Concepts on the Implementation Framework for the Climate Technology Center and Network under the UNFCCC

Discussion Paper

Prepared by the Coordinated Low Emissions Assistance Network (CLEAN)

November 28. 2011

Acknowledgements

This paper was written by Ron Benioff and Sadie Cox of the US National Renewable Energy Laboratory (NREL), and Heleen de Coninck of Energy research Centre of the Netherlands (ECN), with guidance and direction from Mark Radka of United Nations Environment Programme (UNEP) and John Christensen of the UNEP-Risoe Collaborating Center. Valuable technical reviews were provided by additional organizations participating in the Coordinated Low Emission Assistance Network (CLEAN).

Table of Contents

Introduction

This paper aims to offer concrete suggestions on an effective implementation structure for the Climate Technology Center and Network (CTC+N). The concepts presented here reflect our best knowledge of the experiences and lessons learned by many of the international technical institutions participating in CLEAN, while also drawing on experiences from other international climate and technology cooperation programs and reflecting the Cancun Agreements on the Technology Mechanism (UNFCCC, 2010).

The effectiveness of the possible CTC&N structure is surrounded by uncertainty, as a process as complex as technology transfer is difficult to plan. The paper therefore starts from the premise that the CTC&N should primarily be responsive to a dynamic policy and technology field, and create the enabling conditions to for climate technology development and transfer. This paper builds upon a more extensive review by CLEAN partners of potential design options and functions for climate technology centers and networks under the UNFCCC (UNEP, 2010) and also incorporates ideas from earlier work towards what now seems to be the emerging consensus on the CTC+N in the UNFCCC (NREL, ECN and UNEP/Risoe, 2010; ICTSD, 2011; CEG, 2011). Several publications on climate innovation centers highlight the importance of responding to developing country needs. For example infoDev and Climate Strategies, Sagar (2011) states that climate innovation centers "could serve as an effective innovation-cooperation mechanism that is informed and driven by the technology and innovation needs of developing countries" (Sagar, 2011). This review also draws on and adapts content from a July, 2011 CLEAN paper that describes roles of networks and knowledge platforms to support low emission development strategies (NREL, 2011).

