

Financing energy efficiency measures and R&D in emerging economies

A comparative analysis EU-U.S.

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21 February 2011

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I Funding energy efficiency in developing countries – a response to different problems

Emerging economies face myriad challenges satisfying the energy needs of their growing populations. These problems will not become smaller in the future. Increases in energy demand will mostly occur in the developing parts of the world, which have a much lower level of average per capita energy consumption than developed countries. Without fundamental technological changes, a growing consumption of energy in emerging economies also implies the emission of more greenhouse gases into the atmosphere. Energy efficiency has considerable potential to reduce the demand for energy – or, at the very least, drastically reduce the increase in energy demand. In developing countries, reducing the use of energy by enhancing efficiency is frequently a cheaper option for enhanced provision of energy than extending existing infrastructure, and thus is beneficial not only in climate change but also in other terms.

However, market mechanisms (e.g. emissions trading, the Clean Development Mechanism (CDM), and Joint Implementation (JI)) will not suffice to achieve sufficient progress in energy efficiency at the global level.¹ The existing mechanisms either do not lend themselves easily to energy efficiency projects (i.e. the strict methodological requirements under the CDM have resulted in a paltry number of projects) or do not address the institutional, legal, and financial hurdles that energy efficiency projects face (i.e. emissions trading²).

For reasons of cost and potential impact, developed countries have a stake in supporting low carbon development in emerging economies. In addition, the provision of finance for mitigation actions by developed countries is an important demand of developing countries in current international climate change negotiations. The provision of such funding is thus an important precondition for reaching progress in global climate change negotiations. At the same time, because energy efficiency measures are frequently funded as one part of larger climate and energy aid packages, and because international money is often disbursed through multiple bilateral, regional, and multilateral channels, record-keeping to track funds for energy efficiency is difficult.

Against this background the following paper presents an overview of existing EU, U.S. and multilateral mechanisms for funding energy efficiency measures in developing countries (sec. 2). This also includes a comparison between the EU and the U.S. In a second step (sec. 3), three selected funding mechanisms are assessed more in depth. The initiatives are assessed against four criteria: 1. The impact of the mechanism, in terms of delivering reductions in energy use; 2. The ownership and involvement of stakeholders and civil society in decision-making and disbursement of funds; 3. The efficiency of disbursement in terms the percentage of total funds that actually fund projects (less administrative and other non-productive costs); and easy access to the funds; and 4. The coordination of the mechanism or initiative with other existing and complementary mechanisms. The paper concludes (sec. 4) by presenting several conclusions on funding mechanisms for energy efficiency measures in emerging economies by developed countries and multilateral institutions.

The paper's focus is on funding mechanisms, i.e. public money spent with the purpose of attaining certain aims and providing some advantages from the perspective of the recipient as compared to strictly commercial lending mechanisms.³ The use of market-based

mechanisms (such as the CDM) and private investment (i.e. from private banks, development banks, or other funding sources) as sources of financing for energy efficiency measures in emerging economies and developing countries is beyond the scope of analysis.

2 Existing funding mechanisms – an overview

2.1 Funding by the EU

EU funding for energy efficiency measures in emerging countries comes through a variety of channels.⁴ In general, there are no mechanisms targeting energy efficiency exclusively. The following table provides an overview of the most important funding mechanisms at the EU level.

Table 1: Overview of main EU funding for energy efficiency

| Mechanism | Year ⁵ | Funds available/ spent | Funding source |
|--|--|--|---|
| ACP-EU Energy Facility ⁶ | 2005-2013 | First facility: € 220 million of which €196 million from the spent, with a total project cost of € 430 million ⁷ Second facility: € 200 million ⁸ | EU (10 th EDF) |
| SWITCH Asia ⁹ | 2007-2010 | Indicative total amount available in 2007-2010 € 90 million | |
| Global Energy Efficiency and Renewable Energy Fund (GEEREF) | Operational Nov 2008 Prospected end: 2023 | Pledges: € 108 million 2007-2011 (Nov 2009) ¹⁰ | EU COM (through ENRTP) Germany Norway |
| Environment and Sustainable Management of Natural Resources including Energy (ENRTP) ¹¹ | 2007 - 2013 | Indicative budget of € 470 million for 2007-2010 Budget lines with climate relevance: in 2008: ca. € 57 million Euro ¹² | EU |
| COOPENER ¹³ | Launched 2003 | Budget of ca. € 17 million | EU, DG TREN |

The existing mechanisms differ, in particular, by geographical coverage, eligible recipients, the type and rate of funding provided and type of measures that are funded.

Concerning geographical coverage, some of the mechanisms have a regional focus, e.g. the ACP-EU Energy Facility only funds measures in certain countries in Africa, the Caribbean and the Pacific and only EU member states and certain Asian countries are eligible for SWITCH-Asia. Other mechanisms are not formally restricted to certain countries. For example, the GEEREF covers, in principle, projects in all countries eligible for official development assistance (ODA). However, it gives priority to ACP countries. Moreover, given

that its focus is in countries that have private sector engagement in their national policies, funding is not likely to cover all countries in practice.

Eligible recipients are state entities (both in Member States and outside of the EU) NGOs, regional economic communities and/or international organisations. Sometimes, a partnership between EU and non- EU institutions is a pre-condition for funding, such as in the case of COOPENER.¹⁴

The types and rates of funding widely differ. They include grants, interest rate subsidies¹⁵ as well as funding for technical cooperation. Grants rarely cover the full cost of a project, but typically a substantial part. For example, the SWITCH Asia programme involves EU-funding rates 80%, and 90% in the case of least developed countries (LDC), while only 50% are covered by COOPENER. The GEEREF has adopted a unique approach: It invests in regional investment funds, rather than directly in projects, aimed at providing risk capital to otherwise under-funded investments. Also minimum and maximum amounts of funding vary significantly between the mechanisms; while ENRTP's maximum funding is one million Euro per project, the GEEREF gives priority to projects with a maximum budget of 10 million Euro. It is noteworthy that GEEREF does not invest in nuclear energy.¹⁶

