Framework Convention on Climate Change

TEC/2023/26/7

Technology Executive Committee

07 March 2023

Twenty-sixth meeting

21–23 March and 24 March 2023 (TEC-CTCN Joint session)

Survey on Future Needs of Cleantech Research, Development and Demonstration

Concept note

I. Background

1. At TEC25, the TEC agreed on its rolling workplan for 2023–2027, as part of the first joint work programme of the Technology Mechanism.[1] Under this workplan, the TEC identified the Future Cleantech Architects as a potential partner for its Workstream 1: National Systems of Innovation and Collaborative Research, Development and Demonstration and General-Purpose Technologies, and specifically for "A.2 Stimulate climate technology RD&D through partnerships, strengthening the roles of innovators and incubators and accelerators, and the participation of developing country Parties in collaborative approaches to RD&D".

2. As per activity A.2.1 of the TEC rolling workplan for 2023–2027, the TEC is to seek engagement and consult potential partners inter alia, during the TEC meetings, workshops and events to: define the scope of the TEC work on RD&D for high-impact emission-reduction technologies to help countries implement their NDCs and other mitigation strategies, and ensure long-term environmentally sustainable energy supply; an identify ways to increase participation of developing country Parties in collaborative approaches to RD&D.

3. Since the launch of its rolling workplan for 2023–2027, the TEC Chair and Vice-Chair with support from the secretariat has engaged with Future Cleantech Architects (FCA), with a view to advance work under this activity. Consequently, a draft concept note for a survey to achieve a comprehensive overview of the current and future global RD&D needs to fundamentally decarbonize human activity in line with the targets of the Paris Agreement was developed by FCA.

II. Scope of the note

4. The annex to this note contains the draft survey to seek input on current and future global RD&D.

5. This survey addresses one of the recommendations of the results of the TEC's *2021 Compilation of Good Practices and lessons learned on international collaborative RD&D initiatives of climate technology*. This survey will help provide a needs-assessment for further and future RD&D at the global, regional and national scale.

III. Expected action by the Technology Executive Committee

6. The TEC will be invited to consider the concept note and provide guidance, in on further work on this matter, including feedback to the draft survey questions and dissemination of the results.

[1] Joint Work Programme of the UNFCCC Technology Mechanism for 2023–2027.

Annex

Draft Survey on Future Needs of Cleantech RD&D

I. Background

1. The IEA's 2019 report on "Innovation Gaps – Key long-term technology challenges for research, development and demonstration" estimates that more than 50% of technical innovations needed to reach net-zero by 2050 either do not yet exist or are not on track. The acceleration of RD&D in critical sectors is imperative to ensure these tech gaps are closed on time.

2. Future Cleantech Architects is a multi-disciplinary climate innovation think tank with a focus on high-impact R&D, targeting technologies that carry the potential to drive down greenhouse gas emissions in key sectors massively. The focus on promoting and developing technologies to close the innovation gaps needed to reach net-zero by 2050 led FCA to complete a first comprehensive expert survey on the future needs of cleantech R&D in 2021 with structured feedback from 114 expert participants worldwide. Experts were specifically asked to identify gaps remaining in the development of technologies and processes that have the potential to help reduce emissions quickly, thereby effectively tackling the climate challenge. Participants shared their view on funding priorities for three time periods using an interactive online survey: 2021-2025; 2026-2030; beyond 2030.

3. The survey allowed participants to rank the importance of various cleantech segments on a scale from 1 (most important) to 10 (least important) within certain time periods. A second section of the survey provided the option to add segments that were not listed and elaborate on more visionary ideas – beyond 2030 – and the best political measures they would recommend to quickly develop and scale those segments.

4. The Rolling Workplan of the Technology Executive Committee for 2023–2027 identifies FCA as a potential partner for activity A.2 "Stimulate climate technology RD&D through partnerships, strengthening the roles of innovators and incubators and accelerators, and the participation of developing country Parties in collaborative approaches to RD&D". Activity A.2.1 reads as follows:

> *RD&D: Building on the TEC's work on collaborative RD&D, analyse the needs for RD&D for high-impact emission-reduction technologies to help countries implement their NDCs and other mitigation strategies, and ensure long-term environmentally sustainable energy supply. Identify ways to increase participation of developing country Parties in collaborative approaches to RD&D.*

5. A virtual meeting in January of 2023 between members of FCA and the Technology Executive Committee (TEC) Chair and Vice Chair to discuss possible future collaborations identified a sequel of the 2021 survey as one such potential action as pertaining to activity A.2.1.

II. Purpose/Objective of the Survey

6. The objective of the survey is to achieve a comprehensive overview of the current and future global RD&D needs to fundamentally decarbonize human activity in line with the targets of the Paris Agreement. The results of the TEC's 2021 Compilation of Good Practices and lessons learned on international collaborative research, development and demonstration initiatives of climate technology identify 5 key recommendations for strengthening collaborative RD&D.

7. Recommendation 2 is to "facilitate flexible and evolving participation of countries in line with national needs and capacities" (p. 59). One of the goals in designing survey will be to do so in such a way that the results can help provide a needs-assessment for current and future RD&D both an a global, but importantly also on a regional, national scale. Be enabling a differentiated analysis of global vs. specific regional needs, the survey hopes to contribute to "identifying (and regularly updating) thematic areas in line with member country priorities" (p. 55).