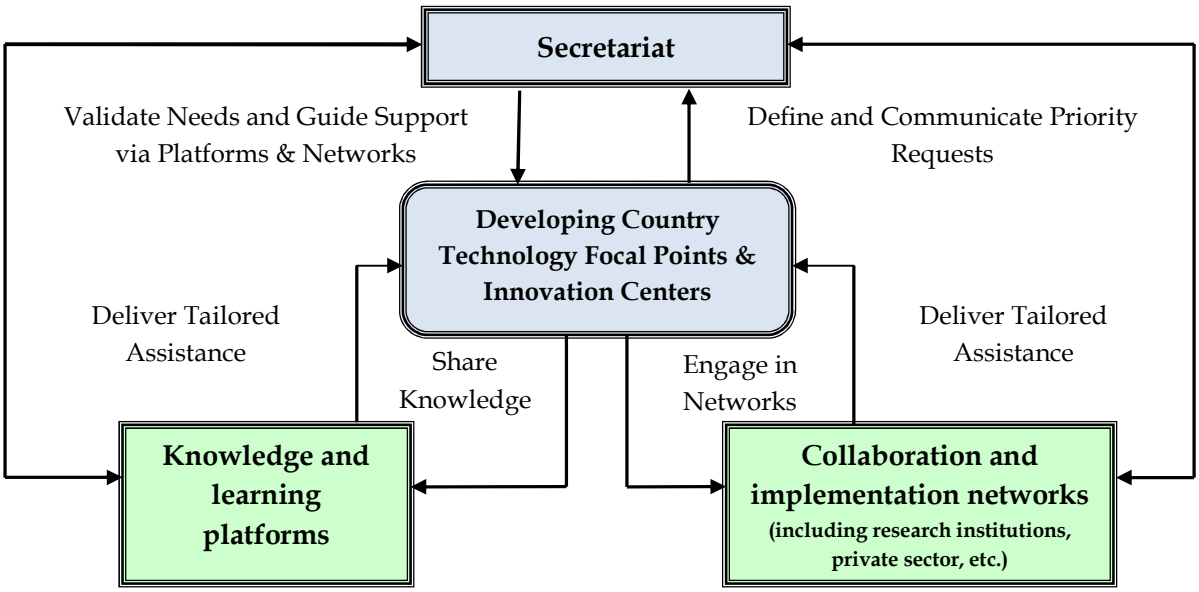
Summary of possible CTC&N Structure

Based on what the Cancun Agreements mandate, this document describes a potential structure for the CTC+N with the following four basic components:

- A secretariat to manage and guide implementation of technology cooperation programs. This secretariat could be light in size and operations and could play primarily a facilitating and management role.
- Developing-country technology focal points and innovation centers which participate in those collaboration, implementation, knowledge and learning networks that are relevant to them.
- Virtual knowledge and learning forums operating through remote means. An important feature here is peer learning, where actors learn from and inspire each other, rather only than unidirectional training.
- Regional and global implementation and collaboration networks providing tailored country implementation assistance and peer learning

In this scheme, and consistent with the Cancun Agreements, the secretariat and the developing country technology focal points and innovation centers could be considered the CTC (in blue), while the platforms and networks would form the Network (in green)

This report includes an examples depicting how these four elements would support enhancing climate technology development and use in developing countries in response to their requests and needs.



It is important to note that the CTC&N could both deliver tailored assistance to countries based on requests received from focal points as well as pursue multi-country collaborative initiatives to address common needs across multiple countries. Such multi-country collaboration is not fully depicted in this diagram.

Key Design Principles

The following principles can guide the design of the CTC+N, building on lessons from other international climate change and development programs:

1. ***Balance Attention to Country Based Demand along with Supply of Technology Cooperation Services***. The CTC+N will be most effective if it develops a robust platform for delivery of climate technology programs in tandem with mechanisms to aid countries in defining and implementing priority technology actions. This paper discusses support for in-country technology focal points and innovation centers to help address this issue.
2. ***Tailor Country or Regional Assistance on a Few Carefully Selected Topics Sustained Over Multiple Years.*** The CTC+N will only be able to have concrete results by focusing its limited resources on a couple priority topics for a country or region where cooperation can be sustained over several years to gain the necessary traction.
3. ***Organize Topical Learning Platforms and Collaboration networks that Tap into Current Expertise and Programs.*** The CTC+N can leverage its limited resources by engaging existing institutions and experts and partnering with other international programs in providing support to countries through topical collaboration networks and learning platforms.

4. ***Promote Peer Learning at All Levels.*** The most effective programs are often those where actors learn from and inspire each other. The CTC+N should facilitate such peer learning besides expert training alone across and between all levels of government, the private sector, technical institutes, and civil society through a portfolio of mechanisms.
5. ***Pursue a Phased Implementation Approach.*** Given the diverse challenges faced by the CTC+N, it will likely benefit from a phased development approach that will allow for learning from initial experiences, responding to new realities and making use of dynamics in society. This could be achieved for example, by having the CTC+N focus in its first years on one mitigation (e.g. energy) and one adaptation (e.g. agriculture) topic and then extending its scope to more climate technology topics based on early lessons and country requests.
6. ***Actively Engage the Private Sector.*** In most cases the ultimate success of the CTC+N will depend on how effective its programs are at helping actors mobilize increase private sector investment in priority technologies. Thus, the CTC+N should seek to foster active participation of the private sector in its programs. This could include establishing a private sector financing and investment advisory implementation network.
7. ***Engage the Academic and NGO Community.*** The CTC&N will also benefit from close collaboration with university and education institutions along with community based NGOs are around the world. This could include building capacity for education and training programs and to support implementation of technology programs and could participation of academic institutions and other NGOs in the collaboration networks.