The existing mechanisms also differ widely with regard to what they fund. As mentioned, the GEEREF invests primarily in regional investment funds. The ACP-EU Energy Facility and SWITCH Asia fund a wide range of individual projects, though only a portion of the projects are dedicated to energy efficiency.¹⁷ The ENRTP, in turn, is a larger funding scheme, which operates partially through calls for project proposals in various areas of environmental policy making and provides grants to these projects. At the same time, ENRTP is also a source of funding for the GEEREF.¹⁸

In addition to the above funding mechanisms, there are funding instruments at the EU level which occasionally fund projects aimed at enhancing energy efficiency in emerging countries, but in a less targeted manner than the above funds. For example, the EU Framework Programme, the EU funding instrument for research, annually issues calls on a wide range of issues, which includes energy efficiency. The research institutions of most developing countries are eligible for funding under the 7th Framework Programme, provided they work with EU partners, though no specific amount is dedicated specifically for such institutions. The European Investment Bank (EIB) occasionally provides loans for energy efficiency measures in developing countries. A recent example is a 40 million Euro credit to a South African bank for investments in renewable energies and energy efficiency.¹⁹ An interesting feature of the EIB's policy on energy efficiency funding is that it prioritizes projects that improve energy efficiency by at least 20%, or projects that improve energy efficiency by less but generate energy savings worth at least 50% of the total investment cost.²⁰

The overall amount of EU funding for energy efficiency measures in emerging countries is difficult to estimate, given that such measures are always part of larger funding schemes and there is, to this point, no consistent framework for the measuring, reporting and verification of such flows. An internal survey conducted by the European Commission concluded that approximately 140 million Euro were spent by the EU on energy efficiency measures over the period 2002-2007.²¹

2.2 Bilateral funding by the U.S.

In the fiscal year 2010, the Congress appropriated \$1.3 billion for climate change-related activities. For the fiscal year 2011, the Obama Administration has a budget request of \$1.9 billion dollars for international climate change financing and activities.²² Approximately 40% of the funding requests would flow to activities through bilateral mechanisms and initiatives, while the remaining 60% (to be covered in sec. 2.3 below) is directed to activities through multilateral mechanisms and development finance/export credit agencies.

Table 2 Overview of U.S. funding for energy efficiency

| Title of mechanism | Years | Funds available/spent | Funding source (public, private) |
|---|--------------------|--|----------------------------------|
| U.S. Department of State | Ongoing | FY 2011 budgeted amount \$ 149 million; 2010 outlays to date \$ 121 million; 2009 outlays \$ 54 million; e.g. U.S. Peace Corps' Renewable Energy and Climate Change initiative (\$1 million) | Public |
| U.S. Agency for International Development (US AID) | Ongoing | FY'09 approximately \$ 46 million for renewables and energy efficiency (about half for energy efficiency ²³); Total climate change budget 2010 (\$ 383 million); FY 2011 budgeted amount (\$ 491 million) ²⁴ ; e.g. Clean Energy division split \$ 43.6 million equally between renewables and energy efficiency in FY 2009 ²⁵ | Public |
| U.S. Millennium Challenge Corporation | Ongoing since 2004 | FY 2011 has budgeted \$ 25 million for climate change activities; 2009 outlays, \$ 11 million; 2010 outlays, \$5 million ²⁶ | Public |
| U.S. Trade and Development Agency | Ongoing | FY 2011 has budgeted \$2 1 million for climate change activities; 2009 budgeted authority, \$ 10 million; 2010 budgeted authority, \$ 17 million ²⁷ | Public |
| Energy and Climate Partnership of the Americas | Ongoing since 2009 | Specific funding unavailable; support from DOS, DOE, and multilateral institutions | Public and private |

The following is a list of bilateral initiatives and projects that include funding for energy efficiency. In some cases, actual figures could be obtained; by and large, however, the financing totals specifically for energy efficiency were not easily available publicly and had to be obtained through direct contact with employees of the department or agency, where even possible.²⁸ The two main sources of U.S. bilateral funding for climate change activities, and thereby for energy efficiency, are the Department of State (DOS) and the U.S. Agency for International Development (USAID). Augmenting the contributions through the DOS and the USAID, two international agencies also provide bilateral climate change assistance. Both the Millennium Challenge Corporation (MCC) and the U.S. Trade and Development Agency

(USTDA) work with international partners engaging in collaborative projects with benefits for the climate.²⁹

In addition to the Departments and Agencies mentioned above, the U.S. federal government funds other efforts that have direct implications for energy efficiency. Most of these initiatives consist of technical assistance and cooperation.

The U.S. Department of Energy (DOE) has started several initiatives that have an energy efficiency component, including: the Energy Development in Island Nations Project and the Low Carbon Communities of the Americas Initiative. The DOE signed two Memoranda of Understanding with Chinese Ministries in 2007 to work collaboratively on energy efficiency – including industrial efficiency, vehicle efficiency, and the efficiency of energy systems.

The U.S. Environmental Protection Agency (EPA) is also involved internationally in partnerships that include energy efficiency components. These include: the Middle East Partnership Initiative and the Energy and Climate Partnership of the Americas (ECPA). Also, the EPA supported the U.S.-China partnership in industrial pollution prevention and energy efficiency,³⁰ as well two other collaborative projects: the NDRC are the Voluntary Energy Efficiency Improvements in Commercial Buildings and the Energy Efficiency Labeling and Standards for Products and Equipment Projects.³¹

In addition to the EPA, the DOS and the DOE are also supporting the Energy and Climate Partnership of the Americas. The DOS recently announced that it will provide \$1 million to the U.S. Peace Corps to support related projects, which include the increased use of renewable energy and energy efficiency in communities in Central and South America served by the Peace Corps.³² The Peace Corps' initial ECPA-related efforts will be implemented in Costa Rica, Dominican Republic, Guyana, Honduras, Nicaragua, Panama, Peru, and Suriname. As part of the ECPA, the DOE launched the Low Carbon Communities of the Americas (LCCA) program in June 2009. As part of the LCCA, the DOE worked with the Natural Resources Defense Council and the Costa Rican government to start the Costa Rican Energy Efficiency Training Center;³³ a Regional Energy Efficiency Center has also been started in Peru. Their charge is to provide training and certification for working professionals in energy efficiency auditing procedures and in the use of energy efficiency technologies. An additional initiative under the ECPA is being led by Brazil with funding and support from the U.S.; it deals specifically with efficiency in the building sector throughout the Americas and is called the Building with Energy Efficiency and Sustainability initiative.

