



SUMMARY OF THE FOURTH MEETING OF THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE TECHNOLOGY EXECUTIVE COMMITTEE: 6-8 SEPTEMBER 2012

The fourth meeting of the UN Framework Convention on Climate Change (UNFCCC) Technology Executive Committee (TEC 4) took place at Siam City Hotel in Bangkok, Thailand, from Thursday, 6 September to Saturday, 8 September 2012. The meeting was attended by more than 60 participants, including Committee members and representatives of observer organizations.

The meeting included a continued thematic dialogue with relevant stakeholders on enabling environments and barriers to technology development and transfer, which began at TEC 3. The Committee also considered progress on the implementation of its workplan for 2012-2013, in relation to, *inter alia*: technology roadmaps, relevant work of other institutions under and outside of the Convention, technology needs assessments, and possible topics for technical papers. At the end of the meeting, the TEC adopted key messages to the 18th session of the UNFCCC Conference of the Parties (COP 18) in Doha on enabling environments and barriers to technology development and transfer, technology roadmaps, and technology needs assessments.

BRIEF HISTORY

The TEC was established by the UNFCCC Conference of the Parties at its 16th session (COP 16) in Cancun, Mexico, as one of the two components of the new Technology Mechanism of the Convention. The second component of the Technology Mechanism is a Climate Technology Centre and Network (CTCN), also established at COP 16.

The TEC comprises 20 high-level expert members, elected by COP, who serve in their personal capacity. They are nominated by parties to the UNFCCC with the aim of achieving a fair and balanced representation. The Committee reports to the COP, through the subsidiary bodies, on its activities and the performance of its functions.

The functions of the TEC include:

- Providing an overview of technological needs and analysis of policy and technical issues related to the development and transfer of technologies for mitigation and adaptation;
- Recommending actions to promote technology development and transfer;
- Recommending guidance on policies and programme priorities related to technology development and transfer with special consideration given to the least developed country parties to the UNFCCC;

- Promoting and facilitating collaboration between governments, the private sector, non-profit organizations and academic and research communities on the development and transfer of technologies for mitigation and adaptation;
- Recommending actions to address the barriers to technology development and transfer in order to enable enhanced action on mitigation and adaptation;
- Cooperating with relevant international technology initiatives, stakeholders and organizations, and promoting coherence and cooperation across technology activities, including activities under and outside of the Convention;
- Catalyzing the development and use of technology roadmaps or action plans at the international, regional and national levels through cooperation between relevant stakeholders, particularly governments and relevant organizations or bodies, including the development of best practice guidelines as facilitative tools.

This was the fourth meeting of the TEC since its establishment.

First meeting of the TEC: The TEC's first meeting took place on 1-3 September 2011 in Bonn, Germany. The Committee addressed organizational matters and elaborated on modalities and procedures of the TEC which were subsequently adopted by COP 17.

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Second meeting of the TEC: The Committee held its second meeting on 15-17 February 2012 in Bonn, Germany. At the meeting, the TEC developed its rolling workplan for 2012-2013 and began work on modalities on linkages with other relevant institutional arrangements under and outside the Convention. The Committee also discussed engaging stakeholders in its work.

Third meeting of the TEC: This meeting took place from 28 to 29 May 2012 in Bonn, Germany, and included a thematic dialogue with relevant organizations and stakeholders on enabling environments and barriers to technology development and transfer. The Committee also considered progress on the implementation of its workplan for 2012-2013 and continued work on modalities on linkages with other relevant institutional arrangements under and outside the Convention.

SUMMARY OF THE MEETING

In his opening of the meeting on Thursday, 6 September, Gabriel Blanco, Chair of the TEC, highlighted the importance of this meeting as the last one before COP 18 in Doha.

Wanna Tanunchaiwatana, UNFCCC Secretariat, informed the Committee that the regional group of Asia and the Pacific had nominated Majid al Suwaidi as a new member of the TEC to replace Mohamed Issa Abushahab, who had to resign from the Committee due to other work commitments. She also noted the participation of more than fifty observers at the meeting, making it the biggest TEC meeting so far.

ORGANIZATIONAL MATTERS

ADOPTION OF THE AGENDA AND MINUTES OF THE LAST MEETING: The TEC adopted the agenda of the meeting (TEC/12/4/1) and minutes of its third meeting.

PARTICIPATION OF THE TEC MEMBERS AND THE SECRETARIAT IN RELEVANT MEETINGS AND EVENTS: TEC member Kunihiro Shimada reported on the 21st Asia-Pacific Seminar on Climate Change on 26-27 July 2012, which brought together over 20 governments and experts to discuss: mitigation and adaptation technologies; financing; and post-2012 schemes and platforms for technology development and transfer.

TEC member Jukka Uosukainen noted that Finland has joined the Climate and Clean Air Coalition, which focuses on reducing short-lived pollutants such as methane, black carbon and hydrofluorocarbons, and is preparing a large-scale pilot project on biofuel production from wood.

TEC Vice-Chair Antonio Pflüger reported that the German Industry Association is following the TEC's work and has established a working group on climate technology transfer that includes ministries, industries and research organizations. He said the group is awaiting outcomes of the TEC and key messages to COP 18, and may host a side event in Doha.