III. Scope of the Survey

8. Whereas the first iteration of the survey had a decidedly European scope and focus, the proposed sequel will incorporate a global approach in the conduct of the survey in order to identify specific needs and priorities on both a global and regional scale. In order to expand the survey's reach, FCA proposes a collaboration with the Technology Executive Committee pertaining to the design and circulation of the survey, and dissemination/uptake of its findings.

9. While the core focus of FCA's work is centered around innovative technologies for mitigation action, we recognize the intrinsic relationship between adaptation and mitigation. In order to properly account for both adaptation and mitigation needs, however, it is suggested that the survey be repeated annually, with the focus shifting from adaptation to mitigation technologies on a bi-annual basis.

10. Finally, the specific technologies included in the previous survey questions (see VI. Annex) were chosen to reflect the areas deemed most important at the time. The included technology segments in the updated survey have been re-evaluated and updated together by TEC and FCA in a brainstorming session in mid-February.

IV. Deliverables

11. FCA has prepared a draft of the survey based on a joint brainstorming session with the TEC in February of 2023. The draft questions resulting from this session can be found in the Annex of this concept note. Once the design and specific content of the survey has been agreed upon, FCA will create the virtual survey. Taking into consideration the requirements of the survey tool, Typeform has been identified as the current forerunner. First tests-runs on Typeform have yielded satisfactory results and can be made available to the TEC at any time. Finally, FCA proposes a collective circulation campaign aimed at experts working in cleantech globally.

12. Possible products resulting from the survey could be:

- A report on the findings accompanied by a media campaign
- A number of panels/actions showcasing the results at various suitable conferences and events
- The establishment of a guideline detailing potential annual/biannual reiterations of the survey
- Presentation of the interim results/results by the TEC and FCA at both The ARC23 and COP28

V. Timeline

13. The table below shows a tentative timeline of the work and deliverables as well as potential opportunities for joint showcasing of the results.

No.	Deliverable	Timeline
1	First draft of survey + survey design	February – March 2023
2	Finalization of survey based on feedback on the first draft	March – April 2023
3	Publication of survey accompanied by joint dissemination campaign	April-July 2023
4	Possible Presentation of survey and intermediate results (informal consultation) at The ARC23 in Remscheid, Germany	6–7 June 2023
5	Finalization of results and consultation on final report	August 2023
6	Presentation of results at TEC27 meeting	September 2023
7	Possible Presentation of final report at COP28	December 2023

VI. Draft Questions 2023 RD&D Survey

1. Which professional field are you in?

    - Industry; Public-sector; Start-up; NGO; Finance & Investors; Researcher; Other (please specify);

2. What region/country of the world are you located in?

- Drop-Down Menu;

3. Does your country have a coastline?

- Yes; No;

4. What is the overall environment for cleantech RD&D globally right now?

- Likert scale;

5. Compared to this, how is the overall environment for cleantech RD&D in your region?

- Likert Scale;

6. Let us first take a look until 2030. Where do we need to accelerate RD&D most urgently globally?

- Please rank from most to least urgent;
- Storage; CCUS; DAC; Zero Carbon Fuels; Clean electricity generation; Industrial processes (e.g. steel, cement); Other (please specify).

7. Again, looking to 2030: Where do we need to accelerate RD&D most urgently in your region?

- Please rank from most to least urgent;
- Storage; CCUS; DAC; Zero Carbon Fuels; Clean electricity generation; Industrial processes (e.g. steel, cement); Other (please specify).

8. Let us now look towards 2035. Where do you see the biggest RD&D needs from 2030 to 2035 globally?

- Please rank from most to least urgent;
- Storage; CCUS; DAC; Zero Carbon Fuels; Clean electricity generation; Industrial processes (e.g. steel, cement); Other (please specify).

9. Once more looking towards 2035: Where do you see the biggest RD&D needs from 2030 to 2035 in your region?

- Please rank from most to least urgent;
- Storage; CCUS; DAC; Zero Carbon Fuels; Clean electricity generation; Industrial processes (e.g. steel, cement); Other (please specify).

10. What are the key elements for successful cleantech RD&D?

- Multiple Choice;
- Financial support; Knowledge sharing; Human capital; Political buy-in; Other (please specify).

11. Let us look at cleantech innovation stages: At which step do we lose a lot of the most promising developments?

- Multiple Choice;
- Lab phase; Prototyping; Financing (research); Large-scale deployment; Financing.

12. What do you consider the 3 biggest roadblocks in advancing the development of critical breakthrough cleantech globally?

- Multiple Choice;
- TBD.

13. What do you consider the 3 biggest roadblocks in advancing the development of critical breakthrough cleantech in your region specifically?

- Multiple Choice;
- TBD.

14. If you have the funding and the technology is available: What stops you from scaling up in your region specifically?

- Multiple Choice;
- Political support; Demand; Legislations; Bureaucracy; Other (please specify).

15. What role should the public sector play?

- Multiple Choice;
- Provide long-term planning security; Reduce bureaucracy; Provide early-stage financing; Perform green public procurement; Internalize CO2-costs; Bring together different stakeholders.

16. If you could wish for three measures to speed up the development of breakthrough cleantech in your region, which would they be?

- Multiple Choice;
- TBD.

Optional Expert Section

17. Do you consider yourself an expert in one of the following cleantech fields?

- Storage; CCUS; DAC; Zero Carbon Fuels; Clean electricity generation; Industrial processes (e.g. steel, cement); Mobility; Other (please specify).

18. What do you consider to be the 3 biggest roadblocks in advancing the development of critical breakthrough cleantech globally in your field of expertise?

- Multiple Choice;
- TBD.

19. In your sector, which key stakeholder could speed things up the most and how?

- Open Answer.