2.3 Multilateral mechanisms with contributions from the EU member states and the U.S.

The following section presents several multilateral funding mechanisms which are likely the most relevant ones for funding energy efficiency measures in developing countries, and where either the EU or the U.S. are among the funders. It should be noted that the EU itself does not contribute to all of these mechanisms. However, EU member states do contribute.

Table 3 Overview of multilateral funding for energy efficiency

| Title of mechanism | Years | Funds available/spent | Funding source |
|---|---|---|---|
| Renewable Energy & Energy Efficiency Partnership (REEEP), in particular Energy Efficiency Coalition | Established 2002 NGO status since 2004 | € 11,3 million 2005-2010 ³⁴ | Public (Australia, Austria, Canada, Germany, Ireland, Italy, New Zealand, Netherlands, Norway, Spain, U.S., UK) Private sector |
| GEF Trust Fund - and earlier GEF programs (e.g. Removal of barriers to energy conservation and energy efficiency) | GEF operational 1991 | Disbursed to energy efficiency projects (1991-2008) \$850 million ³⁵ . Programmed for climate change \$ 1.3 billion (May 2010) U.S. contribution: \$ 26 million (FY 2009 and 2010) and budgeted \$89 million (FY 2011) | Public, 30 countries (including Germany, US) |
| World Bank Clean Technology Fund | Operational July 2008 | Pledged \$ 4.378 billion (June 2010) Disbursed: \$ 5 million for projects, \$ 4 million for administration (Oct 2009) Cumulative funding decisions as of July 2010: \$ 652 million | Australia, France, Germany, Japan, Spain, Sweden, UK, U.S. |
| International Development Association (World Bank) | 1960 | Annual average of \$ 233 million between 2009 and 2011 for energy efficiency and renewable energy ³⁶ . | Public (UK, U.S.; Japan Germany, France, Canada, Italy, Spain, Sweden, Netherlands) |
| Climate REDI | Launched July 2010 | Total projects in renewables and energy efficiency \$ 350 million; | Public (U.S., Britain, the Netherlands, Norway, Switzerland) |

Again, none of the multilateral mechanisms is targeted exclusively at energy efficiency, even though the REEEP has fostering energy efficiency projects as one of its two main objectives. The multilateral mechanisms do not have a specific geographic focus among the developing countries, even though for some of them (.e.g IDA) only certain developing countries are eligible. The mechanisms differ by character, eligible recipients, the type and rate of funding provided and type of measures that are funded.

First of all, while the GEF, the World Bank CTF and IDA are classical international funding mechanisms, the REEEP is not. REEEP is a public-private partnership, of more than 270 partners, including more than 40 governments.³⁷ The types of funding provided are typically grants, loans³⁸, and guarantees.³⁹ The GEF also uses some other financial instruments, e.g. an equity fund.⁴⁰ In addition, technical assistance is also provided, e.g. by the REEEP.

The mechanisms have slightly different funding criteria and objectives: The CTF finances the demonstration, deployment, and transfer of low-carbon technologies; however, it does not fund research and development.⁴¹ REEEP and IDB funded projects are not only dedicated to energy efficiency itself, but also to the development of policy and regulatory frameworks; but again the focus does not seem to be on research. The GEF today focuses on standards,

labeling and regulatory frameworks as well as demonstration and deployment of energy efficiency technologies.⁴²

Differences in where EU-U.S. multilateral funding is flowing are evident Table 3. As mentioned in sec. 2.2. above, 60% of the U.S. federal government's budget request of \$1.9 billion for international climate change-related activities are to be directed to multilateral institutions. In addition to these multilateral mechanisms, in 2010 U.S. federal government mobilized \$706 million for the deployment of clean energy technologies in the form of development finance and through export credit agencies. This money would be used to finance a variety of initiatives and projects; the U.S. Department of State reports that the budget request for additional financial flows to these agencies will increase to \$873 million in 2011.⁴³ A paucity of data at present does not allow an estimate of the amount of these financial flows (both multilateral and development finance) that will go to energy efficiency. The federal government has three priorities in its climate funding: clean energy, adaptation, and sustainable landscapes. In 2010, \$595 million of the government's funds for climate-related efforts went to clean energy; the Obama Administration is requesting this figure increase to \$805 million in FY 2011. Energy efficiency is one of the programmatic areas within the clean energy focus; however, the percentage of these resources that will be dedicated to energy efficiency is not readily available. At present, it is only possible to use the general support for clean energy as a proxy for the U.S.'s support for energy efficiency.

The EU, in turn, seems to channel very little money through the multilateral climate mitigations channels; its member states do, however, contribute.

Table 3 Overview of international EU/U.S. contributions to some multilateral funds

| Title of mechanism | U.S. contribution | EU contribution |
|----------------------------------|---|--|
| REEEP | Unavailable | None, but contributions by member states |
| GEF Trust Fund | 4th GEF replenishment \$105.64 million ⁴⁴ 5th GEF replenishment \$223.95 million \$ 26 million (2010) for GEF; \$ 86.5 million (2010 projected) for GEF | None, but contributions by member states |
| World Bank Clean Technology Fund | \$ 1.49 billion total pledge (\$ 300 million in FY 2010 and \$400 in FY 2011 budget) | None, but contributions by member states |
| IDA | \$ 942 million total to IDA in 2008, \$1.32 billion in FY 2011 total to IDA Share of EE: not available | None, but contributions by member states |
| Inter-American Development Bank | \$ 30.3 billion (general contribution, present) ⁴⁵ | None, but contributions by member states |
| Climate REDI | \$ 35 million ⁴⁶ , of which \$25.5 million for Super-efficient Equipment and Appliance Deployment (SEAD) Program ⁴⁷ | None, but contributions by member states |

2.4 EU-U.S. comparison

This section contains a brief comparison of EU and U.S. funding mechanisms. A first obvious aspect is transparency. While information on EU energy efficiency funding is somewhat dispersed, it is normally publicly available through websites. Also, the EU has made some efforts at evaluating some of its funding schemes. To date, evaluation of U.S. support of energy efficiency projects is not readily available.