TEC member Richard Duke highlighted the Clean Energy Solution Center, which offers governments free policy advice on energy efficiency and renewables, including at sub-national levels.

TEC Chair Blanco said the Intergovernmental Panel on Climate Change (IPCC) is working on its Fifth Assessment Report, and IPCC Working Group III has released a first-order draft addressing climate change mitigation for external review by experts.

Tanunchaiwatana noted the *Ad Hoc* Working Group on Long-term Cooperative Action under the Convention (AWG-LCA) closed on 5 September with an informal overview note, which, although not representing consensus, summarizes, *inter alia*, the main issues with regard to technology on the AWG-LCA agenda and options for addressing those issues.

RESPONSES TO THE CALL FOR INPUTS FROM RELEVANT STAKEHOLDERS: Bert van der Plas, UNFCCC Secretariat, said that following the TEC's request, the Secretariat issued a call for inputs through the UNFCCC TT:Clear technology information clearinghouse, Climate-L list and accredited observers, and received over 40 submissions from a wide range of organizations. Inputs were invited in three areas: ways to promote enabling environments and address barriers to technology development and transfer, including the role that the TEC could play in this area of work; actions undertaken by accredited observer organizations relevant to the work of the TEC in performing its functions; and technology roadmaps and action plans.

Several Committee members expressed gratitude to observers for their submissions and noted the need for a detailed discussion of the submissions by the Committee. A Committee member also expressed concern that there are few observers from developing countries in TEC meetings.

THEMATIC DIALOGUE ON ENABLING ENVIRONMENTS AND BARRIERS TO TECHNOLOGY DEVELOPMENT AND TRANSFER

Van der Plas recalled to Committee members that TEC 3 held a thematic dialogue on enabling environments and barriers to technology development and transfer and had agreed to hold a follow-up dialogue at this meeting to address the gaps identified during the first thematic dialogue. He also presented a synthesis of information provided by organizations on ways to promote enabling environments and to address barriers to technology development and transfer, including the possible role of the TEC in this area of work. He said 17 organizations had made submissions, and described their inputs on: promoting enabling environments in developing countries; barriers to development and technology transfer; and possible follow-up actions for the international community and the TEC.

CONTINUED DIALOGUE WITH RELEVANT STAKEHOLDERS: Session I, "Enabling environments and barriers to technology development and transfer": Ana Pueyo Velasco, Research Fellow, Institute of Development Studies, presented on enabling factors for climate change technology transfer to developing countries. She stated that UNFCCC instruments have so far not delivered significant rates of technology transfer, due to disconnects from frameworks that facilitate private investment, an overly homogenous approach to heterogenous developing countries, and lack of measurement of the magnitude and effectiveness of climate change technology transfer. She then described her research, which evaluated developing countries on the enabling factors of demand, economic and institutional frameworks, local resources and capabilities, and innovation and production, categorizing them as technology developers, technology implementers, countries in need of structural change, or aid-dependent countries. In closing, she listed general policy recommendations for countries in each category to drive low-carbon technology transfer.

Le Nguyet Minh, Country Representative, Oxfam, presented on Oxfam's program on the system of rice intensification in Northern Vietnam. She noted that climate change poses a threat for rice production and hence for food security, noting that an increase of one degree in night temperature will lead to a seven to ten percent reduction in rice yield. At the same time, she said, rice production contributes to greenhouse gas emissions. She said that Oxfam's ten-year program on a community-based system of rice intensification in Vietnam aims to build the capacity of farming communities and extension

services, noting that the program now reaches 11 percent of farmers and covers six percent of paddy areas. She further noted three messages coming out of Oxfam's program: that maintenance of learning spaces is important; that project size should be supported with adequate technological and financial commitments; and that roles and engagement can change over time.

Jim Watson, Director of the Sussex Energy Group, University of Sussex, presented via Skype on low-carbon growth and innovation in developing countries, focusing primarily on research done in China on: energy efficiency in cement production, electric vehicles, offshore wind power, and efficient coal-fired power. His key conclusions noted: large differences between technologies in terms of development stages, markets, and economics; the difficulty of generalizing from China's case; the fast development of China's capabilities; the possibility of accessing intellectual property rights (IPRs) in many cases; and the essential role of policy frameworks.

In the ensuing discussion, participants addressed such issues as: the country-specific nature of technology transfer; the efficiency of the system of rice intensification and its applicability to other countries; the need for scientific support and verification of novel technologies; the need to study developed countries as knowledge suppliers, not just recipient developing countries; the importance of selecting the right indicators for assessments of technology development and transfer; the need to focus more on adaptation technologies; and the links between the UNFCCC instruments and national enabling environments.

Session II, "Panel discussion on enabling environments and barriers to technology development and transfer":

TEC Chair Blanco asked the panel to address the guiding questions of: key issues related to enabling environments in developed countries that could facilitate technology transfer, and incentives governments could provide; key issues in creating enabling environments for technology development and transfer for adaptation to reduce vulnerability; and next steps to address this issue in the context of the UNFCCC and the TEC.

