Internet at <[www.climatefundsupdate.org](http://www.climatefundsupdate.org)> (last accessed on 20 February 2010).

15 Global Environment Facility, *supra*, note 7.

developing countries.<sup>16</sup> Since its inception in 1991, \$2.5 billion have been allocated for climate-friendly technologies in more than 50 developing countries, leveraging roughly \$15 billion in co-financing, according to estimates. Each year, \$250 million are invested in projects in the areas of energy efficiency, renewable energy, low-carbon energy-generating technologies, and sustainable urban transport.<sup>17</sup>

Even though it is difficult to make any overarching claims with respect to the GEF's effectiveness, it clearly offers a number of benefits: Its framework makes collaboration between donor and developing countries and among different multilateral institutions possible. Its Secretariat reviews funding approaches without commercial considerations, and it delivers scientifically based policy guidance.<sup>18</sup> With respect to climate change, the GEF has made marked progress both in the reduction or avoidance of greenhouse gas emissions and the establishment of sustainable market changes. This has been achieved mainly through the support of energy efficiency and renewable energy projects.<sup>19</sup> The GEF's energy efficiency portfolio has played a particularly important catalytic role in the development and transformation of energy and mobility markets in developing countries.<sup>20</sup> The GEF was also a key factor in supporting countries with the preparation of their national communications to the UNFCCC. These efforts have contributed to building national capacity and aware-

ness in the area of climate change.<sup>21</sup> In China, for instance, the GEF and its Implementing Agencies were found to have contributed to raised awareness and technology development and have boosted institutional capacity through project activities and training.<sup>22</sup>

However, the GEF's climate-change related financing has also demonstrated significant weaknesses and challenges remain. The key weaknesses identified in the GEF's climate-related work are its complex project cycle (particularly the lengthy approval periods), its slow response to new opportunities, and its need for additional funding.<sup>23</sup> The long and complex project approval process poses difficulties for recipient countries and discourages private sector participation.<sup>24</sup> Most GEF projects in the field of climate friendly energy technologies have been substantially delayed or even cancelled. Particularly those projects addressing the reduction of long-term costs of climate friendly technologies have shown a disappointing performance.<sup>25</sup> Also, in order for the GEF to become more adaptable, flexible, and innovative, legal and institutional rigidities should be remedied.<sup>26</sup> Further improvements are required in communication, the use of indicators for results, learning processes between projects and countries, strategic directions, transparency, as well as private sector involvement.<sup>27</sup> In order to maximize the GEF's impact on global GHG emissions, emphasis should be placed on the replication of programs and effective knowledge man-

16 Alan S. Miller, "The Global Environment Facility Program to commercialize new energy technologies", 11 *Energy for Sustainable Development* (2007), 5, at 5.

17 Global Environment Facility, *supra*, note 9.

18 Porter et al., *New Finance for Climate Change*, *supra*, note 12, at 53.

19 Overall Performance Studies (OPS) are presented every four years to inform the donor countries about the results of GEF activities before funding for the GEF is replenished. They are conducted by the GEF Evaluation Office, an independent entity within the GEF that reports directly to the GEF Council. Global Environment Facility (GEF) "Fourth Overall Performance Study of the GEF: Progress Toward Impact", 2009, at 11, available on the Internet at <[www.gefweb.org/uploadedFiles/Evaluation\\_Office/OPS4/ops4%20draft%205.pdf](http://www.gefweb.org/uploadedFiles/Evaluation_Office/OPS4/ops4%20draft%205.pdf)> (last accessed on 20 February 2010).

20 Global Environment Facility (GEF), "Third Overall Performance Study – Progressing toward Environmental Results", 2005, at 35, available on the Internet at <[www.gefweb.org/uploadedFiles/Evaluation\\_Office/Publications\\_%28PDF\\_DOC%29/Overall\\_Performance\\_Studies/OPS3%20Final%20Documents%20-%20Light%20PDF%20Option.pdf](http://www.gefweb.org/uploadedFiles/Evaluation_Office/Publications_%28PDF_DOC%29/Overall_Performance_Studies/OPS3%20Final%20Documents%20-%20Light%20PDF%20Option.pdf)> (last accessed on 20 February 2010).