A second difference stems from the fact that the EU has chosen to support energy efficiency through specific mechanisms and programs. Recipients are chosen in a fashion similar to that of multilateral funding mechanisms – U.S. bilateral public financing flows almost exclusively through government-to-government partnerships, often through existing federal departments and agencies. These efforts sometimes suffer from a lack of coordination between departments.⁴⁸

A third distinguishing characteristic of U.S. support flows from the second: since many of the initiatives are run through departments and agencies that are also involved in other types of support, specific support for energy efficiency projects gets subsumed under larger budgets. This, however, is also true for part of the EU mechanisms which are aimed at funding environmental projects in general.

A fourth difference concerns multilateral vs. bilateral funding. Countries have, in general, been observed to take different approaches towards funding, with some countries relying almost exclusively on bilateral channels, and others heavily leaning towards multilateral mechanisms.⁴⁹ In the context of climate mitigation finance (including energy efficiency), it can be observed that the EU does not disburse money through some of the major multilateral channels, while the U.S. uses these channels.

A final difference between U.S. and EU support for energy efficiency can be seen in budgets for energy efficiency research. The Department of Energy's R&D programs for energy efficiency and renewables have very significant budgets, which have increased in recent years with the U.S. Stimulus package and changed priorities of the Obama Administration. The FY 2011 budget proposal for DOE's Office of Energy Efficiency and Renewable Energy would increase R&D funding to over \$2.3 billion – \$231 million for building efficiency, \$325 million for advanced vehicles, and \$100 million for industrial processes.⁵⁰ These funds are dedicated primarily to domestic research, but the DOE and its National Renewable Energy Laboratory support a bevy of initiatives, including those under Climate REDI and the ECPA, indicating an indirect R&D support for international energy efficiency. At the EU level, there seems to be little funding available for international R&D on energy efficiency.

3 Evaluation of selected funding mechanisms

This section serves to evaluate three of the above funding mechanisms and their functioning, one EU mechanism, one U.S. initiative, and one multilateral mechanism. The three funds selected for a more in-depth assessment were the following:

- From the EU, an in-depth look is taken of the GEEREF. It warrants a closer examination, because of its innovative approach of not funding projects directly, but rather investing in other funds that fund projects. In addition, it has energy efficiency

as one of its two main areas of activities which also makes it an interesting case for the purposes of this paper.

- In terms of support for energy efficiency, the U.S. demonstrates a clear preference for establishing bilateral cooperation and projects through existing Departments and Agencies on the one hand, and for providing financial support for existing (i.e. the GEF, the IDB) and new and specific (i.e. the CTF) multilateral funding mechanisms, instead of establishing new mechanisms specifically for this purpose. Due to this, the focus of this section will be on the Energy and Climate Partnership of the Americas (ECPA).
- Of the multilateral funds, we focus on the GEF. Of the two classical multilateral funds listed above, it has funded the most energy efficiency projects so far.⁵¹ The GEF is also the largest international mechanism for environmental funding.

These two funds and the ECPA are also representative of different types of funds and initiatives. The GEEREF stands for an innovative fund, with very specific instruments. The GEF is a classical multilateral fund which funds a broad portfolio of projects, using different funding models. Lastly, the ECPA is a newly formed umbrella of voluntary initiatives developed by recipient countries themselves; U.S. Departments provide technical support (and some funding), while established funding mechanisms, like the IDB and the World Bank, have contributed initial funding for the initiatives.

3.1 Assessment criteria

The criteria against which we will assess three specific efforts are: climate impact; ownership/involvement of stakeholders and civil society; efficiency in disbursement of funds; and coordination with other mechanisms.⁵²

Climate impact in terms of promoting energy efficiency and thus reducing GHG emissions is an obvious criterion. Cost-effectiveness, e.g. the level GHG reduction for each unit of money spent, is an important sub-aspect. Ideally, data would be publicly available that would allow for third-party assessments of the impact of investments. Experience in financing energy efficiency measures and projects demonstrates, however, that the assessment of the impact of financing mechanisms is hardly feasible at a general level, in light of the variety of measures and projects that may be funded. For example, the experience of the World Bank Group in the field has been summarised in a recent article.⁵³ The authors review experience with different program modalities, e.g. funding utility demand-side management or market transformation. The overall picture that emerges is that mechanisms that work well in one place may not function well in another. The reason behind this is that there are a myriad of obstacles to enhancing energy efficiency in developing countries. Some of the factors that have been singled out in the literature are difficulties in raising commercial funding,⁵⁴ long pay-back periods,⁵⁵ and high transaction costs.⁵⁶ While funding for a certain project or measure will typically help remove one or several of these obstacles, it can hardly address all of them. An interesting observation is made in this context by the GEF which states that its energy efficiency portfolio has change over time and across regions: While in the initial stage of funding, a major share of the money went into funding regulatory frameworks, market transformation, and technology transfer in Asian countries. Now, a similar project portfolio is supported in least-developed countries which had not received much funding before.⁵⁷ This indicates that different funding approaches will work at different times and stages in different countries. All in all, assessing the impact of funding will in most cases have to occur at a

level of individual projects. The results of such project-level assessment may then, at best, be aggregated to form a more complete picture. In the present context, the assessment of the impact of the funds will thus necessarily be a preliminary one.