Definitions of Platforms and Networks

- ***Knowledge and Learning Platforms*** – This refers to web sites and data systems that serve as clearinghouses for accessing technology information and tools and for virtual peer to peer exchange (e.g. webinars, blogs, etc.) and training (e.g. videos, on-line courses, etc.).
- ***Collaboration Networks*** – These are networks of experts on a specific technology cooperation related topic (e.g. renewable energy, sea level rise, financing programs, etc.) who are available to deliver assistance to developing countries and foster peer learning and collaborative projects across countries.

Mandate of the CTC&N

The Cancun Agreements (2010) have established the Technology Mechanism, which has the aim of enhancing action on technology development and transfer and determine nationally appropriate technology needs across the stages of the technology innovation chain. The Technology Mechanism will consist of a Technology Executive Committee and a CTC&N. The Agreements state, "the Technology Executive Committee and the Climate Technology Centre and Network, consistent with their respective functions, should facilitate the effective implementation of the Technology Mechanism, under the guidance of the Conference of the Parties". This suggests that the CTC&N would be directly guided by the Convention.

What would the CTC&N do according to the Cancun Agreements? The CTC's primary role seems to be to facilitate the Network, which in itself would be compiled of other networks in the field of technology. The decision mentions regional, sectoral and international technology networks, as well as organizations and initiatives. The secretariat and developing country focal points described in this paper could be viewed as playing the role of the CTC where a secretariat staff works with country focal points to identify priority needs and coordinate programs implemented by expert networks. These secretariat and focal points could also implement programs in response to guidance from the Convention and the TEC and based on common multi-country needs and opportunities that are identified.

The decision also emphasizes that many of the actions by the CTC&N should be driven by demand from developing countries, expressed through a request. Activities that especially need to be demand-driven are support and advice for technology needs identification, information, technical assistance and training provision, and prompt deployment of existing technology.

The actions for which the CTC&N seems to have more freedom to work independently are the setting up of networks for enhancing cooperation with national institutions, R&D collaboration (e.g. through twinning) and analytical tools, policies and best practices for country-driven planning. The CTC is also supposed to engage the networks in working with the private sector to stimulate development and transfer of environmentally sound technologies and all forms of international technology collaboration.

The Technology Mechanism consists of the TEC and the CTC&N. As their activities are not exactly the same but would have a lot in common, they could have potential overlaps but could also certainly benefit from each other. A point of attention is how the TEC and the CTC&N would collaborate and how responsibilities would be divided. The TEC has met for the first time in September 2011 and has agreed on modalities, so their activities are more clearly defined than those of the CTC&N.

The CTC&N has a long list of activities that it should pursue. The Cancun decision leaves several questions unanswered such as how developing countries should specify and deliver requests for assistance, how the CTC&N should respond to such requests, how the networks should be organized, and the extent to which the CTC&N should take initiative in pursuing activities that may not respond to a specific country request but can benefit multiple countries.

Given the long list of activities for the CTC&N and apparent flexibility in its role, it seems prudent to commence with experimentation on a limited set of relevant activities, gain experience, and make sure the lessons from early activities are extracted by an independent third party. Based on the lessons and experiences that will inevitably arise, the CTC&N activities can be expanded.

Potential Roles and Structure for Each Component

Secretariat

A secretariat could be established to review and approve requests from developing countries and guide work by the knowledge and learning platforms and collaboration networks in

responding to country requests. This secretariat could have a relative small number of staff (e.g.10-15) and operate in an efficient manner to allow most of the resources to be allocated to tailored support to developing countries and collaboration across countries through the platforms and networks. This secretariat could have the following responsibilities:

- Review and clarify requests for assistance from developing country technology focal points
- Manage and guide the work of the knowledge and learning platforms and regional and global collaboration networks
- Coordinate responses by these platforms and networks to country needs. Where appropriate, the Secretariat could also direct integrated work by the platforms and networks to address common country needs through regional and global activities.
- Establish and manage partnerships with other programs
- Develop annual plans and performance goals, monitor and review progress, and communicate results

Some examples of such efficient secretariats include the REN21 Secretariat at UNEP, the IPEEC Secretariat at the IEA, and the role of the U.S. National Renewable Energy Laboratory (NREL) as the Clean Energy Solutions Center operating agent. In the case of IPEEC, a small staff operates a Secretariat located at the International Energy Agency and coordinates energy efficiency initiatives led by different countries that provide training, peer learning, and country specific technical assistance on a variety of energy efficiency topics.