Toru Kubo, Principal Climate Change Specialist, Asian Development Bank (ADB), expressed concern at the lack of involvement from multilateral and national development banks at TEC's meetings, and called for linkages between the TEC and the UNFCCC Standing Committee on Finance. He highlighted efforts by governments and NGOs to encourage export credit agencies to focus more on technologies that provide greater public good, and urged governments to support partnerships between small technology owners in developed countries and local players in developing countries, stating that the ADB hoped to work with the World Intellectual Property Organization (WIPO) on related efforts. He noted that technologies for which natural markets exist should be supported through a conducive business environment, while a public sector approach is needed for those without natural markets. Stressing that "one size fits all" approaches do not work, he suggested the CTCN work on country-specific needs while the TEC focuses on cross-cutting issues such as global trade and global access, urging TEC members to collaborate with other organizations.

Gabriela Fischerova, Climate Change Policy Advisor, Bratislava Regional Centre, United Nations Development Programme (UNDP), stressed the need for systemic approaches to technology transfer, in addition to existing project and program approaches. She called for country-driven, in-country

research and development (R&D), aided by institutions in developed countries, which would keep knowledge in countries and build on it to reduce poverty and attract further investment. On adaptation, she noted that each country and case needs an individual approach, of which technology may only be a small part, and called for better publicizing of available tools. She suggested the TEC and CTCN can bring new systemic ideas to the attention of the COP.

Ambuj Sagar, Professor of Policy Studies, Indian Institute of Technology, said that despite decisions and documents global efforts are not currently providing enough innovation to meet the challenge of climate change, and that while strong climate policy would be the best enabling environment, this is not yet achieved. In its absence, he called for continued learning from experiments in renewable energy, and proposed a global effort on R&D and innovation on issues important to developing countries which would not naturally be addressed by national efforts in industrialized countries. He stressed the need for a change in how industrialized countries view the process of technology development and transfer. He called for building sophisticated capacity in developing countries to take a "birds-eye view" of the situation, organize processes and tailor country-specific technologies in collaboration with developed countries, in order to set in place the ability to move quickly once stronger climate policies are enacted.

Dalinyebo Shabalala, Advisor, Center for International Environmental Law and Climate Action Network International, said that work on enabling environments must operate under UNFCCC articles 4.1 (c), 4.3, 4.5 and 4.7, and that demand-side measures are clearly insufficient. He noted barriers including: uncertainty, unpredictability and lack of timelines for return on investment; perceived risk in global markets; transaction costs for small and medium enterprises; information asymmetry; and lack of knowledge of markets. He called for development of reliable, transparent platforms for business-to-business sales and intellectual property exchanges. On adaptation, he urged a broad approach focused on immediate action on: non-fossil-fuel development; agriculture; health and water infrastructure; lower costs of access to existing technology; and reduced trade barriers on countries until they have viable technological bases. He urged UNFCCC and the TEC to be facilitative and encourage platforms, methods and mechanisms for business transactions, IPR transfer and arbitration.

In comments by observers, Martin Khor, South Centre referred to the South Centre's submission, noting the importance of international R&D and underlining the need for technology assessments according to certain criteria.

Joe Bradley, WIPO, noted the relevance of WIPO's work, including in relation to flexibilities around the Agreement on Trade-Related Aspects of IPRs. Yosuke Nakayama, Ministry of Economy, Trade and Industry, Japan, and Jinji Koike, Nomura Research Institute, Japan, reported on a research project relating to the feasibility of the Japanese private sector's contribution to adaptation activities in developing countries, and noted feasibility studies on desert greening technologies and water purification technology using solar energy.

TEC members then discussed: the complexity of issues and the appropriate role of the TEC in this regard; technology assessments; the importance of technology transfer in small and medium companies; division of labor between the CTCN and the TEC; preparation for linkages between the TEC and other UNFCCC bodies such as the Green Climate Fund (GCF) and the Standing Committee on Finance; the need to transmit knowledge from the private sector and researchers to

Parties to the Convention; risks of duplicating already existing mechanisms; the need to involve financial institutions from developing countries; decision-makers' need for simplification; the question of whether technology development and technology transfer should be decoupled; the impact of license fees; and tools for developing countries to assess technologies. One member called for more discussion on capacity building and in-country development of IPR, and another noted that publicly available expired patents can be part of an enabling environment.

In final remarks, Shabalala called for a regulatory approach that would open markets to technology produced in developing countries and suggested that the TEC select an existing IPR arbitration system. He noted that an online system could provide information to buyers and sellers of IPR, while creating a knowledge base for the TEC. Kubo called on the TEC, UN Environment Programme (UNEP), UNDP and Global Environment Facility (GEF) to mainstream technology considerations into development priorities, and reiterated his concern over the absence of national and bilateral development banks at the TEC meeting. Noting that TEC members have backgrounds beyond technology, he called on them to involve the financial community and to be ready to advise the GCF on how best to capitalize technology development and transfer. He urged the TEC to focus on creating enabling conditions and an enabling business environment and on promoting public action where natural markets do not exist. He stressed the importance of technologies being available, affordable, and maintainable. Fischerova underlined the importance of integrating technology transfer in national development planning and the need for a programmatic approach in financing technology, possibly through the GCF. Sagar noted the importance of capacity building for implementation of plans.