21 Global Environment Facility (GEF), "Focusing on the Global Environment – The First Decade of the GEF – Second Overall Performance Study", 2002, at 16, available on the Internet at <[www.gefweb.org/uploadedFiles/Evaluation\\_Office/Publications\\_%28PDF\\_DOC%29/Overall\\_Performance\\_Studies/OPS2.pdf%20ENGLISH.pdf](http://www.gefweb.org/uploadedFiles/Evaluation_Office/Publications_%28PDF_DOC%29/Overall_Performance_Studies/OPS2.pdf%20ENGLISH.pdf)> (last accessed on 20 February 2010).

22 Gørild Heggelund, Steinar Andresen and Sun Ying, "Performance of the Global Environmental Facility (GEF) in China: Achievements and Challenges as seen by the Chinese", 2005, available on the Internet at: <[www.allacademic.com/meta/p\\_mla\\_apa\\_research\\_citation/0/6/9/6/5/pages69655/p69655-1.php](http://www.allacademic.com/meta/p_mla_apa_research_citation/0/6/9/6/5/pages69655/p69655-1.php)> (last accessed 19 February 2010).

23 Porter et al., *New Finance for Climate Change and the Environment*, *supra*, note 12, at 48.

24 *Ibid.*

25 Alan S. Miller, "The Global Environment Facility Program to Commercialize New Energy Technologies", 11 *Energy for Sustainable Development* (2007), 5, at 7.

26 Porter et al., *New Finance for Climate Change and the Environment*, *supra*, note 12, at 49.

27 Global Environment Facility, *supra*, note 20 and note 21.

agement among the different actors in the GEF network.<sup>28</sup>

Some member states criticize the GEF over the issue of adequate representation. Although the GEF Council has equal numbers of members from developing and developed countries, developing coastal nations and small-island developing states have disparaged the fact that they have little influence on where the funds are spent due to the internal structure of the GEF Council.<sup>29</sup> Others have criticized the fact that some Parties to the UNFCCC are not represented in the GEF decision-making structure. This lack of representation has been judged to create the risk that the GEF Council could produce decisions that were incompatible with the COP decisions.<sup>30</sup> This problem is exacerbated by the fact that the guidance provided to the GEF by the COP has been, “extremely general in nature,”<sup>31</sup> and while this generality reduces potential conflicts, it also makes it difficult for the GEF to implement the guidance given by the COP. In response to these criticisms, a recent GEF-internal call for reform seeks to improve communication between the groups by involving COP leaders and their Secretariats in GEF Council meetings.<sup>32</sup>

Developing coastal nations and small island developing states (SIDS) are particularly frustrated by the GEF Council’s system for allocating its climate change funds.<sup>33</sup> These countries underscore the shortcoming that the GEF has not funded adap-

tation projects<sup>34</sup> and resent the “difficulty of accessing GEF funding, the GEF’s slow disbursement process and the problematic concept of incremental costs in the context of adaptation.”<sup>35</sup> Even after several structural changes, reviews have rated the functioning of the GEF to be still “technically inadequate,” due to the “complex design of the funds and poor implementation of the guidance.”<sup>36</sup>

While the GEF is certainly a central player in the climate technology field, its effectiveness and political legitimacy can be evaluated as mixed.

## b. The Climate Investment Funds

The Climate Investment Funds (CIFs), including the Clean Technology Fund (CTF), were created in 2008 in a process driven mainly by developed countries.<sup>37</sup> The CIFs are administered by the World Bank; regional development banks are involved in their implementation. The CTF finances demonstration, deployment, and transfer of low-carbon technologies for greenhouse gas reductions; it does not fund research and development.<sup>38</sup> Both states and private entities may submit proposals that fit country-level CTF Investment Plans, which are drawn up by recipient countries in cooperation with multilateral development banks (MDBs).<sup>39</sup> The CTF Trust Fund Committee that oversees the operations and activities of the CTF is composed of an equal number of representatives from recipient

28 Peter Hennicke, Sylvia Borbonus and Christine Woerlen, “The GEF’s Interventions in the Climate Change Focal Area: The Contribution to Strategies for Climate Change Mitigation and Sustainable Development”, 11 *Energy for Sustainable Development* (2007), 13, at 23.

29 M.J. Mace, “Funding for Adaptation to Climate Change: UNFCCC and GEF Developments since COP-7”, 14 *Review of European Community and International Environmental Law* (2005), 225, at 230.