Developing Country Technology Focal Points and Innovation Centers

Developing countries could establish focal points to serve as coordinators in working across government agencies to define current technology cooperation priorities, communicate these priorities to the Secretariat, and coordinate support from the platforms and networks in tandem with in-country programs. Such focal points would ensure that the CTC+N resources are focused on the highest priority needs of developing countries as defined through one primary government authority. They would also enable CTC+N support to be tightly coupled to in-country government programs and stakeholders to ensure that assistance leads to effective and sustained results. These focal points could have the following responsibilities:

- Work across government agencies and with input from key stakeholders to define current technology cooperation priorities based on and consistent with technology needs assessments, low emission development strategies, NAMAs and NAPAs, national communications, and similar climate change plans
- Communicate highest priority needs for technology cooperation assistance to the CTC+N Secretariat
- Work with the Secretariat to clarify these needs and the desired scope of assistance where needed
- Assist in linking assistance provided by the platforms and collaboration networks with in-country programs and stakeholders to ensure that this collaboration leads to meaningful and sustainable results
- Facilitate engagement of in-country experts in the knowledge platforms and collaboration networks to share expertise with other countries

- Determine how the country can most appropriately engage in regional and global technology cooperation programs coordinated by the secretariat
- Communicate results and lessons from technology collaboration to the secretariat and provide review and advice on annual plans and platform and network design and services

Current examples of such focal points include the national climate change focal points under the UNFCCC. In some countries, these national climate focal points are already stretched thin and it may be necessary for countries to establish separate technology focal points that would work in close coordination with these climate focal points.

Along with designation of national technology focal points, developing countries could identify existing organizations operating at national or regional levels that could participate in CTC+N networks, capacity building, and peer-to-peer learning and exchange programs. These organizations would serve as the in-country or regional coordinators of technology development and adaptation, commercialization, and deployment programs. Ideally they will have expertise in the full technology value chain from invention to diffusion. Since it is not feasible for every developing country to have a robust center of excellence on all technologies, countries could designate a couple national institutions to participate in networks and peer learning on specific topics of greatest interest and capability and countries could work together to define opportunities for engagement of regional institutions on topics of common interest.

These developing country technology development and deployment institutions could play the following roles:

- Inform the technology focal points of opportunities and needs for capacity building and technical assistance to advance technology development and diffusion
- Participate in global and regional technology collaboration networks to guide the design of these networks and to engage in delivery of peer learning and assistance programs.
- Coordinate engagement of the country (or group of countries for regional institutions) in programs to build capacity in technical institutes, businesses, financial institutions and governments in the country on technology development, adaptation, and deployment
- Foster partnerships between key country institutions and international technical institutions, the private sector, and multilateral organizations

Knowledge and Learning Platforms

The CTC+N could support knowledge and learning platforms to serve as clearinghouses of data and technical resources on technology options and applications, policies and programs, financing, and international technology cooperation initiatives. The knowledge platforms can provide technical reports, data, and analysis tools, while also providing interactive services such as remote expert assistance, peer-to-peer exchange, and training to support technology transfer. The platforms can be designed to link users to expert networks for more in-depth support and learning.