CONSIDERATION OF PROGRESS ON THE IMPLEMENTATION OF THE ROLLING WORKPLAN OF THE TEC FOR 2012-2013

INVENTORY OF RELEVANT WORK OF INSTITUTIONS IN THE TECHNOLOGY AREA:

TEC Vice-Chair Pflüger introduced this item, noting that a background paper on experiences and lessons learned from the work of relevant constituted bodies under the Convention was presented at TEC 3, along with a call for inputs that resulted in submissions from 17 organizations. Van der Plas presented a synthesis of submissions, grouped into six key elements based on the TEC's functions: analysis and synthesis; policy recommendations; facilitation and catalyzing; linkages with other institutional arrangements under UNFCCC; linkages with other institutional arrangements outside UNFCCC; and information and knowledge sharing.

In the ensuing discussion, participants expressed appreciation for the submissions and noted that they show opportunities for collaboration with observers and organizations through expert groups, task forces and data sharing, as well as delineating areas of competence and work by others that the TEC need not duplicate. One member called the TEC "the tip of the iceberg" of the overall Technology Mechanism of the Convention. Proposals were made for future work of the TEC, including mapping the interests, activities and involvement of other organizations relative to those of the TEC, creating rosters of expert personnel and institutions for use by the TEC and CTCN, categorizing experts' relevance to specific issues in the TEC's work, extending a call for additional responses, and opening dialogues to identify areas of the workplan where collaboration is possible.

MODALITIES ON LINKAGES WITH OTHER RELEVANT INSTITUTIONAL ARRANGEMENTS:

Vladimir Hecl, UNFCCC Secretariat, presented a background paper on Inventory of relevant work of institutions in the technology area under the Convention (TEC/2012/4/3), which identifies activities within the respective work programmes of the Least Developed Countries Expert Group (LEG) and the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (CGE) that have possible linkages to the workplan of the TEC for 2012-2013, with a view to identifying areas for collaboration. TEC Vice-Chair Pflüger then invited observer organizations' comments.

Mark Radka, UNEP, called for a bold and specific approach in collaborating with observers. Toru Kubo, ADB, identified the need for contributions from other relevant organizations working in developing countries, such as venture funds. Nick Campbell, Business Europe, suggested obtaining company expertise through workshops similar to the IPCC's practice. Angel Valverde, Ministry of Environment, Ecuador, highlighted the importance of continuing the process of developing technology needs assessments (TNAs) as part of country capacity building, because technologies are evolving. Mark Bonner, Global Carbon Capture and Storage Institute, noted that his organization can serve as a gateway to various actors in the field, including governments, business, and civil society.

TEC members then discussed follow-up actions on this agenda item. TEC Vice-Chair Pflüger summarized the discussions, noting calls: for the TEC to respond to observer organizations that made submissions, be more specific in the future in requesting submissions, invite submissions from other relevant sectors, engage in more detailed discussion of the information submitted, and formally invite other bodies under the Convention to send representatives to TEC meetings; and for the Secretariat to look into how to keep a call for submissions open.

TECHNOLOGY ROADMAPS: TEC Vice-Chair Pflüger noted that the TEC's mandate includes catalyzing development and use of technology roadmapping. TEC member Krzysztof Klincewicz presented on the ongoing work by the Committee's Task Team formed on this subject at TEC 3 and Xiaohua Zhang, UNFCCC Secretariat, noted its work on a pilot online inventory of technology roadmaps. Zhang then introduced consultants Marc Londo, ECN, and Elliott More, University of Cambridge, who described the nature, structure and features of technology roadmapping and discussed proposed objectives for a background paper which is to be prepared, public-domain roadmaps, relationships between structure and context, best practices in quality roadmaps, and technology roadmapping examples featuring climate change technologies. They presented tentative recommendations on defining technology roadmapping in the context of the TEC, the advantages and limitations of roadmaps, enabling conditions for roadmapping, existing gaps, and challenges to roadmap development and use. They suggested that the TEC identify priority technologies, support the linking of technology roadmapping to national planning, encourage international donors to support roadmaps, local stakeholders and specific guidelines, and disseminate best practices.

In the ensuing discussion, participants called for identifying positive aspects of existing developing country roadmaps, focusing on adaptation, training TNA experts to participate in roadmapping, connecting countries to institutions providing

planning services, and involving the CTCN in country-driven roadmapping linked to TNAs while the TEC provides broader guidance and tools on technology availability and applications.

Committee members discussed possible criteria for and definitions of technology roadmapping in the context of the TEC, roadmap coherence and consistency with other roadmaps and TNAs, the lack of roadmaps for some technologies and geographies, the value of the TEC's output to the CTCN and other organizations, and roadmapping's importance to realistic development planning.

Questions were raised about the prioritizing of technologies, the timeliness of roadmaps and milestones, the feasibility of global roadmaps for technology development and transfer, the relevance of roadmapping frameworks from partner organizations, the CTCN's role and capacity, the choice of providing roadmap training through COP side events or workshops with partner organizations, and the readiness of TEC to endorse tentative recommendations on roadmapping.

TECHNOLOGY INFORMATION PLATFORM: TEC Vice-Chair Pflüger highlighted the wealth of information available through TT:Clear and noted the ongoing work on a new design for TT:Clear before COP 18 in Doha.

OVERVIEW OF ONGOING WORK AND SUPPORT FOR ACTIVITIES RELATING TO TNAs: Vladimir Hecl presented on the development of the TNA process, noting the second synthesis report on technology needs (FCCC/SBSTA/2009/INF.1).

