

## Thirteenth meeting of the Technology Executive Committee

United Nations Campus (AHH building), Bonn, Germany  
6-9 September 2016

### Concept note

## Assessing global technology RD&D financing needs

### I. Background

1. In accordance with its 2016-2018 workplan, activity 4, the Technology Executive Committee (TEC) decided to assess the global technology RD&D financing needs, including options for stimulating private sector investment in RD&D and deploying climate technologies. The agreed deliverables for this activity were a draft concept note for TEC 13 on this topic and input to workplan activities 19, 20, 23 and 24.
2. To support it in undertaking this work, the TEC agreed to undertake its inter-sessional work through a task force. The TEC revised its task force on enabling environments and barriers by broadening its mandate to address innovation and research, development and demonstration (RD&D) activities, and renaming it the task force on innovation and research, development and demonstration.

### II. Scope of the note

3. This background note provides, in its annex, the draft concept note on assessing the global technology RD&D financing needs. This note was prepared by the TEC task force on innovation and RD&D.

### III. Expected action by the Technology Executive Committee

4. The TEC will be invited to take note of the information contained in the concept note and provide guidance to the taskforce on further follow-up activities on RD&D.



## Annex

# Assessing global climate technology RD&D financing needs

Including options for stimulating public and private sector investment in research, development and demonstration and deploying climate technologies

## Draft concept note

### 1. Rationale

*(Note that a detailed overview of climate technology RD&D and the role that it may play to address climate change may be found in the TEC RD&D scoping paper.<sup>1</sup>)*

The global community gives significant importance to technology's role in addressing climate change. In particular, the Paris Agreement reiterates the importance of technology development and transfer in meeting the climate challenge.<sup>2</sup> The Agreement also notes that “accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change...”<sup>3</sup> Furthermore; it calls for support to strengthen cooperative action on technology development and transfer at different stages of the technology cycle.<sup>4</sup> It was against this backdrop that COP 21 requested the Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN) to undertake further work relating to technology research, development and demonstration (RD&D).<sup>5</sup>

RD&D lies at the heart of innovation. It is the process that develops new, improved, and cheaper technologies and demonstrates their utility in the real-world, helping to solve the biggest challenges facing society while unleashing countless opportunities along the way. Since a new technology's ability to displace an incumbent one or create a new market is dependent on costs or performance attributes, the role of RD&D in delivering improvements on these fronts is critical. Indeed, more than 70 developing countries referred to innovation and R&D in their nationally determined contributions (NDCs).<sup>6</sup> Strengthening RD&D is an important element of the effort to advance climate technology innovation. A corollary of this understanding is ensuring that finance is available, accessible and attracted to countries to underpin RD&D efforts.

The TEC can play an important role in helping to advance our understanding of climate technology RD&D financing. It can also provide recommendations to the COP on policy options and actions that enhance climate technology RD&D financing for implementing NDCs, technology action plans and national adaptation plans (NAPs).

### 2. Background and motivation for this work

Our understanding of the current state of climate RD&D financing is incomplete. In the energy sector, the International Energy Agency (IEA) has collected sectoral data on the public energy RD&D (ERD&D) investments of IEA countries going back to 1980. It has also analyzed RD&D financing gaps to reach climate goals. However, in other areas the picture is not as clear. For instance, there is limited data for the agriculture sector. Beintema 2012<sup>7</sup> provides a sense of the overall trends: industrialized countries cutting back RD&D investments,<sup>8</sup> major developing countries increasing theirs and least developed countries lagging behind. For RD&D relevant to adaptation technologies, data is more difficult to come by.

<sup>1</sup> The TEC mandated the secretariat to prepare this paper for TEC 13. See the TEC's 2016-2018 rolling workplan, activity 3.1: <<http://goo.gl/A5U2tV>>.

<sup>2</sup> “Parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions.” Paris Agreement, Article 10.1.

<sup>3</sup> Paris Agreement, Article 10.5

<sup>4</sup> “Cooperative action on technology development and transfer at different stages of the technology cycle” includes RD&D.

<sup>5</sup> Decision 1/CP.21, paragraph 67(a).

<sup>6</sup> Based on an analysis of all INDCs. For further information, see: <<http://goo.gl/YC040d>>.

<sup>7</sup> Beintema, N, G-J Stads, K Fuglie, and P Hei, “ASTI Global Assessment of Agricultural R&D Spending: Developing Countries Accelerate Investment,” International Food Policy Research Institute: Washington, DC (2012).

<sup>8</sup> In the energy sector such countries are now increasing these investments through Mission Innovation.

Furthermore, there are limited publicly-available assessments of private RD&D investments in climate sectors. Undertaking these assessments is not easy, as firm-level RD&D investment data is typically not available disaggregated by objective. An assessment of finance RD&D gaps is also difficult to quantify and is closely connected to (regional) capacities in the relevant technology areas. This is due to both the aforementioned incompleteness of data of existing RD&D and the inability to accurately quantify RD&D financing needs to meet climate objectives. While various articles and reports have called for increasing RD&D investments, especially ERD&D investments, there are diverging views on the extent to which RD&D investments need to increase – and over what timescales.