The CTC+N could support a comprehensive climate technology knowledge and learning platform (likely managed directly by the Secretariat) that could address cross-cutting climate technology cooperation issues along with more in-depth topical platforms for key sectors level

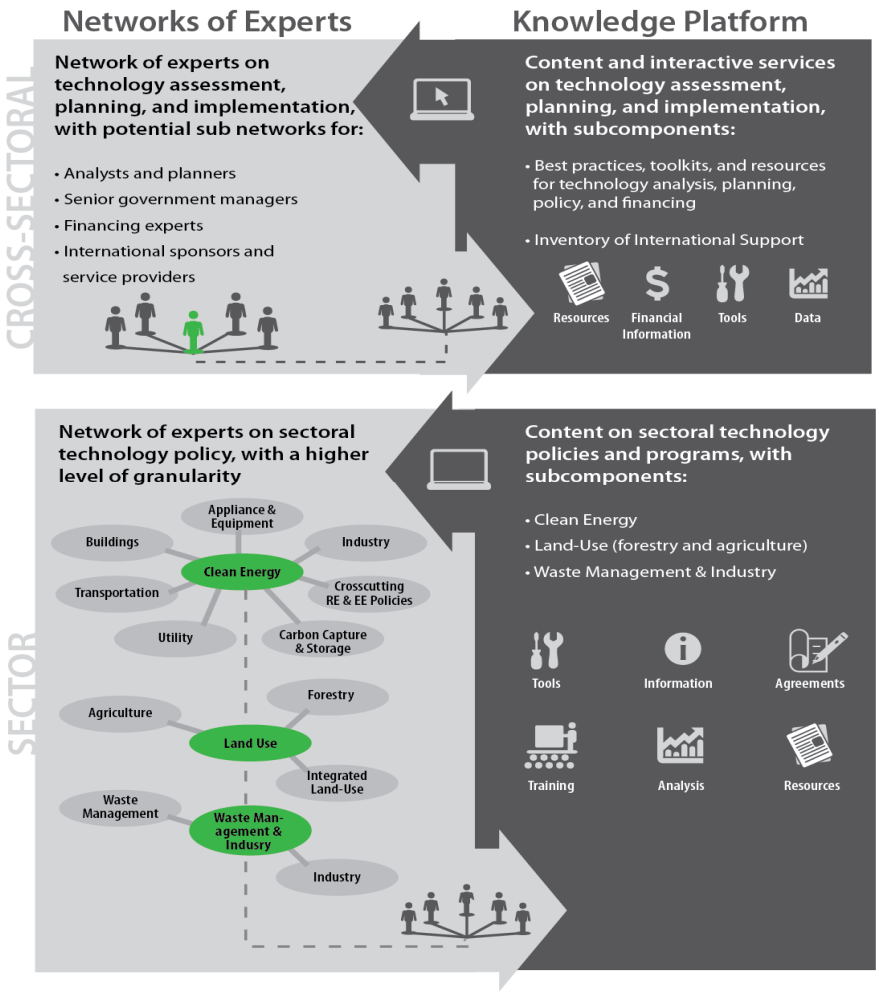
addressing both adaptation and mitigation issues (agriculture, energy, forestry, etc.). Some platforms could also be organized around cross-sectoral topics (e.g. financing, M&V, etc.). The Secretariat could play a clearinghouse role in connecting requests to the appropriate platforms.

Such knowledge and learning platforms can play several vital roles in facilitating technology transfer:

- Technical Tools - Providing developing countries with technical resources to help them understand and implement technology programs. This includes data on technology performance, cost, potential, and applications, analysis tools to help countries evaluate technical and market potential along with development impacts, reports and case studies of policies and programs for enabling technology diffusion and investment, and information on financing options and resources.
- Expert Assistance – Enabling access to remote expert assistance and advice via phone, email, and web based communications to support development and implementation of country technology transfer programs with experts tapped from the technology networks. This could include conducting analysis of key technology issues of concern to developing countries. Note that this remote assistance would be complemented with in-person assistance through the collaboration networks where needed.
- Virtual Learning – Offering e-learning programs, such as on-line technology training courses, training videos, and peer-to-peer learning forums as described further below.
- Peer to peer forums – Convening webinars, blogs, and other peer-to-peer forums to share experiences, good practices, and lessons. These peer-to-peer forums would tap into the technology networks.