Ownership and involvement of stakeholders and civil society are two separate, but closely related criteria.⁵⁸ They both relate to who is involved in decision-making about how and for what funds are disbursed. Ownership is a term well established in development cooperation terminology, denoting that recipients of development assistance set their own strategies and development policies and co-ordinate development actions.⁵⁹ Who is involved in decision-making about funding is important for at least two reasons. First, previous experience with climate funding in developing countries tends to show that the involvement of recipients, civil society and stakeholders tends to improve the performance of environmental mechanisms. For example, the involvement of outside experts in the decisions-making of the Montreal Protocol's Multilateral Fund is regarded as a factor contributing to the Protocol's exemplary success in phasing out substances depleting the ozone layer.⁶⁰ Second, decision-making processes in which the recipients of the funds were not involved tend to provoke harsh criticism, which in turn undermine the acceptance of such funding mechanisms. This is true in particular in situations where funding for developing countries is seen as a remedy for past or current actions of developed countries, and part of political trade-offs. Climate change is an important example in this regard; developing countries have consistently demanded funding for climate change mitigation and adaptation from developed countries as part of any international climate change agreement, pointing to developed countries historical and current responsibility for climate change.

Efficiency in disbursement of funds and easy access are again criteria with apparent relevance.⁶¹ It is, of course, desirable that the lowest possible share of the available funds be spent for the administrative costs of the fund itself. Moreover, lengthy and complicated application procedures will not only delay gains in energy efficiency, but may also deter prospective applicants from submitting a proposal.

The **coordination with other mechanisms** is important against the background of the lack of strong international energy governance⁶² and the utter fragmentation of the energy efficiency funding landscape. Coordination serves to avoid the duplication of work, enables mutual learning and could also enable different funders to bundle their efforts in a complementary, and thus ultimately, effective way.⁶³

3.2 Assessment of selected mechanisms

3.2.1 The Global Energy Efficiency and Renewable Energy Fund – an EU mechanism

The GEEREF was created relatively recently which limits its impact so far. To date, three investments have been officially approved according to the GEEREF website; none of them, however, has a focus on energy efficiency.⁶⁴ There are press reports mentioning approval of a fourth investment, a 10 million Euro investment in the Greenstar Energy Conservation and Emission Reduction Private Equity Fund, a fund targeting energy efficiency measures in China.⁶⁵ However, so far this information cannot be tracked back to official EU sources.

The first of the three approved investments has a value of 10 million Euro and the second one of 12.5 million Euro,⁶⁶ which represents about 20% of the capital that GEEREF currently has at its disposal. That three investments already account for more than 20% of the GEEREF's working capital illustrates one of the weaknesses of the GEEREF in terms of its effectiveness for funding energy efficiency projects: As the GEEREF makes fewer, but larger, investments, the impact on energy efficiency may be very limited, if the majority of investments are made in the renewable energies sector. While the GEEREF has (or is expected to have) performance targets on energy efficiency, development, environmental impact and financial return⁶⁷ details have not been made public to this point. Further, there do not seem to be guidelines as to how the GEEREF's capital is to be divided between renewables and energy efficiency. The "fund of funds" structure of the GEEREF will also make it extremely difficult to track which efficiency measures were actually promoted through the GEEREF money, as well as making the assessment of results challenging. Observers consider the expected leverage factor of the GEEREF to be the most promising aspect of the GEEREF;⁶⁸ the Commission has estimated that the GEEREF will leverage a minimum additional 300 million Euro in private capital, and may leverage up to 1 billion.⁶⁹ The latter estimate is, however, seen as too optimistic by some observers against the backdrop of the economic crisis.⁷⁰

When applying the criteria of ownership and the involvement of stakeholders and civil society in the GEEREF's decision-making process, the GEEREF could hardly fare worse. First of all, neither GEEREF decision-making structures nor details of the individual investments are made public and transparent by the GEEREF. While the overall amount of GEEREF money invested in a regional fund is published on the GEEREF website, nothing is said on the specific measures financed through these funds, the details of the investment agreement and the expected returns and who will receive them. Negotiations are kept confidential.⁷¹ Equally, while the GEEREF has an investment committee of sponsors and industry experts,⁷² it is not evident who serves on this committee board and what the modalities for decision-making are. From the information publicly available, there does not appear to be any kind of involvement of civil society neither from recipient countries nor from the EU or its Member States. There is also no evidence that representatives of recipient countries are involved in decision-making. This is all the more worrisome as GEEREF is registered as an ODA contribution,⁷³ and should thus be disbursed according to established principles for development cooperation, in particular the principle of ownership.

Concerning the remaining two criteria (efficiency of disbursement and coordination with other mechanisms), there is no evidence that the GEEREF coordinates its choices of the funds in which to invest with other fundings instruments. The ultimate investment decision is made by the sub-fund managers and thus left to the market. Concerning the efficiency in the disbursement of funds, lack of evidence on decision-making structures makes a precise assessment difficult. However, anecdotal evidence indicates that the GEEREF rather efficiently disburses its capital: GEEREF employs only a small team; investments will come in the form of a few large projects rather than many small ones, minimizing transaction cost; and the GEEREF has disbursed well above 20% of its investible capital in its first eighteen months in operation.

3.2.2 The Energy and Climate Partnership of the Americas – a U.S. initiative

As the preceding sections on U.S. contributions to energy efficiency projects internationally make clear, bilaterally several U.S. Departments and Agencies are involved in a variety of efforts, while at the multilateral level the U.S. prefers partnerships and also directing funding to tested institutions like the World Bank and the Inter-American Development Bank. To this point, the U.S. has not yet developed a new and specific mechanism to fund energy efficiency projects directly.

However, despite the initiative existing for only one year to this point, it is possible to present an initial assessment of the Energy and Climate Partnership of the Americas (ECPA),⁷⁴ which intends to be an ongoing collaborative effort between the U.S. and governments throughout the Americas; importantly, the work and support of the Department of State, the Department of Energy, and others are partially integrated in these efforts.

With respect to the impact of the initiatives under the ECPA, the design of the partnership itself points to having learned lessons from previous initiatives. A country (or group of countries) proposes an initiative (e.g. Brazil's Building with Energy Efficiency and Sustainability initiative), which is then joined and supported by other countries, NGOs, and technical and financial support.⁷⁵ Each initiative seeks to redress a specific issue, instead of being an overarching program for the over 30 member countries.