Mark Radka presented on the TNA project implemented by UNEP and financed by the GEF. He noted the project focuses on building implementation structures in countries, supports the preparation of technology action plans (TAPs), provides technical support on the methodology of the process and tools for assessing needs, and provides guidance, including through the TNA Handbook. As project outcomes, he identified: capacity development, national consensus on priority technologies, methodologies that complement the revised TNA Handbook, regional networks, and increased national and interregional cooperation. He noted that by February 2013 all TNAs and TAPs will be completed, as well as a regional synthesis report, reports on best practices, and a report on participating countries' mitigation and adaptation policies. Among lessons, he noted the importance of the needs assessment process and of networking among countries.

A Committee member emphasized that the TNA process cannot be done in isolation from policy frameworks, and that identified technologies should be the basis for the TEC's discussion and technical papers. A question was also raised as to the follow-up to, or implementation of, TNAs. Participants also discussed the relationship between TNAs/TAPs and technology roadmaps, with Radka noting that the former can be a useful initial step for the latter.

A TEC member enquired about peer review of TNAs, another noting that this is done by countries with UNEP providing a robust process. The Committee also discussed the related key messages to the COP, particularly on the importance of continuing and financing the TNA process, and the relevance of the workshop on TNAs on 10-12 September 2012 in this regard.

In observer comments, Toru Kubo, ADB, underlined the need to focus not only on action plans but also on results and progress. Noting the importance of financing, he suggested keeping an eye on GCF Board discussions.

POSSIBLE TOPICS FOR TECHNICAL PAPERS: Noting that the TEC workplan includes preparation of technical papers to provide policy guidance, TEC Chair Blanco showed

graphs of the sectors and technologies needed for mitigation and adaptation, and of barriers to technology transfer, from a synthesis report prepared by the Secretariat based on a review of 69 TNAs in the first round and needs identified by 39 non-Annex I parties (FCCC/SBSTA/2009/INF.1). He highlighted the needs and barriers most often identified by countries, and asked members whether they felt papers should be more technical or policy-focused.

In the ensuing discussion, TEC members praised the synthesis for presenting the needs identified by developing countries, highlighted the opportunity to address the lack of frameworks for adaptation technology roadmaps, emphasized the need to focus on aspects of enabling environments or barriers that the TEC can influence, and called for the TEC to react to identified needs with multiple briefs framing adaptation technologies in systemic ways useful to policy-makers and technology mechanisms and highlighting key information relevant to climate change such as technologies' CO₂ impact, life cycle and availability. One emphasized the importance of water as a factor in enabling environments.

They also discussed: the underlying purposes of technical papers; the value of existing work such as IPCC reports and the UNEP guidebooks used in the TNA process; the possibility of the TEC addressing the issue of geoengineering; and the questions of how to quantify adaptation impacts, whether to engage the academic, NGO and business communities in considering impacts, and whether the COP might be asked what topics were of greatest interest.

In response to questions on the availability of more detailed information on technology needs and barriers, Hecl explained that the graphs from the synthesis report showed only top-level groupings but said much more detail is available.

Observers urged the TEC to take existing knowledge and contextualize and package it, using bold, visually appealing presentation. Some observers stressed that although the COP and climate ministers are the primary audience, NGOs and the business community are also interested in technical papers from the TEC, again highlighting the issue of geoengineering.

After consultations, TEC Chair Blanco proposed that the Secretariat prepare a literature review on barriers and issue a call for input from observers. He also proposed that a workshop on adaptation technology issues be convened immediately before the next TEC meeting, for which the literature reviews and workshop outcomes would inform discussions on what briefs to prepare and on messages to COP 19.

Members requested that the literature review be available four weeks before the meeting and include examples of technology briefs, highlighted the lack of small island states in the TNAs, and suggested engaging the Adaptation Committee and the LEG. Chair Blanco said the Chairs and Vice-Chairs of these and other relevant bodies will be invited to the next TEC meeting.

DELIVERABLES AND OTHER KEY MESSAGES BY THE TEC TO COP 18

ENABLING ENVIRONMENTS AND BARRIERS TO TECHNOLOGY DEVELOPMENT AND TRANSFER: Under this agenda item, the Committee addressed possible key messages to COP 18 on Friday and Saturday, on the basis of the thematic dialogue on enabling environments and barriers to technology development and transfer at TEC 3 and 4.

In discussions on Friday, one participant noted that "because we don't deliver money, we have to deliver advice," with others agreeing that it is important to provide the right "tease up" when delivering the TEC's first message to the COP, and

to “develop a personality” for the TEC. Some participants called for a cautious approach in recommendations, noting that the TEC is an expert body and should maintain its credibility and base recommendations on sound scientific data.

On the format of the message, suggestions were made to make a list of the TEC’s planned actions and deliver the message at the highest political level of the COP.

Participants also discussed the need to: reflect a synthesis of inputs and discussions; present issues already identified, noting their complexity; address not only mitigation but also adaptation; include technology developed in local communities of developing countries; discuss barriers to technology development and transfer, lessons learned and positive messages; and highlight that “no one size fits all.” Suggestions were also made to include such issues as data management, capacity building in countries, engagement of the private sector, and IPRs, with one participant calling for real life examples of barriers to technology transfer, including IPRs.