30 Jake Werksman, “Consolidating Global Environmental Governance: New Lessons from the GEF”, 2003, at 8, available on the Internet at <[www.environmental-governance.org/cms/wp-content/uploads/docs/dialogue/oct03/papers/Werksman%20GEF.pdf](http://www.environmental-governance.org/cms/wp-content/uploads/docs/dialogue/oct03/papers/Werksman%20GEF.pdf)> (last accessed on 20 February 2010).

31 Annett Möhner and Richard J.T. Klein, “The Global Environment Facility: Funding for Adaptation or Adapting to Funding?”, 2007, at 14, available on the Internet at <[www.2007amsterdam-conference.org/Downloads/AC2007\\_Moehner.pdf](http://www.2007amsterdam-conference.org/Downloads/AC2007_Moehner.pdf)> (last accessed on 20 February 2010).

32 Benito Müller, with a Reply by Monique Barbut, “The Global Environment Facility (GEF) and the Reformed Financial Mechanism (RFM) of the UNFCCC”, 2009, available on the Internet at <[www.oxfordclimatepolicy.org/publications/TheGEFandtheRFM.pdf](http://www.oxfordclimatepolicy.org/publications/TheGEFandtheRFM.pdf)> (last accessed on 20 February 2010).

33 Decisions are generally made by consensus of the council members. However, when it has become clear that no consensus will be reached, members may call for a vote to reach a decision. The voting system inherently favors developed countries on the council by requiring not only a 60% majority among council members, but the voting majority contributed 60% of the GEF’s funds. Therefore, developed countries, who provide the largest contributions at replenishments, have stronger influence during the voting process, substantially reducing the developing nations’ voting power in the decision making process.

34 Mace, “Funding for Adaptation”, supra, note 29, at 228.

35 Ibid. at 232.

36 Möhner et al. “The Global Environment Facility”, supra, note 31, at 16.

37 Congressional Research Service, “The World Bank’s Clean Technology Fund (CTF)”, 2008, at 1, available on the Internet at <[digital.library.unt.edu/govdocs/crs/permalink/meta-crs-10826:1](http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-10826:1)> (last accessed on 20 February 2010).

38 Steve Herz, “The Clean Technology Fund and Coal: A Cautionary Tale for Copenhagen”, 9 *Sustainable Development Law & Policy* (2009), 21, at 21.

39 World Bank, “Governance Framework for the Clean Technology Fund”, 2008, available on the Internet at <[siteresources.worldbank.org/INTCC/Resources/CTF\\_Governance\\_Framework\\_jan.pdf](http://siteresources.worldbank.org/INTCC/Resources/CTF_Governance_Framework_jan.pdf)> (last accessed on 20 February 2010).

and contributing countries with decision-making power.<sup>40</sup> Voting is by consensus. A “Partnership Forum” (comprising a broad range of stakeholders, including MDBs, UN organizations, the GEF, UNFCCC, the Adaptation Fund, bilateral development agencies, NGOs, and the private sector) meet annually for discussion on the strategic directions, results and impacts of the CIF. By January 2009, the 12 contributing countries had pledged \$4.3 billion to the CTF.<sup>41</sup> CTF will disburse funds in the forms of grants, loans, and guarantees.<sup>42</sup>

The relatively short operation period of the CTF does not allow for an in-depth assessment of its functioning, particularly as the CTF is just starting to distribute funds. However, some preliminary observations can be made. First, criticism of the CTF is wide-spread, stemming partially from the fact that the CTF finances “clean” coal technologies.<sup>43</sup> Moreover, its incorporation into the World Bank structure has been assessed negatively, inter alia with respect to a perceived lack of transparency in the Fund’s decision-making structure.<sup>44</sup> In addition, the fact that some CTF financing will be distributed in the form of loans has led to criticism that the CTF will force poor countries to pay for climate change, which is seen as a problem predominantly created by developed countries.<sup>45</sup> Observers have also warned of some overlap between the funding areas of the CTF and the GEF.<sup>46</sup> Finally, a review of three CTF Investment Plans concludes that they give only a varying degree of attention to improving institutional capacities and the regulatory environment,<sup>47</sup> a formal assessment of which is required by the relevant guidelines.<sup>48</sup>

While definite conclusions cannot be made yet, the fact that the CTF is faced with such an amount of criticism before spending major sums of money calls into question the effectiveness of this institutional framework.