In terms of ownership and involvement of stakeholders and civil society, ECPA has a design structure that allows for strong elements of both. Especially when considering ownership, ECPA already has demonstrated effective ownership structures, as the countries beginning initiatives and requesting assistance develop the initiatives for themselves and introduce them for support under the auspices of the ECPA. Anecdotally, the ECPA allows for civil society involvement – e.g. the Natural Resources Defense Council, a U.S.-based NGO, teamed with the Costa Rican government and the U.S. Department of Energy and its Office of Energy Efficiency and Renewable Energy to launch the Costa Rican Energy Efficiency Training Center, which will train and certify professionals in a variety of technical and diagnostic tools and procedures related to energy efficiency.⁷⁶ Whether other stakeholders and domestic civil society have been involved in the crafting of ECPA initiatives to date is not transparent on the ECPA website or related materials, and, thus, cannot be evaluated at present. This lack of information does point to the need for additional transparency.

A transparent accounting of the funds that have been dedicated to specific ECPA initiatives is not available on the ECPA website, calling clearly for additional transparency going forward. At the same time, U.S. financial support for ECPA initiatives flows through existing funding mechanisms, like the Inter-American Development Bank and the World Bank, and technical and financial support also comes from existing offices of the Departments of State and Energy.⁷⁷ In this way, the U.S. has not sought to create new and additional bureaucracies to manage involvement and direct funding to ECPA initiatives, which, anecdotally at least, indicates higher efficiency in the disbursement of funds. A formal evaluation of the efficiency of disbursement would require official funding contributions, which should be made available.

Lastly, the ECPA is one area where the U.S.'s various Departments and Agencies responsible for addressing climate change are working together, at least in part. The Departments of State, Energy, and Agriculture are involved in several initiatives. The DOE's Office of Energy Efficiency and Renewable Energy and the National Renewable Energy

Laboratory are providing technical and research support,⁷⁸ while the U.S. Peace Corps is providing hands-on assistance through its Renewable Energy and Climate Change initiative.⁷⁹ Further, support for the various initiatives is open to all funding mechanisms, and the World Bank and the IDB have already lent financial support to several of the initiatives.⁸⁰ While the ECPA remains intentionally voluntary and partially uncoordinated, compared to other aspects of U.S. climate support, there is greater coordination (and potential for coordination) than many other U.S. programs.

3.2.3 The Global Environment Facility – a multilateral mechanism

Concerning the impact in terms of energy efficiency, it should be noted that the GEF has funded a considerable number of energy efficiency projects in different countries. A broad range of energy efficiency projects have been supported, including industrial efficiency and efficiency in buildings, and also efficiency standards and labels and lighting efficiency.⁸¹ The GEF has also funded projects which are aimed at improving the regulatory environment for energy efficiency. According to GEF figures, the \$850 million have brought another \$6.7 billion in co-financing. This is lower than what is expected for the GEREFF for example, but still a much higher ratio than in other funding mechanisms. The GEF itself expects direct CO₂ emissions reduction of 1.3 billion tonnes of CO₂ equivalent by 2020 through projects funded so far. The average cost-effectiveness of GEF funding for energy efficiency projects is estimated to be about \$0.64 per tonne of direct CO₂ emissions. This makes it the most cost-effective among all GEF programmes.⁸² In the absence of figures from other international funding mechanisms this ratio cannot be rated on a comparative scale. At any rate, the cost-effectiveness of reductions from energy efficiency projects indicates that GEF funding has identified projects with low-cost reduction potential.

With respect to ownership and the involvement of stakeholders and civil society, the GEF decision-making structure is the result of hard-fought compromises. In the beginning, developing countries strongly opposed the GEF and demanded changes in its governance structure and operational principles. Agreement was reached after years of negotiations between donor and developing countries.⁸³ The GEF's main governing body, its Council, consists of representatives from developing countries (with 16 members), developed countries (14 members), and two members from countries with economies in transition. Decisions are made by consensus.⁸⁴ Civil society is involved in the GEF's decision-making process as well as project and program implementation through NGO participation in GEF NGO Consultations and Council Meetings. More than 700 NGOs are currently accredited to the GEF.⁸⁵ Scientific and technical advice is provided by the Scientific and Technical Advisory Panel (STAP).⁸⁶ The overall picture of the GEF concerning ownership and the involvement of stakeholders and civil society is thus relatively positive on paper. While recipient countries do not lead the process of determining funding priorities, they are involved in decision-making on a formally equal footing with developed countries. However, there is also evidence that, in practice, power differences between donor and recipient countries have an effect on decision-making, favoring donor countries. In addition, it has also been critically noted that the GEF decision-making procedures differ considerably from those of the multilateral environmental agreements that the GEF is designed to help implement – to the disadvantage of developing countries.⁸⁷ Overall, it appears that GEF decision-making could be improved from the viewpoint of ownership. The GEF itself seems to acknowledge

this in a recent paper where it declares enhancing its responsiveness to developing countries as one of its objectives.⁸⁸

The efficiency in disbursement of GEF funds and easy access to these funds also need to be improved. Areas of weakness identified in the current GEF structure and cited for improvement include: the GEF's complex project cycle, in particular the lengthy approval periods; its slow response to new opportunities; and the GEF's periodic need for additional funding.⁸⁹ The long and complex project approval process has been found to pose difficulties for recipient countries and discourage private sector participation.⁹⁰ Improvements have been made recently and the duration between the submission of a proposal and the funding decision is now 22 months, as compared to four years previously.⁹¹ However, this remains a lengthy process compared to other funding mechanisms.

Lastly, in consideration of the GEF's coordination with other mechanisms, the GEF has an integrative function as 10 UN agencies and multilateral development banks are GEF partners, and the GEF, in addition, serves as implementing mechanism for five environmental conventions. It also administers a number of climate-related funds. As the GEF plays a leading role in funding climate-related projects to date, some other climate funding mechanisms are tailored to be complementary to GEF funding, e.g. the SCAF.⁹² Thus, the GEF has achieved a certain degree of coordination with other mechanisms. However, it must also be noted that even the GEF itself has recently started to reflect critically about problems concerning its accountability to multilateral environmental agreements,⁹³ indicating a need for further improvements in coordination.

4 Conclusions

Several conclusions can be drawn from the above analysis.