On technology assessments, one TEC member suggested assessments of adaptation technologies and another said information from TNAs could also be important. One opined that the TEC is not the right body for assessing technologies, while another said that the TEC’s function of providing an overview of technology transfer includes technology assessment.

Later on Friday, TEC Chair Blanco introduced a list of elements in relation to enabling environments, prepared by the Chairs as key TEC messages to COP 18 in Doha. He noted the list was not comprehensive but was intended to trigger discussion.

Expressing appreciation to the chairs for preparing the list, members suggested making mention of rosters of expert individuals and institutions and financial assistance and called for action-oriented language in the context of development. One proposed broad, positive wording and another urged the TEC to continue soliciting input from observers. Observers highlighted the need to include business in the audience of key messages, and stressed the importance of early finance and cooperation between organizations.

In response to questions from members on possible mention of workshops and issues on which the TEC has held discussions but not yet reached consensus, Chair Blanco and Vice-Chair Pflüger explained that the key messages are a subset of the report of the TEC to the COP and are intended to deal with areas of consensus, but that all discussions would be summarized in the overall report.

On Saturday, the Chairs presented a revised version of the list of elements, and participants discussed the text mainly in terms of clarification and greater specificity. A suggestion was made to incorporate mention of technology assessments.

The Committee adopted its key messages to COP 18, which note that:

- Collaborative research, development and demonstration should be promoted for sharing knowledge and experiences, including through North-South and South-South collaboration, to meet the technology needs of developing countries;
- The capacity of developing countries to assess, absorb and develop technologies needs to be enhanced to address their climate change-related development challenges, taking into account their national circumstances and enabling factors;
- Activities related to the technology cycle, policy and regulatory frameworks and financing should be considered in an integrated manner;

- Engaging the financial and business community, both at the international and national level, at the early stage is crucial to enhance access to financing for the development and transfer of technologies;
- Strengthening national systems of innovation provides an effective and efficient way to enhance national capacity to address climate change;
- The Technology Mechanism of the Convention and other international instruments used to promote technology transfer to developing countries should be clearly aligned with the enabling frameworks that facilitate private and public sector investment; and
- IPRs were identified as an area for which more clarity would be needed on their role in the development and transfer of climate technologies, based upon evidence on a case-by-case basis.

The Committee also noted that enabling environments and barriers to technology transfer are broad, multi-dimensional topics, and further work is needed to inform future deliberations within the TEC.

On next steps, the Committee agreed to undertake the following activities in 2013:

- Continuing the thematic dialogue with relevant stakeholders with a view to broadening the scope of engagement;
- Further mobilizing support and issuing another call for further inputs from stakeholders;
- Analyzing information from various sources, including presentations and discussions during the ongoing dialogue as well as submissions received in response to calls for input;
- Organizing workshops on specific issues to enable in-depth discussion, to elaborate on strategic and policy advice for addressing those issues; and
- Exploring the possibility of developing a technical paper on enabling environments.

TECHNOLOGY ROADMAPPING: On Saturday, TEC Chair Blanco introduced possible key messages to the COP on technology roadmapping. During discussion of the document, participants made suggestions for: more specific and stronger language; explanation of linkages between technology roadmapping and TNAs, TAPs, and nationally appropriate mitigation actions (NAMAs); and reflecting the need to develop generic guidance for countries on how to develop roadmaps. With these proposals, the text was subsequently revised and agreed by the Committee.

In its key messages to the COP, the TEC notes:

- Technology roadmaps provide a coherent basis for international and/or national policies to support enhanced action on development and transfer of technologies to address climate change; and
 - Technology roadmaps can complement efforts and actions undertaken by various stakeholders at international and national levels including TNA, NAMAs and National Adaptation Plans (NAPs), and help to build confidence of stakeholders who need to be engaged from an early stage
- The TEC also agreed that in 2013 it will work to:
- Continue its efforts to improve the inventory of technology roadmaps in collaboration with relevant organizations;
 - Complete the review of technology roadmaps contained in the inventory with a view to identifying gaps and making recommendations to address these gaps;
 - Organize an expert meeting with a focus on technology roadmaps in the area of adaptation to climate change; and
 - Develop practical guidelines and relevant tools for the development and use of technology roadmaps.

TNAS: Possible key messages to COP 18 on this topic were presented by TEC Chair Blanco to Committee members on Saturday. Several participants suggested strengthening the tone of the messages and also noted the importance of financing for the implementation of TNAs.

In its key messages to COP 18, the TEC states that:

- TNAs and their syntheses are a key information source for the work of the TEC for prioritization of activities under the Technology Mechanism of the Convention, and are a rich source of information for governments, business and other stakeholders.
- Development and implementation of TNAs should continue and become integrated with other UNFCCC-related processes including NAMAs and NAPs.
- TNAs are instrumental to support national planning and other development processes and tools.
- There is a need to engage financial and business communities and funding sources under and outside the Convention in order to facilitate the implementation of the TNA outcomes.