### c. The Montreal Protocol’s Multilateral Fund

The performance of the Montreal Protocol, in contrast, has been evaluated positively. Moreover, its financial mechanisms, the Multilateral Fund (MLF) and the GEF, are credited with being critical to the Protocol’s success.<sup>49</sup> The MLF finances activities undertaken by developing countries in order to comply with their obligations under the Montreal Protocol to phase out the use of ozone-depleting substances on an agreed schedule. It operates within the Montreal Protocol framework and is governed by an Executive Committee comprised of an equal number of developed and developing countries. Voting procedures prevent either of the two country groups from dominating the decision-making. The MLF received \$2.34 billion in funds from 1991 until July 2009.<sup>50</sup> Implementation is overseen by various UN agencies and the World Bank.<sup>51</sup> Financing is generally made in the form of grants,<sup>52</sup> which are distributed on the basis of country programs for the phase-out of ozone-depleting substances.<sup>53</sup>

Several features of the MLF seem to have been instrumental for the Montreal Protocol’s positive track record of technology transfer from developed to developing countries. First, developed nations committed to covering the incremental costs associ-

40 World Bank, “Climate Investment Funds, Clean Technology Fund: Guidelines for Investment Plans”, 2008, available on the Internet at <siteresources.worldbank.org/INTCC/Resources/GuidelinesInvestmentPlansDec1\_08.pdf> (last accessed on 20 February 2010).

41 World Bank, “Climate Investment Funds, Financial Status as of January 26, 2009”, 2009, available on the Internet at <siteresources.worldbank.org/INTCC/Resources/CIF\_Financial\_Status\_Jan\_26\_2009.pdf> (last accessed on 20 February 2010).

42 World Bank, “Climate Investment Funds”, 2008, supra, note 40.

43 Herz, “The Clean Technology Fund and Coal” supra, note 38, at 24; Anna Rooke, “Doubling the Damage: World Bank Climate Investment Funds Undermine Climate and Gender Justice”, 2009, at 4, available on the Internet at <www.genderaction.org/images/2009.02\_Doubling%20Damage\_AR.pdf> (last accessed on 20 February 2010).

44 Smita Nakhooda, “Catalyzing Low Carbon Development? The Clean Technology Fund”, 2009, at 8, available on the Internet at <pdf.wri.org/working\_papers/catalyzing\_low\_carbon\_development.pdf> (last accessed on 20 February 2010).

45 Rooke, supra, note 45, at 12.

46 Porter et. al., *New Finance for Climate Change and the Environment*, supra, note 12, at 40.

47 Nakhooda, “Catalyzing Low Carbon Development?”, supra, note 44, at 8.

48 World Bank, “Climate Investment Funds”, 2008, supra, note 40.

49 The GEF was used to provide financial support to countries with an economy in transition (CEITs), as they were not eligible to receive MLF. It functioned in a similar way as the MLF, including exhibiting the flexibility to fund a broad range of projects. See Stephen O. Andersen, K. Madhava Sarma, and Kristen N. Taddonio, *Technology Transfer for the Ozone Layer: Lessons for Climate Change* (London: Earthscan, 2007), at 311.

50 MLF, “Multilateral Fund to the Montreal Protocol: Achievements”, 2009, available on the Internet at <www.multilateral-fund.org/achievements.htm> “Climate Investment Funds”.

51 Ibid.

52 Ibid.

53 Ibid.

ated with technology transfer and compliance. Second, the mechanism offers flexibility to also fund non-listed incremental costs to meet the goals of the program. Third, duplicate activities are avoided as all projects related to the Montreal Protocol have to go through the Executive Committee. Fourth, all party members are equally represented. Finally, and arguably most importantly, the fund itself goes through a replenishment process that takes into account current projects, future projects, and goals for three year periods. Consequently, this process provides developing countries with a high degree of confidence that funding for projects will come through.<sup>54</sup> Moreover, the governance framework (including project guidelines, preparation of periodic progress reports, tracking of project delays and finances) has also contributed to the Fund's effectiveness.<sup>55</sup>

While the example of the MLF is encouraging, it is important to also keep in mind that the challenges addressed by the Montreal Protocol are much less complex than the ones the UNFCCC process seek to tackle. Phasing out certain well-known substances that deplete the ozone layer is much less difficult than contributing to the global economic and societal transformations needed to deal with climate change.