### 3. Previous UNFCCC work

In the past, within the UNFCCC process, Parties have considered issues related to climate technology RD&D financing. In 2010 the Expert Group on Technology Transfer produced a report on future financing options for enhancing the development, deployment, diffusion and transfer of technologies under the Convention, which explored options for financing RD&D.<sup>9</sup>

### 4. Objectives

The TEC's work could include the following objectives:

#### *(a) Identify climate technology RD&D financing trends and explore the value and impact of enhanced RD&D financing*

This objective is twofold. Firstly it aims to develop a better understanding, based on existing information, of climate technology RD&D financing trends. It will look at broad trends regionally (including among least developed countries and small island developing states) and by different sectors, both for mitigation and adaptation.

Secondly, it aims to explore the value and impact of enhancing climate technology RD&D financing, including by decreasing the costs for wide-scale deployment of climate technologies. It will explore the possible impact that increased climate technology RD&D financing has on greenhouse gas reductions (with the understanding that it is impossible to develop a strong positive correlation between the two). It will also explore the possible impact that such increased financing could have on enhancing resilience to climate change effects. This will be based on a broad statistical analysis, where possible. See also section 6.

#### *(b) Identify possible ways to enhance climate technology RD&D financing to support Parties to achieve the Paris Agreement objectives*

This objective aims to identify possible ways to enhance climate technology RD&D financing, supporting Parties to achieve the Paris Agreement objectives. It may identify options to stimulate and catalyze public and private sector investment in RD&D and deploy climate technologies. It may also identify how these policies and actions may support NDC development and implementation.

Work under this objective will include a look at approaches that stimulate increased investments by traditional actors, such as governments, and early-stage private sector investors.<sup>10</sup> It will also explore how to increase investment by non-traditional actors such as foundations. On the demand side, it will look at approaches that induce or attract RD&D investments such as innovation prizes, favourable tax policies or tariffs, and deployment targets. Such policies and actions will have to consider the different financing required for different RD&D activities: public financing is more likely to target domestic and cooperative (e.g. bilateral) RD&D, while private financing is more transnational in scope. Foundations, by their inherent flexibility, could support other kinds of targeted multi-actor partnerships. It could also look at how to develop coalitions that finance applied research in developing countries and provide technical advisory services for research and science-based approaches. Furthermore, the work will identify approaches that allow for more effective RD&D outcomes for a given level of financial RD&D investment.<sup>11</sup>

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<sup>9</sup> FCCC/SB/2009/2.

<sup>10</sup> For example, as Mission Innovation did by creating a coalition of the willing among governments and the Breakthrough Energy Coalition with private investors.

<sup>11</sup> For example, the United States Advanced Research Projects Agency-Energy (ARPA-E) provides financing for selected high-risk, high-impact areas with greater due diligence and guidance than a standard R&D funding agency.

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*(c) Identify what the UNFCCC process and other actors can do to enhance climate technology RD&D financing, to support Parties to achieve the Paris Agreement objectives*

Through this objective, the TEC may explore the role that UNFCCC could play in enhancing climate technology RD&D financing. For instance:

- An analytical role. By engaging in task (a) above the UNFCCC could work to fill the knowledge gaps about climate technology RD&D financing;
- A convening role. The UNFCCC could play a role in coordinating the process to develop a comprehensive picture of current global climate technology RD&D financing;
- A facilitating role. The CTCN could facilitate interaction and synergies between the plethora of RD&D actors, initiatives and coalitions. The TEC could present successful policy options and actions on climate technology RD&D financing in processes such as the TEP-M and TEP-A;
- An action-oriented role. The CTCN could provide technical assistance to RD&D requests. They could also prioritize requests that support NDC implementation, which could include aspects of facilitating RD&D.

Financial actors such as the Standing Committee on Finance (SCF), the GCF, the GEF, and the multilateral development banks, and private sector finance such as venture capitalists and banks, could also help to enhance climate technology RD&D funding. Through their knowledge and experience in providing financial support and working to enhance climate finance, they would provide valuable insights into how to enhance such efforts. They would also be valuable partners in collaboration efforts with other actors on this issue. Their work on national and regional capacity-building and readiness activities could also enhance climate technology RD&D financing activities. Modalities for interactions between actors could also be explored, for example, through cooperative north-south, south-south and triangular RD&D. It may also be useful to explore possible synergies between various efforts to support RD&D (such as the Breakthrough Energy Coalition, CGIAR, Climate and Clean Air Coalition, CTCN, Mission Innovation and the Technology Facilitation Mechanism). Furthermore, it could be useful to highlight some of the challenges that have plagued multilateral efforts at cooperative RD&D.