REPORT ON ACTIVITIES AND PERFORMANCE OF THE TEC FOR 2012

TEC Chair Blanco explained that the report would cover all the work the TEC has done during the year, the results of its activities, assessment of its performance *vis-à-vis* its workplan, activities expected in 2013, and the TEC's key messages to the COP. Wanna Tanunchaiwatana explained that the report would be prepared by the Secretariat following the order of the workplan and taking note of issues; it would then be circulated to members the last week of September 2012. Comments received by 5 October would be incorporated and the edited report might also be circulated to members before its submission on 15 October. She noted the report is usually due six weeks before the COP for translation. TEC Chair Blanco added that the Chairs and Secretariat would discuss the preparation of other documentation, such as a brochure, for the TEC side event in Doha.

DATE AND VENUE OF THE NEXT MEETING

TEC Chair Blanco informed delegates that the Secretariat would be unable to convene a TEC meeting back-to-back with COP 18 and instead had proposed a meeting in Bonn the last week of February or first week of March, 2013. One member asked the Secretariat to check for any conflicts with the UNEP Governing Council, and the TEC Chair Blanco said conflicts with IPCC meetings would also be checked.

ISSUES FOR FURTHER CONSIDERATION AT THE NEXT MEETING

Noting that a number of issues for the next meeting have already been identified, TEC Chair Blanco asked members about any further issues. One member requested a report from the IPCC on its activities on climate technology issues and suggested the Secretariat report on discussions within the UN system on an overall "facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies," as called for in the Rio+20 outcome document. Tanunchaiwatana responded that input from all UN agencies on this subject has been compiled for consideration by the next session of the UN General Assembly.

The Secretariat also announced that since there may be time constraints for all bodies constituted under UNFCCC to report at COP 18 in Doha, the Secretariat has already reserved a side event slot on Thursday, 29 November, from 13:15 to

14:45 for the Chairs of the TEC to report on its workplan, its progress so far, and its key messages for the COP. They noted that UNFCCC parties are keenly interested in means of implementation, both technological and financial, so any TEC side event is likely to attract attention.

CLOSING OF THE SESSION

At the request of the Secretariat, Radka noted the dates and location of the UNEP-GEF TNA Experience Sharing Workshop, being held on 10-12 September 2012 in Bangkok.

In closing the meeting, TEC Chair Blanco noted that this was his last meeting of the TEC as its Chair and thanked TEC Vice-Chair Pflüger, the Committee members, the Secretariat, and observers. He drew the meeting to a close at 15:36.

UPCOMING MEETINGS

UNEP-GEF TNA Experience Sharing Workshop: This event is taking place from 10-12 September 2012, in Bangkok, Thailand. The workshop's objectives are to: showcase best TNA practices; get feedback from participating countries; enhance capacity of national TNA coordinators; and facilitate interaction between country representatives and the funding community. **dates:** 10-12 September 2012 **location:** Bangkok (Krung Thep), Thailand **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **www:** <http://ttclear.unfccc.int>

Transitions to Low-Carbon Energy Systems: Which Pathways to Energy Access for All? This workshop is organized by the Low-Carbon Energy for Development Network and hosted by the University of Sussex, UK. It is taking place to reflect on the outcomes of the UN Conference on Sustainable Development (Rio+20) and to consider how low-carbon development can simultaneously address energy access, poverty reduction, human development and economic growth. The aim of the workshop is to identify and discuss priority questions that need to be answered to meet the UN goal of "Sustainable energy for all." **dates:** 10-11 September 2012 **location:** Brighton, United Kingdom **contact:** Dr. Rob Byrne **phone:** +44-1273-873-217 **email:** r.p.byrne@sussex.ac.uk **www:** http://www.ukcds.org.uk/event-Transitions_to_low_carbon_energy_systems_which_pathways_to_energy_access_for_all_-1819.html

International Conference on Climate, Water and Policy: This conference brings together climate scientists, water resource managers and other specialists to discuss the impacts of climate change on water resources across four categories: climate variability impacts on water availability and floods at short-term and seasonal time scales; climate change and variability impacts on water security and flood damage at decadal and inter-decadal time scales; dissemination of probabilistic climate and water information for operational planning and decision making; and policy and international cooperation building for adaptation to climate change. **dates:** 11-13 September 2012 **location:** Busan, Republic of Korea **contact:** Jin-Ho Yoo **email:** jhyoo@apcc21.net **www:** <http://www.apcc21.org/eng/acts/int/ann/japcc020701.jsp>

Third Symposium on the Ocean in a High-CO₂ World: This symposium is sponsored by the Scientific Committee on Oceanographic Research, the Intergovernmental Oceanographic Commission of UNESCO, and the International Geosphere-Biosphere Programme. The symposium aims to attract over 300 of the world's leading scientists to discuss the impacts of ocean acidification on marine organisms, ecosystems and biogeochemical cycles. It will also cover socioeconomic consequences of ocean acidification, including

policy and management implications. **dates:** 24-27 September 2012 **location:** Monterey, California, USA **email:** secretariat@scor-int.org **www:** <http://www.highco2-iii.org>

UNU-WIDER Conference on Climate Change and Development Policy: The UN University (UNU)-World Institute for Development Economics Research (WIDER) Conference on Climate Change and Development Policy aims to reflect the diverse range of perspectives on how to balance climate and development objectives. The conference will evaluate how research can inform development policy and identify existing knowledge gaps, focusing on both low-carbon development (mitigation) and climate-resilient strategies (adaptation). **dates:** 28-29 September 2012 **location:** Helsinki, Finland **contact:** Anne Ruohonen **email:** anne@wider.unu.edu **www:** http://www.wider.unu.edu/events/2012-conferences/Climate-change-2012/en_GB/28-09-2012/