#### d. Lessons Learnt

Several core lessons for a technology fund under the UNFCCC can be gleaned from the aforementioned examples. They are consolidated in Table 1 below.

<ul style="list-style-type: none"> <li>– Decision-making bodies should be composed of the same number of developed and developing country representatives; different groups of developing countries should be represented adequately (e.g. small island states). Voting procedures should ensure that both groups have equal influence in the decision-making structure.</li> <li>– The different needs of different developing country groups should be taken into consideration in the funding criteria.</li> <li>– Overly complex project approval procedures should be avoided.</li> <li>– Funding should only be approved on the basis of prior strategic planning at the country level, and should follow established and transparent criteria. The body itself should also have a mandate for strategic planning.</li> <li>– Defining what technologies will be funded is essential.</li> </ul>	<p>Funding the “wrong” technologies is not only likely to decrease environmental effectiveness, but also might undermine support for a future fund.</p> <ul style="list-style-type: none"> <li>– Priority should be given to funding for projects with the potential for replication and appropriate knowledge management should enable effective learning processes between projects and countries.</li> <li>– Under the UNFCCC, where developed countries have a legal obligation to engage in technology transfer, funding must come in the form of grants, and not in the form of loans or guarantees.</li> <li>– Adequate involvement of civil society, non-governmental organizations, and the private sector should be ensured and procedures must be transparent.</li> <li>– The provision of independent scientific advice should be ensured.</li> </ul>
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Table 1: Lessons for a New Technology Fund

Moreover, given the complex landscape of existing funding mechanism in the climate technology field,<sup>56</sup> it is imperative that any future funds or funding mechanisms should be harmonized with (and made additive to) existing funding mechanisms – especially with respect to the procedures, technologies, and activities that are eligible for funding.

## 2. An Assessment of the Proposed Technology Mechanism

As outlined above, the technology negotiations reflect consensus on the establishment of a technology mechanism. As important details have not yet been settled, such as the composition of the bodies envisaged as well as voting and reporting procedures, it is difficult to give a sound assessment on how this technology mechanism is likely to perform. Still, taking a look at existing institutions may give a sense of how effective one could expect the mechanism to be, should the draft eventually be adopted.

To measure effectiveness, the key criterion is determining the ability of an institution (or institutional framework) to achieve a specific end – in the

<sup>54</sup> All points taken from Andersen et al., *supra*, note 51, at 311.

<sup>55</sup> Lauren Kelly *The Multilateral Fund for the Implementation of the Montreal Protocol – Addressing Challenges of Globalization: An Independent Evaluation of the World Bank's Approach to Global Program* (Washington, D.C.: World Bank, 2004), at xiii.

<sup>56</sup> A good overview of existing structures can be found at Heinrich Böll Stiftung et al., “Climate Funds Update”, *supra*, note 14.



present case, enabling and enhancing the diffusion of climate technologies. In international relations scholarship, there are only a few publications that single out specific institutional factors for the effectiveness of different international organizations.<sup>57</sup> Moreover, measuring effectiveness is methodologically complex. In spite of these complicating factors, the following observations can be made:

- Institutions, including their organizational arrangement, matter for effectiveness. However, the effectiveness of a specific international regime depends on a large number of factors. Therefore, it is difficult to “tailor” institutions to be effective.<sup>58</sup>
- The openness of institutions to non-state actors tends to increase the effectiveness of environmental regimes or institutions.<sup>59</sup> The establishment and structure of a Technology and Economic Assessment Panel and the Technical Option Committees have contributed to the success of the Montreal Protocol. These bodies have competent members from industry and they are allowed to publish their reports without governments’ approval. Their reports are not only based on published, peer-reviewed scientific literature, but also contain more forward-looking statements.<sup>60</sup>
- As can be learned from the experience of existing funds, institutional decision-making bodies should be composed of the same number of developed and developing country representatives; voting procedures should ensure that both groups have equal influence in the decision-making process. Moreover, it is also important that

different groups of developing countries (e.g. small island states) are adequately represented. This serves to enhance the legitimacy of these funds in the eyes of stakeholders.