For example, with support from the Clean Energy Ministerial countries and UN-Energy, the Clean Energy Solutions Center, www.cleanenergysolutions.org, provides all countries around the world with technical resources and dynamic services on clean energy policies and programs. This includes policy best practice studies, policy and deployment data, analysis tools, along with clean energy potential and impact information. The Clean Energy Solutions Center also offers remote expert assistance via a network of global energy policy experts coupled with webinars and blogs for peer-to-peer learning, and training resources. The Clean Energy Solutions Center could be expanded to cover the full range of clean energy technology issues in support of the CTC+N.

The knowledge and learning platforms would operate in a tightly linked manner with technology cooperation networks as depicted in the figure below.



Source: Adapted from International Experiences and Frameworks to Support Country-driven Low Emission Development, Coordinated Low Emissions Assistance Network, July 2011

This diagram illustrates the operation of the networks and platforms at both cross-sectoral and sectoral levels, and the types of content covered by each. The networks would serve as the primary sources of expert assistance, peer learning, and training, while also providing content for the knowledge platforms. The knowledge platforms would maintain and disseminate technical resources and knowledge developed through the networks, link users to expert networks, and deliver interactive virtual services together with the networks such as remote expert assistance, peer learning, and training.

Global and Regional Collaboration and Implementation Networks

International networks would serve as the primary sources of assistance and capacity building for developing countries through the CTC+N. Several different types of networks could be established with operations at both the global and regional levels including:

1. ***Sectoral Technology Networks.*** Sectoral networks would provide support and support peer learning on technology transfer issues for each sector (e.g. agriculture, energy, forestry, water resources, etc.). These sectoral networks could have the following functions:

    - Peer Exchanges – coordinating and supporting exchanges of experts across institutions to support in-depth learning and collaboration. This would include peer exchanges operating at in South-North and South-South contexts, and could be focused on different stages in the technology maturity chain. It is an important lesson from the past that these efforts are sustained over longer periods. Elements such as twinning between applied R&D institutions could be part of this.
    - Institutional Capacity Building – delivering expert advice and technical resources to assist developing countries with strengthening of technology centers of excellence. This would include support to developing country institutions operating at national and regional levels.
    - Technical Assistance – delivering both in person and remote expert assistance to countries on design and implementation of all phases of technology programs. The CTC+N secretariat could provide financial support to expert networks to deliver such assistance within clearly defined bounds and procedures, with coordination of support through the secretariat and the knowledge platforms. This is similar to how the Clean Energy Solutions Center operates. Efforts would also be made to leverage limited CTC+N resources with support available from existing international programs for maximum impact and global reach.
    - Training Programs – providing training to developing countries on technology innovation programs, applications, project development, policies, and financing. Such training could be provided through global and regional workshops and virtual forums conducted with the knowledge platforms. These activities would be designed as train the trainer initiatives to achieve sustained echo training in each country.
    - Technical Studies – conducting and commissioning independent background analysis and studies on relevant technology issues for the sector of interest to many countries at global or regional levels, such as cost studies, R&D roadmaps, technology standards, commercialization, and related technology transfer issues.

2. ***Country Technology Focal Point Networks.*** These focal point networks would offer capacity building and peer to peer learning across developing country technology transfer leads, including:

    - Focal Point Workshops – delivering training to focal points on technology transfer issues and fostering sharing of experiences, good practices, and lessons
    - Virtual Forums – offering blog forums, webinars, and similar tools to foster direct communications between country focal points in multiple languages

- Expert Assistance – offering focal points with access to climate technology experts to provide advice and assistance with country technology plans and overall technology programs.