First of all, it is absolutely necessary to enhance transparency on funding mechanisms for energy efficiency, to come up with a framework for measuring, reporting and verifying these flows and to enhance coordination between different mechanisms. This is true for the international arena and for the U.S., to a lesser degree also for the EU. This observation may seem ingenuous against the backdrop of an ongoing international effort to come up with such a framework. However, even in the absence of such a framework some steps could be taken, e.g. creating websites where disperse information on funding mechanisms for different purposes is gathered⁹⁴ or establishing an institution to provide advice on funding to interested parties.

Governance sticks out as a second important area where adequate solutions are still lacking. This does not specifically relate to energy efficiency funding, but to climate funding at large. So far, governance mechanisms all seem to suffer from one or several flaws. Some of the multilateral mechanisms do have appropriate procedures in place on paper, but reality does not necessarily follow them. With a view to the political dynamics of current climate change negotiations, where climate financing is one of the areas where developing countries would like to see progress and be involved in decision-making, in exchange for making commitments of their own this is a point where improvement are needed. As the example of the GEEREF as compared to the GEF indicates there may be target conflicts between an inclusive decision-making structure, and the efficiency with which funds are disbursed.

There are considerable differences among the EU and the U.S. in their approach to funding energy efficiency, regarding direct access of recipients, how specific programmes are and whether funds are disbursed through bilateral or multilateral channels. There is no evidence that one approach is generally preferable over the other in terms of impact. Funding experience to date tends to show that the conditions for successful projects vary from country to country, from type of activity to type of activity. A noticeable trend is, however, a diversification of funding instruments for funding energy efficiency with new types of funding (e.g. equity capital) being added to the existing landscape.

Lastly, the sums that the EU and the U.S. combined are dedicating to energy efficiency projects and R&D stand to be significantly increased in light of their levels compared to overall need⁹⁵ and, perhaps more importantly, due to the fact that energy efficiency investments and projects can currently deliver some of the lowest cost emission reductions around the world. Recently increased budgets are a start, but long-term, sustained increases will be required as well.

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http://www.wbcsd.org/DocRoot/E1erYPqD60xOaOIAdv5V/91719_EEBReport_WEB.pdf

6 Endnotes

¹ Gupta/Ivanonva (2009).

² The World Business Council (2009) estimated that a willingness to accept a 10-year pay-back period on energy efficiency investments at today's energy prices would yield 52% of the reductions sought from the building sector. Adding a carbon price of \$40 per ton increased the achieved reductions from 52% to 55%. See also Houser (2009).

³ It may be useful in this regard, to recall the criteria for what counts as official development assistance (ODA). ODA is defined as financial flows to developing countries which are provided by official agencies, including state and local governments, which are ii) administered with the promotion of the economic development and welfare of developing countries as its main objective and iii) concessional in character and conveys a grant element of at least 25 per cent, see OECD (2008). While this definition has not been used literally for purposes of this paper, the criteria of the involvement of official agencies, a public policy aim (rather than a commercial one) and the concessional character have served as guidance which source of finance were taken into account.

⁴ This paper looks at mechanisms at E.U., rather than at member state level. However, some member states provide bilateral climate funding, including for energy efficiency. One major example is the German International Climate Initiative (IKI), see <http://www.bmu-klimaschutzinitiative.de>.

⁵ Years indicate the duration currently envisaged. The duration may be extended in the future.

⁶ http://ec.europa.eu/europeaid/where/acp/regional-cooperation/energy/documents/pooling_mechanism_en.pdf, slide 5.

⁷ ACP-EU Energy Facility (n.d.), Results of the 1st Call for Proposals, http://ec.europa.eu/europeaid/where/acp/regional-cooperation/energy/documents/analysis_of_1stcfp_results_en.pdf

⁸ See European Commission, ACP-EU Energy Facility, http://ec.europa.eu/europeaid/where/acp/regional-cooperation/energy/index_en.htm

⁹ <http://www.switch-asia.eu/switch-info/basic-information-on-switch.html> and http://ec.europa.eu/europeaid/where/asia/regional-cooperation/environment/switch_en.htm

¹⁰ <http://geeref.com/posts/display/1>

¹¹ http://ec.europa.eu/europeaid/how/finance/dci/environment_en.htm

¹² The figure is taken from Behrens (2008), p. 10.

¹³ COOPENER is the external component of the European Commission's Intelligent Energy - Europe programme, see http://ec.europa.eu/development/policies/9interventionareas/waterenergy/energy/initiative/coopener_en.cfm and [www.managenergy.net/conference/eie0501/\(3\)%20COOPENER.ppt](http://www.managenergy.net/conference/eie0501/(3)%20COOPENER.ppt)

¹⁴ Projects must involve a minimum of two European partners from two European countries and participants from developing countries.

¹⁵ E.g. the ACP-EU Energy Facility.

¹⁶ Ridolfi (2009), slide 11.

¹⁷ This figure is based on the following considerations: According to an internal E.U. survey, 1.15 billion Euro of E.U. funding were spent on mitigation projects in 2002-2007.

¹⁸ The budget share of the ENRTP allocated to the GEEREF is about 75 million Euro for 2007-2010, see ENRTP presentation available at http://ec.europa.eu/development/policies/9interventionareas/environment/funding/enrtp/enrtp_en.cfm.

¹⁹ See <http://www.eib.org/projects/press/2009/2009-239-european-investment-bank-funds-for-renewable-energy-and-energy-efficiency-projects-across-south-africa.htm>. It is not evident what the conditions of this credit were, i.e. whether it was granted at concessional conditions.

²⁰ European Investment Bank (2010).

²¹ See the figure in Behrens (2008), p. 8.

²² White House (2010).

²³ Phone and email correspondence with US AID employee. September 1, 2010.

²⁴ Department of State (2010).

²⁵ Phone and email correspondence with US AID employee. September 1, 2010.

²⁶ Source for all data, White House (2010), p. 22.

²⁷ Ibid.

²⁸ Even here the response rate was minimal, which has resulted in a paucity of actual figures for most of the U.S.'s bilateral initiatives.

²⁹ White House (2010), p. 20.

³⁰ See Clear Air Initiative for Asian Cities <http://www.cleanairnet.org/caiasia/1412/article-58566.html> (last accessed 31 August 2010).