- Failures of coordination and coherence resulting from the proliferation of institutions contribute to the lack of effectiveness of the international environmental governance system.<sup>61</sup>

In view of these insights, some positive aspects about the preliminary structure of the technology mechanism as contained in the latest negotiation draft can be highlighted. Notably, the Climate Technology Network, consisting of experts and stakeholders, is envisaged as a part of the overarching technology mechanism. This is likely to facilitate technology transfer in terms of bringing in outside expertise to the process. In addition, the draft mentions the need to cooperate with existing institutions. While this is not spelled out in substantial detail, it demonstrates an awareness of the problems inherent in creating multiple institutions and fora charged with similar tasks.

#### IV. Conclusions

Technology transfer is one of the topics in international climate change politics that is likely to remain high on the agenda as negotiations on the future of the climate regime resume after Copenhagen. While developing countries are – justifiably – demanding from developed countries the fulfillment of the latter’s technology-related commitments under the UNFCCC, developed countries (and private firms) are eager to find new markets for their clean tech industries. While the weak outputs of the Copenhagen negotiations have also prevented a successful conclusion of the technology negotiations, there is reason to believe that the issue will receive significant further attention. This will likely be the case both within the UNFCCC – with the mandate of the AWG-LCA having been extended beyond Copenhagen – and outside of the UNFCCC. Despite increasing consensus, however, large obstacles remain before the technology negotiations can be concluded – worthy of extended consideration but beyond the scope of this study, these challenges are both particular to technology (e.g. intellectual property) and more systemic in nature (e.g. finance and MRV).

57 Frank Biermann and Steffen Bauer, “Assessing the Effectiveness of Intergovernmental Organizations in International Environmental Politics”, 14 *Global Environmental Change* (2004), 189, at 189.

58 Arild Underdal, “Conclusions: Patterns of Regime Effectiveness”, in Edward Miles (ed.), *Environmental Regime Effectiveness* (Cambridge, Mass.: MIT Press, 2002), at 458; Jørgen Wettestad, *Designing Effective Environmental Regimes* (Cheltenham: Edward Elgar Publishing, 1999), at 240.

59 Stine Madland Kaasa, “The UN Commission on Sustainable Development: Which Mechanisms Explain Its Accomplishments?” 7 *Global Environmental Politics* (2007) 107, at 124; Biermann and Bauer, supra, note 57, at 189.

60 Andersen et al., supra, note 51, at 300–303.

61 Adil Najam, Mihaela Papa and Nadaa Taiyab, “Global Environmental Governance: A Reform Agenda”, 2006, available on the Internet at <[www.iisd.org/pdf/2006/geg.pdf](http://www.iisd.org/pdf/2006/geg.pdf)> (last accessed on 20 February 2010); Tadanori Inomata, *Management Review of Environmental Governance within the United Nations System*, UN Doc. JIU/REP/2008/3, 2008.

The technology challenge is complex. There are multiple channels of action and a diversity of actors, both private and public. The channels and actors must come together to produce consistent, consensual, and well-designed policies and institutions to promote R&D for the development of new technologies and the widespread adoption of these technologies around the world. New policies and institutions must be soundly integrated into the existing landscape. Moreover, the emergence of some developing countries as major players in the climate technology field is likely to result in changed political dynamics and may bring up new issues on who will provide technologies to whom and under what conditions.

On the other hand, the UNFCCC negotiators can also draw lessons from previous experiences – which will potentially make their task significantly easier. For example, it is quite obvious that the UNFCCC rules on technology as they currently stand are much too general to allow any meaningful assessment of whether developed countries are doing enough and by which standards “enough”

should be measured. Moreover, experience with existing funds points to the need of transparent and representative decision-making structure in technology funding mechanisms and institutions, as well the usefulness of integrating expertise from the non-governmental sector.

Finally, it is also clear that even if a new technology-related mechanism were created under the UNFCCC and new rules with a positive impact on technology use were crafted, the UNFCCC will only be one – albeit important – part of a large mosaic. The private and public sectors will be intricately involved, as will bilateral, regional, and other multilateral institutions and funds. More importantly, it should not be forgotten that technological advances alone will likely prove insufficient to mitigate climate change and enable societies to adequately adapt to it. Deep changes in consumption patterns of the richer parts of the world population and a transformation of global production structures will be equally needed – and this presupposes considerable political will on the part of all actors.