3. ***Financing and Investment Networks***. A network could be established of international financing experts and investment organizations to assist countries with access to such investment resources and to provide advice on country actions that will be most effective at mobilizing sustained private and public investment in priority technologies. Activities could include:

    - Investment Training Programs – workshops and virtual training forums to build capacity of developing country governments, private sector institutions, and NGOs on mobilizing investment in priority climate technologies
    - Investment Advisory Services – providing expert advice and coaching on actions countries can take to attract sustained investment in priority technologies. Given resource limitations, such investment advice will likely need to be limited in scope and delivered primarily through remote means
    - Peer to Peer Learning – convening virtual and some in-person forums to allow countries to share experiences, good practices, and lessons with technology investment

Examples of such expert networks include the ClimateWorks policy networks, www.climateworks.org/network, and the UNEP facilitated Global Network on Energy for Sustainable Development, www.GNESD.org. The Climate Technology Initiative Private Financing Advisory Network, www.CTI-PFAN.org, and Sustainable Energy Finance Alliance, www.sefalliance.org, are good examples of investment networks. Appendix 1 presents key principles that can help inform the design of these climate technology networks.

Implementation Example - Development of an energy efficient lighting action plan

The example below describes the engagement of the various potential components of the CTC&N in responding to a request from a country for assistance with an action plan to advance the use of energy efficient lighting. This is a simplified process to illustrate some of the key steps. Actual CTC&N projects will likely have more complexity.

Identify need and request assistance

- Country focal point identifies energy efficient lighting as a priority based on TNAs, LEDs, etc.
- Focal point designates lead national institution and defines scope of assistance desired
- Focal point submits request for assistance to the Secretariat

Develop workplan for support

- Secretariat reviews request with focal point to clarify scope
- Secretariat and lighting efficiency expert (from expert network) share information on alternative approaches and resources to support lighting efficiency
- Workplan developed for assistance by focal point, lead national institution, Secretariat, and lighting efficiency expert

Share knowledge and conduct peer learning

- Lighting efficiency expert engages works with energy knowledge platform to share lighting efficiency technical reports, analysis tools, and data sets with national institution
- Energy knowledge platform and lighting expert facilitate peer learning programs (webinars, blogs, direct peer exchanges, etc.) on energy efficient lighting
- Energy knowledge platform and lighting expert provide remote expert assistance to the country (where appropriate)

Deliver in-country support

- Lighting efficiency expert team (from network and existing programs) deliver training in partnership with in-country institutions
- Llighting efficiency team delivers technical support (e.g. analysis, policy and project development advice, etc.) in collaboration with in-country team
- LIghting efficiency team engages implementation networks to advise country on strategies for securing ongoing support for lighting efficiency measures

Report and review

- Focal point and lighting efficiency expert communicates results and lessons from assistance to Secretariat
- Secretariat reviews progress and communicates results to TEC and the international community.
- Lessons learned inform improvements to expert networks and knowledge platforms

Conclusions

This paper has suggested a structure for the CTC&N that foresees an international secretariat and developing country technology focal points, possibly located at innovation centers, comprising the CTC, and networks of governmental institutions, and other stakeholders to support knowledge sharing and peer learning networks and deliver assistance to developing countries in response to their requests. . It has also given an example of how the CTC&N could work in a practical case.

An important caveat to make about this work is that no international institution, especially a relatively new and complex one like a mechanism to develop and transfer technology for resolving a global public good issue, can be planned fully upfront. Success and failure will depend on the ability of the Technology Mechanism and the CTC&N to learn from its own experiences and those of others. A great amount of flexibility will have to be allowed in the planning processes, and many issues, such as how much developing country demand there will be for certain services, are very hard to predict. It is not the intention of this paper to suggest that the functioning of the CTC&N can be predicted or meticulously planned.

Other uncertainties include whether there will be sufficient funding, and whether of developing country technology focal points will find themselves enabled to perform their crucial role in the successful implementation of the CTC&N.

This work could benefit from more insights from existing institutions as well as insight in what the demands and questions of developing countries could be. A possibility would be to hold a survey among current negotiators on what their expectations are of the CTC&N, and what abilities they would have to contribute to the technology focal point function in the proposed structure.

References

ICTSD, 2011. The New Climate Technology Mechanism: an Opportunity to Seize. By Ahmed Abdel Latif. http://ictsd.org/i/trade-and-sustainable-development-agenda/98857/.