*(d) Identify what needs to be done to maintain technological knowledge available for the implementation of sustainable RD&D capacities*

Ultimately, the development of sustainable RD&D capacity is central to effectiveness of RD&D programmes. This requires paying attention to human, institutional, and technological dimensions of this capacity. A detailed exposition of how to achieve this is beyond an effort on RD&D financing, but it is considered in the RD&D scoping paper.<sup>12</sup>

*(e) Develop key messages and recommendations that the TEC can give to the COP to enhance the effectiveness of climate technology RD&D financing, to support Parties to achieve the Paris Agreement objectives*

Key messages and recommendations will serve as key information sources for Parties, government representatives and other stakeholders designing and implementing policies related to climate technology RD&D financing. Such guidance could also identify ways to enhance the effectiveness of related activities of the Technology Mechanism and the Financial Mechanism.

*(f) Identify further TEC work on the issue to support the implementation of the Paris Agreement, in particular Article 10, and accompanying COP 21 decisions*

## 5. Outputs

- (a) Technical paper (see section 6 below for further details).
- (b) Identified possible ways to enhance climate technology RD&D financing. These may also enhance the sustainable availability of RD&D knowledge, including structural arrangements. It may include options for stimulating and catalyzing public and private sector investment in RD&D, enhancing the effectiveness of RD&D efforts, and developing strategies for deploying climate technologies in developing countries. It may also highlight how these efforts may support NDC development and implementation (see section 6 below for further details).
- (c) Key messages and recommendations to the COP on how countries, the UNFCCC process and other actors can enhance climate technology RD&D financing.

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<sup>12</sup> The TEC mandated the secretariat to prepare this paper for TEC 13. See the TEC's 2016-2018 rolling workplan, activity 3.1: <<http://goo.gl/A5U2tV>>.

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- (d) TEC Brief to disseminate the results to key stakeholders. Undertaken with the view to applying the results to contribute to meeting the Paris Agreement objectives.
- (e) List of further TEC activities on the issue to support the implementation of the Paris Agreement.

## 6. Activities

### *Objectives 4(a) and 4(b)*

- Technical paper. Prepare a technical paper on global climate technology RD&D financing, based on existing data and literature. Specifically, the paper will:
  - (i) Identify climate technology RD&D financing trends. It will look at broad trends regionally (including among least developed countries and small island developing states) and by different sectors, both for mitigation and adaptation;
  - (ii) Explore the value and impact of enhancing climate technology RD&D financing, including by decreasing the costs for wide-scale deployment of climate technologies. It will explore the possible impact that increased climate technology RD&D financing has on greenhouse gas reductions (with the understanding that it is impossible to develop a strong positive correlation between the two). It will also explore the possible impact that such increased financing could have on enhancing resilience to climate change effects. This will be based on a broad statistical analysis, where possible;
  - (iii) Highlight, based on sections (i) and (ii), possible ways to enhance climate technology RD&D financing.

### *Objectives 4(c), (d), (e) and (f)*

- Event. Organize a workshop/thematic-dialogue/forum on trends in, impacts of, and ways of enhancing climate technology RD&D financing. This event will explore how UNFCCC bodies and processes may enhance climate technology RD&D financing. It will also consider how this may be achieved in collaboration with other initiatives under and outside the Convention, including coalitions and those that have made pledges under the Lima-Paris Action Agenda.
- Key messages. Based on the event above, develop key messages and recommendations to the COP on how the UNFCCC process may enhance climate technology RD&D financing. Include these in the final version of the technical paper.
- TEC Brief. Translate the key findings from the technical paper into a TEC Brief for wider dissemination.

## 7. Beneficiaries and partners

Primary beneficiaries from this work include Parties, government representatives, UNFCCC processes (such as technology needs assessments, technology action plans, NAPs, NAMAs, TEP-M, and TEP-A), and decision-makers supporting NDC development and implementation. It could also include the CTCN, the GCF, the GEF, multilateral development banks, NDEs, the private sector, RD&D development partners and investors, and RD&D practitioners.

Key partners in the TEC's work identified in 6(a) and 6(b) above may include: academic researchers and analysts, Adaptation Committee, Bloomberg New Energy Finance, Breakthrough Energy Coalition and other private investors, CGIAR, CTCN R&D task force, Food and Agriculture Organization of the United Nations, foundations, GCF, GEF, IEA, International Food Policy Research Institute, International Renewable Energy Agency, Mission Innovation, Parties, SCF, Red Cross, Technology Facilitation Mechanism, World Bank International Finance Corporation, World Health Organization, United Nations Conference on Trade and Development, UN Least Developed Country Technology Bank, and partners in the UNFCCC Action Agenda, including pledges from the Lima-Paris Action Agenda.

## 8. Dissemination

The TEC agreed that the outputs from this concept note will serve as input into activities 19, 20, 23 and 24 of the TEC's 2016-2018 rolling workplan.<sup>13</sup> It can also serve as an input into activity 3 of the workplan. The dissemination of the TEC's work should be to all kinds of stakeholders. It should be undertaken in a coordinated way to assist building consensus on effective RD&D financing and thus creating more long-term certainty and a clearer roadmap for coordinated engagement of investors, researchers and related knowledge management systems.

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<sup>13</sup> See: <<http://goo.gl/A5U2tV>>.