³¹ See U.S. Environmental Protection Agency (2010): <http://www.epa.gov/international/air/chinaair.html> (last accessed 31 August 2010).

³² See EERE Network News (2010) http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=16278 (accessed 1 September 2010).

³³ ECPA (2010).

³⁴ See <http://www.reep.org/index.php?assetType=news&assetId=249> (accessed 1 September 2010).

³⁵ GEF (n.d.), p. 8.

³⁶ IDA (2009), p. 3.

³⁷ Parthan et al. (2010).

³⁸ CTF and IDA.

³⁹ Provided by the CTF.

⁴⁰ GEF (n.d.), p. 16.

⁴¹ Herz (2009)

⁴² GEF (n.d.), p. 9.

⁴³ Dept. of State (2010).

⁴⁴ Figures for 4th and 5th Replenishment of the GEF from <http://www.climatefundsupdate.org/graphs-statistics/pledges-by-country>.

⁴⁵ The total amount is made up of shares held by the US in the IDB and callable capital. <http://idbdocs.iadb.org/wsdocs/getdocument.aspx?docnum=35104877>

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- ⁴⁶ <http://ase.org/efficiencynews/renewables-and-efficiency-deployment-initiative-climate-redi>
- ⁴⁷ Clean Energy Ministerial (2010).
- ⁴⁸ Hassell et al. (2009).
- ⁴⁹ Porter et al. (2008).
- ⁵⁰ White House (2010).
- ⁵¹ See the list of projects at <http://www.climatefundsupdate.org/projects>. As the CTF has only started operating in 2008, the list of approved projects is relatively short so far, including two projects dedicated to energy efficiency projects so far, see [p://www.climateinvestmentfunds.org/cif/Decisions_by_Mail](http://www.climateinvestmentfunds.org/cif/Decisions_by_Mail).
- ⁵² Other criteria proposed in the relatively recently literature on climate finance are the polluter pays principle, the adequateness of funds for the task at hand, the additionality of funds, predictability of funds, verifiability, access for the most vulnerable and the generation of co-benefits, see Bird (2009), p. 4; Spratt (2009), p. 21f; Möhner/Klein (2007), p. 5.
- ⁵³ Sarkar/Singh (2010).
- ⁵⁴ Ridolfi, (2009), slide 7.
- ⁵⁵ Ridolfi, (2009), slide 7.
- ⁵⁶ Ridolfi, (2009), slide 7.
- ⁵⁷ GEF (n.d.), p. 10.
- ⁵⁸ Bird (2009), p. 6, uses the somewhat similar criterion of democratic governance; Action Aid (2008), p. 12f, talks about representative governance and the participation of relevant communities.
- ⁵⁹ Ownership is laid down as own of the principles for development cooperation in the Paris Declaration on Aid Effectiveness, <http://www.oecd.org/dataoecd/11/41/34428351.pdf>.
- ⁶⁰ See Andersen et al. (2007) p. 300-303. The point that the openness of institutions to non-state actors tends to increase the effectiveness of environmental regimes or institutions is also made at a more general level, see e.g. Kaasa (2007) p. 124; Biermann and Bauer (2004).
- ⁶¹ The criterion is also used e.g. by Action Aid (2008), p. 15.
- ⁶² See on this Gupta/Ivanona (2009).
- ⁶³ The criterion is also used e.g. by Bird (2009), p. 4;
- ⁶⁴ See <http://geeref.com/posts/display/25>.
- ⁶⁵ See e.g. People's Daily Online, European Commission approves investment in China's Greenstar, 6 July 2010, <http://english.peopledaily.com.cn/90001/90776/90883/7054794.html>.
- ⁶⁶ The amount of the third investment has not been specified on the GEREFF website.
- ⁶⁷ Ridolfi (n.d.), p.13.
- ⁶⁸ See e.g Behrens (2009).
- ⁶⁹ European Commission (2006).
- ⁷⁰ Behrens (2009), p. 6.
- ⁷¹ Behrens (2009), p. 5.
- ⁷² Ridolfi (n.d.).

⁷³ Behrens (2009), p. 7.

⁷⁴ For details on the Energy and Climate Partnership of the Americas, see <http://www.ecpamericas.org/about.php?lan=eng>.

⁷⁵ ECPA (2010).

⁷⁶ See http://www.ecpamericas.org/initiatives.php?lan=eng&initiative_id=4.

⁷⁷ See <http://www.state.gov/p/wha/rls/fs/2010/146176.htm>.

⁷⁸ See <http://www.nrel.gov/docs/fy10osti/48004.pdf>.

⁷⁹ See http://www.peacecorps.gov/index.cfm?shell=resources.media.press.view&news_id=1605.

⁸⁰ ECPA (2010).

⁸¹ See the list of projects at <http://www.climatefundsupdate.org/projects>.

⁸² GEF (n.d.), p. 8.

⁸³ Porter et al. (2008), p. 26.

⁸⁴ <http://www.thegef.org/gef/council>. While decisions are taken by consensus in practice, there are formal voting rules according to which for a decision to be adopted it needs to be supported both by 60% majority of the total number of participating countries as well as a 60% majority of total contributions.

⁸⁵ <http://www.thegef.org/gef/csos>

⁸⁶ <http://www.thegef.org/gef/STAP>

⁸⁷ Werksman (2003), p. 6.

⁸⁸ GEF (2009), p. ii; GEF Evaluation Office (2010), p. 35.

⁸⁹ Porter et al. (2008).

⁹⁰ Porter et al. (2008).

⁹¹ GEF Evaluation Office (2010), p. 30.

⁹² See <http://scaf-energy.org/about/GC.html>.

⁹³ GEF (2009), p. ii.

⁹⁴ Some websites have recently been created, e.g. www.climatefundsupdate.org, but they seem to be directed rather at informing the interested public than fund-seekers and do not specifically address different areas of funding.

⁹⁵ A UN Foundation (2007) report (p. 5) estimates that a doubling of energy efficiency worldwide through 2030 would require total investments of \$3.2 trillion, of which nearly \$1 trillion would be needed in developing countries.