CEG, 2011. Moving Climate Innovation into the 21st Century: Emerging Lessons from Other Sectors and Options for a New Climate Innovation Initiative. By Clean Energy Group, Jessica Morey and Lewis Milford. http://www.cleanegroup.org/publications/resource/moving-climate-innovation-into-the-21st-century-emerging-lessons-from-other-sectors-and-options-for-a-new-climate-innovation-initiative.

Sagar, Ambuj, 2011. Climate Innovation Centers: Innovation Cooperation to Meet Climate and Development Challenges. Climate Strategies, 201. http://www.climatestrategies.org/research/our-reports/category/56/314.html.

UNEP, 2010: Cochran, J., Cox, S., Benioff, R., de Coninck, H. and Wuertenberger, "An Exploration of Options and Functions of Climate Technology Centres and Networks", United Nations Environment Programme, 2010. http://www.unep.fr/energy/.

NREL, 2011: Coordinated Low Emissions Assistance Network (CLEAN), “International Experiences and Frameworks to Support Country-driven Low Emission Development”, July 2011, US National Renewable Energy Laboratory. http://en.openei.org/wiki/CLEAN_Reports.

NREL, ECN and UNEP/Risoe, 2010. Strengthening Clean Energy Technology Cooperation under the UNFCCC: Steps toward Implementation. By Ron Benioff (NREL), Heleen de Coninck (ECN), Subash Dhar (Risoe National Lab), Ulrich Hansen (Risoe National Lab), Joyce McLaren (NREL) and Jyoti Painuly (Risoe National Lab). http://www.nrel.gov/docs/fy10osti/48596.pdf.

UNFCCC, 2010: “The Cancun Agreements: Outcome of the work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention”, Decision 1/CP.1, December 2010. Available via www.unfccc.int.

Appendix 1 – Potential Principles to Inform Design of Climate Technology Networks

Based on experiences of existing peer to peer networks, the following principles can be identified to help guide the structure of such global and regional technology transfer networks.

1. ***Narrowly Defined Scope Reflecting Common Interests***. Peer networks are most effective when all participants share mutual interests in learning about specific topics and the scope of the network is well defined and not too broad. Networks should devote effort to defining and continually updating common topics of interest.
2. ***Couple Networks with Virtual Clearinghouses and Learning Platforms***. Expert networks should be coupled with virtual information and learning clearinghouses which offer both state-of-the art information and tools and interactive services (e.g. expert assistance, training, etc.) and can serve as the knowledge management system for the networks.
3. ***Frequent Direct Peer Interaction***. Networks thrive where peers have multiple opportunities to interact directly with their counterparts through webinars, in-person meetings, moderated peer to peer knowledge sharing, and related forums.
4. ***Establish Global and Regional Forums***. Global peer forums should be combined with regional forums since for many topics approaches and contents need to be tailored to regional needs and circumstances and learning will occur best at the regional level.
5. ***Learning from Leading Innovators***. Much learning and motivation occurs through exposure to innovative programs and successes achieved by peers. Networks should identify such champions and create multiple opportunities for learning from their experiences.
6. ***Tailoring of Services to Country and Regional Needs***. Effective dissemination of knowledge in countries requires dedicated efforts to tailor and deliver resources (e.g. data systems, training resources and webinars, education and outreach, etc.) to meet country and regional circumstances. This requires resources devoted to supporting country specific (and regional) products and outreach.
7. ***Long-Term Commitment to Developing Country Capacity Building***. Networks will need to make multi-year investments in building institutional and human capacity at the regional and country level for developing countries to ensure that these countries have the sustained expertise needed to participate in and disseminate knowledge from the network. This includes support for professional training and academic education programs in developing countries.
8. ***Robust Partnerships and Integration***. Networks should closely integrate with the broad portfolio of existing networks and clearinghouses to tap into the knowledge and resources of these initiatives rather than creating duplicative or competing sites. This includes carefully attention to clearly defining and communicating the unique niche for each network and developing integrated information platforms to utilize common databases.
9. ***Multiple Languages.*** Knowledge will be most effectively disseminated if resources are presented in multiple languages rather than just in English.