Second Workshop on Long-term Finance: The workshop is part of the work programme on long-term finance agreed on at COP 17 with the aim to contribute to on-going efforts to scale up the mobilization of climate change finance after 2012. **dates:** 1-3 October 2012 **location:** Cape Town, South Africa **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** secretariat@unfccc.int **www:** http://unfccc.int/cooperation_support/financial_mechanism/long-term_finance/items/6814txt.php

Pre-COP 18 Ministerial Meeting: This ministerial meeting will be held in preparation for UNFCCC COP 18. **dates:** 21-23 October 2012 **location:** Seoul, Republic of Korea **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** secretariat@unfccc.int

African Sustainable Energy Finance Summer Academy: The Sustainable Energy Finance Academy, to be held in Nairobi, Kenya, within the new framework of the Frankfurt School – UNEP Collaborating Centre for Climate and Sustainable Energy Finance, will provide a comprehensive framework on renewable energy and energy efficiency financing, with a special emphasis on renewable energy in Africa. **dates:** 21-26 October 2012 **location:** Nairobi, Kenya **contact:** Summer Academy Team **phone:** +49-69-154008-692 **fax:** +49-69-154008-4692 **email:** summeracademy@fs.de **www:** http://www.frankfurt-school.de/content/en/consulting/ias/summer_and_winter_academies/sustainable_energy_finance_nairobi.html

Climate Investment Funds Partnership Forum and Associated Meetings: The Climate Investment Funds (CIF) and European Bank for Reconstruction and Development are co-hosting the CIF 2012 Partnership Forum, on 6-7 November 2012, as well as associated meetings. The Forum will provide an opportunity for stakeholders to contribute to deepening global understanding of the linkages between climate change and development as they have been addressed within the context of the CIF. The Forum will be preceded by Pilot Country meetings for all CIF programs (the Clean Technology Fund, the Forest Investment Program, the Pilot Program for Climate Resilience, and the Program for Scaling-Up Renewable Energy in Low Income Countries), from 30 October-1 November, and a Private Sector Forum, on 5 November. **dates:** 30 October - 7 November 2012 **location:** Istanbul, Turkey **contact:** CIF Administrative Unit **email:** cifevents@worldbank.org **www:** http://www.climateinvestmentfunds.org/cif/partnership_forum_2012_home

World Energy Outlook 2012 Launch: The International Energy Agency will launch its flagship publication, the World Energy Outlook (WEO) 2012. The WEO-2012 will include

analysis and insights into global energy market trends and their meaning for energy security, environmental protection and economic development. It will also contain updated forecasts to 2035 of energy production and demand, investment, trade and emissions, broken down by country, fuel and sector. The WEO-2012 will also investigate specific strategic energy issues, including: “golden rules” for the coming “Golden Age of Gas,” an in-depth examination of the value of improving energy efficiency; the increasing importance of the water-energy nexus; climate feedbacks on energy trends; and the 2012 International Year of Sustainable Energy for All. **date:** 12 November 2012 **location:** Paris, France **contact:** Paweł Olejarnik, IEA **phone:** +33-1-40-57-67-57 **email:** pawel.olejarnik@iea.org **www:** <http://www.worldenergyoutlook.org/publications/weo-2012/>

UNFCCC COP 18: COP 18 and the eighth session of the Conference of the Parties serving as the Meeting of Parties to the Kyoto Protocol (MOP 8), among other associated meetings, are scheduled to take place in Doha, Qatar. **dates:** 26 November-7 December 2012 **location:** Doha, Qatar **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** secretariat@unfccc.int **www:** http://unfccc.int/meetings/doha_nov_2012/meeting/6815.php

TEC Side Event at COP 18: The Chairs of the UNFCCC TEC will hold a side event to present on its workplan, progress to date and key messages to the COP. **date:** 29 November 2012 **time:** 13:15-14:45 **location:** Doha, Qatar **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** secretariat@unfccc.int **www:** <http://unfccc.int/ttclear/jsp/index.jsp>

Fifth meeting of the TEC: The fifth meeting of the TEC will be convened in late February or early March 2013. Prior to TEC 5, a workshop to address adaptation technologies will take place **dates:** TBD **location:** Bonn, Germany **contact:** UNFCCC Secretariat **phone:** +49-228-815-1000 **fax:** +49-228-815-1999 **email:** secretariat@unfccc.int **www:** <http://unfccc.int/ttclear/jsp/TECMeeting.jsp>

GLOSSARY

ADB	Asian Development Bank
COP	Conference of the Parties
CTCN	Climate Technology Centre and Network
GEF	Global Environment Facility
GCF	Green Climate Fund
IPCC	Intergovernmental Panel on Climate Change
IPRs	Intellectual property rights
LEG	Least Developed Countries Expert Group
NAMAs	Nationally appropriate mitigation actions
R&D	Research and development
TAP	Technology action plan
TNA	Technology Needs Assessment
TEC	Technology Executive Committee
TT:Clear	Technology Information Clearinghouse under the UNFCCC
UNEP	UN Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WIPO	World Intellectual Property Organization